

# INTEL® PRODUCT QUICK REFERENCE MATRIX

Intel<sup>®</sup> Product Quick Reference Matrix **Q3 2018** 

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Intel<sup>®</sup> Product Quick Reference Matrix **Q3 2018** 



# INTEL® TECHNOLOGY PROVIDER

Intel<sup>®</sup> Product Quick Reference Matrix **Q2 2018** 

### YOUR SOLUTIONS. OUR TECHNOLOGY. SMARTER TOGETHER.

### INTEL® TECHNOLOGY PROVIDER

Intel<sup>®</sup> Technology Provider provides support to keep your business running smoothly, knowledge and expertise to provide an edge and rewards to grow your business.

### **ONLINE RESOURCES**

Access a number of online resources designed to help provide the right solutions for your customers and grow your business.

### **ONLINE TRAINING**

Access a wide range of online courses that include in-depth technical, business and technology specific training. Earn credits as you learn more.

### **INTEL® TECHNOLOGY PROVIDER**



### Your Solutions. Our Technology. Smarter Together.

Whether selling to businesses or consumers, Intel<sup>®</sup> Technology Providers get the competitive advantage. Access your many benefits as you progress through the program, receiving the support, expertise, and recognition you need to succeed in a fast-moving global marketplace.

SUPPORT	EXPERTISE	RECOGNITION	
Grow your bottom line with sales and marketing tools dedicated to Intel Technology Providers.	Become a trusted advisor to your customers with training, events, newsletters, and online guides.	Be recognized for the business you do with Intel. Earn points on purchases to spend on rewards and access promotions and membership materials.	



### Helping You Succeed, with These Partner Benefits:



Platinum tier members may be eligible to

drive sales and solutions, stay ahead of

work with an account manager to help you

industry trends and alert you to the latest

ACCOUNT MANAGEMENT

opportunities.



Greater performance brings greater

rewards. All partners can earn points

while Gold and Platinum partners can

spend points on Intel<sup>®</sup> technology, events



Access to the latest online and face-to-

TRAINING

face training courses.



Invitations to annual partner-only events

other top ecosystem partners as well as

offering the latest product information

and the opportunity to network with





Targeted sales and marketing solutions to boost sales and grow your business.

PRIORITY TECHNICAL SUPPORT

Priority support for Platinum partners via chat, email, or phone, and advanced warranty service. NEW - Intel Support App. Submit support tickets from your mobile device.

### For more information, visit www.intel.com/technologyprovider

POINTS

and more.

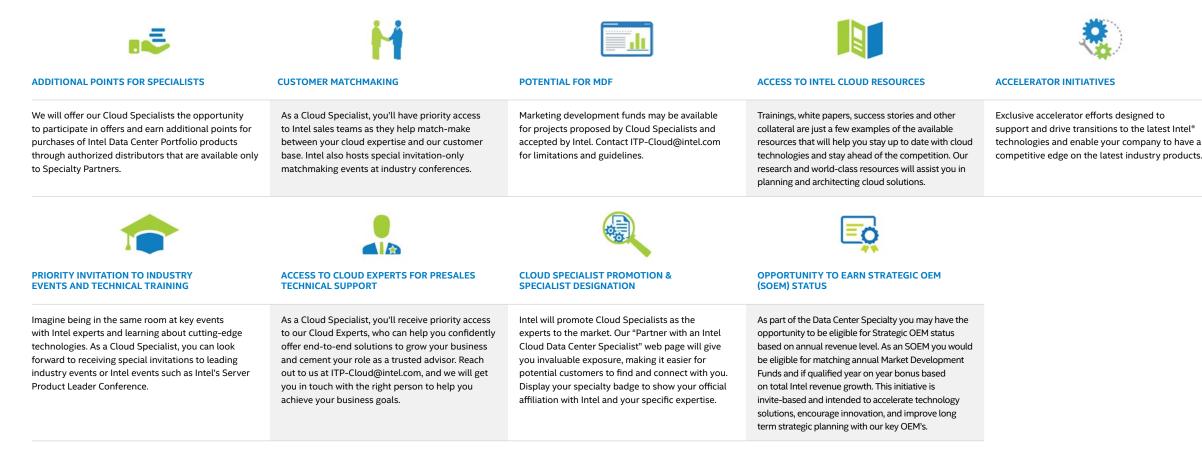
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EVENTS

Intel executives.

### Earn specialty benefits and gain exclusive, partner-only resources to help you plan, build, and deploy your cloud data center solutions.

The Cloud Data Center Specialty aims to reward Partners who have the deepest expertise in designing and deploying cloud solutions. Intel has exclusive resources available to you, through Cloud Data Center Specialty Benefits, to help you plan, implement and deliver your data center solution, opening the door to another level of engagement with Intel on cloud.

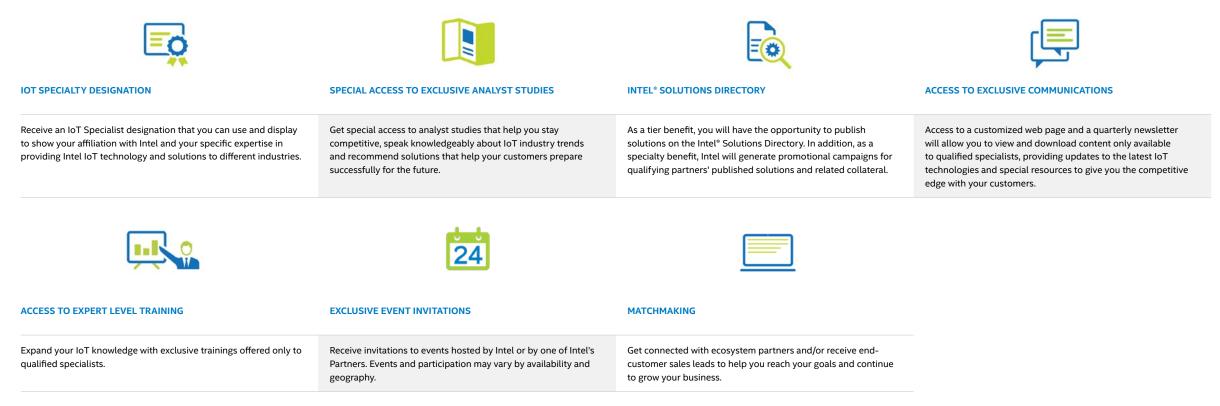


### For more information, visit www.intel.com/technologyprovider/hpc

## **SPECIALTY BENEFITS FOR INTERNET OF THINGS (IOT) SPECIALISTS**

### Maximize Your Membership With Benefits for IoT Solutions Providers

IoT specialty benefits give you exclusive, partner-only resources to help you plan, implement and deliver your IoT solutions with optimal performance and rapid efficiency. Leverage your expertise as an IoT solutions provider to unlock your specialty benefits. Displaying your IoT Specialist badge — on business cards, marketing materials, your website and more — provides third-party validation of your expertise. Stay ahead of your competition with partners-only resources and training opportunities. Make new connections and access resources that can propel your growth by working with IoT solutions providers including ODMs, ISVs, distributors and more.

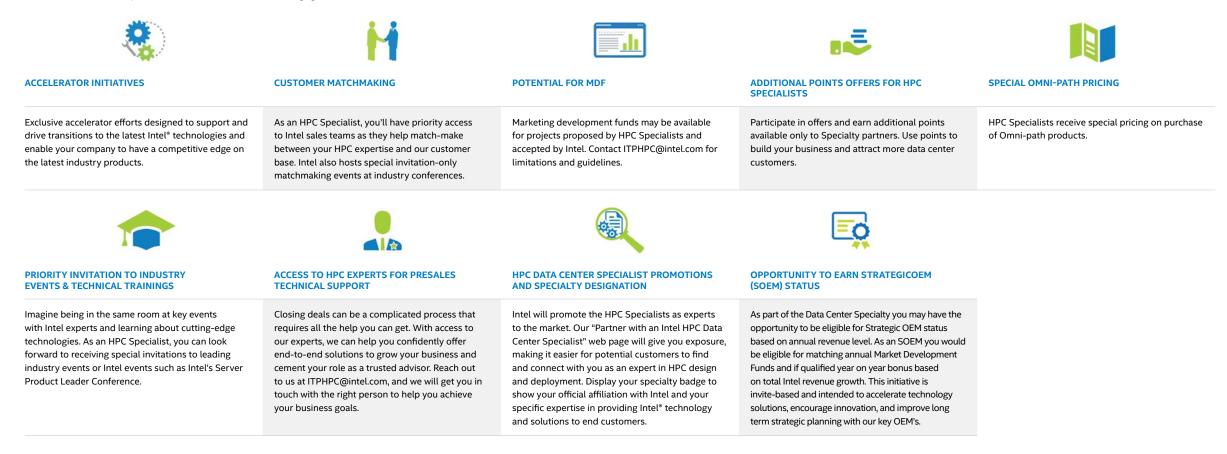


### For more information, visit www.intel.com/technologyprovider/iot

### HIGH-PERFORMANCE COMPUTING (HPC) DATA CENTER SPECIALTY BENEFITS

### Earn specialty benefits and gain exclusive, partner-only resources to help you plan, implement, and deliver your data center solutions.

Intel has preferred resources available to you through HPC Data Center Specialty Benefits to help you plan, implement and deliver your data center solution. This includes access to special members-only training and events. These resources will open the door to another level of engagement with Intel on HPC.

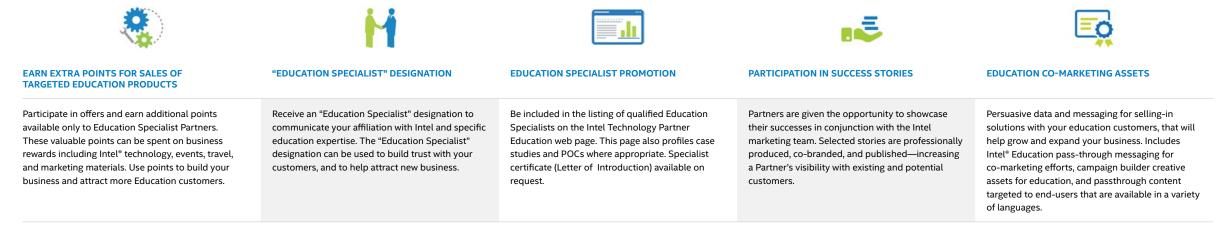


### For more information, visit www.intel.com/technologyprovider/hpc

### **EDUCATION SPECIALTY BENEFITS**

### Maximize your membership with Education Specialty Benefits

In addition to the education-specific tier-level benefits, Partners can qualify to unlock even more powerful Education Specialty Benefits.<sup>1</sup> To qualify, Partners must first meet the criteria for membership status, sales volume, and training. These Specialty Benefits help give education Partners a competitive advantage in supplying complete solutions to their new and existing customers.



### For more information, visit www.intel.com/educationchannel

<sup>1</sup> Benefits may vary by geography.

### **ENTHUSIAST PC SPECIALTY BENEFITS**

### Get Assets, Promotion and Unique Benefits to Help You Differentiate and Succeed

Enthusiast PC specialty benefits give you exclusive, partner-only resources to help you excel, differentiate and accelerate in the enthusiast market segment. Get access to valuable benefits designed and tailored for channel partners selling and promoting finished systems based on Intel® Core™ X, K, H series.



### For more information, visit www.intel.com/enthusiastpc

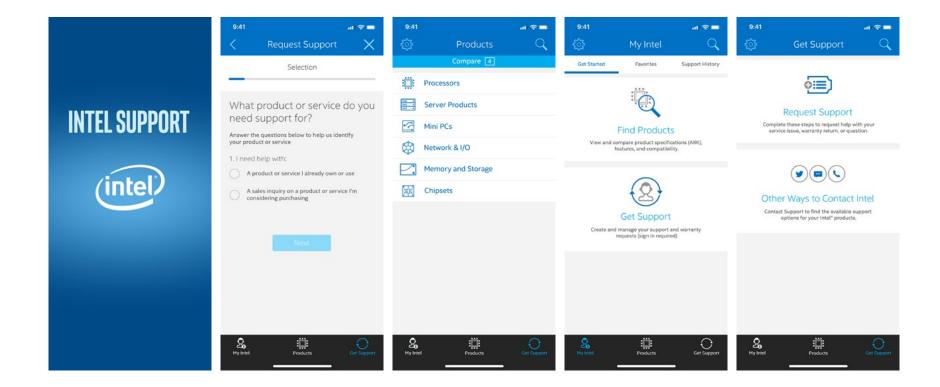
### **INTEL<sup>®</sup> SUPPORT APP**

### Intel<sup>®</sup> Support App

The Intel<sup>®</sup> Support smartphone app allows customers to submit support requests through their mobile device and access product specifications.

- An easy and simple smartphone application that allows customers to submit new support requests, check the status of active requests, or view their support history.
- Product specification tool replaces the former ARK mobile app.
- Gives customers a more personalized experience, and provides more control over where, when, and how they engage with Intel Customer Support.
- Future enhancements will include the ability to submit warranty claims, bar code scanning, and chat directly with a support agent from your mobile device.
- Available on iPhone\*, iPad\*, and Android\* mobile devices.

### AVAILABLE FOR DOWNLOAD ON THE APPLE APP STORE & GOOGLE PLAY





# INTEL® VPRO TECHNOLOGY SOLUTION

Intel<sup>®</sup> Product Quick Reference Matrix **Q3 2018** 



### THE INTEL<sup>®</sup> VPRO<sup>™</sup> PLATFORM

The Intel® vPro<sup>™</sup> platform<sup>1</sup> meets the needs of the user and the business by combining a premium computing experience with hardware-enhanced security, flexible management, and improved stability—all made possible by 8th Generation Intel® Core<sup>™</sup> vPro<sup>™</sup> processors.

<sup>1</sup> Intel<sup>®</sup> technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at http://www.intel.com.

### THE ADVANTAGES OF INTEL® VPRO PLATFORMS FOR BUSINESS OF ALL SIZES

Refresh your desktop fleet with the latest 8th Gen Intel® vPro™ processors to unlock performance and productivity, enhanced security and improved capabilities. The new 8th Gen Intel® vPro™ processors with up to 6 Cores provide exceptional performance and responsiveness leveraging Intel® Optane<sup>™</sup> Memory technology. This is the first 6-core Intel® vPro<sup>™</sup> processor for Mainstream computing with enhanced hardware security and advanced remote manageability. The new 8th Gen Intel® vPro™ platform is Intel's Best-In-Class business platform.





# 31%

### **Up to 31% Better Productivity** Performance vs 7th Gen <sup>1,2,4</sup>

Premium performance enables things like - robust content creation, analyze data using Microsoft\* Office products up to 31% faster than a 7th Gen PC

**Sales Opportunities** 





### Up to 41% Faster Multi-Tasking vs 7th Gen <sup>2,5,6,7,8,9</sup>

Collaborate with teammates while also working on multiple Microsoft Office applications faster than a 7th Gen PC



Up to 10 Hours Battery Life <sup>3</sup>

Enjoy up to 10 hours battery life to analyze data and create content while conducting research on the web



### Processor

Intel<sup>®</sup> Core<sup>™</sup> i7 and Intel<sup>®</sup> Core<sup>™</sup> i5 vPro<sup>™</sup> Processors





Mobile OR Chipset

Intel<sup>®</sup> O Series Chipset

Intel<sup>®</sup> OM Series Chipset





Network

Intel<sup>®</sup> LAN Controller

Nearly half (46%) of small businesses are in a managed environment, and drive 62% of small business IT spending.\*\*

Devices powered by Intel<sup>®</sup> Core<sup>™</sup> vPro<sup>™</sup> processors deliver proven value with reduced repair times and improved system availability.

Intel vPro technology is supported by a broad set of ISV management consoles and a wide variety of devices.

\*\* Source: AMI-Partners (http://www.ami-partners.com) 2013. For more complete information about performance and benchmark results, visit www.intel.com/benchmarks

### 8th Generation Intel<sup>®</sup> Core<sup>™</sup> vPro<sup>™</sup> Processors

#### BUSINESS-CLASS PERFORMANCE YOU CAN COUNT ON

Streamline productivity with performance for serious business compute, multitasking for maximum efficiency, and unprecedented battery life that lasts up to 10 hours.



### Lighten your heaviest workloads

When finance crunches complex calculations, developers compile precise code, and designers manipulate sophisticated graphics, the premium performance of new 8th Intel<sup>®</sup> Core<sup>™</sup> vPro<sup>™</sup> processors give uptime a whole new meaning.

From Excel macros to CAD animations, Intel® Hyper-Threading Technology handles demanding applications by running multiple threads on each core to deliver cutting-edge responsiveness for serious business compute.



### Take the task out of multitasking

Trying to do more than one thing at a time on old technology is a productivity drain, not a driver.

Keep business running smoothly with new 8th Generation Intel<sup>®</sup> Core<sup>™</sup> vPro<sup>™</sup> processor-based devices that have Intel<sup>®</sup> Speedshift<sup>™</sup> Technology for steady load balancing across highly demanding workloads.

Performance automatically adjusts to focus frequencies where they're needed most, while applications running in the background reserve power.



### Unleash real mobile productivity

From improving interactions with patients to delighting customers on the sales floor, modern business is all about mobility and long battery life is central to this transformation.

Make your workforce more productive from anywhere, anytime with the endurance of new 8th Generation Intel<sup>®</sup> Core<sup>™</sup> vPro<sup>™</sup> processorbased devices, which provide up to 10 hours of untethered power to last the entire work day.

### For more information, visit www.intel.com/go/vpro

#### **Refresh Configurations**

Intel® Core<sup>™</sup> i5-8350U (Intel Reference Platform), 15W, 4C8T, Turbo up to 3.6GHz, Memory: 2x4GB DDR4-2400, Storage: Intel® 6000p SSD, Graphics: Intel® UHD Graphics 620, OS: Windows\* 10 Intel® Core<sup>™</sup> i5-3427U, 15W, 2C4T, Turbo up to 2.8GHz, Memory: 2x4GB DDR3-1600, Storage: 80GB SSD, Graphics: Intel(®) HD Graphics 4000, OS: Windows\* 10

#### **Gen-on-Gen Configurations**

Intel® Core<sup>™</sup> i7-8650U (Intel Reference Platform), 15W, 4C8T, Turbo up to 4.2GHz, Memory: 2x4GB DDR4-2400, Storage: Intel® 6000p SSD, Graphics: Intel® UHD Graphics 620, OS: Windows\* 10 Intel® Core<sup>™</sup> i7-7600U (Intel Reference Platform), 15W, 2C4T, Turbo up to 3.9GHz, Memory: 2x4GB DDR4-2400, Storage: Intel® 6000p SSD, Graphics: Intel® UHD Graphics 620, OS: Windows\* 10

#### **Battery Life Configuration**

Intel® Core™ i7-8650U Processor (Intel Reference Platform), 15W, 4C8T, Turbo up to 4.2GHz, Memory: 2x4GB DDR4-2133, Storage: Intel 540s m.2 SSD, Graphics: Intel UHD Graphics 620, OS: Windows\* 10, Battery Size: 42WHr, Screen: 25x14 12.5", Windows 10 Power Slider – Better Performance

#### Workloads

- <sup>1</sup> SYSmark\* 2014 SE: SYSmark\* 2014 SE is a benchmark from the BAPCo\* consortium that measures the performance of Windows\* platforms. SYSmark 2014 SE tests four usage scenarios: Office Productivity, Media Creation, Data/Financial Analysis, and Responsiveness. SYSmark contains real applications from Independent Software Vendors such as Microsoft\* and Adobe\*.
- <sup>2</sup> Office Productivity and Multitasking Workload: Slack is open in the background while a 2.28 MB, Microsoft PowerPoint .ppt presentation is exported as a 1920x1080 H.264 .mp4 video presentation. While the video presentation is being created 1) a 6.49 MB, 844 page, Microsoft Word .docx document is converted to a 7.98 MB, PDF file and 2) a 70.4 MB, .Microsoft Excel .xlsm macro-enabled worksheet that is recalculated.
- <sup>3</sup> EMBC Browsing Bench Component Average Power (projected on Intel Reference Platform using a 42WHr battery and 25x14 Panel): Disconnect all USB devices, connect to a local WiFi access point and set the screen brightness to 200 nits (disable DPST, set brightness to 200 nits on a white background and enable DPST). Wait for 10 mins for the OS to completely idle and then launch EEMBC Browsing Bench using Microsoft<sup>®</sup> Edge Browser. Set the web pages to idle for 20s in between page loads. Measure power for the duration of all page loads and report 3 run median.
- <sup>4</sup> Large numerical calculation workload: uses the Black-Scholes model to execute approximately 300,000 iterations of the Monte Carlo simulation in Microsoft\* Excel\* 2016. It also uses Excel lookup functions to compare the Black-Scholes model's put price with the historical market price for 50,000 rows to understand the convergence, creating a spreadsheet file larger than 70 MB.
- <sup>5,6</sup> WebXPRT\* 2015 (<sup>5</sup> Stock Option Pricing Subscore, <sup>6</sup> DNA Sequencing Subscore: benchmark from Principled Technologies\* that measures the performance of web applications using six usage scenarios. Photo Enhancements, Organize Album, Local Notes, Stock Option Pricing, Sales Graphs, and Explore DNA Sequencing. WebXPRT tests modern browser technologies such as HTML5 Canvas 2D, HTML5 Table, HTML5 Local Storage, as well as JavaScript\*. Reported metrics: elapsed time in seconds (lower is better) for each scenario, plus an overall score (higher is better). Scaling efficiencies: CPU dominant (newer browsers are GPU accelerated), sensitive to frequency. WebXPRT is very sensitive to browser type and version. OS support: Any OS that supports an HTML5 browser.
- <sup>7</sup> Microsoft\* PowerBI Data Source Change Workload: Measures the time to load, query, calculate statistics, and draw 6 charts from a different local data source containing 2.2 million sales records
- <sup>8</sup> Dataset JOIN query workload: Measures the time to perform a multi-table SQL JOIN query in Microsoft\* Access 2016 on a sample dataset containing 2.2 million sales records to create a quarterly sales summary.
- <sup>9</sup> File Compression (Zipping) workload: Measures the time to compress 50 files totaling 118MB using WinZip\* v22.
- \* Other names and brands may be claimed as the property of others.



# INTEL® IOT PLATFORM

Intel<sup>®</sup> Product Quick Reference Matrix **Q3 2018** 

## ENABLING A Connected Digital Lifestyle

### INTEL<sup>®</sup> IOT PLATFORM

The Intel<sup>®</sup> IoT Platform is a reference architecture implemented using products and technologies from Intel, along with developers and the ecosystem that seamlessly and securely connect and manage devices, deliver trusted data to the cloud, and deliver value through analytics.

# INTEL® IOT PLATFORM

### Enabling a connected digital lifestyle through devices that are able to connect to the internet securely.

The Intel® IoT Platform is a reference architecture implemented using products and technologies from Intel, along with developers and the ecosystem that seamlessly and securely connect and manage devices, deliver trusted data to the cloud, and deliver value through analytics.



### INTEL® IOT PLATFORM INFOGRAPHIC

The Internet of Things (IoT) is at the heart of a powerful technology revolution. The act of connecting devices and systems to each other so that they can share data is the seed of new products, services, and experiences. Today, there are many IoT solutions based on Intel<sup>®</sup> technology in operation worldwide and the impact has been significant for businesses and consumers.

### **IOT PRODUCT PORTFOLIO**

Intel technology is the backbone of proven IoT solutions in smart home, industrial, and mobile applications, as well as for vertical markets, including transportation, healthcare, and retail. It is helping billions of devices talk to each other and share valuable information, protecting sensitive data, and providing critical analytics and API offerings.

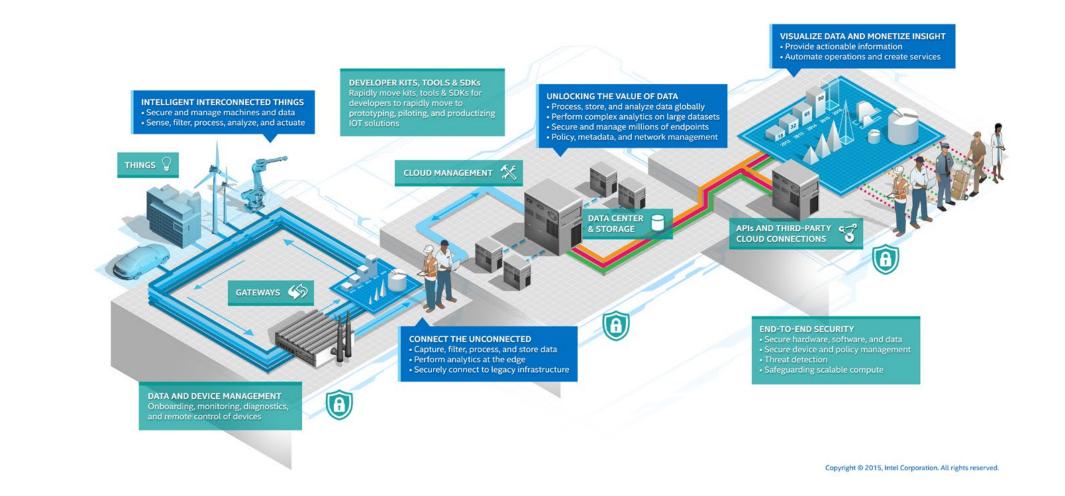
### **IOT SECURITY PORTFOLIO**

Intel supports tightly integrated hardware and software security from the edge to the cloud, along with data protection and policy management, delivering trusted data resulting in valuable insights.

### **INTEL<sup>®</sup> IOT PLATFORM**

### Secure. Scalable. Interoperable.

The Intel® IoT Platform is an end-to-end reference architecture and family of products from Intel, that works with third-party solutions, to provide a foundation for seamlessly and securely connecting devices, delivering trusted data to the cloud, and delivering value through analytics.



For more information, visit www.intel.com/content/www/us/en/internet-of-things/overview.html

### **INTEL® PROCESSORS FOR IOT**

### Hyperreal Visuals Drive Greater IOT Possibilities

Build your most innovative solutions with 7th Gen Intel® Core™ processors, featuring enhanced graphics, performance, and responsiveness.

- 14nm silicon technology
- Reduced electrical and power consumption
- · Latest hardware- and software-enhanced security
- · Long-term availability (up to seven years)

#### BETTER PERFORMANCE

#### • Up to 17%<sup>1</sup> better CPU performance

- Power-optimized for mobility
- Intel<sup>®</sup> Optane<sup>™</sup> memory ensures media responsiveness
- Intel® Speed Shift Technology optimizes task performance

#### ormance

### Intel<sup>®</sup> Processors for IoT



#### INTEL<sup>®</sup> QUARK<sup>™</sup> PROCESSORS

Intel® Quark<sup>™</sup> processors are microcontrollers for intelligent things. They provide flexible, low-power computing for a variety of small form factor applications to offer low-cost connectivity, integration, and compatibility for the IoT.



#### 7TH GENERATION INTEL® CORE™ PROCESSORS

The 7th generation Intel<sup>®</sup> Core<sup>™</sup> processors offer unprecedented power and responsiveness of Intel<sup>®</sup> Turbo Boost Technology.<sup>2</sup> Work with superior CPU and graphics performance, powerful security, and a range of power options to boost edge-to-cloud IoT designs.

### INTEL<sup>®</sup> ATOM<sup>™</sup> PROCESSORS

Intel<sup>®</sup> Atom<sup>™</sup> processors pack an entire system-on-a-chip for the ultimate in power and portability. Get performance/watt leadership, security and manageability, rich graphics, and I/O integration, with stunning graphics performance for edge devices.

#### INTEL® XEON® PROCESSORS

The Intel<sup>®</sup> Xeon<sup>®</sup> processors power any workload and lift date center productivity. They combine multi-core performance and compute density with hardware-based manageability, security, virtualization, and power management for scalability and reliability at the edge.

#### Learn more at intel.com/iot

- 1 Measured by Intel on a system with 7th Gen Intel® Core™ processor i7-7700 versus a system with 6th Gen Intel® Core™ processor i7-6700 using SPECfp2006 (8 copy).
- <sup>2</sup> Requires a system with Intel® Turbo Boost Technology. Intel® Turbo Boost Technology and Intel® Turbo Boost Technology 2.0 are only available on select Intel® processors. Consult your system manufacturer. Performance varies depending on hardware, software, and system configuration. For more information, visit intel.com/ turboboost.

Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. For more complete information about performance and benchmark results, visit intel.com/benchmarks. Copyright © 2017, Intel Corporation. All rights reserved. Intel, the Intel logo, Intel Atom, Intel Core, Xeon and Quark are trademarks of Intel Corporation in the U.S. and/or other countries. \*Other names and brands may be claimed as the property of others.





• Up to 4K Ultra HD

intel

ATOM

(intel)

**XEON** 

inside

- New HEVC 10-bit and VP9 decode
- Integrated HDCP 2.2
- Support for additional formats, such as AVC/H.264, MPEG-2, and VC-1







Intel<sup>®</sup> Product Quick Reference Matrix
Q3 2018

## SMARTER ROOMS. SMARTER COLLABORATION.

### INTEL<sup>®</sup> UNITE

Start meetings fast and be more productive with easy wireless content sharing to room displays and other devices connected to the network.

# SMARTER ROOMS. SMARTER COLLABORATION.

Start meetings fast and be more productive with easy wireless content sharing to room displays and other devices connected to the network.



## (intel<sup>®</sup> UNITE<sup>®</sup>

5

### **ENTERPRISE INSTALLATION**

This easily scalable solution is ideal for enhancing collaboration in *managed* IT environments with more than a few rooms, including medium to large businesses and schools. It features a centralized administrative web portal, broad OS support, and the ability to integrate optional plugin extensions.

### SMALL BUSINESS INSTALLATION - NEW!\*

For unmanaged small business environments with only a few rooms, this easy-to-install option requires no IT expertise or server components, and enables basic collaboration capabilities for users with PCs and Macs. Connection reliability is now on par with the enterprise installation, and multiple subnets are now supported.

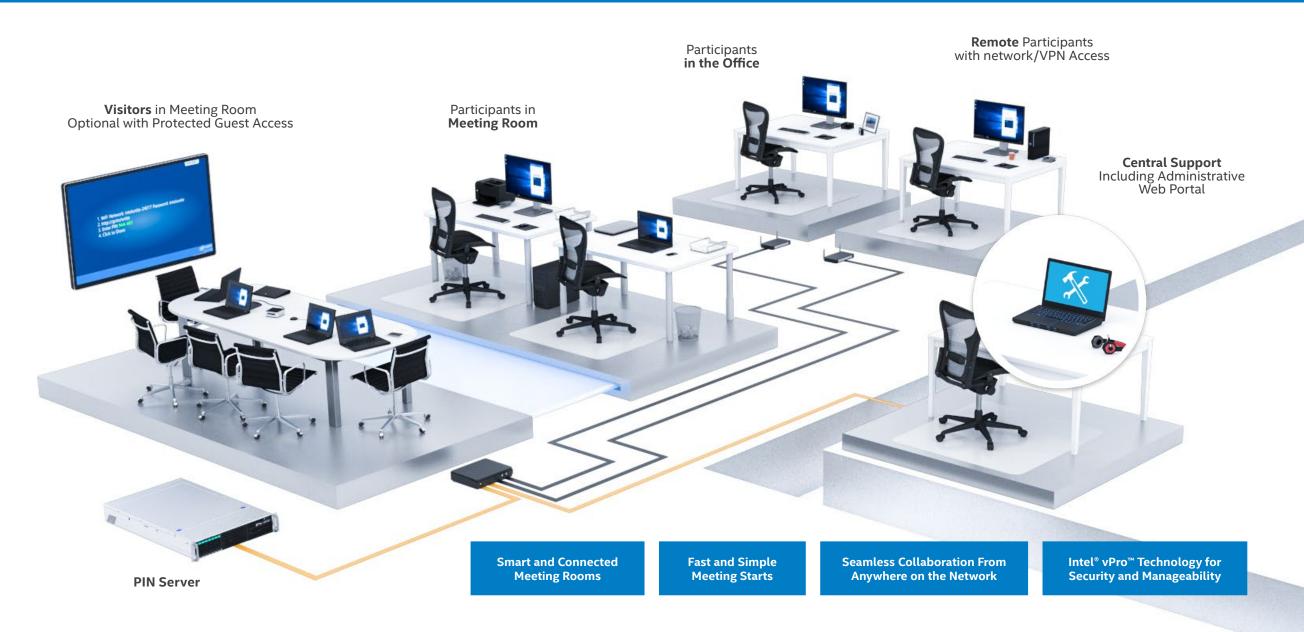
\* Now available with Intel Unite® software version 3.2

## INTEL UNITE<sup>®</sup> SOFTWARE





## INTEL UNITE<sup>®</sup> - ENTERPRISE SOFTWARE INSTALLATION FOR MANAGED ENVIRONMENTS

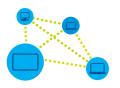


5)

## THE INTEL UNITE® SOLUTION

### Simplify IT Management

With Intel® vPro<sup>™</sup> technology on every room-based PC running Windows and Intel Unite® software, you can easily integrate these PCs into your existing IT infrastructure and leverage the management tools, systems and policies you already have in place. And by simplifying the infrastructure technologies needed in your conference rooms, you can help reduce costs and improve manageability.

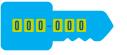


### **Ditch the Dongle**

Technology connects attendees to new or existing displays, projectors, and interactive whiteboards. There's no need to waste time searching for the right adapter or dongle.



Attendees from any location can view, annotate, and share documents in real time, every time. Share files easily using the built-in file transfer feature.



### Safer Meetings

To improve security, attendees must enter the appropriate rotating PIN code to join the meeting. Guests outside of your network can temporarily join and participate in configured rooms using the optional software plugin<sup>3</sup> for protected guest access.



### **Protected Data**

Enterprise-grade security ensures that data is 256-bit Secure Sockets Layer (SSL) encrypted and stays within your corporate network. Data always stays within the virtual walls of your business and isn't dependent on any additional vendor solutions.<sup>1</sup>



### **Host From Your PC**

No room monitor? An Intel<sup>®</sup> Core<sup>™</sup> vPro<sup>™</sup> processor-based client device with the Intel Unite<sup>®</sup> app installed can host a session, allowing workers to share screens wirelessly between their devices.<sup>1</sup>



### **Remote Manageability**

With the remote management tools of Intel® vPro™ technology, you can manage all conference room PCs from any location to complete basic tasks, apply patching, or make repairs. Use the Administrative Web Portal<sup>3</sup> to track analytics and centrally manage or configure your deployed Intel Unite® solutions.

### **RESELLER OPPORTUNITIES**

### **Reseller Conferencing Dilemma**

Conferencing solutions in SMB are quickly becoming the new battle ground. Resellers have numerous solutions from several vendors to offer their customers.

#### Resellers will gravitate towards solutions that:

- Have the features their customer demand
- Are easy to deploy and manage
- Offer them incremental opportunities for margin
- Keep the lines of communications open with their customer
- Offer the best support from the OEM for the entire solution

### **Reseller Opportunities with Conferencing**

#### Resell

- NUCs and branded systems
- Network infrastructure
- Third Party Peripherals

Plan

Plan

- Communication workshops
- Network assessments

Conference Consulting Services

Network Assessment Services

System integration

Vertical applications

### Advantages of adopting Intel Unite® software for the Reseller

#### Added margin opportunities

### Resell

- Intel<sup>®</sup> Core<sup>™</sup> vPro<sup>™</sup> PC with Intel Unite<sup>®</sup> software
- Third Party Peripherals

- Enhance
- Customization Services
- Service Level Agreements
- Configure room hubs with modular plug-ins for added functionality or integrated control of other enabled solutions (enterprise installation only)





## **D**

### **DEPLOY & CONFIGURE**

### Deploy & Configure the Intel Unite® solution with Confidence

Follow these tips to help your customers jumpstart a more collaborative experience in every meeting, whether for a single shared space or throughout their organizations.



### **Unmanaged Small Business Installation**

For basic screen sharing in small, unmanaged business environments, a small business installation – formerly 'standalone' – is now available. In addition to adequate memory and storage, hubs will need Intel® vPro™ technology and Windows\* 10 with Microsoft\* .NET Framework 4 or newer. Clients require Windows\* 7 or newer or Mac OS\* X 10.9 or newer, plus the Intel Unite® app. For a cost-effective approach, configure the mini PC to work as both a collaboration solution and a personal or shared PC work station.



### **Enterprise Installation**

Add a new server or use a compatible existing server to manage connections for enterprise deployment. The server should have Microsoft\* IIS and Microsoft SQL Server\* 2008 or newer. Chromebook, Linux client, iPad and Android tablet support are also now available for enterprise installations via their respective app stores.



### **Customize for Manageability**

IT can configure rooms in enterprise installations differently with plugins and, add the organization's theme with hub customizations. Use the server's Administrative Web Portal to create and manage rooms, generate solution telemetry data reports, and control optional moderator account permissions.

For an exclusive ITP opportunity to download the Intel Unite<sup>®</sup> software today and to learn more, visit: https://www-ssl.intel.com/content/www/us/en/secure/technology-provider/products/software/unite-enables-real-time-collaboration.html

Intel technologies may require enabled hardware, specific software, or services activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at intel.com. Copyright © 2018 Intel Corporation. All rights reserved. Intel, the Intel logo, Intel Core, the Intel Experience What's Inside logo, Intel Experience What's Inside, Intel Unite, and Intel vPro are trademarks of Intel Corporation in the U.S. and/or other countries.

<sup>2</sup> Skype\* for Business sold separately.

<sup>3</sup> Available with enterprise installation only.

\* Other names and brands may be claimed as the property of others.



# INTEL® AERO PLATFORM FOR UAVS

Intel<sup>®</sup> Product Quick Reference Matrix **Q3 2018** 

# INTEL® AERO PLATFORM FOR UAVS

Unmanned aerial vehicle (UAV) applications often require customized hardware, a variety of sensors, and significant compute horsepower. This developer platform is purposely built for UAV applications, with direct support for Intel® RealSense™ technology and the strength of a quad-core Intel® Atom™ processor. Use it to develop autonomous flight navigation capabilities with headroom to do even more.

### INTEL<sup>®</sup> AERO READY TO FLY DRONE

The Intel® Aero Ready to Fly Drone combines tremendous capabilities and design flexibility intended to accelerate development of sophisticated drone applications.

## INTEL® AERO COMPUTE BOARD, INTEL® AERO VISION ACCESSORY KIT, AND INTEL® AERO ENCLOSURE KIT

Connect the Intel<sup>®</sup> Aero Vision Accessory Kit to the Intel<sup>®</sup> Aero Compute Board, install into the Aero Enclosure Kit and attach to your drone, for accelerated application development and rapid prototyping.

### THE INTEL<sup>®</sup> AERO READY TO FLY DRONE

### **Get Drone Applications Airborne Quickly**

The Intel® Aero Ready to Fly Drone combines tremendous capabilities and design flexibility intended to accelerate development of sophisticated drone applications.

### Linux yocto V Dronecode



### **Powerful Compute**

This drone development platform is built around the Intel® Aero Compute Board running a quad-core Intel® Atom™ processor, offering performance in a low power envelope.

Ample memory and expandable storage enable development of demanding in-flight applications.

### **Open Source**

Running embedded Linux built with Yocto Project, developers can customize with confidence.

The platform also integrates ROS, MAVROS, MAVlink, and OpenCV libraries, for broader development support.

### Flexible and Extendable

This drone is fully assembled, flight tested and ready to fly. Yet it is designed to be modified and is intended to support rapid drone application development from inception to deployment on a production drone.

### **Enhanced Computer Vision**

The integrated Intel® RealSense™ R200 camera with stereo vision 3D imaging and depth sensing offers developers a tool for developing advanced algorithms for collision avoidance, localization, and more.

### **Dronecode\* PX4\* Autopilot**

PX4 autopilot is an open-source, fully-featured flight stack, providing all the ingredients necessary for flight. It is pre-loaded on the Intel® Aero Flight Controller and communicates with the Intel® Aero Compute Board using the MAVLink\* protocol.



Compute and vision components can be purchased separately. For more information, ask an Intel sales representative, or visit intel.com/aero.

### **Technical Specifications**

#### COMPUTE BOARD

Processor	Intel® Atom™ x7-Z8750 (2.56 GHz burst, quad core, 2M cache, 64 bit)				
RAM	4 GB LPDDR3-1600				
Storage	32 GB eMMC, MicroSD* memory card slot, M.2 connector 1 lane PCIe for SSD				
Display	1 micro HDMI 1.4b				
Communication	Intel® Dual Band Wireless-AC 8260, 802.11ac, 2x2 MIMO				
I/O Expansion	USB 3.0 OTG, HSUART, I2C, CAN, 6 processor GPIOs, 28 FPGA GPIOs, 5 FPGA Analog Sense, (accessed via the Altera® Max® 10 FPGA)				
VISION					
Cameras	Intel® RealSense™ Camera (R200), 8 MP RGB camera (front-facing), VGA camera, global shutter, monochrome (down-facing)				

#### FLIGHT CONTROL HARDWARE

Intel® Aero Flight Controller	STM32 microcontroller, 6 DoF IMU, magnetometer and altitude sensors					
REMOTE CONTROL						
Transmitter	Spektrum* DXe (2.4 GHz DSMX)					
Receiver	Spektrum* SPM4648 DSMX with Diversity					
SOFTWARE						
Operating System	Yocto Project* 2.1 (Krogoth), Linux* 4.4.3-yocto-standard					
BIOS	Insyde Software InsydeH2O* UEFI BIOS					
Flight Controller	Dronecode* PX4* autopilot					
Communication Protocol	Dronecode* MAVLink*					

#### DRONE

Drone Dimensions	360 mm - hub-to-hub (diagonal)						
Drone Height	222 mm - from base to top of GPS antenna						
Propeller	230 mm – length						
Weight of Drone	865 g – basic configuration without battery						
Gross Weight	1900g <sup>3</sup> (maximum) – takeoff weight						
Flight Time	20 min $^{\rm 3}$ (maximum) with 4S, 4000mAh battery $^{\rm 2}$ , hovering, no added payload						
Sustained Wind	15 knots <sup>3</sup> (maximum)						
Control Distance	300 m <sup>3</sup> (maximum) with supplied remote control						
Airspeed	15 m/s <sup>3</sup> (maximum)						
Altitude of Operation	5000 m <sup>3</sup> (maximum) – height above sea level						
Outside Air Temp.	-0 C / +40 C (minimum / maximum)						
ESC and Motor	Designed and manufactured by Yuneec for Intel® Aero Ready to Fly Drone						
<ul> <li>Input control interface</li> </ul>	UART						
• ESC Input Voltage	11.1 – 14.8 V						

<sup>1</sup> The Intel Aero Ready to Fly Drone is a kit for developers and is intended to be modified by developers according to their professional judgment. Intel has not established operating limitations for the kit nor tested any configurations other than the base configuration. Developers are responsible for testing and ensuring the safety of their own configurations, and establishing the operating limits of those configurations.

<sup>2</sup> Recommended battery: Li-Po, 4S, 4000+ mAh, with XT60 connector. Max dimensions (mm): 150 x 50 x 32

<sup>3</sup> Estimated

\* Other names and brands may be claimed as the property of others.

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Connect the Intel<sup>®</sup> Aero Vision Accessory Kit to the Intel<sup>®</sup> Aero Compute Board, install into the Aero Enclosure Kit and attach to your drone, for accelerated application development and rapid prototyping.



### Intel<sup>®</sup> Aero Compute Board

The Intel<sup>®</sup> Aero Compute Board is a purpose-built, UAV developer kit powered by a quad-core Intel<sup>®</sup> Atom<sup>™</sup> processor and geared toward UAV developers, educators, and researchers.

While only the size of a standard playing card, it features abundant storage capabilities, 802.11ac Wi-Fi\*, support for multiple cameras including the Intel® RealSense™ R200 camera, (part of the optional Vision Accessory Kit), industry standard interfaces, and reconfigurable I/O to facilitate connecting to a broad variety of drone hardware subsystems.

The Compute Board ships with open-source embedded Linux\* and offers sample applications and APIs for flight and vision interfaces, reducing hurdles for developers of sophisticated drone applications.





### Intel<sup>®</sup> Aero Vision Accessory Kit

This three-camera kit includes the Intel® RealSense™ camera R200 with stereo 3D imaging and depth sensing for development of obstacle sense and avoid algorithms, an 8 MP RGB camera for high-resolution photo and video capture, and a monochrome VGA camera with global shutter for development of optical flow algorithms.

These cameras connect directly to the Intel® Aero Compute Board through dedicated low-profile connectors using the supplied cables. All cameras are supported with Linux drivers.

### Intel<sup>®</sup> Aero Enclosure Kit

This mechanical enclosure is designed specifically to hold the Intel® Aero Compute Board and the three camera modules included in the Intel® Aero Vision Accessory Kit.

The enclosure is a two-piece plastic assembly with mounting features to allow relatively easy attachment to most UAV airframes.

When fully assembled, the enclosure holds both the Intel® RealSense R200 camera and the 8MP RGB camera along the front panel. The VGA camera is held in a compartment facing downward. A clear lens cover protects both the 8MP and VGA cameras.

### **Technical Specifications**

#### INTEL® AERO COMPUTE BOARD

Operating SystemEmbedded Linux* 4.4.3-yocto-standard, Yocto Project* 2.1 (Krogoth)BIOSInsyde Software InsydeH2O* UEFI BIOS optimized for the Intel® Aero Platform for UAVsProcessorIntel® Atom™ x7-Z8750 processorDisplay1 micro HDMI 1.4bUSB1 USB 3.0 On-the-Go (OTG) connectorWi-Fi*Intel® Dual Band Wireless-AC 8260; 802.11ac, 2x2 MIMOMemory4 GB LPDDR3-1600Storage Embedded32 GB eMMC
Aero Platform for UAVs       Processor     Intel® Atom <sup>™</sup> x7-Z8750 processor       Display     1 micro HDMI 1.4b       USB     1 USB 3.0 On-the-Go (OTG) connector       Wi-Fi*     Intel® Dual Band Wireless-AC 8260; 802.11ac, 2x2 MIMO       Memory     4 GB LPDDR3-1600
Display       1 micro HDMI 1.4b         USB       1 USB 3.0 On-the-Go (OTG) connector         Wi-Fi*       Intel® Dual Band Wireless-AC 8260; 802.11ac, 2x2 MIMO         Memory       4 GB LPDDR3-1600
USB       1 USB 3.0 On-the-Go (OTG) connector         Wi-Fi*       Intel® Dual Band Wireless-AC 8260; 802.11ac, 2x2 MIMO         Memory       4 GB LPDDR3-1600
Wi-Fi*     Intel® Dual Band Wireless-AC 8260; 802.11ac, 2x2 MIMO       Memory     4 GB LPDDR3-1600
Memory 4 GB LPDDR3-1600
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Storage Embedded 32 GB eMMC
Storage Expansion         microSD* memory card slot           M.2 connector 1 lane PCle for SSD
Camera InterfacesMIPI* CSI-2 (4 lanes + 1 lane), Dedicated USB 3.0 port for Intel® RealSense™ camera R200
I/O Expansion 28 FPGA GPIOs (3.3V) and 5 FPGA analog inputs (0 to 3 V) accessed via the Altera® MAX® 10 FPGA, 6 processor GPIOs, 1 HSUART, 1 CAN bus
Dimensions 88 mm × 63 mm × 20 mm (includes heatsink)
Weight         30 g board only; less than 60 g board with heatsink

#### INTEL® AERO VISION ACCESSORY KIT

Depth Sensing and Vision Camera	Intel® RealSense™ camera R200 with extension cable
8 MP RGB Camera	Omnivision* OV8858 with FPC extension cable
VGA Camera	Omnivision* OV7251 with FPC extension cable

#### **INTEL® AERO ENCLOSURE KIT**

Outer Dimensions	X: 144.8 mm Y: 125.7 mm Z: 47.7 mm
Mass	158 grams
4 Mounting Holes	Separation: 94 x 105.4 mm Size: M3 x 0.5

For more information, visit www.intel.com/aero

<sup>3</sup> Estimated

\* Other names and brands may be claimed as the property of others.

<sup>&</sup>lt;sup>1</sup> The Intel Aero Ready to Fly Drone is a kit for developers and is intended to be modified by developers according to their professional judgment. Intel has not established operating limitations for the kit nor tested any configurations other than the base configuration. Developers are responsible for testing and ensuring the safety of their own configurations, and establishing the operating limits of those configurations.

<sup>&</sup>lt;sup>2</sup> Recommended battery: Li-Po, 4S, 4000+ mAh, with XT60 connector. Max dimensions (mm): 150 x 50 x 32

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	INTEL PART	MIN/MULT	MM#	AVAILABILITY	WARRANTY	UPC CODE
INTEL® AERO READY TO FLY DRONE	82634CRAPRTFC	1 unit	958536	52 countries: (USA, Canada, Japan, Australia, New Zealand, 46 EU countries, PRC)	30 day limited warranty	735858345835
INTEL® AERO COMPUTE BOARD	82634CRAPDVKC	1 unit	958164	52 countries: (USA, Canada, Japan, Australia, New Zealand, 46 EU countries, PRC)	90 day limited warranty	735858344982
INTEL® AERO VISION ACCESSORY KIT	82634DSARPLTVAK	1 unit	953184	52 countries: (USA, Canada, Japan, Australia, New Zealand, 46 EU countries, PRC)	90 day limited warranty	735858325554
INTEL® AERO ENCLOSURE KIT	82634DSARPLTVIK	1 unit	953065	52 countries: (USA, Canada, Japan, Australia, New Zealand, 46 EU countries, PRC)	90 day limited warranty	735858325714



## THE USB-C That does It all

# THUNDERBOLT<sup>™</sup> 3

Intel<sup>®</sup> Product Quick Reference Matrix **Q3 2018** 

### WHAT IS THUNDERBOLT<sup>™</sup> 3?

At 40 Gb/s, it's the fastest port available on a computer today.

- 8x faster than USB 3.0 and 4x more video bandwidth than HDMI 1.4
- Transfer a 4K movie in less than 30 seconds
- Back up a year's worth of continuous MP3s in five minutes
- Plus, connect to any display, Thunderbolt, or USB device

## PRODUCT SHOWCASE

# THUNDERBOLT<sup>™</sup> 3

Thunderbolt<sup>™</sup> 3 brings Thunderbolt to USB-C at speeds up to 40 Gigabits per second (Gbps), creating one compact port that does it all – delivering the fastest\*, most versatile connection to any dock, display, or data device.

### THE SPEED YOU NEED

Thunderbolt<sup>™</sup> 3 technology is 8x faster than USB 3.0 and provides 4x more video bandwidth than HDMI 1.4, helping users work and play more efficiently. Incredible data transfer rates for high-powered external graphics cards - deliver exciting potential for multi-streaming HD and 4K UHD video and also allow you to enjoy the latest games as they were intended. Orchestrate desktop-level performance from a lightweight laptop, experience higher frame rates and improve visual quality with an unprecedented speed of 40Gbps.

### **ALL-IN-ONE SIMPLICITY**

Expand your capabilities while reducing cables with the simplicity of a single Thunderbolt<sup>™</sup> 3 port paired with the latest 8th Generation Intel<sup>®</sup> Core<sup>™</sup> processor. Now, just one compact port can enable lightning-fast data transfer, support two 4K UHD 60 Hz displays, and even charge a laptop. It's the most advanced, efficient, and versatile single-docking solution available.

\* As compared to other PC I/O connection technologies including eSATA, USB, and IEEE 1394 Firewire. Performance will vary depending on the specific hardware and software used. Must use a Thunderbolt-enabled device.

### THUNDERBOLT<sup>™</sup> 3



### Thunderbolt<sup>™</sup> 3 Brings Thunderbolt to USB-C

#### THE USB-C THAT DOES IT ALL

Thunderbolt<sup>™</sup> 3 technology offers a fast and simple level of connection and consistency for work or home, bringing the speed and versatility of Thunderbolt<sup>™</sup> to USB-C. Increase productivity by linking multiple devices through a single, compact port or add a little more power to your gaming with lightning-fast transfers.

- 40Gb/s Thunderbolt<sup>™</sup> 3
- Bi-directional, PCI Express and DisplayPort
- Four lanes of PCI Express Gen 3
- Eight lanes of DisplayPort 1.2
- Native USB 3.1 (10Gb/s)
- Native DisplayPort 1.2



### **More Protocols**

Simplify with one port to connect Thunderbolt devices, every display, and billions of USB devices.



### More Speed

Speed your creation of multi-stream HD or 4K video and archive it with superfast storage.



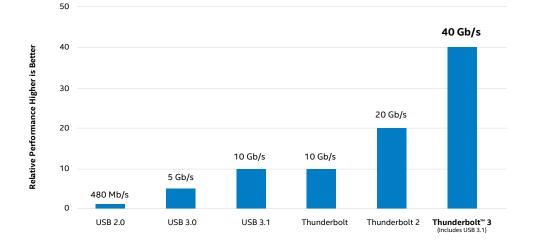
### **More Power**

Data, video, and power on the same cable. Up to 100W notebook charging, 15W to bus-powered devices.



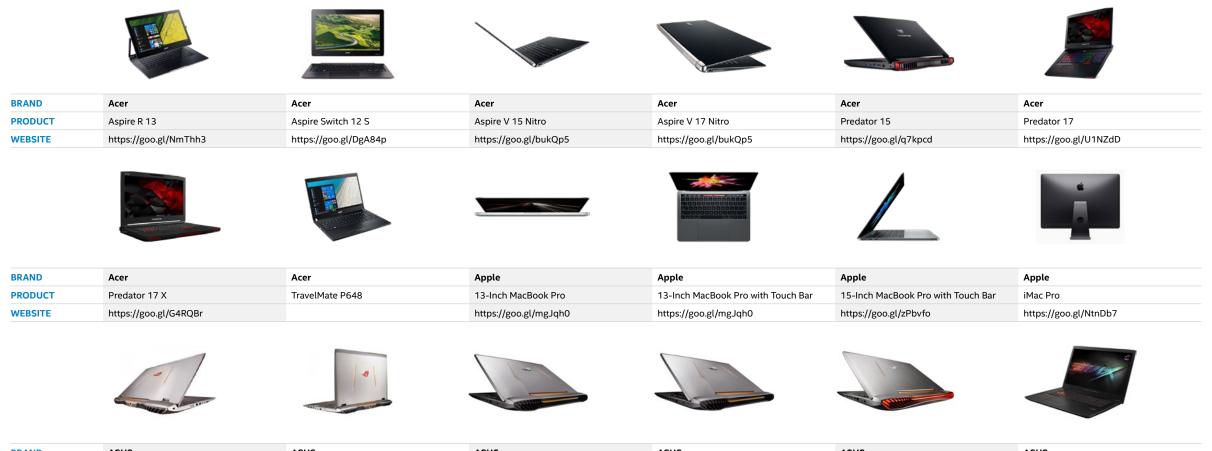
### **More Pixels**

Access the fastest storage, two 4K displays and simultaneously charge with a single cable.





Thunderbolt<sup>™</sup> 3 is available within a variety of form factors, including mini-PCs, 2 in 1s, notebooks, gaming systems, and workstations.



BRAND	ASUS	ASUS	ASUS	ASUS	ASUS	ASUS
PRODUCT	ROG G501 VW	ROG G701 VO	ROG G752VL	ROG G752VT	ROG G752VY	ROG GL702VT
WEBSITE	https://goo.gl/Mgyc27	https://goo.gl/wa45ay	https://goo.gl/BEZRoF	https://goo.gl/yRRnYr	https://goo.gl/JxKPe9	https://goo.gl/qgYDNs

BRAND	ASUS	ASUS	ASUS	ASUS	Clevo	Clevo
PRODUCT	ROG GX700VO	Transformer 3 Pro T303UA	ZenBook Pro UX501VW	ZenBook 3 Deluxe UX490UA	P750DM	P770DM
WEBSITE	https://goo.gl/PQhzky	https://goo.gl/HU1vWe	https://goo.gl/TVJgsg	https://goo.gl/NaVAxH	https://goo.gl/RkRERX	https://goo.gl/knVdwc
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BRAND	Clevo	Clevo	Clevo	Clevo	Dell	Dell
PRODUCT	P870DM	N130WU	N140WU	P870TM1	Alienware 13	Alienware 15
WEBSITE	https://goo.gl/JEG44M	https://goo.gl/4LFmqx	https://goo.gl/Q4MfoD	https://goo.gl/Joix18	https://goo.gl/38gRFy	https://goo.gl/FRGzWw
BRAND	Dell	Dell	Dell	Dell	Dell	Dell
PRODUCT	Alienware 17	Latitude E5570	Latitude 5480	Latitude 5580	Latitude 7280	Latitude 7480
WEBSITE	https://goo.gl/sMWYhq	https://goo.gl/J7edp7	https://goo.gl/yC4Xqj	https://goo.gl/vLLzht	https://goo.gl/tiS5y4	https://goo.gl/rPuCS3
BRAND	Dell	Dell	Dell	Dell	Dell	Dell

BRAND	Dell	Dell	Dell	Dell	Dell	Dell
PRODUCT	Latitude 7520	Latitude 7720	Latitude 12 2-in-1 7275	Latitude 13 7370	Latitude 12 5290 2-in-1	Latitude 12 7285 2-in-1
WEBSITE	https://goo.gl/rXFie2	https://goo.gl/GT8XUH	https://goo.gl/Dl2YWF	https://goo.gl/ftaZ5P	https://goo.gl/NjD9vw	https://goo.gl/ZY6rVD

BRAND	Dell	Dell	Dell	Dell	Dell	Dell
PRODUCT	Latitude 7290	Latitude 7380	Latitude 7390 2-in-1	Latitude 7390	Dell - Latitude 7490	Precision 15 3000 Series (3510)
WEBSITE	https://goo.gl/8WyaTU	https://goo.gl/6VFPBn	https://goo.gl/ZtNMjV	https://goo.gl/Nj7M4X	https://goo.gl/VtBWwo	https://goo.gl/U3aLMv
BRAND	Dell	Dell	Dell	Dell	Dell	Dell
PRODUCT	Precision 3520	Precision 15 5000 Series (5510)	Precision 5520	Precision 15 7000 Series (7510)	Precision 17 7000 Series (7710)	XPS 12 2-in-1
WEBSITE	https://goo.gl/A96gfd	https://goo.gl/SL5Tj3	https://goo.gl/drtHkX	https://goo.gl/y8KdEa	https://goo.gl/4uYw6M	https://goo.gl/psQKtK
		8				
BRAND	Dell	Dell	Dell	Dell	Dell	EVGA
PRODUCT	XPS 13	XPS 13 2-in-1	XPS 15	XPS 13 9370	XPS 15 9575 2-in-1	SC15 Geforce GTX 1060 Gaming Lapto
WEBSITE	https://goo.gl/DNoN3G	https://goo.gl/oNxSKV	https://goo.gl/MBXixA	https://goo.gl/4MFbSG	https://goo.gl/USRZtV	https://goo.gl/H7Sq8B
			Torans			
BRAND	EVGA	FUJITSU	GIGABYTE	GIGABYTE	GIGABYTE	GIGABYTE

BRAND	EVGA	FUJITSU	GIGABYTE	GIGABYTE	GIGABYTE	GIGABYTE
PRODUCT	SC17 Geforce GTX 1080 Gaming Laptop	Workstation CELSIUS H760	AORUS X5v7	AORUS X7v7	AORUS X7 DT v7	AORUS X9
WEBSITE	https://goo.gl/zRRjp7	https://goo.gl/aVZBIH	https://goo.gl/2B5gsW	https://goo.gl/wMWmeV	https://goo.gl/NW7wAh	https://goo.gl/buK2rb

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BRAND	GIGABYTE	GIGABYTE	GIGABYTE	GIGABYTE	GIGABYTE	GIGABYTE
PRODUCT	P56XT	AERO14K	AERO15	GB-GZ1DTi7	GB-BKi5HT2-7200	GB-BKi5T2-7200
WEBSITE	https://goo.gl/oEEeMP	https://goo.gl/1ciBjX	https://goo.gl/W8VxJr	https://goo.gl/gamyKm	https://goo.gl/tiUaA9	https://goo.gl/VtbY9T
	-	CHANTY CHANTY				
BRAND	GIGABYTE	GIGABYTE	GIGABYTE	GIGABYTE	GIGABYTE	GIGABYTE
RODUCT	GB-BKi7HT2-7500	GB-BKi7T2-7500	GB- BSi5T-6200	GB- BSi5HT-6200	GB- BSi7T-6500	GB- BSi7HT-6500
VEBSITE	https://goo.gl/1VvyTk	https://goo.gl/5wbxSo	https://goo.gl/nJxmKD	https://goo.gl/TIFZki	https://goo.gl/Rk7CIq	https://goo.gl/jtr2kU
						0
BRAND	HUAWEI	НР	НР	HP	НР	НР
RODUCT	MateBook X Pro	EliteBook Folio	Elite x2 1012 G2	EliteBook x360 1020 G2	EliteBook x360 G2	Elite X2 1012G1
VEBSITE	https://goo.gl/PUQDq1	https://goo.gl/bJuogH	https://goo.gl/X1rPRS	https://goo.gl/oVFoko	https://goo.gl/eMwM3Z	https://goo.gl/QA4S9W
BRAND	НР	НР	НР	НР	НР	НР
PRODUCT	Spectre x360	Spectre x360 Convertible PC 13	Spectre x360 Convertible PC 15	Spectre	Envy 27 All-in-One PC	Envy Curved 34 All-in-One PC

PRODUCT	Spectre x360	Spectre x360 Convertible PC 13	Spectre x360 Convertible PC 15	Spectre	Envy 27 All-in-One PC	Envy Curved 34 All-in-One
WEBSITE	https://goo.gl/WYTRa7	https://goo.gl/M44pGz	https://goo.gl/nhF7tw	https://goo.gl/73nl0Y	https://goo.gl/1c5eKt	https://goo.gl/8q66yW













BRAND	HP	НР	НР	HP	НР	НР
PRODUCT	ZBook 15 G4 Mobile Workstation	ZBook 17 G4 Mobile Workstation	Z1 G3 Workstation	ZBook 15G3	ZBook Studio Mobile Workstation	OMEN X Laptop 17
WEBSITE	https://goo.gl/d3h1on	https://goo.gl/kdoMjA	https://goo.gl/xUhBUf	https://goo.gl/8Fnh1E	https://goo.gl/uz4Dx9	https://goo.gl/GN1Xq6













BRAND	Intel	Intel	Intel	Intel	Lenovo	Lenovo
PRODUCT	NUC NUC6i7KYK	NUC Kit NUC7i5BNH	NUC Kit NUC7i7BNH	NUC Kit NUC7i5BNK	Legion Y720 Laptop	Miix 720
WEBSITE	https://goo.gl/Yb6CmG	https://goo.gl/I70rZM	https://goo.gl/xpd2Nf	https://goo.gl/ZIGjZm	https://goo.gl/lGyY9A	https://goo.gl/RzGmpb



BRAND	Lenovo	Lenovo	Lenovo	Lenovo	Lenovo	Lenovo
PRODUCT	ThinkPad P50	ThinkPad P51	ThinkPad P51s	ThinkPad P70	ThinkPad P71	ThinkPad T470
WEBSITE	https://goo.gl/EoVqAX	https://goo.gl/Vt2qT1	https://goo.gl/HkAdUa	https://goo.gl/e2xmDB	https://goo.gl/vr9pMD	https://goo.gl/SzBKYd



BRAND	Lenovo	Lenovo	Lenovo	Lenovo	Lenovo	MSI
PRODUCT	ThinkPad T470s	ThinkPad T570	ThinkPad X1 Carbon	ThinkPad X1 Yoga	ThinkPad Yoga 370	GS40 Gaming Notebook
WEBSITE	https://goo.gl/216ZJv	https://goo.gl/ui1xiL	https://goo.gl/KRG62C	https://goo.gl/9GK3iC	https://goo.gl/YGjT3s	https://goo.gl/uqsT8T

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RAND	MSI	MSI	MSI	MSI	MSI	MSI
PRODUCT	GS60 Gaming Notebook	GS63 Gaming Notebook	GT72 Gaming Notebook	GT80 Gaming Notebook	Vortex G65	WS60 Workstation Notebook
WEBSITE	https://goo.gl/Ja2a79	https://goo.gl/Dc1aQh	https://goo.gl/aG29DC	https://goo.gl/zFNOSa	https://goo.gl/6Jkz8f	https://goo.gl/43iMyd
	mst Instanto Cd & House Instanto Cd & House	S. 51		4		
RAND	MSI	Panasonic	Razer	Razer	Razer	Samsung
PRODUCT	WT72 Workstation Notebook	Let's note CF-SV7	The New Razer Blade	Razer Blade Pro	Blade Stealth	NoteBook9 Always 2018
VEBSITE	https://goo.gl/poe59U	https://goo.gl/9V2b78	https://goo.gl/wvS0Ho	https://goo.gl/lr5pul	https://goo.gl/pLFsOG	https://goo.gl/wXTDh9
BRAND	Smartron	Toshiba	Toshiba	Toshiba	Toshiba	Toshiba
PRODUCT	t.book Flex	Portege X20W Convertible Notebook Series	Portege X20W-E Convertible Notebook Series	Portege X30 Laptop Series	Portege X30-E Laptop Series	Tecra X40 Laptop Series
WEBSITE	https://goo.gl/bdHhan	https://goo.gl/nq49tG	https://goo.gl/wm5vpo	https://goo.gl/QAghJ9	https://goo.gl/wdkZ4w	https://goo.gl/5cDj3G
		NNIO	The second			
BRAND	Toshiba	VAIO	ZOTAC	ZOTAC	ZOTAC	
PRODUCT	Tecra X40-E Laptop Series	S11	ZBOX-MI549NANO ZBOX-CI549NANO	ZBOX-MI552 ZBOX-MI572	ZBOX-MI553	

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https://goo.gl/EbEyyN

https://goo.gl/qEo1dE

WEBSITE

https://goo.gl/jX4aa3

https://goo.gl/XtRD1E

### **MOTHERBOARDS**



An easy way to add Thunderbolt<sup>™</sup> 3 to desktop computers is by using one of the motherboards below with Thunderbolt<sup>™</sup> 3 ports.















BRAND GIGABYTE GIGABYTE GIGABYTE GIGABYTE GIGABYTE GIGABYTE PRODUCT GA-Z170X Gaming 7-EU GA-Z170X-Gaming GT GA-Z170X-UD5 TH GA-Z170X-Ultra Gaming GA-Z270X-Gaming 7 GA-Z270X-Gaming 8 WEBSITE https://goo.gl/5yiFy9 https://goo.gl/DZhvsk https://goo.gl/syEEFw https://goo.gl/LG6G6i https://goo.gl/A6LdHc https://goo.gl/tFD9Cj













BRAND	GIGABYTE	GIGABYTE	GIGABYTE	GIGABYTE	GIGABYTE	GIGABYTE
PRODUCT	GA-Z270X-Gaming 9	GA-Z270X-UD5	X170X-WS ECC	GA-Z170X-Designare	Z170X-UD3 Ultra	GC-ALPINE RIDGE
WEBSITE	https://goo.gl/Rd3HdR	https://goo.gl/mjZgDi	https://goo.gl/0Cvy90	https://goo.gl/nOg0BJ	https://goo.gl/1K5y6l	https://goo.gl/SH7tF3







BRAND	GIGABYTE	MSI	QSAN
PRODUCT	X299 UD4 EX + GC-ALPINE RIDGE AIC	THUNDERBOLT M3	XN-TB302
WEBSITE	https://goo.gl/1c9jkX	https://goo.gl/4SKAd4	https://goo.gl/UGxDd2





Thunderbolt<sup>11</sup> 3 enables several categories of compelling devices, such as docks, displays, storage, external graphics, and media. Thunderbolt<sup>11</sup> 3 delivers unrivaled single-cable docking to connect to everything you need, while also charging your notebook. These docks provide fast Thunderbolt<sup>11</sup> 3 data transfers, support for two 4K displays, and quick notebook charging.

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BRAND	Accusys	Accusys	AJA Video Systems	AJA Video Systems	AKITIO	AKITIO
PRODUCT	A12T3-Share	Gamma 8	lo IP	IO-4K Plus	Node Lite with Intel Optane 905P SSD	Thunder3 Dock Pro
WEBSITE	https://goo.gl/pq3ZA6	https://goo.gl/MKMfHb	https://goo.gl/bCpWrE	https://goo.gl/obVXSi	https://goo.gl/J8aXCs	https://goo.gl/DcBTrJ
						•
	AKITIO	AKITIO	AKITIO	AKITIO	AKITIO	AKITIO
RODUCT	Node Duo	Node Pro	Thunder3 10G Network Adapter	Thunder3 RAID STATION	Node	Node Lite
BRAND PRODUCT WEBSITE						
RODUCT	Node Duo	Node Pro	Thunder3 10G Network Adapter	Thunder3 RAID STATION	Node	Node Lite
RODUCT	Node Duo	Node Pro	Thunder3 10G Network Adapter	Thunder3 RAID STATION	Node	Node Lite
RODUCT /EBSITE	Node Duo https://goo.gl/kMT7vM	Node Pro https://goo.gl/Ddj92d	Thunder3 10G Network Adapter https://goo.gl/TkbSHu	Thunder3 RAID STATION https://goo.gl/mgqNfw	Node https://goo.gl/3mtoi3	Node Lite https://goo.gl/kRdOS8

		RENE T	HE STATE			
BRAND	Alogic	Areca	Areca	Areca	Areca	Areca
PRODUCT	Thunderbolt 3 Docking Station with Dual 4K Display & Power Delivery	ARC-4108T3	ARC-4607T3	ARC-8050T3-4	ARC-8050T3-6	ARC-8050T3-6M
WEBSITE	https://goo.gl/uE9byc	https://goo.gl/MhNiRy	https://goo.gl/pGBhek	https://goo.gl/4wEr49	https://goo.gl/X5lry8	https://goo.gl/LSRLMF
BRAND	Areca	Areca	Areca	Areca	ASUS	ASUS
PRODUCT	ARC-8050T3-8	ARC-8050T3-12	ARC-8050T3-12R	ARC-8050T3-24R	ROG XG Station 2	ProArt PA27AC Professional Monitor
WEBSITE	https://goo.gl/URqYVo	https://goo.gl/Iq5hNQ	https://goo.gl/8VKSCJ	https://goo.gl/DCWCMC	https://goo.gl/DO2zr5	https://goo.gl/QYVHRC
BRAND	ASUS	ASUS	Atech Flash Technology	АТТО	АТТО	АТТО
PRODUCT	ProArt PA32UC Professional Monitor	XG-STATION-PRO	Blackjet UX-1 Cinema Dock	ThunderLink <sup>®</sup> FC 3162	ThunderLink <sup>®</sup> FC 3322 (SFP+)	Thunderlink <sup>®</sup> NQ 3401
WEBSITE	https://goo.gl/8UDj2v	https://goo.gl/dZyDzm	https://goo.gl/LsnEsM	https://goo.gl/yed5PO	https://goo.gl/hYoOou	https://goo.gl/pjWBnK

BRAND	ΑΤΤΟ	АТТО	АТТО	АТТО	Avid	Avid
PRODUCT	ThunderLink SH 3128	Thunderlink <sup>®</sup> NQ 3402	Thunderlink <sup>®</sup> NS 3101	Thunderlink <sup>®</sup> NS 3102	Artist DNxI0	Artist DNxIV
WEBSITE	https://goo.gl/GZkJx4	https://goo.gl/krGlBD	https://goo.gl/a7FWrg	https://goo.gl/9h4gKV	https://goo.gl/UJKSrS	https://goo.gl/ymg8st



BRAND	Belkin	BIOS	BlackMagic Design	BlackMagic Design	Cable Matters	Cable Matters
PRODUCT	Thunderbolt <sup>™</sup> 3 Express Dock HD	EP106TB3	UltraStudio 4K Extreme	UltraStudio HD Mini	Thunderbolt™ 3 Dock	Thunderbolt 3 Docking Station
WEBSITE	https://goo.gl/fxAbfp	https://goo.gl/9pHes4	https://goo.gl/ce849h	https://goo.gl/47M9K5	https://goo.gl/k9uNJZ	https://goo.gl/gmY1rD













BRAND	CalDigit	CalDigit	CalDigit	CalDigit	Dell	Dell
PRODUCT	Thunderbolt <sup>™</sup> Station 3	Thunderbolt <sup>™</sup> Station 3 Lite	Thunderbolt <sup>™</sup> Station 3 Plus	T4 Thunderbolt™ 3 RAID	Thunderbolt <sup>™</sup> Dock	Portable Thunderbolt 3 SSD (500GB, 1TB)
WEBSITE	https://goo.gl/1S1AZj	https://goo.gl/S8bRj5	https://goo.gl/KTyY6B	https://goo.gl/gvjxDi	https://goo.gl/tAUUiQ	https://goo.gl/HL213k













BRAND	Delock	Delock	Drobo	Elgato	Galaxy Microsystems	GIGABYTE
PRODUCT	54000 Thunderbolt 3 External Portable SSD (240GB)	54007 Thunderbolt 3 External Portable SSD (480GB)	5D3 Direct Attached Storage	Thunderbolt™ 3 Dock	GALAX SNPR External Graphics Enclosure	AORUS GTX 1070 Gaming Box
WEBSITE	https://goo.gl/jdyzSF	https://goo.gl/3Vonth	https://goo.gl/J7eVSr	https://goo.gl/Y3NVLb	https://goo.gl/QFF7Ak	https://goo.gl/XDxrYW













BRAND	GIGABYTE	GIGABYTE	G-Technology	G-Technology	G-Technology	HighPoint
PRODUCT	AORUS GTX 1080 Gaming Box	RX 580 Gaming Box	G-DRIVE with Thunderbolt™ 3	G-RAID Thunderbolt 3 USB 3.1	G-SPEED Shuttle XL with Thunderbolt™ 3	RocketStor 6628A
WEBSITE	https://goo.gl/kgNQoQ	https://goo.gl/rJwnfy	https://goo.gl/zrZVW2	https://goo.gl/XaZJYt	https://goo.gl/W3tnd4	https://goo.gl/fz4c2n







BRAND	HighPoint	HighPoint	HighPoint	HighPoint	HighPoint	HP
PRODUCT	RocketStor 6628T	RocketStor 6618T	RocketStor 6618A	RocketStor 6661A Thunderbolt 3 to PCIe Expansion Chassis	RocketStor 6674T	ZBook Dock with Thunderbolt <sup>™</sup> 3
VEBSITE	https://goo.gl/7hHvjZ	https://goo.gl/2LGl9K	https://goo.gl/3K9AI8	https://goo.gl/E8n3U1	https://goo.gl/AWg8jP	https://goo.gl/vbLqaQ
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BRAND	НР	IOGear	IOGear	Kensington	Kensington	LaCie
PRODUCT	OMEN by HP Accelerator	Thunderbolt 3 Quantum Docking Station	Thunderbolt 3 Travel Dock	SD5000T Docking Station	SD5200T Thunderbolt 3 Docking Station	d2 Thunderbolt™ 3
VEBSITE	https://goo.gl/MAKpb4	https://goo.gl/9sBsd8	New	https://goo.gl/1Q1GzG	https://goo.gl/twx2Db	https://goo.gl/4eCe8t
BRAND	LaCie	LaCie	LaCie	LaCie	Lenovo	LG
PRODUCT	2big Dock	6big	12big Thunderbolt™ 3	Bolt 3	ThinkPad Thunderbolt™ 3 Dock	UltraFine 5K Display
WEBSITE	https://goo.gl/Tp6ZY4	https://goo.gl/fv1QEj	https://goo.gl/TVJBtk	https://goo.gl/rxqlyk	https://goo.gl/eLqPCD	https://goo.gl/rTyQWc
	LINNKUP					
BRAND	Linkup	Magstor	Mantiz	Mantiz	Micro Solution	Monoprice
	Linkup Thunderbolt 3 Docking Station	Magstor           TRB3-HL8 Desktop LTO8 Tape Drive with Thunderbolt 3		Mantiz Venus eGFX (MZ-02)	Micro Solution Thunderbolt 3 PD Docking Station TB3DS1230-MSJ	<b>Monoprice</b> Thunderbolt 3 Dual HDMI 2.0 Outp Adapter, 4K@60Hz
BRAND PRODUCT WEBSITE	••••••••••••••••••••••••••••••••••••••	TRB3-HL8 Desktop LTO8 Tape Drive with			Thunderbolt 3 PD Docking Station	Thunderbolt 3 Dual HDMI 2.0 Outp

	С					
BRAND	Nekteck	Nektech	Netstor	Netstor	Netstor	Netstor
PRODUCT	480GB Thunderbolt 3 SSD NVME SSD Hard Drive	Thunderbolt 3 PD Docking Station	NA338TB3	NA333TB3	NA211TB3	NA381TB3
WEBSITE	https://goo.gl/f1bkg9	https://goo.gl/XZMHFW	https://goo.gl/pw3sGi	https://goo.gl/0pYHZl	https://goo.gl/Ui5nzr	https://goo.gl/f2WBA9
		Hencules	rentar and the			· A
BRAND	Netstor	Netstor	Netstor	Netstor	Netstor	One Stop Systems
PRODUCT	NA762TB3	HL23T	NA611TB3	NA341TB3	NS370TB3	ExpressBox 3T-V3
WEBSITE	https://goo.gl/FYtdcV	https://goo.gl/tfsT7c	https://goo.gl/CU9joq	https://goo.gl/W157zz	https://goo.gl/BMemXm	https://goo.gl/DZfm6s
BRAND	owc	owc	owc	owc	owc	owc
PRODUCT	Mercury Helios 3	Envoy Pro	ThunderBay 4 - Thunderbolt 3	ThunderBlade	Mercury Helios FX	Envoy Pro EX
WEBSITE	https://goo.gl/dbcfys		https://goo.gl/yC1Ue9	https://goo.gl/hRrysz	New	https://goo.gl/jbLcaa
				and the second	II.	
BRAND	owc	Panasonic	Phision	Plugable	Plugable	Plugable
PRODUCT	Thunderbolt™ 3 Dock	Memory Card Drive "expressP2 drive" AU-XPD3	Thunderbolt 3 Portable SSD	Thunderbolt <sup>™</sup> 3 Docking Station	TBT3-UDV Thunderbolt 3™ Docking Station with Power Delivery	TBT3-NVME480 Thunderbolt 3 480GB NVMe SSD

https://goo.gl/YGKHHh

https://goo.gl/FYQpHF

https://goo.gl/dAJdrV

https://goo.gl/AwyMKR

https://goo.gl/ZDFBRh

WEBSITE

https://goo.gl/BC1puu











BRAND	PowerColor (TUL Corporation)	PowerColor (TUL Corporation)	Promise	Promise	Promise	Promise
PRODUCT	POWERCOLOR GAMING STATION	Devil Box	Pegasus3 R4	Pegasus3 R6	Pegasus3 R8	SANLink3 16G FC
WEBSITE	https://goo.gl/YSjybA	https://goo.gl/3zNgJ5	https://goo.gl/N8BOQe	https://goo.gl/W9fsmu	https://goo.gl/LWBbND	https://goo.gl/AHXxnh













BRAND	Promise	QNAP	QNAP	QNAP	QNAP	QNAP
PRODUCT	SANLink3 T1	TVS-1282T3	TVS-1582TU	TVS-882BRT3	TVS-882ST3	TS-453BT3
WEBSITE	https://goo.gl/kZEeDP	https://goo.gl/yNRvz9	https://goo.gl/qSWGLs	https://goo.gl/DapRvb	https://goo.gl/tyf8i3	https://goo.gl/tSeK75













BRAND	Raidon	Raidon	Raidon	Raidon	Raidon	Raidon
PRODUCT	GR3660-TB3	GR4670-TB3	GR8670-TB3	GR8680-TB3	GT4670-TB3	GT8670-TB3
WEBSITE	https://goo.gl/YJYSbB	https://goo.gl/Yte37j	https://goo.gl/7kb3Ue	https://goo.gl/PGZGi5	https://goo.gl/cJmWMR	https://goo.gl/8avjFc













BRAND	Raidon	Raidon	Raidon	Raidon	Raidon	Raidon
PRODUCT	STARDOM DR2-TB3	STARDOM DR3-TB3	STARDOM DR8-TB3	STARDOM DR8M-TB3	STARDOM PD01-TB3	STARDOM SR4-TB3
WEBSITE	https://goo.gl/gj7KEf	https://goo.gl/QDoLSW	https://goo.gl/aP69G5	https://goo.gl/rssP75	https://goo.gl/iriA2C	https://goo.gl/eC3hwW











BRAND	Raidon	Raidon	Raidon	Raidon	Raidon	Razer
PRODUCT	STARDOM SR8-TB3	STARDOM ST2-TB3	STARDOM ST4-TB3	STARDOM ST8-TB3	STARDOM SA2TB3	Core
WEBSITE	https://goo.gl/4CzeGv	https://goo.gl/spdGU3	https://goo.gl/RwZ6TA	https://goo.gl/iEwBEY	https://goo.gl/YTsi5v	https://goo.gl/LEHY75













BRAND	Rocpro	Rocpro	Rocpro	Sabrent	Sabrent	SAPPHIRE
PRODUCT	RT38 Thunderbolt 3	T34 Thunderbolt 3	T38 Thunderbolt 3	TH-3DP2	TH-3HD2	GearBox Thunderbolt 3 eGFX Solution
WEBSITE	https://goo.gl/vgUsNS	https://goo.gl/hP3VVm	https://goo.gl/dpKuMq	https://goo.gl/hnHvRK	https://goo.gl/f4EKUs	https://goo.gl/rwXddX



PRODUCT	Fusion Thunderbolt 3 PCIe Flash Drive	eGFX Breakaway Box 550	eGFX Breakaway Puck Radeon RX 560	eGFX Breakaway Puck Radeon RX 570	SF3 <sup>™</sup> Series - SxS <sup>™</sup> Pro Card Reader	eGFX Breakaway™ Box
WEBSITE	https://goo.gl/uWHbo3	https://goo.gl/AqN684	https://goo.gl/qH5sX6	https://goo.gl/RHDa6p	https://goo.gl/gFQXxz	https://goo.gl/Thq6Ze













BRAND	Sonnet	Sonnet	Sonnet	Sonnet	Sonnet	Sonnet
PRODUCT	Echo™ Express SE III	Echo Express SEL – Thunderbolt™ 3 Edition	Solo10G Thunderbolt 3 Edition	eGFX Breakaway Box 650	Echo™ Express III-D – Thunderbolt™ 3 Edition	SF3™ Series – CFast™ 2.0 Pro Card Reader
WEBSITE	https://goo.gl/TX3o4g	https://goo.gl/HbDoqU	https://goo.gl/HwWTu4	https://goo.gl/WTUJTZ	https://goo.gl/lL7XrT	https://goo.gl/POhhqL



BRAND	Sonnet	Sonnet	Sonnet	Sonnet	StarTech.com	StarTech.com
PRODUCT	Echo™ Express III-D – Thunderbolt™ 3 Edition	SF3 <sup>™</sup> Series – CFast <sup>™</sup> 2.0 Pro Card Reader	Twin10G SFP+ Thunderbolt <sup>™</sup> 3 Edition	Twin 10G Thunderbolt <sup>™</sup> 3 Edition	Thunderbolt 3 PCIe Expansion Chassis with DisplayPort	Thunderbolt <sup>™</sup> 3 Docking Station
WEBSITE	https://goo.gl/lL7XrT	https://goo.gl/POhhqL	https://goo.gl/bLVNnw	https://goo.gl/FbCjJ1	https://goo.gl/LPDsjH	https://goo.gl/7SIwd4













BRAND	StarTech.com	StarTech.com	StarTech.com	ТЕКО	Toshiba	Visiontek
PRODUCT	Thunderbolt™ 3 Charging Dock	Mini Thunderbolt 3 Dock for Laptops	Thunderbolt 3 Dock with SD Card Reader	Rapide Thunderbolt 3 SSD	Thunderbolt™ 3 Dock	VT-TB3-eGPU100
WEBSITE	https://goo.gl/nZ2QL9	https://goo.gl/4n78TP	https://goo.gl/JtHGNX	https://goo.gl/LV6H3f	https://goo.gl/V9MUUV	https://goo.gl/HGJSGZ

BRAND	Winstars	ZOTAC	ZOTAC
PRODUCT	Thunderbolt 3 USB-C to NVMe SSD Adapter	AMP BOX	AMP BOX MINI
WEBSITE	https://goo.gl/m2W7eW	https://goo.gl/oEmXo3	https://goo.gl/jtXQoy

## **CABLES AND ADAPTERS**



A selection of Thunderbolt<sup>™</sup> 3 cables and adapters provide connectivity for different protocols. The Thunderbolt<sup>™</sup> 3 to Thunderbolt<sup>™</sup> adapter allows new computers with Thunderbolt<sup>™</sup> 3 ports to connect to hundreds of Thunderbolt<sup>™</sup> and Thunderbolt<sup>™</sup> 2 devices.



BRAND	Alogic	Apple	Apple	Atech Flash Technology	Belkin	Cable Matters
PRODUCT	Thunderbolt 3 (USB-C) to Dual HDMI Adapter	Thunderbolt™ 3 (USB-C) to Thunderbolt™ 2 Adapter	Thunderbolt 3 (USB-C) Cable (0.8m)	Blackjet 40Gbps Thunderbolt™ 3 Cable (0.5m)	Thunderbolt 3 Cable (40Gbps) (0.5m)	Thunderbolt™ 3 Cable-1m/2m (20 Gbps)
WEBSITE	https://goo.gl/fpVbaZ	https://goo.gl/eRU4m3	https://goo.gl/fvFjiq	https://goo.gl/TUjSV3	https://goo.gl/KDYWqw	https://goo.gl/9k4ALN













BRAND	Cable Matters	Cable Matters	Cable Matters	Cable Matters	CalDigit	СНОЕТЕСН
PRODUCT	Thunderbolt™ 3 Cable- 0.5m/1.0m/2.0m (40 Gbps)	Thunderbolt™ 3 to Thunderbolt™ Adapter	Thunderbolt <sup>™</sup> 3 Dual HDMI Adapter	Thunderbolt™ 3 Dual DisplayPort Adapter	Thunderbolt 3 Cable 40Gbps 100W Charging (0.5m, 1m, 2m)	Thunderbolt 3 Cable (0.5m) 40Gbps
WEBSITE	https://goo.gl/9k4ALN	https://goo.gl/ug2Yg1	https://goo.gl/r5xyh5	https://goo.gl/YnL34g	https://goo.gl/rXDpYR	https://goo.gl/2rJQ82













BRAND	CHOETECH	CHOETECH	CHOETECH	CHOETECH	Delock	Delock
PRODUCT	Thunderbolt 3 Cable (2m) 40Gbps	Thunderbolt 3 Cable (2m) 20Gbps	Thunderbolt 3 to Dual DisplayPort Adapter	Thunderbolt 3 to Dual HDMI 2.0 Output Adapter	Adapter 62708 Thunderbolt 3 Dual DisplayPort	62709 Adapter Thunderbolt™ 3
WEBSITE	https://goo.gl/YpLBRT	https://goo.gl/NqkjuN	https://goo.gl/sYd75X	https://goo.gl/QJsMqx	https://goo.gl/XP4AEg	https://goo.gl/Sef4As
	Concernent	Concerner:				
BRAND	Delock	Delock	Fullink	HighPoint	HighPoint	HighPoint
PRODUCT	Thunderbolt™ 3 (20 Gb/s) cable 1.0M 1.5M 2.0M	Thunderbolt™ 3 (40 Gb/s) cable 0.5M	Thunderbolt 3 to Dual DisplayPort Adapter	TB3-040G-505	TB3-040G-510	TB3-040G-520
WEBSITE	https://goo.gl/gEuH8n	https://goo.gl/A5CXQY	https://goo.gl/AQbxkY	https://goo.gl/2XJM1K	https://goo.gl/3NBM4G	https://goo.gl/wKrNgB
	$\sim$		<b>66</b> 5	6 <sup>5</sup>		
BRAND	IOGear	IOGear	IOGear	IQGear	Kailet	Kailet
BRAND	IOGear Thunderbolt 3 to Dual 4K DisplayPort	IOGear	IOGear	IOGear	KaiJet	KaiJet
BRAND PRODUCT	IOGear Thunderbolt 3 to Dual 4K DisplayPort Adapter	IOGear Thunderbolt 3 to Dual 4K HDMI Adapter	IOGear Thunderbolt 3 USB-C 0.5m 40Gbps Cable	IOGear Thunderbolt 3 USB-C 1m 20Gbps Cable	KaiJet j5create 40Gbps Thunderbolt™ 3 Cable (1m)	
	Thunderbolt 3 to Dual 4K DisplayPort		Thunderbolt 3 USB-C 0.5m 40Gbps		j5create 40Gbps Thunderbolt™ 3 Cable	j5create 20Gbps Thunderbolt™ 3 Cabl
PRODUCT	Thunderbolt 3 to Dual 4K DisplayPort Adapter	Thunderbolt 3 to Dual 4K HDMI Adapter	Thunderbolt 3 USB-C 0.5m 40Gbps Cable	Thunderbolt 3 USB-C 1m 20Gbps Cable	j5create 40Gbps Thunderbolt™ 3 Cable (1m)	j5create 20Gbps Thunderbolt™ 3 Cable (1m)
PRODUCT	Thunderbolt 3 to Dual 4K DisplayPort Adapter	Thunderbolt 3 to Dual 4K HDMI Adapter	Thunderbolt 3 USB-C 0.5m 40Gbps Cable	Thunderbolt 3 USB-C 1m 20Gbps Cable	j5create 40Gbps Thunderbolt™ 3 Cable (1m)	j5create 20Gbps Thunderbolt™ 3 Cable (1m)
PRODUCT	Thunderbolt 3 to Dual 4K DisplayPort Adapter https://goo.gl/TczQu9	Thunderbolt 3 to Dual 4K HDMI Adapter https://goo.gl/1RpsBm	Thunderbolt 3 USB-C 0.5m 40Gbps Cable https://goo.gl/LZk5ps Kanex	Thunderbolt 3 USB-C 1m 20Gbps Cable https://goo.gl/Lu4zXd	j5create 40Gbps Thunderbolt <sup>™</sup> 3 Cable (1m) https://goo.gl/ZDg9gD	j5create 20Gbps Thunderbolt™ 3 Cable (1m) https://goo.gl/22vQCj



BRAND	Lintes	Lintes	Micro Solution	Micro Solution	Monoprice	Monoprice
PRODUCT	Thunderbolt <sup>™</sup> 3 Baby Adapter	Thunderbolt <sup>™</sup> 3 Legacy Adapter	Thunderbolt 3 DP Dual Display Adapter TB3DDA02-MSJ	Thunderbolt 3 HDMI 2.0 Dual Display Adapter TB3DHA02-MSJ	Thunderbolt 3 (40 Gbps) USB-C Cable, 100W	Thunderbolt 3 Dual DisplayPort Output Adapter, 4K @ 60Hz
WEBSITE	https://goo.gl/g2CvKp	https://goo.gl/uUj7cB	https://goo.gl/KFkpNh	https://goo.gl/cySdKj	https://goo.gl/GW4GVg	https://goo.gl/R6YsZu
BRAND	National Instruments	Nekteck	Nekteck	Nekteck	Nekteck	Nekteck
PRODUCT	PXIe-8301	20 Gbps Thunderbolt™ 3 Cable in Black (1m)	20 Gbps Thunderbolt™ 3 Cable in Black (2m)	40 Gbps Thunderbolt™ 3 Cable in Black (0.5m)	Thunderbolt 3 40Gbps Active Cable – (2m)	Thunderbolt 3 to Dual 4K DP DisplayPor Adapter
WEBSITE	https://goo.gl/ERZoPF	https://goo.gl/ercz4Q	https://goo.gl/zUYU3T	https://goo.gl/jFaa4M	https://goo.gl/dXBy6x	https://goo.gl/JbQ9bS
BRAND	Nekteck	owc	owc	owc	owc	Plugable
PRODUCT	Thunderbolt 3 to Dual 4K HDMI Adapter	Thunderbolt 3 Cable 20Gbps (1.0M,	Thunderbolt 3 Cables 40Gbps (0.5M,	Thunderbolt 3 Dual DisplayPort Adapter	Thunderbolt 3 Dual HDMI Adapter	Thunderbolt <sup>™</sup> 3 20 Gbps USB-C Cable
		2.0M)	1.0M, 2.0M)			(3.3ft/1m)
WEBSITE	https://goo.gl/WqW3iN	https://goo.gl/1UUfu8	https://goo.gl/Wg4wrN	https://goo.gl/14u2t7	https://goo.gl/23xsd2	https://goo.gl/3qa3Gq
					a	0 00 m
PRAND	Diversity	Divertile	Diversity	Divertia	Suc.	cuc.
BRAND PRODUCT	Plugable Thunderbolt <sup>™</sup> 3 20 Gbps USB-C Cable	Plugable Thunderbolt™ 3 40 Gbps USB-C Cable	<b>Plugable</b> Thunderbolt <sup>™</sup> 3 Dual DisplayPort	<b>Plugable</b> Thunderbolt <sup>™</sup> 3 Dual HDMI Adapter	SIIG Thunderbolt 3 (USB-C) to Dual	SIIG USB-C Thunderbolt V3 (USB Type C,

https://goo.gl/kA1PtH

https://goo.gl/FBAcjQ

https://goo.gl/auptw4

https://goo.gl/gA6G6h

https://goo.gl/vE49SC

WEBSITE

https://goo.gl/IH6H1y











BRAND	SAPPHIRE	SAPPHIRE	Sonnet	Sonnet	Sonnet	Sonnet
PRODUCT	Thunderbolt™ 3 to Dual DisplayPort Dongle	Thunderbolt™ 3 to Dual HDMI Dongle	0.5m Thunderbolt™ 3 (40 Gbps) Cable	Thunderbolt 3 to Dual DisplayPort Adapter	1m Thunderbolt™ 3 (40 Gbps) Cable	Thunderbolt 3 to Dual HDMI 2.0 Adapte
WEBSITE	https://goo.gl/tvbPMU	https://goo.gl/hmCXXS	https://goo.gl/snFYeO	https://goo.gl/64tXMU	https://goo.gl/8JUIN8	https://goo.gl/VZ3Ayz
BRAND	StarTech.com	StarTech.com	StarTech.com	StarTech.com	StarTech.com	StarTech
PRODUCT	Dual DisplayPort Adapter	Dual HDMI Adapter	Thunderbolt™ 3 (20 Gbps) USB-C Cable- 1m/2m	Thunderbolt™ 3 (40 Gbps) USB-C Cable- 0.5m	Thunderbolt™ 3 to Thunderbolt™ Adapter	Thunderbolt 3 to eSATA Adapter + USB 3.1 (10Gbps) Port - Mac / Windows
WEBSITE	https://goo.gl/nQhL2j	https://goo.gl/sqRMFe	https://goo.gl/Hlrsb6	https://goo.gl/X2sDzw	https://goo.gl/nq7efZ	https://goo.gl/bGX3s7
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BRAND	StarTech	TEKQ	Vantec	Vantec	Winstars	Winstars
PRODUCT	Thunderbolt 3 to USB 3.1 Controller Adapter - 1x USB-C, 3x USB-A	Thunderbolt 3 Cable (0.5 m)	Thunderbolt™ 3 to Dual DisplayPort 4K (60Hz) Adapter	Thunderbolt™ 3 To Dual HDMI 2.0 4K (60Hz) Adapter	Thunderbolt™ 3 USB-C to dual 4K DisplayPort Adapter	Thunderbolt 3 USB-C to dual 4K HDMI Adapter
WEBSITE	https://goo.gl/LrGfdc	https://goo.gl/3qKaqc	https://goo.gl/HykGWM	https://goo.gl/VuyYiB	https://goo.gl/iSbPAA	https://goo.gl/sEPM9R



BRAND	Zikko			
PRODUCT	Thunderbolt™ 3 Cable 0.5M 40Gbps			
WEBSITE	https://goo.gl/hB6pKU			

Visit **ThunderboltTechnology.net** for more information.

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The products and services described may contain defects or errors which may cause deviations from published specifications. Current characterized errata are available on request.

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\* Other names and brands may be claimed as the property of others.



# INTEL® GRAPHICS

Intel<sup>®</sup> Product Quick Reference Matrix **Q3 2018** 

# A VISION OF EXCELLENCE

### INTEL® GRAPHICS TECHNOLOGY

Work and play in high resolution with Intel® UHD Graphics and Iris® Plus Graphics. Watch captivating 4K Ultra HD (UHD) video on up to three screens, edit photos and videos like a pro, and immerse yourself in vividly rendered, seamless 3D gameplay – all with the added power boost of an Intel® Core™ processor. Intel® Graphics Technology brings stunning visuals to thinner and lighter portable devices, like laptops, 2 in 1s, and desktop computers.

# INTEL® GRAPHICS

Immerse yourself in rich, vivid visuals enabled by integrated Intel<sup>®</sup> UHD Graphics and Iris<sup>™</sup> Plus Graphics, delivering built-in 4K Ultra HD for new home theater, gaming, and conferencing experiences.



Experience visual perfection with Intel<sup>®</sup> UHD graphics and Iris<sup>™</sup> Plus graphics. Watch captivating 4k video on up to three screens, edit photos and videos like a professional, and desktop computers. Immerse yourself in vividly rendered, seamless 3D gameplay. Intel UHD graphics, and Iris<sup>™</sup> Plus graphics are built right in to the processor, bringing stunning visuals to thinner and lighter portable devices, like Notebook 2 in 1s, and portable All-in-Ones.





### Watch

View stunning 4K UHD video and immerse yourself completely in up to three angles of the same experience with multi-screen capability.

- 4K/UHD Premium Content Playback with Netflix\* HDR
- 360 degree playback
- Multiple video streams

### Game

Enjoy the latest games delivered to you in high definition, complete with complex shading, and fast frame rates.

- HD Gaming on Intel<sup>®</sup> UHD Graphics
- Up to 1080p Gaming on Intel® Iris® Plus Graphics
- Accelerated game streaming

Visit Gameplay.intel.com – to discover in-game settings optimized for your Intel<sup>®</sup> Graphics Technology.

### Create

Uninhibited expression through enhanced media conversion and rendering, delivering picture perfect performance, every time. Uses fixed function hardware for fast, low-power video encode and transcode.

- 4K photo and video editing
- 360 degree stitching/VR content creation<sup>1</sup>

### Explore

Immerse yourself in amazing experiences through Mixed Reality-ready PCs<sup>2</sup>. Explore entirely new worlds with a Windows Mixed Reality\* headset, motion controllers, and a range of Intel powered devices.

- Dive right in to your favorite games, like Minecraft\* in VR
- Explore virtual worlds and create stunning 3D art

<sup>1</sup> May not be available on all SKUs

<sup>2</sup> Requires 7th Generation Intel<sup>®</sup> Core<sup>™</sup> i5 Processors with Intel<sup>®</sup> UHD 620 Graphics or higher

## **OPTIMIZE YOUR GAMING EXPERIENCE – VISIT GAMEPLAY.INTEL.COM**

- Auto-detect / Enter Intel processor details and explore supported games
- Click on chosen games and discover optimal in-game settings per your hardware
- Optimized settings available for hundreds of games over multiple genres



# 8<sup>TH</sup> GEN INTEL<sup>®</sup> CORE<sup>™</sup> PROCESSOR GRAPHICS ADVOCACY



Intel® Core™ Processor H-Series, X-Series, S-Series 'K', and G-Series High-End Discrete Graphics	<ul> <li>&gt;1080p gaming &amp; premium VR experiences with H-series processors optimized for discrete graphics</li> </ul>
Intel <sup>®</sup> Core <sup>™</sup> Processor S-Series Intel <sup>®</sup> UHD Graphics Mid-Range Discrete Graphics	<ul> <li>Up to Intel<sup>®</sup> UHD Graphics for HD gaming</li> <li>5K support</li> <li>UHD resolution support</li> </ul>
Intel <sup>®</sup> Core <sup>™</sup> Processor U-Series Intel <sup>®</sup> Iris <sup>®</sup> Plus Graphics Intel <sup>®</sup> UHD Graphics	<ul> <li>Up to Intel<sup>®</sup> Iris<sup>®</sup> Plus Graphics for 1080p gaming</li> <li>UHD resolution support</li> </ul>
Intel® Core™ Processor Y-Series Intel® UHD Graphics	<ul> <li>Up to Intel<sup>®</sup> UHD Graphics for HD gaming</li> <li>UHD resolution support</li> </ul>
Intel <sup>®</sup> Core <sup>™</sup> Processor N-Series Intel <sup>®</sup> UHD Graphics	<ul> <li>Up to Intel<sup>®</sup> UHD Graphics</li> <li>UHD resolution support</li> </ul>

### 8th Generation Intel<sup>®</sup> Core<sup>™</sup> Processor with Radeon<sup>™</sup> RX Vega M Graphics

#### NEXT LEVEL PERFORMANCE IN SLEEK, THIN & LIGHT COMPUTERS

The new 8th Gen Intel® Core<sup>™</sup> mobile processor with Radeon<sup>™</sup> RX Vega M graphics is Intel's first processor and discrete graphics bundled in a single package. This unprecedented design unlocks performance levels previously unseen in thin and light form factors with Intel processors due to its ultra-small footprint and unique power sharing capability. This new processor is for the high performing, small form factor computers like 2-in-1's, thin and light notebooks and mini-PC's.

	INTEL <sup>®</sup> CORE <sup>™</sup> i7-8809G PROCESSOR	INTEL <sup>®</sup> CORE <sup>™</sup> i7-8709G PROCESSOR	INTEL <sup>®</sup> CORE <sup>™</sup> i7-8706G PROCESSOR	INTEL <sup>®</sup> CORE <sup>™</sup> i7-8705G PROCESSOR	INTEL <sup>®</sup> CORE™ i5-8305G PROCESSOR
Discrete Graphics	Radeon™ RX Vega M GH	Radeon™ RX Vega M GH	Radeon™ RX Vega M GL	Radeon™ RX Vega M GL	Radeon™ RX Vega M GL
Intel HD Graphics	630	630	630	630	630
Graphics Dynamic Frequency (MHz)	Up to 1100	Up to 1100	Up to 1100	Up to 1100	Up to 1100
Intel <sup>®</sup> Quick Sync Video	Yes	Yes	Yes	Yes	Yes
Discrete GPU & HBM Overclocking	Yes	No	No	No	No



# **7<sup>TH</sup> GENERATION INTEL® PROCESSOR GRAPHICS**

### 7th Generation Intel® Processor Graphics

Intel® 7th Generation Processor Graphics delivers advanced performance for captivating visuals. With 7th Gen Intel® Core<sup>™</sup> processors, you can watch, create, share, and game like never before. Premium content comes to life in 4K Ultra HD, so users can enjoy amazing and vibrant multimedia experiences on compatible displays. Edit photos and videos like a pro with fast processor graphics. Expand entertainment with multiple video streams, 360° video and high resolution video chat. Challenge your skills with agile, texture-rich graphics for HD gaming. Get the high-impact visuals you want on premium Notebooks, 2 in 1s, mini-pcs and all-in-ones.

INTEL® HD GRAPHICS 6202INTEL® HD GRAPHICS 6504ProductivitySYSmark\* 20141.01.11xVideo EditingTouchXPRT\* 20161.01.40xGaming3DMark\* 111.01.65x

### 7<sup>th</sup> Generation Intel<sup>®</sup> Processor Graphics

	INTEL <sup>®</sup> IRIS <sup>™</sup> PLUS GRAPHICS 650	INTEL <sup>®</sup> IRIS <sup>™</sup> PLUS GRAPHICS 640	INTEL® HD GRAPHICS 630	INTEL® HD GRAPHICS 620	INTEL® HD GRAPHICS 610	INTEL® HD GRAPHICS 615
Processor Family	Intel <sup>®</sup> Core <sup>™</sup> Processor Family	Intel® Core™ Processor Family	Intel® Core™ Processor Family	Intel® Core™ Processor Family	Intel® Core™ Processor Family	Intel <sup>®</sup> Core™ M Family
Processor Line	U-Series	U-Series	H-Series	U-Series	U-Series	Y-Series
Platform	Mobile	Mobile	Mobile	Mobile	Mobile	Mobile
Processor Number	i7-7567U	i7-7660U	i7-7920HQ	i7-7600U	4415U	m-7Y75
	i5-7287U	i7-7560U	i7-7820HQ	i7-7500U	3965U	m-7Y57
	i5-7267U	i5-7360U	i7-7820HK	i5-7300U	3865U	m-7Y54
	i3-7167U	i5-7260U	i7-7700HQ	i5-7200U		m-7Y30
			i5-7440HQ	i3-7100U		
			i5-7300HQ			
			i3-7100H			

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# **6<sup>TH</sup> GENERATION INTEL<sup>®</sup> PROCESSOR GRAPHICS**

multiple screens for home entertainment and gaming. Challenge your skills with agile, texture-rich graphics for gaming. Get the high-impact visuals you want on premium Notebooks, 2 in 1s, mini-pcs and all-in-ones.

# Intel® Iris™ Graphics delivers advanced performance for captivating 4K visuals. Edit photos and videos like a pro with fast processor graphics. Expand entertainment to

		INTEL® HD GRAPHICS 520 <sup>2</sup>	INTEL <sup>®</sup> IRIS <sup>™</sup> GRAPHICS 540 <sup>3</sup>	INTEL® HD GRAPHICS 5504
Productivity	SYSmark* 2014 Overall	1.0	1.06x	1.12x
Video Editing	CyberLink* MediaEspresso 7 Ultra HD Media Transcode	1.0	1.40x	1.40x
Gaming	3DMark* 11 Graphics Score (relative)	1.0	1.30x	1.80x



### 6<sup>th</sup> Generation Intel<sup>®</sup> Processor Graphics

	INTEL <sup>®</sup> IRIS <sup>™</sup> GRAPHICS 580	INTEL <sup>®</sup> IRIS <sup>™</sup> GRAPHICS 550	INTEL <sup>®</sup> IRIS <sup>™</sup> GRAPHICS 540	INTEL® HD GRAPHICS 530	INTEL® HD GRAPHICS 520	INTEL® HD GRAPHICS 510	INTEL® HD GRAPHICS 515
Processor Family	Intel® Core™ Processor Family	Intel <sup>®</sup> Core <sup>™</sup> Processor Family	Intel® Core™ Processor Family	Intel® Core™ Processor Family	Intel® Core™ Processor Family	Intel® Core™ Processor Family	Intel® Core™ M Family
Processor Line	H-Series	U-Series	U-Series	H-Series	U-Series	U-Series	Y-Series
Platform	Mobile	Mobile	Mobile	Mobile	Mobile	Mobile	Mobile
Processor Number	i7-6970HQ	i7-6567U	i7-6650U	i7-6920HQ	i7-6600U	4405U	m-6Y75
	i7-6870HQ	i5-6287U	i7-6560U	i7-6820HQ	i7-6500U	3995U	m-6Y57
	i7-6770HQ	i5-6267U	i5-6360U	i7-6820HK	i5-6300U	3855U	m-6Y54
	i5-6350HQ	i3-6167U	i5-6260U	i7-6700HQ	i5-6200U		m-6Y30
				i5-6440HQ	i3-6100U		
				i5-6300HQ			
				i3-6100H			



# **5<sup>TH</sup> GENERATION INTEL® PROCESSOR GRAPHICS**

Intel® Graphics Technology gives you discrete-level graphics power and performance without the additional add-in card, integrated right into your favorite Intel processor. The results are clear: home theater, gaming, conferencing and video and photo editing are smooth, vivid and faster than ever before. It's an immersive experience for premium notebooks, Ultrabook<sup>™</sup>, mini-pcs, and all-in-ones.

		INTEL® HD GRAPHICS 5500 <sup>5</sup>	INTEL <sup>®</sup> IRIS <sup>™</sup> GRAPHICS 6100 <sup>6</sup>	INTEL <sup>®</sup> IRIS <sup>™</sup> PRO GRAPHICS 6200 <sup>7</sup>
Productivity	CPU Performance SYSmark* 2014 Overall	1x	1.10x	1.70x
Video Editing	Quick Sync Video Accelerated Conversion Performance HDXPRT* Video Conversion	1x	1.20x	1.95x
Gaming	3DMark* 11-P Graphics Subscore, 3DMark* Firestrike Graphics Subscore, 3DMark* Vantage-P Graphics Subscore	1x	1.50x	2x

### **5th Generation Intel® Processor Graphics**

	INTEL® IRIS™ PRO Graphics 6200	INTEL® IRIS™ PRO Graphics 6200	INTEL® IRIS™ Graphics 6100	INTEL <sup>®</sup> IRIS™ Graphics 6000	INTEL® HD Graphics 5600	INTEL® IRIS™ Graphics 5500	INTEL® HD Graphics 5300	INTEL® HD Graphics
Processor Family	Intel® Core™ Processor Family	Intel® Core™ M Processor Family	Intel® Core™ M Processor Family	Intel® Core™ M Processor Family	Intel® Core™ M Processor Family	Intel® Core™ M Processor Family	Intel® Core™ M Processor Family	Intel® Pentium® / Intel® Celeron®
Processor Line	S-Series	H-Series	U-Series	U-Series	H-Series	U-Series	Y-Series	U-Series
Platform	Desktop	Mobile	Mobile	Mobile	Mobile	Mobile	Mobile	Mobile
Processor Number	i7-5775R	i7-5950HQ	i7-5557U	i7-5650U	i7-5700HQ	i7-5600U	M-5Y70	3805U
	i7-5775C	i7-5850HQ	i7-5287U	i7-5550U		i7-5500U	M-5Y71	3755U
	i5-5675R	i7-5750HQ	i7-5257U	i5-5350U		i5-5300U	M-5Y31	3205U
	i5-5675C	i5-5350H	i7-5157U	i5-5250U		i5-5200U	M-5Y10	3825U
	i5-5575R					i5-5010U	M-5Y10a	3765U
						i5-5005U	M-5Y10c	3215U





#### Intel® Core™ i7-7567U Processor (e\*) up to 4 GHz, 4T/2C, 4MB w/ Iris Plus Graphics 650 vs. Intel® Core™ i7-7500U Processor (e\*) up to 3.5GHz, 4T/2C, 4MB w/ HD Graphics 620

Estimates and measurements based on (1) Productivity - SYSmark\* 2014 Overall Score, (2) Media Editing – TouchXPRT\* 2016 – Convert Videos for sharing Sub-score, (3) 3DMark\* Sky Diver\* - Graphics Score

Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more information go to http://www.intel.com/performance

- <sup>1</sup> Data based on SKUs below
- <sup>2</sup> Core i7-6500U 15W w/HD Graphics 520
- <sup>3</sup> Core i7-6560U 15W w/Iris Graphics 540
- <sup>4</sup> Core i7-6567U 28w w/Iris Graphics 550
- 5 System configuration for 5th Generation Intel Core Processor w/ HD Graphics 5500: Intel CRB, Intel® Core<sup>™</sup> i7-5600U Processor, 2C4T, Turbo up to 3.2GHz, Memory: 2x2GB LPDDR3-1600, Storage: Intel SSD, Display Resolution:1920x1080.
- <sup>6</sup> System configuration for 5th Generation Intel Core Processor w/ Iris Graphics 6100: Intel CRB, Intel<sup>®</sup> Core<sup>™</sup> i7-5557U 15W/28W, 2C4T, Turbo up to 3.2GHz/3.4 GHz, Memory: 2x2GB LPDDR3-1866, Storage: Intel SSD, Display Resolution:1920x1080. (Estimates based on measurements done with DDR3L)
- <sup>7</sup> System configuration for 5th Generation Intel Core Processor w/ Iris Pro Graphics 6200: Intel CRB, Intel<sup>®</sup> Core<sup>™</sup> i7-5950HQ PL1=47W TDP, 4C8T, Turbo up to 3.8 GHz, Memory: 2x4GB DDR3-1866, Storage: Intel SSD, Display Resolution:1920x1080.

System configuration for Desktop LGA 5th Generation Intel Core Processor w/ Iris Pro Graphics 6200: Intel CRB, Intel® Core<sup>™</sup> i7-5775C PL1=65W TDP, 4C8T, Turbo up to 3.7 GHz, Memory: 2x4GB DDR3-1866, Storage: Intel SSD, Display Resolution:1920x1080. System configuration for Previous Gen Desktop LGA 4th Generation Intel Core Processor: Intel CRB, Intel® Core<sup>™</sup> i7-4790S 65W, 4C8T, Turbo up to 4.0 GHz, Memory: 2x4GB DDR3L-1600, Storage: Intel SSD, Display Resolution:1920x1080.

Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products.

\* Other names and brands may be claimed as the property of others.



# INTEL® MEMORY AND STORAGE

Intel<sup>®</sup> Product Quick Reference Matrix **Q3 2018** 

# FLEXIBILITY. Stability. Efficiency.

### MEMORY AND STORAGE

Intel provides technically-advanced products that support every level of computing—from data center workloads to enthusiast usage. Intel® Optane<sup>™</sup> memory creates an accelerated bridge between memory and storage. Intel® Solid State Drives (Intel® SSDs) provide storage flexibility, stability, and efficiency.

# INTEL® OPTANE™ MEMORY

Affordably get high-speed performance and greater responsiveness while maintaining high capacity.

### **BREAKTHROUGH SPEED. UNCOMPROMISED CAPACITY.**

Increase PC responsiveness with Intel<sup>®</sup> Optane<sup>m</sup> memory, smart and adaptable system accelerator that pairs with a 7th Gen Intel<sup>®</sup> Core<sup>m</sup> processor based PC to deliver high-performance responsiveness for almost everything—from checking email and web surfing to gaming and business.

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# INTEL<sup>®</sup> OPTANE<sup>™</sup> MEMORY OFFERS BETTER END USER VALUE

# **D**

USES	System Acceleration with 7th Gen Core based systems and an HDD
TARGET SEGMENTS	<ul> <li>Desktops, Workstations (Refer to Intel<sup>®</sup> Optane<sup>™</sup> Memory POR document CDI 568777 for full list of supported platforms)</li> <li>Intel<sup>®</sup> Optane<sup>™</sup> Memory Ready Motherboards</li> </ul>
FEATURES	<ul> <li>High Speed &amp; 2x Responsiveness</li> <li>Revolutionary Intel® Optane<sup>™</sup> Technology</li> <li>Intelligent System Acceleration</li> <li>High performance at low queue depth</li> <li>Intel Q&amp;R backed by 5Yr Warranty</li> <li>Software Encryption with Bitlocker and McAfee</li> <li>New Sell-Up Opportunity</li> <li>Platform Confidence &amp; Intel Branded Solution</li> </ul>



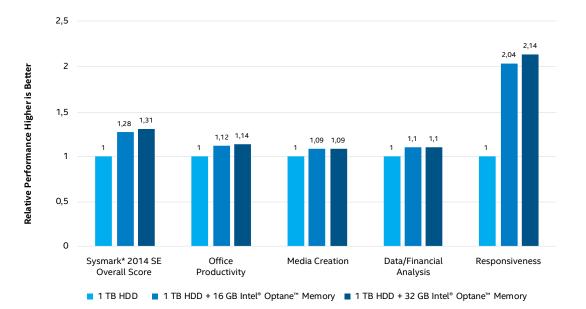
	16 GB INTEL® OPTANE™ MEMORY	32 GB INTEL® OPTANE™ MEMORY
MARKET SEGMENT	<ul> <li>Mainstream / DIY Consumers</li> <li>SMB / Mainstream Corporate Users</li> </ul>	<ul> <li>Mainstream Enthusiast / DIY Consumers</li> <li>Enthusiast / Corporate Users</li> </ul>
IDEAL FOR USERS THAT	<ul> <li>Need high capacity storage and affordable performance</li> <li>Task switch across online applications</li> <li>Often have multiple browser tabs open</li> <li>Utilize a smaller-footprint workload</li> <li>Run multiple applications throughout the day</li> </ul>	<ul> <li>Need high capacity storage and affordable performance</li> <li>Work in applications with large data sets</li> <li>Run a variety of data intensive applications</li> <li>Play Mainstream games</li> <li>Work in content creation applications</li> <li>Regularly multi-task</li> </ul>

### 16 GB Intel® Optane™ memory + 1 TB HDD 4 GB DDR delivers better responsiveness than 1 TB HDD 8 GB DDR

### 16 GB Intel<sup>®</sup> Optane<sup>™</sup> Memory + HDD

Everyday Tasks <sup>1</sup>	Up to 2x More Responsive
Storage Performance <sup>2</sup>	Up to 14x/21x Faster
Computer Boot Time <sup>3</sup>	Up to 2x Faster
Launch Web Browser 4	Up to 5x Faster
Launch Game <sup>5</sup>	Up to 67% Faster
Game Level Load ⁵	Up to 65% Faster
Open Large Media Projects 6	Up to 4.1x Faster
Launch Email 7	Up to 5.8x Faster
Launch Presentations <sup>8</sup>	Up to 3.8x Faster
Windows* File Search <sup>9</sup>	Up to 4x Faster

### Sysmark\* 2014 SE Comparison



<sup>1</sup> SYSmark 2014 SE (Responsiveness Subscore) <sup>2</sup> PCMark\* Vantage (HDD Suite) <sup>3</sup> OS Load Time Workload <sup>4</sup> Browser Launch Workload <sup>5</sup> Game Launch & Level Load Workload <sup>6</sup> Media Project Load Workload <sup>7</sup> Email Launch Workload

<sup>8</sup> Presentation Launch Workload <sup>9</sup> File Search Workload

MAINSTREAM

**ENTHUSIAST** 

BUSINESS

\*Other names and brands may be claimed as the property of others

Software and workloads used in performance tests may have been optimized for performance only on Intel® microprocessors.

Performance tests, such as SYSmark\* and MobileMark\*, are measured using specific computer systems, components, software, operations, and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more information, go to www.intel.com/benchmarks.

## **INTEL<sup>®</sup> SOLID STATE DRIVE OPTANE<sup>™</sup> FAMILY**





INTEL <sup>®</sup> SSD	INTEL <sup>®</sup> OPTANE <sup>™</sup> SSD 900P	INTEL <sup>®</sup> OPTANE <sup>™</sup> SSD 800P
USES	<ul> <li>Storage for high performance Desktop and Workstations</li> <li>CGI, Particle Simulation, Rendering, Game Development</li> <li>High Resolution Image and Video</li> <li>Engineering design and workloads</li> <li>Game development &amp; High</li> </ul>	Standalone M.2 SSD Usages
INTERFACE	PCI Express* 3.0x 4, NVM Express*	PCI Express* 3.0x 2, NVM Express*
FORM FACTOR	AIC, U.2(15mm)	M.2 80mm
CAPACITIES	280GB / 480GB	58GB / 118GB
MAXIMUM RANDOM PERFORMANCE	Reads: Up to 550k IOPS Writes: Up to 500k IOPS	Reads: Up to 300k IOPS Writes: Up to 120k IOPS
MAXIMUM SEQUENTIAL PERFORMANCE	Reads: Up to 2.5 GB/s Writes: Up to 2.0 GB/s	Reads: Up to 1350 MB/s Writes: Up to 500 MB/s
SECURITY	AES 256 bit encryption	AES 256 bit encryption
ENDURANCE	354 TBW	10 DWPD
WARRANTY	5 year limited	5 year limited

### Intel<sup>®</sup> Data Migration Software

• Transfer operating system, applications, and files from an old HDD or SSD to a new Intel® Solid State Drive<sup>4</sup>

- Easy to use
- Free

Download now at <a href="http://www.intel.com/go/ssdinstallation">www.intel.com/go/ssdinstallation</a>

\*Other names and brands may be claimed as the property of others.

### Intel<sup>®</sup> SSD Toolbox v3.4.9

- Update Intel<sup>®</sup> SSD firmware and Intel<sup>®</sup> drivers on host PC
- Optimize PC configuration for Intel SSDs, run drive diagnostics, and Secure Erase
  View SMART attributes, such as host writes and media wear out
- Supported in multiple languages

Download now at www.intel.com/go/ssdtoolbox





INTEL <sup>®</sup> SSD	INTEL <sup>®</sup> OPTANE <sup>™</sup> MEMORY	INTEL <sup>®</sup> OPTANE <sup>™</sup> MEMORY M10
USES	System Acceleration with 7th Gen Core based systems	System Acceleration with 7th Gen Core based systems
INTERFACE	PCI Express* 3.0x 2, NVM Express*	PCI Express* 3.0x 2, NVM Express*
FORM FACTOR	M.2 80mm	M.2 80mm, M.2 42mm
CAPACITIES	16GB / 32 GB	80mm: 16GB / 32GB / 64GB 42mm: 16GB
MAXIMUM RANDOM PERFORMANCE	Reads: Up to 240k IOPS Writes: Up to 65k IOPS	Reads: Up to 300k IOPS Writes: Up to 120k IOPS
MAXIMUM SEQUENTIAL PERFORMANCE	Reads: Up to 1350 MB/s Writes: Up to 290 MB/s	Reads: Up to 1350 MB/s Writes: Up to 500 MB/s
ENDURANCE	40GB DWPD	40GB DWPD
WARRANTY	5 year limited	5 year limited

### Intel<sup>®</sup> Data Migration Software

- Transfer operating system, applications, and files from an old HDD or SSD to a new Intel® Solid State Drive<sup>4</sup>
- Easy to use
- Free
- Download now at www.intel.com/go/ssdinstallation

\*Other names and brands may be claimed as the property of others.

### Intel<sup>®</sup> SSD Toolbox v3.4.9

- Update Intel<sup>®</sup> SSD firmware and Intel<sup>®</sup> drivers on host PC
  Optimize PC configuration for Intel SSDs, run drive diagnostics, and Secure Erase
  View SMART attributes, such as host writes and media wear out
- Supported in multiple languages

Download now at www.intel.com/go/ssdtoolbox

# INTEL® SOLID STATE DRIVES

Intel Corporation manufactures industry leading solid state drives targeting data center, embedded, professional, and consumer market segments.

### **CONSUMER FAMILY**

Impressive performance with NVMe\*/PCIe\* and SATA for enthusiasts and mainstream consumers.

### **PROFESSIONAL FAMILY**

Enhanced security and remote manageability with vPro<sup>™</sup> integration for the corporate client.

### **EMBEDDED FAMILY**

Low power, lower capacities all with Intel reliability for IOT and embedded applications.

### **DATA CENTER FAMILY**

Consistently amazing performance for NVMe\*/PCIe\* and SATA with broad industry compatibility, and robust enterprise RAS features.

### **INTEL® SOLID STATE DRIVE CONSUMER FAMILY**







INTEL <sup>®</sup> SSD	INTEL® SSD 760p SERIES	INTEL® SSD 600p SERIES	INTEL <sup>®</sup> SSD 545s SERIES
USES	PCs- notebooks, desktops, NUCs Everyday computing Gaming Mobile computing	PCs- notebooks, desktops, NUCs Everyday computing Gaming Mobile computing	PCs- notebooks, desktops, NUCs Everyday computing Gaming Mobile computing
INTERFACE	PCI Express* 3.0x 2, NVM Express*	PCI Express*, NVM Express*	SATA 6Gb/s
FORM FACTOR	M.2 80mm	M.2 80mm	M.2 80mm, 2.5"(7mm)
CAPACITIES	128GB / 256GB / 512GB / 1TB / 2TB	128GB / 256GB / 512GB / 1TB	M.2: 128GB / 256GB / 512GB 2.5": 128GB / 256GB / 512GB / 1TB
MAXIMUM RANDOM PERFORMANCE	Reads: Up to 350k IOPS Writes: Up to 280k IOPS	Reads: Up to 155k IOPS Writes: Up to 128k IOPS	Reads: Up to 90k IOPS Writes: Up to 75k IOPS
MAXIMUM SEQUENTIAL PERFORMANCE	Reads: Up to 3200 MB/s Writes: Up to 1600 MB/s	Reads: Up to 1800 MB/s Writes: Up to 560 MB/s	Reads: Up to 560 MB/s Writes: Up to 500 MB/s
SECURITY	End-to-end data protection <sup>3</sup> AES 256 bit encryption	AES 256 bit Encryption	AES 256 bit encryption
ENDURANCE	Up to 576 TBW	Up to 576 TBW	Up to 72 TBW
WARRANTY	5 year limited	5 year limited	5 year limited

### Intel<sup>®</sup> Data Migration Software

- Transfer operating system, applications, and files from an old HDD or SSD to a new Intel® Solid State Drive<sup>4</sup>
- Easy to use
- Free
- Download now at <a href="http://www.intel.com/go/ssdinstallation">www.intel.com/go/ssdinstallation</a>

\*Other names and brands may be claimed as the property of others.

### Intel<sup>®</sup> SSD Toolbox v3.4.9

- Update Intel<sup>®</sup> SSD firmware and Intel<sup>®</sup> drivers on host PC
- Optimize PC configuration for Intel SSDs, run drive diagnostics, and Secure Erase
  View SMART attributes, such as host writes and media wear out
- Supported in multiple languages

Download now at www.intel.com/go/ssdtoolbox

### INTEL<sup>®</sup> SOLID STATE DRIVE PROFESSIONAL FAMILY

### **D**







### INTEL® SSD INTEL® SSD PRO 7600p SERIES

### INTEL<sup>®</sup> SSD PRO 6000p SERIES

#### INTEL<sup>®</sup> SSD PRO 5450s SERIES

USES	Corporate IT Managed Client Workstation Thin and light form factors: Ultrabook*, business tablets, 2-in-1s Desktop and all-in-ones Managed mini-Pcs / Intel NUC	Corporate IT Managed client Workstation Thin and light form factors: Ultrabook*, business tablets, 2-in-1s Desktop and all-in-ones Managed mini-PCs / Intel NUC	Corporate IT Managed Client Workstation Thin and light form factors: Ultrabook*, business tablets, 2-in-1s Desktop and all-in-ones Managed mini-Pcs / Intel NUC
INTERFACE	PCI Express* 3.0, NVM Express*	PCI Express* 3.0, NVM Express*	SATA 6Gb/s
FORM FACTOR	M.2 80mm	M.2 80mm	M.2 80mm, 2.5"(7 mm)
CAPACITIES	128GB / 256GB / 360GB / 512GB / 1TB / 2TB	1.2 TB/ 512 GB/ 256 GB/ 128 GB	M.2 80mm: 256GB / 512GB 2.5": 256GB / 512GB / 1TB
MAXIMUM RANDOM PERFORMANCE	Reads: Up to 350k IOPS Writes: Up to 280k IOPS	Reads up to: 100K IOPS Writes up to: 90K IOPS	Reads: Up to 75k IOPS Writes Up to 90k IOPS
MAXIMUM SEQUENTIAL PERFORMANCE	Reads: Up to 3200 MB/s Writes: Up to 1600 MB/s	Reads up to: 1700 MB/s Writes up to: 600 MB/s	Reads: Up to 560 MB/s Writes: Up to 500 MB/s
SECURITY	AES 256b Encryption, OPAL 2.0 features, eDrive capable	AES 256b Encryption, OPAL 2.0 features, eDrive capable	AES 256b Encryption, OPAL 2.0 features, eDrive capable
ENDURANCE	Up to 576 TBW	72TBW (40GB DWPD)	Up to 576 TBW
WARRANTY	5 years limited	5 year limited	5 year limited

### **INTEL<sup>®</sup> SOLID STATE DRIVE EMBEDDED FAMILY**



#### INTEL® SSD INTEL® SSD E 7000s SERIES



#### INTEL® SSD E 7005s SERIES

USES	Embedded IOT applications – ATMs, digital signage, POS, Kiosk, Vending, NUC, etc. Intel® NUC validated and verified Validated and supported on Windows* Embedded	Embedded IOT applications Outdoor kiosks, ATMs digital signage, POS Industrial applications Validated and supported on Windows10* IoT and Windriver
INTERFACE	SATA 6 Gb/s	SATA 6 Gb/s
FORM FACTOR	M.2 80mm, 2.5" (7mm)	2.5" (7mm)
CAPACITIES (MB)	M.2 80mm, 2.5" (7mm)	150GB / 240GB / 480GB / 960GB
MAXIMUM RANDOM PERFORMANCE	Reads: Up to 65k IOPS Writes: Up to 27k IOPS	Reads: Up to 67k IOPS Writes: Up to 16k IOPS
MAXIMUM SEQUENTIAL PERFORMANCE	Reads: Up to 450 MB/s Writes: Up to 380 MB/s	Reads: Up to 450 MB/s Writes: Up to 380 MB/s
SECURITY	End-to-end data protection, AES 256 bit encryption	End-to-End data protection, AES 256 bit encryption
ENDURANCE	≥1 DWPD	≥1 DWPD
WARRANTY	5 year limited	5 year limited





INTEL <sup>®</sup> SSD	INTEL® SSD E 6000p SERIES	INTEL® SSD E 6100p SERIES
USES	Verticals: Embedded IOT applications – ATMs, digital signage, POS, Kiosk, Vending, NUC	Embedded IOT applications – ATMs, digital signage, POS, Kiosk, Vending, NUC, etc. Intel® NUC validated and verified Validated and supported on Window* Embedded
INTERFACE	PCI Express* 3.0, NVM Express*	PCI Express* 3.0, NVM Express*
FORM FACTOR	M.2 80mm	M.2 80mm
CAPACITIES (MB)	128GB / 256GB	128GB / 256GB
MAXIMUM RANDOM PERFORMANCE	Reads up to: 80K IOPS Writes up to: 70K IOPS	Reads: Up to 205k IOPS Writes: Up to 265k IOPS
MAXIMUM SEQUENTIAL PERFORMANCE	Reads up to: 1600 MB/s Writes up to: 600 MB/s	Reads: Up to 3210MB/s Writes: Up to 1315MB/s
SECURITY	AES 256b Encryption	AES 256b Encryption
ENDURANCE	<1 DWPD	<1 DWPD
WARRANTY	5 year limited	5 year limited

### Intel<sup>®</sup> SSD Data Center Family for PCIe\* - Intel<sup>®</sup> Optane<sup>™</sup>



#### INTEL<sup>®</sup> SSD INTEL<sup>®</sup> OPTANE<sup>™</sup> SSD DC P4800X SERIES

USES	Fast storage or cache Extended memory
INTERFACE	PCI Express* 3.0, NVM Express*
FORM FACTOR	AIC, U.2(15mm)
CAPACITIES (MB)	AIC: 375GB / 750GB / 1.5TB U.2: 375GB / 750GB
MAXIMUM RANDOM PERFORMANCE	Reads: Up to 550k IOPS Writes: Up to 550k IOPS
MAXIMUM SEQUENTIAL PERFORMANCE	Reads: Up to 2500 MB/s Writes: Up to 2200 MB/s
SECURITY	AES 256b Encryption
ENDURANCE	41.0 PBW
WARRANTY	5 year limited

\* Other names and brands may be claimed as the property of others.

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### Intel<sup>®</sup> Solid State Drive Data Center Family for PCIe\*



INTEL <sup>®</sup> SSD	INTEL® SSD DC P4500 SERIES	INTEL® SSD DC P4501 SERIES	INTEL® SSD DC P4510 SERIES
USES	Cloud storage Scale out storage Hard drive replacement	Cloud storage Scale out storage SATA replacement	Cloud storage Scale Out Storage Hard Drive replacement
INTERFACE	PCI Express* 3.0, NVM Express*	PCI Express* 3.0, NVM Express*	PCI Express* 3.0, NVM Express*
FORM FACTOR	U.2(15mm), AIC	U.2(7mm), M.2 (110mm)	U.2 (15mm)
CAPACITIES (MB)	U.2: 1TB / 2TB / 4TB AIC: 4TB / 8TB	U.2: 500GB / 1TB / 2TB / 4TB M.2: 1TB / 2TB	1TB / 2TB / 4TB / 8TB
MAXIMUM RANDOM PERFORMANCE	Reads: Up to 688k IOPS Writes: Up to 65k IOPS	Reads: Up to 361k IOPS Writes: Up to 46.5k IOPS	Reads: Up to 650k IOPS Writes: Up to 135k IOPS
MAXIMUM SEQUENTIAL PERFORMANCE	Reads: Up to 3200 MB/s Writes: Up to 1850 MB/s	Reads: Up to 3200 MB/s Writes: Up to 900 MB/s	Reads: Up to 3200 MB/s Writes: Up to 3000 MB/s
SECURITY	End-to-end data protection Power-loss data protection AES 256-bit encryption	End-to-end data protection Power-loss data protection AES 256-bit encryption	End-to-end data protection Power-loss data protection AES 256-bit encryption
ENDURANCE	<1 DWPD	<1 DWPD	Up to 2.61 PBW
WARRANTY	5 year limited	5 year limited	5 year limited

### Intel<sup>®</sup> Solid State Drive Data Center Family for PCIe\*







### INTEL® SSD INTEL® SSD DC P4600 SERIES

#### INTEL<sup>®</sup> SSD DC P4601 SERIES

#### INTEL<sup>®</sup> SSD DC P4608 SERIES

USES	Virtualization Caching Database Business Analytics	Cloud storage Scale Out Storage SATA replacement	High performance computing Database Big Data Analysis
INTERFACE	PCI Express* 3.0, NVM Express*	PCI Express* 3.0, NVM Express*	PCI Express* 3.0, NVM Express*
FORM FACTOR	AIC, U.2 (15mm)	U.2 (7mm)	AIC x8
CAPACITIES (MB)	AIC: 2TB / 4TB U.2: 1.6TB / 2TB / 3.2TB / 6.4TB	4TB	6.4TB
MAXIMUM RANDOM PERFORMANCE	Reads: Up to 680k IOPS Writes: 246k IOPS	Reads: Up to 325k IOPS Writes: Up to 100k IOPS	Reads: Up to 1379k IOPS Writes: Up to 428k IOPS
MAXIMUM SEQUENTIAL PERFORMANCE	Reads: Up to 3200 MB/s Writes: Up to 2000 MB/s	Reads: Up to 3200 MB/s Writes: Up to 900 MB/s	Reads: Up to 6500 MB/s Writes: Up to 3100 MB/s
SECURITY	End-to-end data protection Power-loss data protection AES 256-bit encryption	End-to-end data protection Power-loss data protection AES 256-bit encryption	End-to-end data protection Power-loss data protection AES 256-bit encryption
ENDURANCE	3 DWPD		3 DWPD
WARRANTY	5 year limited	5 year limited	5 year limited

### Intel<sup>®</sup> Solid State Drive Data Center Family for PCIe\*



#### INTEL® SSD INTEL® SSD DC P3100 SERIES

USES	Read intensive applications, boot drive
INTERFACE	PCIe* 3.0, NVMe*
FORM FACTOR	M.2 (80mm)
CAPACITIES (MB)	1.20 TB/ 512 GB/ 256 GB/ 128 GB
MAXIMUM RANDOM PERFORMANCE	Reads: up to 114K IOPs <sup>1b; 2</sup> Writes: up to 10K IOPs <sup>1b</sup>
MAXIMUM SEQUENTIAL PERFORMANCE	Reads: up to 1800 MB/s <sup>1b</sup> Writes: up to 175 MB/s <sup>1b</sup>
SECURITY	AES 256-bit encryption
ENDURANCE	Up to 0.5 drive writes per day <sup>1b</sup>
WARRANTY	5 year limited

### Intel<sup>®</sup> Solid State Drive Data Center Family for SATA



#### INTEL® SSD INTEL® SSD DC S4600 SERIES

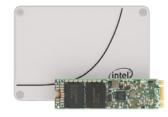


### INTEL® SSD DC S4500 SERIES

USES	Manufacturing Retail Virtualization Analytical & operational databases Machine generated data	Cloud Embedded Boot, Static Web Content Low data rate, Operational databases & Analytics Web server and SQL Logs OS Paging and Media Streaming
INTERFACE	SATA 6Gb/s	SATA 6Gb/s
FORM FACTOR	2.5"(7mm)	2.5"(7mm)
CAPACITIES (MB)	240GB / 480GB / 960GB / 1.92TB	240GB / 480GB / 960GB / 1.92TB / 3.84TB
MAXIMUM RANDOM PERFORMANCE	Reads: Up to 72k IOPS Writes: Up to 65k IOPS	Reads: Up to 72k IOPS Writes: Up to 33k IOPS
MAXIMUM SEQUENTIAL PERFORMANCE	Reads: Up to 500 MB/s Writes: Up to 490 MB/s	Reads: Up to 500 MB/s Writes: Up to 490 MB/s
SECURITY	End-to-end data protection Power-loss data protection AES 256-bit encryption	End-to-end data protection Power-loss data protection AES 256-bit encryption
ENDURANCE	3 DWPD	1 DWPD
WARRANTY	5 year limited	5 year limited

### Intel<sup>®</sup> Solid State Drive Data Center Family for SATA





#### INTEL® SSD INTEL® SSD DC S3110 SERIES

### INTEL® SSD DC S3520 SERIES

USES	Cloud Database Cassandra* No SQL* Boot OS Edge Cache Search Index	Verticals: Cloud & Embedded Workloads: Boot, Static web content; Low data rate operational databases & Analytics; Web server and SQL Logs; OS Paging; Media Streaming
INTERFACE	SATA 6 Gb/s	SATA 6 Gb/s
FORM FACTOR	2.5"(7mm), M.2 (80mm)	2.5"(7mm), M.2 (80mm)
CAPACITIES (MB)	2.5": 128GB / 256GB/ 512GB / 1TB M.2(80mm): 128GB / 256GB / 512GB	2.5": 1.6 TB/ 1.2 TB/ 960 GB/ 800 GB/ 480 GB/ 240 GB/ 150 GB M.2 (80mm): 960 GB/ 760 GB/ 480 GB/ 240 GB/ 150 GB
MAXIMUM RANDOM PERFORMANCE	Reads: Up to 75k IOPS Writes: Up to 8.5k IOPS	Reads: up to 67.5K IOPs Writes: up to 17.5K IOPs
MAXIMUM SEQUENTIAL PERFORMANCE	Reads: Up to 550 MB/s Writes: Up to 450 MB/s	Reads: up to 450 MB/s Writes: up to 380 MB/s
SECURITY	End-to-end data protection Power-loss data protection AES 256-bit encryption	End-to-end data protection Power-loss data protection AES 256-bit encryption
ENDURANCE	0.5 DWPD	0.6 drive writes per day
WARRANTY	5 year limited	5 year limited

### **PRODUCT SELECTION GUIDE**

### Consumer Family SSDs

PRODUCT NAME	CAPACITY	PRODUCT CODE	PRODUCT DESCRIPTION	PACKAGE TYPE	PACKAGE CONTENTS	QUANTITY PER BOX
	280GB	SSDPED1D280GASX	(280GB, ½ Height PCIe 3.0 X4, 20nm 3D XPoint™)	Star Citizen Promo	SSD and Star Citizen Code	1
	280GB	SSDPED1D280GAX1	(280GB, 1/2 Height PCIe x4, 3D XPoint™)	Reseller Single Pack	SSD only	1
	280GB	SSDPE21D280GAX1	(280GB, 2.5in PCIe x4, 3D XPoint™)	Reseller Single	SSD only	1
Intel® Optane™ SSD 900P Series	280GB	SSDPE21D280GASM	(280GB, 2.5in PCIe x4, 3D XPoint™)	Star Citizen Promo	SSD and Star Citizen Code	1
	280GB	SSDPE21D280GASX	(280GB, 2.5in PCIe x4, 3D XPoint™)	Star Citizen Promo	SSD and Star Citizen Code	1
	480GB	SSDPED1D480GASX	(480GB, ½ Height PCIe 3.0 X4, 20nm 3D XPoint™)	Star Citizen Promo	SSD and Star Citizen Code	1
	480GB	SSDPED1D480GAX1	(480GB, 1/2 Height PCIe x4, 3D XPoint™)	Reseller box	SSD only	1
	60GB	SSDPEK1W060GAXT	(60GB, M.2 80mm PCle x4, 3D Xpoint™)	Retail Box	SSD only	10
	120GB	SSDPEK1W120GAXT	(120GB, M.2 80mm PCle x4, 3D Xpoint <sup>™</sup> )	Retail Box	SSD only	10
	120GB	SSDPEK1W120GAX1	(120GB, M.2 80mm PCle x4, 3D Xpoint <sup>™</sup> )	Retail Box	SSD only	1
Intel® Optane™ SSD 800P Series	60GB	SSDPEK1W060GA01	(60GB, M.2 80mm PCle x4, 3D Xpoint™)	Generic Pack	SSD only	1
	120GB	SSDPEK1W120GA01	(120GB, M.2 80mm PCIe x4, 3D Xpoint <sup>™</sup> )	Generic Pack	SSD only	1
	60GB	SSDPEK1W060GA	(60GB, M.2 80mm PCIe x4, 3D Xpoint™)	Generic Pack	SSD only	100
	120GB	SSDPEK1W120GA	(120GB, M.2 80mm PCIe x4, 3D Xpoint <sup>™</sup> )	Generic Pack	SSD only	100
	1.024TB	SSDPEKKW010T8X1	(1.024TB, M.2 80mm PCle 3.0 x4, 3D2, TLC)	Retail Box	SSD only	1
	512GB	SSDPEKKW512G8XT	(512GB, M.2 80mm PCIe 3.0 x4, 3D2, TLC)	Retail Box	SSD only	10
	512GB	SSDPEKKW512G801	(512GB, M.2 80mm, PCIe 3.0 x4, 3D2, TLC)	Generic Single Pack	SSD only	1
Intel <sup>®</sup> SSD 760p Series	256GB	SSDPEKKW256G8XT	(256GB, M.2 80mm PCle 3.0 x4, 3D2, TLC)	Retail Box	SSD only	10
	256GB	SSDPEKKW256G801	(256GB, M.2 80mm, PCIe 3.0 x4, 3D2, TLC)	Generic Single Pack	SSD only	1
	128GB	SSDPEKKW128G8XT	(128GB, M.2 80mm PCle 3.0 x4, 3D2, TLC)	Retail Box	SSD only	10
	128GB	SSDPEKKW128G801	(128GB, M.2 80mm, PCle 3.0 x4, 3D2, TLC)	Generic Single Pack	SSD only	1
	1024 GB	SSDPEKKW010T7X1	3D1, TLC / M.2 / 80mm PCI Express 3.0	Reseller box	SSD only	1
Intel® SSD 600p Series	512 GB	SSDPEKKW512G7X1	3D1, TLC / M.2 / 80mm PCI Express 3.0	Reseller box	SSD only	1
inter 550 600p Series	256 GB	SSDPEKKW256G7X1	3D1, TLC / M.2 / 80mm PCI Express 3.0	Reseller box	SSD only	1
	128 GB	SSDPEKKW128G7X1	3D1, TLC / M.2 / 80mm PCI Express 3.0	Reseller box	SSD only	1

	1.024TB	SSDSC2KW010T8X1	(1.024TB, 2.5in SATA 6Gb/s, 3D2, TLC)	Retail box	SSD only	1
	512GB	SSDSC2KW512G8	(512GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	50
	512GB	SSDSC2KW512G8XT	(512GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Retail Box	SSD only	10
	512GB	SSDSC2KW512G8X1	(512GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Retail Box	SSD only	1
	512GB	SSDSCKKW512G8X1	(512GB, M.2 80mm SATA 6Gb/s, 3D2, TLC)	Retail Box	SSD only	1
	256GB	SSDSC2KW256G8	(256GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	50
	256GB	SSDSC2KW256G8XT	(256GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Retail Box	SSD only	10
ntel® SSD 545s Series	256GB	SSDSC2KW256G8X1	(256GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Retail Box	SSD only	1
	256GB	SSDSCKKW256G8	(256GB, M.2 80mm SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	50
	256GB	SSDSCKKW256G8XT	(256GB, M.2 80mm SATA 6Gb/s, 3D2, TLC)	Retail Box	SSD only	10
	256GB	SSDSCKKW256G8X1	(256GB, M.2 80mm SATA 6Gb/s, 3D2, TLC)	Retail Box	SSD only	1
	128GB	SSDSC2KW128G8	(128GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	50
	128GB	SSDSC2KW128G8XT	(128GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Retail Box	SSD only	10
	128GB	SSDSC2KW128G8X1	(128GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Retail Box	SSD only	1
	128GB	SSDSCKKW128G8X1	(128GB, M.2 80mm SATA 6Gb/s, 3D2, TLC)	Retail Box	SSD only	1

### Consumer Family SSDs Intel® Optane™ Memory

PRODUCT NAME	DENSITY	MM#	PRODUCT DESCRIPTION	PRODUCT CODE
	16GB	957790	Intel® Optane™ Memory Series	MEMPEK1W016GAXT
	16GB	953340	Intel® Optane™ Memory Series	MEMPEK1W016GA01
Intol® Ontono™ Momony	16GB	957794	Intel® Optane™ Memory Series	MEMPEK1W016GA
Intel® Optane™ Memory	32GB	953341	Intel® Optane™ Memory Series	MEMPEK1W032GA01
	32GB	957795	Intel® Optane™ Memory Series	MEMPEK1W032GA
	35GB	957793	Intel® Optane™ Memory Series	MEMPEK1W032GAXT

### Professional Family SSDs

PRODUCT NAME	CAPACITY	PRODUCT CODE	PRODUCT DESCRIPTION	PACKAGE TYPE	PACKAGE CONTENTS	QUANTITY PER BOX
	1024 GB	SSDPEKKF010T7X1	3D1, TLC / M.2 / 80mm PCI Express 3.0	Reseller box	SSD only	1
	512 GB	SSDPEKKF512G7X1	3D1, TLC / M.2 / 80mm PCI Express 3.0	Reseller box	SSD only	1
Intel® SSD Pro 6000p Series	360 GB	SSDPEKKF360G7X1	3D1, TLC / M.2 / 80mm PCI Express 3.0	Reseller box	SSD only	1
	256 GB	SSDPEKKF256G7X1	3D1, TLC / M.2 / 80mm PCI Express 3.0	Reseller box	SSD only	1
	128 GB	SSDPEKKF128G7X1	3D1, TLC / M.2 / 80mm PCI Express 3.0	Reseller box	SSD only	1

	512GB	SSDSC2KF512G8X1	(512GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Retail Box Single Pack	SSD only	1
Intel® SSD Pro 5450s Series	256GB	SSDSC2KF256G8X1	(256GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Retail Box Single Pack	SSD only	1
	256GB	SSDSCKKF256G8ES	(256GB, M.2 80mm SATA 6Gb/s, 3D2, TLC)	Generic Single Pack	SSD only	1
	256GB	SSDSCKKF256G8X1	(256GB, M.2 80mm SATA 6Gb/s, 3D2, TLC)	Retail Box Single Pack	SSD only	1
	2.048TB	SSDPEKKF0202T8X1	(2.048TB, M.2 80mm PCIe 3.0 x4, 3D2, TLC)	Retail Box Single Pack	SSD only	1
	1.02TB	SSDPEKKF010T8X1	(1.024TB, M.2 80mm PCIe 3.0 x4, 3D2, TLC)	Retail Box Single Pack	SSD only	1
Intel® SSD Pro 7600p Series	512 GB	SSDPEKKF512G8X1	(512GB, M.2 80mm PCIe 3.0 x4, 3D2, TLC)	Retail Box Single Pack	SSD only	1
	256 GB	SSDPEKKF256G8X1	(256GB, M.2 80mm PCIe 3.0 x4, 3D2, TLC)	Retail Box Single Pack	SSD only	1
	128 GB	SSDPEKKF128G8X1	(128GB, M.2 80mm PCIe 3.0 x4, 3D2, TLC)	Retail Box Single Pack	SSD only	1

### Embedded Family SSDs

PRODUCT NAME	CAPACITY	PRODUCT CODE	PRODUCT DESCRIPTION	PACKAGE TYPE	PACKAGE CONTENTS	QUANTITY PER BOX
	256 GB	SSDPEKKR256G7XN	3D1, TLC / M.2 / 80mm PCI Express 3.0	Reseller box	SSD only	1
Intel <sup>®</sup> SSD E 6000p Series	128 GB	SSDPEKKR128G7XN	3D1, TLC / M.2 / 80mm PCI Express 3.0	Reseller box	SSD only	1
	150GB	SSDSC2BR150G7XC	(150GB, 2.5in SATA 6Gb/s, 3D1, MLC)	Generic 50 Pack	SSD only	50
	150GB	SSDSC2BR150G7XA	(150GB, 2.5in SATA 6Gb/s, 3D1, MLC)	Generic Single Pack	SSD only	1
	150GB	SSDSCKJR150G7XA	(150GB, M.2 80mm SATA 6Gb/s, 3D1, MLC)	Generic Single Pack	SSD only	1
	150GB	SSDSCKJR150G7XC	(150GB, M.2 80mm SATA 6Gb/s, 3D1, MLC)	Generic 50 Pack	SSD only	50
	240GB	SSDSC2BR240G7XA	(240GB, 2.5in SATA 6Gb/s, 3D1, MLC)	Generic Single Pack	SSD only	1
	240GB	SSDSCKJR240G7XC	(240GB, M.2 80mm SATA 6Gb/s, 3D1,MLC)	Generic 50 Pack	SSD only	50
	240GB	SSDSCKJR240G7XA	(240GB, M.2 80mm SATA 6Gb/s, 3D1 MLC)	Generic Single Pack	SSD only	1
Intel® SSD E 7000s Series	480GB	SSDSC2BR480G7XC	(480GB, 2.5in SATA 6Gb/s, 3D1, MLC)	Generic 50 Pack	SSD only	50
	480GB	SSDSC2BR480G7XA	(480GB, 2.5in SATA 6Gb/s, 3D1, MLC)	Generic Single Pack	SSD only	1
	480GB	SSDSCKJR480G7XC	(480GB, M.2 80mm SATA 6Gb/s, 3D1,MLC)	Generic 50 Pack	SSD only	50
	480GB	SSDSCKJR480G7XA	(480GB, M.2 80mm SATA 6Gb/s, 3D1,MLC)	Generic Single Pack	SSD only	1
	960GB	SSDSC2BR960G7XC	(960GB, 2.5in SATA 6Gb/s, 3D1, MLC)	Generic 50 Pack	SSD only	50
	960GB	SSDSC2BR960G7XA	(960GB, 2.5in SATA 6Gb/s, 3D1, MLC)	Generic Single Pack	SSD only	1
	960GB	SSDSCKJR960G7XC	(960GB, M.2 80mm SATA 6Gb/s, 3D1,MLC)	Generic 50 Pack	SSD only	50
	960GB	SSDSCKJR960G7XA	(960GB, M.2 80mm SATA 6Gb/s, 3D1,MLC)	Generic Single Pack	SSD only	1

	150GB	SSDSC2MN150G701	(150GB, 2.5in SATA 6Gb/s, 3D1, MLC) 7mm	Generic Single Pack	SSD only	1
	150GB	SSDSC2MN150G7	(150GB, 2.5in SATA 6Gb/s, 3D1, MLC) 7mm	Generic 50 Pack	SSD only	50
	240GB	SSDSC2MN240G701	(240GB, 2.5in SATA 6Gb/s, 3D1, MLC) 7mm	Generic Single Pack	SSD only	1
Intel® SED E 700Es Series	240GB	SSDSC2MN240G7	(240GB, 2.5in SATA 6Gb/s, 3D1, MLC) 7mm	Generic 50 Pack	SSD only	50
Intel® SSD E 7005s Series	480GB	SSDSC2MN480G701	(480GB, 2.5in SATA 6Gb/s, 3D1, MLC) 7mm	Generic Single Pack	SSD only	1
	480GB	SSDSC2MN480G7	(480GB, 2.5in SATA 6Gb/s, 3D1, MLC) 7mm	Generic 50 Pack	SSD only	50
	960GB	SSDSC2MN960G701	(960GB, 2.5in SATA 6Gb/s, 3D1, MLC) 7mm	Generic Single Pack	SSD only	1
	960GB	SSDSC2MN960G7	(960GB, 2.5in SATA 6Gb/s, 3D1, MLC) 7mm	Generic 50 Pack	SSD only	50
	256 GB	SSDPEKKR256G810	(256GB, M.2 80mm PCIe 3.0 x4, 3D2, TLC	Generic 10 Pack	SSD only	10
	256 GB	SSDPEKKR256G8	(256GB, M.2 80mm PCIe 3.0 x4, 3D2, TLC)	Generic 50 Pack	SSD only	50
Intel® SSD E 6100m Series	256 GB	SSDPEKKR256G801	(256GB, M.2 80mm PCIe 3.0 x4, 3D2, TLC)	Generic Single Pack	SSD only	1
Intel® SSD E 6100p Series	128 GB	SSDPEKKR128G810	(128GB, M.2 80mm PCIe 3.0 x4, 3D2, TLC)	Generic 10 Pack	SSD only	10
	128 GB	SSDPEKKR128G8	(128GB, M.2 80mm PCIe 3.0 x4, 3D2, TLC)	Generic 50 Pack	SSD only	50
	128 GB	SSDPEKKR128G801	(128GB, M.2 80mm PCIe 3.0 x4, 3D2, TLC)	Generic Single Pack	SSD only	1

### Intel<sup>®</sup> Solid State Drives Data Center for PCIe\*

	CAPACITY	PRODUCT CODE PRODUCT DESCRIPTION		PACKAGE TYPE	PACKAGE CONTENTS	QUANTITY PER BOX
	750GB	SSDPED1K750GA01	(750GB, 1/2 Height PCIe x4, 3D XPoint™)	Generic Pack	SSD only	1
Intel® Optane™ SSD DC P4800X Series	750GB	SSDPE21K750GA01	(750GB, 2.5in PCle x4, 3D XPoint <sup>™</sup> )	Generic Pack	SSD only	1
inter Optane 330 DC P4000X Series	375GB	SSDPED1K375GA01	(375GB, 1/2 Height PCIe x4, 3D XPoint)	Generic Pack	SSD only	1
	375GB	SSDPE21K375GA01	(375GB, 2.5in PCle x4, 3D XPoint <sup>™</sup> )	Generic Pack	SSD only	1
	8TB	SSDPERKX080T701	(8.0TB, Ruler PCIe 3.1 x4, 3D1, TLC)	Generic Pack	SSD only	1
	4TB	SSDPE2KX040T701	4.0TB, 2.5in PCle 3.1 x4, 3D1, TLC)	Generic Pack	SSD only	1
Intel <sup>®</sup> SSD DC P4500 Series	4TB	SSDPEDKX040T701	(4.0TB, 1/2 Height PCIe 3.1 x4, 3D1, TLC)	Generic Pack	SSD only	1
	4TB	SSDPERKX040T701	(4.0TB, Ruler PCIe 3.1 x4, 3D1, TLC)	Generic Pack	SSD only	1
	2TB	SSDPE2KX020T701	(2.0TB, 2.5in PCle 3.1 x4, 3D1, TLC)	Generic Pack	SSD only	1
	1TB	SSDPE2KX010T701	(1.0TB, 2.5in PCle 3.1 x4, 3D1, TLC)	Generic Pack	SSD only	1
	4TB	SSDPE7KX040T701	(4.0TB, 2.5in PCle 3.1 x4, 3D1, TLC)	Generic Pack	SSD only	1
Intel <sup>®</sup> SSD DC P4501 Series	2TB	SSDPE7KX020T701	(2.0TB, 2.5in PCle 3.1 x4, 3D1, TLC)	Generic Pack	SSD only	1
	1TB	SSDPE7KX010T701	(1.0TB, 2.5in PCle 3.1 x4, 3D1, TLC)	Generic Pack	SSD only	1
	500GB	SSDPE7KX500G701	(500GB, 2.5in PCle 3.1 x4, 3D1, TLC)	Generic Pack	SSD only	1
	2TB	SSDPE2KX020T810	(2.0TB, 2.5in PCle 3.1 x4, 3D2, TLC)	Generic Pack	SSD only	10
Intel <sup>®</sup> SSD DC P4510 Series	2TB	SSDPE2KX020T801	(2.0TB, 2.5in PCle 3.1 x4, 3D2, TLC)	Generic Pack	SSD only	1
	1TB	SSDPE2KX010T810	(1.0TB, 2.5in PCle 3.1 x4, 3D2, TLC)	Generic Pack	SSD only	10
	1TB	SSDPE2KX010T801	(1.0TB, 2.5in PCle 3.1 x4, 3D2, TLC)	Generic Pack	SSD only	1
	6.4TB	SSDPE2KE064T701	(6.4TB, 2.5in PCle 3.1 x4, 3D1, TLC)	Generic Pack	SSD only	1
	4TB	SSDPEDKE040T701	(4.0TB, 1/2 Height PCle 3.1 x4, 3D1, TLC)	Generic Pack	SSD only	1
Intel <sup>®</sup> SSD DC P4600 Series	3.2TB	SSDPE2KE032T701	(3.2TB, 2.5in PCle 3.1 x4, 3D1, TLC)	Generic Pack	SSD only	1
liner 350 DC P4000 Series	2TB	SSDPEDKE020T701	(2.0TB, 1/2 Height PCIe 3.1 x4, 3D1, TLC)	Generic Pack	SSD only	1
	2TB	SSDPE2KE020T701	(2.0TB, 2.5in PCle 3.1 x4, 3D1, TLC)	Generic Pack	SSD only	1
	1.6TB	SSDPE2KE016T701	(1.6TB, 2.5in PCle 3.1 x4, 3D1, TLC)	Generic Pack	SSD only	1
Intel® SSD DC P4608	6.4TB	SSDPECKE064T701	(6.4TB, 1/2 Height PCIe 3.1 x8, 3D1, TLC)	Generic Pack	SSD only	1
	1024 GB	SSDPEKKA010TG701	3D1, TLC / M.2 / 80mm PCI Express 3.0	OEM box	SSD only	1
Intel <sup>®</sup> SSD DC P3100 Series	512 GB	SSDPEKKA512G701	3D1, TLC / M.2 / 80mm PCI Express 3.0	OEM box	SSD only	1
inter 330 DC F3 100 Series	256 GB	SSDPEKKA256G701	3D1, TLC / M.2 / 80mm PCI Express 3.0	OEM box	SSD only	1
	128 GB	SSDPEKKA128G701	3D1, TLC / M.2 / 80mm PCI Express 3.0	OEM box	SSD only	1

### Intel<sup>®</sup> SSD Data Center Family for SATA

PRODUCT NAME	CAPACITY	PRODUCT CODE	PRODUCT DESCRIPTION	PACKAGE TYPE	PACKAGE CONTENTS	QUANTITY PER BOX
	1.9TB	SSDSC2KG019T701	(1.9TB, 2.5in SATA 6Gb/s, 3D1, TLC)	Generic Pack	SSD only	1
Intel <sup>®</sup> SSD DC S4600 Series	960GB	SSDSC2KG960G701	(960GB, 2.5in SATA 6Gb/s, 3D1, TLC)	Generic Pack	SSD only	1
inter SSD DC 54600 Series	480GB	SSDSC2KG480G701	(480GB, 2.5in SATA 6Gb/s, 3D1, TLC)	Generic Pack	SSD only	1
	240GB	SSDSC2KG240G701	(240GB, 2.5in SATA 6Gb/s, 3D1, TLC)	Generic Pack	SSD only	1
	3.8TB	SSDSC2KB038T701	(3.8TB, 2.5in SATA 6Gb/s, 3D1, TLC)	Generic Pack	SSD only	1
	1.9TB	SSDSC2KB019T701	(1.9TB, 2.5in SATA 6Gb/s, 3D1, TLC)	Generic Pack	SSD only	1
Intel® SSD S4500 Series	960GB	SSDSC2KB960G701	(960GB, 2.5in SATA 6Gb/s, 3D1, TLC)	Generic Pack	SSD only	1
	480GB	SSDSC2KB480G701	(480GB, 2.5in SATA 6Gb/s, 3D1, TLC)	Generic Pack	SSD only	1
	240GB	SSDSC2KB240G701	(240GB, 2.5in SATA 6Gb/s, 3D1, TLC)	Generic Pack	SSD only	1
	512GB	SSDSC2KI512G801	(512GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	1
	512GB	SSDSCKKI512G801	(512GB, M.2 80mm SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	1
	256GB	SSDSC2KI256G801	(256GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	1
Intel® SSD DC S3110 Series	256GB	SSDSCKKI256G801	(256GB, M.2 80mm SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	1
	128GB	SSDSC2KI128G801	128GB, 2.5in SATA 6Gb/s, 3D2, TLC	Generic Pack	SSD only	1
	128GB	SSDSCKKI128G801	(128GB, M.2 80mm SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	1
	1.60 TB	SSDSC2BB016T701	3D1, MLC / 2.5" / 7mm PCI Express 3.0	OEM box	SSD only	1
	1.20 TB	SSDSC2BB012T701	3D1, MLC / 2.5" / 7mm PCI Express 3.0	OEM box	SSD only	1
	960 GB	SSDSC2BB960G701	3D1, MLC / 2.5" / 7mm PCI Express 3.0	OEM box	SSD only	1
	800 GB	SSDSC2BB800G701	3D1, MLC / 2.5" / 7mm PCI Express 3.0	OEM box	SSD only	1
	480 GB	SSDSC2BB480G701	3D1, MLC / 2.5" / 7mm PCI Express 3.0	OEM box	SSD only	1
Intel® SSD DC S3520 Series	240 GB	SSDSC2BB240G701	3D1, MLC / 2.5" / 7mm PCI Express 3.0	OEM box	SSD only	1
Intel <sup>®</sup> SSD DC 53520 Series	150 GB	SSDSC2BB150G701	3D1, MLC / 2.5" / 7mm PCI Express 3.0	OEM box	SSD only	1
	960 GB	SSDSCKJB960G701	3D1, MLC / M.2 / 80mm PCI Express 3.0	OEM box	SSD only	1
	760 GB	SSDSCKJB760G701	3D1, MLC / M.2 / 80mm PCI Express 3.0	OEM box	SSD only	1
	480 GB	SSDSCKJB480G701	3D1, MLC / M.2 / 80mm PCI Express 3.0	OEM box	SSD only	1
	240 GB	SSDSCKJB240G701	3D1, MLC / M.2 / 80mm PCI Express 3.0	OEM box	SSD only	1
	150 GB	SSDSCKJB150G701	3D1, MLC / M.2 / 80mm PCI Express 3.0	OEM box	SSD only	1

### For more information, visit www.intel.com/ssd

- 1 Performance varies by capacity. Tests document performance of components on a particular test, in specific systems. Differences in hardware, software, or configuration will affect actual performance. Consult other sources of information to evaluate performance as you consider your purchase. System configurations: 1a Intel<sup>®</sup> Core<sup>™</sup> i7-4770 CPU at 3.4 GHz, 8GB DDR3 at 1600 MHz, Intel<sup>®</sup> SSD DC P3608 Series 1.6TB
- 1b Intel Core i7-3770K CPU @ 3.50GHz, 8GB of system memory, Windows<sup>1</sup> Server 2012, IOMeter. Random performance is collected with 4 workers each with 32 QD. Average RMS Active write power measured at max bandwidth
- 1c Performance measured by Intel using Iometer 1.1.0 with queue depth 32. Measurements are performed on 8 GB of Logical Block Address (LBA) range on a full SSD. System configuration: Intel® Core i7-5960X processor, Intel® X99 chipset, PC2666 16GB DRAM.
- 2 Random 4 KB reads. Performance specifications apply to both compressible and non-compressible data.
- 3 Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at www.intel.com
- 4 1 PB = 1000 TeraBytes
- 5 Desktop installation kit contents: SATA signal cables, screws, installation guide, and warranty documentation.
- All products and dates specified are preliminary based on current expectations and are subject to change without notice. Availability in different channels may vary.
- For more complete information about performance and benchmark results, visit www.intel.com/benchmarks
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- \* Other names and brands may be claimed as the property of others.



# INTEL® DESKTOP PROCESSORS

Intel<sup>®</sup> Product Quick Reference Matrix **Q3 2018** 



### **INTEL® DESKTOP PROCESSORS**

This new generation of processors extends all the capabilities users have come to love in our desktop platforms with advanced innovations that deliver exciting new features to immerse you in incredible experiences on a variety of form factors.

## INTEL® DESKTOP PROCESSORS

### ACCELERATE PERFORMANCE WITH 8<sup>th</sup> gen intel<sup>®</sup> core<sup>™</sup> processor family.

All-new performance. All-new experiences. An all-new computer.

### **PERFORMANCE TO EXCITE**

A desktop computer based on a 8th Generation Intel® Core™ processor is always ready for real-life productivity, creativity and entertainment.

### **EXPERIENCE TO AMAZE**

8th Generation Intel<sup>®</sup> Core<sup>™</sup> processor-based desktop PCs are packed with new and enhanced features to deliver amazing experiences that a 5-year old PC can't handle. Uncompromised gaming, while you stream, chat and share with your community – stunning visuals of Ultra HD 4K premium content – or transport into a great VR experience.

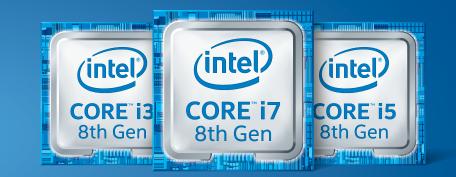
### HARDWARE-BASED FEATURES MITIGATE THREATS

8th Generation Intel<sup>®</sup> Core<sup>™</sup> processors offer hardware-level security features that strengthen the protection of your enabled security software. Hardware-based security to help you compute with greater peace of mind.

## SCALABLE PORTFOLIO OF PROCESSORS

The 8th Generation Intel® Core™ processor family delivers significant value and is a great investment in your success. From the i7-8700K to the i3-8100, there is a processor to fit a wide range of budgets and needs, from the performance-hungry professionals to the first-time buyers.

## 8<sup>TH</sup> GENERATION INTEL<sup>®</sup> CORE<sup>™</sup> DESKTOP PROCESSOR



### **Be Ready for Amazing Experiences**

This new generation of processors extends all the capabilities users have come to love in our desktop platforms with advanced innovations that deliver exciting new features to immerse you in incredible experiences on a variety of form factors.

### **Experience Amazing**

8th Generation Intel<sup>®</sup> Core<sup>™</sup> processor-based desktop platforms are loaded with new and enhanced features to deliver amazing experiences that five-year-old systems can't handle.

#### Ultimate Protection Built Into the Silicon<sup>1</sup>

8th Generation Intel® Core™ processors integrate hardware-level technologies that strengthen the protection of your enabled security<sup>1</sup> software. Hardware-based security helps you experience online and offline activities with peace of mind.

### Incredible VR

A high-performance processor is key to achieving a balanced platform to make your VR experiences great. Attach your premium head-mounted display (HMD) to an Intel<sup>®</sup> Core<sup>™</sup> i7 or i5 processor-based PC, and prepare to be amazed.

### **Scalable Portfolio of Processors**

From the jaw-dropping performance of the 8th Generation Intel® Core™ i7-8700K processor with six cores to the practical capabilities of the 8th Generation Intel® Core™ i3-8100 processor, our latest generation of desktop processors fits a wide range of budgets and needs.

### **Great Gaming**

Outstanding gaming experiences extend beyond your personal smooth gameplay to your entire gaming community. The 8th Generation Intel® Core™ processor family makes it easy to share those experiences by live-streaming or recording, editing, and posting your epic highlights.

### **Prepare to be Amazed**

The 8th Generation Intel<sup>®</sup> Core<sup>™</sup> processors are raising the bar of desktop computing with innovations to drive exciting experiences, capabilities, and form factors. Experience all the amazing things you and a new 8th Generation Intel<sup>®</sup> Core<sup>™</sup> processor-powered PC can do.

### **Ultra-high Definition Entertainment**

Desktop computers based on the 8th Generation Intel® Core™ processors integrate advanced media technologies that bring premium, high-quality content to your desktop.

1 Intel® technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system can be absolutely secure. Check with your system manufacturer or retailer or learn more at https://www.intel.com.

\* Other brands and names may be claimed as the property of others

### 8<sup>TH</sup> GEN INTEL<sup>®</sup> CORE<sup>™</sup> DESKTOP PLATFORM



### **Exceptional Platform Performance**

The 8th Generation Intel<sup>®</sup> Core<sup>™</sup> processors redefine mainstream desktop PC performance with up to six cores for more processing power—that's two more cores than the previous generation Intel<sup>®</sup> Core<sup>™</sup> processor family—Intel<sup>®</sup> Turbo Boost Technology 2.0 to increase the maximum turbo frequency up to 4.7 GHz, and up to 12 MB of cache memory.<sup>1</sup> Intel<sup>®</sup> Hyper-Threading Technology (Intel<sup>®</sup> HT Technology)<sup>1</sup> delivers up to 12-way multitasking support in the latest generation of Intel<sup>®</sup> Core<sup>™</sup> processors. For the enthusiast, the unlocked 8th Generation Intel<sup>®</sup> Core<sup>™</sup> i7-8700K processor provides you the opportunity to tweak the platform performance to its fullest potential and enjoy great gaming and VR experiences.

#### The new 8th Generation Intel<sup>®</sup> Core<sup>™</sup> processor family delivers:

- · An impressive portfolio of standard and unlocked systems for a broad range of usages and performance levels
- New system acceleration when paired with Intel® Optane™ memory to deliver amazing system responsiveness1
- Intel® Turbo Boost Technology 2.0 to give you that extra burst of performance when you need it
- Intel® Hyper-Threading Technology (Intel® HT Technology), which allows each processor core to work on two tasks at the same time, improving multitasking, speeding up workflows, and accomplishing more in less time
- DDR4 RAM memory technology support, which allows systems to have up to 64 GB of memory and up to 2666 MT/s memory transfer speeds
- The ability to set an overclocked ratio per core with unlocked processors,<sup>1</sup> when paired with select chipset SKUs, to provide you more control and more granularity for overclocking<sup>2</sup> your platform



BRAND NAME AND PROCESSOR NUMBER <sup>3</sup>	BASE FREQUENCY	MAX TURBO FREQUENCY <sup>4</sup>	MEMORY SPEED	TDP	SOCKET (LGA)
Intel <sup>®</sup> Core™ i7-8700K	3.70 GHz	4.70 GHz	2 channels DDR4-2666	95 W	1151
Intel® Core™ i7-8700	3.20 GHz	4.60 GHz	2 channels DDR4-2666	65 W	1151
Intel® Core™ i5-8600K	3.60 GHz	4.30 GHz	2 channels DDR4-2666	95 W	1151
Intel® Core™ i5-8600	3.10 GHz	4.30 GHz	2 channels DDR4-2666	65 W	1151
Intel® Core™ i5-8500	3.00 GHz	4.10 GHz	2 channels DDR4-2666	65 W	1151
Intel® Core™ i5-8400	2.80 GHz	4.00 GHz	2 channels DDR4-2666	65 W	1151
Intel <sup>®</sup> Core™ i3-8350K	4.00 GHz	N/A	2 channels DDR4-2400 <sup>5</sup>	91 W	1151
Intel® Core™ i3-8300	3.70 GHz	N/A	2 channels DDR4-2400 <sup>5</sup>	62 W	1151
Intel® Core™ i3-8100	3.60 GHz	N/A	2 channels DDR4-2400 <sup>5</sup>	65 W	1151

#### ... continued from previous page

BRAND NAME AND PROCESSOR NUMBER <sup>3</sup>	BASE FREQUENCY	MAX TURBO FREQUENCY <sup>4</sup>	MEMORY SPEED	TDP	SOCKET (LGA)
Intel® Pentium® Gold G5600	3.90 GHz	N/A	2 channels DDR4-2400⁵	54	1151
Intel® Pentium® Gold G5500	3.80 GHz	N/A	2 channels DDR4-2400⁵	54	1151
Intel® Pentium® Gold G5400	3.70 GHz	N/A	2 channels DDR4-2400⁵	54/58 <sup>6</sup>	1151
Intel® Celeron® G4920	3.20 GHz	N/A	2 channels DDR4-2400⁵	54	1151
Intel® Celeron® G4900	3.10 GHz	N/A	2 channels DDR4-2400⁵	54	1151

<sup>1</sup> Intel<sup>®</sup> technologies features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system can be absolutely secure. Check with your system manufacturer or retailer or learn more at http://www.intel.com.

<sup>&</sup>lt;sup>2</sup> Warning: Altering PC clock or memory frequency and/or voltage may (i) reduce system stability and use life of the system, memory and processor; (ii) cause the processor and other system components to fail; (iii) cause reductions in system performance; (iv) cause additional heat or other damage; and (v) affect system data integrity. Intel assumes no responsibility that the memory, included if used with altered clock frequencies and/or voltages, will be fit for any particular purpose. Check with memory manufacturer for warranty and additional details. For more information, visit http://www.intel.com/content/www/za/en/gaming/overclocking-intel-processors.html.

<sup>&</sup>lt;sup>3</sup> NOTE: Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. See www.intel.com/products/processor\_number for details.

<sup>&</sup>lt;sup>4</sup> Refers to the maximum single-core frequency that can be achieved with Intel® Turbo Boost Technology

<sup>&</sup>lt;sup>5</sup> DDR4-2400 support is 1 and 2 DPC for UDIMMs but only 1DPC for SODIMMs

<sup>&</sup>lt;sup>6</sup> From 4-core die (54W) and fused 6-core die (58w)

<sup>\*</sup> Other brands and names may be claimed as the property of others

### INTEL<sup>®</sup> CORE<sup>™</sup> X-SERIES PROCESSOR FAMILY



### Intel<sup>®</sup> Core<sup>™</sup> X-Series Processors and Intel<sup>®</sup> X299 Chipset<sup>1</sup>

Up to 18 Cores, 36 Way Multitask Processing. Ultimate platform for extreme gaming systems, intensive digital content creation and virtual reality usages.

- Unprecedented scalability from 4 cores to 18 cores
- Fully unlocked for performance tuning
- Improved Intel<sup>®</sup> Turbo Boost Max Technology 3.0
- Intel<sup>®</sup> Turbo Boost Technology 2.0

### Intel<sup>®</sup> X99 Chipset

- Processor Overclocking with all Intel<sup>®</sup> Core<sup>™</sup> X-series processors
- PCI Express 3.0 storage support with Intel® Rapid Storage Technology

BRAND NAME AND PROCESSOR NUMBER <sup>2</sup>	BASE FREQUENCY	MAX TURBO FREQUENCY <sup>3</sup>	INTEL® TURBO BOOST MAX TECHNOLOGY 3.04	CORES/THREADS	PCI EXPRESS* 3.0 LANES	MEMORY SPEED	TDP	SOCKET (LGA)
Intel® Core™ i9-7980XE	2.60 GHz	4.20 GHz	4.40 GHz	18/36	44	4 channels DDR4-2666	165 W	2066
Intel® Core™ i9-7960X	2.80 GHz	4.20 GHz	4.40 GHz	16/32	44	4 channels DDR4-2666	165 W	2066
Intel® Core™ i9-7940X	3.10 GHz	4.30 GHz	4.40 GHz	14/28	44	4 channels DDR4-2666	165 W	2066
Intel® Core™ i9-7920X	2.90 GHz	4.30 GHz	4.40 GHz	12/24	44	4 channels DDR4-2666	140 W	2066
Intel® Core™ i9-7900X	3.30 GHz	4.30 GHz	4.50 GHz	10/20	44	4 channels DDR4-2666	140 W	2066
Intel® Core™ i7-7820X	3.60 GHz	4.30 GHz	4.50 GHz	8/16	28	4 channels DDR4-2666	140 W	2066
Intel® Core™ i7-7800X	3.50 GHz	4.00 GHz	N/A	6/12	28	4 channels DDR4-2400	140 W	2066
Intel® Core™ i7-7740X	4.30 GHz	4.50 GHz	N/A	4/8	16	2 channels DDR4-2666	112 W	2066
Intel® Core™ i5-7640X	4.00 GHz	4.20 GHz	N/A	4/4	16	2 channels DDR4-2666	112 W	2066

<sup>1</sup> Features are present with select chipsets and processor combinations. Warning: Altering clock frequency and/or voltage may (i) reduce system stability and useful life of the system and processor; (ii) cause the processor and other system components to fail; (iii) cause reductions in system performance; (iv) cause additional heat or other damage; and (v) affect system data integrity. Intel has not tested, and does not warranty, the operation of the processor beyond its specifications.

<sup>2</sup> NOTE: Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. See www.intel.com/products/processor\_number for details.

<sup>3</sup> Refers to the maximum dual-core frequency that can be achieved with Intel® Turbo Boost Technology 2.0

<sup>4</sup> Refers to the maximum dual-core frequency that can be achieved with Intel<sup>®</sup> Turbo Boost Technology Max 3.0

\* Other brands and names may be claimed as the property of others

- Rebalanced Intel<sup>®</sup> Smart Cache hierarchy
- Up to 44 PCI Express\* 3.0 lanes
- Support for Optane<sup>™</sup> Memory

### 7th Gen Intel<sup>®</sup> Core<sup>™</sup> Processors and Intel<sup>®</sup> 200 Series Chipset<sup>1</sup>

Leading the pack is the Intel<sup>®</sup> Core<sup>™</sup> i7-7700K processor. Architected for performance, this processor packs 4 high-performing cores with core base frequency of 4.2GHz and 8MB of cache memory. Kick up the performance even higher with Intel<sup>®</sup> Turbo Boost 2.0 technology to bump the max turbo frequency to an amazing 4.5GHz. Add Intel<sup>®</sup> Hyper-Threading Technology for 8-way multitasking to deliver the performance knockout punch. Not enough? For the enthusiast, this processor is unlocked, you can tweak the performance to its fullest potential. The new 7th Gen Intel Core desktop processors deliver:

- An impressive portfolio of standard and unlocked processors
- Supports Intel<sup>®</sup> Optane<sup>™</sup> memory
- Intel<sup>®</sup> Turbo Boost Technology 2.0
- Intel<sup>®</sup> Hyper-Threading Technology
- Intel<sup>®</sup> Smart Cache Technology with up to 8MB of Cache
- Supports Two-Channel DDR4/DDR3L
- Intel<sup>®</sup> HD Graphics 630 (1150 MHz)
- 16 PCI Express\* 3.0 lanes

### Intel<sup>®</sup> Z270 Chipset

- Processor Overclocking with Intel® Processor "K" SKUs
- PCI Express 3.0 storage support with Intel® Rapid Storage Technology
- Support for processor PCIe Express\* 3.0 1x16, 2x8, or 1x8 and 2x4





BRAND NAME AND PROCESSOR NUMBER <sup>2</sup>	BASE FREQUENCY	MAX TURBO FREQUENCY <sup>3</sup>	MAX TURBO FREQUENCY <sup>3</sup> PCI EXPRESS* 3.0 LANES		TDP	SOCKET (LGA)
Intel® Core™ i7-7700K	4.2 GHz	Up to 4.5 GHz	16	2 channels DDR4-2400 <sup>4</sup> DDR3L-1600	91 W	1151
Intel® Core™ i7-7700	3.6 GHz	Up to 4.2 GHz	16	2 channels DDR4-2400 <sup>4</sup> DDR3L-1600	65 W	1151
Intel® Core™ i5-7600K	3.8 GHz	Up to 4.2 GHz	16	2 channels DDR4-2400 <sup>4</sup> DDR3L-1600	91 W	1151
Intel® Core™ i5-7600	3.5 GHz	Up to 4.1 GHz	16	2 channels DDR4-2400 <sup>4</sup> DDR3L-1600	65 W	1151
Intel <sup>®</sup> Core™ i3-7350K	4.2 GHz	N/A	16	2 channels DDR4-2400 <sup>4</sup> DDR3L-1600	60 W	1151
Intel® Core™ i3-7300	4.0 GHz	N/A	16	2 channels DDR4-2400 <sup>4</sup> DDR3L-1600	51 W	1151

<sup>1</sup> Features are present with select chipsets and processor combinations. Warning: Altering clock frequency and/or voltage may (i) reduce system stability and useful life of the system and processor; (ii) cause the processor and other system components to fail; (iii) cause reductions in system performance; (iv) cause additional heat or other damage; and (v) affect system data integrity. Intel has not tested, and does not warranty, the operation of the processor beyond its specifications.

<sup>2</sup> NOTE: Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. See www.intel.com/products/processor\_number for details.

<sup>3</sup> Refers to the maximum single-core frequency that can be achieved with Intel<sup>®</sup> Turbo Boost Technology

<sup>4</sup> DDR4-2400 support is 1 and 2 DPC for UDIMMs but only 1DPC for SODIMMs

\* Other brands and names may be claimed as the property of others

### **INTEL<sup>®</sup> 300 SERIES CHIPSET**



KEY FEATURE DIFFERENTIATION	Z370	H370	H310	Q370	B360
Intel® ME Firmware SKU	ME 11 Consumer	ME 12 Consumer/Corporate	ME 12 Consumer	Corporate	Consumer/Corporate
Processor PCI Express* 3.0 Configuration Support	1x16 or 2x8 or 1x8+2x4	1x16	1x16	1x16 or 2x8 or 1x8+2x4	1x16
Independent Display Ports / Pipes Support <sup>3</sup>	3/3	3/3	3/2	3/3	3/3
Memory Channels / DIMMs per Channel	2/2	2/2	2/1	2/2	2/2
Processor Overclocking <sup>4</sup>	$\checkmark$	-	-	-	-
Integrated Intel® Wireless-AC Support	No		✓	<ul> <li>Image: A set of the set of the</li></ul>	$\checkmark$
Intel® Smart Sound Technology <sup>3</sup>	$\checkmark$		-	<ul> <li>Image: A set of the set of the</li></ul>	$\checkmark$
Intel® Optane™ Memory Support	$\checkmark$	$\checkmark$	· ·	<ul> <li>Image: A set of the set of the</li></ul>	$\checkmark$
Intel® SIPP Eligible <sup>5</sup>	-	-	· ·	<ul> <li>Image: A set of the set of the</li></ul>	-
Intel® vPro™ Technology Eligible <sup>5</sup>	-	-	· ·	<ul> <li>Image: A set of the set of the</li></ul>	-
Intel® Active Management Technology <sup>5</sup>	-	-	· ·	✓	-
Integrated SDXC (SDA 3.0) Support	-		$\checkmark$	✓	$\checkmark$
Maximum High Speed I/O Lanes	30	30	14	30	24
Total USB Ports (Maximum USB 3.1) <sup>2</sup>	14 (10)	14 (8)	10 (4)	14 (10)	12 (6)
Maximum USB 3.1 Ports: Gen 2 (10 Gb/s) / Gen 1 (5 Gb/s) <sup>2</sup>	0 / 10	4 / 8	0 / 4	6 / 10	4 / 6
Maximum SATA 3.0 Ports (6 Gb/s) <sup>2</sup>	6	6	4	6	6
Maximum PCI Express* 3.0 lanes <sup>2</sup>	24	20	6 (Gen 2.0 only)	24	12
Intel® Rapid Storage Technology	$\checkmark$	$\checkmark$	✓	✓	$\checkmark$
Maximum Intel® RST for PCIe Storage Ports (x2 M.2 or x4 M.2) <sup>2</sup>	3	2	0	3	1
Intel® RST PCIe RAID 0, 1, 5 <sup>1</sup>	$\checkmark$	$\checkmark$	-	✓	-
Intel® RST SATA RAID 0, 1, 5, 10 <sup>1</sup>	$\checkmark$	$\checkmark$	-	✓	-
Intel® Rapid Storage Technology for CPU-attached Intel PCIe Storage <sup>1</sup>	$\checkmark$	-	-		-

<sup>1</sup> Some features and capabilities require SSDs and/or multiple HDDs

<sup>2</sup> Maximum lanes/port counts available may vary depending on platform implementation.

<sup>3</sup> Certain features may not be present in all SKUs.

<sup>4</sup> Altering clock frequency or voltage may damage or reduce the useful life of the processor and other system components, and may reduce system stability and performance. Product warranties may not apply if the processor is operated beyond its specifications. Check with the manufacturers of system and components for additional details.

<sup>5</sup> Intel SIPP, Intel vPro<sup>™</sup>, & Intel AMT support requires select Coffee Lake-S processors and select Intel<sup>®</sup> 300 series chipsets

\* Other brands and names may be claimed as the property of others.

### **INTEL<sup>®</sup> 200 SERIES CHIPSET**



FEATURES <sup>1</sup>	H270	Z270	B250	Q250	Q270
Processor Support / Socket	LGA 1151	LGA 1151	LGA 1151	LGA 1151	LGA 1151
Processor Overclocking	-	✓ <sup>1</sup>	-	-	-
Independent Display Support (digital ports/pipes)	3/3	3/3	3/3	3/3	3/3
Intel® Rapid Storage Technology	✓	$\checkmark$	✓	✓	✓
Intel® Rapid Storage Technology SATA RAID 0/1/5/10	✓	✓			✓
Intel® Rapid Storage Technology for PCIe Storage Driver	✓	✓	✓	✓	✓
Intel® Smart Response Technology	-	✓			✓
Intel® Smart Connect Technology	-	-	-	-	-
Intel® Rapid Start Technology	-	-	-	-	-
Intel® Wireless Display	✓	✓	✓	✓	✓
Intel® Platform Trust Technology	✓	$\checkmark$		🗸 (w/o Intel® TXT)	🗸 (w/o Intel® TXT)
Intel® Device Protection Technology with Boot Guard	✓	$\checkmark$	✓	✓	✓
Processor PCI Express* 3.0 Configuration	1x16	1x16 or 2x8 or 1x8+2x4	1x16	1x16	1x16 or 2x8 or 1x8+2x4
Intel <sup>®</sup> ME Firmware SKU <sup>2</sup>	Cons./Corp.	Cons.	Cons./Corp.	Corp.	Corp.
Intel <sup>®</sup> SIPP	-	-	-	✓	✓
Intel® vPro™ Technology	-	-	-	-	✓
Intel® Active Management Technology	-	-	-	-	✓
Intel® Standard Manageability	-	-	-	✓	✓
Intel® Small Business Advantage	Image: A state of the state	-		✓	✓
Intel® Small Business Basics	✓	-	✓	$\checkmark$	✓
Total USB Ports (Max USB 3.0)	14(8)	14(10)	12(6)	14(8)	14(10)
Total SATA Ports (Max 6 Gb/s)	6	6	6	6	6
Max PCI Express* Ports (Gen)	16(3.0)	24(3.0)	12(3.0)	14(3.0)	24(3.0)
Max Intel® RST for PCIe Storage (x4 M.2 or x2 SATA Express)	2	3	1	1	3

<sup>1</sup> Features are present with select chipsets and processor combinations. Warning: Altering clock frequency and/or voltage may (i) reduce system stability and useful life of the system and processor; (ii) cause the processor and other system components to fail; (iii) cause reductions in system performance; (iv) cause additional heat or other damage; and (v) affect system data integrity. Intel has not tested, and does not warranty, the operation of the processor beyond its specifications.

All information provided here is subject to change without notice. Contact your Intel representative to obtain the latest Intel product specifications and roadmaps.

\* Other brands and names may be claimed as the property of others.

### 8th Generation Intel<sup>®</sup> Core<sup>™</sup> Processor SKUs

					Intel <sup>®</sup> Turbo Boost			Dynamic Integrated				Intel Technologies							
Processor Number	Base Frequency (GHz)	Intel® Smart Cache	Cores/ Threads	Memory Speed Support (DDR4) <sup>2</sup>	Technology maximum single core turbo frequency (GHz)	Unlocked <sup>1</sup>	Graphics	Dynamic Frequency (MHz)	Integrated Memory Controller	TDP (W)	Intel® SIPP <sup>3</sup>	Intel® vPro™ Technology <sup>4</sup>	ISM* <sup>4</sup>	Intel® TXT	Intel® Boot Guard	Intel® Optane™ Memory Ready <sup>5</sup>			
Core i7-8700K	3.7	12M	6/12	2666	4.7	1	Intel <sup>®</sup> UHD Graphics 630	1200	2 ch	95	1	1	1	1	1	<ul> <li>Image: A second s</li></ul>			
Core i5-8600K	3.6	9M	6/6	2666	4.3	1	Intel <sup>®</sup> UHD Graphics 630	1150	2 ch	95	1	1	1	1	1	1			
Core i3-8350K	4	8M	4/4	2400	N/A	1	Intel <sup>®</sup> UHD Graphics 630	1150	2 ch	91			1		1	1			
Core i7-8700	3.2	12M	6/12	2666	4.6		Intel <sup>®</sup> UHD Graphics 630	1200	2 ch	65	1	1	1	1	1	<ul> <li>Image: A second s</li></ul>			
Core i5-8600	3.1	9M	6/6	2666	4.3		Intel <sup>®</sup> UHD Graphics 630	1150	2 ch	65	1	1	1	1	1	<ul> <li>Image: A second s</li></ul>			
Core i5-8500	3	9M	6/6	2666	4.1		Intel <sup>®</sup> UHD Graphics 630	1100	2 ch	65	1	1	1	1	1	<ul> <li>Image: A second s</li></ul>			
Core i5-8400	2.8	9M	6/6	2666	4		Intel <sup>®</sup> UHD Graphics 630	1050	2 ch	65			1		1	<ul> <li>Image: A second s</li></ul>			
Core i3-8300	3.7	8M	4/4	2400	N/A		Intel <sup>®</sup> UHD Graphics 630	1150	2 ch	62			1		1	<ul> <li>Image: A second s</li></ul>			
Core i3-8100	3.6	6M	4/4	2400	N/A		Intel <sup>®</sup> UHD Graphics 630	1100	2 ch	65			1		1	<ul> <li>Image: A second s</li></ul>			
Pentium Gold G5600	3.9	4M	2/4	2400	N/A		Intel <sup>®</sup> UHD Graphics 630	1100	2 ch	54			1		1				
Pentium Gold G5500	3.8	4M	2/4	2400	N/A		Intel <sup>®</sup> UHD Graphics 630	1100	2 ch	54			1		1				
Pentium Gold G5400	3.7	4M	2/4	2400	N/A		Intel <sup>®</sup> UHD Graphics 610	1050	2 ch	54/58 <sup>6</sup>			1		1				
Celeron G4920	3.2	2M	2/2	2400	N/A		Intel <sup>®</sup> UHD Graphics 610	1050	2 ch	54					1				
Celeron G4900	3.1	2M	2/2	2400	N/A		Intel <sup>®</sup> UHD Graphics 610	1050	2 ch	54					1				
Core i7-8700T	2.4	12M	6/12	2666	4		Intel <sup>®</sup> UHD Graphics 630	1200	2 ch	35	<ul> <li>Image: A second s</li></ul>	<ul> <li>Image: A second s</li></ul>	1	<ul> <li>Image: A second s</li></ul>	1	✓			
Core i5-8600T	2.3	9M	6/6	2666	3.7		Intel® UHD Graphics 630	1150	2 ch	35	1	1	1	1	1	<b>√</b>			

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	_				Intel® Turbo Boost									Intel Teo	hnologies	
Processor Number	Base Frequency (GHz)	Intel® Smart Cache	Cores/ Threads	Memory Speed Support (DDR4) <sup>2</sup>	Technology maximum single core turbo frequency (GHz)	Unlocked <sup>1</sup>	Graphics	Dynamic Frequency (MHz)	Integrated Memory Controller	TDP (W)	Intel <sup>®</sup> SIPP <sup>3</sup>	Intel® vPro™ Technology⁴	ISM* <sup>4</sup>	Intel® TXT	Intel® Boot Guard	Intel® Optane™ Memory Ready <sup>5</sup>
Core i5-8500T	2.1	9M	6/6	2666	3.5		Intel® UHD Graphics 630	1100	2 ch	35	<ul> <li>Image: A second s</li></ul>	<ul> <li>Image: A second s</li></ul>	1	<ul> <li>Image: A second s</li></ul>	<ul> <li>Image: A second s</li></ul>	✓
Core i5-8400T	1.7	9M	6/6	2666	3.3		Intel® UHD Graphics 630	1050	2 ch	35			1		<ul> <li>Image: A second s</li></ul>	✓
Core i3-8300T	3.2	8M	4/4	2400	N/A		Intel® UHD Graphics 630	1100	2 ch	35			1		✓	✓
Core i3-8100T	3.1	6M	4/4	2400	N/A		Intel® UHD Graphics 630	1100	2 ch	35			1		<ul> <li>Image: A second s</li></ul>	✓
Pentium Gold G5500T	3.2	4M	2/4	2400	N/A		Intel® UHD Graphics 630	1050	2 ch	35			1		✓	
Pentium Gold G5400T	3.1	4M	2/4	2400	N/A		Intel® UHD Graphics 610	1050	2 ch	35			1		✓	
Celeron G4900T	2.9	2M	2/2	2400	N/A		Intel® UHD Graphics 610	1000	2 ch	35					1	

Intel® processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families.

All processors are lead-free (per EU RoHS directive July 2006) and halogen free (residual amounts of halogens are below November 2007 proposed IPC/JEDEC J-STD-709 standards)

All processors support Intel® Virtualization Technology (Intel® VT-x)

<sup>1</sup> See overclocking disclaimer above

<sup>2</sup> DDR4 maximum speed support is 1 and 2 DPC for UDIMMs but only 1 DPC for SODIMMs

<sup>3</sup> Eligible for Intel® SIPP starting with Coffee Lake-S Corporate Platform availability

<sup>4</sup> When paired with the eligible Intel<sup>®</sup> 300 Series chipset SKU, availability targeted Q1 2018.

<sup>5</sup> Intel<sup>®</sup> Optane<sup>™</sup> memory requires specific hardware and software configuration. Visit www.intel.com/Optanememory for configuration requirements

<sup>6</sup> From 4-core die (54W) and fused 60-core die (58w)

### 7th Generation Intel<sup>®</sup> Core<sup>™</sup> Processor SKUs

					Intel® Turbo Boost									h	ntel Techn	ologies	
Processor Number	Base Frequency (GHz) <sup>1</sup>	Total Cache	Cores/ Threads	Memory Support (DDR4/DDR3L)	Technology maximum single core turbo frequency (GHz) <sup>2</sup>	Unlocked <sup>3</sup>	Graphics	Dynamic Frequency (MHz)	Integrated Memory Controller	TDP (W)	FMB	Intel® SIPP	Intel® vPro Technology	Intel® VT-d	Intel® TXT	AES-NI	Intel® Device Protection with Boot Guard
i7-7700K	4.2	8M	4/8	DDR4/DDR3L 2400 <sup>2</sup> /1600	Up to 4.5GHZ	<ul> <li>Image: A start of the start of</li></ul>	Intel® HD Graphics 630	1150	2 ch	91	2015D			1		1	1
i7-7700	3.6	8M	4/8	DDR4/DDR3L 2400 <sup>2</sup> /1600	Up to 4.2GHz		Intel <sup>®</sup> HD Graphics 630	1150	2 ch	65	2015C	1	<ul> <li>Image: A second s</li></ul>	1	1	1	✓
i5-7600K	3.8	6M	4/8	DDR4/DDR3L 2400 <sup>2</sup> /1600	Up to 4.2GHz	1	Intel® HD Graphics 630	1150	2 ch	91	2015D			1		1	1
i5-7600	3.5	6M	4/4	DDR4/DDR3L 2400 <sup>2</sup> /1600	Up to 3.1GHz		Intel® HD Graphics 630	1150	2 ch	65	2015C	1	1	1	1	1	✓
i5-7500	3.4	6M	4/4	DDR4/DDR3L 2400 <sup>2</sup> /1600	Up to 3.8GHz		Intel <sup>®</sup> HD Graphics 630	1050	2 ch	65	2015C	1	1	1	1	1	✓
i5-7400	3.0	6M	4/4	DDR4/DDR3L 2400 <sup>2</sup> /1600	Up to 3.5GHz		Intel® HD Graphics 630	950	2 ch	65	2015C					1	<ul> <li>Image: A second s</li></ul>
i3-7350K	4.2	4M	2/4	DDR4/DDR3L 2400 <sup>2</sup> /1600	N/A	1	Intel® HD Graphics 630	1150	2 ch	60	2015D			1		1	✓
i3-7320	4.1	4M	2/4	DDR4/DDR3L 2400 <sup>2</sup> /1600	N/A		Intel® HD Graphics 630	1150	2 ch	51	2015C					1	✓
i3-7300T	3.5	4M	2/8	DDR4/DDR3L 2400 <sup>2</sup> /1600	N/A		Intel® HD Graphics 630	950	2 ch	35	2015A					1	✓
i3-7300	4.0	4M	2/4	DDR4/DDR3L 2400 <sup>2</sup> /1600	N/A		Intel® HD Graphics 630	1150	2 ch	51	2015C					1	✓
i3-7100T	3.4	ЗМ	2/4	DDR4/DDR3L 2400 <sup>2</sup> /1600	N/A		Intel® HD Graphics 630	950	2 ch	35	2015A					1	✓
i3-7100	3.9	ЗМ	2/4	DDR4/DDR3L 2400 <sup>2</sup> /1600	N/A		Intel® HD Graphics 630	1050	2 ch	51	2015C					1	<ul> <li>Image: A second s</li></ul>

<sup>1</sup> Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. Go to: http://www.intel.com/products/processor\_number/ All processors are lead-free (per EU RoHS directive July 2006) and halogen free (residual amounts of halogens are below November 2007 proposed IPC/JEDEC J-STD-709 standards)

All processors support Intel® Virtualization Technology (Intel® VT-x)

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### 7th Generation Intel<sup>®</sup> Core<sup>™</sup> Processor SKUs

					Memory	Intel® Turbo Boost									li	ntel Techn	ologies	
Processor Number	Base Frequency (GHz) <sup>1</sup>	Total Cache	Cores/ Threads	Memory Type	Speed Support (DDR4/ DDR3L)	Technology maximum single core turbo frequency (GHz) <sup>2</sup>	Unlocked <sup>3</sup>	Graphics	Dynamic Frequency (MHz)	Integrated Memory Controller	TDP (W)	FMB	Intel® SIPP	Intel® vPro Technology	Intel® VT-d	Intel® TXT	AES-NI	Intel® Device Protection with Boot Guard
G4620	3.7	ЗM	2/4	DDR4/ DDR3L	2400 <sup>1</sup> / 1600	N/A		Intel® HD Graphics 630	1100	2 ch	51	2015C			1		1	✓
G4600	3.6	ЗM	2/4	DDR4/ DDR3L	2400 <sup>1</sup> / 1600	N/A		Intel® HD Graphics 630	1100	2 ch	51	2015C						
G4560	3.5	ЗM	2/4	DDR4/ DDR3L	2400 <sup>1</sup> / 1600	N/A		Intel® HD Graphics 610	1100	2 ch	54 <sup>4</sup>	2015C			1		1	✓
G3950	3.0	2M	2/2	DDR4/ DDR3L	2133/ 1600	N/A		Intel® HD Graphics 610	1050	2 ch	51	2015C			1		1	✓
G3930	2.9	2M	2/2	DDR4/ DDR3L	2133/ 1600	N/A		Intel® HD Graphics 610	1050	2 ch	51	2015C			1		1	✓
Socket 1151																		
i3-7300T	3.5	4M	2/4	DDR4/ DDR3L	2400 <sup>1</sup> / 1600	N/A		Intel® HD Graphics 630	1100	2 ch	35	2015A			1		1	✓
i3-7100T	3.4	ЗM	2/4	DDR4/ DDR3L	2400 <sup>1</sup> / 1600	N/A		Intel® HD Graphics 630	1100	2 ch	35	2015A			1		1	✓
G4600T	3.0	ЗM	2/4	DDR4/ DDR3L	2400 <sup>1</sup> / 1600	N/A		Intel® HD Graphics 630	1050	2 ch	35	2015A			<ul> <li>Image: A start of the start of</li></ul>		<ul> <li>Image: A second s</li></ul>	✓
G4560T	2.9	ЗM	2/4	DDR4/ DDR3L	2400 <sup>1</sup> / 1600	N/A		Intel® HD Graphics 610	1050	2 ch	35	2015A			<ul> <li>Image: A start of the start of</li></ul>		<ul> <li>Image: A second s</li></ul>	✓
G3930T	2.7	2M	2/2	DDR4/ DDR3L	2133/ 1600	N/A		Intel® HD Graphics 610	1000	2 ch	35	2015A			<ul> <li>Image: A start of the start of</li></ul>		<ul> <li>Image: A second s</li></ul>	✓

Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families.

All processors are lead-free (per EU RoHS directive July 2006) and halogen free (residual amounts of halogens are below November 2007 proposed IPC/JEDEC J-STD-709 standards)

All processors support Intel® Virtualization Technology (Intel® VT-x)

<sup>1</sup> DDR4-2400 support is 1 and 2 DPC for UDIMMs but only 1 DPC for SODIMMs

<sup>2</sup> Requires a system with Intel<sup>®</sup> Turbo Boost Technology. Intel Turbo Boost Technology 2.0 are only available on select Intel<sup>®</sup> processors. Consult your PC manufacturer. Performance varies tem configuration. For more information, visit http://www.intel.com/go/turbo

<sup>3</sup> Warning: Altering PC clock or memory frequency and/or voltage may (i) reduce system stability and use life of the system, memory and processor; (ii) cause the processor and other system components to fail; (iii) cause reductions in system performance; (iv) cause additional heat or other damage; and (v) affect system data integrity. Intel assumes no responsibility that the memory, included if used with altered clock frequencies and/or voltages, will be fit for any particular purpose. Check with memory manufacturer for warranty and additional details.

<sup>4</sup> Fused from quad core source die

\* Intel® Standard Manageability

# PERFORMANCE TUNING PROTECTION PLAN

Allows a single replacement for your qualified boxed processor, in addition to your standard 3 year warranty.

The Performance Tuning Protection Plan is an additional plan that a customer can purchase to cover boxed processor failures caused by operating the eligible boxed processor outside of Intel's published specifications.

Available for all unlocked boxed processors. Hassle-free, no questions asked. Learn more at http://click.intel.com/tuningplan



# INTEL® ETHERNET DESKTOP ADAPTERS

Intel<sup>®</sup> Product Quick Reference Matrix **Q3 2018** 

### **1GB INTEL® ETHERNET FOR DESKTOP**

PRODUCT	CONNECTOR & CABLE MEDIUM	CABLING TYPE	INTEL® ETHERNET CONTROLLER	SLOT TYPE, MAXIMUM BUS SPEED & BUS WIDTH	PORTS	SUPPORTED SLOT HEIGHTS	HALOGEN FREE	INTELLIGENT OFFLOADS	NETWORK VIRTUALIZATION TECHNOLOGY FOR CONNECTIVITY	STORAGE OVER ETHERNET	INTEL ETHERNET POWER MANAGEMENT <sup>1</sup>	ORDER CODES
	RJ45 Copper Twisted-pair	Category 5 or better: up to 100m	82574	PCI Express* v2.1 2.5 GT/s, x1 Lane	0	Low Profile and Full Height	N/A	N/A	N/A	iSCSI, NFS, SMB	N/A	EXPI9301CT EXPI9301CTBLK
Intel® Gigabit CT Desktop Adapter												

Make the Connection with Intel® Ethernet Adapters at intel.com/ethernet

<sup>1</sup> Intel Ethernet Power Management includes Energy Efficient Ethernet (EEE) and DMA Coalescing.

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# INTEL® BOXED THERMAL SOLUTIONS

Intel<sup>®</sup> Product Quick Reference Matrix **Q3 2018** 

### **INTEL® BOXED THERMAL SOLUTIONS**



#### INTEL® THERMAL SOLUTION TS13X

Intel® Thermal Solution TS13X (liquid cooling) is the perfect fit for extreme gaming and overclocking<sup>1</sup>. It is designed for high-end desktop performance and overclocking needs.



#### **INTEL®**

INTEL® THERMAL SOLUTION TS15A
The Intel® Thermal Solution TS15A (air cooling) is an efficient thermal solution for 6th Generation Intel® Core™ processors. It is designed to support a wide range of processor sockets for
performance desktops.

### Features • Supports up to 130 W processors

- Lower cost
- Shock and vibe compliant and keep out safe
- Supports the LGA 1151/1156/1150
- 3 year limited warranty

Visual improvements

Supports up to 140W TDP processors

Low-profile pump

sockets

· Optimized performance

• 120mm x 25mm fan

Updated cooler block

Features

- Blue LED lighting with ON / OFF switch
- 3 year limited warranty

Supports the LGA1366, LGA115X, LGA2011 and LGA2066

- MM# 929672 MM# 944216 Product code: BXTS13X Product code: BXTS15A
- For processors higher than 140W, please consult your preferred 3rd party manufacturer for a thermal solution that will best meet
- your system requirements.

<sup>1</sup> WARNING: Altering clock frequency and/or voltage may: (i) reduce system stability and useful life of the system and processor; (ii) cause the processor and other system components to fail; (iii) cause reductions in system performance; (iv) cause additional heat or other damage; and (v) affect system data integrity. Intel has not tested, and does not warranty, the operation of the processor beyond its specifications. Intel assumes no responsibility that the processor, including if used with altered clock frequencies and/or voltages, will be fit for any particular purpose. For more information, visit http://www.intel.com/consumer/game/gaming-power.htm

**INTEL® THERMAL SOLUTION TS13A** 

• Supports up to 140 W processors

• 3 year limited warranty

Features

Low cost

MM# 937425

Product code: BXTS13A

The Intel® Thermal Solution TS13A (air cooling) is designed for

budget-focused cooling requirements. Targeted uses include

business, government, and entry-level workstations.

· Shock and vibe compliant and keep out safe

Supports the LGA2011 and LGA2011-v3 socket only

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at http://www.intel.com/support/ processors/sb/CS-034910.htm or http://www.intel.com/support/processors/sb/CS-034340.htm

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\* Other names and brands may be claimed as the property of others.



### INTEL® THERMAL SOLUTION HTS1155LP

The Intel® Thermal Solution HTS1155LP is a compact cooling
solution for Thin Mini-ITX based All-in-One PCs, and compatible
Mini PCs.

•	Low-profile All-In-One / Small For	m Fa	ctor	thermal solution

- Supports up to 65 W processors in the LGA1155 socket
- Compatible with Thin Mini-ITX desktop boards
- Multiple options for fan placement
- Available now from authorized Intel® distributors
- 3 year limited warranty

Product code: BXHTS1155LP

MM# 917752

Features



# INTEL® NUC

Intel<sup>®</sup> Product Quick Reference Matrix **Q3 2018** 

## SMALL Package. Big Potential.

#### INTEL<sup>®</sup> NUC

The Intel® NUC is a powerful 4x4-inch mini PC with entertainment, gaming, and productivity features, including a customizable board that is ready to accept the memory, storage, and operating systems that you want.

#### INTEL® NUC KITS

Customizable kit, configurable features - choose memory, storage, and operating system.

#### INTEL® NUC BOARDS

4x4-inch form factor with soldered-on processor.

# INTEL® NUC MINI PC'S

#### NEW! 7th generation Intel® NUCs, now with Optane!

The Intel® Mini PC has gotten faster, smaller and smarter! The latest products with 7th generation Intel® Core™ processors are available, including 3 skus selling with Intel® Optane memory preinstalled for an incredibly responsive PC experience. Combining an incredibly small form factor, cutting-edge technologies and the performance of Intel's latest processors, the new Intel® NUCs deliver an incredible user experience.

### **NEW INTEL® NUC KITS**

Introducing the most fully featured NUC Kits Intel<sup>®</sup> has offered to date. Including new features such as 7th gen Intel processors, Thunderbolt 3, support for Intel Optane Memory, 4K video at 60Hz and a new modern industrial design.

## INTEL<sup>®</sup> NUC KITS

The Intel<sup>®</sup> NUC kits are available from various retailers and include a highly customizable four-by-four-inch board that is ready to accept the memory, hard drive, and operating system you choose to install.

## INTEL® NUC BOARDS

The four-by-four-inch Intel® NUC board comes complete with a soldered-on processor. The board can be purchased independently of the kit, giving you the flexibility to choose the chassis that best suits your needs.

## SMALL PACKAGE, BIG POTENTIAL

The Intel<sup>®</sup> NUC is an energy-efficient, fully functioning and versatile PC.





## **IMMERSIVE GAMING**

With a form factor as small as a game controller, but as powerful as a dragon slayer, the Intel<sup>®</sup> NUC delivers an immersive gaming experience.



## **BUSINESS PRODUCTIVITY**

The Intel® NUC delivers a fully functioning PC at a fraction of the size, as well as support for VESA\* mount brackets and much more.



### **HOME ENTERTAINMENT**

Compact and capable, Intel<sup>®</sup> NUC gives you the performance you need to be organized, connected and enjoy a visually stunning experience.

## 

## INTEL® NUC KIT NUC6I7KYK

#### Change the Game

Redefining what is possible in a Mini-PC, the Intel® NUC6i7KYK is the highest performing NUC ever. Packed with a 6th generation Intel® Core™ i7 processor, Intel® Iris™ Pro graphics and Thunderbolt 3, this NUC can power through most anything. With a sleek new design specifically optimized to eke out every bit of performance while minimizing fan noise, Skull Canyon raises the bar on what small can do.

#### Specifications

- Intel<sup>®</sup> 6th Generation Core<sup>™</sup> i7-6770HQ processor
- Intel<sup>®</sup> Iris<sup>™</sup> Pro graphics 580
- Up to 32GB 2133+MHz DDR4 SODIMMs
- Up to 7.1 surround audio via HDMI and Mini DisplayPort
- Thunderbolt 3 port, with USB3.1, DP1.2 support (USB-C)
- 2 x M.2 SSD w/ Gen3 PCIe X4 AHCI, NVMe, or SATA-III 6Gbps

## NEW INTEL® NUC KITS<sup>1</sup>, WITH INTEL OPTANE MEMORY







PRODUCT FAMILY	NUC7i7BNHX	NUC7i5BNHX	NUC7i3BNHX
KIT / BOARD	Intel <sup>®</sup> NUC Kit <sup>1</sup>	Intel® NUC Kit <sup>1</sup>	Intel® NUC Kit <sup>1</sup>
5-PACK OUTERCASE	N/A	N/A	N/A
10-PACK PRODUCT CODE	N/A	N/A	N/A
PROCESSOR	Intel® Core™ i7-7567U	Intel <sup>®</sup> Core <sup>™</sup> i5-7260U	Intel <sup>®</sup> Core <sup>™</sup> i3-7100U
CHIPSET	N/A	N/A	N/A
INTEGRATED GRAPHICS CORE <sup>2</sup>	Intel® Iris™ Plus graphics 650	Intel® Iris™ Plus graphics 640	Intel® HD graphics 620
DISPLAY OUTPUTS	HDMI; DisplayPort	HDMI; DisplayPort	HDMI; DisplayPort
MEMORY SUPPORT <sup>4</sup>	Dual-Channel DDR4-2133 SODIMM, 1.2V, 32 GB <sup>4</sup> maximum	Dual-Channel DDR4-2133 SODIMM, 1.2V, 32 GB <sup>4</sup> maximum	Dual-Channel DDR4-2133 SODIMM, 1.2V, 32 GB <sup>4</sup> maximum
2.5" HDD SUPPORT	Yes	Yes	Yes
EXPANSION CONNECTORS	M.2 Populated with 16GB Intel® Optane™ memory module	M.2 Populated with 16GB Intel® Optane™ memory module	M.2 Populated with 16GB Intel® Optane™ memory module
AUDIO <sup>3</sup>	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals 3.5mm front headset jack	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals 3.5mm front headset jack	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals 3.5mm front headset jack
USB PORTS	Two front USB 3.0 (one for charging), two rear USB 3.0, two internal USB 2.0 via header	Two front USB 3.0 (one for charging), two rear USB 3.0, two internal USB 2.0 via header	Two front USB 3.0 (one for charging), two rear USB 3.0, two internal USB 2.0 via header
ONBOARD LAN	Intel® (219-V 10/100/1000 Mbps Ethernet Intel® Wireless-AC 8265	Intel® (219-V 10/100/1000 Mbps Ethernet Intel® Wireless-AC 8265	Intel® (219-V 10/100/1000 Mbps Ethernet Intel® Wireless-AC 8265
POWER CORD OPTION	Multi-country plug (Types A/C/G/I) included	Multi-country plug (Types A/C/G/I) included	Multi-country plug (Types A/C/G/I) included
TRUSTED PLATFORM MODULE	N/A	N/A	N/A
LEAD-FREE	Yes	Yes	Yes
BIOS	Intel® Visual BIOs Intel® Express BIOS update support	Intel® Visual BIOs Intel® Express BIOS update support	Intel® Visual BIOs Intel® Express BIOS update support
WARRANTY	3 year limited warranty	3 year limited warranty	3 year limited warranty
OTHER	Replaceable lid Consumer Infrared sensor on front panel Micro SDXC slot with UHS-I support	Replaceable lid Consumer Infrared sensor on front panel Micro SDXC slot with UHS-I support	Replaceable lid Consumer Infrared sensor on front panel Micro SDXC slot with UHS-I support





PRODUCT FAMILY		NUC7i5BNKP
CPU & GFX	7th Generation Intel® Core™ i7-7567U 3.5 GHz to 4.0 GHz Turbo, Dual Core, 4 MB cache, 28W	7th Generation Intel® Core™ i5-7260U 2.2 GHz up to 3.4 GHz Turbo, Dual Core, 4 MB cache, 15W
	Intel® Iris™ Plus Graphics 650, 300 MHz - 1.1 GHz	Intel® Iris™ Plus Graphics 640, 300 MHz - 950 MHz
RAM	16 GB (2x 8 GB) DDR4-2400 SODIMMs pre-installed, 1.2V; Dual-channel, 32 GB maximum	8 GB (2x 4 GB) DDR4-2400 SODIMMs pre-installed, 1.2V; Dual-channel, 32 GB maximum
SSD	512 GB Intel® 600p SSD pre-installed, M.2 22x80 PCIe X4 Gen3 NVMe	256 GB Intel® 600p SSD pre-installed, M.2 22x80 PCIe X4 Gen3 NVMe
OS LOAD	Windows 10 Home x64, Intel® Remote Keyboard, Intel® Driver & Support Assistant	
DIMENSIONS	115 x 111 x 35 mm	
	Thunderbolt <sup>™</sup> 3 (40 Gbps) and USB 3.1 Gen2 (10 Gbps) and DisplayPort 1.2 via USB-C <sup>™</sup> connector	
CONNECTIVITY	2x front USB 3.0 (one charging), 2x rear USB 3.0, and 2x internal USB 2.0 via header Front Consumer Infrared port	
VIDEO OUTPUTS	HDMI 2.0a (4K 60Hz, HDR) and DisplayPort 1.2 via Thunderbolt <sup>™</sup> 3 (USB-C <sup>™</sup> ) port Both ports support HDCP 2.2	
SDXC	MicroSDXC slot with UHS-I support	
NETWORKING	Intel® I219-V 10/100/1000 Mbps Ethernet	
	Intel® Wireless-AC 8265 soldered-down, IEEE 802.11ac 2x2 + Bluetooth v4.2, internal antennas	
AUDIO	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals 3.5mm front headset jack	
ENCLOSURE	Aluminum and plastic with replaceable lid, Kensington lock with base security	
POWER ADAPTER	12 – 19VDC input range, 19VDC 65W wall-wart power supply with replaceable plugs	
INTERNAL HEADERS	Front Panel, CEC, 2x USB2.0	
	Microsoft Windows* 10 logo'd, compatible with various Linux distros	
	Front panel RGB LED ring	
OTHER FEATURES	Built-in dual-array microphones	
	VESA mounting plate included Individual retail packaging	
	Three-Year Warranty	

**FULL SYSTEM** 

For more information, visit www.intel.com/NUC

+111	





**FULL SYSTEM** 

PRODUCT FAMILY	NUC7i7BNHXG	NUC7i5BNHXF	NUC7i3BNHXF	
DESCRIPTION	Intel® NUC 7 Enthusiast, a Mini PC with Windows 10	Intel® NUC 7 Home, a Mini PC with Windows 10	Intel® NUC 7 Home, a Mini PC with Windows 10	
CPU & GFX	7th Generation Intel® Core™ i7-7567U 3.5 GHz to 4.0 GHz Turbo, Dual Core, 4 MB cache, 28W Intel® Iris™ Plus Graphics 650, 300 MHz - 1.1 GHz	7th Generation Intel® Core™ i5-7260U 2.2 GHz up to 3.4 GHz Turbo, Dual Core, 4 MB cache, 15W Intel® Iris™ Plus Graphics 640, 300 MHz - 950 MHz	7th Generation Intel® Core™ i3-7100U 2.4 GHz, Dual Core, 3 MB cache, 15W Intel® HD Graphics 620, 300 MHz – 1 GHz	
RAM	8 GB DDR4-2400 SODIMM pre-installed, 1.2V Dual-channel capable, 32 GB maximum	4 GB DDR4-2400 SODIMM pre-installed Dual-channel capable, 32 GB maximum		
INTEL <sup>®</sup> OPTANE <sup>™</sup> MEMORY	32 GB M.2 22x80 module pre-installed	16 GB M.2 22x80 module pre-installed		
HDD	2 TB SATA3 pre-installed	1 TB SATA3 pre-installed		
USB-C <sup>™</sup> PORT	Thunderbolt" 3 (40 Gbps) and USB 3.1 Gen2 (10 Gbps) and DisplayPort 1.2 $$		USB 3.1 Gen2 (10 Gbps) and DisplayPort 1.2	
OS LOAD	Windows 10 Home x64, Intel® Remote Keyboard			
DIMENSIONS	115 x 111 x 51 mm			
CONNECTIVITY	2x front USB 3.0 (one charging), 2x rear USB 3.0, and 2x internal USB 2.0 via header; Front Consumer Infrared port			
VIDEO OUTPUTS	HDMI 2.0a (4K 60Hz, HDR) and DisplayPort 1.2 via Thunderbolt™ 3 / USB-C™ port; Both ports support HDCP 2.2			
SDXC	MicroSDXC slot with UHS-I support			
NETWORKING	Intel® I219-V 10/100/1000 Mbps Ethernet; Intel® Wireless-AC 8265 soldered-down, IEEE 802.11ac 2x2 + Bluetooth v4.2, internal antennas			
AUDIO	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals; 3.5mm from the second sec	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals; 3.5mm front headset jack		
ENCLOSURE	Aluminum and plastic with replaceable lid, Kensington lock with base security			
POWER ADAPTER	12 – 19VDC input range, 19VDC 65W wall-wart power supply with replaceable plugs			
INTERNAL HEADERS	Front Panel, CEC, 2x USB2.0			
OTHER FEATURES	Microsoft Windows* 10 logo'd, compatible with various Linux distros Front panel RGB LED ring Built-in dual-array microphones VESA mounting plate included Individual retail packaging Three-Year Warranty			

**FULL SYSTEM** 







PRODUCT FAMILY	NUC7CJYSAL	NUC7PJYH	NUC7CJYH
DESCRIPTION	Intel® NUC 7 Enthusiast, a Mini PC with Windows 10	-	-
CPU & GFX	Intel® Celeron® J4005 x GHz to x GHz burst, Quad Core, 10W Intel® HD Graphics 600, 700 MHz	Intel® Pentium® J5005 x GHz to x GHz burst, Quad Core, 10W Intel® HD Graphics 605, 800 MHz	Intel® Celeron® J4005 x GHz to x GHz burst, Dual Core, 10W Intel® HD Graphics 600, 700 MHz
RAM	4 GB DDR4-2400 SODIMM pre-installed, 1.2V Dual-channel capable, 8 GB maximum	Dual channel DDR4-2400 SODIMMs, 1.2V, 8 GB maximum	
OS LOAD	Windows 10 Home x64, Intel® Remote Keyboard, Intel® Driver & Support Assistant	-	-
FLASH STORAGE	32 GB eMMC v5.1	-	-
2.5" SATA3	9.5mm bay and port		
DIMENSIONS	115 x 111 x 49 mm		
CONNECTIVITY	2x front USB 3.0 (one charging), 2x rear USB 3.0, and 2x internal USB 2.0 via header; Front Consumer Infrared port		
VIDEO OUTPUTS	2x HDMI 2.0a (4K 60Hz, HDR); Both ports support HDCP 2.2		
SDXC	SDXC slot with UHS-I support		
NETWORKING	Intel® I218-V 10/100/1000 Mbps Ethernet ; Intel® Wireless-AC 9462 soldered-down, IEEE 802.11ac 1x1 + Bluetooth v5, internal antennas		
AUDIO	Up to 7.1 multichannel digital audio via HDMI; 3.5mm front headset jack, 3.5mm rear speaker / TOSLINK combo jack		
ENCLOSURE	Plastic with metal inner frame, replaceable lid, Kensington lock with base security		
POWER ADAPTER	12 – 19VDC input range, 19VDC 65W power supply with replaceable AC cords		
INTERNAL HEADERS	Front Panel, CEC, RGB LED, 2x USB2.0		
OTHER FEATURES	Microsoft Windows* 10 logo'd, compatible with various Linux distros Front panel status RGB LED Built-in dual-array microphones VESA mounting plate included Individual retail packaging Three-Year Warranty		

## INTEL<sup>®</sup> NUC KITS<sup>1</sup>







PRODUCT FAMILY	NUC7i7BNH	NUC7i5BNH	NUC7i5BNK
KIT / BOARD	Intel <sup>®</sup> NUC Kit <sup>1</sup>	Intel® NUC Kit <sup>1</sup>	Intel® NUC Kit <sup>1</sup>
5-PACK OUTERCASE	N/A	N/A	N/A
10-PACK PRODUCT CODE	N/A	N/A	N/A
PROCESSOR	Intel® Core™ i7-7567U	Intel® Core™ i5-7260U	Intel® Core™ i5-7260U
CHIPSET	N/A	N/A	N/A
INTEGRATED GRAPHICS CORE <sup>2</sup>	Intel® Iris™ Plus graphics 650	Intel® Iris™ Plus graphics 640	Intel® Iris™ Plus graphics 640
DISPLAY OUTPUTS	HDMI DisplayPort	HDMI DisplayPort	HDMI DisplayPort
MEMORY SUPPORT <sup>4</sup>	Dual-Channel DDR4-2133 SODIMM, 1.2V, 32 GB <sup>4</sup> maximum	Dual-Channel DDR4-2133 SODIMM, 1.2V, 2 GB <sup>4</sup> maximum	Dual-Channel DDR4-2133 SODIMM, 1.2V, 32 GB <sup>4</sup> maximum
2.5" HDD SUPPORT	Yes	Yes	Yes
EXPANSION CONNECTORS	M.2 Support	M.2 Support	M.2 Support
AUDIO <sup>3</sup>	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals 3.5mm front headset jack	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals 3.5mm front headset jack	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals 3.5mm front headset jack
USB PORTS	Two front USB 3.0 (one for charging), two rear USB 3.0, two internal USB 2.0 via header	Two front USB 3.0 (one for charging), two rear USB 3.0, two internal USB 2.0 via header	Two front USB 3.0 (one for charging), two rear USB 3.0, two internal USB 2.0 via header
ONBOARD LAN	Intel® (219-V 10/100/1000 Mbps Ethernet; Intel® Wireless-AC 8265	Intel® (219-V 10/100/1000 Mbps Ethernet; Intel® Wireless-AC 8265	Intel® (219-V 10/100/1000 Mbps Ethernet; Intel® Wireless-AC 8265
POWER CORD OPTION	Multi-country plug (Types A/C/G/I) included	Multi-country plug (Types A/C/G/I) included	Multi-country plug (Types A/C/G/I) included
TRUSTED PLATFORM MODULE	N/A	N/A	N/A
LEAD-FREE	Yes	Yes	Yes
BIOS	Intel® Visual BIOs Intel® Express BIOS update support	Intel® Visual BIOs Intel® Express BIOS update support	Intel® Visual BIOs Intel® Express BIOS update support
WARRANTY	3 year limited warranty	3 year limited warranty	3 year limited warranty
OTHER	Replaceable lid Consumer Infrared sensor on front panel Micro SDXC slot with UHS-I support	Replaceable lid Consumer Infrared sensor on front panel Micro SDXC slot with UHS-I support	Replaceable lid Consumer Infrared sensor on front panel Micro SDXC slot with UHS-I support





PRODUCT FAMILY	NUC7I3BNH	NUC7I3BNK
KIT / BOARD	Intel® NUC Kit <sup>1</sup>	Intel® NUC Kit <sup>1</sup>
5-PACK OUTERCASE	N/A	N/A
<b>10-PACK PRODUCT CODE</b>	N/A	N/A
PROCESSOR	Intel® Core i3-7100U	Intel® Core i3-7100U
CHIPSET	N/A	N/A
INTEGRATED GRAPHICS CORE <sup>2</sup>	Intel® HD graphics 620	Intel® HD graphics 620
DISPLAY OUTPUTS	HDMI DisplayPort	HDMI DisplayPort
MEMORY SUPPORT <sup>4</sup>	Dual-channel DDR4 SODIMMs 1.2V, 2133 MHz, 32GB maximum	Dual-channel DDR4 SODIMMs 1.2V, 2133 MHz, 32GB maximum
2.5" HDD SUPPORT	Yes	No
EXPANSION CONNECTORS	M.2 Support	M.2 Support
AUDIO <sup>3</sup>	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals 3.5mm front headset jack	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals 3.5mm front headset jack
USB PORTS	Two front USB 3.0 (one for charging), two rear USB 3.0, two internal USB 2.0 via header	Two front USB 3.0 (one for charging), two rear USB 3.0, two internal USB 2.0 via header
ONBOARD LAN	Intel® 219-V 10/100/1000 Mbps Ethernet Intel® Wireless-AC 8265	Intel® 219-V 10/100/1000 Mbps Ethernet Intel® Wireless-AC 8265
POWER CORD OPTION	Multi-country plugs (IEC types A/C/G/I)	Multi-country plugs (IEC types A/C/G/I)
TRUSTED PLATFORM MODULE	N/A	N/A
LEAD-FREE	Yes	Yes
BIOS	Intel® Visual BIOs Intel® Express BIOS update support	Intel® Visual BIOs Intel® Express BIOS update support
WARRANTY	3-year Advanced Warranty Replacement	3-year Advanced Warranty Replacement
OTHER	Replaceable lid Consumer Infrared sensor on front panel Micro SDXC slot with UHS-I support	Replaceable lid Consumer Infrared sensor on front panel Micro SDXC slot with UHS-I support





PRODUCT FAMILY	NUC6CAYS	NUC6CAYH
KIT / BOARD	Intel® NUC Mini PC	Intel <sup>®</sup> NUC Kit <sup>1</sup>
5-PACK OUTERCASE	N/A	N/A
10-PACK PRODUCT CODE	N/A	N/A
PROCESSOR	Intel® Celeron® J3455	Intel® Celeron® J3455
CHIPSET	N/A	N/A
INTEGRATED GRAPHICS CORE <sup>2</sup>	Intel® HD graphics 500	Intel® HD graphics 500
DISPLAY OUTPUTS	HDMI VGA	HDMI VGA
MEMORY SUPPORT <sup>4</sup>	Dual-channel DDR3L-1866 SODIMMs 1.35V, 8GB maximum 2Gb DDR3L-1600 module preinstalled	Dual-channel DDR3L-1866 SODIMMs 1.35V, 8GB maximum
2.5" HDD SUPPORT	Yes	Yes
EXPANSION CONNECTORS	SDXC slot with UHS-I support on the side	SDXC slot with UHS-I support on the side
AUDIO <sup>3</sup>	Up to 7.1 multichannel digital audio via HDMI 3.5mm front headset jack, 3.5mm rear speaker / TOSLINK combo jack	Up to 7.1 multichannel digital audio via HDMI 3.5mm front headset jack, 3.5mm rear speaker / TOSLINK combo jack
USB PORTS	Two front USB 3.0 (one charging), two rear USB 3.0, 2 internal USB 2.0 via header	Two front USB 3.0 (one charging), two rear USB 3.0, 2 internal USB 2.0 via header
ONBOARD LAN	Intel® Wireless-AC 3168 10/100/1000 Mbps Ethernet	Intel® Wireless-AC 3168 10/100/1000 Mbps Ethernet
POWER CORD OPTION	Multi-country plugs (IEC types A/C/G/I)	Multi-country plugs (IEC types A/C/G/I)
TRUSTED PLATFORM MODULE	N/A	N/A
LEAD-FREE	Yes	Yes
BIOS	Intel® Visual BIOs Intel® Express BIOS update support	Intel® Visual BIOs Intel® Express BIOS update support
WARRANTY	3-year Advanced Warranty Replacement	3-year Advanced Warranty Replacement
OTHER	Replaceable lid Consumer Infrared sensor on front panel Windows 10 Home pre-installed with latest Intel®drivers	Replaceable lid Consumer Infrared sensor on front panel



PRODUCT FAMILY	NUC5CPYH
KIT / BOARD	Intel® NUC Kit <sup>1</sup>
5-PACK OUTERCASE	N/A
10-PACK PRODUCT CODE	N/A
PROCESSOR	Intel® Celeron® N3050
CHIPSET	N/A
INTEGRATED GRAPHICS CORE <sup>2</sup>	Intel® HD Graphics
DISPLAY OUTPUTS	HDMI VGA
MEMORY SUPPORT <sup>4</sup>	Single Channel DDR3L SODIMM 1.35V, 1333/1600 MHz, 8GB <sup>4</sup> maximum
2.5" HDD SUPPORT	Yes
EXPANSION CONNECTORS	M.2 support
AUDIO <sup>3</sup>	Eight-Channel (7.1) digital audio via Mini HDMI 1.4a output, two-channel via headphone jack
USB PORTS	Four USB 3.0 ports (two front panel with one being charging capable, two back panel) and two USB 2.0 ports (via internal header)
ONBOARD LAN	Intel® 10/100/1000 Network Connection Intel® Wireless-AC 3165
POWER CORD OPTION	Multi-country plugs (IEC types A/C/G/I)
TRUSTED PLATFORM MODULE	N/A
LEAD-FREE	Yes
BIOS	Intel® Visual BIOS BIOS Vault Technology Fast Boot
WARRANTY	3-year Advanced Warranty Replacement
OTHER	Replaceable lid Consumer Infrared sensor on front panel SDXC slot with UHS-I support on the side





PRODUCT FAMILY	NUC7i5DNHE	NUC7i5DNKE
KIT / BOARD	Intel® NUC Kit <sup>1</sup>	Intel® NUC Kit <sup>1</sup>
5-PACK OUTERCASE	BLKNUC7i5DNHE	BLKNUC7i5DNKE
<b>10-PACK PRODUCT CODE</b>	N/A	N/A
PROCESSOR	Intel® Core™ i5-7300U Processor with Intel® vPro™ Technology	Intel® Core™ i5-7300U Processor with Intel® vPro™ Technology
CHIPSET	N/A	N/A
INTEGRATED GRAPHICS CORE <sup>2</sup>	Intel® HD graphics 620	Intel® HD graphics 620
DISPLAY OUTPUTS	Dual HDMI 2.0a (4k @ 60Hz) w/HDCP 2.2 and basic CEC built in for 1 port	Dual HDMI 2.0a (4k @ 60Hz) w/HDCP 2.2 and basic CEC built in for 1 port
MEMORY SUPPORT <sup>4</sup>	Dual-Channel SODIMM DDR4 2133 / 1.2V, 32 GB <sup>4</sup> maximum	Dual-Channel SODIMM DDR4 2133 / 1.2V, 32 GB <sup>4</sup> maximum
2.5" HDD SUPPORT	Yes	No
EXPANSION CONNECTORS	One M.2 22x80 (type M) for SATA & NVMe SSDs / One M.2 22x30 (type E) for wireless card Serial port header HDMI CEC header	One M.2 22x80 (type M) for SATA & NVMe SSDs / One M.2 22x30 (type E) for wireless card Serial port header HDMI CEC header
AUDIO <sup>3</sup>	Dual Eight-Channel (7.1) digital audio via HDMI ports	Dual Eight-Channel (7.1) digital audio via HDMI ports
USB PORTS	Four USB 3.0 ports (two front panel, two back panel) One internal USB 3.0 port header Two internal USB 2.0 port headers	Four USB 3.0 ports (two front panel, two back panel) One internal USB 3.0 port header Two internal USB 2.0 port headers
ONBOARD LAN	Intel® i219 - LM 10/100/1000 Network Connection; Intel® Wireless-AC 8265	Intel® i219 - LM 10/100/1000 Network Connection; Intel® Wireless-AC 8265
POWER DELIVERY	19V 65W AC power adapter	19V 65W AC power adapter
TRUSTED PLATFORM MODULE	Yes (TPM v2.0); Worldwide and China-specific options	Yes (TPM v2.0); Worldwide and China-specific options
LEAD-FREE	Yes	Yes
BIOS	Intel® Visual BIOS	Intel® Visual BIOS
WARRANTY	3 year limited warranty	3 year limited warranty
OTHER	Replaceable lid; 3 year product availability; Qualified for 24x7 operation; Backpanel opening w/DB9 bracket; Internal power connector (12V – 24V DC); Vcc5/1A, 5Vsby/2A, 3.3Vsby/1A internal power sources via header; Kensington lock with base security; Intel® Optane™ Memory support; VESA mounting plate included	Replaceable lid; 3 year product availability; Qualified for 24x7 operation; Internal power connector (12V – 24V DC); Vcc5/1A, 5Vsby/2A, 3.3Vsby/1A internal power sources via header; Kensington lock with base security; VESA mounting plate included





PRODUCT FAMILY	NUC7i3DNHE	NUC7i3DNKE
KIT / BOARD	Intel <sup>®</sup> NUC Kit <sup>1</sup>	Intel® NUC Kit <sup>1</sup>
5-PACK OUTERCASE	BLKNUC7i3DNHE	BLKNUC7i3DNKE
10-PACK PRODUCT CODE	N/A	N/A
PROCESSOR	Intel® Core™ i3-7100U	Intel® Core™ i3-7100U
CHIPSET	N/A	N/A
INTEGRATED GRAPHICS CORE <sup>2</sup>	Intel® HD graphics 620	Intel® HD graphics 620
DISPLAY OUTPUTS	Dual HDMI 2.0a (4k @ 60Hz) w/HDCP 2.2 and basic CEC built in for 1 port	Dual HDMI 2.0a (4k @ 60Hz) w/HDCP 2.2 and basic CEC built in for 1 port
MEMORY SUPPORT <sup>4</sup>	Dual-Channel SODIMM DDR4 2133 / 1.2V, 32 GB <sup>4</sup> maximum	Dual-Channel SODIMM DDR4 2133 / 1.2V, 32 GB <sup>4</sup> maximum
2.5" HDD SUPPORT	Yes	No
EXPANSION CONNECTORS	One M.2 22x80 (type M) for SATA & NVMe SSDs / One M.2 22x30 (type E) for wireless card Serial port header HDMI CEC header	One M.2 22x80 (type M) for SATA & NVMe SSDs / One M.2 22x30 (type E) for wireless card Serial port header HDMI CEC header
AUDIO <sup>3</sup>	Dual Eight-Channel (7.1) digital audio via HDMI ports	Dual Eight-Channel (7.1) digital audio via HDMI ports
USB PORTS	Four USB 3.0 ports (two front panel, two back panel) One internal USB 3.0 port header Two internal USB 2.0 port headers	Four USB 3.0 ports (two front panel, two back panel) One internal USB 3.0 port header Two internal USB 2.0 port headers
ONBOARD LAN	Intel® i219 - LM 10/100/1000 Network Connection Intel® Wireless-AC 8265	Intel® i219 - LM 10/100/1000 Network Connection Intel® Wireless-AC 8265
POWER DELIVERY	19V 65W AC power adapter	19V 65W AC power adapter
TRUSTED PLATFORM MODULE	N/A	N/A
LEAD-FREE	Yes	Yes
BIOS	Intel® Visual BIOS	Intel® Visual BIOS
WARRANTY	3 year limited warranty	3 year limited warranty
OTHER	Replaceable lid; 3 year product availability; Qualified for 24x7 operation; Backpanel opening w/DB9 bracket; Internal power connector (12V – 24V DC); Vcc5/1A, 5Vsby/2A, 3.3Vsby/1A internal power sources via header; Kensington lock with base security; Intel® Optane™ Memory support; VESA mounting plate included	Replaceable lid; 3 year product availability; Qualified for 24x7 operation; Internal power connector (12V – 24V DC); Vcc5/1A, 5Vsby/2A, 3.3Vsby/1A internal power sources via header; Kensington lock with base security; VESA mounting plate included





PRODUCT FAMILY	NUC5i5MYHE	NUC5i3MYHE
KIT / BOARD	Intel® NUC Kit <sup>1</sup>	Intel® NUC Kit <sup>1</sup>
5-PACK OUTERCASE	BLKNUC5i5MYHE	BLKNUC5i3MYHE
10-PACK PRODUCT CODE	N/A	N/A
PROCESSOR	Intel® Core™ i5-5300U	Intel® Core™ i3-5010U
CHIPSET	N/A	N/A
INTEGRATED GRAPHICS CORE <sup>2</sup>	Intel® HD graphics 5500	Intel® HD graphics 5500
DISPLAY OUTPUTS	Two Mini DisplayPort* eDP* with backlight and adjustable voltage / timings	Two Mini DisplayPort* eDP* with backlight and adjustable voltage / timings
MEMORY SUPPORT <sup>4</sup>	Dual-Channel SODIMM DDR3L 1333 / 1600 MHz, 1.35V, 16 GB <sup>4</sup> maximum	Dual-Channel SODIMM DDR3L 1333 / 1600 MHz, 1.35V, 16 GB <sup>4</sup> maximum
2.5" HDD SUPPORT	Yes	Yes
EXPANSION CONNECTORS	One full-size PCI Express* Mini Card with M.2 support One half-size PCI Express Mini Card	One full-size PCI Express* Mini Card with M.2 support One half-size PCI Express Mini Card
AUDIO <sup>3</sup>	Eight-Channel (7.1) digital audio via Mini DisplayPort output Two-channel via headphone jack	Eight-Channel (7.1) digital audio via Mini DisplayPort output Two-channel via headphone jack
USB PORTS	Four USB 3.0 ports (two front panel, two back panel) Two USB 2.0 ports (via internal header)	Four USB 3.0 ports (two front panel, two back panel) Two USB 2.0 ports (via internal header)
ONBOARD LAN	Intel® PRO 10/100/1000 Network Connection	Intel® PRO 10/100/1000 Network Connection
POWER CORD OPTION	Multi-country plug (Types A/C/G/I) included	Multi-country plug (Types A/C/G/I) included
TRUSTED PLATFORM MODULE	Yes (TPM v2.0)	Yes (TPM v2.0)
LEAD-FREE	Yes	Yes
BIOS	Intel® Visual BIOS BIOS Vault Technology Fast Boot	Intel® Visual BIOS BIOS Vault Technology Fast Boot
WARRANTY	3 year limited warranty	3 year limited warranty
OTHER	Replaceable lid Backpanel serial port expandability via onboard header High-speed Custom Solutions header	Replaceable lid Backpanel serial port expandability via onboard header High-speed Custom Solutions header

## INTEL<sup>®</sup> NUC KIT<sup>1</sup> SUMMARY

INTEL <sup>®</sup> NUC	PROCESSOR <sup>5</sup>	SODIMM MEMORY	DIMMS	SUPPORT FOR 2.5" DRIVE	DISPLAY OUTPUT	MINI PCI Express®	AUDIO	USB 3 EXT+ INT	USB 2 EXT+ INT	LAN	3 YEAR PRODUCT LIFE	OTHER
NUC7i7BNKQ	Intel® Core™ i7-7567U processor	DDR4	2	Yes	HDMI 2.0a; USB-C (DP1.2)	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® Iris™ Plus graphics; Thunderbolt 3; CIR
NUC7i5BNKP	Intel® Core™ i5-7260U processor	DDR4	2	Yes	HDMI 2.0a; USB-C (DP1.2)	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® Iris <sup>™</sup> Plus graphics; Thunderbolt 3; CIR
NUC7i7BNHXG	Intel® Core™ i7-7567U processor	DDR4	2	Yes	HDMI 2.0a; USB-C (DP1.2)	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® Iris™ Plus graphics; Thunderbolt 3; CIR
NUC7i5BNHXF	Intel® Core™ i5-7260U processor	DDR4	2	Yes	HDMI 2.0a; USB-C (DP1.2)	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® Iris™ Plus graphics; Thunderbolt 3; CIR
NUC7i3BNHXF	Intel <sup>®</sup> Core <sup>™</sup> i3-7100U processor	DDR4	2	Yes	HDMI 2.0a; USB-C (DP1.2)	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® HD graphics; CIR
NUC7CJYSAL	Intel® Celeron® J4005 processor	DDR4	2	Yes	HDMI*	0	7.1 digital (HDMI)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® HD graphics; CIR
NUC7PJYH	Intel® Pentium® J5005 processor	DDR4	2	Yes	HDMI*	0	7.1 digital (HDMI)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® HD graphics; CIR
NUC7CJYH	Intel® Celeron® J4005 processor	DDR4	2	Yes	HDMI*	0	7.1 digital (HDMI)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® HD graphics; CIR
NUC6CAYH	Intel® Celeron™ J3455 processor	DDR3L	2	Yes	HDMI* + VGA	0	7.1 digital (HDMI)	4 + 0	0 + 2	GbE + WiFi*	No	Intel <sup>®</sup> HD graphics
NUC6CAYS	Intel® Celeron™ J3455 processor	DDR3L	2	Yes	HDMI* + VGA	0	7.1 digital (HDMI)	4 + 0	0 + 2	GbE + WiFi*	No	Intel <sup>®</sup> HD graphics
NUCi3BNK	Intel <sup>®</sup> Core™ i3-7100U processor	DDR4	2	No	HDMI* + DP1.2	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel <sup>®</sup> HD graphics
NUCi3BNH	Intel® Core™ i3-7100U processor	DDR4	2	Yes	HDMI* + DP1.2	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel <sup>®</sup> HD graphics
NUC7i5BNK	Intel® Core™ i5-7260U processor	DDR4	2	No	HDMI* + DP1.2	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel <sup>®</sup> HD graphics
NUC7i5BNH	Intel® Core™ i5-7260U processor	DDR4	2	Yes	HDMI* + DP1.2	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® HD graphics
NUC7i7BNH	Intel <sup>®</sup> Core™ i7-7567U processor	DDR4	2	Yes	HDMI* + DP1.2	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel <sup>®</sup> HD graphics

INTEL® NUC	PROCESSOR <sup>5</sup>	SODIMM MEMORY	DIMMS	SUPPORT FOR 2.5" DRIVE	DISPLAY OUTPUT	MINI PCI Express®	AUDIO	USB 3 EXT+ INT	USB 2 EXT+ INT	LAN	3 YEAR PRODUCT LIFE	OTHER
NUC6i7KYK	Intel® Core™ i7-6770HQ processor	DDR4	2	No	mDP 1.2; HDMI* 2.0; USB-C (DP1.2)	2 M.2	7.1 digital (HDMI mDP); L+R+mic	4 + 0	0 + 2	GbE + WiFi*	No	Intel® Iris™ Pro graphics; Thunderbolt 3; CIR
NUC5CPYH	Intel® Celeron® N3050 processor	DDR3L	1	Yes	mHDMI* + VGA	1 M.2	8-ch + 2-ch	4 + 0	0 + 2	GbE + WiFi*	No	CIR
NUC5i5MYHE	Intel® Core™ i5-5300U processor	DDR3L	2	Yes	Dual mDP	2 M.2	8-ch + 2-ch	4 + 0	0 + 2	GbE	Yes	Intel® vPro™, TPM v2.0
NUC5i3MYHE	Intel® Core™ i3-5010U processor	DDR3L	2	Yes	Dual mDP	2 M.2	8-ch + 2-ch	4 + 0	0 + 2	GbE	Yes	TPM v2.0
NUC7i5DNHE	Intel® Core™ i5-7300U processor	DDR4	2	Yes	Dual HDMI 2.0a	2 M.2	Dual 7.1 digital (HDMI)	4 + 1	0 + 2	GbE + WiFi*	Yes	24x7, vPro, TPM, Serial, Int Exp.
NUC7i5DNKE	Intel® Core™ i5-7300U processor	DDR4	2	No	Dual HDMI 2.0a	2 M.2	Dual 7.1 digital (HDMI)	4 + 1	0 + 2	GbE + WiFi*	Yes	24x7, vPro, TPM, Serial
NUC7i3DNHE	Intel <sup>®</sup> Core™ i3-7100U processor	DDR4	2	Yes	Dual HDMI 2.0a	2 M.2	Dual 7.1 digital (HDMI)	4 + 1	0 + 2	GbE + WiFi*	Yes	24x7, Serial, Int Exp.
NUC7i3DNKE	Intel® Core™ i3-7100U processor	DDR4	2	No	Dual HDMI 2.0a	2 M.2	Dual 7.1 digital (HDMI)	4 + 1	0 + 2	GbE + WiFi*	Yes	24x7, Serial

## INTEL<sup>®</sup> NUC BOARDS







PRODUCT FAMILY	NUC5i5MYBE	NUC5i3MYBE	DE3815TYBE
KIT / BOARD	Intel® NUC Board	Intel® NUC Board	Intel® NUC Board
5-PACK OUTERCASE	BLKNUC5i5MYBE	BLKNUC5i3MYBE	N/A
<b>10-PACK PRODUCT CODE</b>	N/A	N/A	BLKDE3815TYBE
PROCESSOR	Intel® Core™ i5-5300U	Intel® Core™ i3-5010U	Intel® Atom™ E3815
CHIPSET	N/A	N/A	N/A
INTEGRATED GRAPHICS CORE <sup>2</sup>	Intel® HD graphics 5500	Intel® HD graphics 5500	Intel® HD graphics
DISPLAY OUTPUTS	Two Mini DisplayPort* eDP* with backlight and adjustable voltage / timings	Two Mini DisplayPort* eDP* with backlight and adjustable voltage / timings	HDMI*; VGA; eDP*
MEMORY SUPPORT <sup>4</sup>	Dual-Channel SODIMM DDR3L 1333 / 1600 MHz, 1.35V, 16 GB4 maximum	Dual-Channel SODIMM DDR3L 1333 / 1600 MHz, 1.35V, 16 GB4 maximum	Single-Channel SODIMM DDR3L 1333 / 1600 MHz, 1.35V, 8 GB <sup>4</sup> maximum
2.5" HDD SUPPORT	Yes	Yes	Yes
EXPANSION CONNECTORS	One full-size PCI Express* Mini Card with M.2 support and one half-size PCI Express Mini Card	One full-size PCI Express* Mini Card with M.2 support and one half-size PCI Express Mini Card	One half-size PCI Express* Mini Card
AUDIO <sup>3</sup>	Eight-Channel (7.1) digital audio via Mini DisplayPort output, two-channel via headphone jack	Eight-Channel (7.1) digital audio via Mini DisplayPort output, two-channel via headphone jack	Eight-Channel (7.1) digital audio via HDMI 1.4a output, two-channel via headphone jack
USB PORTS	Four USB 3.0 ports (two front panel, two back panel) and two USB 2.0 ports (via internal header)	Four USB 3.0 ports (two front panel, two back panel) and two USB 2.0 ports (via internal header)	One USB 3.0 port (front panel), five USB 2.0 ports (two external ports and three additional ports via internal headers)
ONBOARD LAN	Intel® PRO 10/100/1000 Network Connection	Intel® PRO 10/100/1000 Network Connection	Intel® PRO 10/100/1000 Network Connection
POWER CORD OPTION	Multi-country plug (Types A/C/G/I) included	Multi-country plug (Types A/C/G/I) included	N/A
TRUSTED PLATFORM MODULE	Yes (TPM v2.0)	Yes (TPM v2.0)	N/A
LEAD-FREE	Yes	Yes	Yes
BIOS	Intel® Visual BIOS BIOS Vault Technology Fast Boot	Intel® Visual BIOS BIOS Vault Technology Fast Boot	Intel® Visual BIOS BIOS Vault Technology Fast Boot
WARRANTY	3 year limited warranty	3 year limited warranty	3 year limited warranty
OTHER	Serial port header High-speed Custom Solutions header	Serial port header High-speed Custom Solutions header	4 GB eMMC storage device soldered down, Custom Solutions header, watchdog timer, fanless design





PRODUCT FAMILY	NUC7i5DNBE	NUC7i3DNBE
KIT / BOARD	Intel® NUC Board	Intel® NUC Board
5-PACK OUTERCASE	BLKNUC7i5DNKE	BLKNUC7i5DNKE
10-PACK PRODUCT CODE	N/A	N/A
PROCESSOR	Intel® Core™ i5-7300U Processor with Intel® vPro™ Technology	Intel® Core™ i3-7100U Processor
CHIPSET	N/A	N/A
INTEGRATED GRAPHICS CORE <sup>2</sup>	Intel® HD graphics 620	Intel® HD graphics 620
DISPLAY OUTPUTS	Dual HDMI 2.0a (4k @ 60Hz) w/HDCP 2.2 and basic CEC built in for 1 port Internal 4-lane eDP 1.4 connector	Dual HDMI 2.0a (4k @ 60Hz) w/HDCP 2.2 and basic CEC built in for 1 port Internal 4-lane eDP 1.4 connector
MEMORY SUPPORT <sup>4</sup>	Dual-Channel SODIMM DDR4 2133 / 1.2V, 32 GB <sup>4</sup> maximum	Dual-Channel SODIMM DDR4 2133 / 1.2V, 32 GB <sup>4</sup> maximum
2.5" HDD SUPPORT	Yes	Yes
EXPANSION CONNECTORS	One M.2 22x80 (type M) for SATA & NVMe SSDs / One M.2 22x30 (type E) for wireless card Serial port header HDMI CEC header	One M.2 22x80 (type M) for SATA & NVMe SSDs / One M.2 22x30 (type E) for wireless card Serial port header HDMI CEC header
AUDIO <sup>3</sup>	Dual Eight-Channel (7.1) digital audio via HDMI ports	Dual Eight-Channel (7.1) digital audio via HDMI ports
USB PORTS	Four USB 3.0 ports (two front panel, two back panel) One internal USB 3.0 port header Two internal USB 2.0 port headers	Four USB 3.0 ports (two front panel, two back panel) One internal USB 3.0 port header Two internal USB 2.0 port headers
ONBOARD LAN	Intel® i219 - LM 10/100/1000 Network Connection Intel® Wireless-AC 8265	Intel® i219 - LM 10/100/1000 Network Connection Intel® Wireless-AC 8265
POWER CORD OPTION	19V 65W AC power adapter	19V 65W AC power adapter
TRUSTED PLATFORM MODULE	Yes (TPM v2.0) Worldwide and China-specific options	N/A
LEAD-FREE	Yes	Yes
BIOS	Intel® Visual BIOS	Intel® Visual BIOS
WARRANTY	3 year limited warranty	3 year limited warranty
OTHER	3 year product availability Qualified for 24x7 operation Internal power connector (12V – 24V DC) Vcc5/1A, 5Vsby/2A, 3.3Vsby/1A internal power sources via header	3 year product availability Qualified for 24x7 operation Internal power connector (12V – 24V DC) Vcc5/1A, 5Vsby/2A, 3.3Vsby/1A internal power sources via header

## INTEL<sup>®</sup> NUC BOARD SUMMARY

INTEL <sup>®</sup> NUC	PROCESSOR <sup>5</sup>	SODIMM MEMORY	DIMMS	SUPPORT FOR 2.5" DRIVE	DISPLAY OUTPUT	MINI PCle*	AUDIO	USB 3 EXT+INT	USB 2 EXT+INT	LAN	3 YEAR PRODUCT LIFE	OTHER
NUC5i5MYBE	Intel® Core™ i5-5300U processor	DDR3L	2	Yes	Dual mDP	2 M.2	8-ch + 2-ch	4 + 0	0 + 2	GbE	Yes	Intel <sup>®</sup> vPro <sup>™</sup> , TPM v2.0
NUC5i3MYBE	Intel <sup>®</sup> Core <sup>™</sup> i3-5010U processor	DDR3L	2	Yes	Dual mDP	2 M.2	8-ch + 2-ch	4 + 0	0 + 2	GbE	Yes	TPM v2.0
DE3815TYBE	Intel® Atom™ processor E3815	DDR3L	1	Yes	HDMI + VGA + eDP*	1	8-ch + 2-ch	1+0	2 + 3	GbE	Yes	Fanless + 4 GB on-board memory
NUC7i5DNBE	Intel® Core™ i5-7300U processor	DDR4	2	Yes	Dual HDMI	2 M.2	8-ch + 2-ch	4 + 1	0 + 2	GbE	Yes	Intel® vPro™, TPM v2.0
NUC7i3DNBE	Intel® Core™ i3-7100U processor	DDR4	2	Yes	Dual HDMI	2 M.2	8-ch + 2-ch	4 + 1	0 + 2	GbE	Yes	

#### For more information, visit www.intel.com/NUC

<sup>1</sup> Intel<sup>®</sup> NUC Kit: Each kit contains motherboard, chassis, and power supply.

<sup>2</sup> Requires a processor with Intel<sup>®</sup> HD graphics.

- <sup>3</sup> Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. Check with your system manufacturer or retailer or learn more at www.intel.com/design/chipsets/hdaudio.htm
- <sup>4</sup> System resources and hardware (such as PCI and PCI Express\*) require physical memory address locations that can reduce available addressable system memory. This could result in a reduction of as much as 1 GB or more of physical addressable memory being available to the operating system and applications, depending on the system configuration and operating system.
- <sup>5</sup> Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. Go to: http://www.intel.com/products/processor number/

Intel® NUC Kits and Boards may contain design defects or errors known as errata, which may cause the product to deviate from published specifications. Current characterized errata are available on request. All products and dates specified are preliminary based on current expectations and are subject to change without notice. Availability in different channels may vary.

For more complete information about performance and benchmark results, visit www.intel.com/benchmarks

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# INTEL® COMPUTE STICK

Intel<sup>®</sup> Product Quick Reference Matrix **Q3 2018** 

## BUILT FOR Performance. Sized for Convenience.

#### **INTEL® COMPUTE STICK**

Intel<sup>®</sup> Compute Stick is a device the size of a pack of gum that turns any HDMI display into a fully functional computer: same operating system, same high quality graphics, and same wireless connectivity.

All this in a PC on a stick that measures 4.5 inches from end to end, and is ready to compute right out of the box.

## INTEL® COMPUTE STICK

Connect. Compute. It's that simple.

## QUAD-CORE INTEL<sup>®</sup> ATOM<sup>™</sup> PROCESSOR

This innovative processor delivers great performance while consuming low energy—making the Intel<sup>®</sup> Compute Stick both space and energy efficient.

## **INTEL® HD GRAPHICS**

Exceptional clarity makes for an exceptional visual experience. The Intel<sup>®</sup> Compute Stick delivers HD wow, whether you're viewing videos, games, or photos.

### **INTEL® HD AUDIO**

Get a high quality, multichannel sound experience, without an audio card. It's truly an immersive media experience that will have your ears seeing stars.

## THE INTEL® COMPUTE STICK

Connect. Compute. It's that simple.





## **INTERACTIVE DISPLAY**

Transform a display into a fully functional interactive display solution.



### **CONFERENCE PRESENTATION**

Connect to your presentation device and stream videos or display visual content with ease.



### **ENTERTAINMENT**

Turn your HDMI\* television or monitor into a home entertainment computer.

## **INTEL® COMPUTE STICK "CEDAR CITY"**





Product Code	STK2m3W64CC	STK2mv64CC
Processor	6th generation Intel® Core™ Y-Series m3, 1.6GHz, 3MB L3 cache (M3-6Y30 SoC)	6th generation Intel® Core™ Y-Series m5, 1.6GHz, 3MB L3 cache (M3-6Y30 SoC), Intel® vPro™ Technology
Memory	Integrated in SoC Dual-channel LPDDR3; 1.2V, 1866 MHz, 2GB per channel (4GB total memory)	Integrated in SoC Dual-channel LPDDR3; 1.2V, 1866 MHz, 2GB per channel (4GB total memory)
Graphics	Intel® HD graphics; 1x HDMI 1.4b male plug	Intel® HD graphics; 1x HDMI 1.4b male plug
Audio	Multi-channel digital audio via HDMI interface	Multi-channel digital audio via HDMI interface
Peripheral Connectivity	1x USB 3.0 Type-A host port on side	1x USB 3.0 Type-A host port on side
Storage	64GB eMMC storage device soldered down; Micro SDXC v3.0 slot with UHS I-Support (on side)	64GB eMMC storage device soldered down; Micro SDXC v3.0 slot with UHS I-Support (on side)
Networking	IEEE 802.11 g/n/ac dual band and Bluetooth 4.1 Wireless module soldered down w/ dual band antennas	IEEE 802.11 g/n/ac dual band and Bluetooth 4.1 Wireless module soldered down w/ dual band antennas
Enclosure	Dimensions: Approx. 114mm x 38mm x 11mm; Black Chassis; Security Loop (Size TBD)	Dimensions: Approx. 114mm x 38mm x 11mm; Black Chassis; Security Loop (Size TBD)
Power Delivery	MicroUSB* Type-C power connector & cable 5V/2A Wall-wart style with US (includes Japan), AUS, UK, India, and EU interchangeable plugs	MicroUSB* Type-C power connector & cable 5V/2A Wall-wart style with US (includes Japan), AUS, UK, India, and EU interchangeable plugs
Additional Featured	Pre-installed OS: Windows* 10, 64-bit HDMI* Extender Cable Power LED, Power Button Three Year Warranty	HDMI* Extender Cable Power LED, Power Button Three Year Warranty

#### For more information, visit www.intel.com/computestick

Actual Intel® Compute Stick may differ from the image shown. Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at www.intel.com/computestick

## **INTEL® COMPUTE STICK "STERLING CITY"**





Product Code	STK1AW32SC	STK1A32SC
Processor	Intel® Atom Quad-Core Processor x5-Z8300 Type 3 BGA	Intel® Atom Quad-Core Processor x5-Z8300 Type 3 BGA
Memory	Soldered down Single-channel DDR3L; 1.35V, 1600 MHz, 2GB	Soldered down Single-channel DDR3L; 1.35V, 1600 MHz, 2GB
Graphics	Intel® HD graphics (Gen 8 LP); 1x HDMI 1.4b (1080p) male plug	Intel® HD graphics (Gen 8 LP); 1x HDMI 1.4b (1080p) male plug
Audio	Multi-channel digital audio via HDMI interface	Multi-channel digital audio via HDMI interface
Peripheral Connectivity	1x USB 3.0 Type-A host port on side; 1x USB 2.0 Type-A host port on side	1x USB 3.0 Type-A host port on side; 1x USB 2.0 Type-A host port on side
Storage	32GB eMMC storage device soldered down Micro SDXC v3.0 slot with UHS I-Support (on side)	32GB eMMC storage device soldered down Micro SDXC v3.0 slot with UHS I-Support (on side)
Networking	Intel® Dual Band Wireless AC 7265 with Bluetooth 4.0	Intel® Dual Band Wireless AC 7265 with Bluetooth 4.0
Enclosure	Black chassis with Intel Inside logo, plastic enclosure Dimensions: Approx. 113 mm x 38 mm x 12 mm	Black chassis with Intel Inside logo, plastic enclosure Dimensions: Approx. 113 mm x 38 mm x 12 mm
Power Delivery	MicroUSB power connector 5V/3A wall-mount AC-DC power adapter w/ support for US, EU, UK, AUS (SKU 1) and IND, BRA, ARG, CHN, KOR (SKU 2) outlets	MicroUSB power connector 5V/3A wall-mount AC-DC power adapter w/ support for US, EU, UK, AUS (SKU 1) and IND, BRA, ARG, CHN, KOR (SKU 2) outlets
Additional Featured	Pre-installed OS: Windows* 10, 32-bit (64-bit capable) Intel BIOS Hot Plug video detect Power LED, power button One Year Warranty	Intel BIOS Hot Plug video detect Power LED, power button One Year Warranty

#### For more information, visit www.intel.com/computestick

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#### For more information, visit www.intel.com/computestick

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# INTEL® COMPUTE CARD

Intel<sup>®</sup> Product Quick Reference Matrix **Q3 2018** 

## THE FUTURE IS SMART

#### INTEL<sup>®</sup> COMPUTE CARD — SMALL IN SIZE, NOT IN CAPABILITIES

Intel<sup>®</sup> Compute Card is just slightly longer than a credit card, but it's ready to power anything from entry-level to full featured devices.

The modularity and flexibility of this computer on a card allows compute integration via card slot into devices like digital signage, kiosks, Smart TVs, appliances and more.

## THE FUTURE IS SMART

The Intel<sup>®</sup> Compute Card is pushing the boundaries of where and how technology enriches life.

#### **DRIVING INNOVATION**

Now any device with a Compute Card slot is a smart device, unlocking potential everywhere compute is possible.

#### **DELIVERING VALUE**

Revolutionary in size, form, and function, the Intel<sup>®</sup> Compute Card brings tremendous value to designers, OEMs, manufacturers, distributors, channel partners, and ultimately, their customers.

#### **DELIVERED COMPLETE**

With Intel<sup>®</sup> brand processors and everything your customers need including RAM, storage, and wireless connectivity—already built-in.

## **COMPUTE ANYWHERE**





## IN THE HOME

Smart appliances and devices for a more connected home.



#### **IN BUSINESS**

Digital signage, point of sale, intelligent vending, and smart security solutions to bring business into the future.

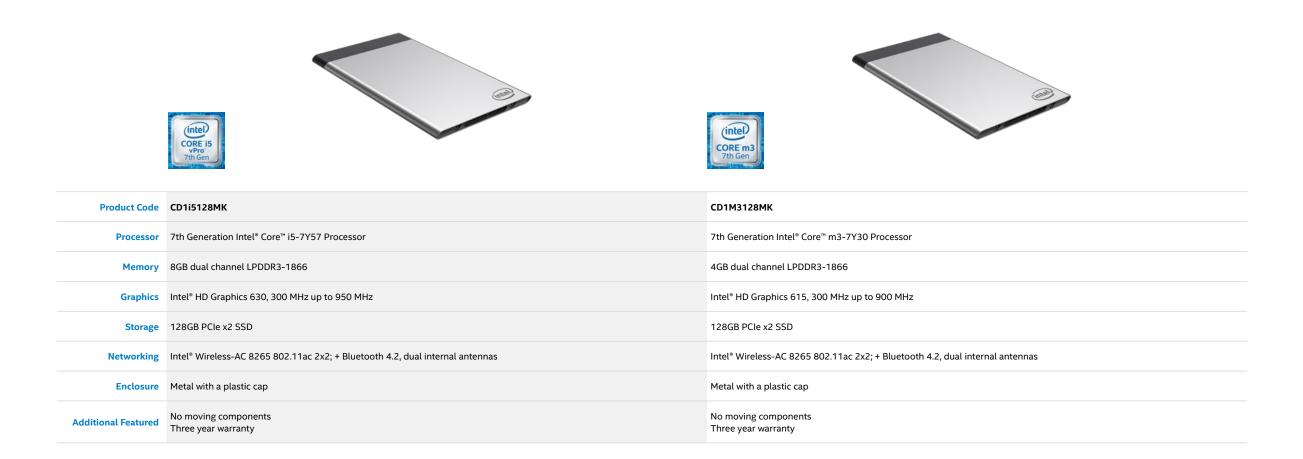


## **IN THE FACTORY**

Automation, inventory management, fleet tracking and mobile workstations to reinvent the factory floor.

## **INTEL<sup>®</sup> COMPUTE CARD - MARBLE CREEK**



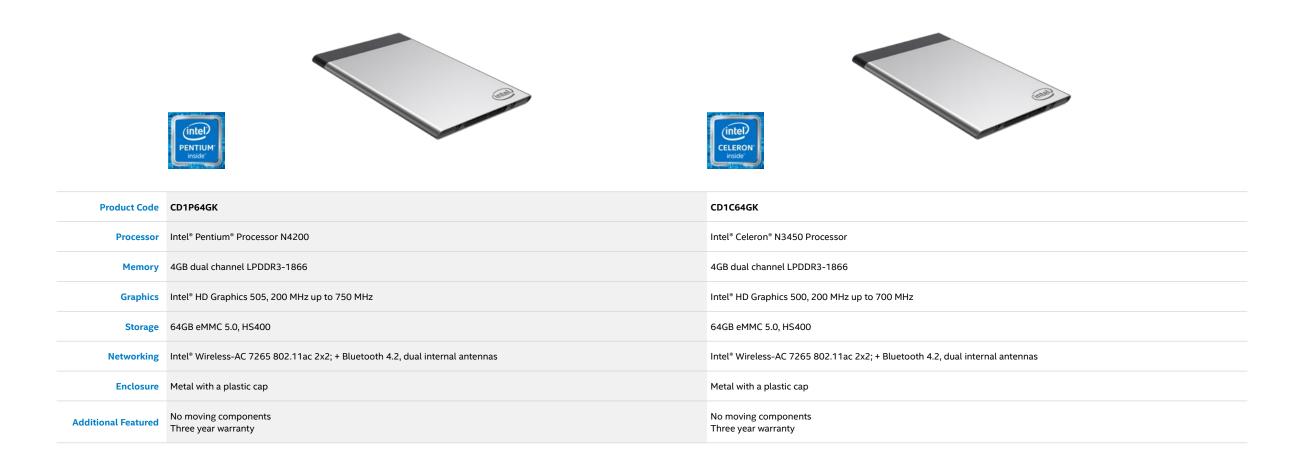


#### For more information, visit www.intel.com/computecard

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## **INTEL<sup>®</sup> COMPUTE CARD - GRANITE CREEK**





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## **INTEL<sup>®</sup> COMPUTE CARD DOCK - PORT JEFFERSON**

Product Code	DK132EPJ	
Supported Cards	CD1IV128MK Intel® Core™ i5 vPro* CD1M3128MK Intel® Core™ m3 CD1P64GK Intel® Pentium® CD1C64GK Intel® Celeron®	
Security	Mechanical security latch, Compute Card ejection lock, Kensington lock	
Networking	Intel® Ethernet Controller I211-AT, IEEE 802.3/u/ab, RJ45 with dual LEDs, 10/00/1000 Mbps	
Enclosure	Metal with plastic	
Additional Featured	Electronic ejection Active cooling One year warranty	





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# INTEL® WIRELESS PRODUCTS

Intel<sup>®</sup> Product Quick Reference Matrix **Q3 2018** 

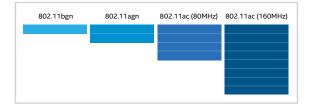
INTEL® WIRELESS-AC WI-FI FOR YOUR CONNECTED LIFE

#### **GIGABIT WI-FI POWERED BY INTEL**

With the right solution from Intel, your Wi-Fi performs just as remarkably as you do—easily keeping pace with your entertainment, business, and super-connected lifestyle.

## **INTEL<sup>®</sup> WIRELESS PRODUCTS**

802.11ac (160MHz) combines eight 20 MHz channels into a super-wide 160MHz channel. More capacity, less congestion.



#### Nearly Twelve Times Faster Data Rates<sup>5</sup>

Less time waiting, more time enjoying. 802.11ac: 2 data streams on 2 antennas for the best experience.

2x2 802.11ac (160 MHz)		1733 Mbps
2x2 802.11ac (80 MHz)	867 Mbps	
1x1 802.11ac	433 Mbps	
1x1 802.11bgn	150 Mbps	

#### **Progression of Wi-Fi Standards & Technologies**

YEAR	WI-FI TYPE	SHORT NAME	MAX SPEED	STREAMS	CHANNEL WIDTH	CHANNEL DENSITY
2016	2x2 802.11ac	2x2AC	1733Mbps	2	160MHz	Heavy
2013	2x2 802.11ac	2x2AC	867Mbps	2	80MHz	Heavy
2013	1x1 802.11ac	1x1AC	433Mbps	1	80MHz	Heavy
2007	1x1 802.11n	1x1BGN/AGN	150Mbps	1	40MHz	Medium

Note: Wider channels, heavier channel densities, and higher number of streams each contribute to higher maximum speeds

- 802.11ac products are nearly 12X faster<sup>5</sup> than 802.11n, is fully backwards compatible, and supports both the 2.4GHz and 5GHz spectrum.
- PC (client) and AP/Router must both have 802.11ac to get highest speeds.
- 2x2AC clients are 2X-4X faster than 1x1AC clients<sup>3</sup>.
- Intel has important additional unique features:
- Wireless Intel<sup>®</sup> Active Management Technology (Intel<sup>®</sup> vPro<sup>™</sup> Technology)<sup>1</sup>
- + Worldwide Regulatory Support with Intel® Dynamic Regulatory Solution  $^{\rm 2}$

#### **Module Form Factors**

#### M.2 2230 Socketed



#### M.2 1216 Soldered Down



#### Wireless Products (802.11ac Wi-Fi and Bluetooth®)

Wi-Fi is not just for laptops. Experience the flexibility and performance offered by Intel® Wireless-AC in the desktop.

PRODUCT	INTEL® WIRELESS-AC 9560	INTEL® WIRELESS-AC 9260	INTEL® WIRELESS-AC 9461/9462	INTEL® DUAL BAND WIRELESS-AC 8265	INTEL® DUAL BAND WIRELESS-AC 8260	INTEL® DUAL BAND WIRELESS-AC 7265	INTEL® DUAL BAND WIRELESS-AC 3168	INTEL® DUAL BAND WIRELESS-AC 3165
FORM FACTOR	M.2 2230, 1216 Solder Down	M.2 2230	M.2 2230, 1216 Solder Down	M.2 2230, 1216 (Solder Down)	M.2 2230, 1216 (Solder Down)	M.2 2230, 1216 (Solder Down)	M.2 2230	M.2 2230
SPEED SPATIAL STREAMS (TX AND RX)	Gigabit - 1733Mb/s (2x2)	Gigabit - 1733Mb/s (2x2)	433Mb/s (1x1) Single Antenna-9461; Diversity Antenna-9462	867Mb/s (2x2)	867 Mb/s (2x2)	867 Mb/s (2x2)	433 Mb/s (1x1)	433 Mb/s (1x1)
ENTERPRISE / SMB FEATURES	Intel® PROset/wireless software, MU-MIMO Rx, Intel® Authenticate Solution	Intel® PROset/wireless software, MU-MIMO Rx, Intel® Authenticate Solution	Intel® PROset/wireless software, MU-MIMO Rx, Intel® Authenticate Solution	Intel® PROSet/Wireless Software, MU-MIMO, Intel® Authenticate Solution	Intel® PROSet / Wireless Software, Intel® Authenticate Solution			
BANDS	Dual Band - 2.4GHz and 5GHz	Dual Band - 2.4GHz and 5GHz	Dual Band - 2.4GHz and 5GHz	Dual Band – 2.4 GHz and 5 GHz	Dual Band – 2.4 GHz and 5 GHz	Dual Band – 2.4 GHz and 5 GHz	Dual Band – 2.4 GHz and 5 GHz	Dual Band – 2.4 GHz and 5 GHz
INTEL <sup>®</sup> vPRO <sup>™</sup> TECHNOLOGY <sup>1</sup>	✓	1		✓	✓	1		
BLUETOOTH®	Bluetooth® 5	Bluetooth 5	Bluetooth 5	Bluetooth <sup>®</sup> 4.2	Bluetooth 4.2	Bluetooth 4.2	Bluetooth 4.2	Bluetooth 4.2
Wi-Fi* CERTIFICATION (802.11)	WiFi certified 802.11 ac/a/b/g/n	WiFi certified 802.11 ac/a/b/g/n	WiFi certified 802.11 ac/a/b/g/n	WiFi certified 802.11ac/a/b/g/n	WiFi certified 802.11ac/a/b/g/n	WiFi certified 802.11ac/a/b/g/n	WiFi certified 802.11ac/a/b/g/n	WiFi certified 802.11ac/a/b/g/n
OPTIMIZED FOR	8th generation Intel <sup>®</sup> Core <sup>™</sup> processors and Intel <sup>®</sup> Pentium <sup>®</sup> Silver and Intel <sup>®</sup> Celeron <sup>®</sup> processors with platforms designed to support connectivity integration	8th generation Intel® Core™ processors and Intel® Pentium® Silver and Intel® Celeron® processors	8th generation Intel <sup>®</sup> Core <sup>™</sup> processors and Intel <sup>®</sup> Pentium <sup>®</sup> Silver and Intel <sup>®</sup> Celeron <sup>®</sup> processors with platforms designed to support connectivity integration	7th generation Intel® Core™ processors	6th generation Intel® Core™ processors	5th & 6th generation Intel® Core™ processors	6th generation Intel® Core™ processors	5th & 6th generation Intel® Core™ processors

## **DESKTOP WIRELESS M.2 KIT**

#### Intel® Dual Band Wireless-AC 8265 Desktop Kit

Intel® wireless networking solutions for desktop platforms enable network connectivity without wires. This solution requires a motherboard with an M.2 key E connector for wireless and includes 2 antennas, 2 RF cables with connectors and 2 mounting brackets (long/short). Integrate wireless in the desktop vs. an external USB dongle for uncompromising performance, enhanced security, and scalability for fast, flexible connectivity at work and home.

SEGMENT	
PRODUCT	INTEL® DUAL BAND WIRELESS-AC 8265 DESKTOP KIT
FORM FACTOR	M.2 (key E)
ANTENNA	Included
SPEED SPATIAL STREAMS (TX AND RX)	867 Mb/s (2x2) <sup>4</sup>
BANDS	Dual Band – 2.4 GHz and 5 GHz
ENTERPRISE / SMB FEATURES	Intel® PROSet / Wireless Software, MU-MIMO
BLUETOOTH® 4	Bluetooth <sup>®</sup> 4.2
WI-FI* CERTIFICATION (802.11)	802.11ac, 802.11n
AVAILABILITY	Shipping

#### Intel offers a full portfolio of advanced technologies to optimise every wireless experience

PRODUCT CODE	MM#	DESCRIPTION	PACKING	PRODUCT CONSIDERATIONS
JEFFERSON PEAK 1 & 2 - 9461 & 956	50			
9560.NGWG	957714	CNVi, Gigabit (160MHz), 2x2 MU-MIMO 802.11ac/a/b/g/n + Bluetooth® 5 - M.2	100 pack	Recommended wireless solution for 8th generation Intel® Core™, Intel® Pentinum® Silver and Intel® Celeron® Processors with platforms designed for connectivity integration. Supports Intel® vPro™ Technology on 8th generation Intel® Core™ processors.
9461.NGWG.NV	958885	CNVi, Single Antenna 1x1 MU-MIMO, 802.11ac/a/b/g/n + Bluetooth 5 - M.2	100 pack	Recommended wireless solution for 8th generation Intel® Core™, Intel® Pentinum® Silver and Intel®
9462.NGWG.NV	958856	CNVi, Diversity Antenna 1x1 MU-MIMO, 802.11ac/a/b/g/n + Bluetooth 5 M.2	100 pack	Celeron® Processors with platforms designed for connectivity integration.
THUNDER PEAK 2 - 9260				
9260.NGWG	957712	Gigabit (160MHz), 2x2 MU-MIMO 802.11ac/a/b/g/n + Bluetooth 5 - M.2	100 pack	Recommended wireless solution for 8th generation Intel® Core™, Intel® Pentinum® Silver and Intel® Celeron® Processors. Supports Intel® vPro™ Technology on 8th generation Intel® Core™ processors.
WINDSTORM PEAK - 8265				
8265.NGWMG	946658	2x2 MU-MIMO 802.11ac/a/b/g/n + Bluetooth <sup>®</sup> 4.2 - m.2	100 Packs	Decembranded everyll wireless celution for M 2 form forther on 7th concretion latel® Cave <sup>m</sup> are second
8265.NGWMG.DTX1	958156	2x2 MU-MIMO 802.11ac/a/b/g/n + Bluetooth 4.2 – m.2 desktop kit	1 Retail Box	Recommended overall wireless solution for M.2 form-factor on 7th generation Intel® Core™ processors.
SNOWFIELD PEAK - 8260				
8260.NGWMG	942165	2x2 MIMO 802.11ac/a/b/g/n + Bluetooth 4.2 - m.2	100 Packs	Recommended overall wireless solution for M.2 form-factor on 6th generation Intel® Core™ processors.
SANDY PEAK - 3168				
3168.NGWG	944884	1x1 802.11ac/a/b/g/n + Bluetooth 4.2 - m.2	100 Packs	Nearly 3x faster than 802.11 bgn/agn based products. <sup>5</sup>
STONE PEAK 1 & 2 - 3165 & 7265				
7265.NGWG.W	939155	2x2 MIMO 802.11ac/a/b/g/n + Bluetooth 4.1 - rev.2, m.2	100 Packs	Recommended overall wireless solution for M.2 form-factor on 5th generation Intel® Core™ processor- based systems. Supports Intel® vPro™ Technology on 5th generation Intel® Core™ processors. <sup>1</sup>
7265.NGWWB.W	945063	2x2 MIMO 802.11ac/a/b/g/n + Bluetooth 4.1 - rev.2, m.2, 10pk	10 Packs	Lower quantity pack to support smaller product orders.
3165.NGWG	940106	1x1 802.11ac/a/b/g/n + Bluetooth 4.1 - m.2	100 Packs	Nearly 3x faster than 802.11 bgn/agn based products. <sup>5</sup>

#### For more information, visit www.intel.com/wireless

- <sup>1</sup> Intel<sup>®</sup> vPro<sup>™</sup> technology is sophisticated and requires setup and activation. Availability of features and results will depend upon the setup and configuration of your hardware, software, and IT environment. To learn more visit: www.intel.com/content/www/us/en/architecture- and-technology/vpro/intel-vpro-technology-developer.html
- <sup>2</sup> For a list of country approvals, please contact your local Intel representative.
- <sup>3</sup> Based on actual product benchmark performance. Theoretical maximum bandwidth enabled by 2x2 802.11ac (80MHz) and 2x2 802.11ac (160MHz) implementations are 867 Mbps and 1733Mbps PHY rates respectively.
- <sup>4</sup> Tests document performance of components on a particular test, in specific systems. Differences in hardware, software, or configuration will affect actual performance. Consult other sources of information to evaluate performance as you consider your purchase. For more complete information about performance and benchmark results, visit http:// www.intel.com/performance.
- <sup>5</sup> "Nearly 3x/6x/12x faster" Intel® Wireless-AC claims are based on the comparison of maximum theoretical data rates for single (433 Mbps), dual (867 Mbps) spatial stream 802.11ac (80MHz) and dual (1733Mbps) spatial stream 802.11ac (160MHz) vs. single spatial stream (150 Mbps) 802.11n Wi-Fi solutions as documented in IEEE 802.11 wireless standard specifications, and require the use of similarly configured 802.11ac wireless network routers or better.
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# INTEL® REALSENSE<sup>TM</sup> TECHNOLOGY

Intel<sup>®</sup> Product Quick Reference Matrix **Q3 2018** 

# INTEL<sup>®</sup> REALSENSE<sup>™</sup> D400 FAMILY OF PRODUCTS

**Intel's Next Generation Depth Sensing Technology** 

## **DELIVERING NEW LEVELS OF EFFICIENCY AND PRODUCTIVITY**

Intel® RealSense<sup>™</sup> technology is fundamentally re-shaping the future of technology by equipping devices with the ability to see, understand, interact with, and learn from their environment. Intel<sup>®</sup> RealSense<sup>™</sup> D400 Family of products delivers an the next generation of end to end suite of depth sensing technologies that enable you to create new and innovative ways to connect with the world.

#### Make Smart Devices Even Smarter

The Intel® RealSense<sup>™</sup> Vision Processor D4 Series does the heavy lifting for you. It uses advanced algorithms to process raw image streams from the depth cameras and computes high resolution 3D depth maps without the need for dedicated GPU or host processor. Adding this vision processor to your system enables rapid custom design, which frees up more bandwidth for your system's host processor.



#### **Real Time Depth Processing**

A vision processor that combines advanced stereo algorithms and enhanced image processing pipeline to deliver 20X better depth compute over the previous generation.

#### **Enhanced Performance**

Generate depth data with up to 90fps dense depth map and Up to 1280x720 highest resolution depth.

#### **Next Generation Technology**

Low cost and size optimized (6.4x6.4mm) for integration flexibility across a spectrum of embedded devices.

Lower active and Standby Power with 28nm process.

#### **Integrate Depth Perception into Your Product**

The Intel® RealSense<sup>™</sup> Depth Module D400 Series provides a turnkey solution for rapid product development and integration for VR, Robotics, and any market where depth matters. Choose the module that has the best combination of power consumption, field of view, and shutter type, to optimize depth vision integration into your product. This tailored depth module adds "eyes" to your product as an enhanced solution.









	STEREO MODE	BASELINE	DEPTH SENSOR	RGB SENSOR	FOV	IR PROJECTOR	DIMENSIONS
D430	Wide	50mm	1280x720, Global	None	H: 91.2, V: 65.5, D: 100.6	Wide IR	X: 70.7mm, Y: 14mm , Z: 10.53mm
D420	Wide	50mm	1280x720, Global	None	H: 91.2, V: 65.5, D: 100.6	None	X: 70.7mm, Y: 14mm, Z: 10.53mm
D415	Standard	55mm	1080p, Rolling	16:9, 1920x1080	H: 69.4, V: 42.5, D: 77	Standard IR	X: 83.7mm, Y: 10mm, Z: 4.7mm
D410	Standard	55mm	1080p, Rolling	None	H: 69.4, V: 42.5, D: 77	Standard IR	X: 74.7mm, Y: 10mm, Z: 4.7mm
D400	Standard	55mm	1080p, Rolling	None	H: 69.4, V: 42.5, D: 77	None	X: 74.7mm, Y: 10mm, Z: 4.7mm

FOV: H – Horizontal FOV, V – Vertical FOV, D – Diagonal FOV. Dimensions: X – Width, Y – Height, Z – Thickness.

Note1: D415 Not Pictured

Note2: Intel® RealSense™ Depth Modules typically purchased in conjunction with Intel® RealSense™ Vision Processor D4 or Intel® RealSense™ Vision Processor D4 Card.

#### **Bolster Your Prototype with Computer Vision**

Intel<sup>®</sup> RealSense<sup>™</sup> Depth Camera D415 and D435 are ready-to-use right out of the box and can be easily added into your existing prototypes via USB. Bring innovative visual solutions to your projects with enhanced, accurate computer vision by adding high image-resolution and high frame-rate capabilities. Both Intel<sup>®</sup> RealSense<sup>™</sup> Depth Cameras include long-range vision and work in both indoor and outdoor settings. Ideal for makers, educators, hardware prototyping and software development.

Start developing immediately with the Intel® RealSense™ SDK an open source and Cross-Platform enabling multiple computing languages, wrappers, sample code and tools.



INTEL<sup>®</sup> REALSENSE<sup>™</sup> DEPTH CAMERA D415



INTEL<sup>®</sup> REALSENSE<sup>™</sup> DEPTH CAMERA D435

Baseline	55mm	50mm
Left/Right Imagers Type	Standard	Wide
Left/Right Imagers FOV (degrees)	H:68 / V:41.5 / D:75	H:91.2 / V:65.5 / D:100.6
IR Projector	Standard	Wide
IR Projector FOV	H:69.5 / V:42.5 / D:77	H:100.4/V:69/D:110.4
Color Sensor	OV2740	OV2740
Color Camera FOV	H:68/V:41.5 /D:75	H:68/V:41.5 /D:75
Depth Module Dimensions (mm)	X=89.7mm Y=10mm Z=4.7mm	X=70.7mm Y=14mm Z=10.53mm

## INTEL® REALSENSE™ Software developer kit 2.0

Open Source, Cross Platform

#### Featuring:

- Tools: Intel<sup>®</sup> RealSense<sup>™</sup> Viewer
- Utilities for Debug
- Code Samples
- RealSense<sup>™</sup> SDK an open source and Cross-Platform enabling multiple computing languages, wrappers, sample code and tools.

For more information, visit realsense.intel.com/develop

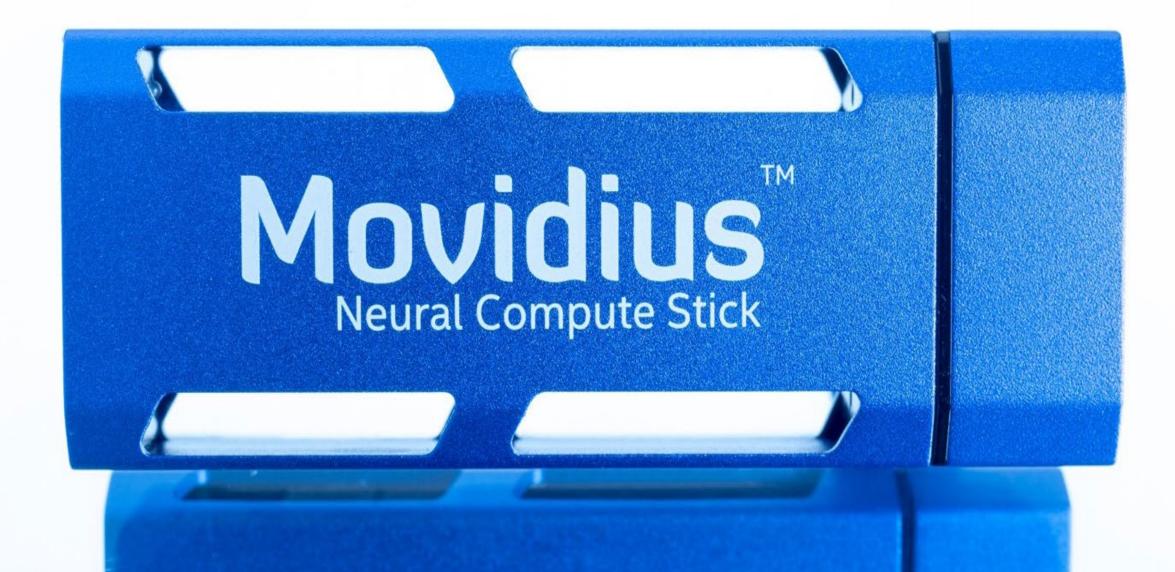


# MOVIDIUS<sup>™</sup> NEURAL COMPUTE STICK

Intel<sup>®</sup> Product Quick Reference Matrix **Q3 2018** 

## ACCELERATE DEEP LEARNING DEVELOPMENT AT THE EDGE

The Movidius<sup>™</sup> Neural Compute Stick is a miniature deep learning hardware development platform that you can use to prototype and tune, validate, and your AI programs, specifically Deep Neural Networks. It features the same Movidius vision processing unit (VPU) used to bring machine intelligence to drones, surveillance cameras, and VR or AR headsets. Now, in a USB stick form factor.



#### **Product Insights**

Powered by the Movidius<sup>™</sup> Vision Processing Unit, capable of running high performance Floating-point CNNs at ultra-low power, packaged in a convenient USB stick form factor for real time deep learning inferences with best in class power efficiency.



## Deep neural networks - on a stick no Cloud required



#### Deep Learning Insights

Profile, Validate, and Run your Deep Neural Network (DNN) to get realworld embedded results for deep learning research and development insights into performance and power.

#### Immediate Productivity

Supports the popular Caffe DNN framework to get up and running easily. Out-of-the-box examples for x86 and Raspberry Pi\* platforms help you easily integrate DNN inferences into any application.

#### **Prototyping Versatility**

USB stick form factor enables deep learning R&D and prototyping on a Linux laptop, x86 based host device, Raspberry Pi\* and others to come.

Run multiple devices on the same platform to scale performance.



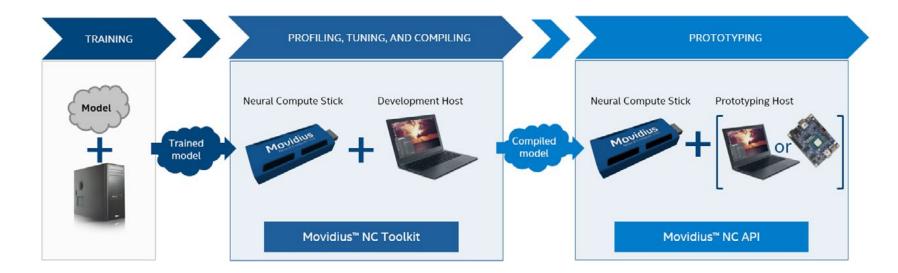
#### **Compile, Tune and Accelerate**

A Software Development Kit (SDK) containing a Toolkit and API allows deep learning developers to profile, tune, compile and deploy deep neural network (DNN) applications on the Movidius<sup>™</sup> Neural Compute Stick.

**Compile the Deep Neural Network:** Automatically convert a trained Caffe-based convolutional neural network (CNN) into an embedded neural network optimized to run on the onboard Movidius Myriad 2 vision processing unit (VPU).

**Tune the Network:** Layer-by-layer performance metrics for both industry standard examples provided and custom-designed neural networks enable effective tuning for optimal real-world performance at ultra-low power. Validation scripts allow developers to compare the accuracy of the optimized model on the device to the original PC-based model.

Accelerate the Network on the Neural Compute Stick: Unique to Movidius Neural Compute Stick, the device can behave as a discrete neural network accelerator by adding dedicated deep learning inference capabilities to existing computing platforms for improved performance and power efficiency.



#### Visit developer.movidius.com for more information.

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# INTEL® SERVER WORKSTATION PROCESSORS

Intel® Product Quick Reference Matrix Q3 2018

## INNOVATION YOU WANT. VERSATILITY YOU NEED.

## ENABLING BETTER DESIGNS AND FASTER TIME TO MARKET

The demand for faster time to market, design optimization, and cost reduction is driving the rapid adoption of workstation products in many industries. Not long ago, workstations were relegated to high-end design tasks such as complex mechanical assemblies, buildings, and aerospace design. Today, workstations are used in every major industry for tasks ranging from financial modeling, to designing complex buildings and vehicles. Workstations have become standard equipment for engineers, content creators, analysts, and others who need the highest levels of performance, visualization, and data integrity.

# INTEL® SERVER/ WORKSTATION PROCESSORS

Innovation You Want. Versatility You Need.

Intel® Xeon® HI™ Product Family Intel® Xeon® Scalable Processors Intel® Xeon® Processor E7-8800/4800 v4 Family Intel® Xeon® Processor E7-8800/4800/2800 v2 Family Intel® Xeon® Processor E7-8800/4800/2800 v2 Family Intel® Xeon® Processor E5-4600 v4 Family Intel® Xeon® Processor E5-4600 v3 Family Intel® Xeon® Processor E5-2600/1600 v4 Family Intel® Xeon® Processor E5-2600/1600 v3 Family Intel® Xeon® Processor E5-4600/2600/2400/1600 v2 Family Intel® Xeon® W Processors Intel® Xeon® Processor E3-1500 v5 Family Intel® Xeon® Processor E3-1200 v6 Family Intel® Xeon® Processor E3-1200 v5 Family Intel® Xeon® Processor E3-1200 v4 Family Intel® Xeon® Processor E3-1200 v3 Family Intel® Xeon® Processor E3-1200 v3 Family

#### The Intel<sup>®</sup> Xeon Phi<sup>™</sup> Processor – Your Path to Deeper Insight

Eliminate node bottlenecks, simplify your code modernization, and build on a power-efficient architecture with the Intel<sup>®</sup> Xeon Phi<sup>™</sup> processor, a foundational element of Intel<sup>®</sup> Scalable System Framework. The bootable host processor offers an integrated architecture for powerful, highly parallel performance that will pave your path to deeper insight, innovation, and impact for today's most-demanding High Performance Computing applications, including Machine Learning. Supported by a comprehensive technology roadmap and robust ecosystem, the Intel<sup>®</sup> Xeon Phi<sup>™</sup> processor is a future-ready solution that maximizes your return on investment by using open standards code that are flexible, portable, and reusable.

#### **Product Specifications**

PROCESSOR NAME	# OF CORES/ # OF THREADS	CLOCK SPEED	MAX TDP/POWER	MEMORY TYPES	FABRIC	L2 CACHE
Intel® Xeon™ Phi Processor 7250 (16GB, 1.40 GHz, 68 core)	68/272	1.4 GHz	215 W	DDR4-2400	Νο	34 MB
Intel® Xeon™ Phi Processor 7230 (16GB, 1.30 GHz, 64 core)	64/256	1.3 GHz	215 W	DDR4-2400	No	32 MB
Intel® Xeon™ Phi Processor 7210 (16GB, 1.30 GHz, 64 core)	64/256	1.3 GHz	215 W	DDR4-2133	No	32 MB
Intel® Xeon™ Phi Processor 7290 (16GB, 1.50 GHz, 72 core)	72/288	1.5 GHz	245 W	DDR4-2400	No	36 MB
Intel® Xeon™ Phi Processor 7290F (16GB, 1.50 GHz, 72 core)	72/288	1.5 GHz	260 W	DDR4-2400	Yes	36 MB
Intel® Xeon™ Phi Processor 7250F (16GB, 1.40 GHz, 68 core)	68/272	1.4 GHz	230 W	DDR4-2400	Yes	34 MB
Intel® Xeon™ Phi Processor 7230F (16GB, 1.30 GHz, 64 core)	64/256	1.3 GHz	230 W	DDR4-2400	Yes	32 MB
Intel® Xeon™ Phi Processor 7210F (16GB, 1.30 GHz, 64 core)	64/256	1.3 GHz	230 W	DDR4-2133	Yes	32 MB

#### Intel<sup>®</sup> Xeon Phi<sup>™</sup> Coprocessors

Power breakthrough innovations with the highly parallel processing of the Intel<sup>®</sup> Xeon Phi<sup>™</sup> coprocessor. Languages, tools, and applications run smoothly across the full spectrum of Intel<sup>®</sup> Xeon<sup>®</sup> processor family-based platforms. Intel Xeon Phi coprocessors provides 68 cores, 272 threads, and 2.828 double-precision teraFLOPS of performance,<sup>4,5,6</sup> and they come in a variety of configurations to address diverse hardware, software, workload, performance, and efficiency requirements.

#### Intel<sup>®</sup> Xeon Phi<sup>™</sup> Coprocessor Product Family for Server Systems

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE	CLOCK SPEED	CACHE	NO. OF CORES	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	THERMAL	UPC CODE
Intel® Xeon Phi™ Coprocessor 7240P	SC7240P	1.3 GHz	34 MB	68	✓	205W	Passive Thermal	7 35858 33734 2
Intel® Xeon Phi™ Coprocessor 7220A	SC7220A	1.2 GHz	34 MB	68	<ul> <li>Image: A second s</li></ul>	205W	Active Thermal	7 35858 33731 1
Intel® Xeon Phi™ Coprocessor 7220P	SC7220P	1.2 GHz	34 MB	68	✓	205W	Passive Thermal	7 35858 33732 8
Intel® Xeon Phi™ Coprocessor 7220AEB (HS)	SC7220AEB	1.2 GHz	34 MB	68	✓	205W	Active Thermal	7 35858 33730 4

#### Intel<sup>®</sup> Xeon<sup>®</sup> Scalable Processors

The Intel® Xeon® Scalable processors are the new foundation for secure, agile, multi-cloud data centers. With uncompromising security and exceptional processing performance for trusted data service delivery, these processors deliver monumental leaps in I/O, memory, storage and network technology to harness actionable insights from our increasingly data-fueled smart and connected world.



#### Intel® Xeon® Scalable Processors for Server and Workstation Systems

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE	CLOCK SPEED	INTEL® UPI <sup>3</sup> SPEED	INTEL® SMART CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL <sup>®</sup> HYPER- THREADING TECHNOLOGY <sup>2</sup>	INTEL <sup>®</sup> TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
Intel® Xeon® Platinum Processor 8180	CD8067303314400 (tray) WX806738180 (box)	2.50 GHz	10.4 GT/s	38.5M	DDR4-2666 MHz	28/56	✓	2.0	205W	TBD
Intel® Xeon® Platinum Processor 8176	CD8067303314700 (tray) WX806738176 (box)	2.10 GHz	10.4 GT/s	38.5M	DDR4-2666 MHz	28/56	✓	2.0	165W	TBD
Intel® Xeon® Platinum Processor 8170	CD8067303327601 (tray) WX806738170 (box)	2.10 GHz	10.4 GT/s	35.75M	DDR4-2666 MHz	26/52	1	2.0	165W	N/A
Intel® Xeon® Platinum Processor 8164	CD8067303408800 (tray) WX806738164 (box)	2.00 GHz	10.4 GT/s	35.75M	DDR4-2666 MHz	26/52	1	2.0	150W	N/A
Intel® Xeon® Platinum Processor 8168	CD8067303327701 (tray)	2.70 GHz	10.4 GT/s	33M	DDR4-2666 MHz	24/48	<ul> <li>Image: A second s</li></ul>	2.0	205W	N/A
Intel® Xeon® Platinum Processor 8160	CD8067303405600 (tray) WX806738160 (box)	2.10 GHz	10.4 GT/s	33M	DDR4-2666 MHz	24/48	✓	2.0	150W	TBD
Intel® Xeon® Platinum Processor 8158	CD8067303406500 (tray)	3.00 GHz	10.4 GT/s	24.75M	DDR4-2666 MHz	12/24	1	2.0	150W	N/A
Intel® Xeon® Platinum Processor 8156	CD8067303368800 (tray)	3.60 GHz	10.4 GT/s	16.5M	DDR4-2666 MHz	4/8	<ul> <li>Image: A second s</li></ul>	2.0	105W	N/A
Intel® Xeon® Platinum Processor 8153	CD8067303408900 (tray)	2.00 GHz	10.4 GT/s	22M	DDR4-2666 MHz	16/32	<ul> <li>Image: A second s</li></ul>	2.0	125W	N/A
Intel® Xeon® Gold Processor 6154	CD8067303592700 (tray)	3.00 GHz	10.4 GT/s	24.75M	DDR4-2666 MHz	18/36	<ul> <li>Image: A set of the set of the</li></ul>	2.0	200W	N/A
Intel® Xeon® Gold Processor 6152	CD8067303406000 (tray) WX806736152 (box)	2.10 GHz	10.4 GT/s	30.25M	DDR4-2666 MHz	22/44	1	2.0	140W	TBD
Intel <sup>®</sup> Xeon <sup>®</sup> Gold Processor 6150	CD8067303328000 (tray)	2.70 GHz	10.4 GT/s	24.75M	DDR4-2666 MHz	18/36	<ul> <li>Image: A second s</li></ul>	2.0	165W	TBD

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE	CLOCK SPEED	INTEL® UPI <sup>3</sup> SPEED	INTEL® SMART CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER- THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
Intel® Xeon® Gold Processor 6148	CD8067303406200 (tray) WX806736148 (box)	2.40 GHz	10.4 GT/s	27.5M	DDR4-2666 MHz	20/40	✓	2.0	150W	TBD
Intel® Xeon® Gold Processor 6142	CD8067303405400 (tray) WX806736142 (box)	2.60 GHz	10.4 GT/s	22M	DDR4-2666 MHz	16/32	✓	2.0	150W	TBD
Intel® Xeon® Gold Processor 6140	CD8067303405200 (tray) WX806736140 (box)	2.30 GHz	10.4 GT/s	24.75M	DDR4-2666 MHz	18/36	$\checkmark$	2.0	140W	TBD
Intel® Xeon® Gold Processor 6138	CD8067303406100 (tray) WX806736138 (box)	2.00 GHz	10.4 GT/s	27.5M	DDR4-2666 MHz	20/40	$\checkmark$	2.0	125W	TBD
Intel® Xeon® Gold Processor 6132	CD8067303592500 (tray)	2.60 GHz	10.4 GT/s	19.25M	DDR4-2666 MHz	14/28	1	2.0	133W	N/A
Intel® Xeon® Gold Processor 6136	CD8067303405800 (tray)	3.00 GHz	10.4 GT/s	24.75M	DDR4-2666 MHz	12/24	<ul> <li>Image: A set of the set of the</li></ul>	2.0	148W	N/A
Intel® Xeon® Gold Processor 6134	CD8067303330302 (tray) WX806736134 (box)	3.20 GHz	10.4 GT/s	24.75M	DDR4-2666 MHz	8/16	✓	2.0	130W	N/A
Intel® Xeon® Gold Processor 6130	CD8067303409000 (tray) WX806736130 (box)	2.10 GHz	10.4 GT/s	22M	DDR4-2666 MHz	16/32	$\checkmark$	2.0	125W	TBD
Intel® Xeon® Gold Processor 6128	CD8067303592600 (tray) WX806736128 (box)	3.40 GHz	10.4 GT/s	19.25M	DDR4-2666 MHz	6/12	$\checkmark$	2.0	115W	N/A
Intel® Xeon® Gold Processor 6126	CD8067303405900 (tray)	2.60 GHz	10.4 GT/s	19.25M	DDR4-2666 MHz	12/24	<ul> <li>Image: A set of the set of the</li></ul>	2.0	125W	N/A
Intel® Xeon® Gold Processor 5122	CD8067303330702 (tray) WX806735122 (box)	3.60 GHz	10.4 GT/s	16.5M	DDR4-2400 MHz	4/8	$\checkmark$	2.0	105W	N/A
Intel® Xeon® Gold Processor 5120	CD8067303535900 (tray) WX806735120 (box)	2.20 GHz	10.4 GT/s	19.25M	DDR4-2400 MHz	14/28	$\checkmark$	2.0	105W	TBD
Intel® Xeon® Gold Processor 5118	CD8067303536100 (tray)	2.30 GHz	10.4 GT/s	16.5M	DDR4-2400 MHz	12/24	<ul> <li>Image: A second s</li></ul>	2.0	105W	N/A
Intel® Xeon® Gold Processor 5115	CD8067303535601 (tray)	2.40 GHz	10.4 GT/s	13.75M	DDR4-2400 MHz	10/20	<ul> <li>Image: A set of the set of the</li></ul>	2.0	85W	N/A
Intel® Xeon® Sliver Processor 4116	CD8067303567200 (tray) WX806734116 (box)	2.10 GHz	9.6 GT/s	16.5M	DDR4-2400 MHz	12/24	✓	2.0	85W	TBD
Intel® Xeon® Sliver Processor 4114	CD8067303561800 (tray) WX806734114 (box)	2.20 GHz	9.6 GT/s	13.75M	DDR4-2400 MHz	10/20	✓	2.0	85W	TBD
Intel® Xeon® Sliver Processor 4112	CD8067303562100 (tray) WX806734112 (box)	2.60 GHz	9.6 GT/s	8.25M	DDR4-2400 MHz	4/8	$\checkmark$	2.0	85W	TBD
Intel® Xeon® Sliver Processor 4110	CD8067303561400 (tray) WX806734110 (box)	2.10 GHz	9.6 GT/s	11M	DDR4-2400 MHz	8/16	✓	2.0	85W	TBD
Intel® Xeon® Sliver Processor 4108	CD8067303561500 (tray) WX806734108 (box)	1.80 GHz	9.6 GT/s	11M	DDR4-2400 MHz	8/16	✓	2.0	85W	TBD
Intel® Xeon® Bronze Processor 3106	CD8067303561900 (tray) WX806733106 (box)	1.70 GHz	9.6 GT/s	11M	DDR4-2133 MHz	8/16	No	No	85W	TBD
Intel® Xeon® Bronze Processor 3104	CD8067303562000 (tray) WX806733104 (box)	1.70 GHz	9.6 GT/s	8.25M	DDR4-2133 MHz	6/12	No	No	85W	TBD

#### Introducing the New Intel Xeon Processor E7-8800/ 4800 v4 Product Family

Unleash exceptional performance for your most demanding data workloads. Fast track your business for real-time analytics and in-memory computing with the secure, reliable, performance workhorse that is the Intel<sup>®</sup> Xeon<sup>®</sup> processor E7-8800/4800 v4 product families. Designed for the most mission-critical workloads and the always-on enterprise, the processor combines large memory capacities with leading performance, reliability, and virtualization capabilities to keep your data center supplying business advantage without interruption.

#### Intel® Xeon® Processor E7-8800 v4 Product Family for Server / Workstation Systems Featuring Up to Eight LGA2011-1 Sockets

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE (TRAY ONLY)	CLOCK SPEED	INTEL <sup>®</sup> QPI <sup>3</sup> SPEED	SHARED L3 CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER- THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER
Intel® Xeon® processor E7-8893 v4	CM8066902065502	3.20 GHz	9.6 GT/s	60M	1866 MHz (DDR4) 1600 MHz (DDR3)	4/8	✓	✓	140 W
Intel® Xeon® processor E7-8891 v4	CM8066902027903	2.80 GHz	9.6 GT/s	60M	1866 MHz (DDR4) 1600 MHz (DDR3)	10/20	✓	✓	165 W
Intel® Xeon® processor E7-8867 v4	CM8066902028403	2.40 GHz	9.6 GT/s	45M	1866 MHz (DDR4) 1600 MHz (DDR3)	18/36	1	✓	165 W
Intel® Xeon® processor E7-8890 v4	CM8066902885200	2.20 GHz	9.6 GT/s	60M	1866 MHz (DDR4) 1600 MHz (DDR3)	24/48	✓	✓	165 W
Intel® Xeon® processor E7-8880 v4	CM8066902325500	2.20 GHz	9.6 GT/s	55M	1866 MHz (DDR4) 1600 MHz (DDR3)	22/44	✓	✓	150 W
Intel® Xeon® processor E7-8870 v4	CM8066902025802	2.10 GHz	9.6 GT/s	50M	1866 MHz (DDR4) 1600 MHz (DDR3)	20/40	✓	✓	140 W
Intel® Xeon® processor E7-8860 v4	CM8066902325800	2.20 GHz	9.6 GT/s	45M	1866 MHz (DDR4) 1600 MHz (DDR3)	18/36	✓	<ul> <li>Image: A second s</li></ul>	140 W

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## **D**

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE (TRAY ONLY)	CLOCK SPEED	INTEL <sup>®</sup> QPI <sup>3</sup> SPEED	SHARED L3 CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL <sup>®</sup> HYPER- THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER
Intel® Xeon® processor E7-4850 v4	CM8066902026904	2.10 GHz	8.0 GT/s	40M	1866 MHz (DDR4) 1600 MHz (DDR3)	16/32	<ul> <li>Image: A second s</li></ul>	<ul> <li>Image: A second s</li></ul>	115 W
Intel® Xeon® processor E7-4830 v4	CM8066902027102	2.00 GHz	8.0 GT/s	35M	1866 MHz (DDR4) 1600 MHz (DDR3)	14/28	<ul> <li>Image: A second s</li></ul>	<b>v</b>	115 W
Intel® Xeon® processor E7-4820 v4	CM8066902027500	2.00 GHz	6.4 GT/s	25M	1866 MHz (DDR4) 1333 MHz (DDR3)	10/20	<ul> <li>Image: A second s</li></ul>		115 W
Intel® Xeon® processor E7-4809 v4	CM8066902027604	2.10 GHz	6.4 GT/s	20M	1866 MHz (DDR4) 1333 MHz (DDR3)	8/16	✓		115 W

## Intel® Xeon® Processor E7-4800 v4 Product Family for Server / Workstation Systems Featuring Up to Four LGA2011-1 Sockets

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# INTEL<sup>®</sup> XEON<sup>®</sup> PROCESSOR E7-8800 / 4800 V3 FAMILY

#### Introducing the New Intel Xeon Processor E7-8800/ 4800 v3 Product Family

In Q2 2015, Intel will launch the next-generation processor family in the Mission Critical and Expandable Segment for server platforms with 2, 4, and 8+ sockets. The Intel<sup>®</sup> Xeon<sup>®</sup> Processor E7-8800/4800 v3 family will offer top-of-the-line performance, scalability, and reliability for enterprise and mission critical workloads, including advanced analytics, databases, virtualization, and scale-up HPC. Based on Haswell<sup>1</sup> microarchitecture on the 22nm process technology, the Intel Xeon Processor E7-8800/4800 v3 family will introduce performance improvements, new RAS capabilities, and new power and thermal management capabilities, as well as support for DDR4 memory.

#### Intel® Xeon® Processor E7-8800 v3 Product Family for Server / Workstation Systems Featuring Up to Eight LGA2011-1 Sockets

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE (TRAY ONLY)	CLOCK SPEED	INTEL® QPI <sup>3</sup> SPEED	SHARED L3 CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER- THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER
Intel® Xeon® processor E7-8893 v3	CM8064501753602	3.20 GHz	9.60 GT/s	45 MB	1866 MHz (DDR4) 1600 MHz (DDR3)	4/8	✓	✓	140 W
Intel® Xeon® processor E7-8891 v3	CM8064501552202	2.80 GHz	9.60 GT/s	45 MB	1866 MHz (DDR4) 1600 MHz (DDR3)	10/20	✓	✓	165 W
Intel® Xeon® processor E7-8890 v3	CM8064501549928	2.50 GHz	9.60 GT/s	45 MB	1866 MHz (DDR4) 1600 MHz (DDR3)	18/36	✓	✓	165 W
Intel® Xeon® processor E7-8880 v3	CM8064501550002	2.30 GHz	9.60 GT/s	45 MB	1866 MHz (DDR4) 1600 MHz (DDR3)	18/36	✓	✓	150 W
Intel® Xeon® processor E7-8880L v3	CM8064501552522	2.00 GHz	9.60 GT/s	45 MB	1866 MHz (DDR4) 1600 MHz (DDR3)	18/36	✓	✓	115 W
Intel® Xeon® processor E7-8870 v3	CM8064501550107	2.10 GHz	9.60 GT/s	45 MB	1866 MHz (DDR4) 1600 MHz (DDR3)	18/36	✓	✓	140 W
Intel® Xeon® processor E7-8867 v3	CM8064502025001	2.50 GHz	9.60 GT/s	45 MB	1866 MHz (DDR4) 1600 MHz (DDR3)	16/32	✓	✓	165 W
Intel® Xeon® processor E7-8860 v3	CM8064502017900	2.20 GHz	9.60 GT/s	40 MB	1866 MHz (DDR4) 1600 MHz (DDR3)	16/32	✓	✓	140 W



PROCESSOR NAME <sup>1</sup>	PRODUCT CODE (TRAY ONLY)	CLOCK SPEED	INTEL <sup>®</sup> QPI <sup>3</sup> SPEED	SHARED L3 CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL <sup>®</sup> HYPER- THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER
Intel® Xeon® processor E7-4850 v3	CM8064501551702	2.20 GHz	8 GT/s	35 MB	1866 MHz (DDR4) 1600 MHz (DDR3)	18/28	<ul> <li>Image: A set of the set of the</li></ul>	✓	115 W
Intel® Xeon® processor E7-4830 v3	CM8064502020101	2.10 GHz	8 GT/s	30 MB	1866 MHz (DDR4) 1600 MHz (DDR3)	12/24	<ul> <li>Image: A second s</li></ul>	✓	115 W
Intel® Xeon® processor E7-4820 v3	CM8064502020200	1.90 GHz	6.40 GT/s	25 MB	1866 MHz (DDR4) 1333 MHz (DDR3)	10/20	<ul> <li>Image: A second s</li></ul>		115 W
Intel® Xeon® processor E7-4809 v3	CM8064501551526	2.00 GHz	6.40 GT/s	20 MB	1866 MHz (DDR4) 1333 MHz (DDR3)	8/16	<ul> <li>Image: A second s</li></ul>		115 W

## Intel® Xeon® Processor E7-4800 v3 Product Family for Server / Workstation Systems Featuring Up to Four LGA2011-1 Sockets

#### Intel® Xeon® Processor E7-8800 / 4800 / 2800 v2 Product Families

Rapidly process and analyze large amounts of data in near real time with the Intel® Xeon® processor E7-8800 / 4800 / 2800 v2 product families.

Keep data local with up to 1.5 TB of memory per socket to manage data-demanding, transaction-intensive workloads. Intel<sup>®</sup> Run Sure Technology<sup>2</sup> helps increase system uptime and data integrity for business-critical solutions. Hardware-embedded security features help better protect data and provide a safer environment.

#### Intel® Xeon® Processor E7-8800 v2 Product Family for Server / Workstation Systems Featuring Eight LGA2011-1 Sockets

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE (TRAY ONLY)	CLOCK SPEED	INTEL <sup>®</sup> QPI <sup>3</sup> SPEED	SHARED L3 CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER- THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
Intel® Xeon® processor E7-8893 v2	CM8063601454907	3.40 GHz	8 GT/s	37.5 MB	1600 MHz	6/12	<ul> <li>Image: A second s</li></ul>	<ul> <li>Image: A second s</li></ul>	155 W	N/A
Intel® Xeon® processor E7-8891 v2	CM8063601377422	3.20 GHz	8 GT/s	37.5 MB	1600 MHz	10/20	$\checkmark$	<ul> <li>Image: A second s</li></ul>	155 W	N/A
Intel® Xeon® processor E7-8890 v2	CM8063601213513	2.80 GHz	8 GT/s	37.5 MB	1600 MHz	15/30	$\checkmark$	✓	155 W	N/A
Intel® Xeon® processor E7-8880 v2	CM8063601271810	2.50 GHz	8 GT/s	37.5 MB	1600 MHz	15/30	<ul> <li>Image: A second s</li></ul>	✓	130 W	N/A
Intel® Xeon® processor E7-8880L v2	CM8063601275812	2.20 GHz	8 GT/s	37.5 MB	1600 MHz	15/30	$\checkmark$	✓	105 W	N/A
Intel® Xeon® processor E7-8870 v2	CM8063601272006	2.30 GHz	8 GT/s	30 MB	1600 MHz	15/30	$\checkmark$	✓	130 W	N/A
Intel® Xeon® processor E7-8857 v2	CM8063601275912	3.00 GHz	8 GT/s	30 MB	1600 MHz	12/12		$\checkmark$	130 W	N/A
Intel® Xeon® processor E7-8850 v2	CM8063601272306	2.30 GHz	7.20 GT/s	24 MB	1333 MHz	12/24	$\checkmark$	<ul> <li>Image: A second s</li></ul>	105 W	N/A



### Intel® Xeon® Processor E7-4800 v2 Product Family for Server / Workstation Systems Featuring Four LGA2011-1 Sockets

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE (TRAY ONLY)	CLOCK SPEED	INTEL <sup>®</sup> QPI <sup>3</sup> SPEED	SHARED L3 CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER- THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
Intel® Xeon® processor E7-4890 v2	CM8063601272412	2.80 GHz	8 GT/s	37.5 MB	1600 MHz	15/30	1	<ul> <li>Image: A second s</li></ul>	155 W	N/A
Intel® Xeon® processor E7-4880 v2	CM8063601272512	2.50 GHz	8 GT/s	37.5 MB	1600 MHz	15/30	1	1	130 W	N/A
Intel® Xeon® processor E7-4870 v2	CM8063601272606	2.30 GHz	8 GT/s	30 MB	1600 MHz	15/30	<ul> <li>Image: A second s</li></ul>	✓	130 W	N/A
Intel® Xeon® processor E7-4860 v2	CM8063601453406	2.60 GHz	8 GT/s	30 MB	1600 MHz	12/24	1	1	130 W	N/A
Intel® Xeon® processor E7-4850 v2	СМ8063601272906	2.30 GHz	7.20 GT/s	24 MB	1333 MHz	12/24	<ul> <li>Image: A set of the set of the</li></ul>	✓	105 W	N/A
Intel® Xeon® processor E7-4830 v2	CM8063601374506	2.20 GHz	7.20 GT/s	20 MB	1333 MHz	10/20	1	1	105 W	N/A
Intel® Xeon® processor E7-4820 v2	CM8063601521707	2.00 GHz	7.20 GT/s	16 MB	1333 MHz	8/16	✓	✓	105 W	N/A
Intel® Xeon® processor E7-4809 v2	CM8063601537106	1.90 GHz	6.40 GT/s	12 MB	1066 MHz	6/12	<ul> <li>Image: A second s</li></ul>		105 W	N/A

#### Intel® Xeon® Processor E7-2800 v2 Product Family for Server / Workstation Systems Featuring Two LGA2011-1 Sockets

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE (TRAY ONLY)	CLOCK SPEED	INTEL <sup>®</sup> QPI <sup>3</sup> SPEED	SHARED L3 CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER- THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
Intel® Xeon® processor E7-2890 v2	CM8063601375306	2.80 GHz	8 GT/s	37.5 MB	1600 MHz	15/30	✓	$\checkmark$	155 W	N/A
Intel® Xeon® processor E7-2880 v2	CM8063601273306	2.50 GHz	8 GT/s	37.5 MB	1600 MHz	15/30	✓	$\checkmark$	130 W	N/A
Intel® Xeon® processor E7-2870 v2	CM8063601273406	2.30 GHz	8 GT/s	30 MB	1600 MHz	15/30	1	<ul> <li>Image: A second s</li></ul>	130 W	N/A
Intel® Xeon® processor E7-2850 v2	CM8063601275706	2.30 GHz	7.20 GT/s	24 MB	1333 MHz	12/24	1	<ul> <li>Image: A second s</li></ul>	105 W	N/A

#### Introducing the New Intel<sup>®</sup> Xeon<sup>®</sup> Processor E5-4600 v4 Product Family

Four-socket servers based on the Intel<sup>®</sup> Xeon<sup>®</sup> processor E5-4600 v4 product family provide high-density, cost-optimized, energy-efficient compute resources to support larger workloads and high virtual machine densities for the data center or cloud.

#### Intel® Xeon® Processor E5-4600 v4 Product Family for Server / Workstation Systems

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE (TRAY ONLY)	CLOCK SPEED	INTEL® QPI <sup>3</sup> SPEED	SHARED L3 CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER- THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER
Intel® Xeon® processor E5-4660 v4	CM8066002062605	2.20 GHz	9.6 GT/s	40 MB	DDR4-2400 MHz	16/32	<ul> <li>Image: A second s</li></ul>	1	120 W
Intel® Xeon® processor E5-4650 v4	CM8066002028621	2.20 GHz	9.6 GT/s	35 MB	DDR4-2400 MHz	14/28	<ul> <li>Image: A second s</li></ul>	✓	105 W
Intel® Xeon® processor E5-4640 v4	CM8066002061701	2.10 GHz	8.0 GT/s	30 MB	DDR4-2133 MHz	12/24	<ul> <li>Image: A second s</li></ul>	1	105 W
Intel® Xeon® processor E5-4620 v4	CM8066002883900	2.10 GHz	8.0 GT/s	25 MB	DDR4-2133 MHz	10/20	$\checkmark$	✓	105 W
Intel® Xeon® processor E5-4610 v4	CM8066002062800	1.80 GHz	6.4 GT/s	25 MB	DDR4-1866 MHz	10/20	<ul> <li>Image: A second s</li></ul>		105 W
Intel® Xeon® processor E5-4669 v4	CM8066002064800	2.20 GHz	9.6 GT/s	55 MB	DDR4-2400 MHz	22/44	$\checkmark$	✓	135 W
Intel® Xeon® processor E5-4667 v4	CM8066002064600	2.20 GHz	9.6 GT/s	45 MB	DDR4-2400 MHz	18 /36	<ul> <li>Image: A second s</li></ul>	1	135 W
Intel® Xeon® processor E5-4655 v4	CM8066002065000	2.50 GHz	9.6 GT/s	30 MB	DDR4-2400 MHz	8/16	<ul> <li>Image: A set of the set of the</li></ul>	✓	135 W
Intel® Xeon® processor E5-4627 v4	CM8066002330800	2.60 GHz	9.6 GT/s	25 MB	DDR4-2400 MHz	10/10		✓	135 W



#### Introducing the New Intel® Xeon® Processor E5-4600 v3 Product Family

Available Q2 2015, the Intel<sup>®</sup> Xeon<sup>®</sup> processor E5-4600 v3 product family is a 4-socket server platform that supports DDR4 memory technology. Target applications and usage models include large memory databases that need a highly scalable number of cores and memory bandwidth per server, and large-scale online transaction processing workloads where high-speed and large capacity memory configurations are required.



#### Intel® Xeon® Processor E5-4600 v3 Product Family for Server / Workstation Systems

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE (TRAY ONLY)	CLOCK SPEED	INTEL® QPI <sup>3</sup> SPEED	SHARED L3 CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL <sup>®</sup> HYPER- THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER
Intel® Xeon® processor E5-4660 v3	CM8064402018700	2.10 GHz	9.60 GT/s	35 MB	2133 MHz	14/28	1	$\checkmark$	120 W
Intel® Xeon® processor E5-4650 v3	CM8064401441008	2.10 GHz	9.60 GT/s	30 MB	2133 MHz	12/24	1	$\checkmark$	105 W
Intel® Xeon® processor E5-4640 v3	CM8064401442601	1.90 GHz	8 GT/s	30 MB	1866 MHz	12/24	✓	$\checkmark$	105 W
Intel® Xeon® processor E5-4620 v3	CM8064401442401	2.00 GHz	8 GT/s	25 MB	1866 MHz	10/20	1	$\checkmark$	105 W
Intel® Xeon® processor E5-4610 v3	CM8064402018800	1.70 GHz	6.40 GT/s	25 MB	1600 MHz	10/20	✓		105 W
Intel® Xeon® processor E5-4669 v3	CM8064401864100	2.10 GHz	9.60 GT/s	45 MB	2133 MHz	18/36	1	$\checkmark$	135 W
Intel® Xeon® processor E5-4667 v3	CM8064401864200	2.00 GHz	9.60 GT/s	40 MB	2133 MHz	16/32	✓	$\checkmark$	135 W
Intel® Xeon® processor E5-4655 v3	CM8064402018600	2.90 GHz	9.60 GT/s	30 MB	2133 MHz	6/12	✓	$\checkmark$	135 W
Intel® Xeon® processor E5-4627 v3	CM8064401544203	2.60 GHz	8 GT/s	25 MB	2133 MHz	10/10		$\checkmark$	135 W

#### Intel<sup>®</sup> Xeon<sup>®</sup> Processor E5-2600 v4 Product Family

The powerful new Intel® Xeon® processor E5-2600 v4 product family offers versatility across diverse workloads. These processors are designed for architecting next-generation data centers running on, software defined infrastructure supercharged for efficiency, performance, and agile services delivery across cloud-native and traditional applications. They support workloads for cloud, high-performance computing, networking, and storage.

#### Intel® Xeon® Processor E5-2600 v4 Product Family for Server and Workstation Systems

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE	CLOCK SPEED	INTEL® QPI <sup>3</sup> SPEED	INTEL® SMART CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER- THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
SERVER SKUS										
Intel® Xeon® Processor E5-2699 v4	CM8066002022506 (tray)	2.20 GHz	9.6 GT/s	55M	DDR4-2400 MHz	22/44	1	2.0	145	N/A
Intel® Xeon® Processor E5-2698 v4	CM8066002024000 (tray)	2.20 GHz	9.6 GT/s	50M	DDR4-2400 MHz	20/40	1	2.0	135	N/A
Intel® Xeon® Processor E5-2697 v4	CM8066002023907 (tray) BX80660E52697V4 (box)	2.30 GHz	9.6 GT/s	45M	DDR4-2400 MHz	18/36	1	2.0	145	735858310574
Intel® Xeon® Processor E5-2697A v4	CM8066002645900 (tray)	2.60 GHz	9.6 GT/s	40M	DDR4-2400 MHz	16/32	1	2.0	145	N/A
Intel® Xeon® Processor E5-2695 v4	CM8066002023801 (tray) BX80660E52695V4 (box)	2.10 GHz	9.6 GT/s	45M	DDR4-2400 MHz	18/36	1	2.0	120W	735858310628
Intel® Xeon® Processor E5-2690 v4	CM8066002030908 (tray) BX80660E52690V4 (box)	2.60 GHz	9.6 GT/s	35M	DDR4-2400 MHz	14/28	1	2.0	135W	735858310857
Intel® Xeon® Processor E5-2683 v4	CM8066002023604 (tray) BX80660E52683V4 (box)	2.10 GHz	9.6 GT/s	40M	DDR4-2400 MHz	16/32	1	2.0	120W	735858310529
Intel® Xeon® Processor E5-2680 v4	CM8066002031501 (tray) BX80660E52680V4 (box)	2.40 GHz	9.6 GT/s	35M	DDR4-2400 MHz	14/28	✓	2.0	120W	735858310802
Intel® Xeon® Processor E5-2660 v4	CM8066002030908 (tray) BX80660E52660V4 (box)	2.00 GHz	9.6 GT/s	35M	DDR4-2400 MHz	14/28	✓	2.0	105W	735858310758
Intel® Xeon® Processor E5-2650 v4	CM8066002031103 (tray) BX80660E52650V4 (box)	2.20 GHz	9.6 GT/s	30M	DDR4-2400 MHz	12/24	1	2.0	105W	735858310703



### Intel® Xeon® Processor E5-2600 v4 Product Family for Server and Workstation Systems

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE	CLOCK SPEED	INTEL <sup>®</sup> QPI <sup>3</sup> SPEED	INTEL® SMART CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER- THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
SERVER SKUS										
Intel® Xeon® Processor E5-2640 v4	CM8066002032701 (tray) BX80660E52640V4 (box)	2.40 GHz	9.6 GT/s	25M	DDR4-2133 MHz	10/20	<ul> <li>Image: A second s</li></ul>	2.0	90W	735858314220
Intel® Xeon® Processor E5-2630v4	CM8066002032301 (tray) BX80660E52630V4 (box)	2.20 GHz	8 GT/s	25M	DDR4-2133 MHz	10/20	<ul> <li>Image: A second s</li></ul>	2.0	85W	735858314121
Intel® Xeon® Processor E5-2620v4	CM8066002032201 (tray) BX80660E52620V4 (box)	2.10 GHz	8 GT/s	20M	DDR4-2133 MHz	8/16	✓	2.0	85W	735858314077
Intel® Xeon® Processor E5-2609v4	CM8066002032901 (tray) BX80660E52609V4 (box)	1.70 GHz	8 GT/s	20M	DDR4-1866 MHz	8/8	<ul> <li>Image: A second s</li></ul>	2.0	85W	735858314022
Intel® Xeon® Processor E5-2603v4	CM8066002032805 (tray) BX80660E52603V4 (box)	1.70 GHz	6.4 GT/s	15M	DDR4-1866 MHz	6	<ul> <li>Image: A second s</li></ul>	2.0	85W	735858313971
Intel® Xeon® Processor E5-2650L v4	CM8066002033006 (tray)	1.70 GHz	9.6 GT/s	35M	DDR4-2400 MHz	14/28	✓	2.0	65W	N/A
Intel® Xeon® Processor E5-2630L v4	CM8066002033202 (tray)	1.80 GHz	8 GT/s	20M	DDR4-2133 MHz	10/20	✓	2.0	55W	N/A
Intel® Xeon® Processor E5-2667 v4	CM8066002041900 (tray)	3.20 GHz	9.6 GT/s	25M	DDR4-2400 MHz	8/16	<ul> <li>Image: A second s</li></ul>	2.0	135W	N/A
Intel® Xeon® Processor E5-2643 v4	CM8066002041500 (tray)	3.40 GHz	9.6 GT/s	20M	DDR4-2400 MHz	6/12	<ul> <li>Image: A set of the set of the</li></ul>	2.0	135W	N/A
Intel® Xeon® Processor E5-2637 v4	CM8066002041100 (tray)	3.50 GHz	9.6 GT/s	15M	DDR4-2400 MHz	4/8	<ul> <li>Image: A second s</li></ul>	2.0	135W	N/A
Intel® Xeon® Processor E5-2623 v4	CM8066002402400 (tray)	2.60 GHz	8 GT/s	10M	DDR4-2133 MHz	4/8	<ul> <li>Image: A second s</li></ul>	2.0	85W	N/A
WORKSTATION SKU										
Intel® Xeon® Processor E5-2687W v4	CM8066002042802 (tray) BX80660E52687V4 (box)	3.0GHz	9.6 GT/s	30M	DDR4-2400 MHz	12/24	✓	2.0	160W	735858310901

### Intel® Xeon® Processor E5-1600 v4 Product Family for Server and Workstation Systems

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE	CLOCK SPEED	INTEL® QPI <sup>3</sup> SPEED	INTEL® SMART CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER- THREADING TECHNOLOGY <sup>2</sup>	INTEL <sup>®</sup> TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
SERVER SKUS										
Intel® Xeon® Processor E5-1680 v4	CM8066002044401 (tray)	3.40 GHz	0 GT/s QPI	20M	DDR4-2400 MHz	8/16	<ul> <li>Image: A second s</li></ul>	2.0	140W	N/A
Intel® Xeon® Processor E5-1660 v4	CM8066002646401 (tray)	3.20 GHz	0 GT/s QPI	20M	DDR4-2400 MHz	8/16	<ul> <li>Image: A second s</li></ul>	2.0	140W	N/A
Intel® Xeon® Processor E5-1650 v4	CM8066002044306 (tray) BX80660E51650V4 (box)	3.60 GHz	0 GT/s QPI	15M	DDR4-2400 MHz	3/12	<ul> <li>Image: A second s</li></ul>	2.0	140W	735858318952
Intel® Xeon® Processor E5-1630 v4	CM8066002395300 (tray)	3.70 GHz	0 GT/s QPI	10M	DDR4-2400 MHz	4/8	<ul> <li>Image: A second s</li></ul>	2.0	140W	N/A
Intel® Xeon® Processor E5-1620 v4	CM8066002044103 (tray) BX80660E51620V4 (box)	3.50 GHz	0 GT/s QPI	10M	DDR4-2400 MHz	4/8	<b>v</b>	2.0	140W	735858314176
WORKSTATION SKU										
Intel® Xeon® Processor E5-1650 v4	BX80660E51650V4 (box)	3.60 GHz	0 GT/s QPI	15M	DDR4-2400 MHz	3/12	✓	2.0	140W	

# INTEL<sup>®</sup> XEON<sup>®</sup> PROCESSOR E5-2600 / 1600 V3 FAMILY

#### Intel<sup>®</sup> Xeon<sup>®</sup> Processor E5-2600 / 1600 v3 Product Family

Intel® Xeon® processor E5-2600 / 1600 v3 product families are at the heart of an agile, efficient data center and help meet your needs for compute, storage, and network. These energy-efficient marvels are designed to help deliver a combination of performance, built-in capabilities, and cost-effectiveness. Whether addressing technical computing challenges, enabling cloud deployments, delivering intelligent storage, or powering design automation and data analytics, enjoy better-than-ever performance. Help better safeguard your data and infrastructure with technology foundational for greater security. Break challenging data management performance bottlenecks with 40 gigabit Intel® Ethernet, DDR4 support, and innovative storage features. Built-in capabilities that measure and monitor make Intel-powered platforms the smart choice for a software-defined world. With the flexibility and versatility of the Intel Xeon processor E5-2600 / 1600 v3 families, you only have to remember one thing: It's what's inside that counts.

INTEL®

#### Intel® Xeon® Processor E5-2600 v3 Product Family for Server and Workstation Systems Featuring Two LGA2011 Sockets

(Thermal Solution Sold Separately)

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE	CLOCK SPEED	INTEL® QPI <sup>3</sup> SPEED	INTEL® SMART CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL <sup>®</sup> HYPER- THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
ADVANCED SKUS										
Intel® Xeon® processor E5-2690 v3	BX80644E52690V3 (box) CM8064401439416 (tray)	2.60 GHz	9.60 GT/s	30 MB	DDR4-2133 MHz	12/24	✓	✓	135 W	7 35858 28363 2
Intel® Xeon® processor E5-2680 v3	BX80644E52680V3 (box) CM8064401439612 (tray)	2.50 GHz	9.60 GT/s	30 MB	DDR4-2133 MHz	12/24	<ul> <li>Image: A second s</li></ul>	✓	120 W	7 35858 28358 8
Intel® Xeon® processor E5-2670 v3	BX80644E52670V3 (box) CM8064401544801 (tray)	2.30 GHz	9.60 GT/s	30 MB	DDR4-2133 MHz	12/24	✓	✓	120 W	7 35858 28368 7
Intel® Xeon® processor E5-2660 v3	BX80644E52660V3 (box) CM8064401446117 (tray)	2.60 GHz	9.60 GT/s	25 MB	DDR4-2133 MHz	10/20	✓	✓	105 W	7 35858 28353 3
Intel® Xeon® processor E5-2650 v3	BX80644E52650V3 (box) CM8064401723701 (tray)	2.30 GHz	9.60 GT/s	25 MB	DDR4-2133 MHz	10/20	✓	✓	105 W	7 35858 28378 6
STANDARD SKUS										
Intel® Xeon® processor E5-2640 v3	BX80644E52640V3 (box) CM8064401830901 (tray)	2.60 GHz	8 GT/s	20 MB	DDR4-1866 MHz	8/16	✓	✓	90 W	7 35858 28522 3
Intel® Xeon® processor E5-2630 v3	BX80644E52630V3 (box) CM8064401831000 (tray)	2.40 GHz	8 GT/s	20 MB	DDR4-1866 MHz	8/16	✓	✓	85 W	7 35858 28533 9
Intel® Xeon® processor E5-2620 v3	BX80644E52620V3 (box) CM8064401831400 (tray)	2.40 GHz	8 GT/s	15 MB	DDR4-1866 MHz	8/16	✓	<ul> <li>Image: A second s</li></ul>	85 W	7 35858 28538 4
BASIC SKUS										
Intel® Xeon® processor E5-2609 v3	BX80644E52609V3 (box) CM8064401850800 (tray)	1.90 GHz	6.40 GT/s	15 MB	DDR4-1600 MHz	6/6			85 W	7 35858 28373 1
Intel® Xeon® processor E5-2603 v3	BX80644E52603V3 (box) CM8064401844200 (tray)	1.60 GHz	6.40 GT/s	15 MB	DDR4-1600 MHz	6/6			85 W	7 35858 28517 9

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PROCESSOR NAME <sup>1</sup>	PRODUCT CODE	CLOCK SPEED	INTEL® QPI <sup>3</sup> SPEED	INTEL® SMART CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER- THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
SEGMENT-OPTIMIZED SKUS										
Intel® Xeon® processor E5-2699 v3	CM8064401739300 (tray only)	2.30 GHz	9.60 GT/s	45 MB	DDR4-2133 MHz	18/36	1	✓	145 W	N/A
Intel® Xeon® processor E5-2698 v3	CM8064401609800 (tray only)	2.30 GHz	9.60 GT/s	40 MB	DDR4-2133 MHz	16/26	✓	✓	135 W	N/A
Intel® Xeon® processor E5-2697 v3	BX80644E52697V3 (box) CM8064401807100 (tray)	2.60 GHz	9.60 GT/s	35 MB	DDR4-2133 MHz	14/28	✓	✓	145 W	7 35858 28264 2
Intel® Xeon® processor E5-2695 v3	BX80644E52695V3 (box) CM8064401438110 (tray)	2.30 GHz	9.60 GT/s	35 MB	DDR4-2133 MHz	14/28	✓	✓	120 W	7 35858 28269 7
Intel® Xeon® processor E5-2683 v3	CM8064401609728 (tray only)	2 GHz	9.60 GT/s	35 MB	DDR4-2133 MHz	14/28	✓	<ul> <li>Image: A second s</li></ul>	120 W	N/A
WORKSTATION SKUS										
Intel® Xeon® processor E5-2687W v3	BX80644E52687V3 (box) CM8064401613502 (tray)	3.10 GHz	9.60 GT/s	25 MB	DDR4-2133 MHz	10/20	✓	$\checkmark$	160 W	7 35858 28348 9
FREQUENCY-OPTIMISED SKUS										
Intel® Xeon® processor E5-2667 v3	CM8064401724301 (tray only)	3.20 GHz	9.60 GT/s	20 MB	DDR4-2133 MHz	8/16	✓	$\checkmark$	135 W	N/A
Intel® Xeon® processor E5-2643 v3	CM8064401724501 (tray only)	3.40 GHz	9.60 GT/s	20 MB	DDR4-2133 MHz	6/12	✓	✓	135 W	N/A
Intel® Xeon® processor E5-2637 v3	CM8064401724101 (tray only)	3.50 GHz	9.60 GT/s	15 MB	DDR4-2133 MHz	4/8	✓	$\checkmark$	135 W	N/A
Intel® Xeon® processor E5-2623 v3	CM8064401832000 (tray only)	3 GHz	8 GT/s	10 MB	DDR4-1866 MHz	4/8	✓	$\checkmark$	105 W	N/A
LOW-POWER SKUS										
Intel® Xeon® processor E5-2650L v3	CM8064401575702 (tray only)	1.80 GHz	9.60 GT/s	30 MB	DDR4-2133 MHz	12/24	✓	✓	65 W	N/A
Intel® Xeon® processor E5-2630L v3	CM8064401832100 (tray only)	1.80 GHz	8 GT/s	20 MB	DDR4-1866 MHz	8/16	✓	✓	55 W	N/A
EMBEDDED SKUS										
Intel® Xeon® processor E5-2658 v3	CM8064401545904 (tray only)	2.20 GHz	9.60 GT/s	30 MB	DDR4-2133 MHz	12/24	<ul> <li>✓</li> </ul>	<ul> <li>Image: A second s</li></ul>	105 W	N/A
Intel® Xeon® processor E5-2648L v3	CM8064401546007 (tray only)	1.80 GHz	9.60 GT/s	30 MB	DDR4-2133 MHz	12/24	<ul> <li>Image: A second s</li></ul>	<ul> <li>Image: A second s</li></ul>	75 W	N/A
Intel® Xeon® processor E5-2628L v3	CM8064401547200 (tray only)	2 GHz	8 GT/s	25 MB	DDR4-1866 MHz	10/20	<ul> <li>Image: A second s</li></ul>	<ul> <li>Image: A second s</li></ul>	75 W	N/A
Intel® Xeon® processor E5-2622 v3	CM8064401576904 (tray only)	2.40 GHz	8 GT/s	20 MB	DDR4-1866 MHz	8/16	✓	<ul> <li>Image: A second s</li></ul>	85 W	N/A
Intel® Xeon® processor E5-2618L v3	CM8064401610301 (tray only)	2.30 GHz	8 GT/s	20 MB	DDR4-1866 MHz	8/16	✓	1	75 W	N/A
Intel® Xeon® processor E5-2608L v3	CM8064401909500 (tray only)	2 GHz	6.40 GT/s	15 MB	DDR4-1866 MHz	6/12	<ul> <li>Image: A second s</li></ul>		52 W	N/A

#### Intel<sup>®</sup> Xeon<sup>®</sup> Processor E5-1600 v3 Product Family for Workstation Systems Featuring One LGA2011 Socket (Thermal Solution Sold Separately)

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE	CLOCK SPEED	INTEL® SMART CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER- THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
ADVANCED SKUS									
Intel® Xeon® processor E5-1680 v3	CM8064401547809 (tray only)	3.20 GHz	20 MB	DDR4-2133 MHz	8/16		<ul> <li>Image: A set of the set of the</li></ul>	140 W	N/A
Intel® Xeon® processor E5-1660 v3	CM8064401909200 (tray only)	3 GHz	20 MB	DDR4-2133 MHz	8/16	$\checkmark$	<ul> <li>Image: A second s</li></ul>	140 W	N/A
Intel® Xeon® processor E5-1650 v3	CM8064401548111 (tray only)	3.50 GHz	15 MB	DDR4-2133 MHz	6/12	<ul> <li>Image: A second s</li></ul>	<ul> <li>Image: A second s</li></ul>	140 W	N/A
Intel® Xeon® processor E5-1630 v3	CM8064401614501 (tray only)	3.70 GHz	10 MB	DDR4-2133 MHz	4/8	<ul> <li>Image: A second s</li></ul>	✓	140 W	N/A
Intel® Xeon® processor E5-1620 v3	CM8064401973600 (tray only)	3.50 GHz	10 MB	DDR4-2133 MHz	4/8	<ul> <li>Image: A second s</li></ul>	<ul> <li>Image: A second s</li></ul>	140 W	N/A

# INTEL<sup>®</sup> XEON<sup>®</sup> PROCESSOR E5-4600 / 2600 / 2400 / 1600 V2 FAMILY

#### Intel<sup>®</sup> Xeon<sup>®</sup> Processor E5-4600 / 2600 / 2400 / 1600 v2 Product Families

The Intel® Xeon® processor E5-2600 / 1600 v2, E5-2400 v2, and E5-4600 v2 product families are at the heart of an agile, efficient data center. Deploy a more trusted private cloud with the technology foundational for greater security. Put the "instantaneous" into data analysis with the performance to quickly process big data. These new Intel Xeon processor families enable greater energy efficiency and power management for a range of enterprise applications.

### Intel® Xeon® Processor E5-4600 v2 Product Family for Server Systems Featuring Four LGA2011 Sockets

(Thermal Solution Sold Separately)

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE	CLOCK SPEED	INTEL <sup>®</sup> QPI <sup>3</sup> SPEED	SHARED L3 CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER- THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
Intel® Xeon® processor E5-4657L v2	CM8063501285605 (tray only)	2.40 GHz	8 GT/s	30 MB	1866 MHz	12/24	1	1	115 W	N/A
Intel® Xeon® processor E5-4650 v2	CM8063501541700 (tray only)	2.40 GHz	8 GT/s	25 MB	1866 MHz	10/20	1	1	95 W	N/A
Intel® Xeon® processor E5-4640 v2	CM8063501285713 (tray only)	2.20 GHz	8 GT/s	20 MB	1866 MHz	10/20	1	1	95 W	N/A
Intel® Xeon® processor E5-4627 v2	CM8063501454002 (tray only)	3.30 GHz	7.20 GT/s	16 MB	1866 MHz	8/8		✓	130 W	N/A
Intel® Xeon® processor E5-4624L v2	CM8063501293407 (tray only)	1.90 GHz	8 GT/s	25 MB	1866 MHz	10/20	1	1	70 W	N/A
Intel® Xeon® processor E5-4620 v2	CM8063501393202 (tray only)	2.60 GHz	7.20 GT/s	20 MB	1600 MHz	8/16	1	✓	95 W	N/A
Intel® Xeon® processor E5-4610 v2	CM8063501521600 (tray only)	2.30 GHz	7.20 GT/s	16 MB	1600 MHz	8/16	1	1	95 W	N/A
Intel® Xeon® processor E5-4607 v2	CM8063501377604 (tray only)	2.60 GHz	6.40 GT/s	12 MB	1333 MHz	6/12	1	✓	95 W	N/A
Intel® Xeon® processor E5-4603 v2	CM8063501453800 (tray only)	2.20 GHz	6.40 GT/s	10 MB	1333 MHz	4/8	✓	✓	95 W	N/A



# **D**

## Intel<sup>®</sup> Xeon<sup>®</sup> Processor E5-2600 v2 Product Family for Server / Workstation Systems Featuring Two LGA2011 Sockets (Thermal Solution Sold Separately)

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE	CLOCK SPEED	INTEL <sup>®</sup> QPI <sup>3</sup> SPEED	INTEL® SMART CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER- THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
Intel® Xeon® processor E5-2697 v2	BX80635E52697V2 (box) CM8063501288843 (tray)	2.70 GHz	8 GT/s	30 MB	1866 MHz	12/24	✓	$\checkmark$	130 W	7 35858 26666 6
Intel® Xeon® processor E5-2695 v2	BX80635E52695V2 (box) CM8063501288706 (tray)	2.40 GHz	8 GT/s	30 MB	1866 MHz	12/24	<b>√</b>	$\checkmark$	115 W	7 35858 26671 0
Intel® Xeon® processor E5-2690 v2	BX80635E52690V2 (box) CM8063501374802 (tray)	3 GHz	8 GT/s	25 MB	1866 MHz	10/20	✓	$\checkmark$	130 W	7 35858 26832 5
Intel® Xeon® processor E5-2687W v2	BX80635E52687V2 (box) CM8063501287203 (tray)	3.10 GHz	8 GT/s	20 MB	1866 MHz	8/16	✓	$\checkmark$	150 W	7 35858 26922 3
Intel® Xeon® processor E5-2680 v2	BX80635E52680V2 (box) CM8063501374901 (tray)	2.80 GHz	8 GT/s	25 MB	1866 MHz	10/20	<ul> <li>Image: A second s</li></ul>	<ul> <li>Image: A second s</li></ul>	130 W	7 35858 26837 0
Intel® Xeon® processor E5-2670 v2	BX80635E52670V2 (box) CM8063501375000 (tray)	2.50 GHz	8 GT/s	20 MB	1866 MHz	10/20	✓	$\checkmark$	115 W	7 35858 26842 4
Intel® Xeon® processor E5-2667 v2	CM8063501287304 (tray only)	3.30 GHz	8 GT/s	25 MB	1866 MHz	8/16	1	✓	130 W	N/A
Intel® Xeon® processor E5-2660 v2	BX80635E52660V2 (box) CM8063501452503 (tray)	2.20 GHz	8 GT/s	25 MB	1866 MHz	10/20	✓	$\checkmark$	95 W	7 35858 26847 9
Intel® Xeon® processor E5-2650 v2	BX80635E52650V2 (box) CM8063501375101 (tray)	2.60 GHz	8 GT/s	20 MB	1866 MHz	8/16	<ul> <li>Image: A second s</li></ul>	$\checkmark$	95 W	7 35858 26852 3
Intel® Xeon® processor E5-2650L v2	CM8063501287602 (tray only)	1.70 GHz	7.20 GT/s	25 MB	1600 MHz	10/20	✓	✓	70 W	N/A
Intel® Xeon® processor E5-2643 v2	CM8063501287403 (tray only)	3.50 GHz	8 GT/s	25 MB	1866 MHz	6/12	1	✓	130 W	N/A
Intel® Xeon® processor E5-2640 v2	BX80635E52640V2 (box) CM8063501288202 (tray)	2 GHz	7.20 GT/s	20 MB	1600 MHz	8/16	✓	$\checkmark$	95 W	7 35858 26857 8
Intel® Xeon® processor E5-2637 v2	CM8063501520800 (tray only)	3.50 GHz	8 GT/s	15 MB	1866 MHz	4/8	<ul> <li>Image: A second s</li></ul>	<ul> <li>Image: A second s</li></ul>	130 W	N/A
Intel® Xeon® processor E5-2630 v2	BX80635E52630V2 (box) CM8063501288100 (tray)	2.60 GHz	7.20 GT/s	15 MB	1600 MHz	6/12	✓	$\checkmark$	80 W	7 35858 26884 4
Intel® Xeon® processor E5-2630L v2	CM8063501376200 (tray only)	2.40 GHz	7.20 GT/s	15 MB	1600 MHz	6/12	1	✓	80 W	N/A
Intel® Xeon® processor E5-2620 v2	BX80635E52620V2 (box) CM8063501288301 (tray)	2.10 GHz	7.20 GT/s	15 MB	1600 MHz	6/12	✓	✓	80 W	735858 26889 9
Intel® Xeon® processor E5-2609 v2	BX80635E52609V2 (box) CM8063501375800 (tray)	2.50 GHz	6.40 GT/s	10 MB	1333 MHz	4/4			80 W	7 35858 26894 3
Intel® Xeon® processor E5-2603 v2	BX80635E52603V2 (box) CM8063501375902 (tray)	1.80 GHz	6.40 GT/s	10 MB	1333 MHz	4/4			80 W	7 35858 26899 8

# Intel® Xeon® Processor E5-2400 v2 Product Family for Server / Workstation Systems Featuring Two LGA2011 Sockets

(Thermal Solution Sold Separately)

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE	CLOCK SPEED	INTEL® QPI <sup>3</sup> SPEED	INTEL® SMART CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER- THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
Intel® Xeon® processor E5-2470 v2	BX80634E52470V2 (box) CM8063401286102 (tray)	2.40 GHz	8 GT/s	25 MB	1600 MHz	10/20	✓	✓	95 W	7 35858 27206 3
Intel® Xeon® processor E5-2450 v2	BX80634E52450V2 (box) CM8063401376400 (tray)	2.50 GHz	8 GT/s	20 MB	1600 MHz	8/16	$\checkmark$	✓	95 W	7 35858 27211 7
Intel® Xeon® processor E5-2450L v2	CM8063401287001 (tray only)	1.70 GHz	8 GT/s	20 MB	1600 MHz	8/16	✓	✓	70 W	N/A
Intel® Xeon® processor E5-2440 v2	BX80634E52440V2 (box) CM8062000862604 (tray)	1.90 GHz	7.20 GT/s	20 MB	1600 MHz	8/16	✓	✓	95 W	7 35858 27201 8
Intel® Xeon® processor E5-2430 v2	BX80634E52430V2 (box) CM8063401286400 (tray)	2.50 GHz	7.20 GT/s	15 MB	1600 MHz	6/12	✓	✓	80 W	7 35858 27196 7
Intel® Xeon® processor E5-2430L v2	CM8063401376704 (tray only)	2.40 GHz	7.20 GT/s	15 MB	1600 MHz	6/12	✓	✓	60 W	N/A
Intel® Xeon® processor E5-2420 v2	BX80634E52420V2 (box) CM8063401286503 (tray)	2.20 GHz	7.20 GT/s	15 MB	1600 MHz	6/12	<ul> <li>Image: A second s</li></ul>	✓	80 W	7 35858 27191 2
Intel® Xeon® processor E5-2407 v2	BX80634E52407V2 (box) CM8063401286600 (tray)	2.40 GHz	7.20 GT/s	10 MB	1333 MHz	4/4			80 W	7 35858 27186 8
Intel® Xeon® processor E5-2403 v2	BX80634E52403V2 (box) CM8063401286702 (tray)	1.80 GHz	7.20 GT/s	10 MB	1333 MHz	4/4			80 W	7 35858 27181 3

## Intel® Xeon® Processor E5-1600 v2 Product Family for Workstation Systems Featuring One LGA2011 Socket

(Thermal Solution Sold Separately)

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE	CLOCK SPEED	CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL <sup>®</sup> HYPER- THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
Intel® Xeon® processor E5-1660 v2	BX80635E51660V2 (box) CM8063501291808 (tray)	3.70 GHz	15 MB	1866 MHz	6/12	✓	✓	130 W	7 35858 26927 8
Intel <sup>®</sup> Xeon <sup>®</sup> processor E5-1650 v2	CM8063501292204 (tray only)	3.50 GHz	12 MB	1600 MHz	6/12	$\checkmark$	<ul> <li>Image: A second s</li></ul>	130 W	N/A
Intel® Xeon® processor E5-1620 v2	CM8063501292405 (tray only)	3.70 GHz	10 MB	1600 MHz	4/8	$\checkmark$	✓	130 W	N/A

INTEL <sup>®</sup> XEON <sup>®</sup> W PROCESSORS
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## Intel<sup>®</sup> Xeon<sup>®</sup> W Processors for Workstation Systems

Intel® Xeon® W processors deliver optimized performance for the needs of mainstream workstation professionals. Hardware-enhanced workload performance, security, and reliability for the increasing demands of professional workstations and ready for professional quality VR design.

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE TRAY	PRODUCT CODE BOX	CLOCK SPEED	CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER- THREADING TECHNOLOGY <sup>2</sup>	INTEL <sup>®</sup> TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
Intel® Xeon® W-2123 Processor	CD8067303533002	BX80673W2123	3.60 GHz	8.25 MB	2400 MHz	4/8	$\checkmark$	<ul> <li>Image: A second s</li></ul>	120W	735858351737
Intel® Xeon® W-2125 Processor	CD8067303533303	N/A	4.00 GHz	8.25 MB	2400 MHz	4/8	$\checkmark$	<ul> <li>Image: A second s</li></ul>	120W	N/A
Intel® Xeon® W-2133 Processor	CD8067303533204	N/A	3.60 GHz	8.25 MB	2400 MHz	6/12	$\checkmark$	<ul> <li>Image: A second s</li></ul>	140W	N/A
Intel® Xeon® W-2135 Processor	CD8067303533403	BX80673W2135	3.70 GHz	8.25 MB	2400 MHz	6/12	$\checkmark$	<ul> <li>Image: A second s</li></ul>	140W	735858355131
Intel® Xeon® W-2145 Processor	CD8067303533601	N/A	3.70 GHz	11 MB	2400 MHz	8/16	$\checkmark$	<ul> <li>Image: A second s</li></ul>	140W	N/A
Intel® Xeon® W-2155 Processor	CD8067303533703	N/A	3.30 GHz	13.75 MB	2400 MHz	10/20	$\checkmark$	<ul> <li>Image: A second s</li></ul>	140W	N/A
Intel® Xeon® W-2195 Processor	CD8067303805901	N/A	2.30 GHz	24.75 MB	2400 MHz	18/36	$\checkmark$	<ul> <li>Image: A second s</li></ul>	140W	N/A



# **D**

# Introducing the Intel® Xeon® Processor E3-1500 v5 product family—the data center graphics powerhouse

Create visually stunning user experiences at low total cost of ownership with the new Intel® Xeon® processor E3-1500 v5 product family featuring Intel® Iris™ Pro graphics P580.



PROCESSOR NAME <sup>1</sup>	PRODUCT CODE	CLOCK SPEED	CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER- THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
Intel® Xeon® Processor E3-1585 v5	JQ8066201935710	3.50 GHz	8 MB	2133 MHz	4/8	$\checkmark$	✓	65W	N/A
Intel® Xeon® Processor E3-1585L v5	JQ8066201935627	3.00 GHz	8 MB	2133 MHz	4/8	✓	1	45W	N/A
Intel® Xeon® Processor E3-1565L v5	JQ8066201935626	2.50 GHz	8 MB	2133 MHz	4/8	$\checkmark$	✓	35W	N/A

# Intel<sup>®</sup> Xeon<sup>®</sup> Processor E3-1200 v6 Product Family for Server and Workstation Systems

The latest Intel<sup>®</sup> Xeon<sup>®</sup> processor E3-1200 v6 product family-based platforms are a smart investment for a wide range of business needs and sizes. In addition to gains in CPU performance, CPU performance per watt, Intel Xeon processor E3-1200 v6 product family-based platforms offer fast access to data, protect the data's integrity, and have proven reliability for a range of business needs.



PROCESSOR NAME <sup>1</sup>	PRODUCT CODE TRAY	PRODUCT CODE BOX	CLOCK SPEED	CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER- THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
Intel® Xeon® Processor E3-1280 v6	CM8067702870647	N/A	3.9 GHz	8 MB	2400 MHz	4/8	✓	$\checkmark$	72 W	N/A
Intel® Xeon® Processor E3-1275 v6	CM8067702870931	BX80677E31275v6	3.8 GHz	8 MB	2400 MHz	4/8	✓	$\checkmark$	73 W	00735858328364
Intel® Xeon® Processor E3-1270 v6	CM8067702870648	BX80677E31270v6	3.8 GHz	8 MB	2400 MHz	4/8	✓	$\checkmark$	72 W	00735858328487
Intel® Xeon® Processor E3-1245 v6	CM8067702870932	BX80677E31245v6	3.7 GHz	8 MB	2400 MHz	4/8	$\checkmark$	$\checkmark$	73 W	00735858328128
Intel® Xeon® Processor E3-1240 v6	CM8067702870649	BX80677E31240v6	3.7 GHz	8 MB	2400 MHz	4/8	$\checkmark$	$\checkmark$	72 W	00735858328180
Intel® Xeon® Processor E3-1230 v6	CM8067702870650	BX80677E31230v6	3.5 GHz	8 MB	2400 MHz	4/8	✓	✓	72 W	00735858328425
Intel® Xeon® Processor E3-1225 v6	CM8067702871024	BX80677E31225v6	3.3 GHz	8 MB	2400 MHz	4/4	✓	$\checkmark$	73 W	00735858328241
Intel® Xeon® Processor E3-1220 v6	CM8067702870812	BX80677E31220v6	3.0 GHz	8 MB	2400 MHz	4/4		<ul> <li>Image: A second s</li></ul>	72 W	00735858328302

# Intel® Xeon® Processor E3-1200 v5 Product Family for Server and Workstation Systems

The latest Intel<sup>®</sup> Xeon<sup>®</sup> processor E3-1200 v5 product family-based platforms are a smart investment for a wide range of business needs and sizes. In addition to gains in CPU performance, CPU performance per watt, and graphics performance, Intel Xeon processor E3-1200 v5 product family-based platforms offer fast access to data, protect the data's integrity, and have proven reliability for a range of business needs.



PROCESSOR NAME <sup>1</sup>	PRODUCT CODE TRAY	PRODUCT CODE BOX	CLOCK SPEED	CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER- THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
Intel® Xeon® Processor E3-1280 v5	CM806620192160		3.7 GHz	8 MB	2133 MHz	4/8	✓	$\checkmark$	80 W	N/A
Intel® Xeon® Processor E3-1270 v5	CM8066201921712	BX80662E31270V5	3.6 GHz	8 MB	2133 MHz	4/8	$\checkmark$	✓	80 W	735858301732
Intel® Xeon® Processor E3-1260L v5	CM8066201921903		2.9 GHz	8 MB	2133 MHz	4/8	$\checkmark$	$\checkmark$	45 W	N/A
Intel® Xeon® Processor E3-1240L v5	CM8066201935808		2.1 GHz	8 MB	2133 MHz	4/8	$\checkmark$	$\checkmark$	25 W	N/A
Intel® Xeon® Processor E3-1240 v5	CM8066201921715	BX80662E31240V5	3.5 GHz	8 MB	2133 MHz	4/8	$\checkmark$	$\checkmark$	80 W	735858301855
Intel® Xeon® Processor E3-1230 v5	CM8066201921713	BX80662E31230V5	3.4 GHz	8 MB	2133 MHz	4/8	<ul> <li>Image: A second s</li></ul>	$\checkmark$	80 W	735858301916
Intel® Xeon® Processor E3-1220 v5	CM8066201921804	BX80662E31220V5	3 GHz	8 MB	2133 MHz	4/4	$\checkmark$	$\checkmark$	80 W	735858302036
Intel® Xeon® Processor E3-1275 v5	CM8066201934909	BX80662E31275V5	3.6 GHz	8 MB	2133 MHz	4/8		$\checkmark$	80 W	735858301671
Intel® Xeon® Processor E3-1245 v5	CM8066201934913	BX80662E31245V5	3.5 GHz	8 MB	2133 MHz	4/8		$\checkmark$	80 W	735858301794
Intel® Xeon® Processor E3-1235L v5	CM8066201935807		2 GHz	8 MB	2133 MHz	4/4		$\checkmark$	25 W	N/A
Intel® Xeon® Processor E3-1225 v5	CM8066201922605	BX80662E31225V5	3.3 GHz	8 MB	2133 MHz	4/4		$\checkmark$	80 W	735858301978

# Intel® Xeon® Processor E3-1200 v4 Product Family for Server and Workstation Systems

The Intel® Xeon® Processor E3-1200 v4 product family supports up to 1.8x the overall graphics performance of the previous-generation<sup>2</sup>, and delivers high-quality visual experiences with up to 1.4x more video transcoding performance per node<sup>4</sup> and up to 4,300 simultaneous HD video streams per rack than the previous generation Intel® Xeon® processor E3-1200 v3 product family.<sup>3</sup>



PROCESSOR NAME <sup>1</sup>	PRODUCT CODE	CLOCK SPEED	CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER- THREADING TECHNOLOGY <sup>2</sup>	INTEL <sup>®</sup> TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
Intel® Xeon® processor E3-1285 v4 <sup>5</sup>	CM8065802482701	3.50 GHz	6 MB	1866 MHz	4/8	$\checkmark$	✓	95 W	N/A
Intel® Xeon® processor E3-1285L v4 <sup>5</sup>	CM8065802482901	3.40 GHz	6 MB	1866 MHz	4/8	$\checkmark$	✓	65 W	N/A
Intel® Xeon® processor E3-1265L v4 <sup>5</sup>	CM8066201937901	2.30 GHz	6 MB	1866 MHz	4/8	$\checkmark$	$\checkmark$	35 W	N/A
Intel® Xeon® processor E3-1278L v4 <sup>6</sup>	FH8065802420303	2.0 GHz	6 MB	1600 MHz	4/8	$\checkmark$	$\checkmark$	47 W	N/A
Intel® Xeon® processor E3-1258L v4 <sup>6, 7</sup>	FH8065802420602	1.8 GHz	6 MB	1600 MHz	4/8	<ul> <li>Image: A second s</li></ul>	✓	47 W	N/A

#### For more information, visit www.intel.com/xeone3

<sup>1</sup> Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. Go to: http://www.intel.com/products/processor\_number/

Up to 1.8x better performance on 3DMark\* 11. Baseline configuration: Intel® Hermosa Beach 2 CRB platform with Intel® Xeon® processor E3-1286v3, 32GB memory (4x 8GB DDR3-1333 UDIMM), 64GB SATA SSD, Intel® Turbo Boost enabled, HT enabled, Red Hat Enterprise Linux\* 6.3, Oracle\* Java\* Hotspot Java 1.7.0\_17. 3DMark\* Score 1524, Source: Internal Intel measurements as of April 2014.

Intel® Xeon® processor workstation platform (Intel® Server Board 51200RP) with one Intel® Xeon® processor E3-1285 v4 (quad- core, 3.5GHz, 6M cache) BIOS 51200RP.8

68.03.01.0002.041520151123, Intel® Hyper-Threading Technology best configuration, 32GB memory (4x8GB DDR3-1600 ECC UDIMM), Intel® Iris<sup>™</sup> Pro graphics P6300 with driver 10.18.10.3980, Intel SDSC2BB300G4, Microsoft Windows 8.1\* 3DMark\* Score 2881, Source: Intel internal testing as of June 2015.

- <sup>3</sup> Up to 4300 streams per rack, or 1.4x vs previous generation. Rack density based on the Supermicro\* SuperServer 5038ML-H24TRF 3U chassis with 12 sleds. Each sled containing 2 Intel<sup>®</sup> Xeon<sup>®</sup> E3-1200 v3 or v4 processors for a total of 24 E3-1200 v3 or v4 processors per 3U chassis. Assuming 2U for top of rack switches, 13 3U chassis could fit in each rack, giving 24\*13=312 sockets in a 42u rack. 312\*10=3120 streams E3-1286L v3; 312\*14=4368 streams on E3-1285L v4
- <sup>4</sup> Up to 1.4x transcoding performance with Intel<sup>®</sup> Xeon<sup>®</sup> E3-1285L v4 when compared with Intel<sup>®</sup> Xeon<sup>®</sup> E3-1286L v3 on Intel Media Server Studio 2015 R3 Essentials Edition. Number of real time threads transcoded simultaneously: 10 on E3-1286L v3, 14 on E3-1285L v4, using 1080p30 20Mbps streams. Baseline configuration: Intel Rainbow Pass SR1200V3RP platform with Intel<sup>®</sup> Xeon<sup>®</sup> E3-1285L v4 (65W, 4C, 3.4Ghz, Intel<sup>®</sup> Iris Pro Graphics P6300) or Intel<sup>®</sup> Xeon<sup>®</sup> Processor E3-1286L v3 (65W, 4C, 3.2Ghz, Intel<sup>®</sup> HD Graphics P4700), 32 GB (4x8GB DDR3-1600MHz UDIMM), 160GB 7200 SATA HOD, Turbo Boost Enabled, HT Enabled, Windows Server 2012 R2, Intel<sup>®</sup> Media Server Studio 2015 R3 Essentials Edition. Multi Transcoding Sample Version 6.0.0.36, Intel graphics driver pGFX 10.18.14.4172, BIOS S1200RP.86B.03.01.002. Source: Intel internal measurements as of May 2015
- <sup>5</sup> Intel<sup>®</sup> Iris<sup>™</sup> Pro Graphics P6300 requires the latest-version Intel<sup>®</sup> Graphics Driver, Intel C226 chipset, and Intel<sup>®</sup> Xeon<sup>®</sup> processor E3-1285 v4, Intel<sup>®</sup> Xeon<sup>®</sup> processor E3-1278L v4, or Intel<sup>®</sup> Xeon<sup>®</sup> processor E3-1265 v4 to enable data centre graphics application optimizations. To learn more about Intel Xeon processors for data centre graphics, visit intel.com/datacentregraphics.
- <sup>6</sup> BGA package
- <sup>7</sup> HD P5700 graphics

# Intel<sup>®</sup> Xeon<sup>®</sup> Processor E3-1200 v3 Product Family

The Intel® Xeon® Processor E3-1200 v3 product family supports a range of business needs. Platforms based on the Intel Xeon processor E3-1200 v3 product family can be used as an entry server for small business applications or as an entry workstation for CAD and financial services. Low-power SKUs are uniquely suited to support scale-out workloads in Microserver platforms, and graphics-enabled SKUs support remote / virtual graphics capabilities and media transcode usages in the data center.

# Intel<sup>®</sup> Xeon<sup>®</sup> Processor E3-1200 v3 Product Family for Server and Workstation Systems Featuring One LGA1150 Socket

(Thermal Solution Included with Box SKUs)

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE	CLOCK SPEED	SINGLECORE TURBO MAX. SPEED	INTEL® SMART CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL <sup>®</sup> GRAPHICS ENGINE	INTEL® HYPER- THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
Intel® Xeon® processor E3-1281 v3	CM8064601575329 (tray only)	3.70 GHz	4.10 GHz	8 MB	1600 MHz	4/8		<ul> <li>Image: A second s</li></ul>	1	80 W	N/A
Intel® Xeon® processor E3-1276 v3	BX80646E31276V3 (box) CM8064601575216 (tray)	3.60 GHz	4 GHz	8 MB	1600 MHz	4/8	Intel HD graphics P4600	✓	<ul> <li>Image: A second s</li></ul>	84 W	7 35858 27876 8
Intel® Xeon® processor E3-1271 v3	BX80646E31271V3 (box) CM8064601575330 (tray)	3.60 GHz	4 GHz	8 MB	1600 MHz	4/8		✓	<ul> <li>Image: A set of the set of the</li></ul>	80 W	7 35858 27900 0
Intel® Xeon® processor E3-1246 v3	BX80646E31246V3 (box) CM8064601575205 (tray)	3.50 GHz	3.90 GHz	8 MB	1600 MHz	4/8	Intel HD graphics P4600	<ul> <li>Image: A second s</li></ul>	<ul> <li>Image: A second s</li></ul>	84 W	7 35858 27882 9
Intel® Xeon® processor E3-1245 v3	BX80646E31245V3 (box) CM8064601466509 (tray)	3.40 GHz	3.80 GHz	8 MB	1600 MHz	4/8	Intel HD graphics P4600	<ul> <li>Image: A second s</li></ul>	<ul> <li>Image: A second s</li></ul>	84 W	7 35858 25940 8
Intel® Xeon® processor E3-1241 v3	BX80646E31241V3 (box) CM8064601575331 (tray)	3.50 GHz	3.90 GHz	8 MB	1600 MHz	4/8		$\checkmark$	<ul> <li>Image: A second s</li></ul>	80 W	7 35858 27906 2
Intel® Xeon® processor E3-1231 v3	BX80646E31231V3 (box) CM8064601575332 (tray)	3.40 GHz	3.80 GHz	8 MB	1600 MHz	4/8		<ul> <li>Image: A second s</li></ul>	<ul> <li>Image: A second s</li></ul>	80 W	7 35858 27912 3
Intel® Xeon® processor E3-1230L v3	CM8064601467601 (tray only)	1.80 GHz	2.80 GHz	8 MB	1600 MHz	2/4		<ul> <li>Image: A second s</li></ul>	<ul> <li>Image: A set of the set of the</li></ul>	25 W	N/A
Intel® Xeon® processor E3-1226 v3	BX80646E31226V3 (box) CM8064601575206 (tray)	3.30 GHz	3.70 GHz	8 MB	1600 MHz	4/4	Intel HD graphics P4600		1	84 W	7 35858 27894 2
Intel® Xeon® processor E3-1225 v3	BX80646E31225V3 (box) CM8064601466507 (tray)	3.20 GHz	3.60 GHz	8 MB	1600 MHz	4/4	Intel HD graphics P4600		<ul> <li>Image: A second s</li></ul>	84 W	7 35858 25946 0
Intel® Xeon® processor E3-1220 v3	BX80646E31220V3 (box) CM8064601467204 (tray)	3.10 GHz	3.50 GHz	8 MB	1600 MHz	4/4			<ul> <li>Image: A second s</li></ul>	80 W	7 35858 25976 7
Intel® Xeon® Processor E3-1220L v3	CM8064601481914 (tray only)	1.10 GHz	1.50 GHz	4 MB	1600 MHz	2/4		<ul> <li>Image: A second s</li></ul>	<ul> <li>Image: A set of the set of the</li></ul>	13 W	N/A



#### For more information, visit www.intel.com/xeon

- <sup>1</sup> Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. Go to: http://www.intel.com/products/processor\_number/
- <sup>2</sup> Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. Check with your system manufacturer or retailer or learn more at www.intel.com
- <sup>3</sup> Intel<sup>®</sup> QPI–Intel<sup>®</sup> QuickPath Interconnect; GT/s–Gigatransfers per second.
- <sup>4</sup> Software and workloads used in performance tests may have been optimized for performance only on Intel<sup>®</sup> microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations, and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more information, go to www.intel.com/performance
- <sup>5</sup> Claim based on calculated theoretical peak double precision performance capability for a single coprocessor. 16 DP FLOPS/clock/core \* 61 cores \* 1.238 GHz = 1.208 TeraFLOPS.
- <sup>6</sup> Results have been estimated based on internal Intel analysis and are provided for informational purposes only. Any difference in system hardware or software design or configuration may affect actual performance.
- <sup>7</sup> Intel<sup>®</sup> Xeon<sup>®</sup> Processor E5-2600 v4 product family (22C, 55M Cache) compared to Intel<sup>®</sup> Xeon<sup>®</sup> Processor E5-2600 v3 product family (18C, 45M Cache).
- <sup>8</sup> E5 v4 up to 47% vs. previous-generation E5 v3 performance based on binomialcpu v3.0\_AVX2 financial services workload results as of 16 March 2016) comparing 1-Node, 2 x Intel<sup>®</sup> Xeon<sup>®</sup> Processor E5-2699 v3 on Grantley-EP (Wellsburg) with 128 GB Total Memory on Red Hat Enterprise Linux\* 6.4 kernel 2.6.32-358, Options per second Score: 106025 vs. 2 x Intel<sup>®</sup> Xeon<sup>®</sup> Processor E5-2699 v4 on Grantley-EP (Wellsburg) with 128 GB Total Memory on Red Hat Enterprise Linux\* 6.4 kernel 2.6.32-358, Options per second Score: 156141 Higher is better. Data Source: Request Number: 1871 E5 v4 up to 27% vs. previous-generation E5 v3 average performance based on key industry-standard benchmarks calculations submitted by OEMs as of 16 March 2016) comparing 2-socket Intel<sup>®</sup> Xeon<sup>®</sup> processor E5 v3 to v4 family. Key industry benchmarks include: SPECint\*\_tate\_base2006, SPECint\*\_base 2006, SPECip\*\_tate\_base2006, SPECip\*\_tate\_base2006, SPECip\*\_tate\_base2006, SPECip\*\_tate\_base2006, SPECip\*\_tate\_base2006, SPECip\*\_tate\_base2007, SPECmpiA\*\_base2007, SPECmpiA\*\_base2007, SPECmpiA\*\_base2007, SPECmpiA\*\_base2007, SPECmpiA\*\_base2012, SPECvirt\_c\*2013, VMmark\* 2.5 performance (matched pairs), TPC-E\*, SPECjEnterprise\*2010, Two-tier SAP SD\* Windows\*/Linux, 1-Node TPC-H\* 1TB, TPCx-B8\* and SPECjbb\*2015 MultiJVM. See http://www.intel.com/performance/datacenter for full configuration details.

All products and dates specified are preliminary based on current expectations and are subject to change without notice. Availability in different channels may vary.

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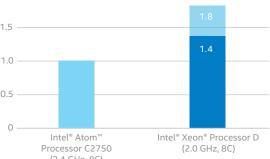
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# **INTEL® XEON PROCESSOR D-1500 PRODUCT FAMILY**

The Intel® Xeon® processor D family offers new options for infrastructure optimization, by bringing the performance and advanced intelligence of Intel® Xeon® processors into a dense, lower-power system-on-a-chip. The Intel Xeon processor D product family is Intel's 3rd generation 64-bit SoC and the first based on Intel Xeon processor technology. It can be deployed for a variety of workloads including dynamic web serving, dedicated web hosting, warm storage, network routing, and more.

# Intel® Xeon® Processor D-1500 Product Family

	INTEL® XEON® PROCESSOR D-1541	INTEL® XEON® PROCESSOR D-1521	Performance Dynamic Web Serving
Thermal Design Point	45W	45W	3.5
Frequency	2.1 GHz	2.4 GHz	U.S 0.6
Max Turbo Frequency	2.7 GHz	2.7 GHz	
Cores	8	4	별표 1.5
Threads	16	8	
Memory Channels	2	2	0
DIMMS per Channel	2	2	Intel <sup>®</sup> Atom™ Processor C2750 Intel <sup>®</sup> Xeon® Processor D
DRAM Interface	ECC (DDR4), DDR3	ECC (DDR4), DDR3	(2.4 GHz, 8C) (2.0 GHz, 8C)
Max. Memory Speed	2133 MT/s	2133 MT/s	Performance per Watt
Max. DRAM Capacity	128 GB	128 GB	Dynamic Web Serving
Integrated I/O	24 PCle 3.0* 8 PCle 2.0* x4 USB 3.0 x4 USB 2.0 x6 SATA 3	24 PCle 3.0* 8 PCle 2.0* x4 USB 3.0 x4 USB 2.0 x6 SATA 3	2.0 1.8 1.5 1.4 1.4 1.4
Network Interface	2 x 1/2.5/10 GbE Intel Ethernet	2 x 1/2.5/10 GbE Intel Ethernet	법 의 1.0
Built-In Intel® Virtualization Technology	VT-x, VT-d, and Cache QoS	VT-x, VT-d, and Cache QoS	
Cache Hierarchy	L1 (32K data, 32K instructions per core) L2 (256K per core) LLC (1.5 MB per core)	L1 (32K data, 32K instructions per core) L2 (256K per core) LLC (1.5 MB per core)	0 Intel® Atom™ Intel® Xeon® Processor D Processor C2750 (2.0 GHz, 8C) (2.4 GHz, 8C)





## Intel® Xeon® Processor D-1500 Product Family

Intel® Xeon® Processor Intelligence in a Low-Power SoC	Up to 3.6x higher performance per node1,3 versus Intel® Atom <sup>™</sup> processor C2750-based solutions. Includes up to 8 cores, two integrated ports of 10 Gigabit Intel® Ethernet, plus support for up to 128 GB of memory. Also includes Intel® 64-bit software support <sup>4</sup> , L1 cache (32K data, 32K instructions per core), L2 cache (256K per core), LLC cache (1.5 MB per core), Intel® Turbo Boost Technology <sup>4</sup> , and Intel® Hyper-Threading Technology. <sup>4</sup>
Industry-Leading 14 nm Process Technology	Enables dense, low power system designs with thermal design points of ~20W to 45W and system level performance per watt of up to 1.8x that of Intel Atom processor C2750-based solutions <sup>2,3</sup> .
Server-Class Reliability, Availability, and Serviceability (RAS)	Provides high system reliability and data integrity with support for error correction code (ECC) memory, single device data correction (SDDC), memory demand and patrol scrubbing, and much more.
Built-In Intel® Virtualization Technology	Delivers near-native compute and I/O performance in virtualized data centers, network infrastructure, and cloud computing, with advanced monitoring of cache and memory bandwidth for better service level and infrastructure management.
Hardware-Enhanced Security and Compliance	Intel Advanced Encryption Standard New Instructions (Intel AES-NI) provide integrated support for fast, low-overhead encryption and Intel® Trusted Execution Technology (Intel® TXT) provides platform verification (through authenticated boot) to enable strong security with reduced performance impact <sup>5</sup> .
Server-Class Manageability	Includes Intel® Node Manager Base for adaptive power management.
Intel® Platform Storage Extensions	Enables fast data movement and high availability through integrated support for non-transparent bridging (NTB), asynchronous DRAM self-refresh (ADR), and Intel® QuickData technology, which provides a direct memory access (DMA) engine within the SoC <sup>6</sup> .

#### For more information, visit www.intel.com/xeon

- <sup>1</sup> Up to 3.6x better performance on Dynamic Web Serving Intel<sup>®</sup> Xeon Processor D-based reference platform with one Xeon Processor D (8C, 2.0GHz, 45W, ES2), Turbo Boost Enabled, Hyper-Threading enabled, 64GB memory (4x16GB DDR4-2133 RDIMM ECC), 2x10GBase-T X552, 3x S3700 SATA SSD, Fedora\* 20 (3.17.8-200.fc20.x86\_64, Nginx\* 1.4.4, Php-fpm\* 15.4.14, memcached\* 1.4.14, Simultaneous users=43844 Supermicro SuperServer\* 5018A-TN4 with one Intel Atom Processor C2750 (8C, 2.4GHz,20W), Turbo Boost Enabled, 32GB memory (4x8GB DDR3-1600 SO-DIMM ECC), 1x10GBase-T X520, 2x S3700 SATA SSD, Ubuntu\* 14.10(3.16.0-23 generic), Nginx\* 1.4.4, Php-fpm\* 15.4.14, memcached\* 1.4.14, Simultaneous users=12896.
- <sup>2</sup> Up to 1.8x (estimated) better performance per watt on Dynamic Web Serving Intel<sup>®</sup> Xeon Processor D-based reference platform with one Xeon Processor D (8C, 2.0GHz, 45W, ES2), Turbo Boost Enabled, Hyper-Threading enabled, 64GB memory (4x16GB DDR4-2133 RDIMM ECC), 2x10GBase-T X552, 3x S3700 SATA SSD, Fedora\* 20 (3.17.8-200,fc20.x86\_64, Nginx\* 1.4.4, Php-fpm\* 15.4.14, memcached\* 1.4.14, Simultaneous users=43844, Estimated wall power based on microserver chassis, power=90W, Perf/W=487.15 users/W Supermicro SuperServer\* 5018A-TN4 with one Intel Atom Processor C2750 (8C, 2.4GHz,20W), Turbo Boost Enabled, 32GB memory (4x8GB DDR3-1600 SO-DIMM ECC), 1x10GBase-T X520, 2x S3700 SATA SSD, Ubuntu\* 14.10 (3.16.0-23 generic), Nginx\* 1.4.4, Php-fpm\* 15.4.14, memcached\* 1.4.14, Simultaneous users=12896. Maximum wall power =46W, Perf/W=280.3 users/W
- <sup>3</sup> Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that products.
- <sup>4</sup> Intel technologies may require enabled hardware, specific software, or services activation. Check with your system manufacturer or retailer.

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- <sup>5</sup> Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at www.intel.com
- <sup>6</sup> Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that products.

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# INTEL® SERVER BOARDS

Intel<sup>®</sup> Product Quick Reference Matrix **Q3 2018** 

THE QUALITY YOU WANT. THE CONFIDENCE YOU NEED.

### **INTEL® SERVER BOARDS**

High quality, unbranded server building blocks featuring Intel's most innovative technologies with Intel worldclass validation, compatibility, certification, warranty and support. Reliable solutions made easy.

# INTEL® SERVER BOARDS

High quality, unbranded server building blocks featuring Intel's most innovative technologies with Intel world-class validation, compatibility, certification, warranty and support. Reliable solutions made easy.

# THE QUALITY YOU WANT WITH THE CONFIDENCE YOU NEED

Intel designs and builds to a high specification, delivering server products with maximum processing power, great flexibility, excellent manageability, and high reliability. Stringent design and manufacturing practices, rigorous validation and testing, and excellent warranty and technical support ensure you receive value that is difficult to find anywhere else.

# Platform connected boards featuring Intel® Xeon® processor Scalable family

#### Intel<sup>®</sup> Server Board S2600WF family:

Power and performance at peak efficiency supporting a 1U and 2U rack mount server form factor.

#### Intel® Server Board S2600BP family:

Density optimized board enabling highest processing and memory performance.

Intel<sup>®</sup> Server Board S2600ST family: Flexible general purpose boards in an SSI EEB form factor.

## Single-socket board featuring bootable Intel® Xeon Phi™ processor family

#### Intel<sup>®</sup> Server Board S7200AP family:

A High Performing Compute Node Featuring a bootable Intel® Xeon Phi<sup>™</sup> Processor. This board family is designed to support the demands of parallel processing while delivering performance, high availability, and serviceability.

# Single-socket board featuring Intel<sup>®</sup> Xeon<sup>®</sup> processor E3 v6 family

#### Refreshed Intel<sup>®</sup> Server Board S1200SP family:

Reliable, cost effective, easy to manage board in a microATX form factor.

# Delivering high performance and increased memory bandwidth

The Intel $^{\circ}$  Xeon $^{\circ}$  processor E5-2600 v4 family delivers versatility across diverse workloads in the data center or cloud.

# **INTEL<sup>®</sup> SERVER BOARDS**

# Intel® Server Board S2600WF Product Family Featuring Intel® Xeon® Scalable Processors

#### FULL FEATURED WITH MAXIMUM FLEXIBILITY FOR EXPANSION

The Intel® Server Board S2600WF product family delivers power and performance at peak efficiency in a 1U and 2U rack mount server form factor that features the energy-efficient dual Intel® Xeon® processor Scalable Family. High memory capacity, networking, storage and I/O flexibility combine with innovative design to provide an exceptional and reliable server for business IT, appliance, data center, cloud and high performance computing applications.

DESCRIPTION	Full-featured Server Board family with maximum flexibility for expansion; available as a 1U or 2U rack-mount form factor featuring the energy efficient Intel® Xeon® processor Scalable Family.
TARGET MARKET	Data Center, Cloud, High Performance Computing (HPC).
ORDER CODE	S2600WFT – Dual 10GbE integrated LAN ports; S2600WF0 – No integrated LAN ports; S2600WFQ – No integrated LAN support; integrated QAT support
FORM FACTOR	Custom (16.7" x 17")
INTEL® SERVER CHASSIS	Intel® Server Chassis R1000WF family; Intel® Server Chassis R2000WF family; Intel® Server System R1000WF family; Intel® Server System R2000WF family
PROCESSOR SUPPORT <sup>1</sup>	Up to 2 Intel® Xeon® Scalable processors 205W Max
CHIPSET	Intel® C612 Chipset
TOTAL PCI SLOTS	3 Riser slots; 1 Intel® RAID Module Connector
PCI SLOT TYPES	2 PCI Express* 3.0 x24 riser super socket (supporting x8, x16, and PCI-X riser card slot options) 1 PCI Express 3.0 mixed x8, x4 slot riser socket (supporting x4, and x8 riser card slot options) 1 PCI Express 3.0 x8 Intel® RAID Module, 1x OCP KR Mezzanine I/O Expansion Module
MEMORY CAPACITY	24 R / LR DIMMs 1333 / 1600 / 1866 / 2133 / 2400/ 2666 MHz ECC DDR4 <sup>2</sup> NVDIMMs 2666 MHz3 Overall Memory size depends on processor used
NVME	Up to 4 OCuLink* (4x PCIe Gen 3 lanes per port)
SATA PORTS	10-port SATA (6.0 Gb/s)
SAS OPTIONS	6 Gb/s or 12 Gb/s SAS via optional SAS module
INTEGRATED LAN	2 integrated Dual Port Intel® Ethernet Controller I350 (1 GbE) or 2 integrated Dual Port Intel® Ethernet Controller X540 (10 GbE)
MANAGEMENT SUPPORT	Intel® Server Management Software Integrated BMC with IPMI 2.0
INTEL® RAID SUPPORT	Intel® VROC supports NVMe andRAID levels 0/1/10/5 Intel® Full-Featured RAID Controllers support NVMe/SAS/SATA, RAID levels 0/1/10/5/50/6/60, optional maintenance-free cache backup, and premium feature keys Intel® Entry-Level RAID Controllers support NVMe/SAS/SATA and RAID levels 0/1/10/5 Intel® Storage Controllers support NVMe/SAS/SATA and run in JBOD mode
MODULE UPGRADES	Intel® OCP Mezzanine Expansion Module; Intel Remote Management Module 4 Lite; Trusted Platform Module; Intel® RAID Module
INTEL® TRANSPARENT SUPPLY CHAIN	Statement of Conformance Platform Certificate
WARRANTY	3 year limited warranty, optional 2 year extended warranty available

DESCRIPTION	Full-featured Server Board family with maximum flexibility for expansion; available as a 1U or 2U rack-mount form factor featuring the energy efficient Intel® Xeon® processor Scalable Family.
TARGET MARKET	Data Center, Cloud, High Performance Computing (HPC).
ORDER CODE	S2600WFT – Dual 10GbE integrated LAN ports; S2600WF0 – No integrated LAN ports; S2600WFQ – No integrated LAN support; integrated QAT support
FORM FACTOR	Custom (16.7" x 17")
INTEL® SERVER CHASSIS	Intel® Server Chassis R1000WF family; Intel® Server Chassis R2000WF family; Intel® Server System R1000WF family; Intel® Server System R2000WF family
PROCESSOR SUPPORT <sup>1</sup>	Up to 2 Intel® Xeon® Scalable processors 205W Max
CHIPSET	Intel® C612 Chipset
TOTAL PCI SLOTS	3 Riser slots; 1 Intel® RAID Module Connector
PCI SLOT TYPES	2 PCI Express* 3.0 x24 riser super socket (supporting x8, x16, and PCI-X riser card slot options) 1 PCI Express 3.0 mixed x8, x4 slot riser socket (supporting x4, and x8 riser card slot options) 1 PCI Express 3.0 x8 Intel® RAID Module, 1x OCP KR Mezzanine I/O Expansion Module
MEMORY CAPACITY	24 R / LR DIMMs 1333 / 1600 / 1866 / 2133 / 2400/ 2666 MHz ECC DDR4 <sup>2</sup> NVDIMMs 2666 MHz3 Overall Memory size depends on processor used
NVME	Up to 4 OCuLink* (4x PCIe Gen 3 lanes per port)
SATA PORTS	10-port SATA (6.0 Gb/s)
SAS OPTIONS	6 Gb/s or 12 Gb/s SAS via optional SAS module
INTEGRATED LAN	2 integrated Dual Port Intel® Ethernet Controller I350 (1 GbE) or 2 integrated Dual Port Intel® Ethernet Controller X540 (10 GbE)
MANAGEMENT SUPPORT	Intel® Server Management Software Integrated BMC with IPMI 2.0
INTEL® RAID SUPPORT	Intel® VROC supports NVMe andRAID levels 0/1/10/5 Intel® Full-Featured RAID Controllers support NVMe/SAS/SATA, RAID levels 0/1/10/5/50/6/60, optional maintenance-free cache backup, and premium feature keys Intel® Entry-Level RAID Controllers support NVMe/SAS/SATA and RAID levels 0/1/10/5 Intel® Storage Controllers support NVMe/SAS/SATA and run in JBOD mode
MODULE UPGRADES	Intel® OCP Mezzanine Expansion Module; Intel Remote Management Module 4 Lite; Trusted Platform Module; Intel® RAID Module
INTEL® TRANSPARENT SUPPLY CHAIN	Statement of Conformance Platform Certificate
	2 year limited warranty, entired 2 year extended warranty available





## Intel® Server Board S2600BP Product Family featuring Intel® Xeon® Scalable processors

#### PERFORMANCE OPTIMIZED FOR PROCESSOR AND MEMORY CAPACITY

The Intel<sup>®</sup> Server Board S2600BP product family is a purpose built, density-optimized server board ideal for use in hyper-converged, data analytics, storage, cloud and high performance computing applications. Designed to support 16 DDR4 DIMM slots per server board at 2 DIMMs per channel and the Intel<sup>®</sup> Xeon<sup>®</sup> processor Scalable Family, the S2600BP family maximizes memory and processor bandwidth to meet demanding compute use requirements.

DESCRIPTION	This density-optimized board family enables high processing and memory performance, making this a compelling offering for compute-intensive workloads.	
TARGET MARKET	High Performance Computing (HPC), Hyper-converged computing, data analytics, cloud infrastructure and storage.	
ORDER CODE	S2600BPB S2600BPS S2600BPQ HNS2600BPB HNS2600BPB24 HNS2600BPS HNS2600BPS24	
FORM FACTOR	6.8" x 19.1"	
INTEL® SERVER CHASSIS	Intel® Server Chassis H2000G Family H2312XXXLR3, H2224XXLP3, H2204XXLRE4	
PROCESSOR SUPPORT, <sup>1</sup> MAX TDP	Up to 2 Intel® Xeon® Scalable processors Support for optional Intel® Omni-path Integrated Fabric Connectors – 1 100Gb/s port per processor Board & Compute Module: 165W Chassis: 140W Chassis: 165W Supported only in enhanced air cooled Intel® Server Chassis H2204XXLRE	
CHIPSET	Intel® C621 chipset Intel® C622 chipset Intel® C628 chipset	
TOTAL PCI SLOTS	4	
PCI SLOT TYPES	1 PCIe* 3.0 x16 (S2600BPQ: Power only) 2 PCIe* 3.0 x24 1 PCIe* 3.0 x16	
MEMORY CAPACITY	16 DIMM Slots (8 per processor) – DDR4 RDIMM/LRDIMM, up to 2666 MT/s, 1.2V	
SATA PORTS	S2600BPB/HNS2600BPB/HNS2600BPB24: Four (4) SATA	
INTEGRATED LAN	S2600BPB/HNS2600BPB/HNS2600BPB24: Dual port integrated Intel® Ethernet Controller x550 (10G BaseT)	
MANAGEMENT SUPPORT	Intel® Server Management Software Integrated BMC with IPMI 2.0	
INTEL® RAID SUPPORT	Select Intel® Bridge Boards enable either pass-through functionality, basic storage functionality, RAID levels 0/1/10, or RAID levels 0/1/10/5	
INTEL® TRANSPARENT SUPPLY CHAIN	Statement of Conformance Platform Certificate	
WARRANTY	3 year limited warranty, optional 2 year extended warranty available	





# Intel® Server Board S2600ST Product Family featuring Intel® Xeon® Scalable processors

#### FLEXIBLE, GENERAL PURPOSE SERVER BOARD IN A STANDARD FORM FACTOR

The Intel® Server Board S2600ST product family delivers robust features and powerful performance in a standard 12" x 13" EEB form factor for flexibility and ease of adoption. Featuring Intel® Xeon® Scalable processors, high PCIe\* lane availability and SAS/SATA/NVMe\* flexibility, it provides a cost-effective option for pedestal, rack mount, or custom systems. The S2600ST is ideal for use in small and medium business, storage, networking, web hosting, and security appliances where feature capacity and price-performance balance is key.

DESCRIPTION	A family of flexible general purpose server boards supporting two Intel® Xeon® Scalable processors up to 205W and 16 DIMMs in a standard SSI EEB form factor board
TARGET MARKET	Enbedded, small- and medium-sized businesses, storage, cloud
ORDER CODE	S2600STB: Dual 10GbE integrated LAN ports S2600STQ: Integrated QAT support, Dual 10GbE integrated LAN ports
FORM FACTOR	SSI EEB (12" x 13")
INTEL® SERVER CHASSIS OR SYSTEM	Intel® Server Chassis P4000G family
PROCESSOR SUPPORT <sup>1</sup>	Up to 2 Intel® Xeon® Scalable processors - 205W Max (board only)
CHIPSET	S2600STB: Intel® C624 Chipset S2600STQ: Intel® C628 Chipset
TOTAL PCI SLOTS	6
PCI SLOT TYPES	CPU0: 1 PCI Express* 3.0 x8, 1 PCI Express 3.0 x16 CPU1: 2 PCI Express 3.0 x8, 2 PCI Express 3.0 x16 (Slots 2 and 5 support PCIe risers - 1 from each CPU)
MEMORY CAPACITY	16 (8 per CPU) 1600/1866/2133/2400 MHz 2DPC, 2666 MHz 1DPC DDR4 <sup>2</sup>
NVME	Up to 4OCuLink* NVMe connectors (4x PCIe Gen3 lanes per port)
SATA PORTS	10-port SATA (6Gb/s); Up to 4 OCuLink* NVMe connectors (4x PCIe Gen3 lanes per)
SAS OPTIONS	Via PCIe adapters
INTEGRATED LAN	2 integrated Dual Port Intel® Ethernet Controller 1350 (1 GbE) or 2 integrated Dual Port Intel® Ethernet Controller X540 (10 GbE)
MANAGEMENT SUPPORT	Intel® Server Management Software Integrated BMC with IPMI 2.0
INTEL® RAID SUPPORT	Intel® VROC supports NVMe and RAID levels 0/1/10/5 Intel® Full-Featured RAID Controllers support NVMe/SAS/SATA, RAID levels 0/1/10/5/50/6/60, optional maintenance-free cache backup and premium feature keys Intel® Entry-Level RAID Controllers support NVMe/SAS/SATA and RAID levels 0/1/10/5 Intel® Storage Controllers support NVMe/SAS/SATA and run in JBOD mode
MODULE UPGRADES	Intel® Remote Management Module 4 Lite Trusted Platform Module
INTEL® TRANSPARENT SUPPLY CHAIN	N/A
WARRANTY	3 year limited warranty, optional 2 year extended warranty available





## Intel® Server Boards Supporting the Intel® Xeon® Processor E5-2600 v4 Family

#### **RELIABLE SOLUTIONS MADE EASY**

Get Intel<sup>®</sup> Server Products built on a foundation of high-quality technology with the Intel<sup>®</sup> Xeon<sup>®</sup> processor E5-2600 v4 family of server solutions. These products are designed to span multiple use-cases and customization requirements while offering performance, power, and cost flexibility to meet customers' requirements and growth needs now and in the future. To address customer security concerns and guard against counterfeiting and malware, select product families feature the Intel<sup>®</sup> Transparent Supply Chain which enables the ability to verify the authenticity of board components and firmware. Intel<sup>®</sup> Server Products products ordered with the new Refresh order codes include the BIOS installed for the Intel<sup>®</sup> Xeon<sup>®</sup> Processor E5-2600 v4<sup>1</sup>. Previous generation products will require an Intel<sup>®</sup> Xeon<sup>®</sup> processor E5-2600 v3 (Haswell) in order to update to an Intel<sup>®</sup> Xeon<sup>®</sup> processor E5-2600 v4 (Broadwell) production BIOS.

PRODUCT NAME	INTEL® SERVER BOARD S2600KP FAMILY	INTEL® SERVER BOARD S2600TP FAMILY
DESCRIPTION	A hot-pluggable, high-density compute module integrated with an Intel <sup>®</sup> Server Board S26000KP model (available with or without integrated FDR InfiniBand*), maximum memory bandwidth, and flexible configuration options for the Intel <sup>®</sup> Server Chassis H2000G family.	A hot-pluggable, high-density compute module integrated with an Intel® Server Board S2600TP model (available with or without integrated FDR InfiniBand*) for higher memory capability and flexible configuration options for the Intel® Server Chassis H2000G family.
TARGET MARKET	High performance computing (HPC) / big data	Hyper-converged infrastructure/ High performance computing (HPC) / big data / storage / cloud
ORDER CODE	HNS2600KPR: 1U node with S2600KPR HNS2600KPR: 1U node with S2600KPFR, onboard FDR InfiniBand* (1 rear InfiniBand 56 Gb/s port) BBS2600KPR: Board BBS2600KPFR: Board with FDR InfiniBand (56 Gb/s) BBS2600KPFR: Board with TPM 1.2	HNS2600TPR: 1U node with S2600TPR HNS2600TPFR: 1U node with S2600TPFR, onboard FDR InfiniBand (1 rear InfiniBand 56 Gb/s port) HNS2600TP24R: 1U node for 24 x 2.5" drive chassis; dual 1G BaseT, dual 10G BaseT HNS2600TP24SR: 1U node for 24 x 2.5" drive chassis; dual 1G BaseT, dual 10G (SFP+) HNS2600TP24STR: 1U node for 24 x 2.5" drive chassis; dual 1G BaseT with TPM2.0 BBS2600TPR: Board BBS2600TPFR: Board with FDR InfiniBand (56 Gb/s)
FORM FACTOR	Custom (6.4" x 17.7")	Custom (6.8" x 18.9")
INTEL® SERVER CHASSIS OR SYSTEM	Intel® Server Chassis H2000G family	Intel® Server Chassis H2000G family
PROCESSOR SUPPORT, <sup>1</sup> MAX TDP	2 Intel® Xeon® processors E5-2600 v4 or v3 product family Boards only: 160 W Compute Modules: 145 W	2 Intel® Xeon® processors E5-2600 v4 or v3 product family Boards only: 160 W Compute Modules: 145 W
CHIPSET	Intel® C612 Chipset	Intel® C612 Chipset
TOTAL PCI SLOTS	3 Riser slots	4 Riser slots
PCI SLOT TYPES	1 PCI Express* 3.0 x16, 2 PCI Express 3.0 x24 super slots or 2 PCI Express 3.0 x16, 1 PCI Express 3.0 x24 super slot	2 PCI Express* 3.0 x16, 2 PCI Express 3.0 x24 super slots or 3 PCI Express 3.0 x16, 1 PCI Express 3.0 x24 super slot
MEMORY CAPACITY	8 LR / R/ DIMMs 1333 /1600 / 1866 / 2133 / 2400 MHz ECC DDR42 NVDIMMs 2133MHz <sup>3</sup> 1024 GB max per system	16 LR / R/ DIMMs 1333 / 1600 / 1866 / 2133 / 2400 MHz ECC DDR42 NVDIMMs 2133MHz <sup>3</sup> 2048 GB max per system
SATA PORTS	10-port SATA (6 Gb/s)	HNS2600TP24R/HNS2600TP24SR: 6-port 6 Gb/s SATA; 10-port SATA (6 Gb/s)
SAS OPTIONS	12 Gb/s SAS via optional 12 GB SAS bridge board and Intel® RAID module / adapter	12 Gb/s SAS via optional 12 GB SAS bridge board and Intel® RAID module / adapter HNS2600TP24R/HNS2600TP24SR: 12 GBb/s SAS via integrated 12 GB SAS bridge board
INTEGRATED LAN	2 integrated Dual Port Intel® Ethernet Controller I350 (1 GbE); 1 dedicated integrated management port	2 integrated Dual Port Intel® Ethernet Controller I350 (1 GbE); 1 dedicated integrated management port
MANAGEMENT SUPPORT	Intel® Server Management Software Integrated BMC with IPMI 2.0	Intel® Server Management Software Integrated BMC with IPMI 2.0
INTEL® RAID SUPPORT	Intel® Rapid Storage Technology 4.0 (0, 1, 5, and 10) Intel® Embedded Server RAID Technology 2 (ESRT2) RAID levels 0, 1, and 10 Up to SW Raid 5 with optional upgrade key	Intel® Rapid Storage Technology 4.0 (0, 1, 5, and 10) Intel® Embedded Server RAID Technology 2 (ESRT2) RAID levels 0, 1, and 10 Up to SW Raid 5 with optional upgrade key
MODULE UPGRADES	Intel® I/O Expansion Module Intel® Remote Management Module 4 Single port 100Gb/s Intel® Omni-Path Fabric	Intel® I/O Expansion Module Intel® Remote Management Module 4 Single port 100Gb/s Intel® Omni-Path Fabric
INTEL® TRANSPARENT SUPPLY CHAIN	Statement of Conformance; Platform Certificate	Statement of Conformance
WARRANTY	3 year limited warranty, optional 2 year extended warranty available	3 year limited warranty, optional 2 year extended warranty available

<sup>1</sup> Intel always recommends updating the BIOS/BM/FRUSDR prior to server deployment <sup>2</sup> Maximum memory speed supported depends on the processor used. <sup>3</sup> NVDIMM support refer to Intel<sup>®</sup> Server Configurator Tool (https://serverconfigurator.intel.com).







PRODUCT NAME	INTEL® SERVER BOARD S2600CW FAMILY	INTEL® SERVER BOARD S2600WT FAMILY
DESCRIPTION	A family of flexible general purpose server boards supporting two Intel® Xeon® processor E5- 2600 v4 family up to 145 W and 16 DIMMs in a standard SSI EEB form factor. Board variations available for two 1 Gb or 10 Gb Ethernet ports, as well as options for an 8-port SAS controller.	A rack-optimized server board supporting two Intel® Xeon® processor E5-2600 v4 family up to 145 W, 24 DIMMs, and two 1 Gb or 10 Gb Ethernet port options available.
TARGET MARKET	Embedded / small- and medium-sized businesses / storage / cloud	Enterprise and medium business IT / big data / storage / cloud
ORDER CODE	DBS2600CW2R: Dual 1 Gb Ethernet ports DBS2600CWTR: Dual 10 Gb Ethernet ports DBS2600CW2SR: Dual 1 Gb Ethernet ports, 8-port LSI* 3008 SAS controller DBS2600CWTSR: Dual 10 Gb Ethernet ports, 8-port LSI 3008 SAS controller	S2600WT2R: 1 Gb Ethernet ports S2600WTTR: 10 Gb Ethernet ports S2600WTTS1R: 10 Gb Ethernet ports with TPM2.0
FORM FACTOR	SSI EEB (12" x 13")	Custom (16.7" x 17")
INTEL® SERVER CHASSIS OR SYSTEM	Intel® Server Chassis P4000G family	Intel <sup>®</sup> Server Chassis R1000WT family Intel <sup>®</sup> Server Chassis R2000WT family Intel <sup>®</sup> Server System R1000WT family Intel <sup>®</sup> Server System R2000WT family
PROCESSOR SUPPORT, <sup>1</sup> MAX TDP	2 Intel Xeon processors E5-2600 v4 or v3 product family; 145 W Max	2 Intel Xeon processors E5-2600 v4 or v3 product family; 145 W Max
CHIPSET	Intel® C612 Chipset	Intel® C612 Chipset
TOTAL PCI SLOTS	6	3 Riser slots; 1 Intel® I/O Expansion Module Connector; 1 Intel® RAID Module Connector
PCI SLOT TYPES	1 PCI Express* 3.0 x8, 4 PCI Express 3.0 x16, 1 PCI Express 2.0 x4 2 PCI Express 3.0 x8, 3 PCI Express 3.0 x16, 1 PCI Express 2.0 x4 (models with LSI* 3008)	2 PCI Express* 3.0 x24 riser super socket (supporting x8, x16, and PCI-X riser card slot options) 1 PCI Express 3.0 mixed x8, x4 slot riser socket (supporting x4, and x8 riser card slot options) 1 PCI Express 3.0 x8 Intel® I/O Expansion Module, 1 PCI Express 3.0 x8 Intel® RAID Module
MEMORY CAPACITY	16 R / LR DIMMs 1333/ 1600 / 1866 / 2133 / 2400 MHz ECC DDR4 <sup>2</sup> NVDIMMs 2133MHz <sup>3</sup> 1 TB max using 64 GB DIMMs 2 TB max using 128 GB DIMMs	24 R / LR DIMMs 1333/ 1600 / 1866 / 2133 / 2400 MHz ECC DDR4 <sup>2</sup> NVDIMMs 2133MHz <sup>3</sup> 1.50 TB max using 64 GB DIMMs
SATA PORTS	10-port SATA (6.0 Gb/s)	10-port SATA (6.0 Gb/s)
SAS OPTIONS	Models with LSI* 3008: 8 Integrated SAS ports, 12G SAS with battery-less hardware RAID	6 Gb/s or 12 Gb/s SAS via optional SAS module
INTEGRATED LAN	2 integrated Dual Port Intel® Ethernet Controller I350 (1 GbE) or 2 integrated Dual Port Intel® Ethernet Controller X540 (10 GbE)	2 integrated Dual Port Intel® Ethernet Controller I350 (1 GbE) or 2 integrated Dual Port Intel® Ethernet Controller X540 (10 GbE)
MANAGEMENT SUPPORT	Intel® Server Management Software; Integrated BMC with IPMI 2.0	Intel® Server Management Software; Integrated BMC with IPMI 2.0
INTEL® RAID SUPPORT	PCH SATA 6G with Intel® Embedded Server RAID Technology 2 (ESRT2) RAID levels 0, 1, and 10 optional RAID 5 supported through the ESRT2 RAID 5 upgrade key Integrated RAID levels 0, 1, 1E, and 10; optional RAID level 5 upgrade available	Intel® Rapid Storage Technology <sup>2</sup> 4.0 (SW RAID levels 0, 1, 5, and 10) Intel® Embedded Server RAID Technology 2 (SW Raid levels 0, 1, and 10; optional RAID level 5 upgrade available)
MODULE UPGRADES	Intel® Integrated RAID Module (ROC or IOC) Intel® Remote Management Module 4 Lite Trusted Platform Module	Intel® I/O Expansion Module Intel Integrated RAID Module (ROC or IOC) Intel Remote Management Module 4 Lite Trusted Platform Module
INTEL® TRANSPARENT SUPPLY CHAIN	N/A	Statement of Conformance; Platform Certificate
WARRANTY	3 year limited warranty, optional 2 year extended warranty available	3 year limited warranty, optional 2 year extended warranty available

<sup>2</sup> Maximum memory speed supported depends on the processor used. <sup>3</sup> NVDIMM support refer to Intel® Server Configurator Tool (https://serverconfigurator.intel.com).

# Intel<sup>®</sup> Server Board S7200AP family supporting the Intel<sup>®</sup> Xeon Phi<sup>™</sup> Processor (Knights Landing and Knights Mill)

#### **RELIABLE SOLUTIONS MADE EASY**

Get Intel<sup>®</sup> Server Products built on a foundation of high-quality technology with the Intel<sup>®</sup> Xeon<sup>®</sup> Phi<sup>™</sup> processor family of server solutions for customers. The latest server products are designed to span multiple use-cases and customization requirements while offering performance, power, and cost flexibility to meet customers' requirements and growth needs now and in the future.

#### PRODUCT NAME INTEL® SERVER BOARD S7200AP FAMILY

DESCRIPTION	A hot-pluggable, efficient, high-density compute module integrated with the Intel <sup>®</sup> Server Board S72000AP and optimized memory performance. Customizable as a 2U, four node system with serviceability and high availablility, hot-swappable compute modules, 2.5" or 3.5" drive bays and redundant power supplies.		
TARGET MARKET	High performance computing (HPC)		
ORDER CODE	S7200APR HNS7200APR HNS7200APRL	S7200AP S7200APL HNS7200AP HSN7200APL	
FORM FACTOR	Custom (6	5.8" x 14.2")	
INTEL® SERVER CHASSIS	Intel® Server Chassis H2204XXLRE	Intel® Server Chassis H2216XXLR2 Intel® Server Chassis H2312XXLR2	
PROCESSOR SUPPORT, <sup>1</sup> MAX TDP	Intel® Xeon Phi™ processor 320 W	Intel® Xeon Phi <sup>™</sup> processor 230 W	
CHIPSET	Intel <sup>®</sup> C612 Chipset		
TOTAL PCI SLOTS	2 Riser slots		
PCI SLOT TYPES	PCI Express* 3.0 x16 PCI Express 3.0 x20 (x16 or x4)		
MEMORY CAPACITY	6 RDIMM/LRDIMM; 2400MHz DDR4; Max memory 385 GB using 64 GB DIMMs		
SATA PORTS	Integrated 10-port SATA (6 Gb/s)		
SAS OPTIONS	12 Gb/s SAS via optional PCIe* card		
INTEGRATED LAN	Dual Intel® Ethernet Controller i210 (1 GbE)		
MANAGEMENT SUPPORT	Intel <sup>®</sup> Server Management Software Integrated BMC with IPMI 2.0		
MODULE UPGRADES	Intel® Remote Management Module 4Lite Intel® Omni-Path Port Upgrade Kit (Two Port) Intel® Omni-Path low provide PCIe* adapter		
INTEL® TRANSPARENT SUPPLY CHAIN	Statement of Conformance Platform Certificate		
WARRANTY	3 year limited warranty, optional 2 year extended warranty available		





# Intel<sup>®</sup> Server Boards Supporting the Intel<sup>®</sup> Xeon<sup>®</sup> Processor E3-1200 v6 Family

#### RELIABLE SOLUTIONS MADE EASY

Get Intel® Server Products built on a foundation of high-quality technology in the sixth generation Intel® Xeon® processor E3-1200 v6 family of server solutions. The latest server products are designed to span multiple use-cases and customization requirements while offering performance, reliability, security, and cost flexibility to meet customers' requirements and growth needs now and in the future.

DESCRIPTION	A flexible and feature-rich entry-level server board family in a uATX form factor is available as a rack-mount system or easily integrated into a general purpose Intel <sup>®</sup> Server Chassis or 3rd party chassis		
TARGET MARKET	Entry level server for small and medium businesses (SMBs), embedded, and storage and security appliance applications.		
ORDER CODE	<b>S1200SPLR:</b> with SAS module support and eight SATA Ports	S1200SPSR	S1200SPOR: with Intel <sup>®</sup> I/O Expansion Module support
FORM FACTOR	microATX (9.6" x 9.6")		
INTEL® SERVER CHASSIS	Intel® Server Chassis P40000SFDR, P4304XXSFCN, P4304XXSHCN Intel® Server System R1000SPO family		
PROCESSOR SUPPORT, <sup>1</sup> MAX TDP	Single In	tel® Xeon® processors E3-1200 v6 product family; up to 8	OW TDP
CHIPSET	Intel® C236 Chipset	Intel® C232 Chipset	Intel <sup>®</sup> C236 Chipset
TOTAL PCI SLOTS	3	-	3; 1 Riser slot
PCI SLOT TYPES	1 PCI Express* 3.0 x8 with x16 connection, 1 PCIe Gen3 x4 with x8 connection, 1 PCIe 3.0 x8 with x8 connection		
MEMORY CAPACITY		4 UDIMMs up to 2400 MHz ECC DDR4; 64 GB max	
SATA PORTS	8-port 6 Gb/s	6-port 6 Gb/s SATA	8-port 6 Gb/s
SAS OPTIONS	Intel® Integrated RAID Module	-	Intel® Integrated RAID Module
INTEGRATED LAN	Dual port integrated Intel <sup>®</sup> Ethernet Controller i210 (1 GbE)		)
MANAGEMENT SUPPORT	Intel <sup>®</sup> Server Management Software Integrated BMC with IPMI 2.0		
INTEL® RAID SUPPORT	Intel® Embedded Server RAID Technology 2 (ESRT2) RAID levels 0, 1, and 10 Intel® Rapid Storage Technology² 4.0 (0, 1, 5, and 10)		
MODULE UPGRADES	Intel® Integrated RAID Module 22x42mm M.2 module Intel® Remote Management Module 4 LITE2 Trusted Platform Module 1.2	-	Intel® I/O Expansion Module Intel® Integrated RAID Module 22x42mm M.2 module Intel® Remote Management Module 4 Lite2 Trusted Platform Module 1.2
WARRANTY	3 year limited warranty, optional 2 year extended warranty available		





The Intel<sup>®</sup> Server Product Marketing Library is designed as a one-stop-shop for all Intel<sup>®</sup> Server Product marketing assets and sales tools. Visit https://www.intelserveredge.com/

For more information, visit www.intel.com/go/serverboards or ark.intel.com

<sup>1</sup> Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. See www.intel.com/products/processor\_number for details. Refer to http://support.intel.com/ support/motherboards/server for up-to-date details on processors supported by each server board.

<sup>2</sup> Requires a 4th generation Intel® Core<sup>™</sup> processor, enabled chipset, and Intel® Rapid Storage Technology (Intel® RST) software.

<sup>3</sup> On interposer (need accessory kit AXXRMM4IOM or AXXRMM4IOMW).

<sup>4</sup> The Intel<sup>®</sup> Server Chassis H2204XXLRE is offered as part of the Intel<sup>®</sup> Data Center Blocks for HPC only. This product can not be ordered separately.

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All products and dates specified are preliminary based on current expectations and are subject to change without notice. Availability in different channels may vary. For more information go to http://www.intel.com/performance.

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# INTEL® SERVER SYSTEMS

Intel<sup>®</sup> Product Quick Reference Matrix **Q3 2018** 

# PERFORMANCE. Reliability. Security.

### **INTEL® SERVER SYSTEMS**

Based on Intel's most innovative technologies with Intel world-class validation, compatibility, certification, warranty and support. Reliable solutions made easy.

# FEATURE-RICH INTEL® SERVER SYSTEMS FOR PERFORMANCE, RELIABILITY AND SECURITY

Customers want data center products designed for outstanding performance and reliability that will address their unique needs. With Intel® Server Systems featuring the latest Intel® Xeon® processor families you can count on trusted performance, quality and reliability to help solve the most complex business challenges.

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**INTEL<sup>®</sup> SERVER SYSTEMS** 

#### INTEL® SERVER SYSTEMS R1000WF AND R2000WF BASED ON THE INTEL® SERVER BOARD S2600WF FAMILY — RELIABLE SOLUTIONS MADE EASY

Intel® Server S2600WF Product family delivers power and performance at peak efficiency in a 1U and 2U rack mount server form factor that features the energy- efficient dual Intel® Xeon® processor Scalable Family. High memory capacity, networking, storage and I/O flexibility combine with innovative design to provide an exceptional and reliable server for business IT, appliance, data center, cloud and high performance computing applications.

WARRANTY	3 year limited warranty, optional 2 year extended warranty available
INTEL® TRANSPARENT SUPPLY CHAIN	Statement of Conformance Platform Certificate
MODULE UPGRADES	Intel® OCP Mezzanine Expansion Module Intel® Integrated RAID Module (ROC or IOC) Intel® Remote Management Module 4 Lite Trusted Platform Module
MEMORY CAPACITY	24 LR / R / DIMMs 1333 / 1600 / 1866 / 2133 / 2400 / 2666 MHz ECC DDR4² NVDIMMs 2666 MHz³
PCI SLOT TYPES	<ul> <li>1U: 2 x PCI Express* 3.0 x16 (FHHL), 1 x PCI Express 3.0 x8 Intel® I/O Expansion Module, 1 x PCI Express 3.0 x8 Intel® Integrated RAID Module</li> <li>2U: 3 Riser Options: Total of up to 7 PCI Express 3.0 x8 or 2 PCI Express 3.0 x16, 3 PCI Express 3.0 x8, 1 x PCI Express 3.0 x8</li> <li>Intel I/O Expansion Module, 1 x PCI Express 3.0 x8 Intel Integrated RAID Module</li> <li>Riser 1 and 2 Options: 1) 3 x PCI Express 3.0 x8 (2 FHFL, 1 FHHL)</li> <li>Riser 1 and 2 Options: 2) 1 x PCI Express 3.0 x16 FHFL, 1 x PCI Express 3.0 x8 FHHL</li> <li>Riser 3: 1 x PCI Express 3.0 x8 LP, 1 x PCI Express 3.0 x4 LP via 3rd riser</li> </ul>
TOTAL PCI SLOTS	3 Riser slots 1 Intel® RAID Module Connector
PROCESSOR SUPPORT, <sup>1</sup> MAX TDP	<b>2 x Intel Xeon processors Scalable Family</b> NOTE: Max CPU TDP supported up to 165 W with configuration limitations, see Technical Product Specifications
SERVER BOARD INCLUDED	S2600WFT: Onboard 10 Gb Ethernet S2600WF0: No LOM
TARGET MARKET	Enterprise and medium business IT / big data / storage / cloud
DESCRIPTION	Manage highly demanding application workloads with 1U and 2U rack systems based on the premier Intel® Server Board W2600WF family featuring power-efficient spread core design, incredible 24 DDR4 DIMMS, and support for dual Intel® Xeon® processors Scalable Family.









# Intel® Server Systems R1000WF Based on the Intel® Server Board S2600WF Family

#### **1U RACK SYSTEMS**

Dimensions (H x W x D)	1.72" x 17.25" x 28"		
System Cooling	Redundant cooling fans		
Power Supply	1100 W AC Redundant PSU (Platinum Efficiency) Optional 750 W DC 48 V Redundant PSU (Gold Effici NOTE: Second power supply sold separately	ency)	
Thermal Solution	Included		
PCI Riser Slots	2 x PCI Express* 3.0 x16 (FHHL) 1 x PCI Express 3.0 x8 Intel® Integrated RAID Module		
Additional Expansion	1x OCP Mezzanine Expansion Module		
Other Components	Intel® System Management Software Integrated BMC with IPMI 2.0 Optional optical disk drive		
Warranty	3 year limited warranty, optional 2 year extended warranty available		
SPECIFIC SKUs		SPECIFIC SKUs	
R1208WFTYS	Intel® Server Board S2600WFT Supports up to 165W TDP processors Single 1100W AC 80 PLUS Platinum PSU Dual 10GbE ports Support for 8x 2.5" hot-swap drives 24 DDR4 DIMMs	R1304WF0YS	Intel® Server Board S2600WF0 Supports up to 165W TDP processors Single 1100W AC 80 PLUS Platinum PSU Support for 4x 3.5" hot-swap drives 24 DDR4 DIMMs No LOM
		R1304WFTYS	Intel® Server Board S2600WFT Supports up to 165W TDP processors Single 1100W AC 80 PLUS Platinum PSU Dual 10GbE ports Support for 4x 3.5" hot-swap drives 24 DDR4 DIMMs

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# Intel® Server Systems R2000WF Based on the Intel® Server Board S2600WF Family

#### **2U RACK SYSTEMS**

Dimensions (H x W x D)	3.44" x 17.25" x 28"
System Cooling	Redundant and hot-swap cooling fans
Power Supply	1300 W AC redundant-capable PSU (Titanium Efficiency) Optional 1100 W AC redundant-capable PSU (Platinum Efficiency) Optional 750 W DC 48 V Redundant PSU (Gold Efficiency) NOTE: Second power supply sold separately
Thermal Solution	Included
PCI Riser Slots	3 Riser Options: Total of up to 6 PCI Express* 3.0 x8 or 2 PCI Express 3.0 x16, 2 PCI Express 3.0 x8,1 x PCI Express 3.0 x8 Intel® Integrated RAID Module Option 1) 3 x PCI Express 3.0 x8 (2 FHFL, 1 FHHL) Option 2) 1 x PCI Express 3.0 x16 FHFL, 1 x PCI Express 3.0 x8 FHHL Additional: 1 x PCI Express 3.0 x8 LP, 1 x PCI Express 3.0 x4 LP via 3rd riser
Additional Expansion	1x Intel® OCP Mezzanine Expansion Module
Other Components	Intel® System Management Software Integrated BMC with IPMI 2.0 Optional optical disk drive
Warranty	3 year limited warranty, optional 2 year extended warranty available



#### SPECIFIC SKUs

R2208WFTZS	Intel® Server Board S2600WFT		Intel® Server Board S2600WFT
	Supports up to 165W TDP processors		Supports up to 140W TDP processors
	Integrated Dual 10GbE ports	R2224WFTZS	Single 1300W AC 80 PLUS Titanium PSU
	Single 1300W AC 80 PLUS Titanium PSU		Support for 24 x 2.5" hot-swap
	Support for 8x 2.5" SAS/SATA/NVMe		SAS/SATA/NVME drives
	hot-swap drives		Integrated Dual 10GbE ports
	24 DDR4 DIMMs		
R2208WF0ZS	Intel® Server Board S2600WF0		
	Supports up to 165W TDP processors		
	Single 1300W AC 80 PLUS Titanium PSU		
	Support for 8x 2.5" SAS/SATA/NVMe hot-swap drives		
	24 DDR4 DIMMs No LOM		

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## Intel® Server Systems R2000WF Based on the Intel® Server Board S2600WF Family

#### **2U RACK SYSTEMS**

SPECIFIC SKUs		SPECIFIC SKUs		
R2308WFTZS	Intel® Server Board S2600WFT Supports up to 165W TDP processors Single 1300W AC 80 PLUS Titanium PSU Dual 10GbE ports Support for 8x 3.5" hot-swap drives 24 DDR4 DIMMs	R2312WFONP	Intel® Server Board S2600WF0 Supports up to 140W TDP processors Support for 12x 3.5" hot-swap drives 24 DDR4 DIMMs No LOM No PSU	
R2312WFTZS	Intel® Server Board S2600WFT Supports up to 140W TDP processors Single 1300W AC 80 PLUS Titanium PSU Dual 10GbE ports Support for 12x 3.5" hot-swap drives 24 DDR4 DIMMs			

Product does not include memory, processors, or hard drives.

For compatibility information please refer to the configuration guide at www.intel.com/support

#### For more information, visit www.intel.com/go/serversystems

1 Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. See www.intel.com/products/processor\_number for details.

- <sup>2</sup> Overall memory size depends on the processor used.
- <sup>3</sup> NVDIMM support refer to Intel<sup>®</sup> Server Configurator Tool (https://serverconfigurator.intel.com).

All products and dates specified are preliminary based on current expectations and are subject to change without notice. Availability in different channels may vary. For more complete information about performance and benchmark results, visit www.intel.com/benchmarks.

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at www.intel.com/go/ serversystems.

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## Intel® Server Systems Supporting the Intel® Xeon® Processor E5-2600 v4 Family

#### INTEL® SERVER SYSTEMS R1000WT AND R2000WT BASED ON THE INTEL® SERVER BOARD S2600WT FAMILY — RELIABLE SOLUTIONS MADE EASY

Supporting 1U and 2U rack systems for expansion flexibility and maximum compute, memory, and I/O capacity to address customer security concerns and guard against counterfeiting and malware, select product families feature the Intel® Transparent Supply Chain which enables the ability to verify the authenticity of board components and firmware. Get the latest Intel® Server Products built on a foundation of high-quality technology in the next-generation Intel® Xeon® processor E5-2600 v4 family of server solutions. The latest Intel Server Products are designed to span multiple use-cases and customization requirements while offering performance, reliability, and security to meet customers' requirements and growth needs now and in the future.

DESCRIPTION	Manage highly demanding application workloads with 1U and 2U rack systems based on the premier Intel® Server Board W2600WT family featuring power-efficient spread core design, incredible 24 DDR4 DIMMS, and support for dual Intel® Xeon® processors E5-2600 v4.
TARGET MARKET	Enterprise and medium business IT / big data / storage / cloud
SERVER BOARD INCLUDED	S2600WT2R: 1 Gb Ethernet S2600WTTR: 10 Gb Ethernet
PROCESSOR SUPPORT, <sup>1</sup> MAX TDP	2 x Intel Xeon processors E5-2600 v4 product family NOTE: Max CPU TDP supported 145 W with configuration limitations, see Technical Product Specifications
TOTAL PCI SLOTS	3 Riser slots 1 Intel® I/O Module Connector 1 Intel® RAID Module Connector
PCI SLOT TYPES	<ul> <li>1U: 2 x PCI Express* 3.0 x16 (FHHL), 1 x PCI Express 3.0 x8 Intel<sup>®</sup> I/O Expansion Module, 1 x PCI Express 3.0 x8 Intel<sup>®</sup> Integrated RAID Module</li> <li>2U: 3 Riser Options: Total of up to 6 PCI Express 3.0 x8 or 2 PCI Express 3.0 x16, 2 PCI Express 3.0 x8, 1 x PCI Express 3.0 x8 Intel I/O Expansion Module, 1 x PCI Express 3.0 x8 Intel Integrated RAID Module</li> <li>Option 1) 3 x PCI Express 3.0 x8 (2 FHFL, 1 FHHL)</li> <li>Option 2) 1 x PCI Express 3.0 x16 FHFL, 1 x PCI Express 3.0 x8 FHHL</li> <li>Option 3) 2 PCI-X 133 MHz FHFL, 1 x PCI Express 3.0 x8 FHHL</li> <li>Additional: 1 x PCI Express 3.0 x8 LP, 1 x PCI Express 2.0 x4 LP via 3rd riser</li> </ul>
MEMORY CAPACITY	24 LR / R / DIMMs 1333/ 1600 / 1866 / 2133 / 2400 MHz ECC DDR4 <sup>1</sup> NVDIMMs 2133MHz <sup>2</sup> 1.50 TB max using 64 GB DIMMS
MODULE UPGRADES	Intel® I/O Expansion Module Intel® Integrated RAID Module (ROC or IOC) Intel® Remote Management Module 4 Lite Trusted Platform Module
INTEL® TRANSPARENT SUPPLY CHAIN	Statement of Conformance Platform Certificate
WARRANTY	3 year limited warranty, optional 2 year extended warranty available



<sup>1</sup> Maximum memory speed supported depends on the processor used.

<sup>2</sup> NVDIMM support refer to Intel<sup>®</sup> Server Configurator Tool (https://serverconfigurator.intel.com).





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# Intel® Server Systems R1000WT Based on the Intel® Server Board S2600WT Family

#### **1U RACK SYSTEMS**

Dimensions (H x W x D)	1.72" x 17.25" x 28"
System Cooling	Redundant cooling fans
Power Supply	750 W AC Redundant PSU (Platinum Efficiency) Optional 750 W DC 48 V Redundant PSU (Gold Efficiency) NOTE: Second power supply sold separately
Thermal Solution	Included
PCI Riser Slots	2 x PCI Express* 3.0 x16 (FHHL) 1 x PCI Express 3.0 x8 Intel® I/O Expansion Module 1 x PCI Express 3.0 x8 Intel® Integrated RAID Module
Other Components	Intel® System Management Software Integrated BMC with IPMI 2.0 Optional optical disk drive
Warranty	3 year limited warranty, optional 2 year extended warranty available



#### SPECIFIC SKUs

R1208WT2GSR	Intel® Server Board S2600WT2R 8 x 2.5" hot-swap HDD, optional support for 1 x 2.5" fixed internal drive 750 W AC redundant-capable PSU; second PSU sold separately Integrated Dual Port Intel® Ethernet Controller I350 (1 GbE)	R1304WTTGSR	Intel <sup>®</sup> Server Board S2600WTTR 4 x 3.5" hot-swap HDD, optional support for 1 x 2.5" fixed internal drive 750 W AC redundant-capable PSU; second PSU sold separately Integrated Dual Port Intel <sup>®</sup> Ethernet Controller X540 (10 GbE)
R1208WTTGSR	Intel® Server Board S2600WTTR 8 x 2.5" hot-swap HDD, optional support for 1 x 2.5" fixed internal drive 750 W AC redundant-capable PSU; second PSU sold separately Integrated Dual Port Intel® Ethernet Controller X540 (10 GbE)		
R1304WT2GSR	Intel <sup>®</sup> Server Board S2600WT2R 4 x 3.5" hot-swap HDD, optional support for 1 x 2.5" fixed internal drive 750 W AC redundant-capable PSU; second PSU sold separately Integrated Dual Port Intel <sup>®</sup> Ethernet Controller 1350 (1 GbE)		



# Intel<sup>®</sup> Server Systems R2000WT Based on the Intel<sup>®</sup> Server Board S2600WT Family

#### **2U RACK SYSTEMS**

Dimensions (H x W x D)	3.44" x 17.25" x 28"
System Cooling	Redundant and hot-swap cooling fans
Power Supply	750 W AC redundant-capable PSU (Platinum Efficiency) 750 W DC -48V redundant-capable power supply (Gold Efficiency) 1100 W AC redundant-capable PSU (Platinum Efficiency) NOTE: Second power supply sold separately
Thermal Solution	Included
PCI Riser Slots	<ul> <li>3 Riser Options: Total of up to 6 PCI Express* 3.0 x8 or 2 PCI Express 3.0 x16, 2 PCI Express 3.0 x8, 1 x PCI Express 3.0 x8 Intel* I/O Expansion Module,1 x PCI Express 3.0 x8 Intel* I/O Expansion Module,1 x PCI Express 3.0 x8 Intel* I/O Expansion Module,1 x PCI Express 3.0 x8 Intel* I/O Expres</li></ul>
Other Components	Intel® System Management Software Integrated BMC with IPMI 2.0 Optional optical disk drive
Warranty	3 year limited warranty, optional 2 year extended warranty available



#### SPECIFIC SKUs

R2208WT2YSR	Intel <sup>®</sup> Server Board S2600WT2R 8 x 2.5" hot-swap HDD, optional 2 x 2.5" SATA rear hot-swap drives, 2 x 2.5" fixed internal drives 1100 W AC redundant-capable PSU; second PSU sold separately Integrated Dual Port Intel <sup>®</sup> Ethernet Controller I350 (1 GbE) 6 PCI Express* 3.0 x8 (4 FHFL, 2 FHHL), 1 riser PCI Express 3.0 x8 LP, PCIe 2.0 x4 LP	R2208WTTYSR	Intel <sup>®</sup> Server Board S2600WTTR 8 x 2.5" hot-swap HDD, optional 2 x 2.5" SATA rear hot-swap drives, 2 x 2.5" fixed internal drives 1100 W AC redundant-capable PSU; second PSU sold separately Integrated Dual Port Intel <sup>®</sup> Ethernet Controller X540 (10 GbE) 6 PCI Express* 3.0 x8 (4 FHFL, 2 FHHL), 1 riser PCI Express 3.0 x8 LP, PCIe 2.0 x4 LP
R2208WTTYC1R	Intel <sup>®</sup> Server Board S2600WTTR 8 x 2.5" hot-swap HDD, optional 2 x 2.5" SATA rear hot-swap drives, 2 x 2.5" fixed internal drives 2 x 1100 W AC redundant-capable PSU Integrated Dual Port Intel <sup>®</sup> Ethernet Controller X540 (10 GbE) 2 PCI Express* 3.0 x16, 2 PCI Express 3.0 x8, 1 PCI Express 3.0 x8 LP, PCIe 2.0 x4 LP	R2224WTTYSR	Intel <sup>®</sup> Server Board S2600WTTR 24 x 2.5" hot-swap HDD, optional 2 x 2.5" SATA rear hot-swap drives, 2 x 2.5" fixed internal drives 1100 W AC redundant-capable PSU; second PSU sold separately Integrated Dual Port Intel <sup>®</sup> Ethernet Controller X540 (10 GbE) 6 PCI Express* 3.0 x8 (4 FHFL, 2 FHHL)

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# Intel® Server Systems R2000WT Based on the Intel® Server Board S2600WT Family

#### SPECIFIC SKUs

	Intel® Server Board S2600WTTR
R2308WTTYSR	8 x 3.5" hot-swap HDD, optional 2 x 2.5" SATA rear hot-swap drives, 2 x 2.5" fixed internal drives
	1100 W AC redundant-capable PSU; second PSU sold separately
	Integrated Dual Port Intel® Ethernet Controller X540 (10 GbE) 6 PCI Express* 3.0 x8 (4 FHFL, 2 FHHL)
	1 riser PCI Express 3.0 x8 LP, PCIe 2.0 x4 LP
	Intel® Server Board S2600WTTR
R2312WTTYSR	12 x 3.5" hot-swap HDD, optional 2 x 2.5" SATA rear hot-swap drives, 2 x 2.5" fixed internal drives
	1100 W AC redundant-capable PSU; second PSU sold separately
	Integrated Dual Port Intel® Ethernet Controller X540 (10 GbE)
	6 PCI Express* 3.0 x8 (4 FHFL, 2 FHHL)

Product does not include memory, processors, or hard drives. For compatibility information please refer to the configuration guide at www.intel.com/support

<sup>1</sup> Maximum memory speed supported depends on the processor used.

## Intel<sup>®</sup> Server Boards S1200SP-Based Systems Supporting the Intel<sup>®</sup> Xeon<sup>®</sup> Processor E3-1200 v6 Family

#### RELIABLE, COST EFFECTIVE AND EASY TO MANAGE

Get Intel<sup>®</sup> Server Products built on a foundation of high-quality technology in the sixth generation Intel<sup>®</sup> Xeon<sup>®</sup> processor E3-1200 v6 family -based server system. The Intel<sup>®</sup> Server System R1000SP Family has the processing power to deliver reliability, durability and performance along with server management features and options for increased storage, functionality or faster networking speed. Intel<sup>®</sup> Server Products are backed by Intel's design excellence and manufacturing expertise to deliver processing power with high levels of flexibility, manageability and reliability.

DESCRIPTION	Robust and cost effective server s that can scale as customers grow. The Intel Server System R1000SP Famiily offers systems that scale via SATA and PCIe* expansion options, server management and storage flexibility at budget friendly prices.
TARGET MARKET	Small and medium businesses, embedded, storage or security appliances and web hosting rack installations
SERVER BOARD INCLUDED	S1200SPOR: Rack optimized to support Intel® I/O Expansion Module and storage modules
PROCESSOR SUPPORT <sup>1</sup>	1 x Intel® Xeon® processor E3-1200 v6 product family
TOTAL PCI SLOTS	1
PCI SLOT TYPES	1 PCle* Gen3 x8 with x16 connection
MEMORY CAPACITY	4 x DDR4 UDIMMs up to 2400 MHz ECC 64 GB max
MODULE UPGRADES	Intel® I/O Expansion Module Intel® Integrated RAID Module Intel® Remote Management Module 4 LITE2 Trusted Platform Module 1.2

**1U RACK SYSTEMS** 

#### SPECIFIC SKUs

Dimensions (H x W x D)	1.7" x 17.26" x 23.84"	R1208SPOSHORR	8 x 2.5" hot-swap HDD Intel® Server Board S1200SPOR 2 x 450 W hot-swap Redundant PSU
System Cooling	Fixed cooling fans	R 12063POSHORR	
Power Supply	450 W Redundant (Gold Efficiency)		4 x 3.5" hot-swap HDD
Thermal Solution	Sold separately	R1304SPOSHBNR	Intel® Server Board S1200SPOR 1 x 350 W fixed PSU
Other Components	Optional optical disk drive		4 x 3.5" hot-swap HDD
Warranty	3 year limited warranty	R1304SPOSHORR	Intel® Server Board S1200SPOR 2 x 450 W hot-swap Redundant PSU

Product does not include memory, processors, or hard drives. For compatibility information please refer to the configuration guide at www.intel.com/support



The Intel<sup>®</sup> Server Product Marketing Library is designed as a one-stop-shop for all Intel<sup>®</sup> Server Product marketing assets and sales tools. Visit https://www.intelserveredge.com/

For more information, visit www.intel.com/go/serversystems

1 Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. See www.intel.com/products/processor\_number for details.

<sup>2</sup> High efficiency power supply.

<sup>3</sup> On interposer (need accessory kit AXXRMM4IOM or AXXRMM4IOMW).

All products and dates specified are preliminary based on current expectations and are subject to change without notice. Availability in different channels may vary.

For more complete information about performance and benchmark results, visit www.intel.com/benchmarks

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at www.intel.com/go/ serversystems.

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# INTEL® DATA CENTER BLOCKS (INTEL® DCB)

Intel<sup>®</sup> Product Quick Reference Matrix **Q3 2018** 

# ACCELERATING DATA CENTER TRANSFORMATION

### **REDUCE COMPLEXITY AND DRIVE INNOVATION**

Customer data centers today require unique server solutions that run complex, business-critical workloads. Increasingly, it takes more of your resources to develop those solutions. Intel® Data Center Blocks make it easier for you to adopt, qualify, and sell the latest Intel® technology, helping you address the demands of today's data centers.

# INTEL® DATA CENTER BLOCKS

Reduce complexity and speed time to market with unbranded, fully-validated data center blocks that feature Intel's latest technologies.

# **HIGHER INTEGRATION AND VALIDATION FOR FASTER TIME-TO-MARKET**

The world of computing is getting more complex. In order to help partners keep up with the rapid pace of technological demands, Intel is making it easier to adopt, qualify and sell the latest Intel technology with purpose-built Data Center Blocks. These fully-validated server building blocks feature the required Intel technology to deliver customized solutions that meet complex customer needs. Because these Data Center Blocks come with a higher level of integration and validation, partners can reallocate R&D resources to higher value activities and accelerate time to market with innovative solutions.

#### **Cloud and Software-Defined Infrastructure**

O

Gain increased access to the private cloud and SDI market with fullyvalidated, server systems featuring the latest Intel® technologies and ISV software certifications.

## High Performance Computing (HPC)

Accelerate your growth in the HPC market with unbranded, semi-integrated 1 and 2U rack system options built-to-order for intensive workloads.

### **Transform Business with Enterprise Performance**

Grow and transform your business with pre-configured, fully validated server systems designed for the needs of business IT.

# **INTEL<sup>®</sup> DATA CENTER BLOCKS**

# Intel® Data Center Blocks for Storage – Intel® Storage System RAF1000JSP

#### **REVOLUTIONIZING DATA CENTER STORAGE**

The Intel<sup>®</sup> Storage System RAF1000JSP provides an innovative solution to address key storage challenges around capacity and performance. Featuring the revolutionary "ruler" form factor for Intel<sup>®</sup> SDDs, the Intel<sup>®</sup> Storage System RAF1000JSP is designed to offer unparalleled density, powerful system performance, and compelling total cost of ownership (TCO) for today's most demanding storage scenarios. The Intel<sup>®</sup> Storage System RAF1000JSP is launching soon!

#### BENEFITS

Unparalleled Density	Powerful Performance	Reduce TCO1	Simplified Deployment
	Maximize system level performance with up to 32 ruler form factor Intel® SSDs in a single 1U system.	Lower CapEx, achieve 6x rack consolidation adn reduce SSD power consumption by up to 55% compared with a standards 2U server. <sup>2</sup>	Available as an integrated system, with the option to select the ruler quantity and capacity to meet your unique workload needs.

#### AN SSD REVOLUTION. NEW "RULER" FORM FACTOR FOR INTEL® SSDS

Designed from the ground up to optimize rack efficiency, the new ruler form factor delivers unparalleled space-efficient capacity, operationally-efficient design and scalable manageability.

- Storage density-optimized design delivers higher per drive and per server capacity
- + Up to 55% more thermally efficient than 15mm  $\rm U.2^3$
- Front loading and hot-swappable to simplify manageability and serviceability

#### INTEL® STORAGE SYSTEM RAF1000JSP SPECIFICATIONS

STORAGE	Up to 32x ruler form factor Intel® SSD DC P4500 Series
SWITCH NODE	2x switch nodes supporting re-timers for interconnect
COMPUTE HOST INTERCONNECT	4x (x16 PCIe* Re-timer AICs with mini HD cables)
COMPUTE HOSTS SUPPORTED	Intel® Server Board S2600WF and Intel® Server Board S2600BP systems
DIMENSIONS	17.25-inch width x 35.7-inch length x 1.72-inch height

<sup>1</sup> Cost reduction scenarios described are intended as examples of how a given Intel<sup>®</sup>-based product, in the specified circumstances and configurations, may affect future costs and provide cost savings. Circumstances will vary. Intel does not guarantee any costs or cost reduction.

<sup>2</sup> Source – Intel. Comparing maximum capacity per 1 rack unit of Intel<sup>®</sup> Server Board S2600WP Family, 24 U.2 bay option using 4TB U.2 15mm Intel<sup>®</sup> SSD DC P4500 Series to 8 TB Intel<sup>®</sup> Storage System RAF1000JSP Server design, 32 "ruler" drive bays using 8 TB "ruler" form factor for Intel<sup>®</sup> SSD DC P4500 Series.

<sup>3</sup> Source – Intel. Comparing airflow required to maintain equivalent temperature of a 4TB U.2 15mm Intel<sup>®</sup> SSD DC P4500 Series to a 4TB "ruler" form factor for Intel<sup>®</sup> SSD DC P4500 Series. Results have been estimated or simulated using internal analysis or architecture simulation or modeling, and provided for informational purposes. Simulation involves 3 drives for each form factor in a sheet metal representation of a server, 12.5mm pitch for "Ruler" form factor, 1000m elevation, limiting SSD on case temp of 70C or thermal throttling performance, whichever comes first. 5C guardband.





# Intel® Data Center Blocks for Networking – NFVI Server Block section

#### SIMPLIFYING AND ACCELERATING NETWORK FUNCTIONS VIRTUALIZATION INFRASTRUCTURE (NFVI) DEPLOYMENT

With the global network functions virtualization (NFV) market projected to grow at a compound annual growth rate (CAGR) of 42%, reaching \$15.5 billion by 2020, a massive market opportunity exists. However, many system builders do not have deep experience in designing for the unique requirements of multi-function systems and are looking for a way to address the complexity they face in selecting and validating optimal configurations. The NFVI Server Block designed and tested by Intel to deliver exceptional performance for NFVI workloads. Rather than procuring hardware as components and building the system from scratch, this Data Center Block comes as a pre-configured system to help partners accelerate time to market with workload optimized solutions.

#### **KEY BENEFITS**

- Optimized for the unique needs of network functions virtualization infrastructure (NFVI) workloads to deliver exceptional performance
- Fully validated, pre-configured Data Center Block saves time and money<sup>1</sup> freeing up resources to focus on value-add and competitive differentiation
- Single order code simplifies procurement and reduces complexity associated with system design and validation
- Intel quality and reliability with world-class integration, validation, certification, and support
- Standard Intel three-year warranty ensures customer satisfaction

#### NFVI ENABLEMENT OPTIONS FROM INTEL

NFVI Server Block	Intel® Select Solution for NFVI Reference Architecture	Intel® Select Fast Track Kit for NFVI
Pre-configured, fully-validated Intel Xeon® Scalable processor-based system with balanced Intel® QuickAssist Technology (Intel® QAT), Networking, and NVMe® Storage are designed to accelerate time to market. Ensures efficient data flows, with consistent, repeatable performance. Designed to meet the Intel® Select Solution for NFVI hardware specification.	Reference Architecture that includes a hardened configuration of hardware, firmware, and software optimized for essential NFV workloads. Delivered as a branded Intel <sup>®</sup> Select Solution systems through Intel partners. The NFVI Server Block hardware is used for reference architecture validation.	Combines the NFVI Server Block with pre-installed Intel® Select Solution for NFVI software (Ubuntu or RedHat). Provides faster access to a fully functional NFVI optimized develop- ment platform.

#### PRODUCT SPECIFICATIONS

ORDER CODE	NB2208WFQNFVI
PROCESSOR	2x Intel® Xeon® Gold 6152 processor, 22 Cores, 2.1 GHz, Base non-AVX Core frequency, 30.25 LLC (MB), 140 W TDP
BOARD + CHASSIS	Intel® Server System R2208WFQZS (including Intel® Server Board S2600WFQ with symmetric Intel® QAT and 2U Intel® Server Chassis with 8 x 2.5" backplane
DIMENSIONS	16.93" x 27.95" x 3.44"
POWER SUPPLY	2x Redundant 1300 W CRPS - AC, Titanium
MEMORY	24x RDIMM 16 GB – DDR4 288-pin, 2666 MHz (384 GB total)
STORAGE-CAPACITY	4x Intel® SSD DC P4500 (1.0 TB)
BOOT DRIVES (R1)	2x Intel® SSD DC S4500 (240 GB)
NVME* SWITCH	1x 4 Port Switch adapter (CPU1 riser)
CABLES - STORAGE	4x OCuLink* Cables for 4 drives AXXCBL470CVCR (1), AXXCBL530CVCR (1), AXXCBL800CVCR (2)
CONNECTIVITY - NICS	4x Intel® Ethernet Network Adapter XXV710-DA2 (25 GbE, 2 adapters per riser)
MANAGEMENT NIC	1x Intel® Ethernet Network Connection OCP I357-T4
REAR HOT SWAP BACKPLANE (HSBP)	Rear Hot-swap Dual Drive Cage Upgrade Kit

<sup>1</sup> Cost reduction scenarios described are intended as examples of how a given Intel<sup>®</sup>-based product, in the specified circumstances and configurations, may affect future costs and provide cost savings. Circumstances will vary. Intel does not guarantee any costs or cost reduction.



## Intel<sup>®</sup> Data Center Block with Firmware Resilience

#### Making It Easier to Deliver Competitive and Secure<sup>1</sup> Servers for Critical Infrastructure, Government, and Financial Institutions.

As security threats continue to evolve and increase, security IT officers are driving for a holistic and expanded view to protect their critical infrastructure. This includes protecting the server all the way down to the firmware at the lowest layers of the platform, where threats are most difficult to detect. While technologies exist to protect the higher layers of the infrastructure stack, system IT users need assurance that the underlying platform launching these security technologies can be trusted.

As hackers seek new ways to infiltrate servers, the lower layers of the platform, where threats are most difficult to detect become a more common target. To address this, Intel has developed the Intel® Data Center Block with Firmware Resilience. Featuring Intel® Platform Firmware Resilience technology, this preconfigured, validated server system enables platform security starting in the factory through power-on, system boot, OS load, and beyond<sup>1</sup>. With this offering, customers can protect firmware from being intercepted, detect firmware corruption, and automatically restore a system if malware is detected. The ability to correct firmware corruptions is a new and innovative capability, and an ideal solution for security-sensitive industries including government, financial institutions, and critical infrastructure.

Intel is simplifying adoption of this technology through fully-validated, configure-to-order systems featuring security-optimized Intel® Xeon® processor, Intel® Server Boards, Intel® Server Chassis, and multiple upgrade options to provide a solution that customers can deploy quickly and with confidence.

#### Configure a system designed for your needs. Choose from three security-optimized processors and a variety of upgrade options.

Intel® Platform Firmware Resilience technology protects, detects critical firmware during boot and runtime attacks

2U Rack form factor:

Intel<sup>®</sup> Server Board S2600WTTCR

Intel® Server Chassis R2000WT family; 2U chassis with 8 hot-swappable 2.5" drive trays, 1100W PSU

Choose from one of three Intel® Xeon® processor E5-2600 v4 versions enhanced to support Intel PFR

16GB memory included with option for up to 1.54T

RFID Antenna for Protect-In-Transit

Intel Fabric, Ethernet and RAID adapters

Up to 8 x Intel<sup>®</sup> SSD DC S3520 Series

Intel® Server Products hardware and accessories from supported families

<sup>1</sup> Intel<sup>®</sup> technologies features and benefits depend on system configuration and may require enabled hardware, software, or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer to learn more at intel.com.





#### Software Guard Extensions Server Block

#### CONTENT DELIVERY NETWORKS, CLOUD SERVICE PROVIDERS, COMMUNICATIONS NETWORKS, AND FINANCIAL INSTITUTIONS

The Software Guard Extensions Server Block is optimized for information security, featuring Intel's industry-leading cryptographic isolation technology - Intel® Software Guard Extensions (Intel® SGX). Intel® SGX provides CPU-hardened enclaves, or protected areas of execution in memory, that increase security for selected code and data on compromised platforms. The Software Guard Extensions Server Block is an unbranded server system designed to be a cost-effective cryptographic security solution that delivers enterprise-grade performance, reliability and security in an easy-to-manage system.

PRODUCT	Software Guard Extensions Server Block
DESCRIPTION	Pre-configured, fully validated 1U rack system, featuring Intel <sup>®</sup> Software Guard Extensions (Intel <sup>®</sup> SGX) for cryptographic security; includes the Intel <sup>®</sup> Server Board S1200SPOR, as well as other Intel components and 3rd party memory that can scale as customers grow via SATA and PCIe <sup>*</sup> expansion options for increased storage functionality or faster networking speed.
ORDER CODE	LR1304SPCFSGX1
TARGET MARKET	Security optimized server for customers with high data protection needs
SERVER BOARD	Intel® Server Board S1200SPOR
FORM FACTOR	1U; microATX 9.6" x 9.6"
PROCESSOR SUPPORT	Single Intel® Xeon® processor E3-1270 v6, up to 72W TDP
CHIPSET	Intel® C236 chipset
MEMORY	64GB (4 x16GB), 2133MHZ, DDR4, UDIMM
SATA PORTS	One DH-10 Serial Port 'A' connector
INTEGRATED LAN	Dual 1GbE – Intel® i210
MANAGEMENT SUPPORT	Intel® Remote Management Module 4 Lite 2 (AXXRMM4LITE2)
CHASSIS	Intel 1U chassis with hot-swappable 4 x 3.5" (2.5" SSD ready) drive trays, dual 450W redundant PSUs (R1304SPOSHOR)
CHASSIS DIMENSIONS	1.7 in (43.18 mm) x 17.26 in (438.5mm) x 21.06 in (548.9 mm) (Height x Width x Depth)
SECURITY	TPM 2.0 Module
FANS	Three managed 40mm single rotor system fans One fan for each installed power supply module
STORAGE	4 x 3.5" (2.5" SSD Ready) hot-swap drive bays 1 x optical drive bay
UPGRADE OPTIONS	Two Intel® SSD DC S3520 Series (1.2 TB, 2.5in. SATA 6Gb/s, 16nm, MLC) Intel® Integrated RAID Module options Intel® I/O Expansion Module options
WARRANTY	3 year limited warranty with options to expand to 5 years



#### Intel<sup>®</sup> Data Center Blocks for Business - Entry Server Block

#### ENTERPRISE PERFORMANCE FOR ENTRY NEEDS

In a highly competitive market, small enterprise and cloud service providers (CSPs) need a cost-effective server that delivers enterprise-grade performance, reliability and security in an easyto-manage system. They also need solutions that are able to scale and be more agile, while also being competitively priced. To help address this demand, Intel is providing pre-configured, fully-validated Entry Server Blocks that will help accelerate time to market with server solutions optimized for the needs of small enterprises and CSPs. This 1U rack system includes Intel<sup>®</sup> components and 3rd party memory, in an unbranded offering that will help reduce the complexity and costs associated with designing, configuring and validating server solutions.

#### ENTRY SERVER BLOCK FROM INTEL

PRODUCT	Intel® Data Center Blocks for Business - Entry Server Block		
DESCRIPTION	Pre-configured, fully validated 1U rack system, featuring the Intel <sup>®</sup> Server Board S1200SPOR as well as other Intel components and 3rd party memory that can scale as customers grow via SATA and PCIe <sup>*</sup> expansion options for increased storage functionality or faster networking speed.		
ORDER CODE	LR1304SPCFG1R		
TARGET MARKET	Entry level server for small and medium businesses (SMBs), optimized for web hosting, enterprise applications and storage		
SERVER BOARD	Intel® Server Board S1200SPOR		
FORM FACTOR	1U; microATX 9.6" x 9.6"		
PROCESSOR SUPPORT	Single Intel® Xeon® processor E3-1230 v6, up to 72W TDP		
CHIPSET	Intel® C236 chipset		
MEMORY	16GB (1 x16GB), 2133MHZ, DDR4, UDIMM		
SATA PORTS	One DH-10 Serial Port 'A' connector		
INTEGRATED LAN	Dual 1GbE – Intel® i210		
MANAGEMENT SUPPORT	Intel® Remote Management Module 4 Lite 2 (AXXRMM4LITE2)		
CHASSIS	Intel 1U chassis with hot-swappable 4 x 3.5" (2.5" SSD ready) drive trays, dual 450W redundant PSUs (R1304SPOSHOR)		
CHASSIS DIMENSIONS	1.7 in (43.18 mm) x 17.26 in (438.5mm) x 21.06 in (548.9 mm) (Height x Width x Depth)		
FANS	Three managed 40mm single rotor system fans One fan for each installed power supply module		
STORAGE	4 x 3.5" (2.5" SSD Ready) hot-swap drive bay, drives not included 1 x optical drive bay		
UPGRADE OPTIONS	Up to 4x 2.5" SSD drives; Intel <sup>®</sup> Integrated RAID Module options; Intel <sup>®</sup> I/O Expansion Module options		
WARRANTY	3 year limited warranty with options to expand to 5 years		



#### Intel<sup>®</sup> Data Center Blocks for Business - SMB Server Block

#### ENTERPRISE PERFORMANCE FOR SMB NEEDS

In a highly competitive market, small and medium businesses need cost-effective IT solutions that deliver business-class performance, security, and manageability. Reduce design, testing and validation costs by taking advantage of fully-validated SMB Server Blocks from Intel. By starting with a higher-level of integration from Intel, you have more flexibility and choice about where to invest R&D spend to ensure you remain competitive and differentiated in the market.

#### SMB SERVER BLOCK FROM INTEL

PRODUCT	Intel® Data Center Blocks for Business - SMB Server Block		
DESCRIPTION	The SMB Server Block is a pre-configured, fully-validated, unbranded system based on Intel® Server Board S1200SPSR, Intel® Xeon® Processor E3-1230 v6, Intel® Server Chassis P4304XXSFCN and other Intel components designed specifically for the SMB market.		
ORDER CODE	LSVRP4304ES6XXR		
TARGET MARKET	Entry level server for small and medium businesses (SMBs)		
SERVER BOARD	Intel® Server Board S1200SPSR		
FORM FACTOR	microATX 9.6" x 9.6"		
PROCESSOR SUPPORT	Single Intel® Xeon® processors E3-1230 v6		
CHIPSET	Intel® C232 chipset		
MEMORY	16GB (1 x16GB), 2133MHZ, DDR4, UDIMM		
MEMORY CAPACITY	4 DIMMs, 64GB total		
SATA PORTS	8-port		
INTEGRATED LAN	Dual port integrated Intel® Ethernet Controller i210 (1 GbE)		
MANAGEMENT SUPPORT	Intel® Server Management Software Integrated BMC with IPMI 2.0		
CHASSIS	Intel® Server Chassis P4304XXSFCN		
CHASSIS DIMENSIONS	17.24 in (438 mm) x 6.81 in (173mm) x 22.05 in (560 mm) (Height X Width X Depth)		
PSUs PER CHASSIS	One 365W, fixed		
FANS	One rear system fan		
STORAGE	4x3.5" in fixed drive trays, no drives included		
UPGRADE OPTIONS	4x DDR4 UDIMM 2133Mhz 4x 3.5"/2.5" drives		
WARRANTY	3 year limited warranty		



# **INTEL<sup>®</sup> DATA CENTER BLOCKS FOR HPC**

### Making the path to reliable HPC Solutions Easier

The process of configuring and validating the foundational components of an HPC solution that is tuned to meet specific customer requirements is a complex and resource intensive process. To help address these challenges, Intel provides high-quality, fully validated Data Center Blocks for HPC that can reduce complexity for resellers. These HPC Compute Blocks incorporate Intel's latest data center technologies - already optimized to work better together - allowing partners to accelerate time to market with reliable HPC solutions.

#### **HPC Compute Blocks**

#### **BUILD TO ORDER**

HPC Compute Blocks are build-to-order and embody the Intel<sup>®</sup> Scalable System Framework - a flexible blueprint for developing high performance, efficient and reliable HPC systems. These blocks capture the innovations taking place in compute, fabric, storage and memory in a building block optimized for HPC environments. This means partners can order based on the specific needs of their customer. By taking advantage of Intel's latest technologies, as well as world-class engineering and validation expertise, partners can build innovative solutions faster and with a lower total cost of ownership.

#### MIX AND MATCH: BUILD YOUR OWN RACK

1U and 2U Rack form factors:		
R1208WFTYS		
R1304WF0YS, R1304WFTYS		
R2208WFTZS, R2208WF0ZS, R2208WFQZS†, R2224WFTZS, R2224WFQZS†		
R2308WFTZS, R2312WFTZS, R2312WF0NP, R2312WFQZS†		
HNS2600BPB, HNS2600BPB24, HNS2600BPS, HNS2600BPS24, HNS2600BPQ, HNS2600BPQ24		
HNS2600KPR, HNS2600KPFR		
HNS2600TPR, HNS2600TP24R, HNS2600TP24SR, HNS2600TPFR		
R1304WT2GSR, R1304WTTGSR		
R1208WT2GSR, R1208WTTGSR		
R2208WT2YSR, R2208WTTYC1R, R2208WTTYSR, R2224WTTYSR		
R2308WTTYSR, R2312WTTYSR		
HNS7200AP		
Intel® Xeon® processor family		
Intel® Xeon Phi™ processor family		
Intel® Omni-Path Fabric		
Intel Ethernet and RAID adapters		
Intel® Server Products hardware and accessories from supported families		

† Launching Q4 '17









#### Intel<sup>®</sup> Data Center Blocks for HPC – LNET Router

#### FULLY INTEGRATED AND VALIDATED PROVIDES "TURN KEY" SOLUTION

This fully-validated, integrated, and optimized system provides an efficient and turnkey approach to bridging Intel<sup>®</sup> Omni-Path Architecture (Intel<sup>®</sup> OPA) with existing InfiniBand\* infrastructure, enabling you to reap the scale benefits of Intel OPA without needing to rip and replace existing hardware or develop a custom routing solution. This saves valuable time and resources, allowing you to re-invest in other value-add software, services and applications.

#### PRE-CONFIGURED AND FULLY VALIDATED BLOCKS WITH THE LATEST INTEL® HPC TECHNOLOGY

Powered by the Intel® Xeon® processor Scalable family
2 operating system options to choose: SUSE and CentOS
Multiple SKUs with different support options
Intel® Fabric Suite 10.5, Intel® Enterprise Edition for Lustre* Software 3.1
Intel® Omni-Path Host Fabric Interface Adapter 100 Series and FDR/EDR InfiniBand* Fabric
Intel® Solid State Drives (Intel® SSD)
Standard Intel 3-year warranty, with the option to extend parts of coverage to 5 years

#### FEATURES

SERVER BOARD	Intel® Server Board S2600WFT ("Wolf Pass")	
PROCESSOR	Intel® Xeon® processor Scalable Family – Gold 6130, "Skylake-SP , XCC", 16C, 2.1GHz, 125W	
NETWORK SUPPORT	Dual 10G Copper, 1 GbE Management Port OmniPath 1x 100HFA016LS OPA HFI 100 series 1 port PCIe x16 FDR/EDR InfiniBand* Fabric: MCX455A-ECAT	
MEMORY	RDIMM 16 GB – DDR4 288-pin, 2666MHz	
POWER SUPPLY	1100W CRPS – AC, Platinum	
REMOTE MANAGEMENT MODULE	AXXRMM4LITE	
FIRMWARE	System BIOS: ME Firmware BMC Firmware: FRUSDR	







### Intel® Data Center Blocks for Cloud – VMware\* (VSAN Ready Node)

Designing, testing and validating an SDS solution can be a complex and resource-intensive process. Cloud Blocks for VMware (VSAN Ready Node) are fully-validated, pre-configured server systems with VMware VSAN certifications included. Designed to address the challenges of storage modernization, this offering helps resellers reduce complexity and speed time to market.

#### INTEL® DATA CENTER BLOCKS FOR CLOUD - VMWARE (VSAN READY NODE)

PRODUCT	Intel® Data Center Blocks for Clouds - VMware (VSA	N Ready Node)	
DESCRIPTION	Intel Cloud Blocks for VMware are fully-validated, pre-configured server systems featuring the latest Intel technology, including Intel <sup>®</sup> Server Boards and Chassis, Intel <sup>®</sup> Xeon <sup>®</sup> processors, and Intel <sup>®</sup> Solid State Drives (SSDs), as well as third-party memory and VMware VSAN certifications in configurations optimized for SDS solutions. These VSAN Ready Nodes from Intel are available multiple All-Flash (AF) or Hybrid (HY) system configurations, each designed for specific workloads and use cases.		
TARGET MARKET	Software-Defined Storage and Private Cloud. Recommended customer use cases include: Business-Critical Applications, Virtual Desktop Infrastructure, Disaster Recovery, Test an Development scenarios, and Enterprise Production Workloads.		
ORDER CODES	VMWARE* VSAN PROFILE	INTEL <sup>®</sup> SERVER SYSTEM	FEATURES*
ALL-FLASH CONFIGURATIONS (SATA SSDs for capacity, NVMe* SSDs for cache)			
VRN2208WFAF83	All Flash (AF-8)³	2U 1 node Intel® Server System R2208WF0ZS and Intel® Server Board S2600WF0	<ul> <li>Up to 120 VMs and 80K IOPs per node</li> <li>24 TB raw storage capacity per node</li> <li>Intel<sup>®</sup> Xeon<sup>®</sup> Gold 6152 processor</li> <li>768GB memory</li> </ul>
VRN2208WFAF82	All Flash (AF-8)³	2U 1 node Intel <sup>®</sup> Server System R2208WF0ZS and Intel <sup>®</sup> Server Board S2600WF0	<ul> <li>Up to 120 VMs and 80K IOPs per node</li> <li>12 TB raw storage capacity per node</li> <li>Intel<sup>®</sup> Xeon<sup>®</sup> Gold 5120 processor</li> <li>384 GB memory</li> </ul>
VRN2208WFAF81	All Flash (AF-8)³	2U 1 node Intel <sup>®</sup> Server Chassis R2208WF0ZS and Intel <sup>®</sup> Server Board S2600WFO	<ul> <li>Up to 120 VMs and 80K IOPs per node</li> <li>11.5 TB raw storage capacity per node</li> <li>Intel<sup>®</sup> Xeon<sup>®</sup> Gold 5118 processor</li> <li>384 GB memory</li> </ul>
VRN2224BPAF6	All Flash (AF-6)³	2U 4 node Intel <sup>®</sup> Server Chassis H2224XXLR3 with Intel <sup>®</sup> Server Board S2600BPS	<ul> <li>Up to 60 VMs and 50K IOPs per node</li> <li>9.6 TB raw storage capacity per node</li> <li>Intel<sup>®</sup> Xeon<sup>®</sup> Xeon Gold 5118 processor</li> <li>256 GB memory</li> </ul>
HYBRID CONFIGURATIONS (Hard for capacity, SSDs for cache)			
VRN2208WFHY6	Hybrid (HY-6)²	2U 1 node Intel <sup>®</sup> Server System R2208WF0ZS and Intel <sup>®</sup> Server Board S2600WF0	<ul> <li>Up to 50 VMs and 20K IOPs per node</li> <li>12 TB raw storage capacity per node</li> <li>Intel<sup>®</sup> Xeon<sup>®</sup> Gold 5115 processor</li> <li>256 GB memory</li> </ul>
VRN2224BPHY6	Hybrid (HY-6)²	2U 4 node Intel <sup>®</sup> Server Chassis VRN2224BPHY6 and Intel <sup>®</sup> Server Board S2600BPS	<ul> <li>Up to 50 VMs and 20K IOPs per node</li> <li>8 TB raw storage capacity per node</li> <li>Intel<sup>®</sup> Xeon<sup>®</sup> Gold 5115 processor</li> <li>256 GB memory</li> </ul>





<sup>2</sup> 3rd party SW stack and HDD NOT included

<sup>3</sup> 3rd party SW stack NOT included

\* Other names and brands may be claimed as the property of others

#### Intel® Data Center Blocks for Cloud - Microsoft Windows Server\* 2016

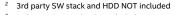
Designing, testing and validating an SDS solution can be a complex and resource-intensive process. Cloud Blocks for Microsoft\* are fully-validated, pre-configured server systems with Microsoft Windows Server 2016 certifications included. Designed to address the challenges of storage modernization, this offering helps resellers reduce complexity and speed time to market.

#### **CLOUD BLOCKS FROM INTEL**

PRODUCT	T Intel® Data Center Blocks for Cloud – Microsoft Windows Server* 2016		
DESCRIPTION	Cloud Blocks for Microsoft Windows Server* 2016 are fully-validated, pre-configured server systems featuring the latest Intel® technology, including Intel® Server Boards and Chassis, Intel® Xeon® processors, and Intel® Solid State Drives (SSDs), as well as third-party memory and Windows Server 2016 certifications in configurations optimized for SDS solutions. These blocks are available in multiple All-Flash (AF) or Hybrid (HY) system configurations, each designed for specific workloads and use cases.		
TARGET MARKET	Software-Defined Storage and Private Cloud. Recommended customer use cases include: Business-Critical Applications, Virtual Desktop Infrastructure, Disaster Recovery, Test and Development scenarios, and Enterprise Production Workloads.		
ORDER CODES	INTEL® SERVER SYSTEM	FEATURES*	
	ALL-FLASH CONFI	IGURATIONS (SATA SSDs for capacity, NVMe* SSDs for cache)	
MCB2208WFAF6 <sup>3</sup>	2U 1 node Intel® Server System R2208WF0ZS and Intel® Server Board S2600WF0	<ul> <li>24 TB raw storage capacity</li> <li>Intel® Xeon® Gold 6152 processor</li> <li>768 GB memory</li> </ul>	
MCB2208WFAF5 <sup>3</sup>	2U 1 node Intel® Server System R2208WF0ZS and Intel® Server Board S2600WF0	<ul> <li>12 TB raw storage capacity</li> <li>Intel® Xeon® Gold 5120 processor</li> <li>384 GB memory</li> </ul>	
MCB2208WFAF4 <sup>3</sup>	2U 1 node Intel® Server System R2208WF0ZS and Intel® Server Board S2600WF0	<ul> <li>11.5 TB raw storage capacity</li> <li>Intel® Xeon® Gold 5118 processor</li> <li>384 GB memory</li> </ul>	
MCB2224BPAF3 <sup>3</sup>	2U 4 node Intel® Server Chassis H2224XXLR3 and Intel® Server Board S2600BPS	<ul> <li>7.7 TB raw storage capacity per node</li> <li>Intel® Xeon® Gold 5118 processor</li> <li>256 GB memory</li> </ul>	
	HYBRID CON	IFIGURATIONS (Hard drives for capacity, SSDs for cache)	
MCB2208WFHY2 <sup>2</sup>	2U 1 node Intel® Server System R2208WF0ZS and Intel® Server Board S2600WF0	<ul> <li>12 TB raw storage capacity</li> <li>Intel® Xeon® Gold 5118 processor</li> <li>128 GB memory</li> </ul>	
MCB2224BPHY1 <sup>2</sup>	2U 4 node Intel <sup>®</sup> Server Chassis H2224XXLR3	8 TB raw storage capacity per node     Intel® Xeon® Gold 5115 processor	

• Intel<sup>®</sup> Xeon<sup>®</sup> Gold 5115 processor

• 128 GB memory



MCB2224BPHY1<sup>2</sup>

<sup>3</sup> 3rd party SW stack NOT included

<sup>4</sup> Virtual Machine count modeled after Microsoft Azure A2 Basic compute instance with Hyper-threading, no oversubscription of any components (CPU, memory and storage).

\* Other names and brands may be claimed as the property of others

and Intel<sup>®</sup> Server Board S2600BPS



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For more information, visit www.intel.com/dcb or ark.intel.com

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# INTEL® SERVER CHASSIS

Intel® Product Quick Reference Matrix Q3 2018

# DESIGNED FOR QUALITY, RELIABILITY, AND SECURITY.

#### 1U/2U RACK

New flexible and highly serviceable 1U and 2U rack chassis targeted for cloud and datacenter environments support custom form factor server boards. Find highdensity, 2U rackable chassis supporting up to 4 hotpluggable Intel<sup>®</sup> Compute Modules up to 24 2.5 inch hot-swap drives or up to 12 3.5 inch hot-swap drives.

#### **TOWER CHASSIS**

Pedestal chassis ideal for small and medium business environments and purpose-built appliances.

# INTEL® SERVER CHASSIS H2000G FAMILY FOR THE INTEL® XEON® SCALABLE PROCESSOR







CHASSIS	2U rack chassis supporting up to 4 hot-pluggable Intel <sup>®</sup> Compute Module HNS2600BPB24, HNS2600BPQ24 or HNS2600BPS24, 24 2.5" hot-swap drives, and 2 2130 W AC Platinum efficiency common redundant power supplies	2U rack chassis supporting up to 4 hot-pluggable Intel <sup>®</sup> Compute Module HNS2600BPB, HNS2600BPQ, or HNS2600BPS, up to 4 2.5" hot-swap drives and 2 2130 W AC Platinum efficiency common redundant power supplies	High-density, 2U rackable chassis supporting up to 4 hot-pluggable Intel <sup>®</sup> Compute Module HNS2600BPB, HNS2600BPQ, HNS2600BPS up to 12 3.5" hot-swap drives and two 2130 W AC Platinum efficiency common redundant power supplies
TARGET MARKET	Hyper-converged infrast	ructure, Cloud, Datacenter	
MODEL	24 2.5" hot-swap drives	4 2.5" hot-swap drives	3.5" Hot-swap drive model
COMPUTE MODULE SUPPORT <sup>1</sup>	HNS2600BP24	HNS26	500BPB
CHASSIS ORDER CODE <sup>1</sup>	H2224XXLR3	H2204XXLRE: Available only as part of the HPC Data Center Block offering	H2312XXLR3
	AHWBPBGB24: 6-Port IT Bridge Board with LSI* 3008 IOC, 6G SATA / 12G SAS, 2 NVMe* drives (pass-through), no RAID	AHWBPBGB: 4-Port SATA SW RAID Bridge Board, 6G SATA only, no RAID	AHWBPBGB: 4-Port SATA SW RAID Bridge Board, 6G SATA Only, no RAID
SPARES KIT ORDER CODE <sup>2</sup>	AHWBPBGB24R: 6-Port iMR Bridge Board with LSI 3008 IOC, 6G SATA / 12G SAS, RAID, 2 NVMe drives (pass-through), RAID 0/1/10	AHWBP12GBGB: 4-Port Bridge Board with LSI 3008 IOC, 6G SATA / 12G SAS, RAID 0/1/10	AHWBP12GBGB: 4-Port Bridge Board with LSI* 3008 IOC, 6G SATA / 12G SAS, RAID 0/1/10
	<b>AHWBPBGB24P:</b> 6-Port Add-In-Card (AIC) pass-through Bridge Board; Must be used in combination with an add-in RAID card to be functional	AHWBP12GBGBR5: 4-Port iMR Bridge Board with LSI 3008 IOC, 6G SATA / 12G SAS, RAID 0/1/5/10	AHWBP12GBGBR5: 4-Port iMR Bridge Board with LSI 3008 IOC, 6G SATA / 12G SAS, RAID 0/1/5/10
FORM FACTOR	2U Rack		
DRIVE BAYS	Supports up to 24 2.5" hot-swap SAS / SATA drives	Supports up to four 2.5" hot-swap SAS / SATA drives	Up to 12 2.5" or 3.5" hot-swap SAS / SATA drives
HOT-SWAP DISK DRIVE BAY (ORDER CODE)		Included	
NVMe*	Support up to 8 2.5" PCIe* SFF devices	None	N/A
SYSTEM COOLING	3 x 40mm x 56mm dual rotor fans per module		
POWER SUPPLIES	2 Common redundant 2130 W AC (Platinum Efficiency)		
TOOL-LESS FEATURES	PSU, Compute module, HDD bays are all hot-swap		
DIMENSIONS (H x W x D)	3.46" x 17.24" x 28.86" 3.46" x 17.24" x 30.35"		
BEZEL FEATURES	Black, independate front panel controls for each individual module		
FRONT CONNECTORS	N/A		
SYSTEM SECURITY	Protection for chassis drives with a lock to the chassis		

# INTEL® SERVER CHASSIS H2000G FAMILY FOR THE INTEL® XEON® PROCESSOR E5-V4



CHASSIS	2U rack chassis supporting up to four hot-pluggable Intel® Compute Module HNS2600TP24R, HNS2600TP24SR or HNS2600TP24STR up to 24 2.5″ hot-swap drives and two 1600W common redundant power supplies.	2U rack chassis supporting up to four hot-pluggable Intel <sup>®</sup> Compute Module NS2600TP24R, HNS2600TP24SR or HNS2600TP24STR up to 24 2.5" hot-swap drives and two 2130 W common redundant power supplies.
TARGET MARKET	Hyper-converged infrastructure/Cloud/Datacenter	
MODEL	4 2.5" hot-swap drives, including support for up	to eight 2.5" PCIe* small form factor (SFF) devices
INTEL® SERVER BOARD SUPPORT <sup>1</sup>	HNS2600TP24R,	,HNS2600TP24SR
CHASSIS ORDER CODE <sup>1</sup>	H2224XXKR2	H2224XXLR2
SPARES KIT ORDER CODE <sup>2</sup>	24 x 2.5" Backplane: FHW24X25HS12G Power interposer board: FXXCRPSPIB Power docking board: FH2000NPB24 Bridge board: FHWKPTPBGB24	24 x 2.5" Backplane: FHW24X25HS12G Bridge board: FHWKPTPBGB24 Front control panel kit: FH2000FPANEL2 Power distribution board: FXXCRPSPDB2 Power board: FH2000NPB24 Power in backplane bridge board module: FXXCRPSPIB
FORM FACTOR	2U Rack	
DRIVE BAYS	Supports up to twenty-four 2.5" hot-swap SAS drives	
HOT-SWAP DISK DRIVE BAY (ORDER CODE)	Included	
NVMe*	Support up to eight 2.5" PCIe* SFF devices	
SYSTEM COOLING	3 x 40mm x 56mm dual rotor fans per module	
POWER SUPPLIES	(2) Common Redundant 1600 W (Platinum Efficiency)	
I/O SLOTS	Up to 2	
BACKPLANE	Included combination backplane with PCIe* SFF device support	
TOOL-LESS FEATURES	PSU, Compute module, HDD bays are all hot-swap	
DIMENSIONS (H x W x D)	3.46″ x 17.24″ x 28.86″	
BEZEL FEATURES	Black, independate front panel controls for each individual module	
FRONT CONNECTORS	N/A	
SYSTEM SECURITY	Protection for chassis drives with a lock to the chassis	

# INTEL® SERVER CHASSIS H2000G FAMILY FOR THE INTEL® XEON® PROCESSOR E5-V4





CHASSIS	High-density, 2U rackable chassis supporting up to four half-width Intel® Compute Modules.	
MODEL	3.5" drive model	2.5" drive model
INTEL® SERVER BOARD SUPPORT <sup>1</sup>	HNS2600KPR, I HNS2600TPR, I	
CHASSIS ORDER CODE <sup>1</sup>	H2312XXKR2	H2216XXKR2
SPARES KIT ORDER CODE <sup>2</sup>	12 x 3.5" Backplane: FHW12X35HS12G 1600 W PSU Spare: FXX1600PCRPS Bridge Board: FHWKPTPBGB Control Panel Spare: FH2000FPANEL2 Node Power Board: FH2000NPB2 Power Distribution Board Spares: FXXCRPSPDB2	16 x 2.5" Backplane: FHW16X25HS12G 1600 W PSU Spare: FXX1600PCRPS Bridge Board: FHWKPTPBGB Control Panel Spare: FH2000FPANEL2 Node Power Board: FH2000NPB2 Power Distribution Board Spares: FXXCRPSPDB2
FORM FACTOR	2U R	Rack
DRIVE BAYS	Up to twelve 2.5" or 3.5" hot-swap SAS / SATA drives	Up to sixteen 2.5" hot-swap SAS / SATA drives
HOT-SWAP DISK DRIVE BAY (ORDER CODE)	FXX35HSCAR	FXX25HSCAR
NVMe*	N/A	
SYSTEM COOLING	3 x 40mm x 56mm dual rotor fans per module	
POWER SUPPLIES	(2) Common Redundant 1600 W (Platinum Efficiency)	
I/O SLOTS	Up to 2	
BACKPLANE	Included	
TOOL-LESS FEATURES	PSU, Compute module, HDD bays are all hot-swap	
DIMENSIONS (H x W x D)	3.42" x 17.24" x 30.35" (87mm x 438mm x 771mm) 3.42" x 17.24" x 28.86" (87mm x 438mm x 771mm)	
BEZEL FEATURES	Black, independate front panel controls for each individual module	
FRONT CONNECTORS	N/A	
SYSTEM SECURITY	Protection for chassis drives with a lock to the chassis	

# INTEL<sup>®</sup> SERVER CHASSIS H2000G FAMILY FOR THE INTEL<sup>®</sup> XEON PHI<sup>™</sup> PROCESSOR





CHASSIS	High-density, 2U rackable chassis supporting up to four half-width Intel® Compute Modules.	
MODEL	3.5" drive model 2.5" drive model	
INTEL® SERVER BOARD SUPPORT <sup>1</sup>		HNS7200AP; HNS7200APL; HNS2600KPR, HNS2600KPFR; HNS2600TPR, HNS2600TPFR
CHASSIS ORDER CODE <sup>1</sup>	H2312XXLR2	H2216XXLR2
SPARES KIT ORDER CODE <sup>2</sup>	12 x 3.5" Backplane: FHW12X35HS12G 2130 W PSU Spare: FXX2130PCRPS Control Panel Spare: FH2000FPANEL2 Node Power Board: FH2000NPB2 Power Distribution Board Spare: FXXCRPSPDB2 Passive Heat-Sink: AXXAPHS Intel® Omni-Path Port Upgrade Kit (2 Port): AXX2PFABKIT 1U Spare PCIe Riser (Slot 2): FHW1U20APRISER 1U PCI Express x16 riser card for Slot 1: FHW1U16APRISER 1U PCI Express x16 riser card for Slot 2: FHW1U20APRISER 1U PCI Express x16 riser card for Slot 2: FHW1U20APRISER 1U PCI Express x16 riser card for Slot 2: FHW1U20APRISER 1U PCI Express x16 riser card for Slot 2: FHW1U20APRISER 1U PCI Express x16 riser card for Slot 2: FHW1U20APRISER	16 x 2.5" Backplane: FHW16X25HS12G 2130 W PSU Spare: FXX2130PCRPS Control Panel Spare: FH2000FPANEL2 Node Power Board: FH2000NPB2 Power Distribution Board Spare: FXXCRPSPDB2 Passive Heat-Sink: AXXAPHS Intel® Omni-Path Port Upgrade Kit (2 Port): AXX2PFABKIT 1U Spare PCIe Riser (Slot 2): FHW1U20APRISER 1U PCI Express x16 riser card for Slot 1: FHW1U16APRISER 1U PCI Express x16 riser card for Slot 2: FHW1U20APRISER 1U PCI Express x4 riser card for Slot 2: FHW1U20APRISER 1U PCI Express x4 riser card for Slot 2: FHW1U20APRISER Bridge Board Spare: FHWAPBGB
FORM FACTOR	2U Rack	
DRIVE BAYS	Up to twelve 2.5" or 3.5" hot-swap SAS / SATA drives Up to sixteen 2.5" hot-swap SAS / SATA drives	
HOT-SWAP DISK DRIVE BAY (ORDER CODE)	FXX35HSCAR FXX25HSCAR	
NVMe*	N/A	
SYSTEM COOLING		3 x 40mm x 56mm dual rotor fans per module
POWER SUPPLIES		(2) Common Redundant 2130 W (Platinum Efficiency)
I/O SLOTS	Up to 2	
BACKPLANE	Included	
TOOL-LESS FEATURES	PSU, Compute module, HDD bays are all hot-swap	
DIMENSIONS (H x W x D)	3.42" x 17.24" x 30.35" (87mm x 438mm x 771mm) 3.42" x 17.24" x 28.86" (87mm x 438mm x 771mm)	
BEZEL FEATURES	Black, independate front panel controls for each individual module	
FRONT CONNECTORS	N/A	
SYSTEM SECURITY	Protection for chassis drives with a lock to the chassis	

# INTEL<sup>®</sup> SERVER CHASSIS R1000WF AND INTEL<sup>®</sup> SERVER CHASSIS R1000WT FAMILIES

The Intel® Server Chassis R1000WF and Intel® Server Chassis R1000WT families support the Intel® Server Board S2600WF family and Intel® Server Board S2600WT family, respectively. See the Accessories and Spares section of the chosen Intel Server Board configuration guide for recommended part numbers.





INTEL® SERVER CHASSIS R1000WF FAMILY

INTEL® SERVER CHASSIS R1000WT FAMILY

CHASSIS	Flexible and highly serviceable 1U and 2U rack chassis targeted for cloud and datacenter environments supporting custom form factor server boards.			
MODEL	Hot-swap drive models			
INTEL® SERVER BOARD SUPPORT <sup>1</sup>	S2600WFT, S2600WF0, S2600WFQ <sup>†</sup>	S2600WT2R, S2600WTTR		
CHASSIS ORDER CODE <sup>1</sup>	R1304WFXXX	R1208WTXXX R1304WTXXX		
SPARES KIT ORDER CODE <sup>2</sup>	1U riser for PCI Express* 3.0 x16 FHHL: F1UL16RISER3 SAS cables depend on usage model, reference Configuration Guide			
FORM FACTOR		1U Rack		
DRIVE BAYS	<b>R1304WTXXX:</b> Up to four 2.5" or 3.5" hot-swap SAS / SATA drives <b>Optional:</b> Fixed-mount SSD in optical drive bay (requires AXXSSDODDKIT accessory)	R1208WTXXX: Up to eight 2.5" hot-swap SAS / SATA drives, up to 4 PCI Express SSD with optional accessory (A1U44X25NVMEDK) R1304WTXXX: Up to four 2.5" or 3.5" hot-swap SAS / SATA drives Optional: Fixed-mount SSD in optical drive bay (requires AXXSSDODDKIT accessory)		
HOT-SWAP DISK DRIVE BAY (ORDER CODE)	Included			
SYSTEM COOLING	6>	x 40mm internal redundant chassis fans		
POWER SUPPLIES	(2) Common Redundant 1100 W AC (Platinum Efficiency) (2) Common Redundant 750 W DC -48V (Gold Efficiency) NOTE: Power supply sold separately			
I/O SLOTS	Up to 2 PCI Express 3.0 x8 (HLFH) with	purchase of risers F1UL16RISER2, Intel® I/O Expansion module, SAS module		
BACKPLANE		Included		
TOOL-LESS FEATURES	Front bezel, PCI card reta	ainer, peripheral bays, PSU installation, and fixed drive carriers		
DIMENSIONS (H x W x D)	Rack: 17.	Rack: 17.25″ x 1.72″ x 28″ (438mm x 44mm x 711mm)		
BEZEL FEATURES		Black, control panel, two USB ports		
FRONT CONNECTORS		2 x USB		
SYSTEM SECURITY		Locking bezel and chassis intrusion		

<sup>†</sup>Q SKU launches Q4'17 For more information, visit www.intel.com/products/server/chassis or ark.intel.com

# INTEL<sup>®</sup> SERVER CHASSIS R2000WF AND INTEL<sup>®</sup> SERVER CHASSIS R2000WT FAMILIES

The Intel® Server Chassis R2000WF and Intel® Server Chassis R2000WT families support the Intel® Server Board S2600WF family and Intel® Server Board S2600WT family, respectively. See the Accessories and Spares section of the chosen Intel Server Board configuration guide for recommended part numbers.





INTEL® SERVER CHASSIS R2000WF FAMILY

INTEL® SERVER CHASSIS R2000WT FAMILY

CHASSIS	Flexible and highly serviceable 1U and 2U rack chassis targeted for cloud and datacenter environments supporting custom form factor server boards.			
MODEL	Hot-swap drive models			
INTEL® SERVER BOARD SUPPORT <sup>1</sup>	\$2600WFT, \$2600WT0 \$2600WTTR			
CHASSIS ORDER CODE <sup>1</sup>	R2000WFXXX	R2000WTXXX; R2312WTXXX		
		Accessory 2U Hot-swap Drive Cage Upgrade Kit with 4x NVMe SSD support: A2U44X25NVMEDK		
SPARES KIT ORDER CODE <sup>2</sup>	2U 3 slot riser for PCI Express* 3.0 x8: A2UL8RISER2 2U short riser PCI Express 3.0 x8, PCI Express x4: A2UX8X4RISER Accessory 2U 2 slot riser for PCI Express 3.0 x16: A2UL16RISER2 Rear 2-drive cage accessory: A2UREARHSDK SAS cables depend on usage model, reference Configuration Guide, See Configuration Guide for detailed list of Spares and Accessories			
FORM FACTOR	20	J Rack		
DRIVE BAYS	<b>R2000FTXXX:</b> Requires accessory bays to support hot-swap drives, support for 2.5" SSDs, optional 2 x 2.5" rear hot-swap drives available with accessory (A2UREARHSDK)	R2312WTXXX: Up to 12 x 3.5" hot-swap SAS / SATA drives, support for 2.5" SSDs, optional 2 x 2.5" rear h swap drives available with accessory (A2UREARHSDK) R200WTXXX: Requires accessory bays to support hot-swap drives, support for 2.5" SSDs, optional 2 x 2. hot-swap drives available with accessory (A2UREARHSDK)		
	Optional: 4 x 2.5" NVM Express* (PCI Express SSDs) available with accessory (A2U44X25NVMEDK)			
HOT-SWAP DISK DRIVE BAY (ORDER CODE)	A2U8X35S3PHSDK1: 8 x 2.5″ drives (Single port) A2U8X35S3PHSDK1(x3), Storage rack handle A2UHANDLKIT2 for 24 x 2.5″ drives (Single port) A2U8X25S3DPDK2: Dual port drive cage kit supports dual port SAS drives up to 24 drives	A2U8X25S3HSDK: 8 x 2.5" drives (Single port) A2U8X25S3HSDK (x3), Storage rack handle A2UHANDLKIT for 24 x 2.5" drives (Single port) A2U8X35S3HSDK: 8 x 3.5" drives A2U44X25NVMEDK: Upgrade kit supporting up to 4 x 2.5" NVMe* drives, optional 8 x 2.5" HDD backplane A2U8X25S3DPDK: Dual port drive cage kit supports dual port SAS drives up to 24 drives		
	See Configuration Guide for detailed list of cables needed			
SYSTEM COOLING	6 x 80mm internal redund	lant and hot-swap chassis fans		
POWER SUPPLIES	(2) Common Redundant 1300 W AC (Titanium Efficiency)	(2) Common Redundant 750 W AC (Platinum Efficiency)		
	(2) Common Redundant 750 W DC -48V (Gold Efficiency); (2) Common Rec	dundant 1100 W AC (Platinum Efficiency); NOTE: Power supply sold separately		
I/O SLOTS	Up to 8 x PCI Express 3.0 with purchase of r	risers: 2 x A2UL8RISER2 and 1 x A2UX8X4RISER		
BACKPLANE	R2000WFXXX: See 'Drive Bays' R2312WTXXX: Included; R2000WTXXX: See 'Drive Bays'			
TOOL-LESS FEATURES	Front bezel, top cover, PCI card retainer, fans, hot-swap drive carriers, hot-swap drive bays, peripheral bays, and PSU installation			
DIMENSIONS (H x W x D)	Rack: 17.25" x 3.44" x 28'	″ (438mm x 87mm x 711mm)		
BEZEL FEATURES	Black, control panel, se	ecurity lock, two USB ports		
FRONT CONNECTORS	2	x USB		
SYSTEM SECURITY	Locking bezel a	nd chassis intrusion		

## INTEL® SERVER CHASSIS P4000M FAMILY FOR THE INTEL® XEON® SCALABLE PROCESSOR AND INTEL® XEON® PROCESSOR E5-V4

Intel® Server Chassis P4000 series requires the separate purchase of a thermal solution kit and air duct specific to the Intel® Server Board selected. See the Accessories and Spares section of the chosen Intel Server Board configuration guide for recommended part numbers. Other boxed Intel® Thermal Solutions are mechanically compatible with the processor socket but are not thermally validated in Intel Server Chassis.

	INTEL® SERVER CHASSIS P4000 FAMILY				
CHASSIS	A sleek and flexible mid-length tower chassis targeted at small- to medium-sized businesses supporting custom form factor server boards.				
MODEL	Fixed drive models (upgradeable to hot-swap drive support)				
INTEL <sup>®</sup> SERVER BOARD SUPPORT <sup>1</sup>	S2600STB, S2600STS, S2600CW2R, S2600CWTR, S2600CW2SR, S2600CWTSR				
CHASSIS ORDER CODE <sup>1</sup>	P4304XXMFEN2, P4304XXMUXX				
SPARES KIT ORDER CODE <sup>2</sup>	120mm Fixed Fan PCI area: FUPMNHFANPCI 120mm Fixed Fan for CPU area: FUPNHFANCPU 1600 W Common Redundant Power Supply: FXX1600PCRPS Accessory kit enables support for 2.5" FF PCI Express* 3.0 SSDs (NVMe): FUP8X25S3NVDK Bezel Spare for P4000 Chassis Supporting Fixed HDD: FUPCRPSCAGE Bracket and Extension Kit for P4000M Chassis Family: AUPMCOPROBR Front bezel with door: FUPBEZELHSD2	High Current P4000 Family Chassis Power Distribution Board Spare: FUPPDBHC2 hot-swap Drive Cage: FXX25SHCAR Redundant Power Supply Cage for Intel® Server Chassis P4000 Family: FUPCRPSCAGE SRC-B tower passive heat sink 92mm x 100mm: AUPCWPBTP Spare 3.5" Fixed HDD Carriers: FUP4X35NHDK Spare hot-swap Fan Kit for Intel® Server Chassis P4000M: FUPMLHSFAN			
FORM FACTOR	4U Tower (rackable)				
DRIVE BAYS	Up to 4 x 3.5" fixed drives, optional 4 or 8 x 3.5" or 8 or 16 x 2.5" hot-swap drive bay (2.5" configuration of the second secon	ions also support up to 4x PCIe 3.0 SSD's)			
HOT-SWAP DISK DRIVE BAY (ORDER CODE)	Upgrade: Convert up to 8 SAS / SATA hot-swap drive bays using the upgrade kit: (FUP8X25HSDK) Upgrade: Convert up to 8 hot-swap PCI Express* drive cages to support 2.5" FF PCIe SSDs (NVMe*): FUP8X25S3NVDK				
SYSTEM COOLING	P4304XXMFEN2: 2 x 120mm Internal fixed chassis fans; P4304XXMUXX : 5 x 80mm Redundant hot-swap internal chassis fans				
POWER SUPPLIES	P4308XXMFEN2: (1) Fixed Non-redundant 550 W (Silver Efficiency); P4304XXMUXX: (2) Common Red	dundant 750 W (Platinum Efficiency) or (2) Common Redundant 1600 W (Platinum Efficiency) sold separately			
I/O SLOTS	Up to 6				
BACKPLANE	None included				
TOOL-LESS FEATURES	Front bezel, EMI cover, side cover, PCI card retainer, peripheral bays, PSU installation, and fixed drive of	carriers			
DIMENSIONS (H x W x D)	Tower: 17.24" x 6.81" x 24.9" (438mm x 173mm x 632mm)	Tower: 17.24" x 6.81" x 24.9" (438mm x 173mm x 632mm)			
BEZEL FEATURES	Black, control panel, two USB ports				
FRONT CONNECTORS	2 x USB				
SYSTEM SECURITY	Locking bezel and chassis intrusion				







#### INTEL® SERVER CHASSIS P4000S FAMILY

CHASSIS	A general purpose 4U tower chassis supporting the Intel <sup>®</sup> Server Board S1200SP family with up to four 3.5" fixed drives, two 460W common redundant power supplies optimized for thermal and acoustic performance.	A general purpose tower chassis optimiz	red for thermal and acoustic performance.		
MODEL	4 x 3.5" Fixed drives	Fixed drive models	Hot-swap drive models		
INTEL <sup>®</sup> SERVER BOARD SUPPORT <sup>1</sup>		S1200SPLR, S1200SPSR			
CHASSIS ORDER CODE <sup>1</sup>	P4000XXSFDR	P4304XXSFCN	P4304XXSHCN		
SPARES KIT ORDER CODE <sup>2</sup>	Front Panel board: FXXFPANELR Power Distribution Board: AP4000E3V5PDB 4 x 3.5" 6Gb/s hard drive hot-swap backplane: FUP4X35HSBP 8 x 3.5" 6Gb/s hard drive hot-swap backplane: FUP8X35HSBP 4 x 3.5" 12Gb/s hard drive hot-swap backplane: FUP4X35S3HSBP 460W Cold redundant power supply: FXX460GCRPS	Distribution Board: AP4000E3V5PDB Mechanical Spares Kit: FUPSMSK " 6Gb/s hard drive hot-swap backplane: FUP4X35HSBP Electrical Spares Kit: FUPSESK " 6Gb/s hard drive hot-swap backplane: FUP4X35S3HSBP Air ducts sold separately based on board purchased			
FORM FACTOR		4U Tower			
DRIVE BAYS	Up to four 3.5" fixed drives	Up to four 3.5" fixed SAS / SATA drives	Up to four 3.5" hot-swap SAS / SATA drives		
HOT-SWAP DISK DRIVE BAY (ORDER CODE)	Hot-swap 6Gbps SATA drives: FUP4X35HSDK Hot-swap 6Gbps SATA drives: FUP8X35HSDK Hot-swap 12Gbps SAS drives: FUP4X35S3HSDK Hot-swap 12Gbps SAS drives: 2x FUP4X35S3HSDK	Upgrade: convert to four slot hot-swap drive bays using the following Drive Bay upgrade kit: (FUP4X35HSDK), supports four SAS / SATA hot-swap drives	Share the same hot-swap drive bay kit (FUP4X35HSDK), use as a spare		
SYSTEM COOLING	(2) 92mm fixed fans (one PCIe* zone and one rear system fan)	2 x 92mm internal chassis fan (single fan in P4304XXSFCN)	2 x 92mm internal chassis fan (single fan in P4304XXSHCN)		
POWER SUPPLIES	(2) Common Redundant 460 W (Gold Efficiency)	P4304XXSFCN: (1) Fixed 365 W (Silver Efficiency)	P4304XXSHCN: (1) Fixed 365 W (Silver Efficiency) P4304XXSHDR: (2) Common Redundant 460 W (Gold Efficiency)		
I/O SLOTS	Up to 3	Up	to 6		
BACKPLANE		None included			
TOOL-LESS FEATURES	Front bezel, EMI cover, PCI card retainer, peripheral bays, power supply unit installation, and fixed drive carriers	Front bezel, EMI cover, side cover, PCI card retainer, peripheral bays, PSU installation, and fixed drive carriers	Front bezel, side cover, PCI card retainer, hot-swap drive carriers, hot-swap drive bay, peripheral bays, and PSU installation		
DIMENSIONS (H x W x D)	Tower: 17.24" x 6.81" x 22.05" (438mm x 173mm x 560mm)	Tower: 17.24" x 6.81" x 21.5"	" (438mm x 173mm x 546mm)		
BEZEL FEATURES	Black, control panel, three 5.25″ peripheral drive bays, four internal drive bays	Black, control panel, three 5.25" peripheral drive bays, four internal drive bays, two USB ports	Black, control panel, three 5.25" peripheral drive bays, four hot-swap drive bays and carriers (behind door), security lock, two USB ports		
FRONT CONNECTORS	Two USB 3.0 ports	2 x	USB		
SYSTEM SECURITY	Protection for chassis drives with a lock to the chassis	Side cover: A padlock loop slot available at the rear of the system access cover to prevent access to the processors, memory, and add-in devices Side cover: Intrusion switch Back panel: Kensington* cable lock mounting hole	Front door: Security lock (available on hot-swap drive SKUs only) Side cover: A padlock loop slot available at the rear of the system access cover to prevent access to the processors, memory, and add-in devices Side cover: Intrusion switch Back panel: Kensington* cable lock mounting hole		

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For more information, visit www.intel.com/products/server/chassis or ark.intel.com

<sup>1</sup> Refer to http://support.intel.com/support/motherboards/server for up-to-date details on server boards supported by each chassis.

<sup>2</sup> For complete spare and accessory list, please download the latest configuration guide from Spare Parts list and Configuration Guide at http://support.intel.com/support/motherboards/server

<sup>3</sup> Intel<sup>®</sup> Server Chassis H2000 series requires the separate purchase of Intel<sup>®</sup> Compute Modules. See the Accessories and Spare Parts section of the chosen Intel<sup>®</sup> Server Board configuration guide for recommended part numbers.

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# INTEL® STORAGE Systems

Intel® Product Quick Reference Matrix Q3 2018



## BUILT WITH INTEL QUALITY, RELIABILITY AND PERFORMANCE

Intel<sup>®</sup> Server Products are backed by Intel's design excellence and manufacturing expertise to deliver processing power with high levels of flexibility, manageability and reliability.

# INTEL<sup>®</sup> STORAGE SYSTEM JB0D2312S3SP

#### Intel<sup>®</sup> JBOD2312S3SP

2U form factor storage system supporting up to 48-TB 3.5-in. drives.

#### Key Features

- Options for single or redundant SAS/SATA 6G connectivity via SFF-8088
- Fan and PSU monitoring and notification via SES
- Redundant power and cooling
- Less than 25-inch deep chassis (3.44 inches by 16.93 inches by 24.95 inches)
- Allows for multiple levels of cascading multiple JBOD's can be connected in a chained sequence
- Dual-port backplane offering full redundancy
- Options to support up to 48-TB storage capacity



<b>1</b> 12 x 3.5-ir	in. drives	2	Redundant cooling with monitoring and notification via SES	3	Redundant power with monitoring and notification via SES
4 Power dist	stribution board	5	SAS 3.0 Converter	6	SAS Expanders with optional redundant configuration

#### Intel<sup>®</sup> Storage System JBOD2000 Product Family

The Intel® Storage System JBOD2000 product family works seamlessly with Intel® Server Systems and Intel® RAID and can even be used as a virtual RBOD by using Intel® RAID Controller RS25SB008 or an Intel® Intelligent RAID module. Combine with Intel® Solid State Drives using Intel® SSD Cache Technology, or set up a network using a SAS switch to serve multiple servers. With several configuration options available, it is a flexible and expandable storage system that simplifies your server environment.

A flexible and expandable storage system with single- and multi-cable connectivity, redundant fans, and options for redundant power supplies simplifies your server configuration. Features 12 **DESCRIPTION** x 3.5" drives or 24 x 2.5" drives and works seamlessly with Intel<sup>®</sup> Server Systems and Intel<sup>®</sup> RAID for a complementary storage solution. Up to 48 TB storage capacity possible. Cascading up to 2 levels. (Extended life product.)

TARGET MARKET Enterprise / storage

#### 2U RACK SYSTEMS

	FIC	

Dimensions (H x W x D)	3.44″ x 16.93″ x 27.95″
System Cooling	Redundant cooling fans
Power Supply	460 W Redundant PSU (Gold Efficiency)
Other Components	Dual-port backplane for full redundancy Fan and PSU monitoring via SES
Warranty	3 year limited warranty, optional 2 year extended warranty available

## JBOD2312S3SP

12 x 3.5" hot-swap HDD 2 x 36-port SAS expander 2 x 460 W AC PSU Single SAS/SATA 12.0 Gb/s 4 x external SFF-8088 connectors











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For the latest product SKUs and specifications, visit http://ark.intel.com

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# INTEL® RAID

Intel<sup>®</sup> Product Quick Reference Matrix **Q3 2018** 

EXCEPTIONAL DATA PROTECTION. FASTER PERFORMANCE. EASE OF USE.

#### INTEL® TRI-MODE GENERATION RAID PRODUCTS

The Intel® Tri-Mode RAID controllers, featuring LSI\* SAS3500/SAS3400 series RAID-on-Chip (ROC) processors, offer significant performance enhancements for solutions architected with SAS, SATA, and PCIe\* 3.0 NVMe\* drives.

#### **INTEL® RAID EXPANDER BOARDS**

For high drive count solutions, Intel offers 12Gb/s SAS expander boards (available in midplane and add-in card form factors) and PCIe 3.0 switches and retimers.

#### INTEL® RAID PREMIUM FEATURES

Get more performance and data protection with Premium Features for Intel® RAID solutions. When combined with Intel® RAID controllers, you can further enhance storage applications and deliver higher ROI for your server boards and systems.



#### **Tailor a Solution to Match Your Storage Needs**

Intel offers multiple categories of RAID products to protect data, increase performance, scale storage, and enhance server availability. A brief description of each category is listed below.



#### **Controller Cards and Modules**

- Intel® RAID Modules are designed for select 2U Intel® Xeon® Processor-based server solutions, affording up to 16 ports of PCIe\*/SAS/SATA connectivity without taking up a standard add-in card PCIe\* slot, for a highly integrated configuration.
- Intel® RAID Adapters come in a low-profile MD2 standard PCIe\* form-factor, and are PCIe\* compliant for flexibility of configuration and use in any system by any vendor.

#### **RAID Cache Backup**

• Maintenance Free Backup Units (MFBUs) are available for Full-Featured RAID products with embedded cache. The backup options are listed in the "Backup Option" row of the product tables.

#### **Expander Boards**

• Intel<sup>®</sup> RAID Expander Cards are intended for any system with more than 8 drives. As an example of use, 8 RAID ports can be expanded to 24 ports.

#### **Premium Feature Keys**

• Several upgrade features can be added to enhance the performance and data protection of Intel's intelligent RAID cards and modules.

#### **Cable Kits and Converter Boards**

• Newer-generation RAID products do not ship with cables, as multiple options exist depending on the system in which the RAID products are installed. Therefore, Intel offers a variety of cables. A converter board that allows for two internal 8087 connectors to be converted to two external 8088 connectors is also available.

## Intel<sup>®</sup> Integrated RAID Modules (Tri-Mode)









#### CONTROLLER INTEL® INTEGRATED RAID MODULE RMSP3AD160F

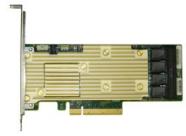
#### INTEL® INTEGRATED RAID MODULE RMSP3CD080F

INTEL® INTEGRATED RAID MODULE RMSP3HD080E

#### INTEL® INTEGRATED RAID MODULE RMSP3JD160J

DESCRIPDIThode SASSATA/PCle full-equired RAD personal nucleic since					
ORDER CODERMSPADIGOFRMSPADIGOFRMSPADIGOFRMSPADIGOFORDER CODERMSPADIGOFRMSPADIGOFRMSPADIGOFRMSPADIGOFPROCESSORLS 1360LS 1360LS 1360LS 1360ONBOARD CACHE MEMORRG DDRAGB DDRAGB DDRANAONBOARD CACHE MEMORGL Expess 3.0 x8ROL Expess 3.0 x8NAPCI E' INTERFACEFI CLE press 4.0 x8PCI Expess 3.0 x8PCI Expess 3.0 x8PCI E' INTERFACEGL Expess 4.0 x8NETAIL DEVELScalane-capable motherboard in 2U or greater) chasisRetrail portsCHASSIS COMPATIBILITMacane-capable motherboard n2U or greater) chasisNacane-capable motherboard in 1U or greater) chasisRetrail portsMacane-capable motherboard in 2U or greater) chasisCHASSIS COMPATIBILITNational-capable motherboard in 2U or greater) chasisNacane-capable motherboard in 1U or greater) chasisNacane-capable motherboard in 1U or greater) chasisNacane-capable motherboard in 1U or greater) chasisCACHE BACKUP OPTIONNatxMFBU7NatxMFBU7NatxMFBU7NatxMFBU7NatxMFBU7CACHE BACKUP OPTIONNatxMFBU7NatxMFBU7NatxMFBU7NatxMFBU7CALEL SERVER BADARSelentiet*Xeon*serverboards with a storage I/O module connectorNatxMFBU7NatxMFBU7INTEL* SERVER BADARSelentiet*Xeon*serverboards with a storage I/O module connectorSelentiet*Xeon*server boards with a storage I/O module connectorSelentiet*Xeon*serverboards with a storage I/O module connectorINTEL* SERVER BADARSelentiet*Xeon*serverboards with a storage I/O module conne	DESCRIPTION	module with 16 internal ports using four Mini-SAS-HD	module with eight internal ports using two Mini-SAS-HD	module with eight internal ports using two Mini-SAS-HD	
PROCESSORLATSAGELATSAGELATSAGELATSAGEONBOARD CACHE MEMORYABDDR4BADDR4BADDR4AAONBOARD CACHE MEMORYABDDR4BADDR4BADDR4AAPCIE*INTERFACEPCExpress 30.x8CExpress 30.x8PCExpress 30.x8PCExpress 30.x8ONBOARD TACHE MEMORYMarana portsAlternal portsPCExpress 30.x8PCExpress 30.x8ONE ADATIONEMarana portsAlternal portsPCExpress 30.x8PCExpress 30.x8CHASSIS COMPATIBILYMarana portsMarana portsMarana portsMarana portsCHASSIS COMPATIBILYMarana portsMarana portsMarana portsMarana portsCHASSIS COMPATIBILYMarana portsMarana portsMarana portsMarana portsCACHE BACKUP OPTIONMarana portsMarana portsMarana portsMarana portsCACHE BACKUP ADATIONMarana portsMarana portsMarana portsMarana portsINTEL* SERVER BOADBBecl Intel*Xeon*server boards with a storage I/OBecl Intel*Xeon*server boards with a storage I/OBecl Intel*Xeon*server boards with a storage I/OBecl Intel*Xeon*server boards with a storage I/OAVAILABILYQ107Q207Q207Q207Q207Q207	MARKET SEGMENT	Full-featured RAID	Full-featured RAID	Entry-level RAID	JBOD
ONBOARD CACHE MEMORGB DRAAB DRAAB DRANAPCI E* INTERFACEFCI Express 3.0 x8PCI Express 3.0 x8PCI Express 3.0 x8PCI Express 3.0 x8PORTSInternal portsBinternal portsBinternal portsBinternal portsBinternal portsCHASSIS COMPATIBILITYMezzanine-capable motherboard in 2U (or greater) chassisMezzanine-capable motherboard in 2U (or greater) chassisMezzanine-capable motherboard in 1U (or greater) chassisMezzanine-capable motherboard in 1U (or greater) chassisCHASSIS COMPATIBILITYMezzanine-capable motherboard in 2U (or greater) chassisMezzanine-capable motherboard in 1U (or greater) chassisMezzanine-capable motherboard in 1U (or greater) chassisCACHE BACKUP OPTIONSAXRMFBU7AXRMFBU7AXRMFBU7MAMezzanine-capable motherboard in 2U (or greater) chassisINTEL* SERVER BOARDVerhoase deparatelyPurchase deparatelyPurchased separatelyMezanine-capable motherboard swith a storage I/OAVALABILITYQ 2017Q 2017Q 2017Q 2017Q 2017	ORDER CODE	RMSP3AD160F	RMSP3CD080F	RMSP3HD080E	RMSP3JD160J
Add and and and and and and and and and a	PROCESSOR	LSI 3516	LSI 3508	LSI 3408	LSI 3416
PORTS       fe Internal ports       B Interna	ONBOARD CACHE MEMORY	4GB DDR4	4GB DDR4	N/A	N/A
CHASSIS COMPATIBILITY       Mezzanine-capable motherboard in 2U (or greater) chassis       Mezzanine-capable motherboard in 1U (or greater) chassis       Mezzanine-capable motherboard in 1U (or greater) chassis         RAID LEVELS       0,1,0,5,50,6,60       0,1,10,5,06,60       0,1,10,5,06,60       JBOD mode only         CACHE BACKUP OPTIONS       AXXRMFBU7       AXXRMFBU7       AXXRMFBU7       N/A         CABLES       Purchased separately       Purchased separately       Purchased separately       Purchased separately       Purchased separately       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® Server boards w	PCI E* INTERFACE	PCI Express* 3.0 x8	PCI Express 3.0 x8	PCI Express 3.0 x8	PCI Express 3.0 x8
RAID LEVELS       0,1,10,5,50,6,60       0,1,05,50,6,60       0,1,05,50,6,60       DBDD mode only         CACHE BACKUP OPTIONS       AXXRHFBU7       AXXRHFBU7       AXXRHFBU7       N/A       N/A         CABLES       Purchased separately       Purchased separately       Purchased separately       Purchased separately       Select Intel® Xeon® server boards with a storage I/O       Select Intel® Xeon® server boards with a storage I/O       Select Intel® Xeon® server boards with a storage I/O       Select Intel® Xeon® server boards with a storage I/O       Select Intel® Xeon® server boards with a storage I/O       Select Intel® Xeon® server boards with a storage I/O       Select Intel® Xeon® server boards with a storage I/O       Select Intel® Xeon® server boards with a storage I/O       Select Intel® Xeon® server boards with a storage I/O       Select Intel® Xeon® server boards with a storage I/O       Select Intel® Xeon® server boards with a storage I/O       Select Intel® Xeon® server boards with a storage I/O       Select Intel® Xeon® server boards with a storage I/O       Select Intel® Xeon® server boards with a storage I/O       Select Intel® Xeon® server boards with a storage I/O       Select Intel® Xeon® server boards with a storage I/O       Select Intel® Xeon® Server boards with a storage I/O       Select Intel® Xeon® Server boards with a storage I/O       Select Intel® Xeon® Server boards with a storage I/O       Select Intel® Xeon® Server boards with a storage I/O       Select Intel® Xeon® Server boards with a storage I/O       Select Intel® Xeon® Server boards with a storage I/O       Select Intel® Xeo	PORTS	16 Internal ports	8 Internal ports	8 Internal ports	16 Internal ports
CACHE BACKUP OPTIONS       AXXRMFBU7       AXXRMFBU7       N/A       N/A         CABLES       Purchased separately       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® Server boards with a storage I/O module connector       Select Intel® Xeon® Server boards with a storage I/O module connector       Select Intel® Xeon® Server boards with a storage I/O module connector       Select Intel® Xeon® Server boards with a storage I/O module connector       Select Intel® Xeon® Server boards with a storage I/O module connector       Select Intel® Xeon® Server boards with a stor	CHASSIS COMPATIBILITY	Mezzanine-capable motherboard in 2U (or greater) chassis	Mezzanine-capable motherboard in 1U (or greater) chassis	Mezzanine-capable motherboard in 1U (or greater) chassis	Mezzanine-capable motherboard in 1U (or greater) chassis
CABLES       Purchased separately       Purchased separately       Purchased separately       Purchased separately         INTEL® SERVER BOARD SUPPOR       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Sel	RAID LEVELS	0, 1, 10, 5, 50, 6, 60	0, 1, 10, 5, 50, 6, 60	0, 1, 10, 5, 50 and JBOD mode	JBOD mode only
INTEL® SERVER BOARD Support       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector       Select Intel® Xeon® server boards with a storage I/O module connector         AVAILABILITY       Q2 2017       Q2 2017       Q2 2017       Q2 2017	CACHE BACKUP OPTIONS	AXXRMFBU7	AXXRMFBU7	N/A	N/A
SUPPORT     module connector     module connector     module connector       AVAILABILITY     Q2 2017     Q2 2017     Q2 2017	CABLES	Purchased separately	Purchased separately	Purchased separately	Purchased separately
			<b>U</b> ,	0,	<b>e</b> ;
WARRANTY       3 year limited warranty       3 year limited warranty       3 year limited warranty	AVAILABILITY	Q2 2017	Q2 2017	Q2 2017	Q2 2017
	WARRANTY	3 year limited warranty	3 year limited warranty	3 year limited warranty	3 year limited warranty

## Intel® RAID Controllers (Tri-Mode) - Full-Featured







#### CONTROLLER INTEL® INTEGRATED RAID MODULE RMSP3AD160F

#### INTEL® INTEGRATED RAID MODULE RMSP3CD080F

#### INTEL® INTEGRATED RAID MODULE RMSP3HD080E

DESCRIPTION	Tri-Mode SAS/SATA/PCIe* full-featured RAID mezzanine module with 16 internal ports using four Mini-SAS-HD connectors	Tri-Mode SAS/SATA/PCIe full-featured RAID mezzanine module with eight internal ports using two Mini-SAS-HD connectors	Tri-Mode SAS/SATA/PCIe entry-level RAID mezzanine module with eight internal ports using two Mini-SAS-HD connectors
MARKET SEGMENT	Full-featured RAID	Full-featured RAID	Entry-level RAID
ORDER CODE	RMSP3AD160F	RMSP3CD080F	RMSP3HD080E
PROCESSOR	LSI 3516	LSI 3508	LSI 3408
ONBOARD CACHE MEMORY	4GB DDR4	4GB DDR4	N/A
PCI E* INTERFACE	PCI Express* 3.0 x8	PCI Express 3.0 x8	PCI Express 3.0 x8
PORTS	16 Internal ports	8 Internal ports	8 Internal ports
CHASSIS COMPATIBILITY	Mezzanine-capable motherboard in 2U (or greater) chassis	Mezzanine-capable motherboard in 1U (or greater) chassis	Mezzanine-capable motherboard in 1U (or greater) chassis
RAID LEVELS	0, 1, 10, 5, 50, 6, 60	0, 1, 10, 5, 50, 6, 60	0, 1, 10, 5, 50 and JBOD mode
CACHE BACKUP OPTIONS	AXXRMFBU7	AXXRMFBU7	N/A
CABLES	Purchased separately	Purchased separately	Purchased separately
INTEL® SERVER BOARD SUPPORT	Select Intel® Xeon® server boards with a storage I/O module connector	Select Intel® Xeon® server boards with a storage I/O module connector	Select Intel® Xeon® server boards with a storage I/O module connector
AVAILABILITY	Q2 2017	Q2 2017	Q2 2017
WARRANTY	3 year limited warranty	3 year limited warranty	3 year limited warranty

## Intel<sup>®</sup> RAID Controllers (Tri-Mode) - Entry-Level and JBOD







#### CONTROLLER INTEL® RAID CONTROLLER RSP3WD080E

#### INTEL® INTEGRATED RAID MODULE RSP3QD160J

#### INTEL® INTEGRATED RAID MODULE RSP3GD016J

DESCRIPTION	Tri-Mode SAS/SATA/PCIe* entry-level RAID adapter with eight internal ports using two Mini-SAS-HD connectors	Tri-Mode SAS/SATA/PCIe entry-level JBOD adapter with 16 internal ports using four Mini-SAS-HD connectors	Tri-Mode SAS/SATA/PCIe entry-level JBOD adapter with 16 external ports using four external Mini-SAS-HD connectors
MARKET SEGMENT	Entry-level RAID	JBOD	JBOD
ORDER CODE	RSP3WD080E	RSP3QD160J	RSP3GD016J
PROCESSOR	LSI* 3408	LSI 3416	LSI 3416
ONBOARD CACHE MEMORY	N/A	N/A	N/A
PCI E* INTERFACE	PCI Express* 3.0 x8	PCI Express 3.0 x8	PCI Express 3.0 x8
PORTS	8 Internal ports	16 Internal ports	8 External ports
CHASSIS COMPATIBILITY	MD2 compliant PCIe x8	MD2 compliant PCIe x8	MD2 compliant PCIe x8
RAID LEVELS	0, 1, 10, 5, 50 and JBOD mode	JBOD only mode	JBOD only mode
CACHE BACKUP OPTIONS	N/A	N/A	N/A
CABLES	Purchased separately	Purchased separately	Purchased separately
INTEL® SERVER BOARD SUPPORT	Intel® Server boards + third party boards	Intel® Server boards + third party boards	Intel® Server boards + third party boards
AVAILABILITY	Q2 2017	Q2 2017	Q2 2017
WARRANTY	3 year limited warranty	3 year limited warranty	3 year limited warranty

## Intel<sup>®</sup> Integrated RAID Modules (12Gb/s SAS 3.0)



CONTROLLER	INTEL® INTEGRATED RAID MODULE RMS3CC080	INTEL® INTEGRATED RAID MODULE RMS3CC040	INTEL® INTEGRATED RAID MODULE RMS3HC080	INTEL® INTEGRATED RAID MODULE RMS3JC080
DESCRIPTION	12 Gb/s SAS/SATA full-featured RAID mezzanine module with eight internal connectors and a storage I/O connector	12 Gb/s SAS/SATA full-featured RAID mezzanine module with four internal connectors and a storage I/O connector	12 Gb/s SAS/SATA entry-level RAID mezzanine module with eight internal ports and a storage I/O connector	12 Gb/s SAS/SATA entry-level RAID mezzanine module with eight internal ports and a storage I/O connector
MARKET SEGMENT	Full-featured RAID	Full-featured RAID	Entry-level RAID	Entry-level RAID
ORDER CODE	RMS3CC080	RMS3CC040	RMS3HC080	RMS3JC080
PROCESSOR	LSI* 3108 ROC	LSI* 3108 ROC	LSI* 3008 IOC	LSI* 3008 IOC
ONBOARD CACHE MEMORY	1 GB DDR3	1 GB DDR3	N/A	N/A
PCI E* INTERFACE	PCI Express* 3.0 x8	PCI Express* 3.0 x8	PCI Express* 3.0 x8	PCI Express* 3.0 x8
PORTS	8 Internal ports	4 Internal ports	8 Internal ports	8 Internal ports
CHASSIS COMPATIBILITY	Mezzanine-capable motherboard in 1U (or greater) chassis	Mezzanine-capable motherboard in 1U (or greater) chassis	Mezzanine-capable motherboard in 1U (or greater) chassis	Mezzanine-capable motherboard in 1U (or greater) chassis
RAID LEVELS	0, 1, 10, 5, 50, 6, 60	0, 1, 10, 5, 50, 6, 60	0, 1, 10, 5, 50 and JBOD mode	0, 1, 1E, 10 and JBOD mode
CACHE BACKUP OPTIONS	AXXRMFBU5	AXXRMFBU5	N/A	N/A
CABLES	Purchased separately	Purchased separately	Purchased separately	Purchased separately
	Select Intel <sup>®</sup> Xeon <sup>®</sup> server boards with a storage I/O module connector	Select Intel® Xeon® server boards with a storage I/O module connector	Select Intel <sup>®</sup> Xeon <sup>®</sup> server boards with a storage I/O module connector	Select Intel® Xeon® server boards with a storage I/O module connector
WARRANTY	3 year limited warranty	3 year limited warranty	3 year limited warranty	3 year limited warranty

## Intel<sup>®</sup> Integrated RAID Modules (12Gb/s SAS 3.0) - High Port Count





CONTROLLER	INTEL® INTEGRATED RAID MODULE RMS3AC160	INTEL® INTEGRATED RAID MODULE RMS3VC160
DESCRIPTION	A 12 Gb/s SAS/SATA full-featured RAID mezzanine module with 16 internal ports and dual core RAID-On-Chip (ROC)	A 12 Gb/s SAS/SATA JBOD mezzanine module with sixteen internal ports and dual core RAID-On-Chip (ROC)
MARKET SEGMENT	Full-featured RAID	Full-featured RAID
ORDER CODE	RMS3AC160	RMS3VC160
PROCESSOR	LSI* 3316 ROC	LSI* 3216 ROC
ONBOARD CACHE MEMORY	2 GB DDR3	NA
PCI E* INTERFACE	PCI Express 3.0 x8	PCI Express 3.0 x8
PORTS	16 internal ports	16 internal ports
CHASSIS COMPATIBILITY	Mezzanine-capable motherboard in 2U (or greater) chassis	Mezzanine-capable motherboard in 1U (or greater) chassis
RAID LEVELS	0, 1, 10, 5, 50, 6, 60	N/A (JBOD mode only)
CACHE BACKUP OPTIONS	AXXRMFBU6	ΝΑ
CABLES	Purchased separately	Purchased separately
INTEL® SERVER BOARD SUPPORT	Select Intel® Xeon® server boards with a storage I/O module connector	Select Intel® Xeon® server boards with a storage I/O module connector
WARRANTY	3 year limited warranty	3 year limited warranty

## Intel<sup>®</sup> RAID Controllers (12Gb/s SAS 3.0) - Full-Featured







CONTROLLER	INTEL® RAID CONTROLLER RS3DC080	INTEL® RAID CONTROLLER RS3DC040	INTEL® RAID CONTROLLER RS3SC008
DESCRIPTION	A 12 Gb/s SAS/SATA full-featured RAID adapter (PCIe* AIC) with 8 internal ports	A 12 Gb/s SAS/SATA full-featured RAID adapter (PCIe* AIC) with 4 internal ports	A12 Gb/s SAS/SATA full-featured RAID adapter (PCIe AIC) with 8 external ports
MARKET SEGMENT	Full-featured RAID	Full-featured RAID	Full-featured RAID
ORDER CODE	RS3DC080	RS3DC040	RS3SC008
PROCESSOR	LSI* SAS3108 ROC	LSI* SAS3108 ROC	LSI* SAS3108 ROC
ONBOARD CACHE MEMORY	1GB DDR3	1GB DDR3	1GB DDR3
PCI E* INTERFACE	PCI Express* 3.0 x8	PCI Express 3.0 x8	PCI Express 3.0 x8
PORTS	8 Internal ports	4 Internal ports	8 External ports
CHASSIS COMPATIBILITY	MD2 compliant PCIe x8	MD2 compliant PCIe x8	MD2 compliant PCIe x8
RAID LEVELS	0, 1, 10, 5, 50, 6, 60	0, 1, 10, 5, 50, 6, 60	0, 1, 10, 5, 50, 6, 60
CACHE BACKUP OPTIONS	AXXRMFBU4	AXXRMFBU4	AXXRMFBU4
CABLES	Purchased separately	Purchased separately	Purchased separately
WARRANTY	3 year limited warranty	3 year limited warranty	3 year limited warranty

## Intel<sup>®</sup> RAID Controllers (12Gb/s SAS 3.0) – Entry Level





CONTROLLER	INTEL® RAID CONTROLLER RS3WC080	INTEL® RAID CONTROLLER RS3UC080
DESCRIPTION	A 12 Gb/s SAS/SATA entry-level RAID adapter (PCIe AIC) with 8 internal ports	A 12 Gb/s SAS/SATA entry-level RAID Adapter (PCIe AIC) with 8 internal ports
MARKET SEGMENT	Entry-level	Entry-level
ORDER CODE	RS3WC080	RS3UC080
PROCESSOR	LSI* SAS3008 IOC	LSI* SAS3008 IOC
ONBOARD CACHE MEMORY	N/A	N/A
PCI E* INTERFACE	PCI Express* 3.0 x8	PCI Express 3.0 x8
PORTS	8 Internal ports	8 Internal ports
CHASSIS COMPATIBILITY	MD2 compliant PCIe x8	MD2 compliant PCIe x8
RAID LEVELS	0, 1, 10, 5, 50 and JBOD mode	0, 1, 1E, 10 and JBOD mode
CACHE BACKUP OPTIONS	N/A	N/A
CABLES	Purchased separately	Purchased separately
WARRANTY	3 year limited warranty	3 year limited warranty

## Intel<sup>®</sup> Storage Controllers (12Gb/s SAS 3.0) - JBOD Only





CONTROLLER	INTEL® RAID CONTROLLER RS3GC008	INTEL® RAID CONTROLLER RS3UC080J
DESCRIPTION	A 12 Gb/s SAS/SATA JBOD Adapter (PCIe AIC) with 8 external ports	A 12 Gb/s SAS/SATA JBOD Adapter (PCIe AIC) with 8 internal ports
MARKET SEGMENT	JBOD	JBOD
ORDER CODE	RS3GC008	RS3UC080J
PROCESSOR	LSI* SAS3008	LSI* SAS3008
ONBOARD CACHE MEMORY	N/A	N/A
PCI E* INTERFACE	PCI Express* 3.0 x8	PCI Express 3.0 x8
PORTS	8 External ports	8 Internal ports
CHASSIS COMPATIBILITY	MD2 compliant PCIe x8	MD2 compliant PCIe x8
RAID LEVELS	JBOD mode (SAS Connectivity)	JBOD mode (SAS Connectivity)
CACHE BACKUP OPTIONS	N/A	N/A
CABLES	Purchased separately	Purchased separately
WARRANTY	3 year limited warranty	3 year limited warranty

#### Intel<sup>®</sup> VROC – Virtual RAID on CPU

Intel® VROC is available on Intel® Server Board S2600WF, S2600BP, and S2600ST family boards. It enables RAID levels 0, 1, 10 (Standard) and 5 (Premium) with no RAID write hole. Intel® VROC boasts high IOPS and low latency.



ACTIVATION KEY	PRODUCT NAME	SKU STORAGE FUNCTIONALITY	
VROCSTANMOD	Intel® Virtual RAID on CPU (Standard)	Activation key to support 3rd party NVMe SSDs and enable RAID (0, 1, 10) functionality	
VROCPREMMOD	Intel® Virtual RAID on CPU (Premium)	Activation key to support 3rd party NVMe SSDs and enable Intel® VROC Premium, RAID 0,1,5,10 with RAID Write Hole Closure	
VROCISSDMOD	Intel® Virtual RAID on CPU (Premium)	Activation key to support 3rd party NVMe SSDs and enable Intel® VROC Premium, RAID 0,1,5,10 with RAID Write Hole Closure (for use with Intel® SSD's only)	

## Intel<sup>®</sup> RAID Expanders (12 Gb/s SAS 3.0)





EXPANDER BOARD	INTEL® RAID EXPANDER RES3FV288	INTEL® RAID EXPANDER RES3TV360
DESCRIPTION	12 Gb/s SAS/SATA expander adapter (PCIe AIC) with 28 internal ports and 8 external ports	12 Gb/s SAS/SATA Expander Midplane Board with 36-ports
ORDER CODE	RES3FV288	RES3TV360
PCI E* INTERFACE	PCIe x4 (for Power Only)	N/A
PORTS	28 Internal ports / 8 External ports	36 Internal ports
CHASSIS COMPATIBILITY	MD2 compliant PCIe* x4 or chassis mount	2U (or greater) system; requires chassis mount
POWER OPTIONS FOR EXPANDERS	PCIe x4 or 4-pin Molex	4-pin Molex
MANAGEMENT	SGPIO	SGPIO
FAULT LED HEADERS	Includes 2 pin headers to support each SAS port	Includes 2 pin headers to support each SAS port
WARRANTY	3 year limited warranty	3 year limited warranty

#### Intel<sup>®</sup> RAID Premium Features

These features are available as an upgrade for all LSI\* SAS2208 and SAS3108 processor-based Intel<sup>®</sup> RAID products. To identify products with these processors, please refer to the Processor row of the preceding feature tables. The Premium Feature Keys are described below.

PREMIUM FEATURE	SSD CACHE 2 – 12G SAS only	DRIVE ENCRYPTION MANAGEMENT - 12G SAS and Tri-Mode	
Key Benefits	SSD Cache allows Solid State Drives (SSD) to be utilized as additional cache for the RAID controller. Frequently accessed information is stored in the cache, allowing rapid access.	Drive encryption management enables authentication key management, auto-lock, and instant erase of self-encrypting drives (SED).	
	SSD Cache capacity of up to 2 TB possible for SAS3108-based products.	All drives eventually leave the data center and the use of SEDs helps reduce risk of data breaches.	
	SSD partitioning so that a portion of the drive is available to the operating system and the remainder for cache.	Instant-erase significantly reduces the cost and time of repurposing or retiring drives.	
Order Code	AXXRPFKSSD2	AXXRPFKDE2	

#### **Mounting Brackets**

MOUNTING BRACKET	ORDER CODE	DESCRIPTION	INTERNAL CONNECTORS	EXTERNAL CONNECTORS
Intel® RAID Battery Remote Mounting Bracket	AXXBBUBRKTP	A mounting bracket that fits in a low-profile PCI Express* slot and holds two RAID batteries or Maintenance Free Backup Units.	None	None



#### **Cable Kits and Converter Boards**

The following cables are available for connecting Intel<sup>®</sup> RAID cards and modules to storage devices and drive bays. Intel<sup>®</sup> cables are designed to a high-quality specification and include the ability to bend at a very small radii. These cables allow low-profile Intel RAID products with vertical 8087 connectors to be used in 2U rack chassis while installed in a standard PCI Express\* slot. Intel offers many other cable kits that help optimize the integration of RAID products into specific Intel<sup>®</sup> Server Systems. For a list of these cables, refer to the Server Board and System Configuration Guide available on the support web site for each given Intel Server System.

CABLE KIT ORDER CODE	NUMBER OF CABLES INCLUDED IN KIT	INITIATOR CONNECTOR	TARGET CONNECTOR	LENGTH
AXXCBL650HDMS	2	HD mini-SAS straight <sup>1</sup>	8087 mini-SAS straight <sup>1</sup>	650mm
AXXCBL730HDMS	2	HD mini-SAS straight <sup>1</sup>	8087 mini-SAS straight <sup>1</sup>	730mm
AXXCBL750MS7P	2	8087 mini-SAS straight <sup>1</sup>	Four x 7-pin SATA style	750mm
AXXCBL650MSMS	2	8087 mini-SAS straight <sup>1</sup>	8087 mini-SAS straight <sup>1</sup>	650mm



<sup>1</sup> Cable is reversible so that either connector can be on the target or initiator side. Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products.

The Intel<sup>®</sup> Server Product Marketing Library is designed as a one-stop-shop for all Intel<sup>®</sup> Server Product marketing assets and sales tools. Visit https://www.intelserveredge.com/

#### For the latest product SKUs and specifications, visit http://ark.intel.com

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at www.intel.com. Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more information go to http://www.intel.com/performance.

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# INTEL® ETHERNET SERVER ADAPTERS

Intel<sup>®</sup> Product Quick Reference Matrix **Q3 2018** 



### WHY INTEL® ETHERNET?

Driving continuous innovation for more than 35 years, Intel® Ethernet products deliver a reliable out-of-the-box experience, and proven interoperability for your current and future networking infrastructure.

# INTEL ETHERNET SERVERADAPTERS

Intel<sup>®</sup> Ethernet. It Just Works.

# WHY INTEL<sup>®</sup> ETHERNET?

Driving continuous innovation for more than 35 years, Intel<sup>®</sup> Ethernet products deliver a reliable out-of-the-box experience, and proven interoperability for your current and future networking infrastructure.

## High Compatibility and Broad Interoperability

- Fully tested network adapters and accessories (optics and cables)
- · Hardware and software is thoroughly validated across server and networking ecosystem
- Supports a broad selection of operating systems

### Ease of Use

- Works out of the box
- Automatic and highly optimized configuration setups
- Delivers the right traffic to the right VM with 128 perfect match filters

### Performance Assurance

- Optimized for Intel<sup>®</sup> architecture and broad OSV ecosystem
- Scales with CPU technology, leverages intelligent hardware offloads, network virtualization, and fast packet processing via Data Plane Development Kit (DPDK)

### Worldwide product support

- World-class pre- and post-sales support provide convenient accessibility to customers
- Adheres to global regulatory, environmental, and market requirements
- Long product lifecycle support

### **Broad Product Selection and Accessories**

- Supports all speeds (1/10/25/40GbE) and media types (BASE-T, Fiber, SFP+, QSFP+, SFP28, QSFP28, KR, XAUI, CAUI)
- Available in many different form factors: discrete controller, Intel<sup>®</sup> SoCs, and add-in cards (PCIe\*, OCP, and custom form factors)

Accelerate the delivery of new services and capabilities by increasing the speed and efficiency of your network infrastructure. The Intel® Ethernet 700 Series is the foundation for server connectivity, providing broad interoperability, critical performance optimizations, and increased agility for Telecommunications, Cloud, and the Data Center.

- Interoperability Multiple speeds and media types for broad compatibility backed by extensive testing and validation.
- Optimization Intelligent offloads and accelerators to unlock network performance in servers with Intel® Xeon® processors.
- Agility Both kernel and Data Plane Development Kit (DPDK) drivers for scalable packet processing.

PRODUCT	CONNECTOR & CABLE MEDIUM	CABLING TYPE	INTEL® ETHERNET CONTROLLER	SLOT TYPE, MAXIMUM BUS SPEED & BUS WIDTH	BUS SPEED & BUS WIDTH CONNECTION SPEED	PORTS	SUPPORTED SLOT HEIGHTS	NETWORK VIRTUALIZATION ACCELERATION	STORAGE OVER ETHERNET	ORDER CODES
XXV710-DA1 XXV710-DA2	SFP28 Direct Attach Copper Twinaxial SFP28 LC Fiber Optic Module	Direct Attach Passive Twinaxial 25GbE: up to 5m with RS-FEC, up to 3m with no FEC Direct Attach Passive Twinaxial 10 GbE: up to 15m Multimode Fiber: up to 70m (OM3), up to 100m (OM4) Single-mode Fiber: up to 10km	XL710	PCI Express* v 3.0 8.0 GT/s, x8 Lanes	1 GbE / 10 GbE / 25 GbE	Single and Dual Port	Low Profile and Full Height	Multi-Queue and Stateless Offloads for NVO, such as VXLAN, NVGRE, and GENEVE Enhanced DPDK packet- processing support <sup>1</sup>	iSCSI, NFS, SMB	XXV710DA1, XXV710DA1BLK, XXV710DA2, XXV710DA2BLK
X710-DA2 X710-DA4FHBLK	SFP+ Direct Attach Copper Twinaxial SFP+ LC Fiber Optic Module	Direct Attach Passive Twinaxial: up to 15m Multimode Fiber: up to 300m (OM3), up to 400m (OM4) Single-mode Fiber: up to 10km	X710	PCI Express* v 3.0 8.0 GT/s, x8 Lanes	1 GbE / 10 GbE	Dual and Quad Port	Low Profile (DA2 only) and Full Height	Multi-Queue and Stateless Offloads for NVO, such as VXLAN, NVGRE, and GENEVE Enhanced DPDK packet- processing support <sup>1</sup>	iSCSI, NFS, SMB	X710DA2, X710DA2BLK, X710DA4FH, X710DA4FHBLK
XL710-QDA1 XL710-QDA2	QSFP+ Direct Attach Copper Twinaxial QSFP+ Fiber Optic Module	Direct Attach Passive Twinaxial: up to 7m Multimode Fiber: up to 100m (OM3), up to 150m (OM4) Single-mode Fiber: up to 10km	XL710	PCI Express* v 3.0 8.0 GT/s, x8 Lanes	10 GbE / 40 GbE	Single and Dual Port	Low Profile and Full Height	Multi-Queue and Stateless Offloads for NVO, such as VXLAN, NVGRE, and GENEVE Enhanced DPDK packet- processing support <sup>1</sup>	iSCSI, NFS, SMB	XL710QDA1, XL710QDA1BLK, XL710QDA2, XL710QDA2BLK
Х710-Т4	RJ45 Copper Twisted-pair	Category 6: up to 55m Category 6A or better: up to 100m	XL710	PCI Express* v 3.0 8.0 GT/s, x8 Lanes	100 Mb / 1 GbE / 10 GbE	Quad Port	Low Profile and Full Height	Multi-Queue and Stateless Offloads for NVO, such as VXLAN, NVGRE, and GENEVE Enhanced DPDK packet- processing support <sup>1</sup>	iSCSI, NFS, SMB	X710T4, X710T4BLK

<sup>1</sup> Learn more about DPDK at intel.com/dpdk

All Intel® Ethernet 700 Series and 500 Series Network Adapters include intelligent offloads, are optimized for Data Plane Development Kit (DPDK) and Intel® Ethernet Flow Director, and include these server virtualization attributes: on-chip QoS and traffic management, Flexible Port Partitioning, Virtual Machine Device Queues (VMDq), PCI-SIG\* SR-IOV capable.

# INTEL<sup>®</sup> ETHERNET 500 SERIES NETWORK ADAPTERS

The best choice for 10GBASE-T, the Intel<sup>®</sup> Ethernet 500 Series is a backward compatible with existing 1000BASE-T networks, simplifying the transition to 10GbE when more bandwidth is needed.

- Supports 100Mb, and 1/2.5/5/10GBASE-T
- Low cost, low power
- Optimized for network virtualization overlays

PRODUCT	CONNECTOR & CABLE MEDIUM	CABLING TYPE	INTEL® ETHERNET CONTROLLER	SLOT TYPE, MAXIMUM BUS SPEED & BUS WIDTH	BUS SPEED & BUS WIDTH CONNECTION SPEED	PORTS	SUPPORTED SLOT HEIGHTS	NETWORK VIRTUALIZATION ACCELERATION	STORAGE OVER ETHERNET	ORDER CODES
X550-T1 X550-T2	RJ45 Copper Twisted-pair	Category 6: up to 55m (10 GbE); Category 6A or better: up to 100m (10 GbE); Category 5 or better: up to 100m (1 GbE / 2.5 GbE / 5 GbE)	X550	PCI Express* v3.0 8.0 GT/s, x4 Lanes Operable in x8 and x16 slots	100 Mb / 1 GbE / 2.5 GbE / 5 GbE / 10 GbE	Single and Dual Port	Low Profile and Full Height	Multi-Queue and Stateless Offloads for NVO, such as VXLAN, NVGRE, and GENEVE Enhanced DPDK packet- processing support <sup>1</sup>	iSCSI, FCoE, ² NFS, SMB	X550T1, X550T1BLK; X550T2, X550T2BLK
X540-T1 X540-T2	RJ45 Copper Twisted-pair	Category 6: up to 55m (10 GbE); Category 6A or better: up to 100m (10 GbE); Category 5 or better: up to 100m (1 GbE)	X540	PCI Express* v2.1 5.0 GT/s, x8 Lanes	100 Mb / 1 GbE / 10 GbE	Single and Dual Port	Low Profile and Full Height	RSS for UDP for VXLAN Enhanced DPDK packet- processing support <sup>1</sup>	iSCSI, FCoE, ² NFS, SMB	X540T1, X540T1BLK; X540T2, X540T2BLK
X520-DA2	SFP+ Direct Attach Copper Twinaxial SFP+ LC Fiber Optic Module	Direct Attach Passive Twinaxial: up to 15m; Multimode Fiber: up to 300m (OM3), up to 400m (OM4); Single- mode Fiber: up to 10km	82599ES	PCI Express* v2.0 5.0 GT/s, x8 Lanes	1 GbE / 10 GbE	Dual Port	Low Profile and Full Height	RSS for UDP for VXLAN Enhanced DPDK packet- processing support <sup>1</sup>	iSCSI, FCoE, ² NFS, SMB	E10G42BTDA, E10G42BTDABLK
X520-SR1 X520-SR2	LC Fiber Optic Customer may remove optics as needed.	Multimode Fiber: up to 300m (OM3), up to 400m (OM4)	82599ES	PCI Express* v2.0 5.0 GT/s, x8 Lanes	1 GbE / 10 GbE	Single and Dual Port	Low Profile and Full Height	RSS for UDP for VXLAN Enhanced DPDK packet- processing support <sup>1</sup>	iSCSI, FCoE, ² NFS, SMB	E10G41BFSR, E10G41BFSRBLK; E10G42BFSR, E10G42BFSRBLK
X520-LR1	LC Fiber Optic Customer may remove optics as needed.	Single-mode Fiber: up to 10km	82599ES	PCI Express* v2.0 5.0 GT/s, x8 Lanes	1 GbE / 10 GbE	Single Port	Low Profile and Full Height	RSS for UDP for VXLAN Enhanced DPDK packet- processing support <sup>1</sup>	iSCSI, FCoE, <sup>2</sup> NFS, SMB	E10G41BFLR, E10G41BFLRBLK

<sup>1</sup> Learn more about DPDK at intel.com/dpdk

<sup>2</sup> Support for new operating systems will not be added to FCoE. The last operating system versions supporting FCoE are: Microsoft Windows Server\* 2012 R2, Red Hat Enterprise Linux\* 7.2 & 6.7, SUSE Linux Enterprise Server 11 SP4, 12 SP1; VMware ESX\* 6.0

All Intel® Ethernet 700 Series and 500 Series Network Adapters include intelligent offloads, are optimized for Data Plane Development Kit (DPDK) and Intel® Ethernet Flow Director, and include these server virtualization attributes: on-chip QoS and traffic management, Flexible Port Partitioning, Virtual Machine Device Queues (VMDq), PCI-SIG\* SR-IOV capable.

# INTEL® ETHERNET OPTICS AND CABLES FOR Intel® Ethernet 700 Series and 500 Series Network Adapters

Combine these accessories with Intel Ethernet 700 Series and 500 Series Network Adapters, for dependable interoperability and consistent performance across the network.

INTEL® ETHERNET SFP+ OPTICS	INTEL® ETHERNET SFP+ TWINAXIAL CABLES	INTEL® ETHERNET QSFP+ OPTICS	INTEL® ETHERNET QSFP+ TWINAXIAL CABLES	INTEL® ETHERNET QSFP+ TWINAXIAL BREAKOUT CABLES	INTEL® ETHERNET SFP28 OPTICS	INTEL® ETHERNET SFP28 TWINAXIAL CABLES	INTEL <sup>®</sup> ETHERNET QSFP28 TO SFP28 TWINAXIAL BREAKOUT CABLES
E10GSFPSR = SFP+ SR Optic E10GSFPSRX = SFP+ SRX Optic E10GSFPLR = SFP+ LR Optic	SFP+ to SPF+ copper direct attach cable XDACBL1M = 1 Meter XDACBL3M = 3 Meter XDACBL5M = 5 Meter	E40GQSFPSR = QSFP+ SR Optic E40GQSFPLR = QSFP+ LR Optic		QSFP+ to (4) SFP+ copper direct attach breakout cable X4DACBL1 = 1 Meter X4DACBL3 = 3 Meter X4DACBL5 = 5 Meter	E25GSFP28SR = SFP28 SR Optic	SFP28 to SFP28 copper direct attach cable XXVDACBL1M = 1 Meter XXVDACBL2M = 2 Meter XXVDACBL3M = 3 Meter	QSFP28 to (4) SFP+ copper direct attach breakout cable XXV4DACBL1M = 1 Meter XXV4DACBL2M = 2 Meter XXV4DACBL3M = 3 Meter

# **1GB INTEL® ETHERNET NETWORK ADAPTERS**

PRODUCT	CONNECTOR & CABLE MEDIUM	CABLING TYPE	INTEL® ETHERNET CONTROLLER	SLOT TYPE, MAXIMUM BUS SPEED & BUS WIDTH	PORTS	SUPPORTED SLOT HEIGHTS	HALOGEN FREE	INTELLIGENT OFFLOADS	NETWORK VIRTUALIZATION TECHNOLOGY FOR CONNECTIVITY	STORAGE OVER ETHERNET	INTEL ETHERNET POWER MANAGEMENT <sup>1</sup>	ORDER CODES
I210-T1	RJ45 Copper Twisted-pair	Category 5 or better: up to 100m	1210	PCI Express* v2.1 2.5 GT/s, x1 Lane	Single Port	Low Profile and Full Height	Yes	Yes	Includes Audio-Video Bridging (AVB) support 802.1Qav)	iSCSI, NFS, SMB	Yes	I210T1 I210T1BLK
I350-T4	RJ45 Copper Twisted-pair	Category 5 or better: up to 100m	1350	PCI Express* v2.1 5 GT/s, x4 Lanes	Quad Port	Low Profile and Full Height	Yes	Yes	On-chip QoS and traffic management, Flexible Port Partitioning (FPP), Virtual Machine Device Queues (VMDq), PCI- SIG* SR-IOV capable	iSCSI, NFS, SMB	Yes	I350T4V2
I350-T2	RJ45 Copper Twisted-pair	Category 5 or better: up to 100m	1350	PCI Express* v2.1 5 GT/s, x4 Lanes	Dual Port	Low Profile and Full Height	Yes	Yes	On-chip QoS and traffic management, Flexible Port Partitioning (FPP), Virtual Machine Device Queues (VMDq), PCI- SIG* SR-IOV capable	iSCSI, NFS, SMB	Yes	I350T2V2
1350-F2	LC Fiber Optic	Multimode Fiber OM1 (62.5 μm): up to 275m Multimode Fiber OM2 or better (50 μm): up to 550m	1350	PCI Express* v2.1 5 GT/s, x4 Lanes	Dual Port	Low Profile and Full Height	N/A	Yes	On-chip QoS and traffic management, Flexible Port Partitioning (FPP), Virtual Machine Device Queues (VMDq), PCI- SIG* SR-IOV capable	iSCSI, NFS, SMB	Yes	1350F2 1350F2BLK
1350-F4	LC Fiber Optic	Multimode Fiber OM1 (62.5 μm): up to 275m Multimode Fiber OM2 or better (50 μm): up to 550m	1350	PCI Express* v2.1 5 GT/s, x4 Lanes	Quad Port	Full Height	N/A	Yes	On-chip QoS and traffic management, Flexible Port Partitioning (FPP), Virtual Machine Device Queues (VMDq), PCI- SIG* SR-IOV capable	iSCSI, NFS, SMB	Yes	1350F4 1350F4BLK
1340-F4	LC Fiber Optic	Multimode Fiber OM1 (62.5 μm): up to 275m Multimode Fiber OM2 or better (50 μm): up to 550m	82580	PCI Express* v2.1 5 GT/s, x4 Lanes	Quad Port	Full Height	N/A	Yes	On-chip QoS and traffic management, Flexible Port Partitioning (FPP), Virtual Machine Device Queues (VMDq)	iSCSI, NFS, SMB	N/A	E1G44HF

<sup>1</sup> Learn more about DPDK at intel.com/dpdk

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#### www.intel.com/ethernet

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# INTEL® SERVER MANAGEMENT

Intel<sup>®</sup> Product Quick Reference Matrix **Q3 2018** 

# BUILD. Deploy. Manage.

# SOFTWARE TO BUILD, DEPLOY AND MANAGE SERVERS WITH EASE

Intel® System Management Software is a set of management applications for Intel® Server Products that let you view and control hardware (servers, desktops, and laptops) and software (operating systems, applications, and patches) across your network.

### **REMOTE MANAGEMENT – IT MADE EASY**

The Intel® Remote Management Module (Intel® RMM) helps you to securely gain access and control servers and other devices from any machine on the network—any place, any time. It is all about IT made easy.

# INTEL® SERVER MANAGEMENT

Software to build, deploy and manage servers with ease.

# GET YOUR SERVERS UP AND RUNNING FAST—AND KEEP THEM RUNNING

Intel® System Management Software is a set of management applications for Intel® Server Products that let you view and control hardware (servers, desktops, and laptops) and software (operating systems, applications, and patches) across your network.

Small- and mediumsized businesses (SMBs) face complex IT challenges similar to those of large enterprises, but often without the large budget or staff of IT specialists. Now businesses can simply, smartly, and scalably manage their server hardware with applications and embedded server management tools.

# REMOTE MANAGEMENT -It made easy

The Intel® Remote Management Module (Intel® RMM) helps you to securely gain access and control servers and other devices from any machine on the network—any place, any time. It is all about IT made easy. With features like a full remote access keyboard, video and mouse (KVM), USB media redirection, remote power actions, proactive system health monitoring, and secure, embedded web server, plus a dedicated network connection it is easy to avoid expensive and messy cabling hardware KVM solutions and lower total server management costs with Intel® Remote Management.

For more information, visit www.intel.com/go/servermanagement

### Intel<sup>®</sup> System Management Software

Intel® System Management Software is a set of management applications comprised of Intel® Active System Console and Intel® SNMP Subagent that let you view and control hardware (servers, desktops, and laptops) and software (operating systems, applications, and patches) across your network. Embedded Intel System Management Software is available in two varieties—an Integrated BMC, which has the full IPMI 2.0 stack available for comprehensive remote (out-of-band) or local (in-band) management, or an Integrated BMC web console available without the requirements for any agents and is always accessible, regardless of the state of the operating system.

FEATURES	INTEL® ACTIVE SYSTEM CONSOLE	INTEL® SNMP SUBAGENT	INTEGRATED BMC	INTEGRATED BMC WEB CONSOLE
Install Requirements	Application: Requires agent install on top of operating system	Application: Requires agent install on top of operating system	Embedded: Nothing to install and always running	Embedded: Nothing to install and always running
Server Environment	Small business, mid-market (One to ten servers)	Enterprise and cloud	Enterprise and cloud	All
User Interface	Web-based (Walkup and remote)	Integrates into SNMP-aware enterprise tools	None (Enables IPMI 2.0 connection)	None (Enables IPMI 2.0 connection)
Operating System Support	Windows*, Linux*	Windows*, Linux*	Firmware (All)	Firmware (All)
Network Configuration	Uses existing operating system network	Uses existing operating system network	Requires additional network configured by BIOS or utilities	Requires additional network configured by BIOS or utilities
Single, Easy-to-Use Console	Yes	No	No	Yes
View Operating System and BIOS Information	Yes	Νο	Limited BIOS only	Limited BIOS only
Hardware Predictive Failure Analysis	Yes	Yes	Yes	Yes
Sensor Readings	Yes	Yes	Yes	Yes
Hardware Event Log	Yes	No	Yes	Yes
Alerting	Yes (e-mail and SNMP)	Yes (e-mail and SNMP)	Yes (e-mail and SNMP)	Yes (e-mail and SNMP)
Reporting	Yes	No	No	Yes
BMC Configuration	Yes	No	Yes	Yes
Power Management	Yes	No	Yes	Yes
Remote Management	Yes (If operating system is up)	Yes (If operating system is up)	Yes	Yes
Remote Power On/Off/Reboot	No	Yes (If operating system is up)	Yes	Yes
Serial Over LAN (Console Redirection)	No	No	Yes	Yes
OEM Customization	Yes	No	No	Yes

# SERVER MANAGEMENT

## Intel® Remote Management Module

MODULE

The Intel<sup>®</sup> Remote Management Module (Intel<sup>®</sup> RMM) helps you to securely gain access and control servers and other devices from any machine on the network—any place, any time.

#### INTEL® REMOTE MANAGEMENT MODULE 4

ORDER CODE	AXXRMM4R	AXXRMM4Lite	AXXRMM4LITE2
SUPPORTED SYSTEMS <sup>1</sup>	Select systems based on Intel® Server Boards S1400FP, S2600GL, S2600GZ, S2600CP, S2600CO	Select systems based on Intel® Server Boards S1400FP family, S2600CO, S2600CP, S2600CW family, S2600GL, S2600GZ, S2600KP family, S2600TP family, S2600WT	Select systems based on Intel® Server Boards S2600BP family, S2600ST Family, S2600WF family, and S1200SP Family
DEDICATED SERVER MANAGEMENT NIC	Yes	family	No
EMBEDDED VIDEO / GUI (KVM) REDIRECTION	Yes	Yes	Yes
USB VIRTUAL MEDIA REDIRECTION	Yes	Yes	Yes
REMOTE SERVER RESTART	Feature enabled through BMC firmware	Feature enabled through BMC firmware	Feature enabled through BMC firmware
OEM CUSTOMIZATION	Feature enabled through BMC firmware	Feature enabled through BMC firmware	Feature enabled through BMC firmware
LDAP, SSH, SSL SUPPORT	Feature enabled through BMC firmware	Feature enabled through BMC firmware	Feature enabled through BMC firmware
WS-MAN	No	No	No
EMBEDDED WEB SERVER	Feature enabled through BMC firmware	Feature enabled through BMC firmware	Feature enabled through BMC firmware
LOCAL AND REMOTE CONFIGURATION	Feature enabled through BMC firmware	Feature enabled through BMC firmware	Feature enabled through BMC firmware
AGENT-LESS MANAGEMENT	Feature enabled through BMC firmware	Feature enabled through BMC firmware	Feature enabled through BMC firmware



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For more information, visit www.intel.com/go/servermanagement

<sup>1</sup> For the latest Intel<sup>®</sup> Server Board support, visit http://support.intel.com/support/motherboards/server

All products and dates specified are preliminary based on current expectations and are subject to change without notice. Availability in different channels may vary.

For more complete information about performance and benchmark results, visit www.intel.com/benchmarks

Features and functions of the Intel® Management Packs are dependent on the features and functions available on the server and client hardware and the loaded software and operating systems.

Not all features and functions are available on all products and may require Intel® AMT or IPMI technologies for additional functionality.

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at www.intel.com/go/ servermanagement.

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# INTEL® ACCELERATORS

Intel<sup>®</sup> Product Quick Reference Matrix **Q3 2018** 

# OPTIMIZE VIDEO DELIVERY

# SUPERCHARGE YOUR MEDIA AND GRAPHICS WORKLOADS.

The Intel® Visual Compute Accelerator is designed to optimize video delivery (transcoding and encoding). This new product is the ideal media and graphics solution bringing together the power of Intel® Xeon® Processor E5 with the graphics performance of Intel® Xeon® Processor E3 within one system along with flexible software architecture enabling software vendors to write applications quicker for many different graphics workloads.

### Intel<sup>®</sup> Visual Compute Accelerator 2

#### SUPERCHARGE YOUR MEDIA AND GRAPHICS WORKLOADS

The Intel<sup>®</sup> Visual Compute Accelerator 2 is the second generation PCI Express\* card containing three Intel<sup>®</sup> Xeon<sup>®</sup> Processors E3 v5 designed to deliver cutting edge rendering performance per watt for graphics intensive workloads.<sup>1</sup> For OTT content providers and telecommunications service providers, Intel<sup>®</sup> VCA 2 takes the next step in transcode density, adding HEVC encode into the Quick Sync Video portfolio of accelerated codecs.

In the enterprise domain, security concerns and worker mobility are driving the need for cloud-based remote workstations, while at same time, applications such as AutoCad\* are consuming ever more graphics processing cycles.

The accelerator card provides customers:

- Best-in-class media transcode channel density for Intel® Xeon® processor E5-based systems in communications service provider deployments
- High performance remote graphics for Intel® Xeon® processor E5-based systems in purpose-built clouds and IT datacenters



#### PRODUCT NAME INTEL® VISUAL COMPUTE ACCELERATOR

385LMV
s SPs, Video Cloud Builders (Private Cloud), Enterprise Datacenter
Intel® Xeon® Processor E3-1585L v5 res at 3.0 GHz TDP ⁰ Iris™ Pro graphics P580 (GT4e), 128MB eDRAM
ngth, full-height, double-width PCIe* card
3.0, x16, 8 lanes per processor
2133MHz (1.2V), ECC SODIMMs, 2 channels per processor, 54GB per processor
cluded
S* 7.2, Windows* 10 and Windows Server* 2016 Xen* and KVM hypervisors

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For more information, visit www.intel.com/xeon and ark.intel.com

<sup>1</sup> Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. Check with your system manufacturer or retailer or learn more at www.intel.com.

Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products.

All products and dates specified are preliminary based on current expectations and are subject to change without notice. Availability in different channels may vary.

For more complete information about performance and benchmark results, visit www.intel.com/benchmarks

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# INTEL® OMNI-PATH ARCHITECTURE

Intel<sup>®</sup> Product Quick Reference Matrix **Q3 2018** 

# THE HIGH PERFORMANCE, LOW COST FABRIC FOR HPC

### INTEL® OMNI-PATH ARCHITECTURE

Intel® Omni-Path Architecture (Intel® OPA), an element of Intel® Scalable System Framework, delivers the performance for tomorrow's high performance computing (HPC) workloads and the ability to scale to tens of thousands of nodes—and eventually more—at a price competitive with today's fabrics.

# INTEL<sup>®</sup> OMNI-PATH ARCHITECTURE

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THE HIGH PERFORMANCE, LOW COST FABRIC FOR HPC. INTEL® OMNI-PATH ARCHITECTURE.

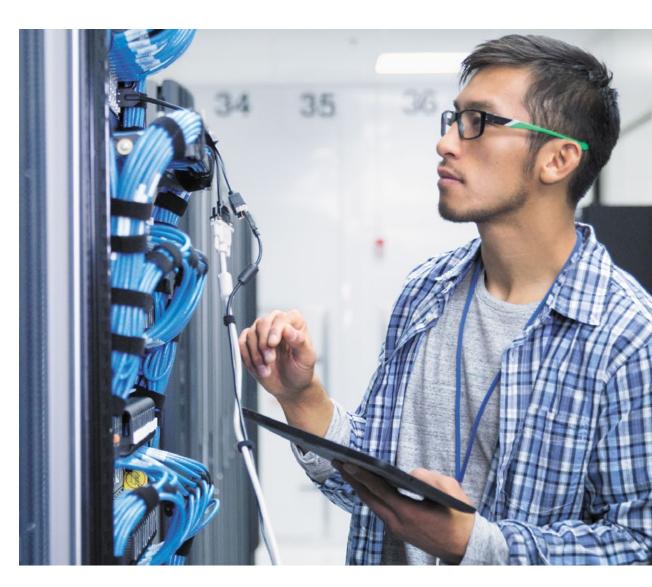
Imagine you could achieve supercomputing-class performance for your HPC fabric, while reducing your infrastructure requirements by as much as 50 percent.<sup>1</sup>

You could use the money you saved to expand your cluster, potentially delivering up to 24 percent more compute power to your scientists and engineers.<sup>2</sup>

That's the transformative power of Intel<sup>®</sup> Omni-Path Architecture, a foundational component of the Intel<sup>®</sup> Scalable System Framework. This end-to-end fabric solution provides 100 Gbps port bandwidth with low latency that stays low even at extreme scale.

With cost-effective scaling from desk-side clusters to exascale supercomputers, Intel Omni-Path Architecture offers world-class fabric solutions for every level of HPC.

For more information, visit www.intel.com/omnipath



### **100GB Host Interfaces**

Designed specifically for HPC, the Intel<sup>®</sup> Omni-Path Host Fabric Interface (Intel<sup>®</sup> OP HFI) uses an advanced connectionless design that delivers performance that scales with high node and core counts, making it the ideal choice for the most demanding application environments. Intel OP HFI supports 100 Gbps per port, which means each Intel OP HFI port can deliver up to 25 GBps per port of bidirectional bandwidth. The same ASIC utilized in the Intel OP HFI will also be integrated into future Intel<sup>®</sup> Xeon<sup>®</sup> processors and used in third-party products.





#### **100GB HOST INTERFACES**

INTEL PART #	100HFA018LS 100HFA018FS	100HFA016LS 100HFA016FS
DESCRIPTION	Single-port PCIe x8 Adapter, Low Profile and Std Height	Single-port PCIe x16 Adapter, Low Profile and Std Height
SPEED	58 Gbps	100 Gbps
PORTS, MEDIA	Single port, QSFP28	Single port, QSFP28
FORM FACTOR	Low profile PCIe Std Height PCIe	Low profile PCIe Std Height PCIe
FEATURES	Passive thermal – QSFP heatsink, supports up to Class 4 max optical transceivers	Passive thermal – QSFP heatsink, supports up to Class 4 max optical transceivers
SANDY BRIDGE	None	None
IVY BRIDGE	None	None
INTEL® XEON® PROCESSOR E5-2600 V3 (HASWELL-EP)	$\checkmark$	$\checkmark$
INTEL® XEON® PROCESSOR E5-2600 V4 (BROADWELL-EP)	$\checkmark$	$\checkmark$

## **Edge Switches**

The next generation of high performance computing (HPC) fabrics use Intel® Omni-Path Architecture to create fabrics that meet the needs of the most demanding set of applications.

The Intel® Omni-Path Edge Switch consists of two models supporting 100 Gb/s for all ports, an entry-level 24-port switch for small clusters and a 48-port switch. The larger switch, in addition to enabling a 48-port fabric in 1U, can be combined with other edge switches and directors to build much larger multitier fabrics.

These Intel Omni-Path Edge Switches are members of the Intel<sup>®</sup> Omni-Path Fabric 100 series of switches, host adapters, and software delivering an exceptional set of high-speed networking features and functions.

### **100GB Host Interfaces**

INTEL PART #	100SWE48UF2 / R2 (2 Power Supplies) 100SWE48QF2 / R2 (2 Power Supplies) 100SWE48UF1 / R1 (1 Power Supply) 100SWE48QF1 / R1 (1 Power Supply)	100SWE24UF2 / R2(2 Power Supplies) 100SWE24QF2 / R2 (2 Power Supplies) 100SWE24UF1 / R1 (1 Power Supply) 100SWE24QF1 / R1 (1 Power Supply)	100SWE48QFH 100SWE48UFH
DESCRIPTION	48 Port Edge Switch ("Q" = mgmt card)	24 Port Edge Switch ("Q" = mgmt card)	Hot Swap Power Supply/Fans 48 Port Edge Switch ("Q" = mgmt card)
SPEED	100 Gbps	100 Gbps	100 Gbps
MAX EXTERNAL PORTS	48	24	48
MEDIA	QSFP28	QSFP28	QSFP28
FORM FACTOR	10	1U	10
FEATURES	Forward / reverse airflow and mgmt card options, up to 2 PSU	Forward / reverse airflow and mgmt card options, up to 2 PSU	Forward airflow and mgmt card options, up to 2 PSU

#### Hot Swap Modules

INTEL PART #	100SWEHSFTF	100SWEHSPSF
DESCRIPTION	Hot Swap Fan Module	Hot Swap Power Supply Module





## **Director Switches**

The Intel® Omni-Path Director Class Switch (Intel® OP Director Class Switch), based on Intel's next generation 48-radix switch silicon, has many innovative features that provide optimum performance for both small and large fabrics. Both switch models are dense form factor designs capable of supporting up to 768 100 Gb/s ports in a low 20U footprint. Designed to be modular alongside edge switches, host adapters, and software, the Intel OP Director Class Switch 100 series enables customers to tailor their system configuration to meet present and future needs.



#### DIRECTOR SWITCHES

INTEL PART #	100SWD24B1N 100SWD24B1D 100SWD24B1A	100SWD06B1N 100SWD06B1D 100SWD06B1A	100SWDLF32Q	100SWDSPINE	100SWDMGTSH
DESCRIPTION	24-slot Director Class Switch, Base Config	6-slot Director Class Switch, Base Config	Director Class Switch Leaf Module	Director Class Switch Spine Module	Director Class Switch Management Module
SPEED	100 Gbps	100 Gbps	100 Gbps	100 Gbps	100 Gbps
MAX EXTERNAL PORTS	768	192	32	N/A	N/A
MEDIA	10/100/1000 Base-T USB Gen2	10/100/1000 Base-T USB Gen2	QSFP28	Internal high speed connections	10/100/1000 Base-T USB Gen2
FORM FACTOR	20U	7U	Half-width module 2 modules per leaf	Full width module, 2 boards/module	Half-width module
FEATURES	Up to 2 mgmt modules, up to 12 PSUs, AC and DC options	Up to 2 mgmt modules, up to 6 PSUs, AC and DC options	Hot swappable	96 internal mid-plane connections,hot swappable	N+1 redundancy,hot swappable

## Intel<sup>®</sup> Omni-Path Cables

Intel® Omni-Path Fabric solutions support a broad array of 3rd party cable types and lengths from the industry's leading providers. These cables, together with the Intel® OPA Packet Integrity Protection feature, provide highly reliable communication links with superior bit error rate (BER) performance.

#### PASSIVE COPPER CABLES

CABLE LENGTH	INTEL® ONMI-PATH PASSIVE COPPER CABLES
0.5M	100CQQF3005; 100CQQH3005 (30 AWG)
1.0M	100CQQF3010; 100CQQH3010 (30 AWG)
1.5M	100CQQH2615 (26 AWG); 100CQQF3015 (30 AWG)
2.0M	100CQQH2620 (26AWG); 100CQQF3202 (30 AWG)
3.0M	100CQQH2630 (26AWG); 100CQQF3030 (30 AWG); 100CQQF2630 (26 AWG)
3.5M*	100CQQH3035 (30 AWG)
4.0M*	100CQQH2640 (26 AWG); 100CQQF3040 (30 AWG); 100CQQF2640 (26 AWG)
5.0M*	100CQQH2650 (26 AWG); 100CQQF2650 (26 AWG)
5.5M*	100CQQH2655 (26 AWG)
6.0M*	100CQQF2660 (26 AWG)

\* Please consult Intel for configuration details. 100CQQx x=Vendor

#### ACTIVE OPTICAL CABLES

#### CABLE LENGTH INTEL® OMNI-PATH ACTIVE FIBRE CABLES

3.0M	100FRRF0030; 100FRRL0030; 100FRRA0030
5.0M	100FRRF0050; 100FRRL0050; 100FRRA0050
10M	100FRRF0100; 100FRRA0050; 100FRRA0100
15M	100FRRF0150; 100FRRL0150; 100FRRA0150
20M	100FRRF0200; 100FRRL0200; 100FRRA0200
30M	100FRRF0300; 100FRRL0300; 100FRRA0300
40M	100FRRF0300; 100FRRL0300; 100FRRA0300
50M	100FRRF0500; 100FRRL0500; 100FRRA0500
60M	100FRRF0600; 100FRRL0600; 100FRRA0600
100M	100FRRF1000; 100FRRL1000; 100FRRA1000

\* 100FFRx x=Vendor

#### For more information, visit www.intel.com/omnipath

#### FOOTNOTES

1 Reduction of infrastructure requirements claim based on a 1024-node full bisectional bandwidth (FBB) Fat-Tree configuration, using a 48-port switch for Intel Omni-Path cluster and 36-port switch ASIC for either Mellanox or Intel<sup>®</sup> True Scale clusters.

<sup>2</sup> Configuration assumes a 750-node cluster, and number of switch chips required is based on a full bisectional bandwidth (FBB) Fat-Tree configuration. Intel® OPA uses one fully-populated 768-port director switch, and Mellanox EDR solution uses a combination of 648-port director switches and 36-port edge switches. Intel and Mellanox component pricing from www.kernelsoftware.com, with prices as of October 20, 2016. Assumes \$6,200 for a 2-socket Intel® Xeon® processor based compute node.

Software and workloads used in performance tests may have been optimized for performance only on Intel<sup>®</sup> microprocessors. Performance tests, such as SYSmark\* and MobileMark,\* are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more information go to http://www.intel.com/performance

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can provide absolute security.

Cost reduction scenarios described are intended as examples of how a given Intel-based product, in the specified circumstances and configurations, may affect future costs and provide cost savings. Circumstances will vary. Intel does not guarantee any costs or cost reduction.

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\* Other names and brands may be claimed as the property of others.

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