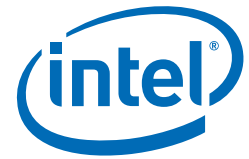


## Product Brief

**Intel® EP80579 Integrated Processor  
with Intel® QuickAssist Technology**

Embedded Computing



# Intel® EP80579 Integrated Processor with Intel® QuickAssist Technology

**Complete System-on-a-Chip for Security, Communications,  
Storage and Embedded Designs**

Based on Intel® architecture, the Intel® EP80579 Integrated Processor with Intel® QuickAssist Technology is among the first in a series of breakthrough system-on-a-chip (SOC) processors, delivering excellent performance-per-watt for small form factor designs in security, communications, storage and embedded applications. This fully pin-compatible product line also includes the Intel® EP80579 Integrated Processor.

This SOC processor delivers a significant leap in architectural design, with an outstanding combination of performance, power efficiency, footprint savings and cost-effectiveness compared to discrete, multi-chip solutions. Featuring embedded lifecycle support, it is ideal for a wide range of applications such as small-to-medium business (SMB) and enterprise security appliances (including VPN/firewall and unified threat management), wireless and WiMax access applications, SMB and home network attached storage, converged IP PBX solutions, converged access platforms, IP media servers and VoIP gateways.

This single-chip design includes an Intel architecture complex based on the Intel® Pentium® M processor, integrated memory controller hub, integrated I/O controller hub and flexible integrated I/O support with three Ethernet MACs, two Controller Area Network (CAN) interfaces and a local expansion bus interface. The design also includes PCI Express\*, High Speed Serial<sup>1</sup> (HSS) ports for TDM or analog voice connectivity, security accelerators for bulk encryption, hashing and public/private key generation.



The Intel QuickAssist Technology initiative consists of a family of interrelated Intel and industry standard technologies that simplify the use and deployment of accelerators on Intel® platforms. The integrated accelerators in this SOC processor support Intel QuickAssist Technology through software packages provided by Intel. These software packages provide the library structures to integrate security and/or VoIP functionality into the application, completely adjunct to the Intel architecture complex, freeing up CPU cycles to support additional features and capabilities. This provides the efficiency of customized hardware with the flexibility to design diverse applications with one platform.

The Intel EP80579 Integrated Processor with Intel QuickAssist Technology includes multiple product offerings with a range of core speeds and thermal design power<sup>2</sup> (TDP), along with an industrial temperature option ideal for communications solutions in unconstrained thermal environments. The processor is software-compatible with previous members of the Intel® microprocessor family, enabling smooth migrations for current x86 developments.

## Flexible Design Options

The Intel EP80579 Integrated Processor with Intel QuickAssist Technology is available in a 1088-ball Flip Chip BGA package and includes a wide range of integrated I/O for flexible design options:

- Three 10/100/1000 Ethernet MACs supporting RGMII or RMII and Management Data Input/Output (MDIO)
- PCI Express\* root complex interface in 1x8, 2x4 or 2x1 configurations
- Three HSS ports for T1/E1 or FXS/FXO connections
- Two USB (1.1 or 2.0) interfaces
- Two SATA (Gen1 or Gen2) interfaces
- 36 General-Purpose I/O (GPIO) ports
- Two CAN 2.0b interfaces
- One synchronous serial port (SSP)
- One local expansion bus for general control or expanded peripheral connections
- Two 16550-compatible UARTs
- Two System Management Bus (SMBus) interfaces
- One Low Pin Count (LPC 1.1) interface
- One Serial Peripheral Interface (SPI) boot interface

### Features

### Benefits

Intel® architecture compatibility	<ul style="list-style-type: none"> <li>▪ Easy migration for existing x86 applications</li> <li>▪ Fully compatible with existing Intel® architecture-based software</li> </ul>
Power-optimized circuitry	<ul style="list-style-type: none"> <li>▪ Multiple frequency/voltage operating points</li> <li>▪ I/O and logic configurations can be powered down for lower power development options</li> <li>▪ Duty cycle configuration management provides reduced switching power</li> <li>▪ Supports S3 (suspend to RAM) for power-efficient sleep modes</li> </ul>
Integrated real-time clock (RTC) support	<ul style="list-style-type: none"> <li>▪ Real-time application and operating system synchronization</li> </ul>
DDR2 memory options	<ul style="list-style-type: none"> <li>▪ DDR2 memory controller supports DIMM or memory down with optional 32-/64-bit and ECC configurations</li> <li>▪ Wide range of memory options from high-performance to power-efficient and cost-effective design configurations</li> </ul>
IEEE 1588* time synchronization hardware assist	<ul style="list-style-type: none"> <li>▪ Real-time network clock synchronization on two Ethernet MACs and CAN interfaces</li> </ul>
Enhanced DMA (EDMA) engine	<ul style="list-style-type: none"> <li>▪ Low latency memory transfers</li> <li>▪ Support for multiple peer-to-peer configurations</li> </ul>
Integrated high-performance security acceleration	<ul style="list-style-type: none"> <li>▪ Algorithms for bulk encryption, hashing, authentication, IKE/PKE and true random number generation through integrated accelerators and security software package supporting Intel® QuickAssist Technology</li> <li>▪ Flexible software architecture choices enable single-chip, small form factor designs for security and communications applications</li> </ul>
Integrated TDM acceleration	<ul style="list-style-type: none"> <li>▪ HDLC channel and voice time slot management</li> <li>▪ T1/E1 WAN connectivity for channelized packet or voice time slot connectivity</li> <li>▪ Analog trunk or POTS connectivity in a single device for small form factor and cost-effective designs</li> </ul>
-40 to 85° C industrial temperature option (1.066 GHz SKU)	<ul style="list-style-type: none"> <li>▪ Supports communications solutions in unconstrained thermal environments</li> </ul>
Pin-compatible with the Intel® EP80579 Integrated Processor	<ul style="list-style-type: none"> <li>▪ Design scalability and feature upgrade simplicity</li> </ul>
Embedded lifecycle support	<ul style="list-style-type: none"> <li>▪ Protects system investment by enabling extended product availability for embedded customers</li> </ul>
Ecosystem support	<ul style="list-style-type: none"> <li>▪ Along with a strong ecosystem of hardware and software vendors, including members of the Intel® Embedded and Communications Alliance, Intel helps to cost-effectively meet development challenges and speed time-to-market</li> </ul>

## Software Overview

Intel provides the following software packages to meet customers' embedded, security and IP telephony needs:

- Intel® EP80579 Software Drivers for Embedded Applications contains all software drivers needed to utilize the hardware features on the integrated processor.
- Intel® EP80579 Software for Security Applications on Intel® QuickAssist Technology builds upon the software drivers for embedded and enables acceleration of cryptographic and packet processing for applications, such as VPN/firewall and unified threat management, wireless and WiMax access applications, and SMB and home network attached storage.
- Intel® EP80579 Software for IP Telephony Applications on Intel® QuickAssist Technology builds upon the software for security applications by adding features for converged IP PBX solutions, converged access platforms, IP media servers and VoIP gateways.

For the most recent software package updates from Intel, please visit: [downloadcenter.intel.com](http://downloadcenter.intel.com)

The following operating system is supported on the Intel EP80579 Integrated Processor with Intel QuickAssist Technology:

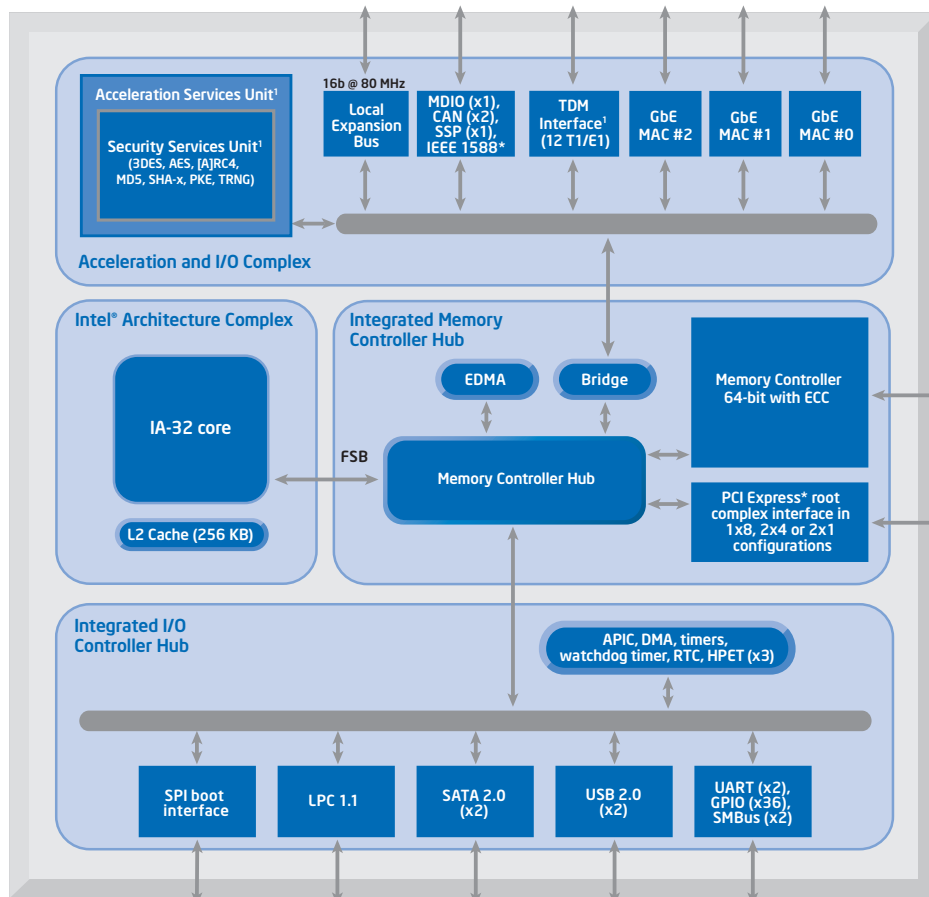
- Red Hat Enterprise Linux\* 5

The following BIOS vendors also support the processor:

- American Megatrends, Inc. (AMI)
- Insyde Software Corp.
- Phoenix Technologies, Ltd.

Contact your preferred vendor or an Intel representative for operating system and BIOS options. Or contact a member of the Intel® Embedded and Communications Alliance for application support ([intel.com/go/ecac](http://intel.com/go/ecac)).

## Block Diagram for the Intel® EP80579 Integrated Processor with Intel® QuickAssist Technology



## Intel® EP80579 Integrated Processor with Intel® QuickAssist Technology

Includes security and TDM acceleration

Product Number	Core Speed	DDR 2 Memory (MHz)	Temperature Range	L2 Data Coherent Cache	Thermal Design Power <sup>2</sup> (estimated)
NU80579EB600C	600 MHz	400/533/667	Commercial 0 to 70° C	256 KB	13 W
NU80579ED004C	1.066 GHz	400/533/667/800	Commercial 0 to 70° C	256 KB	20 W
NU80579ED004CT	1.066 GHz	400/533/667/800	Industrial -40 to 85° C	256 KB	20 W
NU80579ED009C	1.2 GHz	400/533/667/800	Commercial 0 to 70° C	256 KB	21 W

### Intel in Embedded and Communications: [Intel.com/go/embedded](http://Intel.com/go/embedded)

<sup>1</sup> Requires Intel-supplied software for Intel® EP80579 Integrated Processor product line.

<sup>2</sup> TDP specification should be used to design processor thermal solutions. TDP is not the maximum theoretical power the processor can generate.

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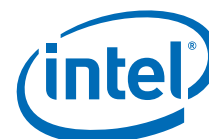
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