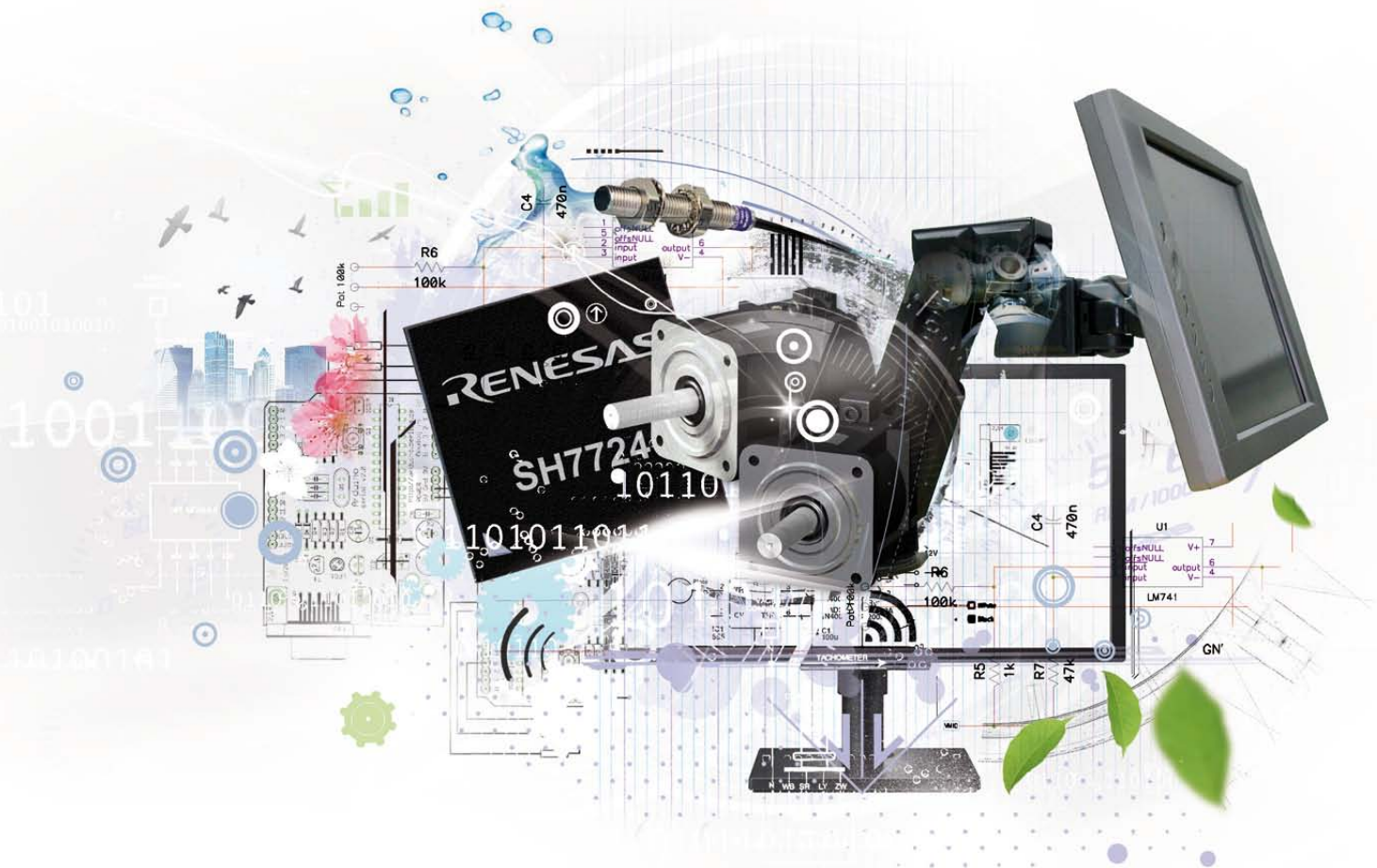


SuperH platform brochure

# 32-bit RISC Microcontrollers



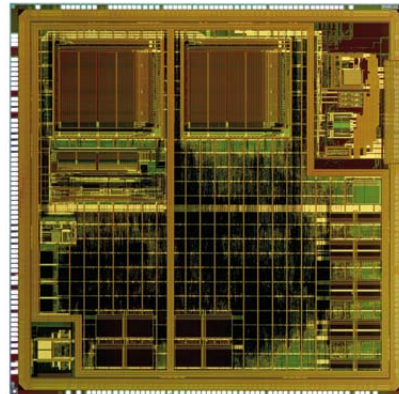
# Introduction

## About Renesas Electronics Corporation

Renesas Electronics Corporation (TSE: 6723), the world's number one supplier of microcontrollers, is a premier supplier of advanced semiconductor solutions including microcontrollers, SoC solutions and a broad-range of analog and power devices. Business operations began as Renesas Electronics in April 2010 through the integration of NEC Electronics Corporation (TSE:6723) and Renesas Technology Corp., with operations spanning research, development, design and manufacturing for a wide range of applications. Headquartered in Japan, Renesas Electronics has subsidiaries in approximately 20 countries worldwide.

More information can be found at [www.renesas.com](http://www.renesas.com)

Renesas Electronics owes its success to its outstanding technology, its excellent quality and to its drive and commitment to listening to customers and meeting their needs. As a result, today Renesas is the world's leading microcontroller company, offering a huge range of 8, 16 and 32-bit microcontrollers.



### These feature:

- > A complete product line-up
- > Outstanding memory integration
- > World-leading embedded Flash technology
- > Leading peripheral integration
- > High-performance CPU's
- > Low power consumption
- > Low EMS / EMI
- > Advanced packaging options

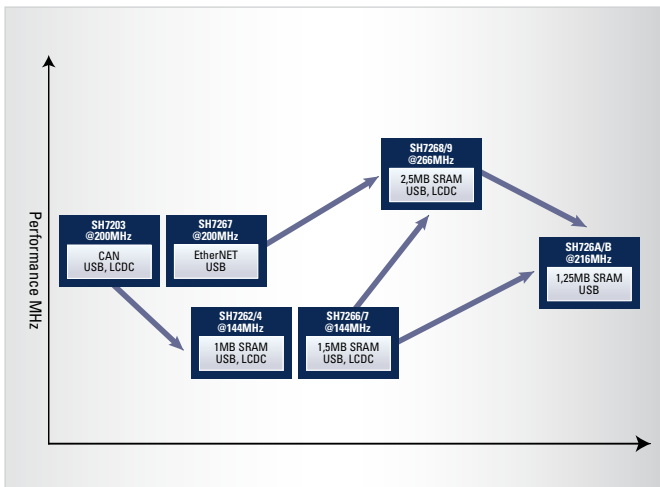
## The SuperH family

The 32-bit RISC SuperH architecture offers the highest performance through its leading-edge technology. It comprises a wide range of optimised, peripheral-rich devices designed for an optimum cost/performance ratio, making it suitable for a wide range of applications including real-time control, high end motor control, multimedia and highly sophisticated user interfaces. The SuperH family is based on three device families which offer upward scalability, software re-usability and an optimised performance, as well as peripheral match for dedicated applications.

- > The SuperH controller (Flash) family is suitable for all high-speed applications, such as factory automation, motor control, induction heating, connectivity and any development where a fast real-time response is required. It features from 16kB to 1MB of integrated MONOS Flash.
- > The SuperH controller (ROMless) family has been designed for general purpose, real-time, connectivity and visualisation applications. These devices do not have an MMU and are therefore suitable for running RTOS and Linux.
- > SuperH processor solutions (SH-3/SH-4A) from 200 to 1000DMIPS provide highly integrated systems comprising various connectivity solutions like USB, PCI or 2-channel G-Ether, with multimedia processing capabilities for audio/video encoding and decoding.



# SuperH controller ROMless product line up



The SuperH controller family includes various ROMless parts. These parts provide several connectivity features, as well as support for visualisation applications. As these devices do not have an MMU on board, they are supported by the Linux Operating System.



## Key benefits of the SuperH controller ROMless platform

### Fast

The SH-2A core is a superscalar core. This means that it can execute two instructions in a single clock cycle. It achieves up to 630DMIPS performance.

### Visualisation

The SuperH controller family features several peripherals to assist in the driving of TFT screens and is supported by a wide range of software to support this functionality. Including up to 2.5MB of integrated SRAM.

### Scaleable

As the middle-ground of the SuperH platform, the SHC-ROMless family allows for significant further expansion with the SuperH processor while also allowing for cost and feature reductions with SuperH controllers with embedded Flash.

### Connectivity

With all the connectivity features that you could wish for on a high-end processor, the SuperH family offers CAN, USB, and Ethernet. The SuperH controller ROMless family has all the connectivity features required for a wide variety of applications and fields.

### Integration

The SH ROMless controller family also incorporates devices with up to 2.5MB of integrated RAM meaning that you can replace the external RAM and video buffer with this internal RAM. Additionally because these devices can run the code from this internal RAM, the external NOR Flash can be replaced by a cheaper serial Flash. This can offer a significant BOM cost saving.

### Easy

With tools including a full Linux Board support package, and several code examples, the SuperH controller ROMless family is very easy to get started with. This, combined with a series of operating systems from a number of vendors to suit all needs means that the SuperH controller family provides an excellent 'straight out of the box' experience.



Device			Memory		Interfaces					
Core	Nickname	Part Number	Size [KB]	RAM [Byte]	I/O /Pins	SPI/ UARTs/ I <sup>2</sup> C	CAN	USB	Ethernet	
SH2A-FPU	SH726A	R5S726A0D216FP#V0	-	64kB URAM + 1.25MB SRAM	120pin	2ch / 5ch / 4ch	-	1ch, F/S H+F	-	
		R5S726A0P216FP#VZ					-			
		R5S726A1D216FP#V0					2ch			
		R5S726A1P216FP#VZ					2ch			
		R5S726A2D216FP#V0					-			
		R5S726A2P216FP#VZ					-			
		R5S726A3D216FP#V0					2ch			
	SH726B	R5S726A3P216FP#VZ	2ch							
		R5S726B0D216FP#V0	-							
		R5S726B0P216FP#VZ	-							
		R5S726B1D216FP#V0	2ch							
	7264	R5S726B1P216FP#VZ	2ch							
		R5S72640W144FP#U0	-	64kB URAM + 1MB SRAM	99 I/O 176-pin	2ch / 8ch / 3ch	-	1ch. H/S H+F	-	
		R5S72641W144FP#U0					1			
		R5S72640P144FP#U0					-			
		R5S72641P144FP#U0					1			
		R5S72644W144FP#U0		-						
		R5S72645W144FP#U0		1						
		R5S72644P144FP#U0		-						
	R5S72645P144FP#U0	1								
	7262	R5S72620W144FP#U0	-	64kB URAM + 1MB SRAM	129 I/O 208-pin	2ch / 8ch / 3ch	-	1ch. H/S H+F	-	
		R5S72621W144FP#U0					1			
		R5S72620P144FP#U0					-			
		R5S72621P144FP#U0					1			
		R5S72624W144FP#U0		-						
		R5S72625W144FP#U0		1						
		R5S72624P144FP#U0		-						
		R5S72625P144FP#U0		1						
SH2A-FPU	7266	R5S72660P144FP#UZ	-	64kB URAM + 1.5MB SRAM	68 I/O 144-pin	2ch / 5ch / 3ch	-	1ch. H/S H+F	-	
		R5S72661P144FP#UZ					1			
		R5S72660W144FP#U0					-			
		R5S72661W144FP#U0					1			
	7267	R5S72670P144FP#UZ	-	64kB URAM + 1.5MB SRAM	92 I/O 176-pin	2ch / 8ch / 3ch	-	1ch. H/S H+F	-	
		R5S72671P144FP#UZ					1			
		R5S72670W144FP#U0					-			
		R5S72671W144FP#U0					1			
	7268	R5S72680P266FP#VZ	-	64kB URAM + 2.5MB SRAM	208pin	-	0	1ch. H/S H+F	-	
		R5S72680W266FP#V0					3			
		R5S72681P266FP#VZ					-			
		R5S72681W266FP#V0					-			
	7269	R5S72690P266BG#UZ	-	64kB URAM + 2.5MB SRAM	-	272 BGA	2ch / 8ch / 4ch	0	1ch. H/S H+F	-
		R5S72690P266FP#VZ						256 LQFP		
		R5S72690W266BG#U0						272 BGA		
		R5S72690W266FP#V0						256 LQFP		
		R5S72691P266BG#UZ						272 BGA		
		R5S72691P266FP#VZ						256 LQFP		
		R5S72691W266BG#U0						272 BGA		
		R5S72691W266FP#V0						256 LQFP		
	7670	R5S76700B200BG	-	32k	-	94 I/O 256-pin	-	-	1ch. H/S H+F	1
		R5S76700D133BG								
		R5S76710B200BG								
		R5S76710D133BG								
		R5S76720B200BG								
		R5S76720D133BG								
		R5S76730B200BG								
		R5S76730D133BG								
SH-2	7619	R4S76190B125BGV	-	16K	78 I/O 176-pin	1ch / 3ch / -	-	-	1 + PHY	
		R4S76190N125BGV								



Device			Memory		Interfaces				
Core	Nickname	Part Number	Size [KB]	RAM [Byte]	I/O /Pins	SPI/ UARTs/ I <sup>2</sup> C	CAN	USB	Ethernet
SH2A-FPU Dual Core	7205	R5S72050W200BG	–	112k	107 / 272	2ch / 6ch / 4ch	2	1ch. H/S H+F	–
	7206	R5S72060W200FPV	–	128K	87 / 176	- / 4ch / 1ch	–	–	–
SH2A-FPU	7203	R5S72030W200FP	–	64K	99 / 240	2ch / 4ch / 4ch	2	1ch. H/S H+F	–
	7201	DS72011RB120FPV	–	32K	123 / 176	- / 8ch / 3ch	2	–	–
		DS72011RW100FPV							
SH2A-FPU	7216	R5F72145BDFA#V1	512	64k	100 / 176	1ch / 5ch / 1ch	1	1ch. F/S F	–
		R5F72146BDFA#V1	768	96kB					–
		R5F72147BDFA#V1	1MB	128kB					–
		R5F72145BDFF#V1	512	64k					–
		R5F72146BDFF#V1	768	96kB					1
		R5F72147BDFF#V1	1MB	128kB					–
		R5F72145BDBG#U1	512	64k					–
		R5F72146BDBG#U1	768	96kB					–
		R5F72147BDBG#U1	1MB	128kB					–
		R5F72145ADFA#V1	512	64k					–
		R5F72146ADFA#V1	768	96kB					1
		R5F72147ADFA#V1	1MB	128kB					–
		R5F72145ADFF#V1	512	64k					–
		R5F72146ADFF#V1	768	96kB					1
		R5F72147ADFF#V1	1MB	128kB					–
		R5F72145ADBG#U1	512	64k					–
		R5F72146ADBG#U1	768	96kB					1
		R5F72147ADBG#U1	1MB	128kB					–
		R5F72165BDFA#V1	512	64k					–
		R5F72166BDFA#V1	768	96kB					–
		R5F72167BDFA#V1	1MB	128kB					–
		R5F72165BDFF#V1	512	64k					–
		R5F72166BDFF#V1	768	96kB					–
		R5F72167BDFF#V1	1MB	128kB					–
R5F72165BDBG#U1	512	64k	–						
R5F72166BDBG#U1	768	96kB	–						
R5F72167BDBG#U1	1MB	128kB	–						
SH2A-FPU	7216	R5F72165ADFA#V1	512	64k	100 / 176	1ch / 5ch / 1ch	1	1ch. F/S F	1
		R5F72166ADFA#V1	768	96kB					–
		R5F72167ADFA#V1	1MB	128kB					–
		R5F72165ADFF#V1	512	64k					–
		R5F72166ADFF#V1	768	96kB					1
		R5F72167ADFF#V1	1MB	128kB					–
		R5F72165ADBG#U1	512	64k					–
		R5F72166ADBG#U1	768	96kB					–
		R5F72167ADBG#U1	1MB	128kB					–
		R5F72145HDFFA#V1	512	64k					–
		R5F72146HDFFA#V1	768	96kB					–
		R5F72147HDFFA#V1	1MB	128kB					–
		R5F72145HDFP#V1	512	64k					–
		R5F72146HDFP#V1	768	96kB					–
		R5F72147HDFP#V1	1MB	128kB					–
		R5F72145HDBG#U1	512	64k					–

Device			Memory		Interfaces				
Core	Nickname	Part Number	Size [KB]	RAM [Byte]	I/O /Pins	SPI/ UARTs/ I <sup>2</sup> C	CAN	USB	Ethernet
SH2A-FPU	7216	R5F72146HDBG#U1	768	96 kB	100 / 176	1ch / 5ch / 1ch	1	1ch. F/S F	1
		R5F72147HDBG#U1	1 MB	128 kB					
		R5F72145GDFA#V1	512	64 k					
		R5F72146GDFA#V1	768	96 kB					
		R5F72147GDFA#V1	1 MB	128 kB					
		R5F72145GDFP#V1	512	64 k					
		R5F72146GDFP#V1	768	96 kB					
		R5F72147GDFP#V1	1 MB	128 kB					
		R5F72145GDBG#U1	512	64 k					
		R5F72146GDBG#U1	768	96 kB					
R5F72147GDBG#U1	1 MB	128 kB	-						
SH2A-FPU	7216	R5F72165HDFA#V1	512	64 k	100 / 176	1ch / 5ch / 1ch	1	1ch. F/S F	-
		R5F72166HDFA#V1	768	96 kB					
		R5F72167HDFA#V1	1 MB	128 kB					
		R5F72165HDFP#V1	512	64 k					
		R5F72166HDFP#V1	768	96 kB					
		R5F72167HDFP#V1	1 MB	128 kB					
		R5F72165HDBG#U1	512	64 k					
		R5F72166HDBG#U1	768	96 kB					
		R5F72167HDBG#U1	1 MB	128 kB					
		R5F72165GDFA#V1	512	64 k					
		R5F72166GDFA#V1	768	96 kB					
		R5F72167GDFA#V1	1 MB	128 kB					
		R5F72165GDFP#V1	512	64 k					
		R5F72166GDFP#V1	768	96 kB					
		R5F72167GDFP#V1	1 MB	128 kB					
		R5F72165GDBG#U1	512	64 k					
		R5F72166GDBG#U1	768	96 kB					
		R5F72167GDBG#U1	1 MB	128 kB					
SH2-A	7211	DF72115D160FPV	512k	32k	81 / 144	1ch / 4ch / 1ch	-	-	-
	7286	R5F72865N100FP#U2	512k	24k	113 / 176	1ch / 5ch / 1ch	1	1ch. F/S F	-
		R5F72865D100FP#U2							
		R5F72865N100FA#U2							
		R5F72865D100FA#U2							
		R5F72866N100FP#U2	768k	32k					
		R5F72866D100FP#U2							
		R5F72866N100FA#U2							
		R5F72866D100FA#U2	1M						
		R5F72867N100FP#U2							
		R5F72867D100FP#U2							
		R5F72867N100FA#U2							
		R5F72867D100FA#U2							
		SH2-A	7285	R5F72855N100FP#U2					
R5F7285D100FP#U2									
R5F72856N100FP#U2	768k			32k					
R5F72856D100FP#U2									
7243	R5F72433N100FP#U0		128k	8k	71 / 100	- / 3ch / -	-	-	-
	R5F72433D100FP#U0								
	R5F72434N100FP#U0	256k	12k						
R5F72434D100FP#U0									

Device			Memory		Interfaces				
Core	Nickname	Part Number	Size [KB]	RAM [Byte]	I/O /Pins	SPI/ UARTs/ I <sup>2</sup> C	CAN	USB	Ethernet
SH-2	7147	DF71476AK64FPV	512 k	16 k	57 / 100	1ch / 3ch / 1ch	1	-	-
		DF71476BD80FPV							
		DF71476BJ80FPV							
		DF71475AK64FPV	384 k	12 k					
		DF71475BJ80FPV							
		DF71474AK64FPV	256 k	16 k					
		DF71474BD80FPV							
DF71474BJ80FPV									
		R5F71474BJ80FPV							
SH2A-FPU	7239	R5F72395AD160FPV	512 k	64 k	69 / 120	1ch / 4ch / -	1	-	-
		R5F72395BD100FPV							
		R5F72375AD160FPV							
		R5F72375AD100FPV	256 k	32 k					
		R5F72394AD160FPV							
		R5F72394BD100FPV							
		R5F72374AD160FPV							
		R5F72374AD160FPV							
SH-2	7142	DF71426AK64FPV	512 k	16 k	57 / 100	1ch / 3ch / 1ch	2	-	-
		DF71426BJ80FPV							
		DF71426BD80FPV							
		DF71424BJ80FPV	256 k	12 k					
		DF71424AK64FPV							
	7136	DF71364AN80FPV	256 k	16 k	60 / 180	1ch / 3ch / 1ch	-	-	-
	7137	DF71374AN80FPV	256 k	16 k	73 / 100	1ch / 3ch / 1ch	-	-	-
		DF71374AD80FPV							
	7146	DF71464AN80FPV	256 k	8 k	57	- / 3ch / -	-	-	-
		DF71464AD80FPV							
		ROM code dependant							
		ROM code dependant							
	7149	DF71464AN80FPV	256 k	8 k	75	- / 3ch / -	-	-	-
		DF71494AD80FPV							
ROM code dependant									
ROM code dependant									
		ROM code dependant							

Core	Device		Memory		Interfaces				
	Nickname	Part Number	Size [KB]	RAM [Byte]	I/O /Pins	SPI/ UARTs/ I <sup>2</sup> C	CAN	USB	Ethernet
SH-2	7125	DF71253N50FPV#Z1	128 k	8 k	45	- /3ch /-	-	-	-
		DF71253D50FPV#Z1							
		DF71253N50FAV#Z1							
		DF71253D50FAV#Z1							
		DF71253N50NPV#Z1							
		DF71253D50NPV#Z1							
		DF71252N50FPV#Z1	64 k						
		DF71252D50FPV#Z1							
		DF71252N50FAV#Z1							
		DF71252D50FAV#Z1							
		DF71251AD50FAV	32 k						
		DF71251AD50FPV							
		DF71251AD50NPV							
		DF71251AN50FAV							
		DF71251AN50FPV							
		DF71251AN50NPV							
		DF71250AD50FAV							
		DF71250AD50FPV							
		DF71250AD50NPV							
		DF71250AN50FAV							
DF71250AN50FPV									
DF71250AN50NPV									
SH-2	7124	DF71243N50FPV#Z1	128 k	8 k	31	- /3ch /-	-	-	-
		DF71243D50FPV#Z1							
		DF71242N50FPV#Z1	64 k						
		DF71242D50FPV#Z1							
		DF71242N50NPV#Z1							
		DF71242D50NPV#Z1							
		DF71241N50FPV	32 k						
		DF71241D50FPV							
		DF71241N50NPV							
		DF71241D50NPV							
		DF71240AD50FPV	16 k						
		DF71240AD50NPV							
		DF71240AN50FPV							
		DF71241D50NPV							



Device			Memory		Interfaces				
Core	Nickname	Part Number	Size [KB]	RAM [Byte]	I/O /Pins	SPI/ UARTs/ I <sup>2</sup> C	CAN	USB	Ethernet
SH3-DSP	SH7712	HD6417712BP	32K unified Cache	16K	256-pin	2 SCIF 2 SIOF	-	-	2ch 10/100 Mbps (with Bridge)
		HD6417712F							
	SH7713	HD6417713BP	32K unified Cache	16K	256-pin	2 SCIF 2 SIOF	-	-	1ch 10/100 Mbps
		HD6417713F							
SH-4A	SH7723	R8A77230C400BG	32K (instr.) 32K (data) 256K (L2 cache)	16K 128K (high speed)	449-pin	6 SCIF 2 SPI I <sup>2</sup> C IrDA	-	1 USB 2.0 Select. Host/ Function (high speed support)	-
		R8A77230D400BG							
SH-4A	SH7724	R8A77240D500BG	32K (instr.) 32K (internal) 256K L2	18K SRAM 128K MERAM	449-pin	6 SCL 2 I <sup>2</sup> C 2 MSIOF	-	2 select. Host/ Function Highspeed/Full-speed/Lowspeed	1 ch 10/100 Mbit
	SH7763	R5S77630AY266BGV	32K (instr.) 32K (data)	16K	449-pin	3 SCIF 3 SIOF 2 I <sup>2</sup> C	-	1 select. Host/ Function (full speed support)	2ch 10/100/1000 Mbps (Gbit)
		R5S77631AY266BGV							
		R5S77632AY266BGV							
	SH7764	R5S77640N300BG	32K (instr.) 32K (data)	16K	404-pin	3 SCIF 1 I <sup>2</sup> C	-	1 USB 2.0 Select. Host/ Function (high speed support)	1ch 10/100 Mbps
R5S77640P300BG									
SH7780	R8A77800	32K (instr.) 32K (data)	16K (high-speed) 32K (medium-speed)	449-pin	2 SCIF 1 SIOF 1 SPI	-	-	-	
SH-4A	SH7785	R8A77850A	32K (instr.) 32K (data)	8K (high-speed) 16K (high-speed) 128K (medium-speed)	436-pin	6 SCIF 1 SIOF 1 SPI	-	-	-
ARM Cortex A9	EM EV2	μPD77642BF1-GA9-A	32K (instruction) 32 (internal) 256K L2 cache 64KB ROM	128KB	393-pin	6ch USI / SPI 4ch UART 1ch I <sup>2</sup> C 2ch SDIO	-	1ch USB Host 1ch USB Func.	-

## SH7239F

### SH2A CPU Core

- > 160MHz = 384DMIPS
- > 100MHz = 240DMIPS
- > 2 instructions executed per clock tick
- > Integrated FPU

### On Chip memory

- > 512kB-256kB MONOS Flash
- > 64kB-32kB on chip RAM
- > BSC for external Memory 40/50MHz 16bit
- > 32kB DataFlash

### Analogue

- > ADC: 2x8ch 12bit  
- 1.0us Conversion time

### Connectivity

- > 1 x RSPI
- > 4 x SCI(F)
- > 1x CAN (RCAN-ET)

### Timers

- > MTU2 – 6ch 16bit timer for Motor Control
- > MTU2S – 3ch 16bit timer for Motor Control
- > CMT – 2ch 16bit timer
- > Watchdog Timer

### Other

- > 8ch DMA
- > Data Transfer Controller (DTC)

### Debug

- > UBC with 2 break channels
- > H-UDI for JTAG

### Digital I/O

- > 91-101 I/O pins  
(+ 8-12 input only)

### Power Supply Voltage

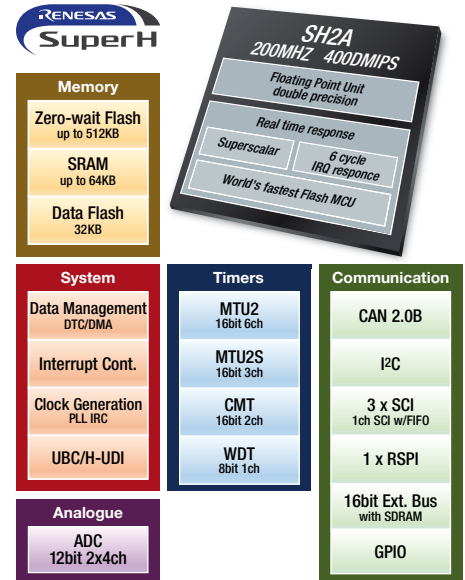
- > 5.0V +/- 0.5V for Analogue
- > 5.0V +/- 0.5V OR 3.3V +/- 0.3V for I/O

### Packages

- > LQFP-120 (16 x 16 mm<sup>2</sup>, 0.5 mm pitch)

### Temperature ranges

- 40 -> +85°C



## SH7216F

### SH2A CPU Core

- > 200MHz = 480DMIPS
- > 2 instructions executed per clock tick
- > Integrated FPU

### On Chip Memory

- > 1M-512kB MONOS Flash
- > 128-64kB on chip RAM
- > BSC for external Memory 50MHz 32bit
- > 32kB DataFlash

### Analogue

- > ADC: 2x4ch 12bit  
- 1.0us Conversion time

### Connectivity

- > 1 x RSPI
- > 5 x SCI(F)
- > 1 x IIC
- > 1x CAN (RCAN-ET)
- > 1x Ether MAC with EDMAC 10/100
- > 1x USB Full Speed Function

### Timers

- > MTU2 – 6ch 16bit timer for Motor Control
- > MTU2S – 3ch 16bit timer for Motor Control
- > CMT – 2ch 16bit timer
- > Watchdog Timer

### Other

- > 8ch DMA
- > Data Transfer Controller (DTC)

### Debug

- > UBC with 2 break channels
- > H-UDI for JTAG
- > Advanced User Debug

### Digital I/O

- > 91-101 I/O pins  
(+ 8-12 input only)

### Power Supply Voltage

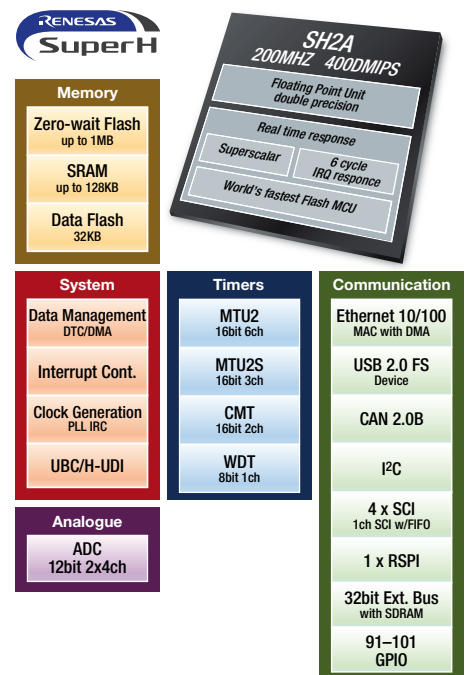
- > 5.0V +/- 0.5V for Analogue
- > 3.3V +/- 0.3V for I/O

### Packages

- > LQFP-176 (20 x 20 mm<sup>2</sup>, 0.4 mm pitch)
- > LQFP-176 (24 x 24 mm<sup>2</sup>, 0.5 mm pitch)
- > BGA 176 (13 x 13 mm<sup>2</sup>, 0.8 mm pitch)

### Temperature ranges

- 40 -> +85°C



## SH7268 and SH7269 in Detail

### High Efficient 32bit CPU Core

- > 266 MHz CPU Clock Frequency
- > 2 Execution Units delivering 640 Dhrystone MIPS

### Single and Double Floating Point Unit compliant with IEEE754

- > Accelerates e.g. trigonometric operations like rotation

### High-Density up to 2.5 MByte internal RAM

- > 1 Bus cycle access time

### 2D-Graphics Engine (RGPVG): OpenVG 1.1

- > Full support for Khronos OpnVG1.1 API
- > Re-rendering, Animation and Acceleration OpenVG w/o CPU

### Support for Booting from QSPI Flash Memory and NAND Flash Memory

- > New Approach. lot of SRAM instead of FLASH
- > External SPI serial flash is extremely cheap compared to onChip Flash
- > Very flexible: 128Kbit - 512Mbit serial Flash

### LCD Controller VGA with 24bit interface

- > 3 layers overlay
- > Dot and window Alpha Blending
- > Chroma Keying

### CMOS Camera Sensor Interface

- > 8bit @ 27 MHz
- > ITU.BT 601/650 (PAL/NTSC)

### Bus Interface Controller for glue less connection of

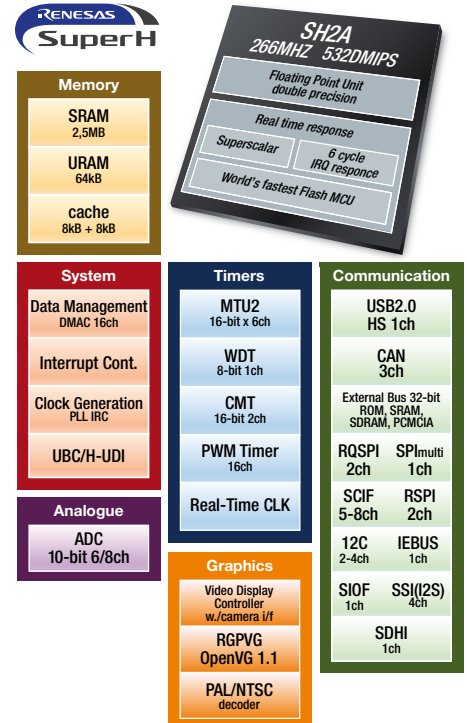
- > SRAM, SDRAM, NOR, NAND, eMMC Flash Memory
- > 16KB cache

### USB 2.0 Host and Function Controller with integrated USB Transceiver

### Up to 3 CAN channels

### Package

- > SH7268 208-pin QFP (0.5 mm)
- > SH7269 272-pin BGA (0.8mm) /256-pin QFP (0.4mm)



## SH7724 – Leading Edge Multimedia + Connectivity

### SH4A-FPU CPU Core @ 500MHz

- > 900 DMIPS + 3.5 GFLOPS FPU
- > 64kB L1 Cache + 256kB L2 Cache

### DDR2 / Mobile-DDR

- > 333Mhz up to 512Mbytes

### Multimedia Support

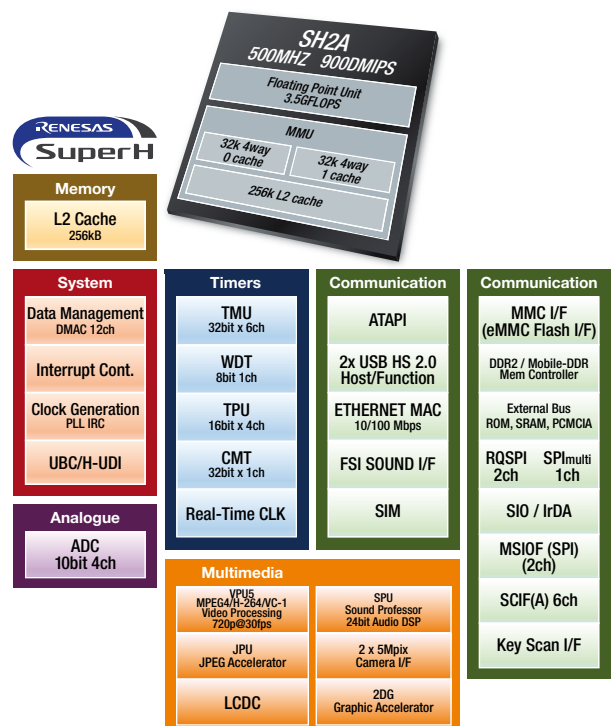
- > VPU5F - Video Codec Engine
  - H.264 / MPEG4 / VC-1
  - 720p video processing @30fps
  - Two-stream video enc/dec
- > JPU - JPEG Codec Engine
- > SPU2 - (24bit Audio DSP)

### Peripherals / Connectivity

- > LCDC : 16/18/24bit RGB and YUV + VOU: 1ch
- > 2DG : High performance 2D rendering engine
- > SDHI : 2ch for (CPRM Option)
- > MMC4.2 : 1ch (CE-ATA/NAND Flash I/F)
- > USB2.0 HS : 2ch (2ch Host or 1ch Function)
- > Ethernet MAC : 1ch 10/100base

### Package

- > BGA 449 (21 x 21 x 1.9 mm, 0.8 mm pitch)



# Tools

## Renesas Starter Kit (RSK)

### The kit includes:

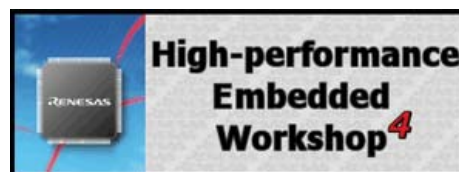
- > CPU board with target microcontroller
- > LCD panel for user/diagnostic interaction
- > E10 on-chip debugger
- > Trial C compiler and IDE
- > Tutorial session
- > Sample peripheral driver code



## High-performance Embedded Workshop

Renesas has developed a fully integrated development environment known as High-performance Embedded Workshop (HEW). HEW pulls together all of the development tasks into one easy-to-use application.

- > Code development
- > Project management
- > Integrated debugger
- > Compiler integration
- > Flash programmer



### Emulator line up

A range of emulators is available for the SuperH family, ranging from the low-cost E8 Flash programmer up to the E200F tool, integrating all the real-time trace required for an application. All RSKs now come with an 'E10A lite – for starterkits' as standard.

## A wide range of boards and operating systems supported for all SuperH devices

### SuperH controllers

These are supported by a wide range of real-time operating systems from a number of different suppliers, as well as Linux.

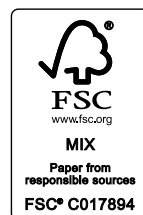


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Before purchasing or using any Renesas Electronics products listed herein, please refer to the latest product manual and/or data sheet in advance.

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**RENESAS**



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[STM8TL53G4U6](#) [PIC16F877-04/P-B](#) [R5F10Y17ASP#30](#) [CY8C3MFIDOCK-125](#) [403708R](#) [MB95F354EPF-G-SNE2](#) [MB95F564KPFT-G-SNE2](#) [MB95F564KWQN-G-SNE1](#) [MB95F636KP-G-SH-SNE2](#) [MB95F636KPMC-G-SNE2](#) [MB95F694KPMC-G-SNE2](#) [MB95F778JPMC1-G-SNE2](#) [MB95F818KPMC-G-SNE2](#) [MC908QY8CDWER](#) [MC9S08PT16AVLD](#) [MC9S08PT32AVLH](#) [MC9S08PT60AVLC](#)  
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