

# INDEX

Subjects	Products Suppliers	Page	
1. CPU & PERIPHERAL	Embedded Processor	Motorola / NS / Hitachi / Intel	2-10
	Microcontroller	Atmel / Intel / Motorola / Hitachi / NS / Microchip	10-26
	CPU Peripherals	NS / Intersil / Intel	27-29
	DSP	Motorola	29-30
	Voice Recognition	Sensory	31-31
2. MEMORY	Flash Memory	Atmel / Intel / Hitachi	32-35
	EPROM	Atmel	36-36
	EEPROM	Atmel / Ramtron	36-39
3. COMMUNICATION	Telecom	Intersil / NS	40-42
	Wireless Comm	Motorola / Intersil	42-48
	Network	NS	49-49
	Interface	Intersil / NS	50-56
4. LOGIC	TTL / CMOS / ECL	Hitachi / On Semi	57-69
	PLD	Lattice	69-77
5. LINEAR	OP-Amp	NS / On Semi / Hitachi	78-81
	Comparator	NS / On Semi / Hitachi	81-83
	Voltage / Current Reference	NS / On Semi	83-84
	Regulator	NS / On Semi / Hitachi	84-87
	LDO	NS / On Semi	88-91
	Switching Regulator	NS / On Semi / Hitachi	91-95
	Data Acquisition	NS / Intersil	95-101
	Audio Amp	NS	101-103
	Power Driver	Allegro / Toshiba	103-105
6. DISCRETE	Diode	Vishay / GS / On Semi / Taiwan Semi	106-119
	Transistor	Vishay / Others	120-124
	FET	Vishay / IR	125-137
	Thyristor	On Semi	138-141
7. POWER MODULE	Diode / FET / TR Module	Sanrex	142-145
	Thyristor / IGBT Module	Sanrex	145-150
8. OPTO-DEVICE & SENSOR	Opto-Device	Vishay / Sharp / Agilent / Toshiba	151-161
	Sensor	NS / Allegro	161-162
9. DISPLAY & DISPLAY DRIVER	LED	Everlight / Agilent	163-165
	LCD Module	Other	166-168
10. PASSIVE COMPONENTS	Resistor / Capacitor / Osillator	Rawmat / Vishay / JTC / Panasonic	169-173
	Noise Suppression	Okaya	173-174
	Switch	Otax / Hartmann	175-176
	Potentiometer	Sakae / Vishay / Tocos	177-180
	Terminal	Mac8	181-181
	11. MECHANICAL PRODUCTS	IC Socket / Tool	Preci-Dip / TZT / 3M
Connector		Hirose / TZT	190-195
Heat Sink		Segyung	196-196
PCB / Supporter / Rack / Cool Sheet		Wisher / Segyung / Sunhayato	197-202
Cassette		Segyung	203-203
Motor / Fan		Japan Servo	204-205
12. POWER SUPPLY		SMPS / DC-DC	Densei-Lambda / Ault Korea
13. APPENDIX	Linear Product pin connection diagrams		216-226
	Power Driver Product pin connection diagrams		227-227
	Logic Product pin connection diagrams		228-238
	Microcontroller Product pin connection diagrams		238-239
	Memory Product pin connection diagrams		239-241
	Semiconductor Company Homepage Address		242-245

\*NS : National Semiconductor, GS : General Semiconductor,  
 IR : International Rectifier, TZT : Taiwan Zetatronic

\*Notes : 1) Please contact your nearest Segyung Bristestone Sales Shops if you need help in the Catalog.  
 2) Segyung Bristestone may not keep all the inventory of products in the Catalog.  
 Please kindly inquire to Bristestone Sales Persons for the products out of inventory.

# EMBEDDED PROCESSOR

## Motorola PowerPC Products

### PowerPC 600 Series Microprocessor



Product	Processor Speed (MHz)	Bus Interface (Bits)	Cache-L1 Instructional (KBytes)	Cache-L1 Data (KBytes)	Voltage (V)	I/O Voltage (V)	Int. Voltage (V)	Performance
MPC603E	100, 133, 166, 200, 266, 300	64 & 32 bit modes	16	16	3.3 @133MHz	3.3 @200MHz & 300 MHz	2.5 @200MHz & 300MHz	188 @133MHz, 283 @200MHz, 423 @300MHz
MPE603E	100, 133, 166, 200, 266, 300	64 & 32-bit modes	16	16	-	3.3	2.5	188 @133MHz, 283 @200MHz, 423 @300MHz

### PowerPC 700 Microprocessor Product Family

Product	Processor Speed (MHz)	Bus Interface (Bits)	Cache-L1 Instructional (KBytes)	Cache-L1 Data (KBytes)	L2 Cache (Max) (KBytes)	I/O Voltage (V)	Int. Voltage (V)	Performance
MPC740	200,233,266,300,333	64	32KB	32KB	up to 1024	3.3	2.6	488 @266MHz, 610 @333MHz
MPC750	200,233,266,300,333,366,400	64	32KB	32KB	1024	3.3	2.6	488 @266MHz, 733 @400MHz
MPC755	300, 350, 400	32/64	-	-	256, 512 1M	1.8/3.3	2	-

### PowerPC 7000 Microprocessor Product Family

Product	Processor Speed (MHz)	Bus Interface (Bits)	Cache-L1 Instructional (Kbytes)	Cache-L1 Data (Kbytes)	L2 Cache (Max) (Kbytes)	I/O Voltage (V)	Int. Voltage (V)	Performance
MPC7400	350, 400, 450	64	-	-	512, 1024, 2048	1.8, 2.5, 3.3	1.8, 2.5	825 @450MHz

### MPC1XX Support and Peripheral Products

Product	Processor Speed	Bus Interface (Bits)	Memory (MHz)	I/O Voltage (V)	Feature
MPC106	supports 603e/740/750/7400	64 & 32	Interface at 25 - 100 MHz	3.3, 5	PCI Bridge / Memory controller for PowerPC
MPC107	supports 603e/740/750/7400	64 & 32	Interface at 25 - 100 MHz	3.3, 5	

### PowerPC 800 Microprocessor Product Family

Product	Processor Speed (MHz)	Drystone Performance (MIPS)	Cache-L1 Instructional (Kbytes)	Cache-L1 Data (Kbytes)	Translation Lookaside Buffers	FPU Floating Point Unit	Parallel (Bits)
MPC801	40	52 @40MHz	2	1	8-entry	-	-
MPC823	81	105 @80MHz	-	-	8-entry	--	53
MPC823E	81	105 @80MHz	16	8	8-entry	--	53
MPC850	80	105 @80MHz	2	1	8-entry	-	53
MPC855T	80	105 @80MHz	4	4	32-entry	--	59
MPC860	80	105 @80MHz	4	4	32-entry	N/A	59

### PowerPC 8000 Microprocessor Product Family

Product	Processor Speed (Max) (MHz)	Drystone Performance (MIPS)	Cache-L1 Instructional (Kbytes)	Cache-L1 Data (Kbytes)	Translation Lookaside Buffers	FPU Floating Point Unit	Parallel (Bits)
MPC8240	-	-	16	16	64-entry	Yes	64
MPC8260	-	-	-	-	-	-	-

## ColdFire Microprocessor

### MCF5XXX Family of Microprocessors



Product	Frequency	Voltage	Power Dissipation (typ) (Watts)	Performance (Max) (MIPS)	Bus Interface (Bits)	Cache-L1 Inst/Data (Kbytes)	Memory (Kbytes)	Process
MCF5407	162	1.8V, 3.3V	-	257	32-Bits, Dynamic	16KB/8KB	4K SRAM	0.22 $\mu$ TLM
MCF5307	66, 90	3.3V	0.95W	70	32-Bits, Dynamic	8K Unified	4K SRAM	0.35 $\mu$ TLM
MCF5206E	40, 54	3.3V	340mW, 460mW	-	32-Bits, Dynamic	4K I-Cache	8K SRAM	0.35 $\mu$ TLM
MCF5206	16, 25, 33	5V	388mW, 554mW, 722mW	17	32-Bits, Dynamic	512 Bytes/ -	512 Bytes SRAM	0.8 $\mu$ TLM
MCF5204	16, 25, 33	5V	320mW, 475mW, 625mW	13.5	32-Bit Add/ 16-Bit Data	512 Bytes/ -	512 Bytes SRAM	0.65 $\mu$ TLM
MCF5202	16, 25, 33	5V	302mW, 448mW, 589mW	27	32-Bit, Dynamic	2K Unified	-	0.65 $\mu$ TLM
MCF5102	16, 20, 25, 33, 40	3.3V	640mW	44	32-Bit, Dynamic	2KB/1KB	-	0.42 $\mu$ TLM

## M683XX Microprocessor

### 3XX Series - 68K Family of Microprocessors

Product	Processor Speed (MHz)	Performance_1 (MIPS)	Cache-L1 Instructional (Kbytes)	Cache-L1 Data (Kbytes)	FPU (Floating Point Unit)	Memory	Voltage
MC68302	16, 20	1.6 (MC68000 Core)	-	-	Yes 68881	No On-Chip MMU	5
MC68306	16, 20	2.7	-	-	-	-	5V
MC68307	16	2.7	-	-	-	-	3.3V, 5V
MC68328	16	2.7 @ 16MHz	-	-	-	-	3.3 - 5.0
MC68EZ328	20	3.4 @ 20 MHz	-	-	-	-	3.0 - 3.6
MC68VZ328	33	5.4 @ 33 MHz	-	-	-	-	2.7 - 3.3
MC68340	16, 25	4.8	-	-	-	-	3.3V, 5V
MC68360	25, 33	8.3 @33MHz	4	4	--	--	3.3, 5

## M680X0 Microprocessor

### 0X0 Series - 68K Family of Microprocessors

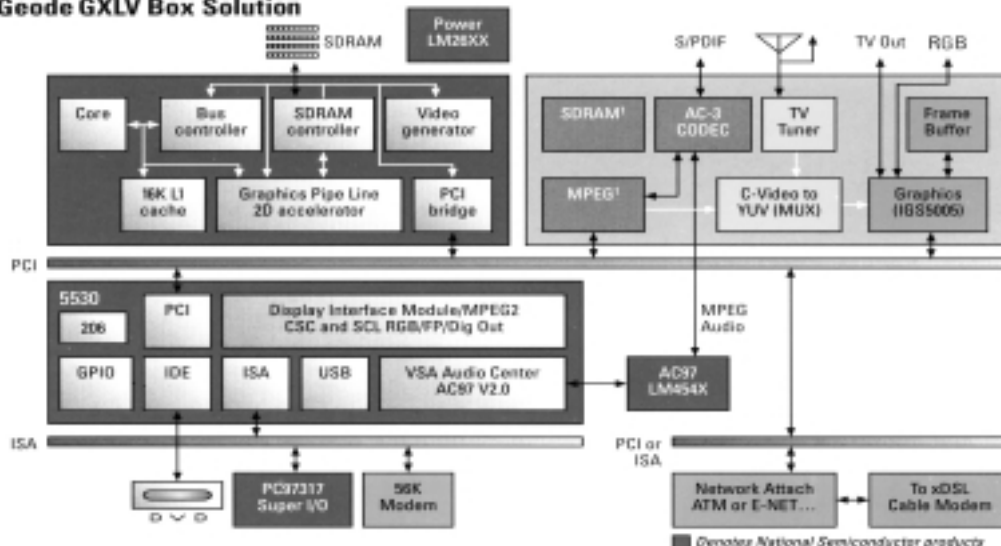
Product	Processor Speed (MHz)	Performance_1 (MIPS)	Cache-L1 Instructional (Bytes)	Bus Interface (Bits)	Memory	Voltage
MC68060	50, 66, 75	110	8K	32-Bit	MMU	3V, 5V
MC68040	25, 33, 40	44	4K	32-Bit	On-Chip MMU	3.3V, 5V
MC68030	16, 20, 25, 33, 40, 50	18	256 Bytes	32-Bit, Dynamic	On-Chip MMU	-
MC68020	12, 16, 20, 25, 33	10	256 Byte I-Cache	32-Bit, Dynamic	-	-
MC68000	8, 10, 12, 16, 20	2	-	-	-	3.3V, 5V
MC68882	-	-	-	-	-	-

## National Semiconductor Integrated X86 Processor (Geode™)



Product	Feature	Speed	Technology	Power Consumption	Voltage	Package
Geode GXm	Integrated X86 with MMX	up to 266MHz	0.35 um	-	core - 2.9V I/O - 3.3V	352-BGA 320-SPGA
Geode GXLV	Low Power Integrated X86 with MMX	up to 266MHz	0.25 um	1.0W @2.2V/166MHz 2.5W @2.9V/266MHz	core - 2.2V, 2.5V, 2.9V I/O - 3.3V	352-BGA 320-SPGA
Geode GX1	Low Power Integrated X86 with MMX	up to 266MHz	0.35 um	0.8W @1.6V/200MHz 1.2W @2.0V/300MHz	core - 1.6V, 1.8V, 2.0V I/O - 3.3V	352-BGA 320-SPGA

**Geode GXLV Box Solution**



## Hitachi SuperH RISC Engine Family



Series No.	Type No.	ROM (byte)	RAM (byte)	Cache (byte)	Operating voltage / Operating frequency	Dhry-stone	Multiply and accumulate	BSC	Timer	DMAC (channels)	SCI (channels)	A/D converter	Package
SH7020	HD6417020		1k		5.0V/20MHz, 3.3V/12.5MHz	26MIPS (20MHz)	161632/1616+4242	SRAM/DRAM	5	4	2		TFP-100B
SH7020	HD6437020	16k	1k		5.0V/20MHz, 3.3V/12.5MHz	26MIPS (20MHz)	161632/1616+4242	SRAM/DRAM	5	4	2		TFP-100B
SH7021	HD6437021	32k	1k		5.0V/20MHz, 3.3V/12.5MHz	26MIPS (20MHz)	161632/1616+4242	SRAM/DRAM	5	4	2		TFP-100B
SH7021	HD6477021	32k	1k		5.0V/20MHz, 3.3V/12.5MHz	26MIPS (20MHz)	161632/1616+4242	SRAM/DRAM	5	4	2		TFP-100B
SH7032	HD6417032		8k		5.0V/20MHz, 3.3V/12.5MHz	26MIPS (20MHz)	161632/1616+4242	SRAM/DRAM	5	4	2	10 bits 8 channels	FP-112 TFP-120
SH7034	HD6417034		4k		5.0V/20MHz, 3.3V/12.5MHz	26MIPS (20MHz)	161632/1616+4242	SRAM/DRAM	5	4	2	10 bits 8 channels	FP-112 TFP-120
SH7034	HD6437034	64k	4k		5.0V/20MHz, 3.3V/12.5MHz	26MIPS (20MHz)	161632/1616+4242	SRAM/DRAM	5	4	2	10 bits 8 channels	FP-112 TFP-120
SH7034	HD6477034	64k	4k		5.0V/20MHz, 3.3V/12.5MHz	26MIPS (20MHz)	161632/1616+4242	SRAM/DRAM	5	4	2	10 bits 8 channels	FP-112 TFP-120
SH7011	HD6417011		4k		3.3V/20MHz	26MIPS (20MHz)	323264/3232+6464	SRAM	7		1	10 bits 7 channels	TFP-100B
SH7014	HD6417014		3k (1k)	1k	5.0V/28.7MHz	37MIPS (28.7MHz)	323264/3232+6464	SRAM/DRAM	5	2	2	10 bits 8 channels	FP-112
SH7016	HD6437016	64k	3k (1k)	1k	5.0V/28.7MHz	37MIPS (28.7MHz)	323264/3232+6464	SRAM/DRAM	5	2	2	10 bits 8 channels	FP-112
SH7017	HD64F7017	128k	4k (2k)	1k	5.0V/28.7MHz	37MIPS (28.7MHz)	323264/3232+6464	SRAM/DRAM	5	2	2	10 bits 8 channels	FP-112
SH7040	HD6437040	64k	4k (2k)	1k	5.0V/28.7MHz, 3.3V/16.7MHz	37MIPS (28.7MHz) 43MIPS 33MHz	323264/3232+6464	SRAM/DRAM	7	4	2	10 bits 8 channels	FP-112

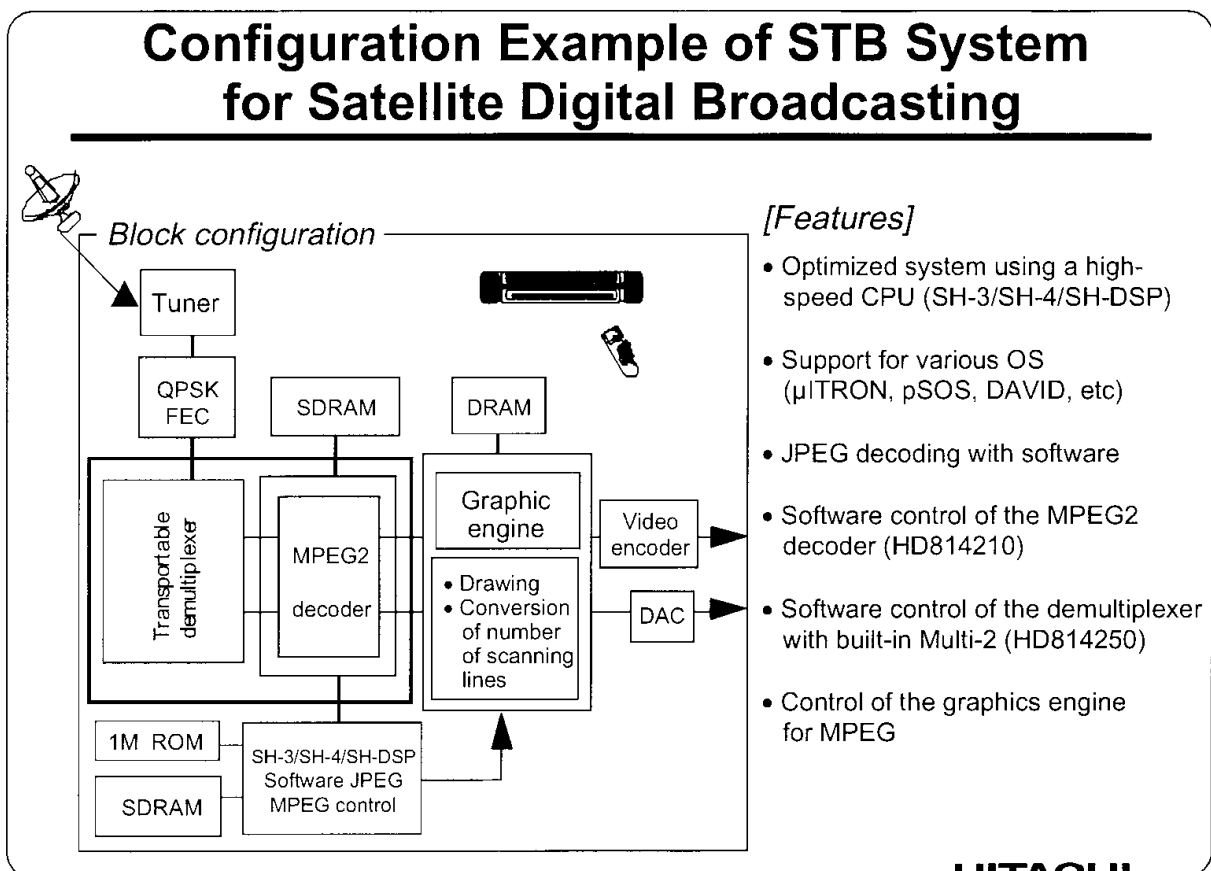


Series No.	Type No.	ROM (byte)	RAM (byte)	Cache (byte)	Operating voltage /Operating frequency	Dhry-stone	Multiplier Multiply and accumulate	BSC	Timer	DMAC (chan-nels)	SCI (chan-nels)	A/D converter	Package
SH7041	HD6437041	64k	4k (2k)	1k	5.0V/28.7MHz, 3.3V/16.7MHz	37MIPS	323264/3232+6464	SRAM/DRAM	7	4	2	10 bits 8 channels	FP-144
						(28.7MHz)							
						43MIPS (33MHz)							
SH7042	HD6437042	128k	4k (2k)	1k	5.0V/28.7MHz, 5.0V/33MHz, 3.3V/16.7MHz	37MIPS	323264/3232+6464	SRAM/DRAM	7	4	2	10 bits 8 channels	FP-112 TFP-120
						(28.7MHz)							
						43MIPS (33MHz)							
SH7042	HD6477042	128k	4k (2k)	1k	5.0V/28.7MHz, 5.0V/33MHz, 3.3V/16.7MHz	37MIPS	323264/3232+6464	SRAM/DRAM	7	4	2	10 bits 8 channels	FP-112 TFP-120
						(28.7MHz)							
						43MIPS (33MHz)							
SH7043	HD6437043	128k	4k (2k)	1k	5.0V/28.7MHz, 5.0V/33MHz, 3.3V/16.7MHz	37MIPS	323264/3232+6464	SRAM/DRAM	7	4	2	10 bits 8 channels	FP-144
						(28.7MHz)							
						43MIPS (33MHz)							
SH7043	HD6477043	128k	4k (2k)	1k	5.0V/28.7MHz, 5.0V/33MHz, 3.3V/16.7MHz	37MIPS	323264/3232+6464	SRAM/DRAM	7	4	2	10 bits 8 channels	FP-144
						(28.7MHz)							
						43MIPS (33MHz)							
SH7044	HD64F7044	256k	4k (2k)	1k	5.0V/28.7MHz	37MIPS (28.7MHz)	323264/3232+6464	SRAM/DRAM	7	4	2	10 bits 8 channels	FP-112
SH7044	HD6437044	256k	4k (2k)	1k	5.0V/28.7MHz	37MIPS (28.7MHz)	323264/3232+6464	SRAM/DRAM	7	4	2	10 bits 8 channels	FP-112
SH7045	HD64F7045	256k	4k (2k)	1k	5.0V/28.7MHz	37MIPS (28.7MHz)	323264/3232+6464	SRAM/DRAM	7	4	2	10 bits 8 channels	FP-144
SH7045	HD6437045	256k	4k (2k)	1k	5.0V/28.7MHz	37MIPS (28.7MHz)	323264/3232+6464	SRAM/DRAM	7	4	2	10 bits 8 channels	FP-144
SH7050	HD6437050	128k	6k		5.0V/20MHz	26MIPS (20MHz)	323264/3232+6464	SRAM	20	4	3	10 bits 16 channels	FP-168
SH7051	HD64F7051	256k	10k		5.0V/20MHz	26MIPS (20MHz)	323264/3232+6464	SRAM	26	4	3	10 bits 16 channels	FP-168
SH7055	HD64F7055	512k	32k		3.3V/40MHz	52MIPS (40MHz)	323264/3232+6464	SRAM	34	4	5	10 bits 32 channels	FP-256
SH7065*1	HD64F7065	256k	8k		3.3V/60MHz	78MIPS (60MHz)	323264/3232+6464	SRAM/DRAM/EDO	9	4	3	10 bits 8 channel	LQFP-176
SH7065*1	HD6437065	256k	8k		3.3V/60MHz	78MIPS (60MHz)	323264/3232+6464	SRAM/DRAM/EDO	9	4	3	10 bits 8 channel	LQFP-176
SH7410	HD6437410	48k	8k		2.7 to 3.6V /60MHz	78MIPS (60MHz)	323264/3232+6464 161640/ 1616+4040	SRAM/DRAM/EDO	3	4	SCI:2ch, SIO:3ch		LQFP-176
SH7612*1	HD6417612		16k	4k	3.3V/60MHz	78MIPS (60MHz)	323264/3232+6464 161640/ 1616+4040	SRAM/DRAM/EDO/SDRAM	4	2	SCI:3ch, SIO:3ch		LQFP-176, CSP-176
SH7604	HD6417604			4k	5.0V/28.7MHz, 3.3V/20MHz	37MIPS (28.7MHz)	323264/3232+6464	SRAM/DRAM SDRAM	1	2	1		FP-144
SH7707	HD6417707			8k	3.3V/60MHz	78MIPS (60MHz)	323264/3232+6464	SRAM/DRAM SDRAM	3	4	3	10 bits 8 channels	FP-208A
SH7708R	HD6417708R			8k	3.3V/100MHz	130MIPS (100MHz)	323264/3232+6464	SRAM/DRAM SDRAM	3		1		FP-144F
SH7708S	HD6417708S			8k	3.3V/60MHz	78MIPS (60MHz)	323264/3232+6464	SRAM/DRAM SDRAM	3		1		FP-144F
SH7718R	HD6417718R			8k	3.3V/100MHz	130MIPS (100MHz)	323264/3232+6464	SRAM/DRAM SDRAM	3		1		FP-144F
SH7709	HD6417709			8k	3.3V/80MHz	104MIPS (80MHz)	323264/3232+6464	SRAM/DRAM SDRAM	3	4	3	10 bits 8 channels	FP-208C
SH7709A*1	HD6417709A			16k	I/O: 3.30.3V Internal: 1.9 0.15V/133MHz	173MIPS (133MHz)	323264/3232+6464	SRAM/DRAM SDRAM	3	4	3	10 bits 8 channels	FP-208C

SuperH RISC Engine Family(cont.)

Series No.	Type No.	ROM (byte)	RAM (byte)	Cache (byte)	Operating voltage /Operating frequency	Dhry-stone	Multipler Multiply and accumulate	BSC	Timer	DMAC (chan-nels)	SCI (chan-nels)	A/D converter	Package
SH7729*1	HD6417729		16k	16k	I/O: 3.30.3V Internal: 1.9 to 0.15V/133MHz	173MIPS (133MHz)	323264/ 3232+6464  161640/ 1616+4040	SRAM/DRAM SDRAM	3	4	3	10 bits 8 channels	FP-208C
SH7750	HD6417750			8k (instruction), 16k (data)	I/O: 3.30.3V Internal: 1.8 to 2.07V/200MHz	360MIPS (200MHz)	323264/ 3232+6464	SRAM/DRAM SDRAM	3	4	2		BP-256
					1.6 to 2.0V/ 167MHz	300MIPS (167MHz)							FP-208E
SH7750V	HD6417750V			8k (instruction), 16k (data)	I/O: 3.3V Internal: 1.5V/ 128MHz	230MIPS (128MHz)	323264/ 3232+6464	SRAM/DRAM SDRAM	3	4	2		FP-208E
SH7751*1	HD6417751			11k	I/O: 3.30.3V Internal: 1.6 to 2.0V/167MHz	300MIPS (167MHz)	323264/ 3232+6464	SRAM/DRAM SDRAM	5	4	2		FP-256G

Notes : \*1Under development \*2Using cashe



## Intel Embedded X86 Architecture

### Intel 186 Processor Standard Product Family



Product Number	Speed (MHz)	I/O Pins	Serial Ports	DMA Channels	Power Options	Chip Select	Voltage	Package	Temp
80C186XL/188XL	25	0	No	2	PS	13	5.0V	A68, N68, R68, S80, SB80	C
80C186XL/188XL	12, 20	0	No	2	PS	13	5.0V	A68, N68, R68, S80, SB80*	C, E

\* Only available in commercial temperature

Key Features : 3 timers/counters, TTL input level, Static design, Clock generator, Address space 1MB, DRAM refresh

### Intel 186 Processor Enhanced Product Family

Product Number	Speed (MHz)	I/O Pins	Serial Ports	DMA Channels	Power Options	Chip Select	Voltage	Package	Temp
80C186EA/188EA	25	0	No	2	PS, PD, I	13	5.0V	N68,S80, SB80	C
80C186EA/188EA	13, 20	0	No	2	PS, PD, I	13	5.0V	N68,S80, SB80	E
80L186EA/188EA	8,13	0	No	2	PS, PD, I	13	3.0V	N68,S80, SB80	E
80C186EB/188EB	25	16	2	0	PD, I	10	5.0V	N84, S80, SB80	C
80C186EB/188EB	13, 20	16	2	0	PD, I	10	5.0V	N84, S80, SB80	E
80L186EB/188EB	16	16	2	0	PD, I	10	3.0V	N84, S80, SB80	C
80L186EB/188EB	8, 13	16	2	0	PD, I	10	3.0V	N84, S80, SB80	E
80C186EC/188EC	25	22	2	4	PS, PD, I	10	5.0V	KU100, S100, SB100	C
80C186EC/188EC	13, 20	22	2	4	PS, PD, I	10	5.0V	KU100, S100, SB100	E
80L186EC/188EC	16	22	2	4	PS, PD, I	10	3.0V	KU100, S100, SB100	E
80L186EC/188EC	13	22	2	4	PS, PD, I	10	3.0V	KU100, S100, SB100	E

Key Features : 3 timers/Counters, DRAM refresh, Static Design, Inrupt controller, Address space 1MB, CMOS Input level, Clock generator

### Intel 386™ Processor Family

Product Number	Speed(MHz)	Voltage	Package	Temp
80386EXTB	25	3.3V	KU132, FA144	E
80386EXTC	25	5.0V	KU132, FA144	E
80386EXTC	33	5.0V	KU132, FA144	E

Key Features : A20 Gate, WDT, System management mode, Interrupt Controller(8259A), Static Design, DRAM refresh, 8 chip selects

### Intel 386™ Integrated Processor Family

Product Number	Speed (MHz)	Static Design	Addr Space	Package	Temp
80386SX	16,20,25,33	No	16M	NG100	C
80386DX	16,20,25,33	No	4G	A132, NG132	C
80386SXTA	25,33,40	Yes	16M	KU100	C

Key Features : TTL Input Level, Voltage = 5V

### Intel 486™ Processor Family - High Performance

Product Number	Speed (MHz)	Core Speed (MHz)	Cache	Voltage	Package	Bus Bits	Temp
80486DX4	100	3X Clk	16Kb, WB	3.3V	A168,FC208	32	C
80486DX2	50, 66	2X Clk	8Kb, WT	5.0V-3.3V	A168,SB208	32	C
80486SX	33	N/A	8Kb, WT	5.0V-3.3V	A168,KU196	32	C

### Intel 486™ Processor Family - Ultra Low Power

Product Number	Speed (MHz)	Core Speed (MHz)	Cache	Voltage	Package	Bus Bits	Temp
80486XSF	33	N/A	8Kb, WT	3.3V	FA176	32	C
80486GXSF	33	N/A	8Kb, WT	3.3V	FA176	16	C



Pentium processors

Product Number	Core Speed (MHz)	External Bus Speed (MHz)	Thermal Design Power (Max)	Voltage	Tcase	Package
A8050266100	100	66	10.1W	3.3V	0-70C	296 SPGA
A8050266133	133	66	11.2W	3.3V	0-70C	296 SPGA
A80502CSLM66133	133 (Voltage Reduction Tech)	66	7.9W	3.1V	0-85C	296 SPGA
A8050266166	166	66	14.5W	3.3V	0-70C	296 SPGA

Pentium processors with MMX™ technology

Product Number	Core Speed (MHz)	External Bus Speed (MHz)	Thermal Design Power (Max)	Voltage	Tcase	Package
FV8050366200	200	66	15.7W	2.8V	0-70C	296 PPGA
FV8050366233	233	66	17.0W	2.8V	0-70C	296 PPGA

Low-power Pentium processors with MMX™ technology

Product Number	Core Speed (MHz)	External Bus Speed (MHz)	Thermal Design Power (Max)	Voltage	Tcase	Package
FV80503CSM66166	166	66	4.5W	1.9V	0-85C	296 PPGA
FV80503CSM66266	266	66	7.6W	1.9V	0-85C	296 PPGA
GC80503CSM66166	166	66	4.1W	1.8V	0-95C	352 HL-PBGA
GC80503CSM66266	266	66	7.6W	2.0V	0-95C	352 HL-PBGA
GC80503CS166EXT	166	66	4.1W	1.8V	-40-115C	352 HL-PBGA

Celeron™ processors

Product Number	Core Speed (MHz)	L2 Cache	External Bus Speed (MHz)	Thermal Design Power (Max)	Voltage	Tcase	Package
FV80524RX300128	300A	128K	66	17.8W	2.0V	5-85C	370 PPGA
FV80524RX366128	366	128K	66	21.7W	2.0V	5-85C	370 PPGA
FV80524RX433128	433	128K	66	24.1W	2.0V	5-85C	370 PPGA
RB80526RX566128	566	128K	66	11.9W	1.5V	90C (junction)	370 FC-PGA

Celeron™ processor - Low Power

Product Number	Core Speed (MHz)	L2 Cache	External Bus Speed (MHz)	Thermal Design Power (Max)	Voltage	Tjunction	Package
KC80526LY400128	400A	128K	100	10.1W	1.35V	0-100C	495 BGA

Pentium II processors - Low Power

Product Number	Core Speed (MHz)	L2 Cache	External Bus Speed (MHz)	Thermal Design Power (Max)	Voltage	Tjunction	Package
KC80524KX266256	266	256K	66	9.8W	1.6V	0-100C	615 BGA
KC80524KX333256	333	256K	66	11.8W	1.6V	0-100C	615 BGA





## Pentium II processors - Low Power modules

Product Number	Core Speed (MHz)	External Bus Speed (MHz)	L2 Cache	L2 Cache On Board Or Die	Thermal Design Power (Max)	Voltage
LPM25P2266A/B	266	66	512K	SRAM, Board	13.9W	1.6V
LPM22PD333A/B	333	66	256K	Die	13.9W	1.6V

## Pentium III processors

Product Number	Core Speed (MHz)	L2 Cache	External Bus Speed (MHz)	Thermal Design Power (Max)	Voltage	Tjunction	Package
RB80526PY600256	600	256K	100	15.8W	1.65V	82C	370 FC-PGA
RB80526PY700256	700	256K	100	18.3W	1.65V	80C	370 FC-PGA
RB80526PZ733256	733	256K	133	19.1W	1.65V	80C	370 FC-PGA

## Pentium III processors - Low Power

Product Number	Core Speed (MHz)	L2 Cache	External Bus Speed (MHz)	Thermal Design Power (Max)	Voltage	Tjunction	Package
KC80526NY400256	400	256K	100	10.1W	1.35V	0-100C	495 BGA
KC80526LY500256	500	256K	100	12.2W	1.35V	0-100C	495 BGA

## Pentium III processor - Low Power module

Product Number	Core Speed (MHz)	External Bus Speed (MHz)	L2 Cache	L2 Cache On Board Or Die	Thermal Design Power (Max)	Voltage
LPM22CUB500A/B	500	100	256K	Die	15.0W	1.6V

## StrongARM Processor

## SA-110 Microprocessor

Speed (MHz)	Performance	Core Power Supply (VDC)	I/O Power Supply (VDC)	Typ. Power Dissipation (mW)	Max Junction Temp.	Ambient Operating Temp.	Storage Temp.	Process Technology	Package
100	115Dhrystone 2.1 MIPS	Vss=0.0 Vdd=1.65 ± 10%	Vssx=0.0 Vddx=3.3 ± 10%	Max=<300 Typ=<110	Tj=100°C	0-70°C	-40°C to +125°C	0.35µm, 3-layer metal	144 TQFP
160	185Dhrystone 2.1 MIPS	Vss=0.0 Vdd=1.65 ± 10%	Vssx=0.0 Vddx=3.3 ± 10%	Max=<450 Typ=<136	Tj=100°C	0-70°C	-40°C to +125°C	0.35µm, 3-layer metal	144 TQFP
166	192Dhrystone 2.1 MIPS	Vss=0.0 Vdd=2.0 ± 10%	Vssx=0.0 Vddx=3.3 ± 10%	Max=<450	Tj=100°C	0-70°C	-40°C to +125°C	0.35µm, 3-layer metal	144 TQFP
200	230Dhrystone 2.1 MIPS	Vss=0.0 Vdd=2.0 ± 10%	Vssx=0.0 Vddx=3.3 ± 10%	Max=<900	Tj=100°C	0-70°C	-40°C to +125°C	0.35µm, 3-layer metal	144 TQFP
233	268Dhrystone 2.1 MIPS	Vss=0.0 Vdd=2.0 ± 10%	Vssx=0.0 Vddx=3.3 ± 10%	Max=<1000	Tj=100°C	0-70°C	-40°C to +125°C	0.35µm, 3-layer metal	144 TQFP



## SA-1100 Microprocessor

Speed (MHz)	Performance	Core PowerSupply (VDC)	I/O PowerSupply (VDC)	Typ. Power Dissipation (mW)	Max Junction Temp.	Ambient Operating Temp.	Storage Temp.	Process Technology	Package
for Embedded Applications									
160	180Dhrystone 2.1 MIPS	Vss=0.0 Vdd=2.0 ± 5%	Vssx=0.0 Vddx=3.3 ± 10%	<450 <sup>1</sup>	-	Standard= 0°C min 70°C max	-20°C to +125°C	0.35µm, 3-layer metal	208 LQFP
220	250Dhrystone 2.1 MIPS	Vss=0.0 Vdd=2.0 ± 5%	Vssx=0.0 Vddx=3.3 ± 10%	<550 <sup>1</sup>	-	Standard= 0°C min 70°C max	-20°C to +125°C	0.35µm, 3-layer metal	208 LQFP
for Portable Applications									
133	150Dhrystone 2.1 MIPS	Vss=0.0 Vdd=1.5 ± 5%	Vssx=0.0 Vddx=3.3 ± 10%	Normal=<230 <sup>1</sup> Idle=<50 Sleep=<50 uA	-	Standard= 0°C min 70°C max	-20°C to +125°C	0.35µm, 3-layer metal	208 LQFP
190	220Dhrystone 2.1 MIPS	Vss=0.0 Vdd=1.5 ± 5%	Vssx=0.0 Vddx=3.3 ± 10%	Normal=<330 <sup>1</sup> Idle=<65 Sleep=<50 uA	-	Standard= 0°C min 70°C max	-20°C to +125°C	0.35µm, 3-layer metal	208 LQFP

## SA-1110 Microprocessor

Speed (MHz)	Performance	Core PowerSupply (VDC), nominal	I/O PowerSupply (VDC), nominal	Typ Power Dissipation (mW)	Max Junction Temp.	Ambient Operating Temp.	Storage Temp.	Process Technology	Package
133	150Dhrystone 2.1MIPS	Vss=0.0VDC Vdd=1.55VDC	Vssx=0.0VDC Vddx=3.3VDC	Normal=<240 Idle=<75 Sleep=<50uA	-	0°C min 70°C max	-20°C to +125°C	0.35µm, 3-layer metal	256mBGA
206	235Dhrystone 2.1MIPS	Vss=0.0VDC Vdd=1.75VDC	Vssx=0.0VDC Vddx=3.3VDC	Normal =<400 Idle=<100 Sleep=<50uA	-	0°C min 70°C max	-20°C to +125°C	0.35µm, 3-layer metal	256 mBGA

## SA-1111 Companion Chip

Core and CMOS Power Supply (VDC)	PLL Power Supply (VDC)	PCMCIA Power Supply (VDC)	Compact Flash Power Supply (VDC)	Typ. Power Consumption at 3.3 Vdd	Max Junction Temp.	Ambient Operating Temp.	Storage Temp.	Process Technology	Package
3.3VDC ±10%	3.3VDC ±10%	0.0, 3.3, or 5.0 VDC ±10%	0.0, 3.3, or 5.0 VDC ±10%	Normal.=<50 mA Doze =<10mA Sleep =<20uA	-	0°C min 70°C max	-20°C to +125°C	0.35µm, 3-layer metal	256mBGA

## MICROCONTROLLER

## Atmel 8-Bit Microcontrollers

## 8051 Architecture Microcontroller



Model	Flash ROM	Quick Flash	Extra Memory	RAM	SPI	Serial UART	ISP	I/O Pins	Vcc	Pin Count
AT89C1051	1K	-	No	64	No	No	Yes	15	2.7 6.0	20
AT89C1051U	1K	-	No	64	No	Yes	Yes	15	2.7 6.0	20
AT89C2051	2K	-	No	128	No	Yes	Yes	15	2.7 6.0	20
AT89C4051	4K	-	No	128	No	Yes	Yes	15	3.0 6.0	20
AT89C51	4K	-	No	128	No	Yes	Yes	32	4.0 6.0	40/44
AT89LV51	4K	-	No	128	No	Yes	Yes	32	2.7 6.0	40/44
AT89C52	8K	-	No	256	No	Yes	Yes	32	4.0 6.0	40/44
AT89LV52	8K	-	No	256	No	Yes	Yes	32	2.7 6.0	40/44
AT89C55	20K	-	No	256	No	Yes	Yes	32	4.0 6.0	40/44
AT89LV55	20K	-	No	256	No	Yes	Yes	32	2.7 6.0	40/44



Model	Flash ROM	Quick Flash	Extra Memory	RAM	SPI	Serial UART	ISP	I/O Pins	Vcc	Pin Count
AT89S53	12K	-	No	256	Yes	Yes	Yes	32	4.0-6.0	40/44
AT89LS53	12K	-	No	256	Yes	Yes	Yes	32	2.7-6.0	40/44
AT89S8252	8K	-	2K EE*	256	Yes	Yes	Yes	32	4.0-6.0	40/44
AT89LS8252	8K	-	2K EE*	256	Yes	Yes	Yes	32	2.7-6.0	40/44
AT89S4D12	4K	-	128K DF*	256	Yes	Yes	Yes	5	3.0-3.6	28/32
AT80F51	-	4K	No	128	No	Yes	No	32	4.0-6.0	40/44
AT80F52	-	8K	No	128	No	Yes	No	32	4.0-6.0	40/44
AT87F51	-	4K OTP	No	128	No	Yes	No	32	4.0-6.0	40/44
AT87F52	-	8K OTP	No	256	No	Yes	No	32	4.0-6.0	40/44
AT87LV52	-	8K OTP	No	256	No	Yes	No	32	2.7-5.5	40/44
AT87F55	-	20K OTP	No	128	No	Yes	No	32	4.0-6.0	40/44
AT87F51RC	-	32K OTP	No	512	No	Yes	No	32	4.0-6.0	40/44
AT87LV51	-	4K OTP	No	128	No	Yes	No	32	2.7-5.5	40/44
AT87LV55	-	20K OTP	No	256	No	Yes	No	32	2.7-5.5	40/44

\* EE:EEPROM DF:Data Flash

### AVR 8-bit RISC Microcontroller

Part Number	Flash ROM	EEPROM	SRAM	SPI	UART	10-bit A/D	Brown-Out	Max. Clock	Vcc (min)	Max I/O	Package
ATtiny11L	1 KB	-	-	-	-	-	-	0-2 MHz	2.7V	6	8-DIP/SO
ATtiny11	1 KB	-	-	-	-	-	-	0-6 MHz	4.0V	6	8-DIP/SO
ATtiny12V	1 KB	64B	-	-	-	-	Yes	0-1 MHz	1.8V	6	8-DIP/SO
ATtiny12L	1 KB	64B	-	-	-	-	Yes	0-4 MHz	2.7V	6	8-DIP/SO
ATtiny12	1 KB	64B	-	-	-	-	Yes	0-8 MHz	4.0V	6	8-DIP/SO
ATtiny15L	1 KB	64B	-	-	-	4	Yes	1-6 MHz	2.7V	6	8-DIP/SO
ATtiny22L	2 KB	128B	128B	-	-	-	Yes	0-4 MHz	2.7V	5	8-DIP/SO
ATtiny22	2 KB	128B	128B	-	-	-	-	0-8 MHz	4.0V	5	8-DIP/SO
ATtiny28V	2 KB	-	-	-	-	-	-	0-1 MHz	1.8V	11	28-DIP, 32-TQFP
ATtiny28L	2 KB	-	-	-	-	-	-	0-4 MHz	2.7V	11	28-DIP, 32-TQFP
AT90S1200	1 KB	64B	-	-	-	-	-	0-12 MHz	2.7V	15	20-DIP/SOIC/SSOP
AT90S2313	2 KB	128B	128B	-	1	-	-	0-10 MHz	2.7V	15	20-DIP/SOIC
AT90LS2323	2 KB	128B	128B	-	-	-	-	0-4 MHz	2.7V	3	8-DIP/SOIC
AT90S2323	2 KB	128B	128B	-	-	-	-	0-10 MHz	4.0V	3	8-DIP/SOIC
AT90LS2343	2 KB	128B	128B	-	-	-	-	0-4 MHz	2.7V	5	8-DIP/SOIC
AT90S2343	2 KB	128B	128B	-	-	-	-	0-10 MHz	4.0V	5	8-DIP/SOIC
AT90LS2333	2 KB	128B	128B	1	1	6	Yes	0-4 MHz	2.7V	20	28-DIP, 32-TQFP
AT90S2333	2 KB	128B	128B	1	1	6	Yes	0-8 MHz	4.0V	20	28-DIP, 32-TQFP
AT90S4414	4 KB	256B	256B	1	1	-	-	0-8 MHz	2.7V	32	40-DIP, 44-PLCC/TQFP
AT90LS4433	4 KB	256B	128B	1	1	6	Yes	0-4 MHz	2.7V	20	28-DIP, 32-TQFP
AT90S4433	4 KB	256B	128B	1	1	6	Yes	0-8 MHz	4.0V	20	28-DIP, 32-TQFP
AT90LS4434	4 KB	256B	256B	1	1	8	-	0-4 MHz	2.7V	32	40-DIP, 44-PLCC/TQFP
AT90S4434	4 KB	256B	256B	1	1	8	-	0-8 MHz	4.0V	32	40-DIP, 44-PLCC/TQFP
AT90S8515	8 KB	512B	512B	1	1	-	-	0-8 MHz	2.7V	32	40-DIP, 44-PLCC/TQFP
AT90C8534	8 KB	512B	256B	-	-	6	-	0-1.5 MHz	3.3V	15	48-Pin VQFP
AT90LS8535	8 KB	512B	512B	1	1	8	-	0-4 MHz	2.7V	32	40-DIP, 44-PLCC/TQFP
AT90S8535	8 KB	512B	512B	1	1	8	-	0-8 MHz	4.0V	32	40-DIP, 44-PLCC/TQFP
ATmega103L	128 KB	4 KB	4 KB	1	1	8	-	0-4 MHz	2.7V	48	64-Pin TQFP
ATmega103	128 KB	4 KB	4 KB	1	1	8	-	0-6 MHz	4.0V	48	64-Pin TQFP
ATmega161L	16 KB	512B	1 KB	1	2	8	Yes	0-4 MHz	2.7V	35	40-DIP, 44-TQFP
ATmega161	16 KB	512B	1 KB	1	2	8	Yes	0-8 MHz	4.0V	35	40-DIP, 44-TQFP
ATmega163	16 KB	512B	1 KB	1	1	8	Yes	0-8 MHz	4.0V	32	40-DIP, 44-TQFP
ATmega163L	16 KB	512B	1 KB	1	1	8	Yes	0-4 MHz	2.7V	32	40-DIP, 44-TQFP



## AT91 ARM Thumb Microcontroller

Part Number	Flash	Mask ROM	SRAM	SPI	USART	PDC Channels	Analog	Hardware Multiplier	OSC & PLL	Max. Clock	Vcc (V)	Package
AT91M40800-33AI	-	-	8 KB	-	2	4	-	1	No	40 MHz	1.8-3.6	TQFP
AT91R40807-33AI	-	-	136 KB	-	2	4	-	1	No	40 MHz	1.8-3.6	TQFP
AT91M40807-33AI	-	128 KB	8 KB	-	2	4	-	1	No	40 MHz	1.8-3.6	TQFP
AT91F40416-25CI	2 MB	-	4 KB	-	2	4	-	1	No	25 MHz	2.7-3.6	BGA
AT91M63200-25AI	-	-	3 KB	1	3	8	-	1	No	25 MHz	1.8-3.6	TQFP
AT91M43300-25CI	-	-	3 KB	1	3	8	-	1	No	25 MHz	1.8-3.6	BGA
AT91M42800-33AI	-	-	8 KB	2	2	8	-	1	Yes	33 MHz	1.8-3.6	TQFP
AT91M42800-33CI	-	-	8 KB	2	2	8	-	1	Yes	33 MHz	1.8-3.6	BGA
AT91M55800-33AI	-	-	8 KB	1	3	8	2 ch DAC 10-bit, 8 cs ADC 10-bit	1	Yes	40 MHz	1.8-3.6	TQFP
AT91M55800-33CI	-	-	8 KB	1	3	8	2 ch DAC 10-bit, 8 cs ADC 10-bit	1	Yes	40 MHz	1.8-3.6	BGA
AT91FR4081-33CI	1 MB	-	136 KB	-	2	4	-	1	No	40 MHz	2.7-3.6	BGA
AT91F40816-33CI	2 MB	-	8 KB	-	2	4	-	1	No	40 MHz	2.7-3.6	BGA

Intel 8-Bit MCS 51/151/251 Microcontroller Family  
MCS<sup>®</sup>51 Microcontroller Line Card

MCS <sup>®</sup> 51 Microcontroller Classic Family												
Product	Key Features	ROM/ EPROM (Bytes)	RAM (Bytes)	Timer/ Counters	Serial Port	Analog Input Channels	I/O Pins	Speed (MHz)	Process / Package	Security	Temp	
80C31BH	Power Save Modes	ROMless	128	2	1	0	32	16, 24	CHMOS/ D,N,P,S	N/A	C,E	
80C51BH	Power Save Modes	4K ROM	128	2	1	0	32	12,16,24	CHMOS/ N,P,S	P	C,E	
87C51	Three-level Memory Lock	4K EPROM/ OTP	128	2	1	0	32	16, 24	CHMOS/ D,N,P,S	L3	C,E	
80C32	Up-Down Timer/Counter	ROMless	256	3	1	0	32	16, 24	CHMOS/ N,P,S	N/A	C,E	
80C52	Up-Down Timer/Counter	8K ROM	256	3	1	0	32	12, 16, 24	CHMOS/ N,P,S	L1	C,E	
87C52	Up-Down Timer/Counter	8K EPROM/ OTP	256	3	1	0	32	16, 24	CHMOS/ D,N,P,S	L3	C,E	
80C54	Up-Down Timer/Counter	16K ROM	256	3	1	0	32	12, 16, 24	CHMOS/ N,P,S	L1	C,E	
87C54	Up-Down Timer/Counter	16K EPROM/ OTP	256	3	1	0	32	16, 24	CHMOS/ D,N,P,S	L3	C,E,A	
87C58 ROM	Up-Down Timer/Counter	32K ROM	256	3	1	0	32	12,16,24,33	CHMOS/ N,P,S	L1	C,E	
87C58	Up-Down Timer/Counter	32K EPROM/ OTP	256	3	1	0	32	16,24,33	CHMOS/ D,N,P,S	L3	C,E	
80C51FA	Programmable Counter Array (PCA), Programmable Clock Out	ROMless	256	3	1	0	32	16,24	CHMOS/ D,N,P,S	N/A	C,E	
83C51FA	Programmable Counter Array (PCA), Programmable Clock Out	8K ROM	256	3	1	0	32	12, 16, 24	CHMOS/ N,P,S	L1	C,E,A	
87C51FA	Programmable Counter Array (PCA), Programmable Clock Out	8K EPROM/ OTP	256	3	1	0	32	16,24,33	CHMOS/ D,N,P,S	L3	C,E,A	
87C51FB ROM	Programmable Counter Array (PCA), Programmable Clock Out	16K ROM	256	3	1	0	32	12,16,24,33	CHMOS/ N,P,S	L1	C,E,A	
87C51FB	Programmable Counter Array (PCA), Programmable Clock Out	16K EPROM/ OTP	256	3	1	0	32	16,24,33	CHMOS/ D,N,P,S	L3	C,E,A	
87C51FC ROM	Programmable Counter Array (PCA), Programmable Clock Out	32K ROM	256	3	1	0	32	12,16,24,33	CHMOS/ D,N,P,S	L1	C,E,A	
87C51FC	Programmable Counter Array (PCA), Programmable Clock Out	32K EPROM/ OTP	256	3	1	0	32	16,24,33	CHMOS/ D,N,P,S	L3	C,E,A	



Product	Key Features	ROM/ EPROM (Bytes)	RAM (Bytes)	Timer/ Counters	Serial Port	Analog Input Channels	I/O Pins	Speed (MHz)	Process / Package	Security	Temp
<b>MCS<sup>®</sup>51 Microcontroller Application Specific Family</b>											
83C51KB	Integrated resonator, Dedicated Scan IN/OUT Pins	4K ROM	128	1	0	0	32	6	CHMOS / P	N/A	C
<b>MCS<sup>®</sup>51 Microcontroller Expanded RAM Family</b>											
80C51RA	Expanded RAM, Programmable Clock-Out, H/W WDT	ROMless	512	3	1	0	32	16, 20	CHMOS / N, P, S	N/A	C,E
83C51RA, 87C51RA ROM	Expanded RAM, Programmable Clock-Out, H/W WDT	8K ROM	512	3	1	0	32	12,16,20,24	CHMOS / N, P, S	L1	C,E
87C51RA	Expanded RAM, Programmable Clock-Out, H/W WDT	8K OTP	512	3	1	0	32	16, 24	CHMOS / N, P, S	L3	C,E
83C51RB, 87C51RB ROM	Expanded RAM, Programmable Clock-Out, H/W WDT	16K ROM	512	3	1	0	32	12,16,20,24	CHMOS / N, P, S	L1	C,E
87C51RB	Expanded RAM, Programmable Clock-Out, H/W WDT	16K OTP	512	3	1	0	32	16, 24	CHMOS / N, P, S	L3	C,E
83C51RC, 87C51RC ROM	Expanded RAM, Programmable Clock-Out, H/W WDT	32K ROM	512	3	1	0	32	12,16,20,24	CHMOS / N, P, S	L1	C,E
87C51RC	Expanded RAM, Programmable Clock-Out, H/W WDT	32K OTP	512	3	1	0	32	16, 24	CHMOS / N, P, S	L3	C,E

**MCS<sup>®</sup>151 Microcontroller Line Card**

Product	Key Features	ROM/ EPROM (Bytes)	RAM (Bytes)	Timer/ Counters	Serial Port	Analog Input Channels	I/O Pins	Speed (MHz)	Process / Package	Security	Temp
87C151SA	High Performance MCS151 Architecture, PCA, H/W WDT	8K	256	3	1	0	32	16	CHMOS / P,N,TN,TP	L3	C,E
87C151SB	High Performance MCS151 Architecture, PCA, H/W WDT	16K	256	3	1	0	32	16	CHMOS / P,N,TN,TP	L3	C,E
83C151SA, 87C151SA ROM	High Performance MCS151 Architecture, PCA, H/W WDT	8K	256	3	1	0	32	16	CHMOS / P,N,TN,TP	L3	C,E
83C151SB, 87C151SB ROM	High Performance MCS151 Architecture, PCA, H/W WDT	16K	256	3	1	0	32	16	CHMOS / P,N,TN,TP	L3	C,E
80C151SB	High Performance MCS151 Architecture, PCA, H/W WDT	ROMless	256	3	1	0	32	16	CHMOS / P,N,TN,TP	L3	C,E

**MCS<sup>®</sup>251 Microcontroller Line Card**

Product	Key Features	ROM/EPROM (Bytes)	RAM (Bytes)	Timer/ Counters	Serial Port	Analog Input Channels	I/O Pins	Speed (MHz)	Process / Package	Security	Temp
87C251SA	High Performance MCS251 Architecture, PCA, H/W WDT	8K	1K	3	1	0	32	16	CHMOS / P,N,TN,TP	L3	C,E
87C251SB	High Performance MCS251 Architecture, PCA, H/W WDT	16K	1K	3	1	0	32	16	CHMOS / P,N,TN,TP	L3	C,E
87C251SP	High Performance MCS251 Architecture, PCA, H/W WDT	8K	512	3	1	0	32	16	CHMOS / P,N,TN,TP	L3	C,E
87C251SQ	High Performance MCS251 Architecture, PCA, H/W WDT	16K	512	3	1	0	32	16	CHMOS / P,N,TN,TP	L3	C,E
83C251SA, 87C251SA ROM	High Performance MCS251 Architecture, PCA, H/W WDT	16K	512	3	1	0	32	16	CHMOS / P,N,TN,TP	L3	C,E
83C251SB, 87C251SB ROM	High Performance MCS251 Architecture, PCA, H/W WDT	16K	1K	3	1	0	32	16	CHMOS / P,N,TN,TP	L3	C,E
83C251SP, 87C251SP ROM	High Performance MCS251 Architecture, PCA, H/W WDT	8K	512	3	1	0	32	16	CHMOS / P,N,TN,TP	L3	C,E
83C251SQ, 87C251SQ, ROM	High Performance MCS251 Architecture, PCA, H/W WDT	16K	512	3	1	0	32	16	CHMOS / P,N,TN,TP	L3	C,E
80C251SB	High Performance MCS251 Architecture, PCA, H/W WDT	ROMless	1K	3	1	0	32	16	CHMOS / P,N,TN,TP	L3	C,E
80C251SQ	High Performance MCS251 Architecture, PCA, H/W WDT	ROMless	512	3	1	0	32	16	CHMOS / P,N,TN,TP	L3	C,E



MCS® 251 Microcontroller Line Card (cont.)

Product	Key Features	ROM/EPROM (Bytes)	RAM (Bytes)	Timer/Counters	Serial Port	Analog Input Channels	I/O Pins	Speed (MHz)	Process / Package	Security	Temp
83C251TA	High Performance MCS251 Architecture, PCA, H/W WDT, 2nd UART	8K	1K	3	2	0	32	24	CHMOS / P,N,TN,TP	L3	C,E
83C251TB	High Performance MCS251 Architecture, PCA, H/W WDT, 2nd UART	16K	1K	3	2	0	32	24	CHMOS / P,N,TN,TP	L3	C,E
83C251TP	High Performance MCS251 Architecture, PCA, H/W WDT, 2nd UART	8K	512	3	2	0	32	24	CHMOS / P,N,TN,TP	L3	C,E
83C251TQ	High Performance MCS251 Architecture, PCA, H/W WDT, 2nd UART	16K	512	3	2	0	32	24	CHMOS / P,N,TN,TP	L3	C,E
80C251TB	High Performance MCS251 Architecture, PCA, H/W WDT, 2nd UART	ROMless	1K	3	2	0	32	24	CHMOS / P,N,TN,TP	L3	C,E
80C251TQ	High Performance MCS251 Architecture, PCA, H/W WDT, 2nd UART	ROMless	512	3	2	0	32	24	CHMOS / P,N,TN,TP	L3	C,E

Nomenclature: D = 40LD CerDIP,  
 Ku = 100LD QFP (Quad Flat Pack)  
 N = 44LD PLCC, N1 = 68LD PLCC  
 P = 40LD PDIP, P1 = 48LD PDIP  
 S = 44LD QFP (Quad Flat Pack)  
 Sb = 100LD SQFP (Shrink Quad Flat Pack)  
 TN = 44 Lead Plastic Lead Chip Carrier at express temp  
 TP = 40 Lead Plastic Dual Inline Package at express temp  
 X = SmartDie™ Product

C = Commercial Temperature (0 to 70 degree C)  
 E = Extended Temperature (-40 to 85 degree C)  
 A = Automotive Temperature (-40 to 125 degree C)

83C51xx = Mask Rom  
 80C5x = Mask Rom  
 87C51xx,Rom = FPROM  
 87C5x,Rom = FPROM  
 Where available, order Factory Programmed Rom (FPROM).

16-bit MCS 96/296 Microcontroller Family

MCS96 Microcontroller Line Card

HSIO Family (Timer Counters = 2; Once Test Mode = Yes; Process = CMOS)											
Product	Speed (MHz)	ROM/OTPROM	Register RAM	Code RAM	I/O Pins	I/O Type	Serial Ports	Analog Input Channels	Address Space	Package	Temp.
8XC196KB16	16	8K	232	NO	48	HSIO	1	8	64K	N-68, S-80	C, E, A
Key Features: Low cost entry level, suitable for replacing NMOS 8X9X.											
8XC196KC20	20	16K	488	NO	48	HSIO	1	8	64K	N-68, S-80 SB-80	C, E, A
Key Features: 16K OTPROM, 488 Byte RAM 3-PWM, PTS											
8XC196KD/ 8XC196KD20	16, 20	32K	1000	NO	48	HSIO	1	8	64K	N-68, S-80 SB-80	C, E, A
Key Features: 32K OTPROM, 1000-byte RAM Version of KC											
Motion Control Family (Timer Counters = 2; Once Test Mode = Yes; Process = CMOS)											
8XC196MC	16	16K	488	NO	53	8 EPA	PTS MODE	13	64K	N-84 S-80 U-64	E
Key Features: PTS, PWM, 3-Phase Waveform Generator											
8XC196MD	16	16K	488	NO	64	12 EPA	PTS MODE	14	64K	N-84 S-80	E
Key Features: MC Enhancement with Frequency Generator											
8XC196MH	16	32K	744	NO	52	6 EPA	2	8	64K	N-84 S-80, U-64	E
Key Features: Enhanced 3-Phase Waveform Generator with 32K EPROM											



Product	Speed (MHz)	ROM/OTEPROM	Register RAM	Code RAM	I/O Pins	I/O Type	Serial Ports	Analog Input Channels	Address Space	Package	Temp.
EPA Family (Timer Counters = 2, except 83C196EA = 4; Once Test Mode = Yes; Process = CMOS)											
87C196CA	16	32K	1000	256	44	6 EPA	2	6	64K	N-68	E
	Key Features: Integrated CAN 2.0 controller										
87C196CB	16	56K	1.5K	512	56	10 EPA	2	8	1M	N-84	E
	Key Features: Integrated CAN 2.0, 1MB linear address range, 2K RAM										
8XC196NP	25	4K	1000	NO	32	4 EPA	1	0	1MB	S-100 SB-100	C
	Key Features: 1MB Linear Address Range, Low Power, 6 Chip select, 3 PWMs, Demux bus										
8XL196NP	14	4K	1000	NO	32	4 EPA	1	0	1MB	S-100 SB-100	C
	Key Features: 3V at 14MHz version of 8XC196NP										
8XC196NT	20	32K	1000	512	56	10 EPA	2	4	1MB	N-68	C, E
	Key Features: High performance and highly, integrated controller with 1MB Address Range										
80C196NU	40,50	0	1000	NO	33, 32	4 EPA	1	0	1MB	S-100 SB-100	C
	Key Features: 1MB Linear Address Range, 6 Chip Selects, 3 PWMs, Demux bus										
80C196EA	40	0	1K	3K	83	17 EPA	3	16	2M	S-160	C
	Key Features: Highly integrated NU-core Controller with Serial Debug Unit										

MCS296 Microcontroller Line Card

Product	Speed (MHz)	ROM/OTEPROM	Register RAM	Code RAM	I/O Pins	I/O Type	Serial Ports	Analog Input Channels	Address Space	Package	Temp.
80296SA	40, 50	0	512	2K	32	4 EPA	1	0	6M	S-100	C
	Key Features: 6 MB Linear Address Range, 6 Chip selects, 3 PWM, 40-bit Hardware Accumulator, Timer counters=2, Once Test Mode=Yes, Process=CMOS										

82527 CAN Standalone Line Card

Product	CAN Version	I/O Ports	Bit Rate	Message Objects	Global Mask	Program Clockout	CPU Interface	Package	Temp.
82527	2	Two 8-Bit Ports	Up to 1Mbit	14 (one with programmable mask)	Yes	Yes	8-Bit MUX 16-Bit MUX 8-Bit Non-MUX (sync/async)	44ld PLCC	E

Packages:

C = 48L Ceramic DIP  
N = 68L PLCC  
N-52 = 52L PLCC

N-68 = 68L PLCC  
N-84 = 84L PLCC  
P = 68L Plastic DIP  
R = 68L Ceramic LCC

S = 80L QFP (EIAJ)  
S-100 = 100L QFP  
SB-100 = 100L SQFP  
U = 64L Shrink DIP

Temperature Ranges:

C = Commercial (0 to 70 degrees C)  
E = Extended (-40 to 85 degrees C)  
A = Automotive (-40 to 125 degrees C)

## Motorola 8-bit Microcontrollers



## 68HC05 8-bit Microcontrollers

Product	ROM (Kbytes)	RAM (Bytes)	EPROM/OTP (Bytes)	EPROM (Bytes)	Timer	I/O	Serial	A/D	PWM	Operating Voltage (V)	Bus Frequency (Max) (MHz)
68HC05B16	15	352	-	256	16-Bit, 2 I/C, 2 O/C	32	SCI	8-CH 8-Bit	2-CH 8-Bit	3.3, 5.0	4
68HC705B16	-	352	15K	256	16-Bit, 2 I/C, 2 O/C	32	SCI	8-CH 8-Bit	2-CH 8-Bit	3.3, 5.0	2.1
68HC05B32	32	528	-	256	16-Bit, 2 I/C, 2 O/C	32	SCI	8-CH 8-Bit	2-CH 8-Bit	3.3, 5.0	2.1
68HC705B32	-	528	32K	256	16-Bit, 2 I/C, 2 O/C	32	SCI	8-CH 8-Bit	2-CH 8-Bit	3.3, 5.0	2.1
68HC05B6	6	176	-	256	16-Bit, 2 I/C, 2 O/C	32	SCI	8-CH, 8-Bit	2-CH, 8-Bit	3.3, 5.0	4
68HC05B8	7	176	-	256	16-Bit, 2 I/C, 2 O/C	32	SCI	8-CH, 8-Bit	2-CH, 8-Bit	3.3, 5.0	4
68HC05BD3	3.75	128	-	-	MFT	24	12C	-	16-CH 8-Bit	5	2.1
68HC705BD3	-	256	7.75K	-	MFT	24	12C	-	16-CH 8-Bit	5	2.1
68HC05BD5	7.75	256	-	-	MFT	24	12C	-	16-CH 8-Bit	5	2.1
68HC705BD7	-	384	11.5K	-	MFT	26	MBUS (DDC 1/2B)	4-CH 8-Bit	16-CH 8-Bit	5	2.1
68HC05C8A	8	176	-	-	16-Bit, 1 I/C, 1 O/C	31	SCI, SPI	-	-	3.3, 5.0	4
68HC705C8A	-	304	8K	-	16-Bit, 1 I/C, 1 O/C	31	SCI, SPI	-	-	3.3, 5.0	4
68HC05C9A	16	352	-	-	16-Bit, 1 I/C, 1 O/C	31	SCI SPI	-	-	3.3, 5.0	4
68HC705C9A	-	352	16K	-	16-Bit, 1 I/C, 1 O/C	31	SCI SPI	-	-	3.3, 5.0	2.1
68HC05D32	32	352	-	-	16-Bit, 1 I/C, 1 O/C	31	SCI	-	5-CH 6-Bit	3.3, 5.0	2.1
68HC705D32A	-	352	32K	-	16-Bit, 1 I/C, 1 O/C	31	SCI	-	5-CH 6-Bit	3.3, 5.0	2.1
68HC05J1A	1.2	64	-	-	MFT, RTI	14	-	-	-	2.0, 3.3, 5.0	4
68HC05J5A	2.5	128	-	-	16-Bit, 1I/C, MFT, RTI	14	-	-	-	2.2, 5.0	2.1
68HC705F32	-	920	32K	256	16-Bit, 4I/C, 4O/C, MFT, RTI	Up to 80	SCI SPI	8-CH 8-Bit	3-CH 8-Bit	3.0, 5.0	2.1
68HC705J1A	-	64	1.2K	-	MFT, RTI	14	-	-	-	3.3, 5.0	4
68HC705J5A	-	128	2.5K	-	16-Bit, 1I/C, MFT, RTI	14	-	-	-	5	2.1
68HC05JB3	2.5	144	-	-	16-Bit, 1I/C, 1O/C, MFT, RTI	19	USB	-	-	5	3
68HC705JB3	-	144	2.5K	-	16-Bit, 1I/C, 1O/C, MFT, RTI	19	USB	-	-	5	3
68HC05JB4	3.5	176	-	-	16-Bit, 1I/C, 1O/C, MFT, RTI	19	USB	6-CH 8-Bit	-	5	3
68HC705JB4	-	176	3.5K	-	16-Bit, 1I/C, 1O/C, MFT, RTI	19	USB	6-CH 8-Bit	-	5	3
68HC05JJ6	6	224	-	-	16-Bit, 1I/C, 1O/C, MFT, RTI	14	SIOP	4-CH 12-Bit	-	3.3, 5.0	2.1
68HC705JJ7	-	224	6K + 64 Bit PEP	-	16-Bit, 1I/C, 1O/C, MFT, RTI	14	SIOP	4-CH 12-Bit	-	3.3, 5.0	2.1
68HC05JP6	6	224	-	-	16-Bit, 1I/C, 1O/C, MFT, RTI	22	SIOP	4-CH 12-Bit	-	3.3, 5.0	2.1
68HC705JP7	-	224	6K + 64 Bit PEP	-	16-Bit, 1I/C, 1O/C, MFT, RTI	22	SIOP	4-CH 12-Bit	-	3.3, 5.0	2.1
68HC05K0	0.5	32	-	-	MFT, RTI	10	-	-	-	2.1, 3.0, 3.3, 5.0	4
68HC05K3	0.9	64	-	16 PEEP	MFT, RTI	10	-	-	-	3.3, 5.0	2.1
68HC705KJ1	-	64	1.2K	-	MFT, RTI	10	-	-	-	3.3, 5.0	4
68HC05L16	16	512	-	-	16-Bit 1I/C 1O/C, 8-Bit 1I/C 1O/C, RTI	39	SIOP	-	-	2.2, 3.3, 5.0	2.1
68HC705L16	-	512	16K	-	16-Bit 1I/C 1O/C, 8-Bit 1I/C 1O/C, RTI	39	SIOP	-	-	3.3, 5.0	2.1
68HC05L25	6	176	-	-	16-Bit Event, Timebase	20	SPI	2-CH 8-Bit	-	3.3, 5.0	2.1
68HC05L5	8	256	-	-	16-Bit 1I/C 1O/C, 8-Bit 1I/C 1O/C, RTI	39	SIOP	-	-	3.3, 5.0	2.1
68HC05LJ5	1.2	64	-	-	MFT, RTI	14	-	-	-	5	2.1
68HC05P1A	2	128	-	-	16-Bit, 1 I/C, 1 O/C	21	-	-	-	3.3, 5.0	2.1
68HC05P4A	4	176	-	-	16-Bit 1 I/C 1 O/C	21	SIOP	-	-	3.3, 5.0	2.1
68HC05P6	4.5	176	-	-	16-Bit 1 I/C 1 O/C	21	SIOP	4-CH 8-Bit	-	3.3, 5.0	2.1
68HC705P6A	-	176	4.5K	-	16-Bit 1 I/C 1 O/C	21	SIOP	4-CH 8-Bit	-	3.3, 5.0	2.1
68HC05PL4B	4	256	-	-	16-Bit 1 I/C 1 O/C, 8-Bit	23	-	-	-	2.0, 4.0	2.5
68HC705PL4B	-	256	4K	-	16-Bit 1 I/C 1 O/C, 8-Bit	23	-	-	-	4	2.5
68HC705RC16	-	350	16K	-	I.R. Timer	20	-	-	-	3.3, 5.0	2.1
68HC05RC18	16	352	-	-	I.R. Timer	20	-	-	-	2.2, 5.0	2.1
68HC05RC9	8	352	-	-	I.R. Timer	20	-	-	-	2.2, 5.0	2.1
68HC05X32	32	528	-	256	16-Bit, 2I/C, 2 O/C	32	SCI CAN	8-CH, 8-Bit	2-CH 8-Bit	5	2.1
68HC705X32	-	528	32K	256	16-Bit, 2I/C, 2 O/C	32	SCI CAN	8-CH 8-Bit	2-CH 8-Bit	5	4
68HC05X4	4	176	-	-	16-Bit 1I/C 1O/C, MFT, RTI	16	CAN	-	-	5	2.1



68HC08 8-bit Microcontrollers



Product	ROM (Kbytes)	RAM (Bytes)	Flash (Kbytes)	EPROM/OTP (Kbytes)	EEPROM (Bytes)	Timer	I/O	Serial	A/D	PWM	Operating Voltage (V)
68HC08AZ0	-	1K	-	-	512	4-CH + 2-CH 16-Bit IC, OC, or PWM	48	SCI, SPI	8-CH 8-Bit	See Timer	5
68HC08AZ32	32	1K	-	-	512	4-CH + 2-CH 16-Bit IC, OC, or PWM	48	SCI, SPI	8-CH 8-Bit	See Timer	5
68HC08LN56	56	1280 + 160 LCD	-	-	-	4-CH 16-Bit IC, OC, or PWM	42	SCI, SPI	4-CH 8-Bit	See Timer	3.3, 5.0
68HC908AB32	32	1K	32	-	512	Two 16-bit, 4-CH IC, OC, and PWM	51	SCI, SPI	8-CH 8-Bit	See Timer	5
68HC908AZ60	-	2K	60	-	1	6-CH + 2-CH 16-Bit IC, OC, or PWM	48	SCI, SPI	15-CH 8-Bit	See Timer	5
68HC908GP20	-	512	20	-	-	Dual 2-CH 16-Bit IC, OC, or PWM	33	SCI, SPI	8-CH 8-Bit	See Timer	3.0, 5.0
68HC908GP32	-	512	32	-	-	Dual 2-CH, 16-Bit IC, OC, or PWM	33	SCI, SPI	8-CH 8-Bit	See Timer	3.0, 5.0
68HC908JB8	-	256	8	-	-	2-CH 16-Bit, IC, OC, or PWM	Up to 37	-	-	See Timer	3
68HC908JK1	-	128	1.5	-	-	2-CH 16-Bit, IC, OC, or PWM	Up to 15	-	10 CH 8-Bit	See Timer	3.0, 5.0
68HC908JK3	-	128	4	-	-	2-CH 16-Bit, IC, OC, or PWM	Up to 15	-	10 CH 8-Bit	See Timer	3.0, 5.0
68HC908JL3	-	128	4	-	-	2-CH 16-Bit, IC, OC, or PWM	Up to 23	-	12-CH 8-Bit	See Timer	3.0, 5.0
68HC708MP16	-	512	-	16K	-	4-CH + 2-CH 16-Bit IC, OC, or PWM	44	SCI SPI	10-CH 8-Bit	See Timer + 6-CH 12-Bit	5
68HC08MR4	4	192	-	-	-	Dual 2-CH 16-bit	22	SCI	4-CH/7-CH 10-bit	6 x 12-bit	5
68HC908MR8	-	256	8	-	-	Dual 2-CH 16-bit	22	SCI	4-CH/7-CH 10-bit	6 x 12-bit	5
68HC908MR16	-	768	16	-	-	4-CH + 2-CH 16-bit IC, OC, or PWM	44	SCI, SPI	10 x 10-bit	6 x 12-bit	5
68HC908MR24	-	512	24	-	-	4-CH + 2-CH 16-Bit IC, OC, or PWM	44	SCI, SPI	10-CH 10-Bit	See Timer + 6-CH 12-Bit	5
68HC908MR32	-	768	32	-	-	4-CH + 2-CH 16-bit IC, OC, or PWM	44	SCI, SPI	10 x 10-bit	6 x 12-bit	5

68HC11 8-bit Microcontrollers

Product	ROM (Kbytes)	RAM (Bytes)	EPROM/OTP (Kbytes)	EEPROM (Bytes)	Timer	Serial	A/D	PWM	Operating Voltage (V)	Bus Frequency (Max) (MHz)
68HC11D0	-	192	-	-	16-Bit, 3/4IC, 4/5OC, RTI, pulse accumulator	SCI, SPI	-	-	3.0, 5.0	3
68HC11D3	4	192	-	-	16-Bit, 3/4IC, 4/5OC, RTI, pulse accumulator	SCI, SPI	-	-	3.0, 5.0	3
68HC11E0	-	512	-	-	16-Bit, 3/4IC, 4/5OC, RTI, pulse accumulator	SCI, SPI	8-CH 8-Bit	-	3.0, 5.0	3
68HC11E1	-	512	-	512	16-Bit, 3/4IC, 4/5OC, RTI, pulse accumulator	SCI, SPI	8-CH 8-Bit	-	3.0, 5.0	3
68HC811E2	-	256	-	2048	16-Bit, 3IC, 4OC, RTI, pulse accumulator	SCI SPI	8-CH 8-Bit	-	5	2
68HC11E9	12	512	-	512	16-Bit, 3/4IC, 4/5OC, RTI, pulse accumulator	SCI, SPI	8-CH 8-Bit	-	3.0, 5.0	3
68HC11E20	20	768	-	512	16-Bit, 3/4IC, 4/5OC, RTI, pulse accumulator	SCI, SPI	8-CH 8-Bit	-	5	3
68HC11F1	-	1	-	512	16-Bit, 3/4IC, 4/5OC, RTI, pulse accumulator	SCI SPI	8-CH 8-Bit	-	3.0, 5.0	5
68HC11K0	-	768	-	-	16-Bit, 3/4IC, 4/5OC, RTI, pulse accumulator	SCI+ SPI	8-CH 8-Bit	4-CH 8-Bit or 2-CH 16-Bit	3.0, 5.0	4
68HC11K1	-	768	-	640	16-Bit, 3/4IC, 4/5OC, RTI, pulse accumulator	SCI+ SPI	8-CH 8-Bit	4-CH 8-Bit or 2-CH 16-Bit	3.0, 5.0	4
68HC11K4	24	768	-	640	16-Bit, 3/4IC, 4/5OC, RTI, pulse accumulator	SCI+ SPI	8-CH 8-Bit	4-CH 8-Bit or 2-CH 16-Bit	3.0, 5.0	4
68HC11KS2	-	1	32	640	16-Bit, 3/4IC, 4/5OC, RTI, pulse accumulator	SCI+ SPI	8-CH 8-Bit	-	5	4
68HC11KW1	-	768	-	640	16-Bit, 3/4IC, 4/5OC, RTI, pulse accumulator	SCI+ SPI	10-CH 10-Bit	4-CH 8-Bit or 2-CH 16-Bit	5	4
68HC11P1	-	1	-	640	16-Bit, 3/4IC, 4/5OC, RTI, pulse accumulator	Triple SCI SPI	8-CH 8-Bit	4-CH 8-Bit or 2-CH 16-Bit	5	4
68HC11P2	32	1	-	640	16-Bit, 3/4IC, 4/5OC, RTI, pulse accumulator	Triple SCI SPI	8-CH 8-Bit	4-CH 8-Bit or 2-CH 16-Bit	5	4
68HC711D3	-	192	4	-	16-Bit, 3/4IC, 4/5OC, RTI, pulse accumulator	SCI SPI	-	-	5	3
68HC711E9	-	512	12	512	16-Bit, 3/4IC, 4/5OC, RTI, pulse accumulator	SCI SPI	8-CH 8-Bit	-	3.0, 5.0	4
68HC711E20	-	768	20	512	16-Bit, 3/4IC, 4/5OC, RTI, pulse accumulator	SCI SPI	8-CH 8-Bit	-	5	4
68HC711KS2	-	1	32	640	16-Bit, 3/4IC, 4/5OC, RTI, pulse accumulator	SCI+ SPI	8-CH 8-Bit	-	5	4



## 16-bit Microcontrollers

### 68HC12 16-bit Microcontrollers

Product	ROM (Kbytes)	RAM (Bytes)	EPROM/OTP (Bytes)	EEPROM (Bytes)	Timer	I/O	Serial	A/D	PWM	Operating Voltage (V)	Bus Frequency (Max) (MHz)
68HC12A0	-	1	-	-	8-CH 16-Bit (IC or OC) RTI, Pulse accumulator	Up to 61	Dual SCI, SPI	8-CH 8-Bit	-	5, 3.3	8, 5
68HC812A4	-	1	4K	-	8-CH 16-Bit (IC or OC) RTI, Pulse accumulator	Up to 91	Dual SCI, SPI	8-CH 8-Bit	-	5, 3.3	8, 5
68HC912B32	-	1	768	32	8-CH 16-Bit (IC or OC) RTI, Pulse accumulator	up to 63	SCI, SPI, J1850	8-CH 10-Bit	4-CH 8-Bit or 2-CH 16-Bit	5	8
68HC12BE32	32	1	768	-	8-CH 16-Bit (IC or OC) RTI, Pulse accumulator	up to 63	SCI, SPI, J1850	8-CH 10-Bit	4-CH 8-Bit or 2-CH 16-Bit	5	8
68HC912BC32	-	1	768	32	8-CH 16-Bit (IC or OC) RTI, Pulse accumulator	Up to 63	SCI, SPI, CAN	8-CH 10-Bit	4-CH 8-Bit or 2-CH 16 Bit	5	8
68HC912D60	-	2	1K	60	8-CH 16-Bit (IC or OC) RTI, Pulse accumulator	Up to 63	Dual SCI, SPI, CAN	16-CH 10-Bit	4-CH 8-Bit or 2-CH 16 Bit	5	8
68HC912DG128	-	8	2K	128	8-CH 16-Bit (IC or OC) RTI, Pulse accumulator	Up to 85	Dual SCI, SPI, I2C	16-CH 10-Bit	4-CH 8-Bit or 2-CH 16 Bit	5	8

### 68HC16 16-bit Microcontrollers

Product	ROM (Kbytes)	RAM (Bytes)	Flash (Kbytes)	Device Integration Module	Timer	Serial	A/D	Operating Voltage (V)	Operating Frequency (MHz)
68HC16R1	48	2	-	SCIM2	CTM7	Dual SCI, SPI	8-CH 10-Bit	5	16
68HC916R1	-	2	48+2	SCIM2	CTM7	Dual SCI, SPI	8-CH 10-Bit	5	16
68HC916X1	-	2	48+2	SCIM	GPT	SCI, queued SPI	6-CH 10-Bit	5	16
68HC16Y1	48	2	-	SCIM	GPT, TPU	Dual SCI, SPI	8-CH 10-Bit	5	16
68HC916Y1	-	2+2	48+2	SCIM	GPT, TPU	Dual SCI, SPI	8-CH 10-Bit	5	16
68HC16Y3	96	4	-	SCIM2	GPT, TPU2	Dual SCI, queued SPI	8-CH 10-Bit	5	16
68HC916Y3	-	4	96+4	SCIM2	GPT, TPU2	Dual SCI, queued SPI	8-CH 10-Bit	5	16
68HC16Z1	-	1	-	SIM	GPT	SCI, queued SPI	8-CH 10-Bit	3, 5	16, 20, 25
68HC16Z3	8	4	-	SIM	GPT	SCI, queued SPI	8-CH 10-Bit	5	16, 20, 25
68HC16Z4	-	1	-	SIML	GPT	Dual SCI, SPI	8-CH 10-Bit	5	16, 20, 25

## 32-bit Microcontrollers

### 683xx 32-bit Microcontrollers

Product	ROM (Kbytes)	RAM (Bytes)	Device Integration Module	Timer	Serial	A/D	Operating Voltage (V)	Operating Frequency (MHz)
68331	-	-	SIM	GPT	SCI, queued SPI	-	2.7, 5.0	16, 20, 25
68332	-	2	SIM	TPU	SCI, queued SPI	-	3.0, 5.0	16, 20, 25
68336	-	4K + 3.5K	SIM	TPU CTM4	SCI, queued SPI	Queued 16-CH 10-Bit	5	20, 25
68376	8	4K + 3.5K	SIM	TPU CTM4	TOUCAN, SCI, queued SPI	Queued 16-CH 10-Bit	5	20, 25
68CK338	-	-	SIML	CTM6	SCI, queued SPI	-	2.7-3.6	14

### MPC500 32-Bit Microcontroller

Product	RAM (Kbytes)	Flash (Kbytes)	Timer	Serial	A/D	Operating Voltage (Volts)	Operating Frequency (MHz)
MPC509	-	-	-	-	-	-	-
MPC555	26 + 6 for TPUs	448	60 channel timer systems: 2 TPU2 + MIOS	QSMCM (2SCI + QPSI) + 2 TouCAN	2 QADC2 (10 bit A/D w/64 result registers)	3.3 Vdc for core, 5.0 Vdc for FLASH	40

M-Core 32-bit Microcontrollers



Product	ROM (Kbytes)	RAM (Bytes)	Flash (Kbytes)	Timer	I/O	Serial	A/D	Misc Peripherals	Operating Voltage (V)	Operating Frequency (MHz)
MMC2001	256	32	-	Time-of-day, periodic timer, COP	-	Dual UART Interval SPI	-	-	1.8-3.6	33
MMC2107	-	8	128	2-timers 4 CH input capture, PIT, Watchdog, supports PWM	up to 72	SPI, 2-SCI	8-CH 10 BIT	Interrupt Controller, PLL	2.7-3.6	33

Hitachi Microcontrollers

H8/300 8-bit Devices



Series	Product Name	OTP	ROM	FLASH	Memory Size		Speed (MHz)		SCI Sync/ Async	A/D# channel	D/A# channel	Other Features	Note
					ROM	RAM	@5V	@3V		res	8bit		
H8/3217	H8/3202	HD6473214	HD6433202	-	16K	512	16	10	2	-	-	I2C, ISA bus host I/F (not H8/3212), KBD controller (not H8/3212), watchdog timer, 16 high current (10mA) outputs	5,6
	H8/3212	HD6473214	HD6433212	-	16K	512	16	10	1	-	-		5,6
	H8/3214	HD6473214	HD6433214	-	32K	1K	16	10	2	-	-		5,6
	H8/3216	HD6473217	HD6433216	-	48K	2K	16	10	2	-	-		5,6
	H8/3217	HD6473217	HD6433217	-	60K	2K	16	10	2	-	-		5,6
H8/3297	H8/3292	HD6473294	HD6433292	-	16K	512	16	10	1	8, 10-bit	-	watchdog timer, wait state controller	5
	H8/3294	HD6473294	HD6433294	-	32K	1K	16	10	1	8, 10-bit	-		5
	H8/3296	HD6473296	HD6433296	-	48K	2K	16	10	1	8, 10-bit	-		5
	H8/3297	HD6473297	HD6433297	-	60K	2K	16	10	1	8, 10-bit	-		5
H8/3337Y	H8/3334Y	HD6473334Y	HD643334Y	HD64F3334Y	32K	1K	16	10	2	8, 10-bit	2	I2C, ISA bus host I/F, KBD controller, watchdog timer, wait state controller, 16 high current(10mA) outputs, 12V flash read/write	2,3,5,6
	H8/3336Y	HD6473337Y	HD643336Y	HD64F3337Y	48K	2K	16	10	2	8, 10-bit	2		2,3,5,6
	H8/3337Y	HD6473337Y	HD643337Y	HD64F3337Y	60K	2K	16	10	2	8, 10-bit	2		2,3,5,6
for new designs using 5V Vcc, Hitachi recommends using the newer series below													
H8/3337S	H8/3337S	-	-	HD64F3337S	60K	2K	16	-	2	8, 10-bit	2	I2C, ISA bus host I/F, KBD controller, watchdog timer, wait state controller, 16 high current(10mA) outputs, 5V Vcc and 5V flash read/write only	2,3,5,6,7
H8/3437	H8/3434	HD6473434	HD6433434	HD64F3434	32K	1K	16	10	2	8, 10-bit	2	I2C, ISA bus host I/F, KBD controller, watchdog timer, wait state controller, 16 high current(10mA) outputs, 12V flash read/write	2,3,5,6
	H8/3436	HD6473437	HD6433436	HD64F3437	48K	2K	16	10	2	8, 10-bit	2		2,3,5,6
	H8/3437	HD6473437	HD6433437	HD64F3437	60K	2K	16	10	2	8, 10-bit	2		2,3,5,6
for new designs using 5V Vcc, Hitachi recommends using the newer series below													
H8/3437SF	H8/3437S	-	-	HD64F3437S	60K	2K	16	-	2	8, 10-bit	2	I2C, ISA bus host I/F, KBD controller, watchdog timer, wait state controller, 16 high current(10mA) outputs, 5V Vcc and 5V flash read/write only	2,3,5,6,7

New Product : Check with Hitachi to confirm device, tools, and literature availability

Notes :

- 1) SCI = Serial Communication Interface
- 2) IKAP = Integrated Keyboard And Power management
- 3) I2C is an option for H8/3334Y, 3336Y, 3337Y, H8/3434, H8/3436, and H8/3437. Inform Hitachi if option is to be used. In mask ROM versions, chips featuring the I2C bus include a W in the part number
- 4) COB is "chip on board", COT "is chip on tape", and SOP is "small outline package"
- 5) Standard temp is -20 °C to + 75 °C. 1 temp is -40 °C to + 85 °C @ 1000hr test. J temp(limited devices) = 1 temp @ 2000 hr test. Please contact Marketing for extended temperature requirements.
- 6) KBD Controller is Keyboard Controller
- 7) The S mask version is 5V flash programmable and only operates at 4.5V-5.5V Vcc

## H8/300L 8-bit Devices

Series	Product Name	Part#			Memory Size		Int. Speed (MHz)		Serial		A/D 8-bit #chan.	Other Features	Note
		OTP	ROM	FLASH	ROM	RAM	@5V	@3V	Sync/ Async	Sync/ Async			
H8/3644	H8/3640	-	HD6433640	-	8K	512	8	5	1	8	8	watchdog timer 32 KHz sub clock generator	5
	H8/3641	-	HD6433641	-	12K	612	8	5	1	8	8		5
	H8/3642	-	HD6433642	HD64F3642	16K	1K	8	5	1	8	8		5,9
	H8/3643	-	HD6433643	HD64F3643	24K	1K	8	5	1	8	8		5
	H8/3644	HD6473644	HD6433644	HD64F3644	32K	1K	8	5	1	8	8		5,6
H8/3657	H8/3652	-	HD6433652	-	16K	1K	5	2.5	1	8	8	watchdog timer 32 KHz sub clock generator	7,8
	H8/3653	-	HD6433653	-	24K	1K	5	2.5	1	8	8		7,8
	H8/3654	-	HD6433654	-	32K	1K	5	2.5	1	8	8		7,8
	H8/3655	-	HD6433655	-	40K	2K	5	2.5	1	8	8		7,8
	H8/3656	-	HD6433656	-	48K	2K	5	2.5	1	8	8		7,8
	H8/3657	HD6473657	HD6433657	-	60K	2K	5	2.5	1	8	8		7,8
H8/3814S	H8/3812S	use H8/38341	HD6433812	-	16K	512	5	2.5	1	12	12	LCD controller 20byte character RAM. 30 segments, 4 common, externally expandable with HD66100up to 160 segments low voltage A/D 32KHz sub clock generator	2,3,4,5
	H8/3813S	use H8/38341	HD6433813	-	24K	512	5	2.5	1	12	12		2,3,4,5
	H8/3814S	use H8/38341	HD6433814	-	32K	512	5	2.5	1	12	12		2,3,4,5
H8/3837S	H8/3832S	-	HD6433832	-	16K	1K	5	2.5	1	12	12	LCD controller 64byte character RAM. 40 segments, 4 common, externally expandable with HD66100up to 512 segments low voltage A/D 32KHz sub clock generator	2,4,5
	H8/3833S	-	HD6433833	-	24K	1K	5	2.5	1	12	12		2,4,5
	H8/3834S	HD64738340	HD6433834	-	32K	1K	5	2.5	1	12	12		2,4,5
	H8/3835S	-	HD6433835	-	40K	2K	5	2.5	1	12	12		2,4,5
	H8/3836S	-	HD6433836	-	48K	2K	5	2.5	1	12	12		2,4,5
	H8/3837S	HD64738370	HD6433837	-	60K	2K	5	2.5	1	12	12		2,4,5
for new designs, Hitachi recommends using the newer series below													
H8/3887	H8/3882	-	HD6433882	-	16K	1K	3	1.6	1	2	12ch,10-bit	LCD controller/driver (40x4) expandable to (256x4) 1.8V-5.5V Vcc on-chip LCD power supply driver	2,4,5,10
	H8/3883	-	HD6433883	-	24K	1K	3	1.6	1	2	12ch,10-bit		2,4,5,10
	H8/3884	-	HD6433884	-	32K	2K	3	1.6	1	2	12ch,10-bit		2,4,5,10
	H8/3885	-	HD6433885	-	40K	2K	3	1.6	1	2	12ch,10-bit		2,4,5,10
	H8/3886	-	HD6433886	-	48K	2K	3	1.6	1	2	12ch,10-bit		2,4,5,10
	H8/3887	HD7473887	HD6433887	-	60K	2K	3	1.6	1	2	12ch,10-bit		2,4,5,10
H8/3847	H8/3842	-	HD6433842	-	16K	1K	3	1.6	1	2	12ch,10-bit	LCD controller/driver (40x4) expandable to (256x4) 1.8V-5.5V Vcc	2,4,5,10
	H8/3843	-	HD6433842	-	24K	1K	3	1.6	1	2	12ch,10-bit		2,4,5,10
	H8/3844	-	HD6433843	-	32K	2K	3	1.6	1	2	12ch,10-bit		2,4,5,10
	H8/3845	-	HD6433844	-	40K	2K	3	1.6	1	2	12ch,10-bit		2,4,5,10
	H8/3846	-	HD6433845	-	48K	2K	3	1.6	1	2	12ch,10-bit		2,4,5,10
	H8/3847	HD7473847	HD6433846	-	60K	2K	3	1.6	1	2	12ch,10-bit		2,4,5,10
H8/3867	H8/3862	-	HD6433862	-	16K	1K	3	1.6	-	2	8ch,10-bit	LCD controller/driver (40x4) expandable to (256x4) 1.8V-5.5V Vcc on-chip LCD power supply driver	2,4,5,11
	H8/3863	-	HD6433863	-	24K	1K	3	1.6	-	2	8ch,10-bit		2,4,5,11
	H8/3864	-	HD6433864	-	40K	2K	3	1.6	-	2	8ch,10-bit		2,4,5,11
	H8/3865	-	HD6433865	-	40K	2K	3	1.6	-	2	8ch,10-bit		2,4,5,11
	H8/3866	-	HD6433866	-	40K	2K	3	1.6	-	2	8ch,10-bit		2,4,5,11
	H8/3867	HD7473867	HD6433867	-	60K	2K	3	1.6	-	2	8ch,10-bit		2,4,5,11
H8/3827	H8/3822	-	HD6433822	-	16K	1K	3	1.6	-	2	8ch,10-bit	LCD controller/driver (40x4) expandable to (256x4) 1.8V-5.5V Vcc	2,4,5,11
	H8/3823	-	HD6433823	-	24K	1K	3	1.6	-	2	8ch,10-bit		2,4,5,11
	H8/3824	-	HD6433824	-	32K	2K	3	1.6	-	2	8ch,10-bit		2,4,5,11
	H8/3825	-	HD6433825	-	40K	2K	3	1.6	-	2	8ch,10-bit		2,4,5,11
	H8/3826	-	HD6433826	-	48K	2K	3	1.6	-	2	8ch,10-bit		2,4,5,11
	H8/3827	HD7473827	HD6433827	-	60K	2K	3	1.6	-	2	8ch,10-bit		2,4,5,11
H8/3857	H8/3855	-	HD6433855	-	40K	2K	5	0.5	1	1	8	LCD controller/driver 40x32, 56x16, 64x8 Graphic 40x32, 40x16, 40x8 Character LCD Power supply set-up circuit(2x, 3x) Built-in contrast, scroll, blinking	2,4,5,12
	H8/3856	-	HD6433856	-	48K	2K	5	0.5	1	1	8		2,4,5,12
	H8/3857	-	HD6433857	HD64F3857	60K	2K	5	0.5	1	1	8		2,4,5,12

New Product : Check with Hitachi to confirm device, tools, and literature availability

Notes :

- 1) High voltage I/O ports are from Vcc to -40 volts. Normal I/O are from Vcc to Gnd
- 2) The 16 bit timer can be used as two Independent 8-bit timers
- 3) For H8/3812/13/14 expanding segment drivers work only for 1/1 and 1/2 duty ratios
- 4) VFD = Vacuum Fluorescent Display, LCD = Liquid Crystal Display
- 5) Standard temp is -20 °C to +75 °C, 1 temp is -40 °C to +85 °C @ 1000hr test
- 6) For H8/3644 FLASH device Vcc = 3.0 - 5.5V
- 7) Low voltage operation Device : For this device "5V" = 2.7V to 5.5V and "3V" = 2.2V to 5.5V
- 8) This device is offered in two types of TQFP and QFP packages : TQFP-80C, TQFP-80F and QFP-80A, QFP-80B
- 9) The MROM version only has 512bytes of RAM
- 10) This device is offered in 2 types of QFP and TQFP packages : (QFP-100A or B, TQFP-100B or G)



H8/300H 16-bit Devices

Series	Product Name	Part#				Memory Size		Speed(1) (MHz)		SCI(1) Sync/ Async	A/D #chan res	D/A #chan 8bit	DMA # chan	External Bus Interface (BSC)(7)	Other Features	Note
		OTP	ROM	Romless	FLASH	ROM	RAM	@5V	@3V							
H8/3002	H8/3002	-	-	yes	-	-	512	17	10	2	8	-	max 4	DRAM, SRAM	-	2,4
H8/3003	H8/3003	-	-	yes	-	-	512	16	10	2	8	-	max 8	DRAM, SRAM	-	2,4
H8/3005	H8/3004	-	-	yes	-	-	2K	18	13	1	8	-	-	SRAM (6)	-	2,4
	H8/3005	-	-	yes	-	-	4K	18	13	1	8	-	-	SRAM (6)	-	2,4
for new designs, Hitachi recommends using the newer series below																
H8/3007	H8/3006	-	-	yes	-	-	2K	20	13	3	8	2	max 4	DRAM(10), SRAM, Burst ROM	Clock Pulse Generator (8)	2,4
	H8/3007	-	-	yes	-	-	4K	20	13	3	8	2	max 4	DRAM(10), SRAM, Burst ROM	Clock Pulse Generator (8)	2,4
H8/3039	H8/3036	-	yes	-	-	16K	512	18	10	2	8	-	-	SRAM (6)	Smartcard I/F	2,4
	H8/3037	-	yes	-	-	32K	1K	18	10	2	8	-	-	SRAM (6)	Smartcard I/F	2,4
	H8/3038	-	yes	-	-	64K	2K	18	10	2	8	-	-	SRAM (6)	Smartcard I/F	2,4
	H8/3039	-	yes	-	yes	128K	4K	18	10	2	8	-	-	SRAM (6)	Smartcard I/F	2,4,9
H8/3048	H8/3044	-	yes	-	-	32K	2K	18	13	2	8	2	max 4	DRAM, SRAM	Smartcard I/F, Clock Pulse Generator (8)	2,4,5
	H8/3045	-	yes	-	-	64K	2K	18	13	2	8	2	max 4	DRAM, SRAM		2,4,5
	H8/3047	-	yes	-	-	96K	4K	18	13	2	8	2	max 4	DRAM, SRAM		2,4,5
	H8/3048	yes	yes	-	yes	128K	4K	18	13	2	8	2	max 4	DRAM, SRAM		2,4,5
for new designs, Hitachi recommends using the newer series below																
H8/3062	H8/3060	-	yes	-	-	64K	2K	20	10	2	8	2	-	SRAM	Smartcard I/F, Clock Pulse Generator(8)	2,4
	H8/3061	-	yes	-	-	96K	4K	20	10	2	8	2	-	SRAM		2,4
	H8/3062R	-	yes	-	yes	128K	4K	20	10	2	8	2	-	SRAM		2,4,9
H8/3067	H8/3065	-	yes	-	-	64K	2K	20	10	3	8	2	max 4	DRAM(10), SRAM, Burst ROM	Smartcard I/F, Clock Pulse Generator(8)	2,4
	H8/3066	-	yes	-	-	96K	4K	20	10	3	8	2	max 4	DRAM(10), SRAM, Burst ROM		2,4
	H8/3067R	-	yes	-	yes	128K	4K	20	10	3	8	2	max 4	DRAM(10), SRAM, Burst ROM		2,4,9

Notes

- 1) SCI = Serial Communication Interface.
- 2) Bus width is 8 or 16 bits wide except for H8/3004-3005 where it is only 8 bits.
- 3) TPC = Timing Pattern Controller. Provides additional PWM pulse outputs.
- 4) Standard temp is -20 °C to +75 °C. Extended (I) temp. is -40 °C to + 85 °C @ 1000hr test. J temp (limited devices) = 1 temp @ 2000 hr test ; limited availability.
- 5) Flash version operates at a maximum frequency of 16MHz at 5V.
- 6) No Chip Select (CS) lines implies decoding logic needed.
- 7) BSC = Bus State Controller. Allows for wait state insertion during external access cycles.
- 8) Allows dynamic system frequency modification.
- 9) The H8/3039F, 3062R, and 3067R flash can be programmed from A SINGLE 5V VOLTAGE SOURCE(3V versions from a 3V source).
- 10) Supports DRAM fast page mode.

H8S/2100 16-bit Devices

Series	Product	Part #		Memory Size			Add space	Ext Data Bus	Speed (MHz)		SCI3 Sync/ Async	IrDA 1.0	I2C4 (option)	PC Peripheral I/F		Compa-rator #ch. 6-bit	A/D #ch. 10-bit	D/A #ch. 8-bit
		ROM	FLASH5	ROM	Flash	RAM			@5V	@3V				ISA I/F	PS/2			
H8S/2148	H8S/2148	HD6432148R	HD64F2148R	128K	128K	4K	16M	8,16	20	10	3	1	2	4	3	16	8	2
	H8S/2147	HD6432147	HD64F2148RV5	128K	128K	4K	16M	8,16	20	10	3	1	2	4	3	16	8	2
H8S/2144	H8S/2144	HD6432144	HD64F2144	128K	128K	4K	16M	8,16	20	10	3	1	-	-	-	16	8	2
	H8S/2143	HD6432143	HD64F2144V5	128K	128K	4K	16M	8,16	20	10	3	1	-	-	-	16	8	2
		HD6432142	HD64F2142	96K	64K	4K	16M	8,16	20	10	3	1	-	-	-	16	8	2
		HD64F2142V5	64K	64K	2K	16M	8,16	20	10	3	1	-	-	-	16	8	2	
H8S/2138	H8S/2138	HD6432138R	HD64F2138R	128K	128K	4K	16M	8	20	10	3	1	2	2	-	8	8	2
	H8S/2137	HD6432137	HD64F2138R5	128K	128K	4K	16M	8	20	10	3	1	2	2	-	8	8	2
H8S/2134	H8S/2134	HD6432134	HD64F2134	128K	128K	4K	16M	8	20	10	3	1	-	-	-	8	8	2
	H8S/2133	HD6432133	HD64F2134V5	128K	128K	4K	16M	8	20	10	3	1	-	-	-	8	8	2
		HD6432132	HD64F2132	96K	64K	4K	16M	8	20	10	3	1	-	-	-	8	8	2
		HD64F2132V5	64K	64K	2K	16M	8	20	10	3	1	-	-	-	8	8	2	
H8S/2130	HD6432130	-	32K	-	2K	16M	8	20	10	3	1	-	-	-	8	8	2	
H8S/2128	H8S/2128	HD6432126	HD64F2128	128K	128K	4K	16M	8	20	10	2	-	2	2	-	8	8	-
	H8S/2127R	HD6432127R	HD64F2128V5	128K	128K	4K	16M	8	20	10	2	-	2	2	-	8	8	-
		H8S/2126R	HD6432126R	-	64K	-	2K	16M	8	20	10	2	-	2	2	-	8	8
H8S/2124	H8S/2124	HD6432124	-	128K	-	4K	16M	8	20	10	2	-	-	-	-	8	8	-
	H8S/2123	HD6432123	-	96K	-	4K	16M	8	20	10	2	-	-	-	-	8	8	-
	H8S/2122	HD6432122	-	64K	-	2K	16M	8	20	10	2	-	-	-	-	8	8	-
	H8S/2120	HD6432120	-	32K	-	2K	16M	8	20	10	2	-	-	-	-	8	8	-

New Product : Check with Hitachi to confirm device, tools, and literature availability

Notes :

- 1) WD is WatchDog
- 2) DTC is Data Transfer Controller
- 3) SCI is Serial Communication Interface
- 4) I2C where available is an option on MROM and standard on Flash
- 5) "V" version operates between 2.7-5.5V(mROM) and 3.0-5.5V(flash ; flash programming and erase is between 3.0-3.6V)

H8S/2200/2300/2600 16-bit Devices



Series	Product Name	Part#				Memory Size		Speed (MHz)		SCI(2) Sync/ Async	A/D(3) 10-bit #chan	D/A 8-bit #chan	DMA # chan	External Bus Interface (BSC)(4)	Other Features	Note
		OTP	ROM	Romless	FLASH	ROM	RAM	@5V	@3V							
H8S/2245	H8S/2240	-	-	yes	-	-	4K	20	13	3	4	-	-	SRAM, Burst ROM Smartcard I/F, Interrupt Priority Ctrl(5), DTC(6)	8	
	H8S/2241	-	yes	-	-	32K	4K	20	13	3	4	-	-		8	
	H8S/2242	-	yes	-	-	32K	8K	20	13	3	4	-	-		8	
	H8S/2244	-	yes	-	-	128K	4K	20	13	3	4	-	-		8	
	H8S/2246	yes	-	-	-	128K	8K	20	13	3	4	-	-		8	
for new designs, Hitach recommends using the newer series below																
H8S/2227	H8S/2227	-	yes	-	-	128K	16K	-	13	3	8	-	-	SRAM, Burst ROM	Smartcard I/F, Interrupt Priority Ctrl(5), DTC(6), 32KHz subclk, PC break Ctrl(10)	7
H8S/2237	H8S/2233	-	yes	-	-	64K	4K	-	13	4	8	2	-	SRAM, Burst ROM	Smartcard I/F, Interrupt Priority Ctrl(5), DTC(6), 32KHz subclk, PC break Ctrl(10)	7
	H8S/2235	-	yes	-	-	128K	4K	-	13	4	8	2	-	SRAM, Burst ROM		7
	H8S/2237	yes	yes	-	-	128K	16K	-	13	4	8	2	-	SRAM, Burst ROM		7
H8S/2345	H8S/2340	-	-	yes	-	-	2K	20	13	2	8	2	-	SRAM, Burst ROM	Smartcard I/F, Interrupt Priority Ctrl(5), DTC(6), PLL	7
	H8S/2341	-	yes	-	-	32K	2K	20	13	2	8	2	-	SRAM, Burst ROM		7
	H8S/2343	-	yes	-	-	64K	2K	20	13	2	8	2	-	SRAM, Burst ROM		7
	H8S/2345	yes	yes	-	yes	128K	4K	20	13	2	8	2	-	SRAM, Burst ROM		7, 11
H8S/2250	H8S/2351	-	yes	-	-	64K	2K	20	13	2	8	2	max 4	DRAM(10), SRAM, Burst ROM	Smartcard I/F, Interrupt Priority Ctrl(5), DTC(6)	7
	H8S/2350	-	-	yes	-	-	2K	20	13	2	8	2	max 4	SRAM, Burst ROM		7
H8S/2355	H8S/2353	-	yes	-	-	64K	2K	20	13	3	8	2	-	SRAM, Burst ROM	Smartcard I/F, Interrupt Priority Ctrl(5), DTC(6)	7
	H8S/2355	yes	yes	-	-	128K	4K	20	13	3	8	2	-	SRAM, Burst ROM		7
H8S/2357	H8S/2352	-	-	yes	-	-	8K	20	13	3	8	2	max 4	DRAM(9), SRAM, Burst ROM	Smartcard I/F, I nterrupt Priority Ctrl(5), DTC(6)	7
	H8S/2357	yes	yes	-	yes	128K	8K	20	13	3	8	2	max 4	SRAM, Burst ROM		7, 11
H8S/2655	H8S/2653	-	yes	-	-	64K	4K	20	13	3	8	2	max 4	DRAM(9), SRAM, Burst ROM	Smartcard I/F, Interrupt Priority Ctrl(5), DTC(6)	7, 8
	H8S/2655	yes	yes	-	-	128K	4K	20	13	3	8	2	max 4	SRAM, Burst ROM		7, 8

Notes :

- 1) PPG = Programmable Pattern Generator, Provides additional PWM pulse outputs.
- 2) SCI = Serial Communication Interface.
- 3) A/D conversion times at 20MHz : 2.2us (H8S/2655), 6.7us (H8S/23xx), 9.9us(H8S/22xx)
- 4) BSC = Bus State Controller. Allows for wait state insertion during external access cycles.
- 5) H8S devices allow for 8 interrupt priority levels except the H8S/2245 which only allow 3.
- 6) DTC = Data Transfer Controller. Provides another means of transferring data(besides the DMA) within the allowable memory space.
- 7) Standard temp is -20 °C to + 75 °C. I(wide) temp -40 °C to + 85 °C @1000 hr test(planned).
- 8) A Multiply-Accumulate function (MAC) is provided on the H8S/2655 performing 16x16+42-bit operations.
- 9) Supports DRAM fast page mode.
- 10) Allows on-chip debugging.
- 11) Single voltage flash programming(3 or 5V).

National Semiconductor COP8 Microcontroller



8-bit COP8 Microcontroller (Mask ROM)

Part Number	Description	Package	Code Memory	RAM	I/O Pins	MIWU	Analog Feature	Watchdog /Clock Monitor	USART Interface
COP912C	Lowest cost basic microcontroller, only commercial grade	20-DIP/SO	768	64	16	No	No	No	No
COP820C/822C	Basic Family microcontroller	28-DIP/SO, 20-DIP/SO	1K	64	24,16	No	No	No	No
COP840C/842C	Basic Family microcontroller	28-DIP/SO, 20-DIP/SO	2K	128	24,16	No	No	No	No
COP880C /881C/882C	Basic Family microcontroller	40-DIP, 44-PLCC, 28-DIP/SO, 20-DIP/SO	4K	128	40,36, 24,16	No	No	No	No
COP820CJ /822CJ/823CJ	Basic Family for Small appliance application	28-DIP/SO, 20-DIP/SO, 16-SO	1K	64	24,16,12	Yes	1-Comp.	Yes/No	No
COP840CJ/842CJ	Basic Family for Small appliance application	28-DIP/SO, 20-DIP/SO	4K	128	24,16	Yes	1-Comp.	Yes/No	No
COP884BC /885BC	Microcontroller with Comparators and CAN Interface	28-SO, 20-SO	2 K	64	19,11	Yes	2,1-Comp.	No	No



Part Number	Description	Package	Code Memory	RAM	I/O Pins	MIWU	Analog Feature	Watchdog /Clock Monitor	USART Interface
COP884CF/888CF	Microcontroller with A/D Converter	28-DIP/SO, 40-DIP, 44-PLCC	4 K	128	22,34,38	Yes	ADC	Yes/Yes	No
COP884CL/888CL	Microcontroller with Watchdog	28-DIP/SO, 40-DIP, 44-PLCC	4 K	128	24,34,40	Yes	No	Yes/Yes	No
COP888EB	Microcontroller with CAN Interface, 8-Bit A/D, and USART	44-PLCC	8 K	192	34	Yes	ADC	Yes/Yes	Yes
COP884EK/888EK	Microcontroller with Comparator, and Single-slope A/D Capability	28-DIP/SO, 40-DIP, 44-PLCC	8 K	256	24,36,40	Yes	ADC, 1-Comp.	Yes/Yes	No
COP888FH	Microcontroller with Comparators and USART	40-DIP, 44-PLCC	12 K	512	36,40	Yes	2-Comp.	Yes/Yes	Yes
COP888GD	Microcontroller with 8-Channel A/D	44-PLCC/PQFP	16 K	256	40	Yes	ADC	Yes/Yes	No
COP888GW	Microcontroller with Pulse Train Generators and Capture Modules	68-PLCC	16 K	512	53	Yes	No	Yes/Yes	Yes
COP884CS /888CS/888CS	Microcontroller with Comparators and USART	28-DIP/SO, 40-DIP, 44-PLCC	4 K, 8 K	192	24,36,40	Yes	1-Comp.	Yes/Yes	Yes
COP8SAA5 Family	Microcontroller with On-chip RC Oscillator	16-DIP/SO, 20-DIP/SO, 28-DIP/SO/CSP	1K	64	12,16,24	Yes	No	Yes/Yes	No
COP8SAB5 Family	Microcontroller with On-chip RC Oscillator	20-DIP/SO, 28-DIP/SO/CSP	2K	128	16,24	Yes	No	Yes/Yes	No
COP8SAC5 Family	Microcontroller with On-chip RC Oscillator	20-DIP/SO, 28-DIP/SO/CSP, 40-DIP, 44-PLCC/PQFP	4K	128	16,24,36,40	Yes	No	Yes/Yes	No
COP8ACC5 Family	Microcontroller with High Resolution A/D	20-SO, 28-DIP/SO	4 K	128	16,24	Yes	ADC, 1-Comp.	Yes/Yes	No
COP8SEC5 Family	Microcontroller with 128 Bytes EEPROM	16-SO, 20-SO	4K	128	12,16	Yes	No	Yes/Yes	No

8-bit COP8 Microcontroller (OTP)

Part Number	Description	Package	Code Memory	RAM	I/O Pins	MIWU	Analog Feature	Watchdog /Clock Monitor	USART Interface
87L20CJ/22CJ	OTP for COP820C/822C, COP820CJ/822CJ/823CJ	28-DIP/SO, 20-DIP/SO	1K	64	24,16	Yes	1-Comp.	Yes/No	No
87L40CJ/42CJ	OTP for COP912C/840C/842C/881C / 882C, COP840CJ/842CJ	28-DIP/SO, 20-DIP/SO	4K	128	24,16	Yes	1-Comp.	Yes/No	No
87L40RJ/42RJ	OTP for COP840C/842C/881C/882C, COP840CJ/842CJ	28-DIP/SO, 20-DIP/SO	32K	128	24,16	Yes	1-Comp.	Yes/No	No
87L84BC	OTP for COP884BC	28-SO	16K	64	19	Yes	2-Comp.	No	No
87L84CF/88CF	OTP for COP884CF/888CF	28-DIP/SO, 40-DIP, 44-PLCC	16K	128	22,34,38	Yes	ADC	Yes/Yes	No
87L84CL/88CL	OTP for COP884CL/888CL	28-DIP/SO, 40-DIP, 44-PLCC	16K	128	24,34,40	Yes	No	Yes/Yes	No
87L88EB, 87L88RB	OTP for COP888EB	44-PLCC	16K, 32K	192	34	Yes	ADC	Yes/Yes	Yes
87L84EK/88EK, 87L84RK/88RK	OTP for COP884EK/888EK	28-DIP/SO, 40-DIP, 44-PLCC	16K, 32K	256	24,36,40	Yes	ADC, 1-Comp.	Yes/Yes	No
87L88FH	OTP for COP888FH	40-DIP, 44-PLCC	16K	512	36,40	Yes	2-Comp.	Yes/Yes	Yes
87L88RD	OTP for COP888GD	44-PLCC/PQFP	32K	256	40	Yes	ADC	Yes/Yes	No
87L88GW	OTP for COP888GW	68-PLCC	32K	512	53	Yes	No	Yes/Yes	Yes
8SGE728/740, 8SGR728/740/744	OTP for COP884CS/888CS/888CS	28-DIP/SO, 40-DIP, 44-PLCC	8K, 32K	256, 512	24,36,40	Yes	1-Comp.	Yes/Yes	Yes
8SAA7 Family	OTP for COP8SAA5 Family	16-DIP/SO, 20-DIP/SO, 28-DIP/SO/CSP	1K	64	12,16,24	Yes	No	Yes/Yes	No
8SAB7 Family	OTP for COP8SAB5 Family	20-DIP/SO, 28-DIP/SO/CSP	2K	128	16,24	Yes	No	Yes/Yes	No
8SAC7 Family	OTP for COP8SAC5 Family	20-DIP/SO, 28-DIP/SO/CSP, 40-DIP, 44-PLCC/PQFP	4K	128	16,24,36,40	Yes	No	Yes/Yes	No
8ACC7 Family	OTP for COP8ACC5 Family	20-SO, 28-DIP/SO	16K	128	16,24	Yes	ADC, 1-Comp.	Yes/Yes	No

## Microchip PIC Microcontroller

PICmicro Microcontroller Family Products														
Product	Program Memory			EEPROM Data Memory Bytes	RAM Bytes	I/O Ports	Packages	Analog			Digital			MAX Speed MHz
	Bytes	OTP/FLASH Words	ROM Words					8-Bit ADC Channels	Comparators	PWM 10-Bit	Timers/WDT	Serial I/O		
PIC12CXXX: 400ns Instruction Execution, 33/35 Instructions, 8-Pin Package, 4MHz Internal Oscillator, 4/5 Oscillator Selections														
PIC12C508	768	512x12	-	-	25	6	8P, 8SM, 8JW	-	-	-	-	1-8bit, 1-WDT	-	4
PIC12C508A	768	512x12	-	-	25	6	8P, 8SM, 8JW, 8SN	-	-	-	-	1-8bit, 1-WDT	-	4
PIC12C509	1536	1024x12	-	-	41	6	8P, 8SM, 8JW	-	-	-	-	1-8bit, 1-WDT	-	4
PIC12C509A	1536	1024x12	-	-	41	6	8P, 8SM, 8JW, 8SN	-	-	-	-	1-8bit, 1-WDT	-	4
PIC12CR509A	1536	-	1024x12	-	41	6	8P, 8SM, 8SN	-	-	-	-	1-8bit, 1-WDT	-	4
PIC12CE518	768	512x2	-	16	25	6	8P, 8SM, 8JW, 8SN	-	-	-	-	1-8bit, 1-WDT	-	4
PIC12CE519	1536	1024x12	-	16	41	6	8P, 8SM, 8JW, 8SN	-	-	-	-	1-8bit, 1-WDT	-	4
PIC12C671	1792	1024x12	-	-	128	6	8P, 8SM, 8JW	4	-	-	-	1-8bit, 1-WDT	-	10
PIC12C672	3584	2048x14	-	-	128	6	8P, 8SM, 8JW	4	-	-	-	1-8bit, 1-WDT	-	10
PIC12CE673	1792	1024x14	-	16	128	6	8P, 8JW	4	-	-	-	1-8bit, 1-WDT	-	10
PIC12CE674	3584	2048x14	-	16	128	6	8P, 8JW	4	-	-	-	1-8bit, 1-WDT	-	10
PIC16C5X: 200ns Instruction Execution, 33 Instructions, 4/5 Oscillator Selections														
PIC16C54	768	512x12	-	-	25	12	18P, 18JW, 18SO, 20SS	-	-	-	-	1-8bit, 1-WDT	-	20
PIC16CR54A	768	-	512x12	-	25	12	18P, 18SO, 20SS	-	-	-	-	1-8bit, 1-WDT	-	20
PIC16C54A	768	512x12	-	-	25	12	18P, 18JW, 18SO, 20SS	-	-	-	-	1-8bit, 1-WDT	-	20
PIC16C54C	768	512x12	-	-	25	12	18P, 18JW, 18SO, 20SS	-	-	-	-	1-8bit, 1-WDT	-	20
PIC16CR54C	768	-	512x12	-	25	12	18P, 18SO, 20SS	-	-	-	-	1-8bit, 1-WDT	-	20
PIC16C55	768	512x12	-	-	24	20	18P, 28JW, 28SP, 28SO, 28SS	-	-	-	-	1-8bit, 1-WDT	-	20
PIC16C55A	768	512x12	-	-	24	20	28P, 28JW, 28SP, 28SO, 28SS	-	-	-	-	1-8bit, 1-WDT	-	20
PIC16C56	1536	1024x12	512x12	-	25	12	18P, 18JW, 18SO, 20SS	-	-	-	-	1-8bit, 1-WDT	-	20
PIC16C56A	1536	1024x12	-	-	25	12	18P, 18JW, 18SO, 20SS	-	-	-	-	1-8bit, 1-WDT	-	20
PIC16CR56A	1536	-	-	-	25	12	18P, 18SO, 20SS	-	-	-	-	1-8bit, 1-WDT	-	20
PIC16C57	3072	2048x12	-	-	72	20	28P, 28JW, 28SP, 28SO, 28SS	-	-	-	-	1-8bit, 1-WDT	-	20
PIC16C57C	3072	2048x12	1024x12	-	72	20	28P, 28JW, 28SP, 28SO, 28SS	-	-	-	-	1-8bit, 1-WDT	-	20
PIC16CR57C	3072	-	-	-	72	20	28P, 28SP, 28SO, 28SS	-	-	-	-	1-8bit, 1-WDT	-	20
PIC16C58B	3072	2048x12	-	-	73	12	18P, 18JW, 18SO, 20SS	-	-	-	-	1-8bit, 1-WDT	-	20
PIC16CR58B	3072	-	2048x12	-	73	12	18P, 18SO, 20SS	-	-	-	-	1-8bit, 1-WDT	-	20
PIC16C505	1536	1024x12	-	-	72	12	14P, 14JW, 14LJ	-	-	-	-	1-8bit, 1-WDT	-	20
PIC16HV540	768	512x12	-	-	25	12	18P, 18JW, 18SO, 20SS	-	-	-	-	1-8bit, 1-WDT	-	20
PIC16CXXX: 4-12 Interrupts, 200ns Instruction Execution, 35 Instructions, 4/5 Oscillator Selections, Upwardly Compatible with PIC16C5X/IPC12CXXX														
PIC14000	7168	4096x14	-	-	192	20	28SP, 28SO, 28SS, 28JW	8SLAC	2	-	-	1-16bit, 1-8bit, 1-WDT	I2CTM/SMB	20
PIC16C554	896	512x14	-	-	80	13	18P, 18SO, 18JW, 20SS	-	-	-	-	1-8bit, 1-WDT	-	20
PIC16C558	3584	2048x14	-	-	128	13	18P, 18SO, 18JW, 20SS	-	-	-	-	1-8bit, 1-WDT	-	20
PIC16C62A	3584	2048x14	-	-	128	22	28SP, 28SO, 28SS, 28JW	-	-	1	-	1-8bit, 1-16bit, 2-8bit, 1-WDT	I2C/SPITM	20
PIC16C62B	3584	2048x14	-	-	128	22	28SP, 28SO, 28SS, 28JW	-	-	1	-	1-8bit, 1-16bit, 2-8bit, 1-WDT	I2C/SPI	20
PIC16C63	7168	4096x14	-	-	128	22	28SP, 28SO, 28JW	-	-	2	-	1-8bit, 1-16bit, 2-8bit, 1-WDT	USART/I2C/SPI	20
PIC16C63A	7168	4096x14	-	-	192	22	28SP, 28SO, 28SS, 28JW	-	-	2	-	1-16bit, 2-8bit, 1-WDT	USART/I2C/SPI	20
PIC16CR63	7168	-	4096x14	-	192	22	28SP, 28SO, 28SS	-	-	2	-	1-16bit, 2-8bit, 1-WDT	USART/I2C/SPI	20
PIC16C64A	3584	2048x14	-	-	128	33	40P, 40JW, 44L, 44PQ, 44PT	-	-	1	-	1-16bit, 2-8bit, 1-WDT	I2C/SPI	20
PIC16C65A	7168	4096x14	-	-	192	33	40P, 40JW, 44L, 44PQ, 44PT	-	-	2	-	1-16bit, 2-8bit, 1-WDT	USART/I2C/SPI	20
PIC16C65B	7168	4096x14	-	-	192	33	40P, 40JW, 44L, 44PQ, 44PT	-	-	2	-	1-16bit, 2-8bit, 1-WDT	USART/I2C/SPI	20
PIC16CR65	7168	-	4096x14	-	192	33	40P, 44L, 44PQ, 44PT	-	-	2	-	1-16bit, 2-8bit, 1-WDT	USART/I2C/SPI	20
PIC16C66	14336	8192x14	-	-	368	22	28SP, 28SO, 28JW	-	-	2	-	1-16bit, 2-8bit, 1-WDT	USART/I2C/SPI	20
PIC16C67	14336	8192x14	-	-	368	33	40P, 40JW, 44L, 44PQ, 44PT	-	-	2	-	1-16bit, 2-8bit, 1-WDT	USART/I2C/SPI	20
PIC16C620	896	512x14	-	-	80	13	18P, 18SO, 18JW, 20SS	-	2	-	-	1-8bit, 1-WDT	-	20
PCI16C620A	896	512x14	-	-	96	13	18P, 18SO, 18JW, 20SS	-	2	-	-	1-8bit, 1-WDT	-	20
PIC16CR620A	896	-	512x14	-	96	13	18P, 18SO, 20SS	-	2	-	-	1-8bit, 1-WDT	-	20
PIC26C621	1792	1024x14	-	-	80	13	18P, 18SO, 18JW, 20SS	-	2	-	-	1-8bit, 1-WDT	-	20



PICmicro Microcontroller Family Products													
Product	Program Memory			EEPROM Data Memory Bytes	RAM Bytes	I/O Ports	Packages	Analog			Digital		MAX Speed MHz
	Bytes	OTP/FLASH Words	ROM Words					8-Bit ADC Channels	Comparators	PWM 10-Bit	Timers/WDT	Serial I/O	
PIC16C621A	1792	1024x14	-	-	96	13	18P, 18SO, 18JW, 20SS	-	2	-	1-8bit, 1-WDT	-	20
PIC16C622	3584	2048x14	-	-	128	13	18P, 18SO, 18JW, 20SS	-	2	-	1-8bit, 1-WDT	-	20
PIC16C622A	3584	2048x14	-	-	128	13	18P, 18SO, 18JW, 20SS	-	2	-	1-8bit, 1-WDT	-	20
PIC16CE623	896	512x14	-	128	96	13	18P, 18SO, 18JW, 20SS	-	2	-	1-8bit, 1-WDT	-	20
PIC16CE624	1792	1024x14	-	128	96	13	18P, 18SO, 18JW, 20SS	-	2	-	1-8bit, 1-WDT	-	20
PIC16CE625	3584	2048x14	-	128	128	13	18P, 18SO, 18JW, 20SS	-	2	-	1-8bit, 1-WDT	-	20
PIC16F627*	1792 (FLASH)	1024x14 (FLASH)	-	128	224	16	18P, 18SO, 20SS	-	2	1	1-16bit, 2-8bit, 1-WDT	USART	20
PIC16CXXX: 4-12 Interrupts, 200ns Instruction Execution, 35 Instructions, 4/5 Oscillator Selections, Upwardly Compatible with PIC16C5X/IPC12CXXX (continued)													
PIC16F628	3584 (FLASH)	2048x14 (FLASH)	-	128	224	16	18P, 18SO, 20SS	-	2	1	1-16bit, 2-8bit, 1-WDT	USART	20
PIC16C642	7168	4096x14	-	-	176	22	28SP, 28SO, 28JW	-	2	-	1-8bit, 1-WDT	-	20
PIC16C662	896	4096x14	-	-	176	33	40P, 40JW, 44L, 44PQ, 44PT	-	2	-	1-8bit, 1-WDT	-	20
PIC16C710	1792	512x14	-	-	36	13	18P, 18SO, 18JW, 20SS	4	2	-	1-8bit, 1-WDT	-	20
PIC16C71	1792	1024x14	-	-	36	13	18P, 18SO, 18JW	4	-	-	1-8bit, 1-WDT	-	20
PIC16C711	1792	1024x14	-	-	68	13	18P, 18SO, 18JW, 20SS	4	-	-	1-8bit, 1-WDT	-	20
PIC16C712	1792	1024x14	-	-	128	13	18P, 18SO, 18JW, 20SS	4	-	1	1-16bit, 2-8bit, 1-WDT	-	20
PIC16C715	3584	2048x14	-	-	128	13	18P, 18SO, 18JW, 20SS	4	-	-	1-8bit, 1-WDT	-	20
PIC16C716	3584	2048x14	-	-	128	13	18P, 18SO, 18JW, 20SS	4	-	1	1-16bit, 2-8bit, 1-WDT	-	20
PIC16C717*	3584	2048x14	-	-	256	16	18P, 18SO, 18JW, 20SS	6(10-bit)	-	1	1-16bit, 2-8bit, 1-WDT	M2C/SPI	20
PIC16C72	3584	2048x14	-	-	128	22	28SP, 28SO, 28JW, 28SS	5	-	1	1-16bit, 2-8bit, 1-WDT	I2C/SPI	20
PIC16C72A	3584	2048x14	-	-	128	22	28SP, 28SO, 28JW, 28SS	5	-	1	1-16bit, 2-8bit, 1-WDT	I2C/SPI	20
PIC16CR72	3584	-	2048x14	-	128	22	28SP, 28SO, 28SS	5	-	1	1-16bit, 2-8bit, 1-WDT	I2C/SPI	20
PIC16C73A	7168	4096x14	-	-	192	22	28SP, 28SO, 28JW	5	-	2	1-16bit, 2-8bit, 1-WDT	USART/I2C/SPI	20
PIC16C73B	7168	4096x14	-	-	192	22	28SP, 28SO, 28JW, 28SS	5	-	2	1-16bit, 2-8bit, 1-WDT	USART/I2C/SPI	20
PIC16F73*	7168 (FLASH)	4096x14 (FLASH)	-	-	192	22	28SP, 28SO, 28SS	5	-	2	1-16bit, 2-8bit, 1-WDT	USART/I2C/SPI	20
PIC16CR73*	7168	-	4096x14	-	192	22	28SP, 28SO, 28SS	5	-	2	1-16bit, 2-8bit, 1-WDT	USART/I2C/SPI	20
PIC16C74A	7168	4096x14	-	-	192	33	40P, 40JW, 44L, 44PQ, 44PT	8	-	2	1-16bit, 2-8bit, 1-WDT	USART/I2C/SPI	20
PIC16C74B	7168	4096x14	-	-	192	33	40P, 40JW, 44L, 44PQ, 44PT	8	-	2	1-16bit, 2-8bit, 1-WDT	USART/I2C/SPI	20
PIC16F74*	7168 (FLASH)	4096x14 (FLASH)	-	-	192	33	40P, 44L, 44PT	8	-	2	1-16bit, 2-8bit, 1-WDT	USART/I2C/SPI	20
PIC16CR74*	7168	-	4096x14	-	192	33	40P, 44L, 44PT	8	-	2	1-16bit, 2-8bit, 1-WDT	USART/I2C/SPI	20
PIC16C76	14336	8192x14	-	-	368	22	28SP, 28SO, 28JW	5	-	2	1-16bit, 2-8bit, 1-WDT	USART/I2C/SPI	20
PIC16F76*	14336 (FLASH)	8192x14 (FLASH)	-	-	368	22	28SP, 28SO, 28JW	5	w	2	1-16bit, 2-8bit, 1-WDT	USART/I2C/SPI	20
PIC16CXXX: 4-12 Interrupts, 200ns Instruction Execution, 35 Instructions, 4/5 Oscillator Selections, Upwardly Compatible with PIC16C5X/IPC12CXXX (continued)													
PIC16CR76*	14336	-	8192x14	-	368	22	28SP, 28SO, 28SS	5	-	2	1-16bit, 2-8bit, 1-WDT	USART I2C/SPI	20
PIC16C77	14336	8192x14	-	-	368	33	40P, 40JW, 44L, 44PQ, 44PT	8	-	2	1-16bit, 2-8bit, 1-WDT	USART I2C/SPI	20
PIC16CF77*	14336 (FLASH)	8192x14 (FLASH)	-	-	368	33	40P, 44L, 44PT	8	-	2	1-16bit, 2-8bit, 1-WDT	USART I2C/SPI	20
PIC16CR77*	14336	-	8192x14	-	368	33	40P, 44L, 44PT	8	-	2	1-16bit, 2-8bit, 1-WDT	USART I2C/SPI	20
PIC16C770*	3584	2048x14	-	-	256	16	20P, 20SO, 20JW, 20SS	6(12-bit)	-	2	1-16bit, 2-8bit, 1-WDT	M2C/SPI	20
PIC16771*	7168	4096x14	-	-	256	16	20P, 20SO, 20JW, 20SS	6(12-bit)	-	2	1-16bit, 2-8bit, 1-WDT	M2C/SPI	20
PIC16773	7168	4096x14	-	-	256	22	28SP, 28SO, 28SS, 28JW	6(12-bit)	-	2	1-16bit, 2-8bit, 1-WDT	USART/M2C/SPI	20
PIC16C774	7168	4096x14	-	-	256	33	40P, 40JW, 44L, 44PQ, 44PT	10 (12-bit)	-	2	1-16bit, 2-8bit, 1-WDT	USART/M2C/SPI	20
PIC16C745*	14336	8192x14	-	-	256	22	28SP, 28SO, 28JW	5	-	2	1-16bit, 2-8bit, 1-WDT	USART	24
PIC16C765*	14336	8192x14	-	-	256	33	40P, 40JW, 44L, 44PT	8	-	2	1-16bit, 2-8bit, 1-WDT	USART	24
PIC16F83	896 (FLASH)	512x14 (FLASH)	-	64	64	13	18P, 18SO	-	-	-	1-8bit, 1-WDT	-	10
PIC16CR83	896	-	512x14	64	64	13	18P, 18SO	-	-	-	1-8bit, 1-WDT	-	10
PIC16F84	1792 (FLASH)	1024x14 (FLASH)	-	64	64	13	18P, 18SO	-	-	-	1-8bit, 1-WDT	-	10

PIC Microcontroller(cont.)

PICmicro Microcontroller Family Products													
Product	Program Memory			EEPROM Data Memory Bytes	RAM Bytes	I/O Ports	Packages	Analog		Digital			MAX Speed MHz
	Bytes	OTP/FLASH Words	ROM Words					8-Bit ADC Channels	Comparators	PWM 10-Bit	Timers/WDT	Serial I/O	
PIC16CR84	1792	-	1024x14	64	64	13	18P, 18SO	-	-	-	1-8bit, 1-WDT	-	10
PIC16F84A	1792 (FLASH)	1024x14 (FLASH)	-	64	64	13	18P, 18SO, 20SS	-	-	-	1-8bit, 1-WDT	-	20
PIC16F870	3584 (FLASH)	2048x14 (FLASH)	-	64	64	22	28SP, 28SO, 28SS	5(10-bit)	-	1	1-16bit, 2-8bit, 1-WDT	USART	20
PIC16F871	3584 (FLASH)	2048x14 (FLASH)	-	64	64	33	40P, 44L, 44PT	8(10-bit)	5(10-bit)	1	1-16bit, 2-8bit, 1-WDT	USART	20
PIC16F872	3584 (FLASH)	2048x14 (FLASH)	-	64	128	22	28SP, 28SO, 28SS	5(10-bit)	5(10-bit)	1	1-16bit, 2-8bit, 1-WDT	MI2C/SPI	20
PIC16F873	7168 (FLASH)	4096x14 (FLASH)	-	128	192	22	28SP, 28SO	5(10-bit)	-	2	1-16bit, 2-8bit, 1-WDT	USART/MI2C/SPI	20
PIC16F874	7168 (FLASH)	4096x14 (FLASH)	-	128	192	33	40P, 44L, 44PO, 44PT	8(10-bit)	-	2	1-16bit, 2-8bit, 1-WDT	USART/MI2C/SPI	20
PIC16F876	14336 (FLASH)	8192x14 (FLASH)	-	256	368	22	28SP, 28SO	5(10-bit)	-	2	1-16bit, 2-8bit, 1-WDT	USART/MI2C/SPI	20
PIC16F877	14336 (FLASH)	8192x14 (FLASH)	-	256	368	33	40P, 44L, 44PO, 44PT	8(10-bit)	-	2	1-16bit, 2-8bit, 1-WDT	USART/MI2C/SPI	20
PIC16CXXX: 4-12 Interrupts, 200ns Instruction Execution, 35 Instructions, 4/5 Oscillator Selections, Upwardly Compatible with PIC16C5X/IPC12CXXX (continued)													
PIC16C923	7168	4096x14	-	-	176	52	64PT, 68L	-	-	1	1-16bit, 2-8bit, 1-WDT	I2C/SPI	8
PIC16C924	7168	4096x14	-	-	176	52	64PT, 68CL, 658L	5	-	1	1-16bit, 2-8bit, 1-WDT	I2C/SPI	8
PIC17CXXX: 120ns Instruction Execution Including Multiply, 58 Instructions, 4 Oscillator Selections, Externally expandable to 64Kx16 Program Memory, Upwardly Compatible with PIC16CXX/PIC16C5X/PIC12CXXX													
PIC17C42A	4096	2048x16	-	-	232	33	40P, 40JW, 44L, 44PO, 44PT	-	-	2	2-16bit, 2-8bit, 1-WDT	USART	33
PIC17C42	4096	-	2048x14	-	232	33	40P, 44L, 44PO, 44PT	-	-	2	2-16bit, 2-8bit, 1-WDT	USART	33
PIC17C43	8192	4096x16	-	-	454	33	40P, 40JW, 44L, 44PO, 44PT	-	-	2	2-16bit, 2-8bit, 1-WDT	USART	33
PIC17CR43	8192	-	4096x16	-	454	33	40P, 44L, 44PO, 44PT	-	-	2	2-16bit, 2-8bit, 1-WDT	USART	33
PIC17C44	16384	8192x16	-	-	454	33	40P, 40JW, 44L, 44PO, 44PT	-	-	2	2-16bit, 2-8bit, 1-WDT	USART	33
PIC17C752	16384	8192x16	-	-	678	50	64PT, 68L	12(10-bit)	-	3	2-16bit, 2-8bit, 1-WDT	USART(2)/MI2C/SPI	33
PIC17C756A	32768	16384x16	-	-	902	50	64PT, 68L, 68CL	12(10-bit)	-	3	2-16bit, 2-8bit, 1-WDT	USART(2)/MI2C/SPI	33
PIC17C762	16384	8192x16	-	-	678	66	80PT, 84L	16(10-bit)	-	3	2-16bit, 2-8bit, 1-WDT	USART(2)/MI2C/SPI	33
PIC17C766	32763	16384x16	-	-	902	66	80PT, 84L, 84CL	16(10-bit)	-	3	2-16bit, 2-8bit, 1-WDT	USART(2)/MI2C/SPI	33
PIC18CXXX: 10 MIPS, 77Instructions, C-compiler Efficient Instruction Set, Software Stack Capability, Table Operation, 4X PLL Clock, switchable Oscillator Sources, 25mA Source/Sink per I/O, Upwardly Compatible with PIC17CXXX/PIC16CXX/PIC16C5X/PIC12CXXX													
PIC18C242	16384	8192x16	-	-	512	23	28SP, 28SO, 28JW	5(10-bit)	-	2	3-16bit, 1-8bit, 1-WDT	USART(2)/MI2C/SPI	40
PIC18C442	16384	8192x16	-	-	512	34	40P, 40JW, 44L, 44PT	8(10-bit)	-	2	3-16bit, 1-8bit, 1-WDT	USART(2)/MI2C/SPI	40
PIC18C252	32768	16384x16	-	-	1536	23	28SP, 28SO, 28JW	5(10-bit)	-	2	3-16bit, 1-8bit, 1-WDT	USART(2)/MI2C/SPI	40
PIC18C452	32768	16384x16	-	-	1536	34	40P, 40JW, 44L, 44PT	8(10-bit)	-	2	3-16bit, 1-8bit, 1-WDT	USART(2)/MI2C/SPI	40
PIC18CXXX: 10 MIPS, 77Instructions, C-compiler Efficient Instruction Set, Software Stack Capability, Table Operation, 4X PLL Clock, switchable Oscillator Sources, 25mA Source/Sink per I/O, Upwardly Compatible with PIC17CXXX/PIC16CXX/PIC16C5X/PIC12CXXX(continued)													
PIC18C658*	32768	16384x16	-	-	1536	52	64PT, 68L, 68CL	12(10-bit)	2	2	3-16bit, 1-8bit, 1-WDT	USART/MI2C/SPI/CAN2.OB	40
PIC18C858*	32768	16384x16	-	-	1536	68	80PT, 84L, 8CL	16(10-bit)	2	2	3-16bit, 1-8bit, 1-WDT	USART/MI2C/SPI/CAN2.OB	40

Abbrevlation :

9Bit = 9-bit Serial Addressing Mode  
 ADC = Analog-to-Digital Converter  
 BOR = Brown-out Detection/Reset  
 CAP = Capture  
 CCP = Capture/Compare/PWM  
 DAC = Digital-to-Analog Converter

E2 = EEPROM(Reprogrammable)  
 ECCP= Enhanced Captuer/Compare/PWM  
 EMA = External Memroy Addressing  
 I2C = Inter-integrated Circuit Bus  
 ICD = In-Circuit Debug  
 LVD = Low Voltage Detection

MI2C/SPI = Master I2C/SPI  
 PBOR=Programmable Brown-Out Detection/Reset  
 PLVD = Programmable Low-Voltage Detection  
 PSP = Parallel Slave Port  
 PWM = Pulse Width Modulator  
 SLAC = Slope A/D Converter, up to 16bits

SMB = System Management Bus  
 SPI = Serial Peripheral Interface  
 USART = Universal Synchronous/Asynchronous Receiver/Transmitter  
 VREF = Voltage Reference  
 WDT = Watchdog Timer  
 P =Programmable

\*Contact Microchip Technology for availability date.

# CPU PERIPHERALS

## National Semiconductor CPU & PC Peripheral Products



### Microprocessor Support Products

Part Number	Description	Package
<b>Clock Generation and Support (CGS)</b>		
CGS2535TV	Industrial Quad 1 to 4 Clock Driver	PLCC
CGS2535V	Commercial Quad 1 to 4 Clock Driver	PLCC
CGS74B2525	1-to-8 Minimum Skew Clock Driver	SOIC NARROW(MCM)
CGS74C2525	1-to-8 Minimum Skew Clock Driver	SOIC NARROW(MCM)
CGS74CT2524	1 to 4 Minimum Skew (300 ps) Clock Driver	SOIC NARROW
CGS74CT2525	1-to-8 Minimum Skew Clock Driver	SOIC NARROW(MCM), MDIP(MCM)
CGS74LCT2524	1 to 4 Minimum Skew (300 ps) 3 Volts Clock Driver	SOIC NARROW
<b>Real Time Clocks</b>		
DP8570A	Timer Control Peripheral (TCP)	PLCC
DP8573A	Real Time Clock (RTC)	MDIP,PLCC
MM58167B	Microprocessor Real Time Clock	Wafer
MM58274C	Microprocessor Compatible Real Time Clock	MDIP
<b>Dynamic RAM Controller</b>		
DP8421A	microCMOS Programmable 1M Dynamic RAM Controller/Driver(s)	PLCC(MCM)
DP8422A	microCMOS Programmable 4M Dynamic RAM Controller/Driver(s)	PLCC
NSBMC096	Burst Memory Controller	PQFP
<b>Geode Companion Products</b>		
CS4103	Geode IEEE P1394a Physical Layer Device [Preliminary]	LQFP
CS4210	Geode IEEE 1394 OHCI Controller [Preliminary]	LQFP
CS5530	Geode I/O Companion Multi-Function South Bridge	BGA
<b>UARTs</b>		
PC16550D	Universal Asynchronous Receiver/Transmitter with FIFO's	MDIP(MCM), PLCC(MCM), PQFP, DIE
PC16552D	Dual Universal Asynchronous Receiver/Transmitter with FIFO's	PLCC(MCM), DIE

### PC Peripheral Products

Part number	Description	Package	Voltage	Compliance
<b>ISA Super I/O (for Desktop)</b>				
PC87309	SuperI/O Plug and Play Compatible Chip in Compact 100-Pin VLJ Packaging	ev. board,PQFP	5 V	PC97
PC87351	PC98 and ACPI Compliant SuperI/O with System Wake-up Control	PQFP	5 V	PC98,ACPI
PC97307	Plug and Play Compatible and PC97 Compliant SuperI/O	ev. board,PQFP	5 V	PC97
PC97317	SuperI/O Plug and Play Compatible Chip with ACPI-Compliant Controller/Extender	PQFP	5 V	PC97,ACPI
PC97338	ACPI 1.0 and PC98/99 Compliant SuperI/O	LQFP,PQFP	3.3/5 V	PC98/99,ACPI
<b>LPC Super I/O (for Desktop)</b>				
PC87360	128-Pin LPC SuperI/O with Protection and Extensive GPIO Support [Preliminary]	PQFP	3.3 V	PC99,ACPI
PC87363	128-Pin LPC SuperI/O with MIDI and Game Ports,Extended Wake-up and Protection [Preliminary]	PQFP	3.3 V	PC99,ACPI
PC87364	PC87364 128-Pin LPC SuperI/O with Extended Wake-up and Protection Support [Preliminary]	ev. board,PQFP	3.3 V	PC99,ACPI
PC87365	128-Pin LPC SuperI/O with System Hardware Monitoring [Preliminary]	PQFP	3.3 V	PC99,ACPI
PC87366	128-Pin LPC SuperI/O with System Hardware Monitoring, MIDI and Game Ports [Preliminary]	PQFP	3.3 V	PC99,ACPI
<b>LPC Super I/O (for Notebook)</b>				
PC87391	Family 100-Pin LPC SuperI/O Devices for Portable Applications [Preliminary]	LQFP	3.3 V	PC99,ACPI
PC87392	Family 100-Pin LPC SuperI/O Devices for Portable Applications [Preliminary]	LQFP	3.3 V	PC99,ACPI
PC87393	Family 100-Pin LPC SuperI/O Devices for Portable Applications [Preliminary]	LQFP	3.3 V	PC99,ACPI
PC87393F	Family 100-Pin LPC SuperI/O Devices for Portable Applications [Preliminary]	LQFP	3.3 V	PC99,ACPI

### Other products

Part number	Description	Package
<b>Keyboard &amp; System control</b>		
PC87570	Keyboard and Power Management Controller [Preliminary]	LQFP
<b>PCI to ISA</b>		
PC87200	PCI to ISA Bridge	PQFP
<b>USB Control</b>		
USB9603	USB function controller with enhanced DMA support, for self-powered application	28-SOIC, CSP
USB9604	USB function controller with enhanced DMA support, for bus-powered application	28-SOIC, CSP

Intersil X86 CPU Peripheral Cross Reference



Intersil	INTEL	NEC	OKI	NEWBRIDGE	PRODUCT DESCRIPTION
<b>Processor Peripheral</b>					
82C37A-5	82C37A-5		MSM82C37A-5	CAB2C37A5	
82C37A				CAB2C37A8	Programmable DMA Controller
82C237					Enhanced Programmable DMA Controller
82C37A-12		UPD71037-10		CA82C37A10	
82C237-12					
82C54	82C54	UPD71054	MSM82C54	CA82C54-8	Programmable Interval Timer
82C54-10	82C54-2	UPD71054-10	MSM82C54-2	CA82C54-10	
82C55A-5			MSM82C55A-5	CA82C55A-5	
82C55A	82C55A-2	UPD71055	MSM82C55A-2	CA82C55A-8	Programmable Peripheral Interface
82C59A-5	82C59A				
82C59A	82C59A-2	UPD71059	MSM82C59-2	CA82C59A-8	Priority Interrupt Controller
82C59A-12				CA82C59A-10	
<b>UARTs</b>					
82C50A				CA82C50A-10	Asynchronous Communications Element
82C52				CA82C52-16	Serial Controller Interface
<b>BUS SUPPORT</b>					
82C284-10	82C284-10				Clock Generator and Ready
82C284-12	82C284-12				Interface for 80C286 Processors
82C82		UPD71082			Octal Latching Bus Driver
82C83H		UPD71083			Octal Latching Inverting Bus Driver
82C84A (DC-25MHz)	82C84A	UPD71084	MSM82C84A	CA82C84A-8	Clock Generator Driver
	82C84A-5		MSM82C84A-5	CA82C84A-5	
			MSM82C84A-2	CA82C84A-10	
82C85					Static Clock Controller/Generator
82C86H		UPD71086			Octal Bus Transceiver
82C87H		UPD71087			Octal Inverting Bus Transceiver
82C88	82C88	UPD71088	MSM82C88	CA82C88-5	Bus Controller
	82C88-2		MSM82C88-2	CA82C88-8	
82C89					Bus Arbiter

Intel Chipsets for Embedded CPU

Embedded Intel® Chipsets Comparison Chart



	Intel®430TX PClset	Intel®430HX PClset		Intel®810 Chipset	Intel®840 Chipset	Intel®440BX AGPset	Intel®815 & 815E Chipsets
<b>HOST</b>			<b>HOST</b>				
Host Processor	Pentium® processor	Pentium® processor	Host Processor	Pentium® III processor, Celeron™ processor	Pentium® II processor	Pentium® III processor, Pentium® II processor, Celeron™ processor	Pentium® III processor, Celeron™ processor (FC-PGA only)
Voltage	3.3V (I/O)	3.3V (I/O)	Voltage	AGTL+	AGTL+	GTL+	AGTL+
Dual Processing Support	No	Yes	Dual Processing Support	No	Yes	No	No
<b>DRAM</b>			<b>DRAM</b>				
Refresh	CAS-before-RAS	CAS-before-RAS	Refresh	CAS-before-RAS	RDRAM* Active Refresh	CAS-before-RAS	CAS-before-RAS
RAS Lines	6	8	Memory Supported	4	RDRAM: 32 devices per channel	8	-3 double-sided PC100 SDRAM -2 double-sided or 3 single-sided PC133 SDRAM
64 Mbit Support	Yes	Yes	64 Mbit Support	Yes-16/64/128 Mbit	Yes-64/128/256 Mbit	Yes	Yes-16/64/128/256 Mbit
Max Memory Size	256 MB	512 MB	Max Memory Size	512 MB	4 GB	1 GB	512 MB
Memory Types	SDRAM/EDO/FPM	EDO/FPM	Memory Types	PC100 SDRAM	PC600, PC800 (RDRAM)	SDRAM	PC100/PC133 SDRAM



	Intel®430TX PCIsset	Intel®430HX PCIsset		Intel®810 Chipset	Intel®840 Chipset	Intel®440BX AGPset	Intel®815 & 815E Chipsets
SDRAM(CL=2)	6-1-1-1	N/A	Memory Interleave	N/A	No	No	N/A
EDO (66 MHz)	5-2-2-2	5-2-2-2	ECC/Parity	N/A	Yes	Yes	N/A
MA Buffers	Integrated	Integrated	<b>PCI INTERFACE</b>				
ECC/Parity	No	Yes	PCI Support	PCI 2.2	PCI 2.2	PCI 2.1	PCI 2.2
<b>L2</b>			Concurrent PCI	Yes	Yes	Yes	Yes
Cache Type	Pburst	Pburst	<b>AGP INTERFACE</b>				
Cacheability	64 MB	512 MB	AGP compliant	Yes	Yes	Yes	Yes
<b>PCI INTERFACE</b>			1x Support	Integrated Graphics	Yes	Yes	Yes
PCI Support	PCI 2.1	PCI 2.1	2x Support	Integrated Graphics	Yes	Yes	Yes
Concurrent PCI	Yes	Yes	4x Support	N/A	Yes	N/A	Yes
<b>ARBITRATION</b>			PIPE	Integrated Graphics	Yes	Yes	Yes
MTT	Yes	Yes	SBA	Integrated Graphics	Yes	Yes	Yes
<b>SOUTH BRIDGE</b>			<b>SOUTH BRIDGE</b>				
Type	PIIX4	PIIX3	Type	ICH	ICH	PIIX4E	ICH2 (815E), ICH (815)
USB Support	Yes	Yes	USB Support	Yes	Yes	Yes	Yes
IDE	Ultra DMA	BMIDE	IDE	Yes-ATA/66	Yes-ATA/66	Yes-ATA/33	Yes-ATA/66 (815) Yes-ATA/100 (815E)
RTC	Integrated	External	RTC	Yes	Yes	Yes	Yes
<b>MANAGEABILITY</b>			<b>MANAGEABILITY</b>				
Power Mgt	ACPI	N/A	Power Mgt	SMM & ACPI	SMM & ACPI	SMM & ACPI	SMM & ACPI
I/O Mgt	SM Bus/GPIO	N/A	I/O Mgt	SMBus/GP10	SMBus/GP10	SMBus/GP10	SMBus/GP1

## DSP

### Motorola 16-Bit Data Path DSP

#### DSP56800 Series



Product	RAM (Program) (Kbytes)	Flash (Program) (Kbytes)	RAM (Data) (Kbytes)	Flash (Data) (Kbytes)	Timer	I/O	Serial	A/D	PWM	Operating Voltage (V)	Bus Freq. (MHz)
DSP56824	1	-	3.5	-	3 16-Bit Timers	16	2 SPI	-	-	2.7	70
DSP56F801	-	-	-	-	1 Quad Timer Module	11	SPI, SCI	Dual, 4-Input, 12-Bit	6-CH	3.3	80
DSP56F803	-	-	-	-	2 Quad Timer Modules	16	SPI, SCI	Dual, 4-Input, 12-Bit	6-CH	3.3	80
DSP56F805	1	64	4	8	4 Quad Timer Modules	32	SPI, 2 SCI	Dual, 4-Input, 12-Bit	Two 6-CH	3.3	80
DSP56F807	4	120	8	16	4 Quad Timer Modules	32	SPI, 2 SCI	Quad, 4-Input, 12-Bit	Two 6-CH	3.3	80

#### MSC8100 Series

Product	Package-Pin Count	Bus Interface (Bits)	Speed (MHz)	Performance (MIPS)	Voltage (V)	RAM (Words)	ROM (Words)	Miscellaneous Peripherals	Comments
MSC8101	-	32 or 64	300	1200	1.5 Core, 3.3 I/O	256k	-	HID16, CPM, SPI, SMC, SCC, MCC, PLL	Four 16-bit ALUs, two 32-bit AGUs and one 32-bit RISC communications engine



DSP56600 Series

Product	Package-Pin Count	Bus Interface (Bits)	Speed (MHz)	Performance (MHz)	Voltage (V)	RAM (Words)	ROM (Words)	Miscellaneous Peripherals	Comments
DSP56651	196 PBGA	MCU:16 Program, 32 Data , DSP: 24 Program, 16 Data	MCU: 16.8, DSP: 58.8	-	2.4 Core, 3.3 I/O	MCU:512, DSP:24K P, 16K X/Y	MCU:4K, DSP:24K P, 18K X/Y	EIM, MDI, PLL, SAP, BBP, SCP, QSPI, GPIO, UART, Keypad Port, PWM Output, Protocol Timer, General Timers	Development tool for the DSP56652, No production quantities available
DSP56652	196 PBGA	MCU:16 Program, 32 Data , DSP: 24 Program, 16 Data	MCU: 16.8, DSP : 58.8	-	1.8 Core, 3.3 I/O	MCU:512, DSP:512 P, 14K X/Y	MCU:4K, DSP:48K P, 20K X/Y	GPIO, EIM, MDI, PLL, SAP, BBP, SCP, QSPI, Keypad Port, PWM Output, Protocol Timer, General Timers	Production companion to the DSP56651.
DSP56654	256 PBGA	MCU:16 Program, 32 Data , DSP: 24 Program, 16 Data	MCU: 16.8, DSP : 58.8	-	1.8 Core, 3.3 I/O	MCU: 512, DSP: 40K P, 31K X/Y	MCU:4K, DSP : 2K P	GPIO, EIM, MDI, PLL, SAP, BBP, SCP, 2 QSPI, 2 UART, Keypad Port, PWM Output, Protocol Timer, General Timers	Tailored for cellular phone and 2-way radio handset usage. Available in production quantities.
DSP56690	256 PBGA	MCU:16 Program, 32 Data , DSP: 24 Program, 16 Data	MCU: 52, DSP: 104	-	2.2	MCU: 6.5k, DSP: 3.5K P, 18K X/Y	MCU: 16k, DSP: 84K P, 44K X/Y	SIR, USB, AAM, GEM, DPLL, 2 SIM, OWIRE, 2 UART, 2 DUART	Available in 1Q00.

24-Bit Data Path DSP

DSP56000 Series

Product	Package-Pin Count	Bus Interface (Bits)	Speed (MHz)	Performance (MHz)	Voltage (V)	RAM (Words)	ROM (Words)	Miscellaneous Peripherals	Comments
DSP56002	132 PQFP, 144 TQFP	24 Program, 24 Data	40/66/80	20/33/40	5 Core, 5 I/O	256 P, 512 X/Y	512 X/Y	PLL, GPIO, 1 SSI, 1 SCI, 1 Timer, HI08	On-chip data ROMs contain sine, A-law and $\mu$ -law tables
DSP56004	80 QFP	24 Program, 24 Data	50/66/81	24/33/40.5	5 Core, 5 I/O	256 P, 512 X/Y	512 X/Y	PLL, GPIO, 1 SHI, 1 SAI, 1 EMI	On-chip data ROMs contain log <sub>2</sub> x, 2 <sup>2</sup> and sine tables. Pin compatible with DSP56007 and DSP56009.
DSP56007	80 QFP	24 Program, 24 Data	50/66/88	25/33/44	5 Core, 5 I/O	3200 X/Y	6400 P, 1024 X/Y	PLL, GPIO, 1 SHI, 1 SAI, 1 EMI	Pin compatible with DSP56004 and DSP56009. Available with ROMs for Dolby Digital (AC-3), DTS, MPEG2 and other features (licenses required).
DSP56009	80 QFP	24 Program, 24 Data	81/88	40.5/44	5 Core, 5 I/O	512 P, 8.75K X/Y	10k P, 4.75K X/Y	PLL, GPIO, 1 SHI, 1 SAI, 1 EMI	Pin compatible with DSP56004 and DSP56007. Available with ROMs for Dolby Digital (AC-3), DTS, MPEG2 and other features (licenses required).

DSP56300 Series

Product	Package-Pin Count	Bus Interface (Bits)	Speed (MHz)	Performance (MHz)	Voltage (V)	RAM (Words)	ROM (Words)	Miscellaneous Peripherals	Comments
DSP56301	208 TQFP, 252 PBGA	24 Program, 24 Data	66/80	66/80	3.3 Core, 3.3 I/O	4k P, 4K X/Y	-	PLL, GPIO, 1 SCI, 2 ESSI, HI32, Triple Timer Module	Provides glueless interface to PCI or ISA bus. Can act as PCI bus master.
DSP56303	144 TQFP, 196 PBGA	24 Program, 24 Data	66/80/100	66/80/100	3.3 Core, 3.3 I/O	4k P, 4K X/Y	-	PLL, GPIO, 1 SCI, 2 ESSI, HI08, Triple Timer Module	-
DSP56305	252 PBGA	-	80	80	3.3	-	-	GPIO, 1 SCI, 2 ESSI, HI32, Triple Timer Module	-

# VOICE RECOGNITION

## Sensory Voice Recognition Products



### 8-bit Low Cost Microcontroller for Voice Recognition

FEATURE	RSC 164	RSC 200/264T	RSC 300/364
Technology Supported	3.1	4.0	4.0, 5.0, 6.0
Support for on-chip pre-amp - reducing overall system cost	NO	YES	YES
Sleep mode - minimal power consumption (<5uA)	NO	YES	YES
ROM-less version available	NO	YES	YES
User RAM registers available	46	58	58
SI Response Time with 6 word set	480 mSec	165 mSec	83 mSec
Voltage Range	3.5 - 5.0 V	2.4 - 5.25 V	2.4 - 5.25 V
Package Availability	Die, 64-QFP, 68-PLCC	Die	Die, 64-TQFP

### Software Technology for Voice Recognition

FEATURE	Tenhnology 3.1	Technology 4.0	Technology 5.0	Technology 6.0
ICs Supported	RSC-164	RSC-200/264T	RSC-300/364	RSC-300/364, Std. Microprocessor & DSP
Target Applications	General Consumer Applications	Toy Applications	Mainstream consumer electronic products (e.g., telephones, automobile equipment)	Wireless Consumer Electronics
Supports Fast Digits - Fast entry of connected digit strings (e.g., telephone numbers)	NO	NO	YES	YES
Supports Continuous Listening Technology - identification of an isolated word during speech	YES	YES	Advanced Version	Advanced Version
Supports Multi-word Continuous Listening Technology	NO	NO	YES	YES
Supports Word Spotting - Picking a word out of a sentence	NO	NO	NO	YES
Simultaneous Creation of a Digital Recording and Recognition Template - ideal for phone dialing applications	NO	NO	YES	YES
SD Template Size	91 bytes	91 bytes	128 bytes	IC Dependent
Maximum number of SD templates stored on-chip	0	1	6	6
Recognition accuracy	Good	Better	Substantially better	Substantially better

### Standard Product Solution (ASSP)

Products	Description
Voice Dialer 364	Voice dialing to Car H/F Kit, Telephone handset, PDA or other personal electronics devices
Voice Direct 364	Applicable for cost-sensitive products with speaker-dependent speech recognition and speech synthesis
Voice Extreme	RSC-300 based ASSP that enables intuitive programming of interactive speech applications

