

MOTOROLA
CSIC
MICROCONTROLLERS

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68HC08 MICROCONTROLLERS

The 68HC08 Family is an evolutionary extension of the world's most popular 8-bit microcontrollers, Motorola's 68HC05 Family.

The 68HC08 maintains 68HC05 code compatibility with an expanded instruction set and a more powerful processor. It incorporates a flexible, modular "7-day CSIC" design and a library of proven peripherals — to achieve even faster design cycle times, enhanced manufacturing quality, and maximum cost-efficiency.

MC68HC08XL36 and MC68HC708XL36 are the first two 68HC080 that have reached volume production.

The following table showcases 15 additional HC08 derivatives that are planned for sampling during the next 6 months.

Motorola Part Number	ROM/ EPROM Flash (Bytes)	RAM (Bytes)	EEPROM (Bytes)	Timer	Serial	A/D	PWM (D/A)	Display Drive	I/O	COP	Additional Features	Packages	Emulation Version	General Samples	Documentation
68HC08AB32	32K	1K	512	4 ch & 2 ch 16-bit: (IC, OC, or PWM), PIT	SCI SPI	8 ch 8-bit	See Timer		50 i/o	✓	8 MHz Internal Bus (5 V) Programmable PLL LVI/LVR KBI (5 pins)	64 QFP - FU	908AT32 4Q97 samples	3Q97	HC08AZ32TS/D CPU08RM/AD TIM08RM/AD M68HC08RG/AD
68HC08AB24	24K	768	512	4 ch & 2 ch 16-bit: (IC, OC, or PWM), PIT	SCI SPI	8 ch 8-bit	See Timer		50 i/o	✓	8 MHz Internal Bus (5 V) Programmable PLL LVI/LVR KBI (5 pins)	64 QFP - FU	908AT32 4Q97 samples	3Q97	HC08AZ23TS/D CPU08RM/AD TIM08RM/AD M68HC08RG/AD
68HC08AB16	16K	512	512	4 ch & 2 ch 16-bit: (IC, OC, or PWM), PIT	SCI SPI	8 ch 8-bit	See Timer		50 i/o	✓	8 MHz Internal Bus (5 V) Programmable PLL LVI/LVR KBI (5 pins)	64 QFP - FU	908AT32 4Q97 samples	3Q97	HC08AZ32TS/D CPU08RM/AD TIM08RM/AD M68HC08RG/AD
68HC08AB0		1K	512	4 ch & 2 ch 16-bit: (IC, OC, or PWM), PIT	SCI SPI	8 ch 8-bit	See Timer		50 i/o	✓	8 MHz Internal Bus (5 V) External Bus Interface Programmable PLL LVI/LVR KBI (5 pins)	100 TQFP - PU	N/A	3Q97	HC08AZ32TS/D CPU08RM/AD TIM08RM/AD M68HC08RG/AD
68HC08AS20	20K	640	512	6 ch 16-bit: (IC, OC, or PWM)	SCI SPI	15 ch 8-bit	See Timer		40 i/o	✓	8 MHz Internal Bus (5 V) SAEJ1850 BDLC-D Programmable PLL LVI/LVR	52 PLCC - FN	908AT32 (4Q97 samples) OR 708AS48 (very limited!)	3Q97	HC08AS20GRS/D CPU08RM/AD TIM08RM/AD M68HC08RG/AD
68HC908AT32	32K	1K	512	AZ/AB emulation: 4 ch & 2 ch 16-bit: (IC, OC, or PWM), PIT OR AS emulation: 6 ch 16-bit: (IC, OC, or PWM)	SCI SPI	8 ch (AZ/AB) or 15 ch (AS) 8-bit	See Timer		50 i/o	✓	8 MHz Internal Bus (5 V) Programmable PLL LVI/LVR, KBI (5 pins) AZ emulation: Controller Area Network 2.0B (MSCAN) OR AS emulation: SAEJ1850 BDLC-D	64 QFP - FU (AZ/AB) OR 52 PLCC - FN (AS)	N/A	4Q97	HC908AT32GRS/D CPU08RM/AD TIM08RM/AD M68HC08RG/AD
68HC08AZ32	32K	1K	512	4 ch & 2 ch 16-bit: (IC, OC, or PWM), PIT	SCI SPI	8 ch 8-bit	See Timer		50 i/o	✓	8 MHz Internal Bus (5 V) Controller Area Network 2.0B (MSCAN) Programmable PLL LVI/LVR KBI (5 pins)	64 QFP - FU	908AT32 4Q97 samples	3Q97	HC08AZ32TS/D CPU08RM/AD TIM08RM/AD M68HC08RG/AD

*Windowed packages are available only in sample quantities.

68HC08 MICROCONTROLLERS (Continued)

Motorola Part Number	ROM/ EPROM Flash (Bytes)	RAM (Bytes)	EEPROM (Bytes)	Timer	Serial	A/D	PWM (D/A)	Display Drive	I/O	COP	Additional Features	Packages	Emulation Version	General Samples	Documentation
68HC08AZ24	24K	768	512	4 ch & 2 ch 16-bit: (IC, OC, or PWM), PIT	SCI SPI	8 ch 8-bit	See Timer		50 i/o	✓	8 MHz Internal Bus (5 V) Controller Area Network 2.0B (MSCAN) Programmable PLL LVI/LVR KBI (5 pins)	64 QFP - FU	908AT32 4Q97 samples	3Q97	HC08AZ32TS/D CPU08RM/AD TIM08RM/AD M68HC08RG/AD
68HC08AZ16	16K	512	512	4 ch & 2 ch 16-bit: (IC, OC, or PWM), PIT	SCI SPI	8 ch 8-bit	See Timer		50 i/o	✓	8 MHz Internal Bus (5 V) Controller Area Network 2.0B (MSCAN) Programmable PLL LVI/LVR KBI (5 pins)	64 QFP - FU	908AT32 4Q97 samples	3Q97	HC08AZ32TS/D CPU08RM/AD TIM08RM/AD M68HC08RG/AD
68HC08AZ0		1K	512	4 ch & 2 ch 16-bit: (IC, OC, or PWM), PIT	SCI SPI	8 ch 8-bit	See Timer		50 i/o	✓	8 MHz Internal Bus (5 V) External Bus Interface Controller Area Network 2.0B (MSCAN) Programmable PLL LVI/LVR KBI (5 pins)	100 TQFP - PU	N/A	3Q97	HC08AZ32TS/D CPU08RM/AD TIM08RM/AD M68HC08RG/AD
68HC08LN56	56K	1280		4 ch 16-bit: (IC, OC, or PWM), TBM	SCI Dual SPIs	4 ch 8-bit	See Timer	1280 Segment LCD; 40 x 32	51 i/o	✓	8 MHz Internal Bus (5 V) Programmable 32 kHz PLL LVI/LVR KBI (8 pins) Programmable pullups (8 pins)	144 QFP - PV	708LN56	3Q97	HC08LN56GRS/D CPU08RM/AD TIM08RM/AD M68HC08RG/AD
XC68HC708LN56	56K	1280		4 ch 16-bit: (IC, OC, or PWM), TBM	SCI Dual SPIs	4 ch 8-bit	See Timer	1280 Segment LCD; 40 x 32	51 i/o	✓	8 MHz Internal Bus (5 V) Programmable 32 kHz PLL LVI/LVR KBI (8 pins) Programmable pullups (8 pins)	144 QFP - PV *144 CQFP	N/A	Now	HC08LN56GRS/D CPU08RM/AD TIM08RM/AD M68HC08RG/AD
XC68HC708MP16	16K	512		4 ch & 2 ch 16-bit: (IC, OC, or PWM),	SCI SPI	10 ch 8-bit	See Timer + 6 ch (12-bit)		37 i/o and 7 i	✓	8 MHz Internal Bus (5 V) 6 channel 12-bit PWM for Motor Control Programmable PLL LVI/LVR	64 QFP - FU *64 CQFP - FE	N/A	Now	HC708MP16GRS/D CPU08RM/AD TIM08RM/AD M68HC08RG/AD
XC68HC08XL36	36K	1K		4 ch 16-bit: (IC, OC, or PWM),	SCI SPI		See Timer		54 i/o or 46 i/o	✓	8 MHz Internal Bus (5 V) Direct Memory Access Module (3 ch) Programmable PLL LVI/LVR KBI (8 pins) Programmable pullups (8 pins)	56 SDIP - B 64 QFP - FU	708XL36	Now	M68HC08XL36/D CPU08RM/AD TIM08RM/AD DMA08RM/AD M68HC08RG/AD
XC68HC708XL36	36K	1K		4 ch 16-bit: (IC, OC, or PWM),	SCI SPI		See Timer		54 i/o or 46 i/o	✓	8 MHz Internal Bus (5 V) Direct Memory Access Module (3 ch) Programmable PLL LVI/LVR KBI (8 pins) Programmable pullups (8 pins)	56 SDIP - B *56 Cerdip-K 64 QFP - FU *64 CQFP - FE	N/A	Now	MC68HC708XL36/D CPU08RM/AD TIM08RM/AD DMA08RM/AD M68HC08RG/AD

*Windowed packages are available only in sample quantities.

68HC05 NEW PRODUCTS

All 68HC05 and 68HC705 products have a standard operating voltage range from 3 V to 5.5 V unless noted in Comments.

All 68HC05 and 68HC705 products have a standard operating temperature range from 0 to 70 °C. Contact a Motorola Sales Office for availability of extended temperature versions.

Motorola Part Number	ROM/ EPROM (Bytes)	RAM (Bytes)	EEPROM (Bytes)	Timer	Serial	A/D	PWM	Display Drive	I/O	COP	Comments	Packages	Emulation Version	General Samples	Documentation
68HC05B32	32K	528	256	16-bit (2IC, 2OC):	SCI+	8 ch (8-bit)	2 ch (8-bit)		32 i/o	✓	On-Chip Charge Pump EEPROM Write Protect	52 PLCC - FN 56 SDIP - B 64 QFP - FU	705B32	Now	MC68HC05B6/D
XC68HC705D32A	32K	352		16-bit: (1IC, 1OC)	SCI		5 ch (6-bit)		31 i/o	✓	8 High Current Pins (24 mA sink) 30 kHz PWM, KBI (8 pins)	40 DIP - P *40 Cerdip - S 44 PLCC - FN *44Cerquad - FS	N/A	Now	Contact Sales Office
68HC705JB2	2K	128		16-bit (1IC, 1OC) MFT, RTC	USB				11 i/o	✓	1.5 mbs USB with 3 Endpoints Low Voltage Reset, KBI (4 pins) 3.3 V Bandgap Reference	20 DIP - P 20 SOIC - DW	N/A	3Q97	HC05JB2GRS/H
68HC05JJ6	6K	224		16-bit (1IC, 1OC) MFT, RTI	SIOP	See Comments			14 i/o	✓	Two voltage comparators used with timer to create A/D (12-bit resolution), KBI (4 pins), Programmable Pulldowns (14 pins), 6 High Current Pins (10 mA sink), LVI	20 DIP - P 20 SOIC - DW	705JJ7	4Q97	HC05JJ6GRS/D
68HC05JP6	6K	224		16-bit (1IC, 1OC) MFT, RTI	SIOP	See Comments			22 i/o	✓	Two voltage comparators used with timer to create A/D (12-bit resolution), KBI (4 pins), Programmable Pulldowns (14 pins), 6 High Current Pins (10 mA sink), LVI	28 DIP - P 28 SOIC - DW	705JP7	4Q97	HC05JJ6GRS/D
XC68HC705JJ7	6K + 64-bit PEP	224		16-bit (1IC, 1OC) MFT, RTI	SIOP	See Comments			14 i/o	✓	Two voltage comparators used with timer to create A/D (12-bit resolution), KBI (4 pins), Programmable Pulldowns (14 pins), 6 High Current Pins (10 mA sink), EPROM security feature, LVI	20 DIP - P 20 SOIC - DW	N/A	Now	HC705JJ7GRS/D
XC68HC705JP7	6K + 64-bit PEP	224		16-bit (1IC, 1OC) MFT, RTI	SIOP	See Comments			22 i/o	✓	Two voltage comparators used with timer to create A/D (12-bit resolution), KBI (4 pins), Programmable Pulldowns (14 pins), 6 High Current Pins (10 mA sink), EPROM security feature, LVI	28 DIP - P 28 SOIC - DW	N/A	Now	HC705JJ7GRS/D
XC68HC805K3		64	920 16PEEP	MFT, RTI					10 i/o	✓	KBI (4 pins), Programmable Pulldowns (10 pins), 4 High Current Pins (8 mA sink), On-chip Charge Pump	16 DIP - P 16 SOIC - DW	N/A	Now	HC805K3GRS/D
XC68HC705P6A	4K	176		16-bit (1IC, 1OC)	SIOP	4 ch (8 - bit)			20 i/o	✓	KBI (8 pins) 2 High Current Pins (15 mA sink)	28 DIP - P 28 SOIC - DW	N/A	Now	HC705P6AGRS/D

68HC05 NEW PRODUCTS (Continued)

Motorola Part Number	ROM/ EPROM (Bytes)	RAM (Bytes)	EEPROM (Bytes)	Timer	Serial	A/D	PWM	Display Drive	I/O	COP	Comments	Packages	Emulation Version	General Samples	Documentation
XC68HC805P18		192	8K + 128	16-bit (1IC, 1OC)	SIOP	4 ch (8 - bit)			20 i/o	✓	KBI (8 pins), LVR 2 High Current Pins Pullups (8 pins), clock out option	28 DIP - P 28 SOIC - DW	N/A	Now	HC805P18GRS/D
XC68HC05RC9	8K	350		Infrared Timer, MFT, RTI					20 i/o	✓	Mask Option Pullups (8) KBI (8), Low-Power Stop Pin, 2.2 V Operation, 4 Hi-Current Pins	28 DIP - P 28 SOIC - DW 44 PLCC - FN	N/A	Now	HC05RC18GRS/D
XC68HC05RC18	16K	350		Infrared Timer, MFT, RTI					20 i/o	✓	Mask Option Pullups (8) KBI (8), Low-Power Stop Pin, 2.2 V Operation, 4 Hi-Current Pins	28 DIP - P 28 SOIC - DW 44 PLCC - FN	N/A	Now	HC05RC18GRS/D
MSC0501	20K	896	4K						5 i/o	✓	Smartcard Security Features, Modular Arithmetic Processor Random Number Generator	Die 44 QFP - FB	N/A	4Q97	MSC0501PP/D
68HC05V12	12K	384	256	16-bit: (1IC, 1OC) 8-bit, RTI	SPI	5 ch (8-bit)	2 ch (6-bit)		23 i/o 5 i	✓	J1850 BDLC, LVI H-Bridge Drivers for 6 Gauges: 4 Minor – 180° 2 Major – 360°	68 PLCC - FN	N/A	3Q97	HC05V12GRS/D

*Dates subject to change. Call product marketer to verify dates.

E = EPROM or OTPROM
EE = EEPROM

ONE-TIME PROGRAMMABLE (OTP) / EMULATOR MCUs

All 68HC705 products have a standard operating voltage range from 3 V to 5.5 V unless noted in Comments.

All 68HC705 products have a standard operating temperature range from 0 to 70 °C. Contact a Motorola Sales Office for availability of extended temperature versions.

Motorola Part Number	EPROM (Bytes)	RAM (Bytes)	EEPROM (Bytes)	Timer	Serial	A/D	PWM	Display Drive	I/O	COP	Comments	Packages	Documentation
MC68HC705B5	6K	176		16-bit: (21C, 20C)	SCI+	8 ch (8-bit)	2-ch (8-bit)		24 i/o 8 i 2 o	✓	Programmable Pulldowns (16 pins) EPROM Write Protect	56 SDIP - B 52 PLCC - FN	MC68HC05B6/D AN1058/D
MC68HC705B16	15K	352	255	16-bit: (21C, 20C)	SCI+	8 ch (8-bit)	2 ch (8-bit)		32 i/o 2o	✓	On-Chip Charge Pump EEPROM Write Protect	52 PLCC - FN *52 Cerquad - FS 64 QFP - FU	MC68HC05B6/D AN1058/D
XC68HC705B32	32K	528	255	16-bit, (21C, 20C)	SCI+	8 ch (8-bit)	2 ch (8-bit)		32 i/o	✓	On-Chip Charge Pump EEPROM Write Protect	52 PLCC - FN 56 SDIP - B 64 QFP - FU	MC68HC05B6/D AN1058/D
MC68HC705BD3	7.75K	256		MFT, RTI	I ² C		16 ch (8-bit)		24 i/o	✓	Horizontal and Vertical Sync Signal Processor	42 SDIP - B *42 Cersdip - K 40 DIP - P *40 Cerdip - S	MC68HC05BD3D/H
MC68HC705C4A	4K	176		16-bit: (11C, 10C)	SPI SCI				24 i/o 7i	✓	Mask Option Register Pullups (8 pins) KBI (8 pins) 1 High Current Pin (20 mA sink) EPROM Security	40 DIP - P 44 PLCC - FN 42 SDIP - B 44 QFP - FB	MC68HC705C4A/D
MC68HC705C8A	8K	304		16-bit: (11C, 10C)	SPI SCI				24 i/o 7i	✓	Mask Option Pullups (8 pins) KBI (8 pins) 1 High Current Pin (20 mA sink) High Speed Option (HSC705C8A) Superset of ROM C8A with more RAM EPROM Security	40 DIP - P 44 PLCC - FN *40 Cerdip - S 42 SDIP - B 44 QFP - FB *44 Cerquad - FS	MC68HC705C8A/D
MC68HC705C9A	16K	352		16-bit: (11C, 10C)	SPI SCI				31 i/o	✓	Mask Option Pullups (8 pins) KBI (8 pins) 1 High Current Pin (20 mA sink) EPROM Security	40 DIP - P *40 Cerdip - S *44 Cerquad - FS 44 PLCC - FN	

ONE-TIME PROGRAMMABLE (OTP) / EMULATOR MCUs (Continued)

All 68HC705 products have a standard operating voltage range from 3 V to 5.5 V unless noted in Comments.

All 68HC705 products have a standard operating temperature range from 0 to 70 °C. Contact a Motorola Sales Office for availability of extended temperature versions.

Motorola Part Number	EPROM (Bytes)	RAM (Bytes)	EEPROM (Bytes)	Timer	Serial	A/D	PWM	Display Drive	I/O	COP	Comments	Packages	Documentation
MC68HC705F8	8K	320		16-bit: (1IC, 1OC) 16-bit: auto	SPI				50 i/o 2 o	✓	DTMF Generator, KBI (8 pins) 8 High Current Pins (10 mA sink) Manchester Encoder/Decoder	64 QFP - FU *64 CQFP - FZ	MC68HC05F8D/H
MC68HC705G1	12K	176		16-bit: (1IC, 1OC) RTC	SPI	4 ch (8-bit)			40 i/o 8 i	✓	32 kHz PLL	56 SDIP - B *56 Cersdip - K 64 QFP - FU *64 CQFP - FZ	MC68HC05G1D/H AN1058/D
MC68HC705G4	32K	1024		16 bit: (1IC, 1OC) 8-bit: Evnt	Dual SPI	8 ch (8-bit)	4 ch (8-bit)		48 i/o 16 i 4 o	✓	KBI (8 pins) Dual IRQ Dual Oscillators, Selectable Clock	80 QFP - FU *80 CQFP - FZ	HC05G3GRS/D AN1058/D
MC68HC705J1A	1.2K	64		MFT, RTI					14 i/o	✓	KBI (4 pins), EPROM Security Feature 4 High-Current Pins (8 mA sink) Programmable Pulldowns (14 pins) RC osc version (68HRC705J1A) Hi-Speed Version (68HSC705J1A)	20 DIP - P 20 SOIC - DW *20 cerdip - S	MC68HC705J1A/D
MC68HC705J2	2K	112		MFT, RTI					14 i/o	✓		20 DIP - P 20 SOIC - DW *20 Cerdip - S	MC68HC705J2/D
MC68HC705K1	0.5K	32		MFT, RTI					10 i/o	✓	4 High Current Pins (8 mA sink) PEP (64 bits) Programmable Pulldowns (10 pins) Low Voltage Reset Mask Option	16 DIP - P 16 SOIC - DW *16 Cerdip - S	MC68HC705K1/D
XC68HC705L1	6K	128		16-bit: (2IC, 2OC)		6 ch (8-bit)		64 Segment LCD: (3/4 x 12/16)	17 i/o 15 i 2 o			56 SDIP - B 64 QFP - FU *64 CQFP - FZ *56 Cersdip - K	MC68HC05L1D/H AN1058/D
MC68HC705L5	8K	256		16-bit: (1IC, 1OC) RTI 8-bit: (1IC, 1OC)	SIOP			156 Segment LCD: (1-4 x 27-39)	14 i/o 10 i 15 o		KBI (8 pins), Dual Oscillators 8 High Current Pins (10 mA sink) Programmable Pullups (24 pins) Open Drain (31 pins)	80 QFP - FU *80 CQFP - FZ	MC68HC705L5/D
MC68HC705L16	16K	512		16-bit: (1IC, 1OC) RTI, 8-bit: (1IC, 1OC)	SIOP			156 Segment LCD: (1-4 x 27-39)	16 i/o 8 i 15 o	✓	KBI (8 pins), Dual Oscillators 8 High Current Pins (10 mA sink) Programmable Pullups (24 pins) Open Drain (31 pins)	80 QFP - FU *80 CQFP - FZ	HC05L16GRS/D
MC68HC705MC4	3.5K	176		16-bit: (2IC or 1IC, 1OC) MFT, RTI	SCI	6 ch (8-bit)	2 hi sp (8-bit 24 kHz Max)		22 i/o	✓	Eight High Current Pins (10 mA Source Pin, 20 mA Max/Port), 1 High Sink Current Pin (10 mA) Commutation Mux for PWM	28 DIP - P *28 Cerdip - S 28 SOIC - DW	HC705MC4GRS/D AN1058/D
MC68HC705P6	4.5K	176		16-bit: (1IC, 1OC)	SIOP	4 ch (8-bit)			20 i/o 1 i	✓		28 DIP - P 28 SOIC - DW *28 Cerdip - S	MC68HC705P6/D AN1058/D

* Windowed packages available only in sample quantities.

ONE-TIME PROGRAMMABLE (OTP) / EMULATOR MCUs (Concluded)

All 68HC705 products have a standard operating voltage range from 3 V to 5.5 V unless noted in Comments.

All 68HC705 products have a standard operating temperature range from 0 to 70 °C. Contact a Motorola Sales Office for availability of extended temperature versions.

Motorola Part Number	EPROM (Bytes)	RAM (Bytes)	EEPROM (Bytes)	Timer	Serial	A/D	PWM	Display Drive	I/O	COP	Comments	Packages	Documentation
MC68HC705P9	2K	128		16-bit: (1IC, 1OC)	SIOP	4 ch (8-bit)			20 i/o 1 i	✓		28 DIP - P 28 SOIC - DW *28 Cerdip - S	MC68HC705P9/D AN1058/D
MC68HC705SR3	3.75K	192		8-bit Timer (7-bit prescaler)		4 ch (8-bit)			32 i/o		Programmable pullups (24 pins) KBI (8 pins), LED drive (8 pins) LVR	40 DIP- P *40 Cerdip - S 42 SDIP - B 44 QFP - FB	MC68HC05SR3D/H
MC68HC705T10	12K	320		16-bit: (1IC, 1OC) RTC	I ² C	1 ch (8-bit)	8 ch (6-bit) 1 ch (14-bit)	OSD (64 Char EPROM)	20 i/o 4 i		Open Drain PWM Outputs KBI (8 pins) 5 V Only	56 SDIP - B *56 Cersdip - K	MC68HC05T10D/H AN1058/D
MC68HC705T16	24K	320		16-bit: (1IC, 2OC) 8-bit, PAC	I ² C	2 ch (5-bit)	9 ch (7-bit) 1 ch (14-bit)	OSD (128 char EPROM)	40 i/o	✓	12 V Open Drain I/O Lines (up to 22) 4 Row OSD Buffer Timer Output Compare Functions Do Not Have Output Pins	56 SDIP - B *56 Cersdip - K	MC68HC05T16D/H
XC68HC705V8	12K	512	128	16-bit (1IC, 1OC) 8-bit, RTI	SPI	8ch (8-bit)	1ch (6-bit)		22 i/o	✓	LVR, On-chip Charge Pump, J1850 MDLC (Message Datalink Control) 5 V Regulator, KBI (16 pins)	56 SDIP - B 68 PLCC - FN 68 CLCC - FS 56 Cersdip - K	HC705V8GRS/D AN1224/D AN1058/D
XC68HC705V12	12K	384	256	16-bit: (1IC, 1OC) 8-bit, RTI	SPI	5 ch (8-bit)	2 ch (6-bit)		23 i/o 5 i	✓	J1850 BDLC, LVI H-Bridge Drivers for 6 Gauges: 4 Minor – 180° 2 Major – 360°	68 PLCC - FN	HC705V12GRS/D
XC68HC705X4	4K	176		16-bit: (1IC, 1OC) MFT, RTI					16 i/o	✓	CAN (Controller Area Network) KBI (16 pins)	28 SOIC - DW	MC68HC05X4/D AN464/D
MC68HC705X32	32K	528	255	16-bit, (21C, 2OC)	SCI+	8 ch (8-bit)	2 ch (8-bit)		32 i/o	✓	CAN (Controller Area Network)	64 QFP - FU	MC68HC05X16/D AN1058/D

* Windowed packages available only in sample quantities.

68HC05 MICROCONTROLLERS

All 68HC05 products have a standard operating voltage range from 3 V to 5.5 V unless noted in Comments.

All 68HC05 products have a standard operating temperature range from 0 to 70 °C. Contact a Motorola Sales Office for availability of extended temperature versions.

Motorola Part Number	ROM (Bytes)	RAM (Bytes)	EEPROM (Bytes)	Timer	Serial	A/D	PWM	Display Drive	I/O	COP	Comments	Packages	Emulation Version	Documentation
MC68HC05B4	4K	176		16-bit: (2IC, 2OC)	SCI+	8 ch (8-bit)	2 ch (8-bit)		24 i/o 8 i 2 o	✓		56 SDIP - B 52 PLCC - FN 64 QFP - FU	705B5	MC68HC05B6/D AN431/D, ANE416/D
MC68HC05B6	6K	176	256	16-bit: (2IC, 2OC)	SCI+	8 ch (8-bit)	2 ch (8-bit)		24 i/o 8 i 2 o	✓	On-Chip Charge Pump EEPROM Write Protect	56 SDIP - B 52 PLCC - FN 64 QFP - FU	705B16	MC68HC05B6/D AN1120/D, AN434/D
MC68HC05B8	7.25K	176	256	16-bit: (2IC, 2OC)	SCI+	8 ch (8-bit)	2 ch (8-bit)		24 i/o 8 i 2 o	✓	On-Chip Charge Pump EEPROM Write Protect	56 SDIP - B 52 PLCC - FN 64 QFP - FU	705B16	MC68HC05B6/D AN1058/D
MC68HC05B16	15K	352	256	16-bit: (2IC, 2OC)	SCI+	8 ch (8-bit)	2 ch (8-bit)		24 i/o 8 i 2 o	✓	On-Chip Charge Pump EEPROM Write Protect	56 SDIP - B 52 PLCC - FN 64 QFP - FU	705B16	MC68HC05B6/D AN1058/D
MC68HC05BD3	3.75K	128		MFT, RTI	I ² C		16 ch (8-bit)		24 i/o	✓	Horizontal and Vertical Sync Signal Processor	40 DIP - P 42 SDIP - B	705BD3	MC68HC05BD3D/H
MC68HC05BD5	7.75K	256		MFT, RTI	I ² C		16 ch (8-bit)		24 i/o	✓	Horizontal and Vertical Sync Signal Processor	40 DIP - P 42 SDIP - B	705BD3	MC68HC05BD3D/H
MC68HC05C0	0	512		16-bit: (1IC, 1OC) MFT	SCI+				18 i/o	✓	MUX or Non-MUX EBI (16-bit) 3 Chip Selects, KBI (8 pins) Programmable Pullups (8 pins) 1 High Current Pin (20 mA sink)	44 PLCC - FN 40 DIP - P 42 SDIP - B	Not Applicable	HC05C0GRS/D
MC68HC05C4A	4K	176		16-bit: (1IC, 1OC)	SPI SCI				24 i/o 7 i	✓	KBI (8 pins) 1 High Current Pin (20mA sink) Mask Option Pullups High Speed Option (HSC05C4A) Low Power Option (HCL05C4A) (1.8 V minimum)	40 DIP - P 44 PLCC - FN 44 QFP - FB 42 SDIP - B	705C8A 705C4A	HC05C4AGRS/D
MC68HC05C8A	8K	176		16-bit: (1IC, 1OC)	SPI SCI				24 i/o 7 i	✓	KBI (8 pins) 1 High Current Pin (20mA sink) Mask Option Pullups High Speed Option (HSC05C8A) Low Power Option (HCL05C8A) (1.8 V minimum):	40 DIP - P 44 PLCC - FN 44 QFP - FB 42 SDIP - B	705C8A	HC05C8AGRS/D
MC68HC05C9A	16K	352		16-bit: (1IC, 1OC)	SPI SCI				24 i/o 7 i	✓	KBI (8 pins) 1 High Current Pin (10mA sink) Mask Option Pullups High Speed Option (HSC05C9A) Low Power Option (HCL05C9A)	40 DIP - P 44 PLCC - FN 44 QFP - FB 42 SDIP - B	705C9A	HC05C9AGRS/D
MC68HC05C12	12K	176		16-bit: (1IC, 1OC)	SCI SPI				24 i/o 7 i	✓	1 High Current Pin (20mA sink) KBI (8 pins) Mask Option Pullups (8 pins) High Speed Option (HSC05C12) Low Power Option (HCL05C12): (1.8 V minimum)	40 DIP - P 44 PLCC - FN 44 QFP - FB 42 SDIP - B	705C9A	MC68HC05C12/D
MC68HC05CJ4	4K	224		16-bit: (1IC, 1OC) MFT	SPI SCI I ² C				24 i/o	✓	I ² C (Slave Only)	44 QFP - FB	705CJ4	HC05CJ4GRS/D
MC68HC05CT4	5K	256		16-bit: (1IC, 1OC) MFT, RTI	SIOP		1 ch (6-bit)		31 i/o	✓	Dual 60 MHz PLLs, KBI, 3 Comparators	44 PLCC - FN	705CT4 (limited availability)	HC05CT4GRS/D
MC68HC05D9	16K	352		16-bit: (1IC, 1OC)	SCI		5 ch (6-bit)		31 i/o	✓	8 High Current Pins (25 mA sink) 30 kHz PWM	40 DIP - P 44 PLCC - FN	705D9	MC68HC05D9/D
MC68HC05D24	24K	352		16-bit: (1IC, 1OC)	SCI		5 ch (6-bit)		31 i/o	✓	8 High Current Pins (24 mA sink) 30 kHz PWM	40 DIP - P 44 PLCC - FN	705D32A	MC68HC05D9/D

68HC05 MICROCONTROLLERS (Continued)

All 68HC05 products have a standard operating voltage range from 3 V to 5.5 V unless noted in Comments.

All 68HC05 products have a standard operating temperature range from 0 to 70 °C. Contact a Motorola Sales Office for availability of extended temperature versions.

Motorola Part Number	ROM (Bytes)	RAM (Bytes)	EEPROM (Bytes)	Timer	Serial	A/D	PWM	Display Drive	I/O	COP	Comments	Packages	Emulation Version	Documentation
XC68HC05D32	32K	352		16-bit: (1IC, 1OC)	SCI		5 ch (6-bit)		31 i/o	✓	8 High Current Pins (24 mA sink) 30 kHz PWM	40 DIP - P 44 PLCC - FN	705D32A	MC68HC05D9/D
MC68HC05E1	4K	368		MFT, RTI					20 i/o	✓	32 kHz PLL Clock Synthesizer	28 DIP - P 28 SOIC - DW	705E1	HC05E1GRS/D
MC68HC05E5	5K	384		MFT, RTI	I ² C				20 i/o	✓	32 kHz PLL Clock Synthesizer	28 DIP - P 28 SOIC - DW	705E5	HC05E5GRS/D
MC68HC05E6	6K	128	160	MFT, RTI 16-bit: (1IC, 1OC)		4 ch (8-bit)			32 i/o 4 i	✓	KBI (8 pins) Pin for External LVI	44 QFP - FB 28 SOIC - DW	705E6 (limited availability)	MC68HC05E6/D
MC68HC05E16	16K	352	320	16-bit: (2IC, 2OC) MFT, RTI	Dual I ² C	4 ch (8-bit)			47 i/o 2 i	✓	KBI (8 Pins) LVI 32 kHz Programmable PLL Periodic Interrupt (.25, .5, 1s)	44 QFP - FB 64 QFP - FU 56 SDIP - B	705E24 (limited availability)	HC05E16GRS/D
MC68HC05F5	5K	224		MFT, RTI					30 i/o 1 i	✓	DTMF Receiver Mask IRQ	40 DIP - P 44 PLCC - FN	No OTP/EPROM	MC68HC05F5/D
MC68HC05F6	4K	320		16-bit: (1IC, 1OC)	SPI				26 i/o 4 i 2 o		DTMF Generator 8 High Current Pins (10 mA sink) KBI (6 pins)	42 SDIP - B 44 QFP - FB	705F6	MC68HC05F6PR/H AN-HK-12/H
MC68HC05F8	8K	320		16-bit: (1IC, 1OC) 16-bit: auto	SPI				50 i/o 2 o	✓	DTMF Generator KBI (8 pins) Manchester Encoder/Decoder 8 High Current Pins (10 mA sink)	64 QFP - FU	705F8	MC68HC05F8D/H
MC68HC05F12	12K	384	256	16-bit: (3IC, 3OC) MFT, RTI				128 segment LCD: (4 x 32)	50 i/o	✓	DTMF Generator, KBI	100 TQFP - PU 80 QFP - FU	Not available	MC68HC05F12/D
MC68HC05F32	32K	920	256	16-bit: (4IC, 4OC) MFT, RTI	SCI SPI	8 ch (8-bit)	3 ch (8-bit)	160 segment LCD: (4 x 40): 100 QFP OR 128 segment LCD: (4 x 32): 80 QFP	40 i/o 16 i 24 o	✓	DTMF Generator, KBI	100 TQFP - PU 80 QFP - FU	705F32 (limited availability)	MC68HC05F32/D
MC68HC05G1	8K	176		16-bit: (1IC, 1OC) RTC	SPI	4 ch (8-bit)			40 i/o 8 i	✓	32 kHz PLL - Standby modes	56 SDIP - B 64 QFP - FU	705G1	MC68HC05G1D/H AN1058/D
MC68HC05G3	24K	768		16-bit: (1IC, 1OC) 8-bit: Event Cntr	Dual SPI	8 ch (8-bit)	4 ch (8-bit)		48 i/o 16 i 4 o	✓	KBI (8 pins) Dual Oscillators - Selectable Clock Dual IRQ	80 QFP - FU	705G4	HC05G3GRS/D AN1058/D
MC68HC05J1A	1.2K	64		MFT, RTI					14 i/o	✓	KBI (4 pins) 4 High Current Pins (8 mA sink) Mask Option Pulldowns (14 pins) High Speed Version (HSC05J1A) Low Power Version (HCL05J1A): (1.8 V minimum)	20 DIP - P 20 SOIC - DW	705J1A	MC68HC05J1A/D
MC68HC05J3	2K	128		16-bit: (1IC, 1OC) MFT, RTI					14 i/o	✓	14 High Current Pins (8 mA sink) KBI (4 pins)	20 DIP - P 20 SOIC - DW	No OTP/EPROM	MC68HC05J3/D
MC68HC05K0	0.5K	32		MFT, RTI					10 i/o	✓	4 High Current Pins (8 mA sink) Programmable Pulldowns (10 pins) Low Voltage Reset Mask Option Low Power version (HCL05K0): (1.8 V minimum)	16 DIP - P 16 SOIC - DW	705K1	MC68HC05K1/D AN463/D

68HC05 MICROCONTROLLERS (Continued)

All 68HC05 products have a standard operating voltage range from 3 V to 5.5 V unless noted in Comments.

All 68HC05 products have a standard operating temperature range from 0 to 70 °C. Contact a Motorola Sales Office for availability of extended temperature versions.

Motorola Part Number	ROM (Bytes)	RAM (Bytes)	EEPROM (Bytes)	Timer	Serial	A/D	PWM	Display Drive	I/O	COP	Comments	Packages	Emulation Version	Documentation
MC68HC05K1	0.5K	32		MFT, RTI					10 i/o	✓	4 High Current Pins (8 mA sink) PEP (64 bits) Programmable Pulldowns (10 pins) Low Voltage Reset Mask Option	16 DIP - P 16 SOIC - DW	705K1	MC68HC05K1/D AN465/D
MC68HC05K3	920	64	16 PEEP	MFT, RTI					10 i/o	✓	KBI (4 pins), Prog. Pulldowns (10 pins) 4 High Current Pins (8 mA sink) On-Chip Charge Pump 1.8 V Operating Voltage	16 DIP - P 16 SOIC - DW	805K3	HC05K3GRS/D
MC68HC05L1	4K	128		16-bit: (2IC, 2OC)		6 ch (8-bit)		64 Segment LCD: (3/4 x 12/16)	17 i/o 15 i 2 o			56 SDIP - B 64 QFP - FU	705L1	MC68HC05L1D/H AN1058/D
MC68HC05L5	8K	256		16-bit: (1IC, 1OC) RTI 8-bit: (1IC, 1OC)	SIOP			156 Segment LCD: (1-4 x 27-39)	14 i/o 10 i 15 o	✓	KBI (8 pins), Dual Oscillators 8 High Current Pins (10 mA sink) Programmable Pullups (24 pins), Open Drain (31 pins), 2.2 V	80 QFP - FU	705L5	MC68HC05L5TS/D
MC68HC05L16	16K	512		16-bit: (1IC, 1OC) RTI 8-bit: (1IC, 1OC)	SIOP			156 Segment LCD: (1-4 x 27-39)	16 i/o 8 i 15 o	✓	KBI (8 pins), Dual Oscillators 8 High Current Pins (10 mA sink) Programmable Pullups (24 pins) Open Drain (31 pins), 2.2 V Operation	80 QFP - FU	705L16	HC05L16GRS/D
MC68HC05P1A	2K	128		16-bit: (1IC, 1OC)					20 i/o 1 i	✓	KBI (8 pins) Mask Option Pullups (8 pins) 2 High Current Pins (20 mA)	28 DIP - P 28 SOIC - DW	705P6A	HC05P1AGRS/D
MC68HC05P3	3K	128	128	16-bit: (1IC, 1OC) MFT, RTI					22 i/o	✓	KBI (6 pins) On-Chip Charge Pump	28 DIP - P 28 SOIC - DW	705P3 (limited availability)	MC68HC05P3/D
MC68HC05P4A	4K	176		16-bit: (1IC, 1OC)	SIOP				20 i/o 1 i	✓	KBI (8 pins) 2 High Current Pins	28 DIP - P 28 SOIC - DW	705P6A	HC05P4AGRS/D
MC68HC05P6	4.5K	176		16-bit: (1IC, 1OC)	SIOP	4 ch (8-bit)			20 i/o 1 i	✓		28 DIP - P 28 SOIC - DW	705P6	MC68HC05P6/D AN1058/D
MC68HC05P7	2K	128		16-bit: (1IC, 1OC)	SIOP				20 i/o 1 i	✓		28 DIP - P 28 SOIC - DW	705P9	MC68HC05P7/D
MC68HC05P8	2K	112	32	MFT, RTI		4 ch (8-bit)			16 i/o 4 i	✓	LVPI Option on EEPROM On-Chip Charge Pump	28 DIP - P 28 SOIC - DW	No OTP/EPROM	MC68HC05P8/D AN1058/D
MC68HC05P9A	2K	128		16-bit: (1IC, 1OC)	SIOP	4 ch (8-bit)			20 i/o 1 i	✓	KBI (8 pins) 2 High Current Pins (15 mA sink)	28 DIP - P 28 SOIC - DW	705P6A	HC05P9AGRS/D AN1058/D
XC68HC05P18	8K	192	128	16-bit: (1IC, 1OC)	SIOP	4 ch (8-bit)			20 i/o	✓	2 High Current Pins KBI (8 pins) Mask Option Pullups (8 pins) LVR, Mask option clock out	28 DIP - P 28 SOIC - DW	805P18	HC05P18GRS/D
MC68HC05RC8	8K	350		Infrared Timer, MFT, RTI					20 i/o	✓	Mask Option Pullups (8 pins) KBI (8 pins), Low Power Stop Pin 2.2 Volt Operation, 2 Hi-Curent Pins	28 DIP - P 28 SOIC - DW 44 PLCC	705RC16	HC05RC16GRS/D
MC68HC05RC16	16K	350		Infrared Timer, MFT, RTI					20 i/o	✓	Mask Option Pullups (8 pins) KBI (8 pins), Low Power Stop Pin 2.2 Volt Operation, 2 Hi-Curent Pins	28 DIP - P 28 SOIC - DW 44 PLCC	705RC16	HC05RC16GRS/D

68HC05 MICROCONTROLLERS (Concluded)

All 68HC05 products have a standard operating voltage range from 3 V to 5.5 V unless noted in Comments.

All 68HC05 products have a standard operating temperature range from 0 to 70 °C. Contact a Motorola Sales Office for availability of extended temperature versions

Motorola Part Number	ROM (Bytes)	RAM (Bytes)	EEPROM (Bytes)	Timer	Serial	A/D	PWM	Display Drive	I/O	COP	Comments	Packages	Emulation Version	Documentation
MC68HC05RC17	16K	350		Infrared Timer, MFT, RTI					20 i/o	✓	Mask Option Pullups (8 pins) KBI (8 pins), Low Power Stop Pin 2.2 Volt Operation, 2 Hi-Curent Pins, Programmable 32-kHz PLL	28 DIP - P 28 SOIC - DW 44 PLCC	705RC17 (limited availability)	HC05RC17GRS/D
MSC0401	6K	128	3K						5 i/o		Smartcard Security Features On-Chip Charge Pump	Die 16 DIP - P 20 SOIC - DW	N/A	MSC0401PP/D
MSC0402	23K	384	8K						5 i/o	✓	Smartcard Security Features On-Chip Charge Pump Random Number Generator	Die 52 PLCC - FN	N/A	MSC0402PP/D
MSC0405	6K	128	512						5 i/o		Smartcard Security Features On-Chip Charge Pump	Die 44 PLCC - FN	N/A	MSC0405PP/D
MSC0406	9K	240	1K						5 i/o	✓	Smartcard Security Features On-chip Charge Pump	Die 44 PLCC - FN	N/A	MSC0406PP/D
MSC0408	13K	240	8K						5 i/o		SmartcardSecurity Features, On-Chip Charge Pump	Die 52 PLCC	N/A	MSC0408PP/D
MC68HC05SR3	3.75K	192		8-bit Timer (7-bit prescaler)		4 ch (8-bit)			32 i/o	✓	Mask Option Pullups (24 pins) KBI (8 pins), LED drive (8 pins) LVR	40 DIP - P 42 SDIP - B 44 QFP - FB	705SR3	M68HC05SR3D/H
MC68HC05T1	8K	320		16-bit: (1IC, 1OC)	SIOp	1 ch (6-bit)	9 ch (6-bit)	OSD (64 Char ROM)	29 i/o 1 i	✓	Open Drain PWM Outputs 5 V Only	40 DIP - P 42 SDIP - B	No OTP/EPROM	BR770/D AN433/D, AN1058/D
XC68HC05T2	15K	320		16-bit: (1IC, 1OC)	SIOp	1 ch (6-bit)	9 ch (6-bit)	OSD (64 Char ROM)	29 i/o 1 i	✓	Open Drain PWM Outputs 5 V Only	40 DIP - P 42 SDIP - B	No OTP/EPROM	BR771/D AN1058/D
MC68HC05T10	12K	320		16-bit: (1IC, 1OC) RTC	I ² C	1 ch (8-bit)	8 ch (6-bit) 1 ch (14-bit)	OSD (64 Char ROM)	20 i/o 4 i		Open Drain PWM Outputs KBI (8 pins) 5 V Only	56 SDIP - B	705T10	MC68HC05T10D/H AN1058/D
MC68HC05T16	24K	320		16-bit: (1IC, 2OC) 8-bit PAC	I ² C	2 ch (5-bit)	9 ch (7-bit) 1 ch (14-bit)	OSD (128 Char EPROM)	40 i/o	✓	12V Open Drain I/O Lines (up to 22) 4 Row OSD Buffer Timer Output Compare Functions Do Not Have Output Pins	56 SDIP - B	705T16	MC68HC05T16D/H
XC68HC05V7	10K	384	128	16-bit: (1IC, 1OC) 8-bit RTI	SPI	8 ch (8-bit)	1 ch (6-bit)		22 i/o 16 i	✓	J1850 MDLC (Message Datalink Control) 5 V Power Regulator KBI (16 pins) LVR	56 SDIP - B 68 PLCC - FN	705V8 (limited availability)	
MC68HC05X4	4K	176		16-bit: (1IC, 1OC) MFT, RTI					16 i/o	✓	CAN (Controller Area Network) KBI (16 pins)	28 SOIC - DW	705X4	MC68HC05X4/D AN464/D
MC68HC05X16	15K	352	255	16-bit: (2IC, 2OC)	SCI+	8 ch (8-bit)	2 ch (8-bit)		32 i/o	✓	CAN (Controller Area Network), KBI (8 pins), EEPROM Write Protect, On-Chip Charge Pump	64 QFP - FU	705X32	MC68HC05X16/D AN1058/D
MC68HC05X32	32K	528	255	16-bit: (2IC, 2OC)	SCI+	8 ch (8-bit)	2 ch (8-bit)		32 i/o	✓	CAN (Controller Area Network), KBI (8 pins), EEPROM Write Protect, On-Chip Charge Pump	64 QFP - FU	705X32	MC68HC05X16/D AN1058/D

DEFINITIONS

CAN	– Controller Area Network	OC	– Output Compare	VREG	– Voltage Regulator
CCTV	– Closed Caption Television	OSD	– On—Screen Display	WDOG	– Watch Dog Timer
COP	– Computer Operating Properly (Watch Dog Timer)	PEEP	– Personality EEPROM	B	– Shrink DIP (70 mil spacing)
DTMF	– Dual-Tone Multi-Frequency	PEP	– Personality EPROM	DW	– Small Outline (Wide—Body SOIC)
EBI	– External Bus Interface	PIO	– Parallel Input Output (IBM PC/AT Type)	FA	– 7 x 7 mm Quad Flat Pack (QFP)
IC	– Input Capture	PIT	– Programmable Interrupt Timer	FB	– 10 x 10 mm Quad Flat Pack (QFP)
I ² C	– Inter-Integrated Circuit	PLL	– Phase-Lock Loop	FE	– CQFP (windowed) – Samples Only
IDE	– Integrated Device Electronics (IBM PC/AT Type)	PWM	– Pulse-Width Modulation	FN	– Plastic Quad (PLCC)
i/o	– Bidirectional Input and Output Port Pins	RTC	– Real-Time Clock	FS	– CLCC (windowed) – Samples Only
i	– Input Only Port Pins	RTI	– Real-Time Interrupt	FT	– 28 x 28 mm Quad Flat Pack (QFP)
KBI	– Key Board Interrupt	SCI	– Serial Communications Interface (asynchronous)	FU	– 14 x 14 mm Quad Flat Pack (QFP)
LCD	– Liquid Crystal Display	SCI+	– Serial Communications Interface (asynch. and synch.)	FZ	– CQFP (windowed) – Samples Only
LVI	– Low-Voltage Interrupt	SIO	– Serial Input Output (IBM PC/AT Type)	K	– Cerdip (windowed) – Samples Only
LVPI	– Low Voltage Program Inhibit	SIOP	– Simple Serial I/O Port	L	– Ceramic Sidebrazed
LVR	– Low Voltage Reset	SPI	– Serial Peripheral Interface	P	– Dual—in—Line Plastic
MDLC	– Message Data Link Controller (J1850)	VFD	– Vacuum Fluorescent Display	PU	– 14 x 14 Thin Quad Flat Pack (TQFP)
MFT	– Multi Function Timer	USB	– Universal Serial Bus	PV	– 20 x 20 mm Thin Quad Flat Pack (TQFP)
o	– Output Only Port Pins			S	– Cerdip (windowed) – Samples Only

DEVELOPMENT TOOLS

Please refer to the *Modular Development Tools Selector Guide*, document number SG180/D, for detailed ordering and configuration information on development tools.

WORLD WIDE WEB SITE

<http://sps.motorola.com/csic>

The CSIC WWW pages provide a direct line to the latest information and software for 68HC05 and 68HC08 microcontrollers. The web site provides access to:

- The Latest News and Press Releases
- Product, Market, and Development Tool Overviews
- On-line MCU and Development Tool Selector Guides
- Hyper-text Linked Data Sheets and Application Notes
- Development Tool Software Upgrades, Free Software
- Applications Software
- 3rd Party Development Tool Information
- On-line Technical Support, FAQs, MSEs

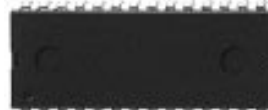
CD-ROM

CSIC technical documentation is available on CD-ROM. Use document order number CDCSIC2/D

HC05 PACKAGE OPTIONS (SHOWN ACTUAL SIZE)



40-PIN DIP (P)
(100 mil PITCH)



28-PIN DIP (P)
(100 mil PITCH)



20-PIN DIP (P)
(100 mil PITCH)



16-PIN DIP (P)
(100 mil PITCH)



56-PIN SDIP (B)
(70 mil PITCH)



42-PIN SDIP (B)
(70 mil PITCH)



28-SOIC (DW)
(50 mil PITCH)



20-SOIC (DW)
(50 mil PITCH)



16-SOIC (DW)
(50 mil PITCH)



68-LEAD PLCC (FN)
(50 mil PITCH)



52-LEAD PLCC (FN)
(50 mil PITCH)



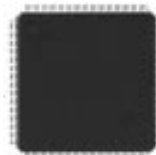
44-LEAD PLCC (FN)
(50 mil PITCH)



28-LEAD PLCC (FN)
(50 mil PITCH)



160/144/128-LEAD QFP (FT)
(0.65/0.65/0.80 mm PITCH)
(28x28 mm)



120/144-LEAD QFP (FV)
(0.65/0.50 mm PITCH)
(20x20 mm)



100/80/64-LEAD QFP (FU)
(0.50/0.65/0.80 mm PITCH)
(14x14 mm)




80/48-LEAD QFP (FK)
(0.50/0.80 mm PITCH)
(12x12 mm)



52/44-LEAD QFP (FB)
(0.65/0.80 mm PITCH)
(10x10 mm)



48/32-LEAD QFP (FA)
(0.50/0.80 mm PITCH)
(7x7 mm)

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