

PIC Microcontrollers

Order code	Manufacturer code	Description
73-1900	n/a	PIC12C508-04P MICROCONTROLLER
73-1915	n/a	PIC12C509-04P MICROCONTROLLER
73-2200	n/a	PIC12C508JW MICROCONTROLLER
73-2202	n/a	PIC12C509JW MICROCONTROLLER
73-2560	n/a	PIC12C508-04SM MICROCONTROLLER SMD
73-2562	n/a	PIC12C508A-04/P MICROCONTROLLER
73-2564	n/a	PIC12C508A-04SM MICROCONTROLLER SMD
73-2566	n/a	PIC12C508AJW
73-2568	n/a	PIC12C509-04SM
73-2570	n/a	PIC12C509A-04/P MICROCONTROLLER
73-2572	n/a	PIC12C509A-04SM
73-2574	n/a	PIC12C509AJW MICROCONTROLLER
73-3140	PIC12CE518-04P PIC	PIC12CE518-04P
73-3142	PIC12CE518-04SM	PIC12CE518-04SM
73-3144	PIC12CE518JW	PIC12CE518JW
73-3146	PIC12CE519-04P	PIC12CE519-04P
73-3148	PIC12CE519-04SM	PIC12CE519-04SM
73-3150	PIC12CE519JW	PIC12CE519JW

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The enclosed information is believed to be correct, Information may change 'without notice' due to product improvement. Users should ensure that the product is suitable for their use. E. & O. E.	Revision A 04/07/2003

PIC12C5XX 8-Pin Microcontroller

A new range of 8 pin DIP or SOIC OTP microcontrollers suited to the user seeking a general purpose device without the added cost of unnecessary peripherals and the associated large pin counts. They have between 512 and 2048 words of program memory and between 25 and 128 bytes of user RAM.

- 6 I/O pins with on chip oscillator
- 33/35 word instructions
- 1 μ sec instruction cycle (@ 4MHz)
- 8-bit timer/counter with prescaler, watchdog timer
- 12C6XX offers an 8-bit ADC
- All 12CXXX parts allow In-Circuit Serial Programming.

Device	Max Freq.	PROM	RAM	I/O lines	Other Features	Package
PIC12C508-04/P	4MHz	512b OTP	25	6	-	8 DIL
PIC12C508-04SM	4MHZ	512b OTP	25	6	-	SO8
PIC12C508JW	4MHz	512b EPROM	25	6	-	8 DIL
PIC12C508A-04/P	4MHz	512b OTP	25	6	-	8 DIL
PIC12C508A-04SM	4MHz	512b OTP	25	6	-	SO8
PIC12C508AJW	4MHz	512b EPROM	25	6	-	8 DIL
PIC12C509-04/P	4MHz	1024b OTP	41	6	-	8 DIL
PIC12C509-04SM	4MHz	1024b OTP	41	6	-	SO8
PIC12C509JW	4MHz	1024b EPROM	41	6	-	8 DIL
PIC12C509A-04/P	4MHz	1024b OTP	41	6	-	8 DIL
PIC12C509A-04SM	4MHz	1024b OTP	41	6	-	SO8
PIC12C509AJW	4MHz	1024b EPROM	41	6	-	8 DIL

* Full Technical Information for the PIC range is available on the Microchip CD-ROM *
Microchip CDRom – Rapid Order Code 73-2010



PIC12C5XX

8-Pin, 8-Bit CMOS Microcontrollers

Devices included in this Data Sheet:

- PIC12C508 • PIC12C508A • PIC12CE518
- PIC12C509 • PIC12C509A • PIC12CE519
- PIC12CR509A

Note: Throughout this data sheet PIC12C5XX refers to the PIC12C508, PIC12C509, PIC12C508A, PIC12C509A, PIC12CR509A, PIC12CE518 and PIC12CE519. PIC12CE5XX refers to PIC12CE518 and PIC12CE519.

High-Performance RISC CPU:

- Only 33 single word instructions to learn
- All instructions are single cycle (1 μ s) except for program branches which are two-cycle
- Operating speed: DC - 4 MHz clock input
DC - 1 μ s instruction cycle

Device	Memory			
	EPROM Program	ROM Program	RAM Data	EEPROM Data
PIC12C508	512 x 12		25	
PIC12C508A	512 x 12		25	
PIC12C509	1024 x 12		41	
PIC12C509A	1024 x 12		41	
PIC12CE518	512 x 12		25	16
PIC12CE519	1024 x 12		41	16
PIC12CR509A		1024 x 12	41	

- 12-bit wide instructions
- 8-bit wide data path
- Seven special function hardware registers
- Two-level deep hardware stack
- Direct, indirect and relative addressing modes for data and instructions
- Internal 4 MHz RC oscillator with programmable calibration
- In-circuit serial programming

Peripheral Features:

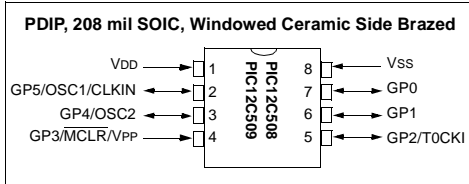
- 8-bit real time clock/counter (TMR0) with 8-bit programmable prescaler
- Power-On Reset (POR)
- Device Reset Timer (DRT)
- Watchdog Timer (WDT) with its own on-chip RC oscillator for reliable operation
- Programmable code-protection
- 1,000,000 erase/write cycle EEPROM data memory
- EEPROM data retention > 40 years
- Power saving SLEEP mode
- Wake-up from SLEEP on pin change
- Internal weak pull-ups on I/O pins
- Internal pull-up on MCLR pin
- Selectable oscillator options:
 - INTRC: Internal 4 MHz RC oscillator
 - EXTRC: External low-cost RC oscillator
 - XT: Standard crystal/resonator
 - LP: Power saving, low frequency crystal

CMOS Technology:

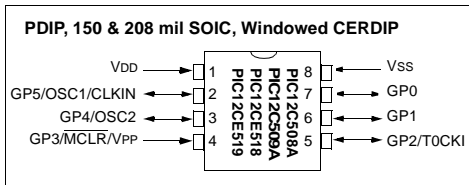
- Low power, high speed CMOS EPROM/ROM technology
- Fully static design
- Wide operating voltage range
- Wide temperature range:
 - Commercial: 0°C to +70°C
 - Industrial: -40°C to +85°C
 - Extended: -40°C to +125°C
- Low power consumption
 - < 2 mA @ 5V, 4 MHz
 - 15 μ A typical @ 3V, 32 KHz
 - < 1 μ A typical standby current

PIC12C5XX

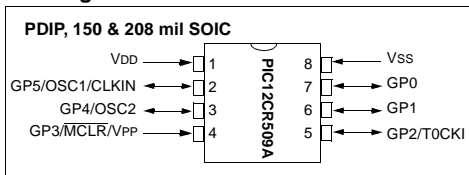
Pin Diagram - PIC12C508/509



Pin Diagram - PIC12C508A/509A, PIC12CE518/519



Pin Diagram - PIC12CR509A



Device Differences

Device	Voltage Range	Oscillator	Oscillator Calibration ² (Bits)	Process Technology (Microns)
PIC12C508A	3.0-5.5	See Note 1	6	0.7
PIC12LC508A	2.5-5.5	See Note 1	6	0.7
PIC12C508	2.5-5.5	See Note 1	4	0.9
PIC12C509A	3.0-5.5	See Note 1	6	0.7
PIC12LC509A	2.5-5.5	See Note 1	6	0.7
PIC12C509	2.5-5.5	See Note 1	4	0.9
PIC12CR509A	2.5-5.5	See Note 1	6	0.7
PIC12CE518	3.0-5.5	-	6	0.7
PIC12LCE518	2.5-5.5	-	6	0.7
PIC12CE519	3.0-5.5	-	6	0.7
PIC12LCE519	2.5-5.5	-	6	0.7

Note 1: If you change from the PIC12C50X to the PIC12C50XA or to the PIC12CR50XA, please verify oscillator characteristics in your application.

Note 2: See Section 7.2.5 for OSCCAL implementation differences.

PIC12C5XX Product Identification System

PART NO.	-XX	X	/XX	XXX		Examples	
					Pattern:	Special Requirements	a) PIC12C508A-04/P Commercial Temp., PDIP Package, 4 MHz, normal VDD limits
					Package:	SN = 150 mil SOIC SM = 208 mil SOIC P = 300 mil PDIP JW = 300 mil Windowed Ceramic Side Brazed	b) PIC12C508A-04/SM Industrial Temp., SOIC package, 4 MHz, normal VDD limits
					Temperature Range:	- = 0°C to +70°C I = -40°C to +85°C E = -40°C to +125°C	c) PIC12C509-04/P Industrial Temp., PDIP package, 4 MHz, normal VDD limits
					Frequency Range:	04 = 4 MHz	
					Device	PIC12C508 PIC12C509 PIC12C508T (Tape & reel for SOIC only) PIC12C509T (Tape & reel for SOIC only) PIC12C508A PIC12C509A PIC12C508AT (Tape & reel for SOIC only) PIC12C509AT (Tape & reel for SOIC only) PIC12LC508A PIC12LC509A PIC12LC508AT (Tape & reel for SOIC only) PIC12LC509AT (Tape & reel for SOIC only) PIC12CR509A PIC12CR509AT (Tape & reel for SOIC only) PIC12LCR509A PIC12LCR509AT (Tape & reel for SOIC only) PIC12CE518 PIC12CE518T (Tape & reel for SOIC only) PIC12CE519 PIC12CE519T (Tape & reel for SOIC only) PIC12LCE518 PIC12LCE518T (Tape & reel for SOIC only) PIC12LCE519 PIC12LCE519T (Tape & reel for SOIC only)	

Please contact your local sales office for exact ordering procedures.

Sales and Support:

Data Sheets

Products supported by a preliminary Data Sheet may have an errata sheet describing minor operational differences and recommended workarounds. To determine if an errata sheet exists for a particular device, please contact one of the following:

1. Your local Microchip sales office
2. The Microchip Corporate Literature Center U.S. FAX: (602) 786-7277
3. The Microchip Worldwide Site (www.microchip.com)

Please specify which device, revision of silicon and Data Sheet (include Literature #) you are using.

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