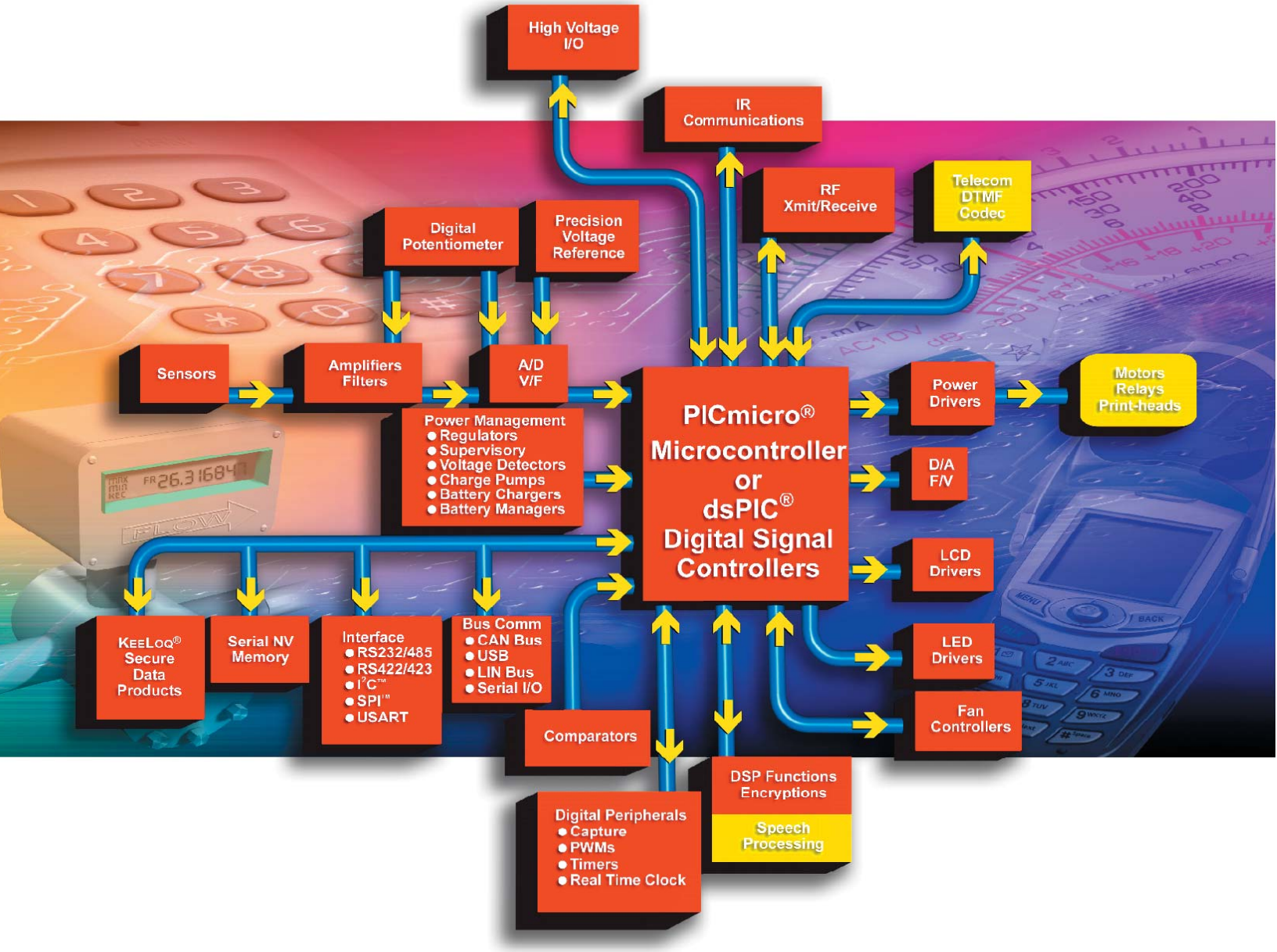
MICROCHIP

# 2005 Product Selector Guide



# Product Profile

## PICmicro® Microcontrollers

Microchip's PICmicro® family of microcontrollers combine high performance, low cost and small package size to offer the best price/performance ratio in the industry. Based on a powerful RISC core, the PICmicro architecture provides users an easy migration path from 6 to 84 pins among all families with little or no code change required. Advanced features available are:

- sophisticated timing peripherals
- embedded analog-to-digital converters (ADCs) and digital-to-analog converters (DACs)
- extended instruction/data memory
- communications peripherals ($I^2C$™/SPI™/USB/CAN and USARTs)
- In-Circuit Serial Programming™ technology (ICSP™)
- memory technology including one-time programmable (OTP), reprogrammable (FLASH) and read-only memory (ROM)
- advanced analog features (PBOR, PLVD, DAC, VREF, Op Amps and PSMC)

## dsPIC® Digital Signal Controllers

Building on its leadership position in 8-bit microcontrollers, Microchip now offers a family of 16-bit High Performance Digital Signal Controllers (DSC) that combine in a single core the best features of microcontrollers with the best features of DSPs. These dsPIC DSC devices reach speeds of up to 30 MIPS, are very efficient for C programming, and have Flash, data EEPROM, powerful peripherals and a variety of software libraries that allow high performance embedded solutions to be designed effortlessly and in a short amount of time. With a familiar microcontroller architecture and design environment, these dsPIC DSC devices target applications such as motor control and power conversion, high-speed sensors, speech and audio, internet and modem connectivity, telecom, encryption and automotive applications.

## Analog & Interface Products

Microchip offers a wide range of analog and related products:

- *Linear and Mixed-Signal*. ADCs/DACs, digital potentiometers, op amps and comparators.
- *Power Management*. LDO and switching regulators, charge pumps, voltage references, CPU/system supervisors and voltage detectors, battery chargers and power MOSFET drivers.
- *Thermal Management*. Temperature sensors (logic output, voltage output, and serial output), brushless DC fan controllers, and fan fault detectors.
- *Interface.* Peripheral products supporting industry-standard networking protocols like CAN, LIN and infrared (including IrDA® Standard infrared), as well as products that provide embedded system input/output expansion capability.

## Secure Data Products

Microchip's KEELOQ® family of code hopping devices provides "rock solid" security for remote-keyless-entry (RKE) and authentication applications. Devices using the KEELOQ code hopping algorithm combine high security, a small package outline and a very low cost to make this an ideal solution for unidirectional RKE systems. The KEELOQ code hopping technology creates a high degree of security using a long code word length together with encryption and synchronization techniques.

## Memory Products

- Microchip offers one of the broadest selections of serial EEPROMs in densities from 128 bits to 512 Kbits, with operating voltages down to 1.8V, in all popular bus protocols ($I^2C$™, Microwire and SPI™ compatible). They are available in all standard temperature ranges from -40°C to +125°C and packaged in the world's smallest standard packaging; up to 16 Kbits in 5-lead SOT-23 and up to 256 Kbits in 8-lead MSOP. With high-speed buses, low power consumption, the highest E/W endurance and the longest data retention in the industry, Microchip's serial EEPROMs are used for virtually every application in the automotive, PC, consumer electronics, communications and industrial markets.

## rfPIC® Microcontrollers and rfHCS Devices

The rfPIC® family significantly eases the radio frequency (RF) design process while reducing component count and board space. The first devices feature an integrated 315/433 MHz ASK/FSK transmitter. These low-power single-chip RF solutions are the first of many planned devices in the new family which targets RF connectivity for high-volume embedded control applications, such as remote sensing, remote control, toys, security and access control.

## Development Systems

Microchip offers a full range of microcontroller development systems, including the MPLAB® ICE 2000 and ICE 9000 in-circuit emulators; MPLAB Integrated Development Environment; MPLAB C18 and C30 Compiler; the MPLAB ICD In-Circuit Debugger, MPLAB PM3 full-featured device programmer; PICSTART® low-cost development system; the PICkit™ 1 Flash Starater Kit, SEEVAL® Serial EEPROM Evaluation Kit and various demonstration boards. Microchip has shipped more than 300,000+ development systems worldwide.

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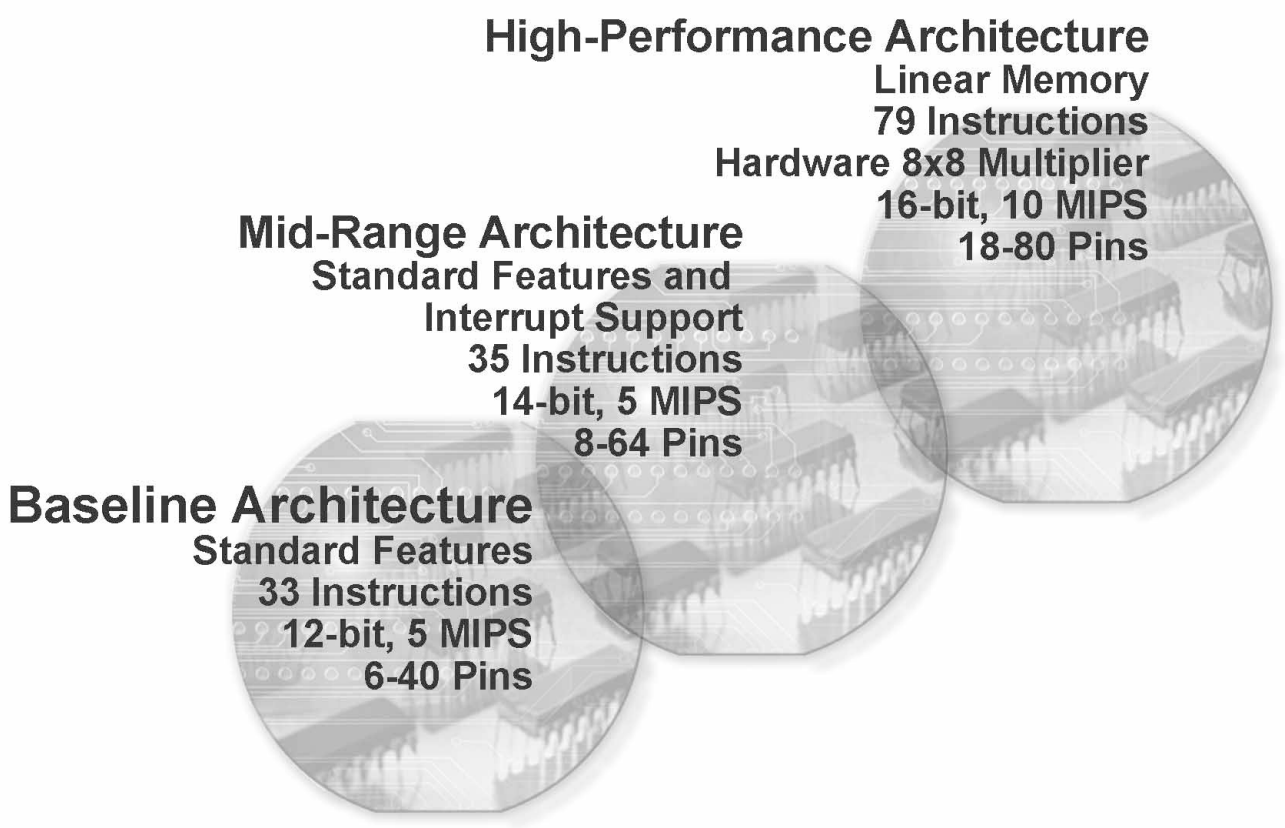
# PICmicro® MICROCONTROLLER FAMILIES



# CURRENT 8-BIT PICmicro® MICROCONTROLLER FAMILY PRODUCTS

## Baseline 8-Bit PICmicro® Microcontroller Family (12-bit Instruction Set)

| Product | Program Memory Bytes & Type (Words) | RAM Bytes | I/O Pins | Packages | Analog | | Digital | Max. Speed MHz | IntOSC | ICSP™ | BOR/ PBOR/ PLVD | ICD # of Breakpoints | Operating Voltage (V) | Other Features |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ADC | Comp. | Timers/WDT | | | | | | | |
| **PIC10FXXX: 1 µs Instruction Execution, 33 Instructions** | | | | | | | | | | | | | | |
| PIC10F200 | 384 StdFl (256) | 16 | 4 | 6OT, 8P | — | — | 1-8 bit, 1-WDT | 4 | 4 MHz | ✓ | — | 1** | 2.0 - 5.5 | |
| PIC10F202 | 768 StdFl (512) | 24 | 4 | 6OT, 8P | — | — | 1-8 bit, 1-WDT | 4 | 4 MHz | ✓ | — | 1** | 2.0 - 5.5 | |
| PIC10F204 | 384 StdFl (256) | 16 | 4 | 6OT, 8P | — | 1 | 1-8 bit, 1-WDT | 4 | 4 MHz | ✓ | — | 1** | 2.0 - 5.5 | Bandgap reference |
| PIC10F206 | 768 StdFl (512) | 24 | 4 | 6OT, 8P | — | 1 | 1-8 bit, 1-WDT | 4 | 4 MHz | ✓ | — | 1** | 2.0 - 5.5 | Bandgap reference |
| **PIC12FXXX: 1 µs Instruction Execution, 33 Instructions, 4 Oscillator Selections** | | | | | | | | | | | | | | |
| PIC12F508 | 768 StdFl (512) | 25 | 6 | 8P, 8SN, 8MS | — | — | 1-8 bit, 1-WDT | 4 | 4 MHz | ✓ | — | 1** | 2.0 - 5.5 | |
| PIC12F509 | 1536 StdFl (1024) | 41 | 6 | 8P, 8SN, 8MS | — | — | 1-8 bit, 1-WDT | 4 | 4 MHz | ✓ | — | 1** | 2.0 - 5.5 | |
| **PIC16C/F5X: Upwardly Compatible with PIC16C5X/PIC12CXXX, 100-200 ns Instruction Execution, 33/35 Instructions, 4/5 Oscillator Selections** | | | | | | | | | | | | | | |
| PIC16C55A | 768 OTP (512) | 24 | 20 | 28P, 28JW, 28SP, 28SO, 28SS | — | — | 1-8 bit, 1-WDT | 40 | — | — | — | — | 2.5 - 5.5 | |
| PIC16C56A | 1536 OTP (1024) | 25 | 12 | 18P, 18JW, 18SO, 20SS | — | — | 1-8 bit, 1-WDT | 40 | — | — | — | — | 2.5 - 5.5 | |
| PIC16CR56A | 1536 ROM (1024) | 25 | 12 | 18P, 18SO, 20SS | — | — | 1-8 bit, 1-WDT | 20 | — | — | — | — | 2.5 - 5.5 | |
| PIC16C58B | 3072 OTP (2048) | 73 | 12 | 18P, 18JW, 18SO, 20SS | — | — | 1-8 bit, 1-WDT | 40 | — | — | — | — | 2.5 - 5.5 | |
| PIC16CR58B | 3072 ROM (2048) | 73 | 12 | 18P, 18SO, 20SS | — | — | 1-8 bit, 1-WDT | 20 | — | — | — | — | 2.5 - 5.5 | |
| PIC16HV540 | 768 OTP (512) | 25 | 12 | 18P, 18JW, 18SO, 20SS | — | — | 1-8 bit, 1-WDT | 20 | — | — | BOR | — | 3.5 - 15 | 8 high-voltage (15V) I/Os, 4 deep stack, 5 I/Os with wake-up-on-change |
| PIC16F505 | 1536 StdFl (1024) | 72 | 12 | 14P, 14JW, 14SL | — | — | 1-8 bit, 1-WDT | 20 | 4 MHz | ✓ | — | 1** | 2.0 - 5.5 | |
| PIC16F54 | 768 StdFl (512) | 25 | 12 | 18P, 18SO, 20SS | — | — | 1-8 bit, 1-WDT | 20 | — | ✓ | — | — | 2.0 - 5.5 | |
| PIC16F57 | 3072 StdFl (2048) | 72 | 20 | 28P, 28SO, 28SS, 28SP | — | — | 1-8 bit, 1-WDT | 20 | — | ✓ | — | — | 2.0 - 5.5 | |
| PIC16F59 | 3072 StdFl (2048) | 134 | 32 | 40P, 44PT | — | — | 1-8 bit, 1-WDT | 20 | — | ✓ | — | — | 2.0 - 5.5 | |

***Contact Microchip Technology for availability date.**
**** Requires ICD specific device with header module – refer to Development Tools.**
**Abbreviations are found on the last page of the Selector Guide.**

## Mid-Range 8-Bit PICmicro® Microcontroller Family (14-bit Instruction Set)

| Product | Program Memory Bytes & Type (Words) | EEPROM Data Memory Bytes | RAM Bytes | I/O Pins | Packages | Analog | | Digital | | Max. Speed MHz | IntOSC | BOR/ PBOR /PLVD | ICD # of Breakpoints | CCP/ ECCP | nW | Other Features |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | ADC Ch | Comp. | Timers/WDT | Serial I/O | | | | | | | |
| **PIC12FXXX: Upwardly Compatible with PIC12CXXX, 200 ns – 1 μs Instruction Execution, 35 Instructions, 4/5 Oscillator Selections, ICSP™** | | | | | | | | | | | | | | | | |
| PIC12F629 | 1792 StdFl (1024) | 128 | 64 | 6 | 8P, 8SN, 8MF | — | 1 | 1-8 bit, 1-16 bit, 1-WDT | — | 20 | 4 MHz | BOR | 1** | — | — | |
| PIC12F635 | 1792 StdFl (1024) | 128 | 64 | 6 | 8P, 8SN, 8MF | — | 1 | 1-8 bit, 1-16 bit, 1-WDT | — | 20 | 8 MHz | BOR/ PLVD | 1** | — | ✓ | KEELOQ® hardware peripheral |
| PIC12F675 | 1792 StdFl (1024) | 128 | 64 | 6 | 8P, 8SN, 8MF | 4x10-bit | 1 | 1-8 bit, 1-16 bit, 1-WDT | — | 20 | 4 MHz | BOR | 1** | — | — | |
| PIC12F683 | 3584 StdFl (2048) | 256 | 128 | 6 | 8P, 8SN, 8MF | 4x10-bit | 1 | 1-16 bit, 2-8 bit, 1-WDT | — | 20 | 8 MHz | BOR | 1** | 1/0 | ✓ | |
| **PIC16CXXX: Upwardly Compatible with PIC16C5X/PIC12CXXX, 4-12 Interrupts, 100-200 ns Instruction Executions, 35 Instructions, 4/5 Oscillator Selections, ICSP™ (except ROM)** | | | | | | | | | | | | | | | | |
| PIC14000 | 7168 OTP (4096) | — | 192 | 20 | 28SP, 28SO, 28SS, 28JW | 8 SLAC | 2 | 1-8 bit, 1-16 bit, 1-WDT | $I^2C$™/SMB | 20 | 4 MHz | — | — | — | — | Temperature Sensor, Program Reference Generator |
| PIC16C432 | 3584 OTP (2048) | — | 128 | 12 | 20SS, 20P, 20JW | — | 2 | 1-8 bit, 1-WDT | LIN | 20 | — | BOR | — | — | — | LIN XCVR, 18V/40 mA |
| PIC16C433 | 3584 OTP (2048) | — | 128 | 6 | 18SO, 18P, 18JW | 4x8-bit | — | 1-8 bit, 1-WDT | LIN | 10 | 4 MHz | — | — | — | — | LIN XCVR, 18V/40 mA |
| PIC16C554 | 896 OTP (512) | — | 80 | 13 | 18P, 18SO, 18JW, 20SS | — | — | 1-8 bit, 1-WDT | — | 20 | — | — | — | — | — | |
| PIC16C558 | 3584 OTP (2048) | — | 128 | 13 | 18P, 18SO, 18JW, 20SS | — | — | 1-8 bit, 1-WDT | — | 20 | — | — | — | — | — | |
| PIC16C62B | 3584 OTP (2048) | — | 128 | 22 | 28SP, 28SO, 28SS, 28JW, 28ML | — | — | 1-16 bit, 2-8 bit, 1-WDT | $I^2C$/SPI™ | 20 | — | BOR | — | 1/0 | — | |
| PIC16C620A | 896 OTP (512) | — | 96 | 13 | 18P, 18SO, 18JW, 20SS | — | 2 | 1-8 bit, 1-WDT | — | 40 | — | BOR | — | — | — | |
| PIC16CR620A | 896 OTP (512) | — | 96 | 13 | 18P, 18SO, 20SS | — | 2 | 1-8 bit, 1-WDT | — | 20 | — | BOR | — | — | — | |
| PIC16C621A | 1792 OTP (1024) | — | 96 | 13 | 18P, 18SO, 18JW, 20SS | — | 2 | 1-8 bit, 1-WDT | — | 40 | — | BOR | — | — | — | |
| PIC16C622A | 3584 OTP (2048) | — | 128 | 13 | 18P, 18SO, 18JW, 20SS | — | 2 | 1-8 bit, 1-WDT | — | 40 | — | BOR | — | — | — | |
| PIC16C63A | 7168 OTP (4096) | — | 192 | 22 | 28SP, 28SO, 28SS, 28JW, 28ML | — | — | 1-16 bit, 2-8 bit, 1-WDT | USART, $I^2C$/SPI | 20 | — | BOR | — | 2/0 | — | |
| PIC16CR63 | 7168 OTP (4096) | — | 192 | 22 | 28SP, 28SO, 28SS | — | — | 1-16 bit, 2-8 bit, 1-WDT | USART, $I^2C$/SPI | 20 | — | BOR | — | 2/0 | — | |
| PIC16C65B | 7168 OTP (4096) | — | 192 | 33 | 40P, 40JW, 44L, 44PQ, 44PT | — | — | 1-16 bit, 2-8 bit, 1-WDT | USART, $I^2C$/SPI | 20 | — | BOR | — | 2/0 | — | PSP |
| PIC16CR65 | 7168 OTP (4096) | — | 192 | 33 | 40P, 44L, 44PQ, 44PT | — | — | 1-16 bit, 2-8 bit, 1-WDT | USART, $I^2C$/SPI | 20 | — | BOR | — | 2/0 | — | PSP |
| PIC16C717 | 3584 OTP (2048) | — | 256 | 16 | 18P, 18SO, 18JW, 20SS | 6x10-bit | — | 1-16 bit, 2-8 bit, 1-WDT | MI$^2$C/SPI | 20 | 4 MHz | PBOR /PLVD | — | 0/1 | — | |
| PIC16CR72 | 3584 OTP (2048) | — | 128 | 22 | 28SP, 28SO, 28SS | 5x8-bit | — | 1-16 bit, 2-8 bit, 1-WDT | $I^2C$/SPI | 20 | — | BOR | — | 1/0 | — | |
| PIC16C745 | 14336 OTP (8192) | — | 256 | 22 | 28SP, 28SO, 28JW | 5x8-bit | — | 1-16 bit, 2-8 bit, 1-WDT | USART, low-speed USB | 24 | — | BOR | — | 2/0 | — | USB 1.1, 64 bytes dual port RAM |

***Contact Microchip Technology for availability date.**
**** Requires ICD specific device with header module – refer to Development Tools.**
**Abbreviations are found on the last page of the Selector Guide.**

## Mid-Range 8-Bit PICmicro® Microcontroller Family (14-bit Instruction Set)

| | Product | Program Memory Bytes & Type (Words) | EEPROM Data Memory Bytes | RAM Bytes | I/O Pins | Packages | Analog | | Digital | | Max. Speed MHz | IntOSC | BOR/ PBOR /PLVD | ICD # of Breakpoints | CCP/ ECCP | nW | Other Features |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | ADC Ch | Comp. | Timers/WDT | Serial I/O | | | | | | | |
| | **PIC16CXXX: Upwardly Compatible with PIC16C5X/PIC12CXXX, 4-12 Interrupts, 100-200 ns Instruction Executions, 35 Instructions, 4/5 Oscillator Selections, ICSP™ (except ROM) (continued)** | | | | | | | | | | | | | | | | |
| | PIC16C765 | 14336 OTP (8192) | — | 256 | 33 | 40P, 40JW, 44L, 44PT | 8x8-bit | — | 1-16 bit, 2-8 bit, 1-WDT | USART, low-speed USB | 24 | — | BOR | — | 2/0 | — | USB 1.1, 64 bytes dual port RAM, PSP |
| | PIC16C770 | 3584 OTP (2048) | — | 256 | 16 | 20P, 20SO, 20JW, 20SS | 6x12-bit | — | 1-16 bit, 2-8 bit, 1-WDT | MI$^2$C/SPI | 20 | 4 MHz | PBOR /PLVD | — | 0/1 | — | |
| | PIC16C771 | 7168 OTP (4096) | — | 256 | 16 | 20P, 20SO, 20JW, 20SS | 6x12-bit | — | 1-16 bit, 2-8 bit, 1-WDT | MI$^2$C/SPI | 20 | 4 MHz | PBOR /PLVD | — | 0/1 | — | |
| | PIC16C773 | 7168 OTP (4096) | — | 256 | 22 | 28SP, 28SO, 28SS, 28JW | 6x12-bit | — | 1-16 bit, 2-8 bit, 1-WDT | AUSART, MI$^2$C/SPI | 20 | — | PBOR /PLVD | — | 2/0 | — | |
| | PIC16C774 | 7168 OTP (4096) | — | 256 | 33 | 40P, 40JW, 44L, 44PQ, 44PT | 10x12-bit | — | 1-16 bit, 2-8 bit, 1-WDT | AUSART, MI$^2$C/SPI | 20 | — | PBOR /PLVD | — | 2/0 | — | PSP |
| | PIC16C781 | 1792 OTP (1024) | — | 128 | 16 | 20P, 20SO, 20SS, 20JW | 8x8-bit | 2 | 1-16 bit, 2-8 bit, 1-WDT | — | 20 | 4 MHz | PBOR | — | — | — | Op Amp, PSMC, DAC |
| | PIC16C782 | 3584 OTP (2048) | — | 128 | 16 | 20P, 20SO, 20SS, 20JW | 8x8-bit | 2 | 1-16 bit, 2-8 bit, 1-WDT | — | 20 | 4 MHz | PBOR /PLVD | — | — | — | Op Amp, PSMC, DAC |
| | PIC16C925 | 7168 OTP (4096) | — | 176 | 52 | 68CL, 68L, 64PT | 5x10-bit | — | 1-16 bit, 2-8 bit, 1-WDT | I$^2$C/SPI | 20 | — | BOR | — | 1/0 | — | LCD module, static, 1/2, 1/3, 1/4 multiplex |
| | PIC16C926 | 14336 OTP (8192) | — | 336 | 52 | 68CL, 68L, 64PT | 5x10-bit | — | 1-16 bit, 2-8 bit, 1-WDT | I$^2$C/SPI | 20 | — | BOR | — | 1/0 | — | LCD module, static, 1/2, 1/3, 1/4 multiplex |
| | **PIC16FXXX: Migration to PIC16CXXX/PIC16C5X/PIC12CXXX, 17 Interrupts, 200 ns Instruction Executions, 33/35 Instructions, 4 Oscillator Selections, ICSP™ (except ROM)** | | | | | | | | | | | | | | | | |
| | PIC16F627A | 1792 StdFl (1024) | 128 | 224 | 16 | 18P, 18SO, 20SS, 28ML | — | 2 | 1-16 bit, 2-8 bit, 1-WDT | AUSART | 20 | 4 MHz | BOR | 1** | 1/0 | ✓ | |
| | PIC16F628A | 3584 StdFl (2048) | 128 | 224 | 16 | 18P, 18SO, 20SS, 28ML | — | 2 | 1-16 bit, 2-8 bit, 1-WDT | AUSART | 20 | 4 MHz | BOR | 1** | 1/0 | ✓ | |
| | PIC16F648A | 7168 StdFl (4096) | 256 | 256 | 16 | 18P, 18SO, 20SS, 28ML | — | 2 | 1-16 bit, 2-8 bit, 1-WDT | AUSART | 20 | 4 MHz | BOR | 1** | 1/0 | ✓ | |
| | PIC16F630 | 1792 StdFl (1024) | 128 | 64 | 12 | 14P, 14SL, 14ST | — | 1 | 1-8-bit, 1-16 bit, 1-WDT | — | 20 | 4 MHz | BOR | 1** | — | — | |
| | PIC16F636 | 3584 StdFl (2048) | 256 | 128 | 12 | 14P, 14SL, 14ST | — | 2 | 1-8 bit, 1-16 bit, 1-WDT | — | 20 | 8 MHz | BOR/ PLVD | 1** | — | ✓ | KEELOQ® hardware peripheral |
| **NEW** | PIC16F639* | 3584 StdFl (2048) | 256 | 128 | 12 | 20P, 20SO, 20SS | — | 2 | 1-16 bit, 1-8 bit, 1-WDT | — | 20 | 8 MHz | BOR | 1** | — | ✓ | Transponder Analog Front End, KEELOQ® hardware peripheral |
| | PIC16F676 | 1792 StdFl (1024) | 128 | 64 | 12 | 14P, 14SL, 14ST | 8x10-bit | 1 | 1-8 bit, 1-16 bit, 1-WDT | — | 20 | 4 MHz | BOR | 1** | — | — | |
| | PIC16F684 | 3584 StdFl (2048) | 256 | 128 | 12 | 14P, 14SL, 14ST | 8x10-bit | 2 | 1-16 bit, 2-8 bit, 1-WDT | — | 20 | 8 MHz | BOR | 1** | 0/1 | ✓ | |
| **NEW** | PIC16F685* | 7168 StdFl (4096) | 256 | 256 | 18 | 20P, 20SO, 20SS | 12 x 10-bit | 2 | 1-16 bit, 2-8 bit, 1-WDT | — | 20 | 8 MHz | BOR | 1** | 0/1 | ✓ | |
| **NEW** | PIC16F687* | 3584 StdFl (2048) | 256 | 128 | 18 | 20P, 20SO, 20SS | 12 x 10-bit | 2 | 1-16 bit, 1-8 bit, 1-WDT | EUSART, I$^2$C/SPI | 20 | 8 MHz | BOR | 1** | — | ✓ | |
| | PIC16F688 | 7168 StdFl (4096) | 256 | 256 | 12 | 14P, 14SL, 14ST | 8x10-bit | 2 | 1-8 bit, 1-16 bit, 1-WDT | EUSART | 20 | 8 MHz | BOR | 1** | — | ✓ | |
| **NEW** | PIC16F689* | 7168 StdFl (4096) | 256 | 256 | 18 | 20P, 20SO, 20SS | 12x10-bit | 2 | 1-16 bit, 1-8 bit, 1-WDT | EUSART, I$^2$C/SPI | 20 | 8 MHz | BOR | 1** | — | ✓ | |

***Contact Microchip Technology for availability date.**
**** Requires ICD specific device with header module – refer to Development Tools.**
**Abbreviations are found on the last page of the Selector Guide.**

## Mid-Range 8-Bit PICmicro® Microcontroller Family (14-bit Instruction Set)

| | Product | Program Memory Bytes & Type (Words) | EEPROM Data Memory Bytes | RAM Bytes | I/O Pins | Packages | Analog | | Digital | | Max. Speed MHz | IntOSC | BOR/ PBOR /PLVD | ICD # of Breakpoints | CCP/ ECCP | nW | Other Features |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | ADC Ch | Comp. | Timers/WDT | Serial I/O | | | | | | | |
| | **PIC16FXXX: Migration to PIC16CXXX/PIC16C5X/PIC12CXXX, 17 Interrupts, 200 ns Instruction Execution, 33/35 Instructions, 4 Oscillator Selections, ICSP™ (except ROM) (continued)** | | | | | | | | | | | | | | | | |
| **NEW** | PIC16F690* | 7168 StdFl (4096) | 256 | 256 | 18 | 20P, 20SO, 20SS | 12x10-bit | 2 | 1-16 bit, 2-8 bit, 1-WDT | EUSART, $I^2C$, SPI | 20 | 8 MHz | BOR | 1** | 0/1 | ✓ | |
| | PIC16F716 | 3584 StdFl (2048) | — | 128 | 13 | 18P, 18SO, 20SS | 4x8-bit | — | 1-16 bit, 2-8 bit, 1-WDT | — | 20 | — | BOR | 1** | 0/1 | — | |
| | PIC16F72 | 3584 StdFl (2048) | — | 128 | 22 | 28SP, 28SO, 28SS, 28ML | 5x8-bit | — | 1-16 bit, 2-8 bit, 1-WDT | $I^2C$/SPI | 20 | — | BOR | — | 1/0 | — | |
| | PIC16F73 | 7168 StdFl (4096) | — | 192 | 22 | 28SP, 28SO, 28SS, 28ML | 5x8-bit | — | 1-16 bit, 2-8 bit, 1-WDT | USART, $I^2C$/SPI | 20 | — | BOR | — | 2/0 | — | |
| | PIC16F737 | 7168 StdFl (4096) | — | 368 | 25 | 28SP, 28SO, 28SS, 28ML | 11x10-bit | 2 | 1-16 bit, 2-8 bit, 1-WDT | AUSART, MI$^2$C/SPI | 20 | 8 MHz | PBOR /PLVD | 1 | 3/0 | ✓ | |
| | PIC16F74 | 7168 StdFl (4096) | — | 192 | 33 | 40P, 44ML, 44L, 44PT | 8x8-bit | — | 1-16 bit, 2-8 bit, 1-WDT | USART, $I^2C$/SPI | 20 | — | BOR | — | 2/0 | — | PSP |
| | PIC16F747 | 7168 StdFl (4096) | — | 368 | 36 | 40P, 44PT, 44ML | 14x10-bit | 2 | 1-16 bit, 2-8 bit, 1-WDT | AUSART, MI$^2$C/SPI | 20 | 8 MHz | PBOR /PLVD | 1 | 3/0 | ✓ | PSP |
| | PIC16F76 | 14336 StdFl (8192) | — | 368 | 22 | 28SP, 28SO, 28SS, 28ML | 5x8-bit | — | 1-16 bit, 2-8 bit, 1-WDT | USART, $I^2C$/SPI | 20 | — | BOR | — | 2/0 | — | |
| | PIC16F767 | 14336 StdFl (8192) | — | 368 | 25 | 28SP, 28SO, 28SS, 28ML | 11x10-bit | 2 | 1-16 bit, 2-8 bit, 1-WDT | AUSART, MI$^2$C/SPI | 20 | 8 MHz | PBOR /PLVD | 1 | 3/0 | ✓ | |
| | PIC16F77 | 14336 StdFl (8192) | — | 368 | 33 | 40P, 44ML, 44L, 44PT | 8x8-bit | — | 1-16 bit, 2-8 bit, 1-WDT | USART, $I^2C$/SPI | 20 | — | BOR | — | 2/0 | — | PSP |
| | PIC16F777 | 14336 StdFl (8192) | — | 368 | 36 | 40P, 44PT, 44ML | 14x10-bit | 2 | 1-16 bit, 2-8 bit, 1-WDT | AUSART, MI$^2$C/SPI | 20 | 8 MHz | PBOR /PLVD | 1 | 3/0 | ✓ | PSP |
| **NEW** | PIC16F785* | 3584 StdFl (2048) | 256 | 128 | 18 | 20P, 20SO, 20SS | 12x10-bit | 2 | 1-16 bit, 2-8 bit, 1-WDT | — | 20 | 8 MHz | BOR | 1** | 1/0 | ✓ | 2 phase PWM, 2 x OpAmp, VREF |
| | PIC16F818 | 1792 EnhFl (1024) | 128 | 128 | 16 | 18P, 18SO, 20SS, 28ML | 5x10-bit | — | 1-16 bit, 2-8 bit, 1-WDT | $I^2C$/SPI | 20 | 8 MHz | BOR | 1 | 1/0 | ✓ | |
| | PIC16F819 | 3584 EnhFl (2048) | 256 | 256 | 16 | 18P, 18SO, 20SS, 28ML | 5x10-bit | — | 1-16 bit, 2-8 bit, 1-WDT | $I^2C$/SPI | 20 | 8 MHz | BOR | 1 | 1/0 | ✓ | |
| | PIC16F84A | 1792 StdFl (1024) | 64 | 68 | 13 | 18P, 18SO, 20SS | — | — | 1-8 bit, 1-WDT | — | 20 | — | — | — | — | — | |
| | PIC16F87 | 7168 EnhFl (4096) | 256 | 368 | 16 | 18P, 18SO, 20SS, 28ML | — | 2 | 1-16 bit, 2-8 bit, 1-WDT | AUSART, $I^2C$/SPI | 20 | 8 MHz | BOR | 1 | 1/0 | ✓ | |
| | PIC16F870 | 3584 EnhFl (2048) | 64 | 128 | 22 | 28SP, 28SO, 28SS | 5x10-bit | — | 1-16 bit, 2-8 bit, 1-WDT | AUSART | 20 | — | BOR | 1 | 1/0 | — | |
| | PIC16F871 | 3584 EnhFl (2048) | 64 | 128 | 33 | 40P, 44L, 44PT | 8x10-bit | — | 1-16 bit, 2-8 bit, 1-WDT | AUSART | 20 | — | BOR | 1 | 1/0 | — | PSP |
| | PIC16F872 | 3584 EnhFl (2048) | 64 | 128 | 22 | 28SP, 28SO, 28SS | 5x10-bit | — | 1-16 bit, 2-8 bit, 1-WDT | MI$^2$C/SPI | 20 | — | BOR | 1 | 1/0 | — | |
| | PIC16F873A | 7168 EnhFl (4096) | 128 | 192 | 22 | 28SP, 28SO, 28SS, 28ML | 5x10-bit | 2 | 1-16 bit, 2-8 bit, 1-WDT | AUSART, MI$^2$C/SPI | 20 | — | BOR | 1 | 2/0 | — | |
| | PIC16F874A | 7168 EnhFl (4096) | 128 | 192 | 33 | 40P, 44ML, 44L, 44PT | 8x10-bit | 2 | 1-16 bit, 2-8 bit, 1-WDT | AUSART, MI$^2$C/SPI | 20 | — | BOR | 1 | 2/0 | — | PSP |

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**** Requires ICD specific device with header module – refer to Development Tools.**
**Abbreviations are found on the last page of the Selector Guide.**

## Mid-Range 8-Bit PICmicro® Microcontroller Family (14-bit Instruction Set)

| | Product | Program Memory Bytes & Type (Words) | EEPROM Data Memory Bytes | RAM Bytes | I/O Pins | Packages | Analog | | Digital | | Max. Speed MHz | IntOSC | BOR/ PBOR /PLVD | ICD # of Breakpoints | CCP/ ECCP | nW | Other Features |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | ADC Ch | Comp. | Timers/WDT | Serial I/O | | | | | | | |
| | **PIC16FXXX: Migration to PIC16CXXX/PIC16C5X/PIC12CXXX, 17 Interrupts, 200 ns Instruction Execution, 33/35 Instructions, 4 Oscillator Selections, ICSP™ (except ROM) (continued)** | | | | | | | | | | | | | | | | |
| | PIC16F876A | 14336 EnhFl (8192) | 256 | 368 | 22 | 28SP, 28SO, 28SS, 28ML | 5x10-bit | 2 | 1-16 bit, 2-8 bit, 1-WDT | AUSART, MI$^2$C/SPI | 20 | — | BOR | 1 | 2/0 | — | |
| | PIC16F877A | 14336 EnhFl (8192) | 256 | 368 | 33 | 40P, 44ML, 44L, 44PT | 8x10-bit | 2 | 1-16 bit, 2-8 bit, 1-WDT | AUSART, MI$^2$C/SPI | 20 | — | BOR | 1 | 2/0 | — | PSP |
| | PIC16F88 | 7168 EnhFl (4096) | 256 | 368 | 16 | 18P, 18S0, 20SS, 28ML | 7x10-bit | 2 | 1-16 bit, 2-8 bit, 1-WDT | AUSART, I$^2$C/SPI | 20 | 8 MHz | BOR | 1 | 1/0 | ✓ | |
| NEW | PIC16F913* | 7168 StdFl (4096) | 256 | 256 | 25 | 28P, 28SO, 28SS, 28ML | 5x10-bit | 2 | 2-8 bit, 1-16 bit | AUSART, I$^2$C/SPI | 20 | 8 MHz | BOR/ PLVD | 1 | 1/0 | ✓ | Integrated LCD control modules with 60 segments |
| NEW | PIC16F914* | 7168 StdFl (4096) | 256 | 256 | 36 | 40P, 44PT, 44ML | 8x10-bit | 2 | 2-8 bit, 1-16 bit | AUSART, I$^2$C/SPI | 20 | 8 MHz | BOR/ PLVD | 1 | 2/0 | ✓ | Integrated LCD control modules with 96 segments |
| NEW | PIC16F916* | 14336 StdFl (8192) | 256 | 352 | 25 | 28P, 28SO, 28SS, 28ML | 5x10-bit | 2 | 2-8 bit, 1-16 bit | AUSART, I$^2$C/SPI | 20 | 8 MHz | BOR/ PLVD | 1 | 1/0 | ✓ | Integrated LCD control modules with 60 segments |
| NEW | PIC16F917* | 14336 StdFl (8192) | 256 | 352 | 36 | 40P, 44PT, 44ML | 8x10-bit | 2 | 2-8 bit, 1-16 bit | AUSART, I$^2$C/SPI | 20 | 8 MHz | BOR/ PLVD | 1 | 2/0 | ✓ | Integrated LCD control modules with 96 segments |

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**** Requires ICD specific device with header module – refer to Development Tools.**
**Abbreviations are found on the last page of the Selector Guide.**

## High Performance 8-Bit PICmicro® Microcontroller Family (16-bit Instruction Set)

| Product | Program Memory Bytes & Type (Words) | EEPROM Data Memory Bytes | RAM Bytes | I/O Pins | Packages | Analog | | Digital | | Max. Speed MHz | IntOSC | BOR/ PBOR/ PLVD | ICD # of Breakpoints | CCP/ECCP | nW | Other Features |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | ADC Ch | Comp. | Timers/WDT | Serial I/O | | | | | | | |
| **PIC18FXXX Flash MCUs: Upwardly Compatible with PIC18CXXX/PIC17C7XX/PIC16CXX/PIC16C5X/PIC12CXXX, 77 Instructions, C Compiler Efficient Instruction Set, 10 MIPS, VDD = 2.0 - 5.5V (except ROM)** | | | | | | | | | | | | | | | | |
| PIC18C601 | ROM-less | — | 1536 | 26 | 64PT, 68L | 8x10-bit | — | 3-16 bit, 1-8 bit, 1-WDT | AUSART, MI$^2$C/SPI | 25 | — | — | — | 2/0 | — | 256KB EMA, Bootloader RAM |
| PIC18C801 | ROM-less | — | 1536 | 37 | 80PT, 84L | 12x10-bit | — | 3-16 bit, 1-8 bit, 1-WDT | AUSART, MI$^2$C/SPI | 25 | — | — | — | 2/0 | — | 2MB EMA, Bootloader RAM |
| PIC18F1220 | 4096 EnhFl (2048) | 256 | 256 | 16 | 18P, 18SO, 20SS, 28ML | 7x10-bit | — | 3-16 bit, 1-8 bit, 1-WDT | EUSART | 40 | 8 MHz | PBOR/ PLVD | 1 | 0/1 | ✓ | |
| PIC18F1320 | 8192 EnhFl (4096) | 256 | 256 | 16 | 18P, 18SO, 20SS, 28ML | 7x10-bit | — | 3-16 bit, 1-8 bit, 1-WDT | EUSART | 40 | 8 MHz | PBOR/ PLVD | 1 | 0/1 | ✓ | |
| PIC18F2220 | 4096 EnhFl (2048) | 256 | 512 | 25 | 28SP, 28SO | 10x10-bit | 2 | 3-16 bit, 1-8 bit, 1-WDT | AUSART, MI$^2$C/SPI | 40 | 8 MHz | PBOR/ PLVD | 1 | 2/0 | ✓ | |
| PIC18F2320 | 8192 EnhFl (4096) | 256 | 512 | 25 | 28SP, 28SO | 10x10-bit | 2 | 3-16 bit, 1-8 bit, 1-WDT | AUSART, MI$^2$C/SPI | 40 | 8 MHz | PBOR/ PLVD | 1 | 2/0 | ✓ | |
| PIC18F2331 | 8192 EnhFl (4096) | 256 | 768 | 24 | 28SP, 28SO, 28MM | 5x10-bit, 200 ksps | — | 3-16 bit, 1-8 bit, 1-WDT | EUSART, I$^2$C/SPI | 40 | 8 MHz | PBOR/ PLVD | 1 | 2/0 | ✓ | 6 channel 14-bit Motor Control PWMs, 2-ch Quadrature Encoder |

***Contact Microchip Technology for availability date.**
**Abbreviations are found on the last page of the Selector Guide.**

## High Performance 8-Bit PICmicro® Microcontroller Family (16-bit Instruction Set)

| | Product | Program Memory Bytes & Type (Words) | EEPROM Data Memory Bytes | RAM Bytes | I/O Pins | Packages | Analog | | Digital | | Max. Speed MHz | IntOSC | BOR/ PBOR/ PLVD | ICD # of Breakpoints | CCP/ECCP | nW | Other Features |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | ADC Ch | Comp. | Timers/WDT | Serial I/O | | | | | | | |
| | **PIC18FXXX Flash MCUs: Upwardly Compatible with PIC18CXXX/PIC17C7XX/PIC16CXX/PIC16C5X/PIC12CXXX, 77 Instructions, C Compiler Efficient Instruction Set, 10 MIPS, $V_{DD}$ = 2.0 - 5.5V (except ROM) (continued)** | | | | | | | | | | | | | | | | |
| | PIC18F2410 | 16384 StdFl (8192) | — | 768 | 25 | 28SP, 28SO, 28ML | 10x10-bit 100 ksps | 2 | 3-16 bit, 1-8 bit, 1-WDT | EUSART, MI$^2$C/SPI | 40 | 8 MHz | PBOR/ PLVD | 3 | 2/0 | ✓ | |
| | PIC18F2420 | 16384 EnhFl (8192) | 256 | 768 | 25 | 28SP, 28SO, 28ML | 10x10-bit 100 ksps | 2 | 3-16 bit, 1-8 bit, 1-WDT | EUSART, MI$^2$C/SPI | 40 | 8 MHz | PBOR/ PLVD | 3 | 2/0 | ✓ | |
| | PIC18F2431 | 16384 EnhFl (8192) | 256 | 768 | 24 | 28SP, 28SO, 28MM | 5x10-bit, 200 ksps | — | 3-16 bit, 1-8 bit, 1-WDT | EUSART, I$^2$C/SPI | 40 | 8 MHz | PBOR/ PLVD | 1 | 2/0 | ✓ | 6 channel 14-bit Motor Control PWMs, 2-ch Quadrature Encoder |
| **NEW** | PIC18F2455 | 24576 EnhFl (12288) | 256 | 2048 | 23 | 28SP, 28SO | 11x10-bit 100 ksps | 2 | 3-16 bit, 1-8 bit, 1-WDT | USB 2.0, MI$^2$C/SPI, EUSART | 48 | 8 MHz | PBOR/ PLVD | 3 | 2/0 | ✓ | Full-speed USB 2.0 Compliant |
| **NEW** | PIC18F2480 | 16384 EnhFl (8192) | 256 | 768 | 25 | 28SP, 28SO, 28ML | 8x10-bit 100 ksps | — | 3-16 bit, 1-8 bit, 1-WDT | CAN 2.0B, MI$^2$C/SPI, EUSART | 40 | 8 MHz | PBOR/ PLVD | 3 | 1/0 | ✓ | ECAN |
| | PIC18F2510 | 32768 StdFl (16384) | — | 1536 | 25 | 28SP, 28SO, 28ML | 10x10-bit 100 ksps | 2 | 3-16 bit, 1-8 bit, 1-WDT | EUSART, MI$^2$C/SPI | 40 | 8 MHz | PBOR/ PLVD | 3 | 2/0 | ✓ | |
| | PIC18F2520 | 32768 EnhFl (16384) | 256 | 1536 | 25 | 28SP, 28SO, 28ML | 10x10-bit 100 ksps | 2 | 3-16 bit, 1-8 bit, 1-WDT | EUSART, MI$^2$C/SPI | 40 | 8 MHz | PBOR/ PLVD | 3 | 2/0 | ✓ | |
| | PIC18F2515 | 49152 StdFl (24576) | — | 3968 | 25 | 28SP, 28SO | 10x10-bit 100 ksps | 2 | 3-16 bit, 1-8 bit, 1-WDT | EUSART, MI$^2$C/SPI | 40 | 8 MHz | PBOR/ PLVD | 3 | 2/0 | ✓ | |
| | PIC18F2525 | 49152 EnhFl (24576) | 1024 | 3968 | 25 | 28SP, 28SO | 10x10-bit 100 ksps | 2 | 3-16 bit, 1-8 bit, 1-WDT | EUSART, MI$^2$C/SPI | 40 | 8 MHz | PBOR/ PLVD | 3 | 2/0 | ✓ | |
| **NEW** | PIC18F2550 | 32768 EnhFl (16384) | 256 | 2048 | 23 | 28SP, 28SO | 11x10-bit 100 ksps | 2 | 3-16 bit, 1-8 bit, 1-WDT | USB 2.0, MI$^2$C/SPI, EUSART | 48 | 8 MHz | PBOR/ PLVD | 3 | 2/0 | ✓ | Full-speed USB 2.0 Compliant |
| **NEW** | PIC18F2580 | 32768 EnhFl (16384) | 256 | 1536 | 25 | 28SP, 28SO, 28ML | 8x10-bit 100 ksps | — | 3-16 bit, 1-8 bit, 1-WDT | CAN 2.0B, MI$^2$C/SPI, EUSART | 40 | 8 MHz | PBOR/ PLVD | 3 | 1/0 | ✓ | ECAN |
| | PIC18F2585 | 49152 EnhFl (24576) | 1024 | 3328 | 25 | 28SP, 28SO | 8x10-bit 100 ksps | — | 3-16 bit, 1-8 bit, 1-WDT | EUSART, MI$^2$C/SPI | 40 | 8 MHz | PBOR/ PLVD | 3 | 1/0 | ✓ | ECAN |
| | PIC18F2610 | 65536 StdFl (32768) | — | 3968 | 25 | 28SP, 28SO | 10x10-bit 100 ksps | 2 | 3-16 bit, 1-8 bit, 1-WDT | EUSART, MI$^2$C/SPI | 40 | 8 MHz | PBOR/ PLVD | 3 | 2/0 | ✓ | |
| | PIC18F2620 | 65536 EnhFl (32768) | 1024 | 3968 | 25 | 28SP, 28SO | 10x10-bit 100 ksps | 2 | 3-16 bit, 1-8 bit, 1-WDT | EUSART, MI$^2$C/SPI | 40 | 8 MHz | PBOR/ PLVD | 3 | 2/0 | ✓ | |
| | PIC18F2680 | 65536 EnhFl (32768) | 1024 | 3328 | 25 | 28SP, 28SO | 8x10-bit 100 ksps | — | 3-16 bit, 1-8 bit, 1-WDT | CAN 2.0B, MI$^2$C/SPI, EUSART | 40 | 8 MHz | PBOR/ PLVD | 3 | 1/0 | ✓ | ECAN |
| | PIC18F4220 | 4096 EnhFl (2048) | 256 | 512 | 36 | 40P, 44ML, 44PT | 13x10-bit | 2 | 3-16 bit, 1-8 bit, 1-WDT | AUSART, MI$^2$C/SPI | 40 | 8 MHz | PBOR/ PLVD | 1 | 1/1 | ✓ | PSP |
| | PIC18F4320 | 8192 EnhFl (4096) | 256 | 512 | 36 | 40P, 44ML, 44PT | 13x10-bit | 2 | 3-16 bit, 1-8 bit, 1-WDT | AUSART, MI$^2$C/SPI | 40 | 8 MHz | PBOR/ PLVD | 1 | 1/1 | ✓ | PSP |

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**Abbreviations are found on the last page of the Selector Guide.**

## High Performance 8-Bit PICmicro® Microcontroller Family (16-bit Instruction Set)

| | Product | Program Memory Bytes & Type (Words) | EEPROM Data Memory Bytes | RAM Bytes | I/O Pins | Packages | Analog | | Digital | | Max. Speed MHz | IntOSC | BOR/ PBOR/ PLVD | ICD # of Breakpoints | CCP/ECCP | nW | Other Features |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | ADC Ch | Comp. | Timers/WDT | Serial I/O | | | | | | | |
| | **PIC18FXXX Flash MCUs (x16): Upwardly Compatible with PIC18CXXX/PIC17C7XX/PIC16CXX/PIC16C5X/PIC12CXXX, 77 Instructions, C Compiler Efficient Instruction Set, 10 MIPS, VDD = 2.0 - 5.5V (except ROM) (continued)** | | | | | | | | | | | | | | | | |
| | PIC18F4331 | 8192 EnhFl (4096) | 256 | 768 | 36 | 40P, 44ML, 44PT | 9x10-bit 200 ksps | — | 3-16 bit, 1-8 bit, 1-WDT | EUSART, I²C/SPI | 40 | 8 MHz | PBOR/ PLVD | 1 | 2/0 | ✓ | 8 channel 14-bit Motor Control PWMs, 2-ch Quadrature Encoder |
| | PIC18F4410 | 16384 StdFl (8192) | — | 768 | 36 | 40P, 44ML, 44PT | 13x10-bit 100 ksps | 2 | 3-16 bit, 1-8 bit, 1-WDT | EUSART, MI²C/SPI | 40 | 8 MHz | PBOR/ PLVD | 3 | 1/1 | ✓ | PSP |
| | PIC18F4420 | 16384 EnhFl (8192) | 256 | 768 | 36 | 40P, 44ML, 44PT | 13x10-bit 100 ksps | 2 | 3-16 bit, 1-8 bit, 1-WDT | EUSART, MI²C/SPI | 40 | 8 MHz | PBOR/ PLVD | 3 | 1/1 | ✓ | PSP |
| | PIC18F4431 | 16384 EnhFl (8192) | 256 | 768 | 36 | 40P, 44ML, 44PT | 9x10-bit 200 ksps | — | 3-16 bit, 1-8 bit, 1-WDT | EUSART, I²C/SPI | 40 | 8 MHz | PBOR/ PLVD | 1 | 2/0 | ✓ | 8 channel 14-bit Motor Control PWMs, 2-ch Quadrature Encoder |
| **NEW** | PIC18F4455 | 24576 EnhFl (12288) | 256 | 2048 | 34 | 40P, 44ML, 44PT | 13x10-bit 100 ksps | 2 | 3-16 bit, 1-8 bit, 1-WDT | USB 2.0, MI²C/SPI, EUSART | 48 | 8 MHz | PBOR/ PLVD | 3 | 1/1 | ✓ | Full-speed USB 2.0 Compliant, Streaming Port |
| **NEW** | PIC18F4480 | 16384 EnhFl (8192) | 256 | 768 | 36 | 40P, 44ML, 44PT | 11x10-bit 100 ksps | 2 | 3-16 bit, 1-8 bit, 1-WDT | CAN 2.0B, MI²C/SPI, EUSART | 40 | 8 MHz | PBOR/ PLVD | 3 | 1/1 | ✓ | ECAN |
| | PIC18F4510 | 32768 StdFl (16384) | — | 1536 | 36 | 40P, 44ML, 44PT | 13x10-bit 100 ksps | 2 | 3-16 bit, 1-8 bit, 1-WDT | EUSART, MI²C/SPI | 40 | 8 MHz | PBOR/ PLVD | 3 | 1/1 | ✓ | PSP |
| | PIC18F4520 | 32768 EnhFl (16384) | 256 | 1536 | 36 | 40P, 44ML, 44PT | 13x10-bit 100 ksps | 2 | 3-16 bit, 1-8 bit, 1-WDT | EUSART, MI²C/SPI | 40 | 8 MHz | PBOR/ PLVD | 3 | 1/1 | ✓ | PSP |
| | PIC18F4515 | 49152 StdFl (24576) | — | 3968 | 36 | 40P, 44ML, 44PT | 13x10-bit 100 ksps | 2 | 3-16 bit, 1-8 bit, 1-WDT | EUSART, MI²C/SPI | 40 | 8 MHz | PBOR/ PLVD | 3 | 1/1 | ✓ | PSP |
| | PIC18F4525 | 49152 EnhFl (24576) | 1024 | 3968 | 36 | 40P, 44ML, 44PT | 13x10-bit 100 ksps | 2 | 3-16 bit, 1-8 bit, 1-WDT | EUSART, MI²C/SPI | 40 | 8 MHz | PBOR/ PLVD | 3 | 1/1 | ✓ | PSP |
| **NEW** | PIC18F4580 | 32768 EnhFl (16384) | 256 | 1536 | 36 | 40P, 44ML, 44PT | 11x10-bit 100 ksps | 2 | 3-16 bit, 1-8 bit, 1-WDT | CAN 2.0B, MI²C/SPI, EUSART | 40 | 8 MHz | PBOR/ PLVD | 3 | 1/1 | ✓ | ECAN |
| **NEW** | PIC18F4550 | 32768 EnhFl (16384) | 256 | 2048 | 34 | 40P, 44ML, 44PT | 13x10-bit 100 ksps | 2 | 3-16 bit, 1-8 bit, 1-WDT | USB 2.0, MI²C/SPI, EUSART | 48 | 8 MHz | PBOR/ PLVD | 3 | 1/1 | ✓ | Full-speed USB 2.0 Compliant, Streaming Port |
| | PIC18F4585 | 49152 EnhFl (24576) | 1024 | 3328 | 36 | 40P, 44ML, 44PT | 11x10-bit 100 ksps | 2 | 3-16 bit, 1-8 bit, 1-WDT | CAN 2.0B, MI²C/SPI, EUSART | 40 | 8 MHz | PBOR/ PLVD | 3 | 1/1 | ✓ | ECAN |
| | PIC18F4610 | 65536 StdFl (32768) | — | 3968 | 36 | 40P, 44ML, 44PT | 13x10-bit 100 ksps | 2 | 3-16 bit, 1-8 bit, 1-WDT | EUSART, MI²C/SPI | 40 | 8 MHz | PBOR/ PLVD | 3 | 1/1 | ✓ | PSP |
| | PIC18F4620 | 65536 EnhFl (32768) | 1024 | 3968 | 36 | 40P, 44ML, 44PT | 13x10-bit 100 ksps | 2 | 3-16 bit, 1-8 bit, 1-WDT | EUSART, MI²C/SPI | 40 | 8 MHz | PBOR/ PLVD | 3 | 1/1 | ✓ | PSP |
| | PIC18F4680 | 65536 EnhFl (32768) | 1024 | 3328 | 36 | 40P, 44ML, 44PT | 11x10-bit 100 ksps | 2 | 3-16 bit, 1-8 bit, 1-WDT | CAN 2.0B, MI²C/SPI, EUSART | 40 | 8 MHZ | PBOR/ PLVD | 3 | 1/1 | ✓ | ECAN |
| | PIC18F6310 | 8192 StdFl (4096) | — | 768 | 54 | 64PT | 12x10-bit 100 ksps | 2 | 3-16 bit, 1-8 bit, 1-WDT | MI²C/SPI, EUSART, AUSART | 40 | 8 MHz | PBOR/ PLVD | 3 | 3/0 | ✓ | EMA |

***Contact Microchip Technology for availability date.**
**Abbreviations are found on the last page of the Selector Guide.**

## High Performance 8-Bit PICmicro® Microcontroller Family (16-bit Instruction Set)

| | Product | Program Memory Bytes & Type (Words) | EEPROM Data Memory Bytes | RAM Bytes | I/O Pins | Packages | Analog | | Digital | | Max. Speed MHz | IntOSC | BOR/ PBOR/ PLVD | ICD # of Breakpoints | CCP/ECCP | nW | Other Features |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | ADC Ch | Comp. | Timers/WDT | Serial I/O | | | | | | | |
| | **PIC18FXXX Flash MCUs (x16): Upwardly Compatible with PIC18CXXX/PIC17C7XX/PIC16CXX/PIC16C5X/PIC12CXXX, 77 Instructions, C Compiler Efficient Instruction Set, 10 MIPS, $V_{DD}$ = 2.0 - 5.5V (except ROM) (continued)** | | | | | | | | | | | | | | | | |
| | PIC18F6410 | 16384 StdFl (8192) | — | 768 | 54 | 64PT | 12x10-bit 100 ksps | 2 | 3-16 bit, 1-8 bit, 1-WDT | MI$^2$C/SPI, EUSART, AUSART | 40 | 8 MHz | PBOR/ PLVD | 3 | 3/0 | ✓ | EMA |
| | PIC18F6390 | 8192 StdFl (4096) | — | 768 | 50 | 64PT | 12x10-bit 100 ksps | 2 | 3-16 bit, 1-8 bit, 1-WDT | MI$^2$C/SPI, EUSART, AUSART | 40 | 8 MHz | PBOR/ PLVD | 3 | 2/0 | ✓ | LCD: up to 128 Segments |
| | PIC18F6490 | 16384 StdFl (8192) | — | 768 | 50 | 64PT | 12x10-bit 100 ksps | 2 | 3-16 bit, 1-8 bit, 1-WDT | MI$^2$C/SPI, EUSART, AUSART | 40 | 8 MHz | PBOR/ PLVD | 3 | 2/0 | ✓ | LCD: up to 128 Segments |
| | PIC18F6520 | 32768 EnhFl (16384) | 1024 | 2048 | 52 | 64PT | 12x10-bit | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x AUSART, MI$^2$C/SPI | 40 | — | PBOR/ PLVD | 1 | 5/0 | — | PSP |
| | PIC18F6525 | 49152 EnhFl (24576) | 1024 | 3840 | 53 | 64PT | 12x10-bit | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, MI$^2$C/SPI | 40 | — | PBOR/ PLVD | 1 | 2/3 | — | PSP |
| **NEW** | PIC18F6527* | 49152 EnhFl (24576) | 1024 | 3936 | 54 | 64PT | 12x10-bit 100 ksps | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI$^2$C/SPI | 40 | 8 MHz | PBOR/ PLVD | 3 | 2/3 | ✓ | PSP |
| | PIC18F6585 | 49152 EnhFl (24576) | 1024 | 3328 | 53 | 64PT, 68L | 12x10-bit | 2 | 3-16 bit, 1-8 bit, 1-WDT | EUSART, MI$^2$C/SPI, CAN 2.0B | 40 | — | PBOR/ PLVD | 1 | 1/1 | — | ECAN |
| | PIC18F6621 | 65536 EnhFl (32768) | 1024 | 3840 | 53 | 64PT | 12x10-bit | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, MI$^2$C/SPI | 40 | — | PBOR/ PLVD | 1 | 2/3 | — | PSP |
| **NEW** | PIC18F6622* | 65536 EnhFl (32768) | 1024 | 3936 | 54 | 64PT | 12x10-bit 100 ksps | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI$^2$C/SPI | 40 | 8 MHz | PBOR/ PLVD | 3 | 2/3 | ✓ | PSP |
| **NEW** | PIC18F6627 | 98304 EnhFl (49152) | 1024 | 3936 | 54 | 64PT | 12x10-bit 100 ksps | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI$^2$C/SPI | 40 | 8 MHz | PBOR/ PLVD | 3 | 2/3 | ✓ | PSP |
| | PIC18F6680 | 65536 EnhFl (32768) | 1024 | 3328 | 53 | 64PT, 68L | 12x10-bit | 2 | 3-16 bit, 1-8 bit, 1-WDT | EUSART, MI$^2$C/SPI, CAN 2.0B | 40 | — | PBOR/ PLVD | 1 | 1/1 | — | ECAN |
| | PIC18F6720 | 131072 EnhFl (65536) | 1024 | 3840 | 52 | 64PT | 12x10-bit | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x AUSART, MI$^2$C/SPI | 25 | — | PBOR/ PLVD | 1 | 5/0 | — | PSP |
| **NEW** | PIC18F6722 | 131072 EnhFl (65536) | 1024 | 3936 | 54 | 64PT | 12x10-bit 100 ksps | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI$^2$C/SPI | 40 | 8 MHz | PBOR/ PLVD | 3 | 2/3 | ✓ | PSP |
| | PIC18F8310 | 8192 StdFl (4096) | — | 768 | 70 | 80PT | 12x10-bit 100 ksps | 2 | 3-16 bit, 1-8 bit, 1-WDT | MI$^2$C/SPI, EUSART, AUSART | 40 | 8 MHz | PBOR/ PLVD | 3 | 3/0 | ✓ | EMA |
| | PIC18F8410 | 16384 StdFl (8192) | — | 768 | 70 | 80PT | 12x10-bit 100 ksps | 2 | 3-16 bit, 2-8 bit, 1-WDT | MI$^2$C/SPI, EUSART, AUSART | 40 | 8 MHz | PBOR/ PLVD | 3 | 3/0 | ✓ | EMA |
| | PIC18F8390 | 8192 StdFl (4096) | — | 768 | 66 | 80PT | 12x10-bit 100 ksps | 2 | 3-16 bit, 1-8 bit, 1-WDT | MI$^2$C/SPI, EUSART, AUSART | 40 | 8 MHz | PBOR/ PLVD | 3 | 2/0 | ✓ | LCD: up to 192 Segments |

***Contact Microchip Technology for availability date.**
**Abbreviations are found on the last page of the Selector Guide.**

## High Performance 8-Bit PICmicro® Microcontroller Family (16-bit Instruction Set)

| | Product | Program Memory Bytes & Type (Words) | EEPROM Data Memory Bytes | RAM Bytes | I/O Pins | Packages | Analog | | Digital | | Max. Speed MHz | IntOSC | BOR/ PBOR/ PLVD | ICD # of Breakpoints | CCP/ECCP | nW | Other Features |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | ADC Ch | Comp. | Timers/WDT | Serial I/O | | | | | | | |
| | **PIC18FXXX Flash MCUs: Upwardly Compatible with PIC18CXXX/PIC17C7XX/PIC16CXX/PIC16C5X/PIC12CXXX, 77 Instructions, C Compiler Efficient Instruction Set, 10 MIPS, VDD = 2.0 - 5.5V (except ROM) (continued)** | | | | | | | | | | | | | | | | |
| | PIC18F8490 | 16384 StdFl (8192) | — | 768 | 66 | 80PT | 12x10-bit 100 ksps | 2 | 3-16 bit, 2-8 bit, 1-WDT | MI$^2$C/SPI, EUSART, AUSART | 40 | 8 MHz | PBOR/ PLVD | 3 | 2/0 | ✓ | LCD: up to 192 Segments |
| | PIC18F8520 | 32768 EnhFl (16384) | 1024 | 2048 | 68 | 80PT | 16x10-bit | 2 | 2-8 bit, 3-16 bit, 1-WDT | 2x AUSART, MI$^2$C/SPI | 40 | — | PBOR/ PLVD | 1 | 5/0 | — | PSP, EMA |
| | PIC18F8525 | 49152 EnhFl (24576) | 1024 | 3840 | 69 | 80PT | 16x10-bit | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, MI$^2$C/SPI | 40 | — | PBOR/ PLVD | 1 | 2/3 | — | PSP, EMA |
| **NEW** | PIC18F8527* | 49152 EnhFl (24576) | 1024 | 3936 | 70 | 80PT | 16x10-bit 100 ksps | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI$^2$C/SPI | 40 | 8 MHz | PBOR/ PLVD | 3 | 2/3 | 3 | PSP, EMA |
| | PIC18F8585 | 49152 EnhFl (24576) | 1024 | 3328 | 69 | 80PT | 16x10-bit | 2 | 3-16 bit, 1-8 bit, 1-WDT | EUSART, MI$^2$C/SPI, CAN2.0B | 40 | — | PBOR/ PLVD | 1 | 1/1 | — | ECAN, EMA |
| | PIC18F8621 | 65536 EnhFl (32768) | 1024 | 3840 | 69 | 80PT | 16x10-bit | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, MI$^2$C/SPI | 40 | — | PBOR/ PLVD | 1 | 2/3 | — | PSP, EMA |
| **NEW** | PIC18F8622* | 65536 EnhFl (32768) | 1024 | 3936 | 70 | 80PT | 16x10-bit 100 ksps | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI2C/SPI | 40 | 8 MHz | PBOR/ PLVD | 3 | 2/3 | 3 | PSP, EMA |
| **NEW** | PIC18F8627 | 98304 EnhFl (49152) | 1024 | 3936 | 70 | 80PT | 16x10-bit 100 ksps | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI$^2$C/SPI | 40 | 8 MHz | PBOR/ PLVD | 3 | 2/3 | 3 | PSP, EMA |
| | PIC18F8680 | 65536 EnhFl (32768) | 1024 | 3328 | 69 | 80PT | 16x10-bit | 2 | 3-16 bit, 1-8 bit, 1-WDT | EUSART, MI$^2$C/SPI, CAN2.0B | 40 | — | PBOR/ PLVD | 1 | 1/1 | — | ECAN, EMA |
| | PIC18F8720 | 131072 EnhFl (65536) | 1024 | 3840 | 68 | 80PT | 16x10-bit | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x AUSART, MI$^2$C/SPI | 25 | — | PBOR/ PLVD | 1 | 5/0 | — | PSP, EMA |
| **NEW** | PIC18F8722 | 131072 EnhFl (65536) | 1024 | 3936 | 70 | 80PT | 16x10-bit 100 ksps | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI$^2$C/SPI | 40 | 8 MHz | PBOR/ PLVD | 3 | 2/3 | 3 | PSP, EMA |
| | **PIC18FXXJXX Flash MCUs: Upwardly Compatible with PIC18CXXX/PIC17C7XX/PIC16CXX/PIC16C5X/PIC12CXXX, 77 Instructions, C Compiler Efficient Instruction Set, 10 MIPS, VDD = 2.0 - 3.6V** | | | | | | | | | | | | | | | | |
| **NEW** | PIC18F66J15* | 98304 StdFl (49152) | — | 3936 | 51 | 64PT | 11x10-bit 100 ksps | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI$^2$C/SPI | 40 | 32 kHz | BOR | 3 | 2/3 | ✓ | PSP |
| **NEW** | PIC18F67J10* | 131072 StdFL (65536) | — | 3936 | 51 | 64PT | 11x10-bit 100 ksps | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI$^2$C/SPI | 40 | 32 kHz | BOR | 3 | 2/3 | ✓ | PSP |
| **NEW** | PIC18F86J15* | 98304 StdFL (49152) | — | 3936 | 67 | 80PT | 15x10-bit 100 ksps | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI$^2$C/SPI | 40 | 32 kHz | BOR | 3 | 2/3 | ✓ | PSP, EMA |
| **NEW** | PIC18F87J10* | 131072 StdFl (65536) | — | 3936 | 67 | 80PT | 15x10-bit 100 ksps | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI$^2$C/SPI | 40 | 32 kHz | BOR | 3 | 2/3 | ✓ | PSP, EMA |

***Contact Microchip Technology for availability date.**
**Abbreviations are found on the last page of the Selector Guide.**

# CURRENT dsPIC® DIGITAL SIGNAL CONTROLLER (DSC) PRODUCTS

| Product | Program (FLASH) KBytes | Memory (FLASH) KWords | EE Bytes | SRAM Bytes | I/O Pins (max.) | Packages | A/D 12-bit 100 KSPS | A/D 10-bit 500 KSPS | Timer 16-bit | Input Cap | Output Comp/ Std PWM | Motor Control PWM | Quad Enc. | UART | SPI™ | $I^2C$™ | CAN | Codec Interface |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **dsPIC30F Motor Control and Power Conversion Family** | | | | | | | | | | | | | | | | | | |
| dsPIC30F2010 | 12 | 4 | 1024 | 512 | 20 | 28SO, 28SP, 28MM | — | 6 ch | 3 | 4 | 2 | 6 | ✓ | 1 | 1 | 1 | — | — |
| dsPIC30F3010 | 24 | 8 | 1024 | 1024 | 20 | 28SO, 28SP, 44ML (8x8) | — | 6 ch | 5 | 4 | 2 | 6 | ✓ | 1 | 1 | 1 | — | — |
| dsPIC30F4012 | 48 | 16 | 1024 | 2048 | 20 | 28SO, 28SP, 44ML (8x8) | — | 6 ch | 5 | 4 | 2 | 6 | ✓ | 1 | 1 | 1 | 1 | — |
| dsPIC30F3011 | 24 | 8 | 1024 | 1024 | 30 | 40P, 44PT, 44ML (8x8) | — | 9 ch | 5 | 4 | 4 | 6 | ✓ | 2 | 1 | 1 | — | — |
| dsPIC30F4011 | 48 | 16 | 1024 | 2048 | 30 | 40P, 44PT, 44ML (8x8) | — | 6 ch | 5 | 4 | 4 | 6 | ✓ | 2 | 1 | 1 | 1 | — |
| dsPIC30F6010 | 144 | 48 | 4096 | 8192 | 68 | 80PF | — | 16 ch | 5 | 8 | 8 | 8 | ✓ | 2 | 2 | 1 | 2 | — |
| **dsPIC30F General Purpose Family** | | | | | | | | | | | | | | | | | | |
| dsPIC30F3014 | 24 | 8 | 1024 | 2048 | 30 | 40P, 44PT, 44ML (8x8) | 13 ch | — | 3 | 2 | 2 | No | No | 2 | 1 | 1 | — | — |
| dsPIC30F4013 | 48 | 16 | 1024 | 2048 | 30 | 40P, 44PT, 44ML (8x8) | 13 ch | — | 5 | 4 | 4 | No | No | 2 | 1 | 1 | 1 | AC97, $I^2S$ |
| dsPIC30F5011 | 66 | 22 | 1024 | 4096 | 52 | 64PT | 16 ch | — | 5 | 8 | 8 | No | No | 2 | 2 | 1 | 2 | AC97, $I^2S$ |
| dsPIC30F6011 | 132 | 44 | 2048 | 6144 | 52 | 64PF | 16 ch | — | 5 | 8 | 8 | No | No | 2 | 2 | 1 | 2 | — |
| dsPIC30F6012 | 144 | 48 | 4096 | 8192 | 52 | 64PF | 16 ch | — | 5 | 8 | 8 | No | No | 2 | 2 | 1 | 2 | AC97, $I^2S$ |
| dsPIC30F5013 | 66 | 22 | 1024 | 4096 | 68 | 80PT | 16 ch | — | 5 | 8 | 8 | No | No | 2 | 2 | 1 | 2 | AC97, $I^2S$ |
| dsPIC30F6013 | 132 | 44 | 2048 | 6144 | 68 | 80PF | 16 ch | — | 5 | 8 | 8 | No | No | 2 | 2 | 1 | 2 | — |
| dsPIC30F6014 | 144 | 48 | 4096 | 8192 | 68 | 80PF | 16 ch | — | 5 | 8 | 8 | No | No | 2 | 2 | 1 | 2 | AC97, $I^2S$ |

**Abbreviations are found on the last page of the Selector Guide.**

| | Product | Program (FLASH) KBytes | Memory (FLASH) KWords | EE Bytes | SRAM Bytes | I/O Pins (max.) | Packages | A/D 12-bit 100 KSPS | A/D 10-bit 500 KSPS | Timer 16-bit | Input Cap | Output Comp/ Std PWM | Motor Control PWM | Quad Enc. | UART | SPI™ | $I^2C$™ | CAN | Codec Interface |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **dsPIC30F Sensor Family** | | | | | | | | | | | | | | | | | | |
| **NEW** | dsPIC30F2011 | 12 | 4 | 0 | 1024 | 12 | 18SO, 18P, 28ML (6x6) | 8 ch | — | 3 | 2 | 2 | No | No | 1 | 1 | 1 | — | — |
| **NEW** | dsPIC30F3012 | 24 | 8 | 1024 | 2048 | 12 | 18SO, 18P, 44ML (8x8) | 8 ch | — | 3 | 2 | 2 | No | No | 1 | 1 | 1 | — | — |
| **NEW** | dsPIC30F2012 | 12 | 4 | 0 | 1024 | 12 | 28SO, 28SP, 28ML (6x6) | 10 ch | — | 3 | 2 | 2 | No | No | 1 | 1 | 1 | — | — |
| **NEW** | dsPIC30F3013 | 24 | 8 | 1024 | 2048 | 12 | 28SO, 28SP, 44ML (8x8) | 10 ch | — | 3 | 2 | 2 | No | No | 2 | 1 | 1 | — | — |

**Abbreviations are found on the last page of the Selector Guide.**

# FOCUSED SOLUTIONS
# PICmicro® and dsPIC® DSC MICROCONTROLLER FAMILY PRODUCTS

| Product | Program Memory Bytes & Type (Words) | EEPROM Data Memory Bytes | RAM Bytes | I/O Pins | Packages | Analog Peripherals | Digital Peripherals | Max. Speed MHz | ICD # of Breakpoints | Function-Specific Features | | | | | Development Boards |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | ISO-16845 Tested | Transmit Buffers | Receive Buffers | Configurable RX/TX | Acceptance Filters/Mask | |
| **CAN Solutions** | | | | | | | | | | | | | | | |
| PIC18F2480 | 16384 EnhFl (8192) | 256 | 768 | 25 | 28SP, 28SO, 28ML | ADC | EUSART, CCP | 40 | 3 | Planned | 3 | 2 | 6 | 16/2 | DM163011 PICDEM™ CAN-LIN 2 |
| PIC18F2580 | 32768 EnhFl (16384) | 256 | 1536 | 25 | 28SP, 28SO, 28ML | ADC | EUSART, CCP | 40 | 3 | Planned | 3 | 2 | 6 | 16/2 | DM163011 PICDEM™ CAN-LIN 2 |
| PIC18F2585 | 49152 EnhFl (24576) | 1024 | 3328 | 25 | 28SP, 28SO | ADC | EUSART, CCP | 40 | 3 | Planned | 3 | 2 | 6 | 16/2 | DM163011 PICDEM™ CAN-LIN 2 |
| PIC18F2680 | 65536 EnhFl (32768) | 1024 | 3328 | 25 | 28SP, 28SO | ADC | EUSART, CCP | 40 | 3 | Planned | 3 | 2 | 6 | 16/2 | DM163011 PICDEM™ CAN-LIN 2 |
| PIC18F4480 | 16384 EnhFl (8192) | 256 | 768 | 36 | 40P, 44PT, 44ML | ADC/Comp | EUSART, CCP/ECCP | 40 | 3 | Planned | 3 | 2 | 6 | 16/2 | DM163011 PICDEM™ CAN-LIN 2 |
| PIC18F4580 | 32768 EnhFl (16384) | 256 | 1536 | 36 | 40P, 44PT, 44ML | ADC/Comp | EUSART, CCP/ECCP | 40 | 3 | Planned | 3 | 2 | 6 | 16/2 | DM163011 PICDEM™ CAN-LIN 2 |
| PIC18F4585 | 49152 EnhFl (24576) | 1024 | 3328 | 36 | 40P, 44PT, 44ML | ADC/Comp | EUSART, CCP/ECCP | 40 | 3 | Planned | 3 | 2 | 6 | 16/2 | DM163011 PICDEM™ CAN-LIN 2 |
| PIC18F4680 | 65536 EnhFl (32768) | 1024 | 3328 | 36 | 40P, 44PT, 44ML | ADC/Comp | EUSART, CCP/ECCP | 40 | 3 | Planned | 3 | 2 | 6 | 16/2 | DM163011 PICDEM™ CAN-LIN 2 |
| PIC18F6585 | 49152 EnhFl (24576) | 1024 | 3328 | 53 | 64PT, 68L | ADC/Comp | EUSART, CCP/ECCP | 40 | 1 | Yes | 3 | 2 | 6 | 16/2 | DM163015 PICDEM™ CAN-LIN 3 |
| PIC18F6680 | 65536 EnhFl (32768) | 1024 | 3328 | 53 | 64PT, 68L | ADC/Comp | EUSART, CCP/ECCP | 40 | 1 | Yes | 3 | 2 | 6 | 16/2 | DM163015 PICDEM™ CAN-LIN 3 |
| PIC18F8585 | 49152 EnhFl (24576) | 1024 | 3328 | 69 | 80PT | ADC/Comp | EUSART, CCP/ECCP | 40 | 1 | Yes | 3 | 2 | 6 | 16/2 | DM163015 PICDEM™ CAN-LIN 3 |
| PIC18F8680 | 65536 EnhFl (32768) | 1024 | 3328 | 69 | 80PT | ADC/Comp | EUSART, CCP/ECCP | 40 | 1 | Yes | 3 | 2 | 6 | 16/2 | DM163015 PICDEM™ CAN-LIN 3 |

**Refer to Design pages on www.microchip.com for further details.**
**Abbreviations are found on the last page of the Selector Guide.**

| Product | Program Memory Bytes & Type (Words) | EEPROM Data Memory | RAM Bytes | I/O Pins | Packages | Analog Peripherals | Digital Peripherals | Max. Speed MHz | ICD-# of Breakpoints | Function-Specific Features | | | | | Development Boards |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | IEEE.802.3 Complaint | MAC | PHY | TX/RX Buffer (bytes) | Ethernet Voltage Range (V) | |
| **Ethernet Solutions - Integrated** | | | | | | | | | | | | | | | |
| PIC18F66J60* | 16384 EnhFl (8192) | — | 3808 | 39 | 64PT | ADC/Comp | EUSART, CCP/ECCP | 42 | 3 | Yes | Yes | 10 BASE-T | 8192 | 3.14 to 3.45 | |
| PIC18F66J65* | 32768 EnhFl (16384) | — | 3808 | 39 | 64PT | ADC/Comp | EUSART, CCP/ECCP | 42 | 3 | Yes | Yes | 10 BASE-T | 8192 | 3.14 to 3.45 | |
| PIC18F67J60* | 49152 EnhFl (24576) | — | 3808 | 39 | 64PT | ADC/Comp | EUSART, CCP/ECCP | 42 | 3 | Yes | Yes | 10 BASE-T | 8192 | 3.14 to 3.45 | |
| PIC18F86J60* | 65536 EnhFl (32768) | — | 3808 | 55 | 80PT | ADC/Comp | EUSART, CCP/ECCP | 42 | 3 | Yes | Yes | 10 BASE-T | 8192 | 3.14 to 3.45 | |
| PIC18F86J65* | 16384 EnhFl (8192) | — | 3808 | 55 | 80PT | ADC/Comp | EUSART, CCP/ECCP | 42 | 3 | Yes | Yes | 10 BASE-T | 8192 | 3.14 to 3.45 | |

***Contact Microchip Technology Inc. for availability.**
**Abbreviations are found on the last page of the Selector Guide.**

| Product | Program Memory Bytes & Type (Words) | EEPROM Data Memory | RAM Bytes | I/O Pins | Packages | Analog Peripherals | Digital Peripherals | Max. Speed MHz | ICD-# of Breakpoints | Function-Specific Features | | | | | Development Boards |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | IEEE.802.3 Complaint | MAC | PHY | TX/RX Buffer (bytes) | Ethernet Voltage Range (V) | |
| **Ethernet Solutions - Integrated (continued)** | | | | | | | | | | | | | | | |
| PIC18F87J60* | 32768 EnhFl (16384) | — | 3808 | 55 | 80PT | ADC/Comp | EUSART, CCP/ECCP | 42 | 3 | Yes | Yes | 10 BASE-T | 8192 | 3.14 to 3.45 | |
| PIC18F96J60* | 49152 EnhFl (24576) | — | 3808 | 70 | 100PT | ADC/Comp | EUSART, CCP/ECCP | 42 | 3 | Yes | Yes | 10 BASE-T | 8192 | 3.14 to 3.45 | |
| PIC18F96J65* | 65536 EnhFl (32768) | — | 3808 | 70 | 100PT | ADC/Comp | EUSART, CCP/ECCP | 42 | 3 | Yes | Yes | 10 BASE-T | 8192 | 3.14 to 3.45 | |
| PIC18F97J60* | 49152 EnhFl (24576) | — | 3808 | 70 | 100PT | ADC/Comp | EUSART, CCP/ECCP | 42 | 3 | Yes | Yes | 10 BASE-T | 8192 | 3.14 to 3.45 | |

***Contact Microchip Technology Inc. for availability.**
**Abbreviations are found on the last page of the Selector Guide.**

NEW

| Product | MAC | PHY | TX/RX Dual Port RAM Buffer | Interrupts | LEDs | Operating Voltage (V) | Temp. Range (°C) | Max. Speed MHz | Serial | Features | Package | Development Boards |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Ethernet Solutions - Stand-Alone** | | | | | | | | | | | | |
| ENC28J60* | Yes | 10 BASE-T | 8KB | 2 | 2 | 3.3 | -40 to +85 | 25 | SPI | Loop back test modes, auto-polarity | 28SO, 28SS, 28ML | |

***Contact Microchip Technology Inc. for availability.**
**Abbreviations are found on the last page of the Selector Guide.**

| Product | Program Memory Bytes & Type (Words) | EEPROM Data Memory Bytes | RAM Bytes | I/O Pins | Packages | Analog Peripherals | Digital Peripherals | Max. Speed MHz | ICD # of Breakpoints | Function-Specific Features | | | | | Development Boards |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | Compliant | Speed | # of Endpoints | USB Buffer (bytes) | Streaming Port | |
| **USB Solutions** | | | | | | | | | | | | | | | |
| PIC16C745 | 14336 OTP (8192) | — | 256 | 22 | 28SP, 28SO, 28JW | ADC | UART | 24 | — | USB 1.1 | Low-speed (1.5Mbit/s) | 16 | 64 | — | DM163010, PICDEM™ USB |
| PIC16C765 | 14336 OTP (8192) | — | 256 | 33 | 40P, 40JW, 44L, 44PT | ADC | UART | 24 | — | USB 1.1 | Low-speed (1.5Mbit/s) | 16 | 64 | — | DM163010, PICDEM™ USB |
| PIC18F2455 | 24576 EnhFl (12288) | 256 | 2048 | 24 | 28SP, 28SO, 28ML | ADC/Comp | EUSART, MI$^2$C/SPI | 48 | 3 | USB 2.0 | Full-speed (12Mbit/s) | 16 | 1024 | — | DM163025 PICDEM™ FS-USB |
| PIC18F2550 | 32768 EnhFl (16384) | 256 | 2048 | 24 | 28SP, 28SO, 28ML | ADC/Comp | EUSART, MI$^2$C/SPI | 48 | 3 | USB 2.0 | Full-speed (12Mbit/s) | 16 | 1024 | — | DM163025 PICDEM™ FS-USB |
| PIC18F4455 | 24576 EnhFl (12288) | 256 | 2048 | 36 | 40P, 44PT, 44ML | ADC/Comp | EUSART, MI$^2$C/SPI | 48 | 3 | USB 2.0 | Full-speed (12Mbit/s) | 16 | 1024 | Yes | DM163025 PICDEM™ FS-USB |
| PIC18F4550 | 32768 EnhFl (16384) | 256 | 2048 | 36 | 40P, 44PT, 44ML | ADC/Comp | EUSART, MI$^2$C/SPI | 48 | 3 | USB 2.0 | Full-speed (12Mbit/s) | 16 | 1024 | Yes | DM163025 PICDEM™ FS-USB |

**Refer to Design pages on www.microchip.com for further details.**
**Abbreviations are found on the last page of the Selector Guide.**

**ACTIVE RF Solutions**

**rfPIC® Microcontrollers with UHF RF Transmitter, ICSP™**

| Product | Program Memory Bytes & Type (Words) | EEPROM Data Memory Bytes | RAM Bytes | I/O Pins | Packages | Analog Peripherals | Digital Peripherals | Max. Speed (MHz) | Function-Specific Specifications | | | | | Development Boards |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Modulation | Data Rate (kbps) | Output Power (dBm) | Operating Voltage (V) | Frequency Range (MHz) | |
| rfPIC12C509AF | 1536 OTP (1024) | — | 41 | 6 | 20JW, 20SS | — | 1-8 bit Timer, WDT | 4 | FSK, ASK | 40 | 2 | 2.5-5.5 | 310-440 | |
| rfPIC12C509AG | 1536 OTP (1024) | — | 41 | 6 | 18JW, 18SO | — | 1-8 bit Timer, WDT | 4 | ASK | 40 | 2 | 2.5-5.5 | 310-440 | |
| rfPIC12F675F | 1792 StdFl (1024) | 128 | 64 | 6 | 20SS | 4x10-bit A/D, Comp | 1-8 bit, 1-16 bit Timer, WDT | 20 | FSK, ASK | 40 | 10 | 2.0-5.5 | 380-450 | DV164102, rfPIC® Development Kit |
| rfPIC12F675H | 1792 StdFl (1024) | 128 | 64 | 6 | 20SS | 4x10-bit A/D, Comp | 1-8 bit, 1-16 bit Timer, WDT | 20 | FSK, ASK | 40 | 10 | 2.0-5.5 | 850-930 | DV164102, rfPIC® Development Kit |
| rfPIC12F675K | 1792 StdFl (1024) | 128 | 64 | 6 | 20SS | 4x10-bit A/D, Comp | 1-8 bit, 1-16 bit Timer, WDT | 20 | FSK, ASK | 40 | 10 | 2.0-5.5 | 290-350 | DV164102, rfPIC® Development Kit |

**rfHCS KEELOQ® Encoders with UHF RF Transmitter**

| Product | Transmission Code Length Bits | Code Hopping Bits | Programmable Encryption Key Bits | Packages | Protocols | Function Codes | Tunable OSC | CRC | Function-Specific Specifications | | | | Development Boards |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Modulation | Output Power (dBm) | Operating Voltage (V) | Frequency Range (MHz) | |
| rfHCS362F | 69 | 32 | 2 x 64 | 20SS | PWM, Manchester | 4 x 15 | ✓ | ✓ | FSK, ASK | 2 | 2.2-5.5 | 310-440 | DM303006, KEELOQ® Evaluation Kit II |
| rfHCS362G | 69 | 32 | 2 x 64 | 18SO | PWM, Manchester | 4 x 15 | ✓ | ✓ | ASK | 2 | 2.2-5.5 | 310-440 | DM303006, KEELOQ® Evaluation Kit II |

**UHF RF Receiver**

| Product | Modulation | Data Rate (kbps) | Frequency Range (MHz) | Sensitivity dBm (FSK) | IF Frequency Range (MHz) | Operating Voltage (V) | Package | Development Boards |
|---|---|---|---|---|---|---|---|---|
| rfRXD0420 | ASK, FSK, FM | 80 | 300-450 | -111 | 0.455-21.4 | 2.5-5.5 | 32LQ | DV164102, rfPIC® Development Kit |
| rfRXD0920 | ASK, FSK, FM | 80 | 800-930 | -109 | 0.455-21.4 | 2.5-5.5 | 32LQ | DV164102, rfPIC® Development Kit |

**Refer to Design pages on www.microchip.com for further details.**
**Abbreviations are found on the last page of the Selector Guide.**

| Product | Program Memory Bytes & Type (Words) | EEPROM Data Memory Bytes | RAM Bytes | I/O Pins | Packages | Analog Peripherals | Digital Peripherals | Max. Speed MHz | ICD # of Breakpoints | LCD Function-Specific Features | | | | | Development Boards |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | COMxSegment = # Segments | Drive in Sleep | Software Configurable Driver Pins | Direct Drive | Intl. Charge Pump | |
| **LCD Solutions** | | | | | | | | | | | | | | | |
| PIC16C925 | 7168 OTP (4096) | — | 176 | 52 | 64PT, 68CL, 68L | ADC | $I^2C$/SPI | 20 | — | 4x29 (116) | Yes | No | Yes | Yes | DM163003, PICDEM™ 3 LCD |
| PIC16C926 | 14336 OTP (8192) | — | 336 | 52 | 64PT, 68CL, 68L | ADC | $I^2C$/SPI | 20 | — | 4x29 (116) | Yes | No | Yes | Yes | DM163003, PICDEM™ 3 LCD |
| PIC16F913* | 7168 EnhFl (4096) | 256 | 256 | 25 | 28P, 28SO, 28SS, 28ML | ADC/Comp | AUSART, $I^2C$/SPI | 20 | 1 | 4x15 (60) | Yes | Yes | Yes | No | |
| PIC16F914* | 7168 EnhFl (4096) | 256 | 256 | 36 | 40P, 44PT, 44ML | ADC/Comp | AUSART, $I^2C$/SPI | 20 | 1 | 4x24 (96) | Yes | Yes | Yes | No | |
| PIC16F916* | 14336 EnhFl (8192) | 256 | 352 | 25 | 28P, 28SO, 28SS, 28ML | ADC/Comp | AUSART, $I^2C$/SPI | 20 | 1 | 4x15 (60) | Yes | Yes | Yes | No | |
| PIC16F917* | 14336 EnhFl (8192) | 256 | 352 | 36 | 40P, 44PT, 44ML | ADC/Comp | AUSART, $I^2C$/SPI | 20 | 1 | 4x24 (96) | Yes | Yes | Yes | No | |
| PIC18F6390 | 8192 StdFl (4096) | — | 768 | 50 | 64PT | ADC/Comp | EUSART, AUSART, MI$^2$C/SPI | 40 | 3 | 4x32 (128) | Yes | Yes | Yes | No | DM163028, PICDEM™ LCD Demo Board |
| PIC18F6490 | 16384 StdFl (8192) | — | 768 | 50 | 64PT | ADC/Comp | EUSART, AUSART, MI$^2$C/SPI | 40 | 3 | 4x32 (128) | Yes | Yes | Yes | No | DM163028, PICDEM™ LCD Demo Board |
| PIC18F8390 | 8192 StdFl (4096) | — | 768 | 66 | 80PT | ADC/Comp | EUSART, AUSART, MI$^2$C/SPI | 40 | 3 | 4x48 (192) | Yes | Yes | Yes | No | DM163028, PICDEM™ LCD Demo Board |
| PIC18F8490 | 16384 StdFl (8192) | — | 768 | 66 | 80PT | ADC/Comp | EUSART, AUSART, MI$^2$C/SPI | 40 | 3 | 4x48 (192) | Yes | Yes | Yes | No | DM163028, PICDEM™ LCD Demo Board |

***Contact Microchip Technology Inc. for availability.**
**Refer to Design pages on www.microchip.com for further details.**
**Abbreviations are found on the last page of the Selector Guide.**

| Product | Program Memory Bytes & Type (Words) | EEPROM Data Memory Bytes | RAM Bytes | I/O Pins | Packages | Analog Peripherals | Digital Peripherals | Max. Speed MHz | ICD # of Breakpoints | Function-Specific Features | | | | | Development Boards |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | Timers | Input Capture | Output Comp/Std PWM | Motor Control PWM | Quadrature Encoder | |
| **Motor Control Solutions** | | | | | | | | | | | | | | | |
| PIC12F683 | 3584 StdFl (2048) | 256 | 128 | 6 | 8P, 8SN, 8MF | ADC/Comp | — | 20 | 1 | 1-16 bit, 2-8 bit, WDT | 1 | 1x10 bit | — | — | PICkit™ 1 |
| PIC16F684 | 3584 EnhFl (2048) | 256 | 128 | 12 | 14P, 14SL, 14ST | ADC/Comp | — | 20 | 1 | 1-16 bit, 2-8 bit, WDT | 1 | 4x10 bit | — | — | PICkit™ 1 |
| PIC16F716 | 3584 StdFl (2048) | — | 128 | 13 | 18P, 18SO, 20SS | ADC | — | 20 | 1 | 1-16 bit, 2-8 bit, WDT | 1 | 4x10 bit | — | — | DM163022, PICDEM™ 2 Plus |

*****Refer to dsPIC DSC Brochure for further details.**
**Refer to Design pages on www.microchip.com for further details.**
**Abbreviations are found on the last page of the Selector Guide.**

| Product | Program Memory Bytes & Type (Words) | EEPROM Data Memory Bytes | RAM Bytes | I/O Pins | Packages | Analog Peripherals | Digital Peripherals | Max. Speed MHz | ICD # of Breakpoints | Function-Specific Features | | | | | Development Boards |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | Timers | Input Capture | Output Comp/Std PWM | Motor Control PWM | Quadrature Encoder | |
| **Motor Control Solutions (continued)** | | | | | | | | | | | | | | | |
| PIC16F737 | 7168 StdFl (4096) | — | 368 | 25 | 28SP, 28SO, 28SS, 28ML | ADC/Comp | USART, MI$^2$C/SPI | 20 | 1 | 1-16 bit, 2-8 bit, WDT | 3 | 3x10 bit | — | — | DM163022, PICDEM™ 2 Plus |
| PIC16F747 | 7168 StdFl (4096) | — | 368 | 36 | 40P, 44PT, 44ML | ADC/Comp | USART, MI$^2$C/SPI | 20 | 1 | 1-16 bit, 2-8 bit, WDT | 3 | 3x10 bit | — | — | DM163022, PICDEM™ 2 Plus |
| PIC16F767 | 14336 StdFl (8192) | — | 368 | 25 | 28SP, 28SO, 28SS, 28ML | ADC/Comp | USART, MI$^2$C/SPI | 20 | 1 | 1-16 bit, 2-8 bit, WDT | 3 | 3x10 bit | — | — | DM163022, PICDEM™ 2 Plus |
| PIC16F777 | 14336 StdFl (8192) | — | 368 | 36 | 40P, 44PT, 44ML | ADC/Comp | USART, MI$^2$C/SPI | 20 | 1 | 1-16 bit, 2-8 bit, WDT | 3 | 3x10 bit | — | — | DM163022, PICDEM™ 2 Plus |
| PIC18F2331 | 8192 EnhFl (4096) | 256 | 768 | 22 | 28SP, 28SO, 28MM | 200 ksps ADC | EUSART, I$^2$C/SPI | 40 | 1 | 3-16 bit, 1-8 bit, WDT | 3 | 2x10 bit | 6 | Yes | DM183011, PICDEM™ MC |
| PIC18F2431 | 16384 EnhFl (8192) | 256 | 768 | 22 | 28SP, 28SO, 28MM | 200 ksps ADC | EUSART, I$^2$C/SPI | 40 | 1 | 3-16 bit, 1-8 bit, WDT | 3 | 2x10 bit | 6 | Yes | DM183011, PICDEM™ MC |
| PIC18F4331 | 8192 EnhFl (4096) | 256 | 768 | 34 | 40P, 44PT, 44ML | 200 ksps ADC | EUSART, I$^2$C/SPI | 40 | 1 | 3-16 bit, 1-8 bit, WDT | 3 | 2x10 bit | 8 | Yes | DM183011, PICDEM™ MC |
| PIC18F4431 | 16384 EnhFl (8192) | 256 | 768 | 34 | 40P, 44PT, 44ML | 200 ksps ADC | EUSART, I$^2$C/SPI | 40 | 1 | 3-16 bit, 1-8 bit, WDT | 3 | 2x10 bit | 8 | Yes | DM183011, PICDEM™ MC |
| dsPIC30F2010 | 12288 EnhFl (4096) | 1024 | 512 | 20 | 28SO, 28SP, 28MM | 500 ksps ADC | UART, I$^2$C/SPI | 120 | 1 | 3-16 bit, WDT | 4 | 2 | 6 | Yes | DM300020*** |
| dsPIC30F3010 | 24576 EnhFl (8102) | 1024 | 1024 | 20 | 28SO, 28SP, 44ML (8x8) | 500 ksps ADC | UART, I$^2$C/SPI | 120 | 2 | 5-16 bit, WDT | 4 | 2 | 6 | Yes | DM300020*** |
| dsPIC30F4012 | 49152 EnhFl (16384) | 1024 | 2048 | 20 | 28SO, 28SP, 44ML (8x8) | 500 ksps ADC | UART, I$^2$C/SPI, CAN | 120 | 1 | 5-16 bit, WDt | 4 | 2 | 6 | Yes | DM300020*** |
| dsPIC30F3011 | 24576 EnhFl (8102) | 1024 | 1024 | 30 | 40P, 44PT, 44ML (8x8) | 500 ksps ADC | UART, I$^2$C/SPI | 120 | 2 | 5-16 bit, WDT | 4 | 4 | 6 | Yes | DM300020*** |
| dsPIC30F4011 | 49152 EnhFl (16384) | 1024 | 2048 | 30 | 40P, 44PT, 44ML (8x8) | 500 ksps ADC | UART, I$^2$C/SPI, CAN | 120 | 1 | 5-16 bit, WDT | 4 | 4 | 6 | Yes | DM300020*** |
| dsPIC30F6010 | 147456 EnhFl (49152) | 4096 | 8192 | 68 | 80PF | 500 ksps ADC | UART, I$^2$C/SPI, CAN | 120 | 4 | 5-16 bit, WDT | 8 | 8 | 8 | Yes | DM300020*** |

*****Refer to dsPIC DSC Brochure for further details.**
**Refer to Design pages on www.microchip.com for further details.**
**Abbreviations are found on the last page of the Selector Guide.**

| Product | Program Memory Bytes & Type (Words) | EEPROM Data Memory Bytes | SRAM Bytes | I/O Pins (max.) | Packages | A/D 12-bit 100 KSPS (ch) | A/D 10-bit 500 KSPS | Timer 16-bit | Input Cap | Output Comp/ Std PWM | Motor Control PWM | Quad. Encoder | UART | SPI™ | $I^2C$™ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **High Speed Sensor Solutions** | | | | | | | | | | | | | | | |
| dsPIC30F2011 | 12288 EnhFl (4096) | — | 1024 | 12 | 18SO, 18P, 28ML (6x6) | 8 | — | 3 | 2 | 2 | — | — | 1 | 1 | 1 |
| dsPIC30F3012 | 24576 EnhFl (8192) | 1024 | 2048 | 12 | 18SO, 18P, 44ML (8x8) | 8 | — | 3 | 2 | 2 | — | — | 1 | 1 | 1 |
| dsPIC30F2012 | 12288 EnhFl (4096) | — | 1024 | 20 | 28SO, 28SP, 28ML (6x6) | 10 | — | 3 | 2 | 2 | — | — | 1 | 1 | 1 |
| dsPIC30F3013 | 24576EnhFl (8192) | 1024 | 2048 | 20 | 28SO, 28SP, 44ML (8x8) | 10 | — | 3 | 2 | 2 | — | — | 2 | 1 | 1 |

**Abbreviations are found on the last page of the Selector Guide.**

| **Power-Managed Solutions Featuring *nanoWatt* Technology** | | | |
|---|---|---|---|
| **Minimum nanoWatt Feature Set ($V_{DD}$ = 2.0-5.5V)** | **6-20 Pin** | **28-44 Pin** | **64-80 Pin** |
| Internal Oscillator<br>Quick Start-up (4 MHz)<br>Power-Managed Modes<br>Sleep<br>Low-Power Timer1<br>Low-Power Watchdog | PIC16F627A, PIC16F628A, PIC16F648A | | |
| **Additional Features to Minimum** | **6-20 Pin** | **28-44 Pin** | **64-80 Pin** |
| IntOSC: Quick Start-up (Two speed) and Clock Divide (8 MHz)<br>BOR | PIC16F818, PIC16F819 | | |
| IntOSC: Quick Start-up (Two speed), Fail-safe Clock Monitor and Clock Divide (8 MHz)<br>Ultra Low-Power Wake-up | PIC12F683<br>PIC16F684, PIC16F688 | | |
| IntOSC: Quick Start-up (Two speed), Fail-safe Clock Monitor and Clock Divide (8 MHz)<br>Ultra Low-Power Wake-up<br>Low-Power Watchdog – Enhanced<br>Software Controlled BOR | PIC16F631, PIC16F677, PIC16F685, PIC16F687, PIC16F689, PIC16F785, PIC16F690 | | |
| IntOSC: Quick Start-up (Two speed), Fail-safe Clock Monitor and Clock Divide (8 MHz)<br>Ultra Low-Power Wake-up<br>Wake-up Reset<br>Low-Power Watchdog – Enhanced<br>PLVD<br>Software Controlled BOR | PIC12F635<br>PIC16F636, PIC16F639 | | |
| IntOSC: Quick Start-up (Two speed), Fail-safe Clock Monitor and Selectable Clock (31 kHz-8 MHz)<br>Power-Managed Modes: RC Run Modes<br>PLVD<br>PBOR | PIC16F87, PIC16F88 | PIC16F737, PIC16F747, PIC16F767, PIC16F777, PIC16F913, PIC16F914, PIC16F916, PIC16F917 | |

**For additional details, please refer to device data sheets and design pages on www.microchip.com.**

| Power-Managed Solutions Featuring *nanoWatt* Technology (continued) | | | |
|---|---|---|---|
| **Additional Features to Minimum** | **6-20 Pin** | **28-44 Pin** | **64-80 Pin** |
| IntOSC: Quick Start-up (Two speed), Fail-safe Clock Monitor and Selectable Clock (31 kHz)<br>Power-Managed Modes: Multiple Idle Modes and RC Run Modes<br>BOR | | PIC18F24J10, PIC18F25J10, PIC18F45J10, PIC18F44J10, | PIC18F65J10, PIC18F65J15, PIC18F66J10, PIC18F66J15, PIC18F67J10, PIC18F85J10, PIC18F85J15, PIC18F86J10, PIC18F86J15, PIC18F87J10, |
| IntOSC: Quick Start-up (Two speed), Fail-safe Clock Monitor and Selectable Clock (31 kHz - 8 MHz)<br>Power-Managed Modes: Multiple Idle Modes and RC Run Modes<br>PLVD<br>PBOR | PIC18F1220, PIC18F1320 | PIC18F2220, PIC18F2221, PIC18F2320, PIC18F2321, PIC18F2331, PIC18F2410, PIC18F2420, PIC18F2431, PIC18F2480, PIC18F2510, PIC18F2515, PIC18F2520, PIC18F2525, PIC18F2550, PIC18F2580, PIC18F2585, PIC18F2610, PIC18F2620, PIC18F2680, PIC18F4220, PIC18F4221, PIC18F4320, PIC18F4321, PIC18F4331, PIC18F4410, PIC18F4420, PIC18F4431, PIC18F4455, PIC18F4480, PIC18F4510, PIC18F4515, PIC18F4520, PIC18F4525, PIC18F4550, PIC18F4580, PIC18F4585, PIC18F4610, PIC18F4620, PIC18F4680 | PIC18F6310, PIC18F6390, PIC18F6410, PIC18F6490, PIC18F6522, PIC18F6527, PIC18F6622, PIC18F6722, PIc18F8310, PIC18F8390, PIC18F8410, PIC18F8490, PIC18F8522, PIC18F8527, PIC18F8622, PIC18F8627, PIC18F8722 |

**For additional details, please refer to device data sheets and design pages on www.microchip.com.**

# MATURE – PICmicro® MICROCONTROLLER FAMILY PRODUCTS

**Not recommended for new designs.**

**Please use a device from the recommended column for new designs.**

| Product | Program Memory (Bytes/Words) | Package Size | Recommended Design-In Device |
|---|---|---|---|
| PIC12C508 | 768/512x12 | 8 | PIC12F508 |
| PIC12C508A | 768/512x12 | 8 | PIC12F508 |
| PIC12C509 | 1536/1024x12 | 8 | PIC12F509 |
| PIC12C509A | 1536/1024x12 | 8 | PIC12F509 |
| PIC12C671 | 1536/1024x14 | 8 | PIC12F675 |
| PIC12C672 | 3584/2048x14 | 8 | PIC12F683 |
| PIC12CE673 | 1792/1024x14 | 8 | PIC12F675 |
| PIC12CE674 | 3584/2048x14 | 8 | PIC12F683 |
| PIC12CE518 | 768/512x12 | 8 | PIC12F629 |
| PIC12CE519 | 1536/1024x12 | 8 | PIC12F629 |
| PIC12CR509A | 1536/1024x12 | 8 | PIC12F509 |
| PIC16C505 | 1536/1024x12 | 14 | PIC16F505 |
| PIC16C54 | 768/512x12 | 18 | PIC16F54 |
| PIC16C54A | 768/512x12 | 18 | PIC16F54 |
| PIC16C54C | 768/512x12 | 18 | PIC16F54 |
| PIC16C55 | 768/512x12 | 28 | PIC16C55A |
| PIC16C56 | 1536/1024x12 | 18 | PIC16C56A |
| PIC16C57 | 3072/2048x12 | 28 | PIC16F57 |
| PIC16C57C | 3072/2048x12 | 28 | PIC16F57 |
| PIC16C62A | 3584/2048x14 | 28 | PIC16C62B or PIC16F72 |
| PIC16C620 | 896/2048x14 | 18 | PIC16C620A |
| PIC16C621 | 1792/1024x14 | 18 | PIC16C621A |
| PIC16C622 | 3584/2048x14 | 18 | PIC16C622A |
| PIC16C63 | 7168/4096x14 | 28 | PIC16C63B or PIC16F73 |
| PIC16C64A | 3584/2048x14 | 40 | PIC16F74 |
| PIC16C642 | 7168/4096x14 | 28 | PIC16F72 |
| PIC16C65A | 7168/4096x14 | 40 | PIC16C65B or PIC16F74 |
| PIC16C66 | 14336/8192x14 | 28 | PIC16F76 |
| PIC16C662 | 7168/4096x14 | 40 | PIC16F74 |
| PIC16C67 | 14336/8192x14 | 40 | PIC16F77 |
| PIC16C71 | 17921024x14 | 18 | PIC16F716 |
| PIC16C72 | 3584/2048x14 | 28 | PIC16F72 |
| PIC16C72A | 3584/2048x14 | 28 | PIC16F72 |
| PIC16C710 | 896/512x14 | 18 | PIC16F716 |
| PIC16C711 | 1792/1024x14 | 18 | PIC16F716 |
| PIC16C712 | 1792/1024x14 | 18 | PIC16F716 |
| PIC16C715 | 3584/2048x14 | 18 | PIC16F716 |

| Product | Program Memory (Bytes/Words) | Package Size | Recommended Design-In Device |
|---|---|---|---|
| PIC16C716 | 3584/2048x14 | 18 | PIC16F716 |
| PIC16C73A | 7168/4096x14 | 28 | PIC16F73 |
| PIC16C73B | 7168/4096x14 | 28 | PIC16F73 |
| PIC16C74A | 7168/4096x14 | 40 | PIC16F74 |
| PIC16C74B | 7168/4096x14 | 40 | PIC16F74 |
| PIC16C76 | 14336/8192x14 | 28 | PIC16F76 |
| PIC16C77 | 14336/8192x14 | 40 | PIC16F77 |
| PIC16C923 | 7168/4096x14 | 68 | PIC16C925 |
| PIC16C924 | 7168/4096x14 | 68 | PIC16C925 |
| PIC16CE623 | 896/512x14 | 18 | PIC16F627A |
| PIC16CE624 | 1792/1024x14 | 18 | PIC16F627A |
| PIC16CE625 | 3584/2048x14 | 18 | PIC16F628A |
| PIC16CR54A | 768/512x12 | 18 | PIC16CR54C |
| PIC16CR54C | 768/512x12 | 18 | PIC16F54 |
| PIC16CR57C | 3072/2048x12 | 28 | PIC16F57 |
| PIC16CR83 | 896/512x14 | 18 | PIC16F84A |
| PIC16CR84 | 1792/1024x14 | 18 | PIC16F84A |
| PIC16F627 | 1792/1024x14 | 18 | PIC16F627A |
| PIC16F628 | 3584/2048x14 | 18 | PIC16F628A |
| PIC16F83 | 896/512x14 | 18 | PIC16F84A |
| PIC16F84 | 1792/1024x14 | 18 | PIC16F84A |
| PIC16F873 | 7168/4096x14 | 28 | PIC16F873A |
| PIC16F874 | 7168/4096x14 | 28 | PIC16F874A |
| PIC16F876 | 14336/8192x14 | 40 | PIC16F876A |
| PIC16F877 | 14336/8192x14 | 40 | PIC16F877A |
| PIC17C42A | 4096/2048x16 | 40 | PIC18F4220 |
| PIC17C43 | 8192/4096x16 | 40 | PIC18F4320 |
| PIC17C44 | 16384/8192x16 | 40 | PIC18F442 |
| PIC17C752 | 16384/8192x16 | 68 | PIC18F6520 |
| PIC17C756A | 32768/16384x16 | 68 | PIC18F6520 |
| PIC17C762 | 16384/8192x16 | 84 | PIC18F8520 |
| PIC17C766 | 32768/16384x16 | 84 | PIC18F8520 |
| PIC18C242 | 16384/8192x16 | 28 | PIC18F2420 |
| PIC18C252 | 32768/16384x16 | 28 | PIC18F2520 |
| PIC18C442 | 16384/8192x16 | 40 | PIC18F4420 |
| PIC18C452 | 32768/16384x16 | 40 | PIC18F4520 |
| PIC18C658 | 32768/16384x16 | 68 | PIC18F6585 |

| Product | Program Memory (Bytes/Words) | Package Size | Recommended Design-In Device |
|---|---|---|---|
| PIC18C858 | 32768/16384x16 | 84 | PIC18F8585 |
| PIC18F242 | 16384/8192x16 | 28 | PIC18F2420 |
| PIC18F248 | 16384/8192x16 | 28 | PIC18F2480 |
| PIC18F252 | 32768/16384x16 | 28 | PIC18F2520 |
| PIC18F258 | 32768/16384x16 | 28 | PIC18F2580 |
| PIC18F442 | 16384/8192x16 | 40 | PIC18F4420 |
| PIC18F448 | 16384/8192x16 | 40 | PIC18F4480 |
| PIC18F452 | 32768/16384x16 | 40 | PIC18F4520 |

| Product | Program Memory (Bytes/Words) | Package Size | Recommended Design-In Device |
|---|---|---|---|
| PIC18F458 | 32768/16384x16 | 40 | PIC18F4580 |
| PIC18F2439 | 12288/6144x16 | 28 | PIC18F2431 |
| PIC18F2539 | 24576/12288x16 | 28 | PIC18F2431 |
| PIC18F4439 | 12288/6144x16 | 40 | PIC18F4431 |
| PIC18F4539 | 24576/12288x16 | 40 | PIC18F4431 |
| PIC18F6620 | 65536/32768x16 | 64 | PIC18F6621 |
| PIC18F8620 | 65536/32768x16 | 80 | PIC18F8621 |

# BATTERY MANAGEMENT FAMILY PRODUCTS

**Battery Fuel Gauge ICs**

| | Product | Battery Chemistry | # of Cells | Interface | Data Set | A/D Converter | Programmable Memory | Programmable I/O Functions | Accuracy | Time Base | Temp. Sensor | Packaging | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PS501 | Li-Ion<br>NimH | 2-4<br>6-12 | SMBus | > 1% | 16-bit Sigma Delta | 16 Kbytes Flash, 256 bytes EEPROM | 12 GPIO | N/A | On-chip | On-chip external | 28SSOP | Single chip reprogrammable battery manager IC reports capacity, current, temperature, voltage and other status for Li-Ion or Nickel batteries. |
| | PS700 | Li-Ion | 1 - 2 | SMBus v1.1 | > 1% | 16-bit Sigma Delta | 512 bytes EEPROM | 1 A/D input, 2 inputs configurable as GPIO or A/D inputs | N/A | On-chip | On-chip and external | 8TSOP | Highly accurate analog front end that measures, stores and reports all of the critical parameters required for recharge-able battery monitoring with a minimum of external components. |
| **NEW** | PS810* | Li-Ion | 1 | SMBus/SPS | N/A | 16-bit Sigma Delta | 4k x 16 Flash | 6 GPIO | 1% | On-chip | On-chip | 14ST, 16ML | Single cell Li-Ion fuel gauge provides battery status such as run time to empty, run time to full, relative state-of-charge and battery state-of-health |

*** Contact Microchip Technology for availability.**
**Supporting Development Tools are listed in the Development Systems Products Section.**
**Abbreviations are found on the last page of the Selector Guide.**

**Switching Battery Chargers**

| | Product | Mode | Cell Type | # of Cells | Vin Range (V) | Max. Voltage Regulation (%) | Int/Ext FET | Features | Package |
|---|---|---|---|---|---|---|---|---|---|
| **NEW** | PS200* | Switch | Li-Ion, Li-Polymer, NiMH, NiCD, Pb | multi | 5 -18 | ±1% | Ext | Voltage and current regulation, safety charge timers and temperature limits, internal voltage regulator, 1 MHz (max.) PWM | 20P, 20SO, 20SS |

*** Contact Microchip Technology for availability.**
**For Linear Battery Chargers, refer to Analog/Interface Family Products.**
**Supporting Development Tools are listed in the Development Systems Products Section.**
**Abbreviations are found on the last page of the Selector Guide.**

# RADIO FREQUENCY PRODUCTS

**PASSIVE**

**microID® RFID Tagging Devices**

| Product | Carrier Frequency | Programming | Anticollision | Memory Type | Memory Size | Protocols | Packages | Other |
|---|---|---|---|---|---|---|---|---|
| MCRF200 | 100-150 kHz | Factory | No | OTP | 96/128 bits | PSK, FSK, ASK, bi-phase, Manchester, NRZ | W, WF, S, WB, WFB, SB, 1M, 3M, P, SN | – |
| MCRF202 | 100-150 kHz | Factory | Yes | OTP | 96/128 bits | FSK, ASK, bi-phase, Manchester, NRZ | W, WF, S, WB, WFB, SB, P, SN | Sensor input |
| MCRF250 | 100-150 kHz | Factory | Yes | OTP | 96/128 bits | PSK, FSK, ASK, bi-phase, Manchester, NRZ | W, WF, S, WB, WFB, SB, 1M, 3M, P, SN | – |
| MCRF355 | 13.56 MHz | Contact/Factory | Yes | R/W | 154 bits | ASK Manchester | W, WF, S, WB, WFB, SB, P, SN, 7M | – |
| MCRF360 | 13.56 MHz | Contact/Factory | Yes | R/W | 154 bits | ASK Manchester | W, WF, S, WB, WFB, SB, P, SN | 100 pF res cap |
| MCRF450 | 13.56 MHz | Contactless | Yes | R/W | 1 Kbit | PPM, ASK Manchester | W, WF, S, WB, WFB, SB, P, SN, 7M | 32-bit unique ID user lock control by block |
| MCRF451 | 13.56 MHz | Contactless | Yes | R/W | 1 Kbit | PPM, ASK Manchester | W, WF, S, WB, WFB, SB, P, SN, 7M | 100 pF res cap |
| MCRF452 | 13.56 MHz | Contactless | Yes | R/W | 1 Kbit | PPM, ASK Manchester | W, WF, S, WB, WFB, SB, P, SN, 7M | Dual 50 pF res cap |
| MCRF455 | 13.56 MHz | Contactless | Yes | R/W | 1 Kbit | PPM, ASK Manchester | W, WF, S, WB, WFB, SB, P, SN, 7M | 50 pF res cap |

# SECURE DATA PRODUCTS

**KEELOQ® Encoder Devices**

| Product | Transmission Code Length Bits | Code Hopping Bits | Programmable Encryption Key Bits | Seed Length | Operating Voltage (V) | Turnable OSC | Function Codes | CRC | Protocols | Other Features | Packages |
|---|---|---|---|---|---|---|---|---|---|---|---|
| HCS101 | 66 | — | — | — | 3.5 to 13.0 | ✓ | 7 | No | PWM | Fixed code support for non-secure applications, up to 28-bit serial numbers | 8P, 8SN |
| HCS200 | 66 | 32 | 64 | 32 | 3.5 to 13.0 | No | 7 | No | PWM | Entry level, Fixed code support, Battery-low indicator | 8P, 8SN |
| HCS201 | 66 | 32 | 64 | 32 | 3.5 to 13.0 | ✓ | 7 | No | PWM | Entry level, Fixed code support, Battery-low indicator, Step-up voltage operation | 8P, 8SN |
| HCS300 | 66 | 32 | 64 | 32 | 2.0 to 6.3 | No | 15 | No | PWM | LED Drive, Overflow bits, Time-out, Battery-low indicator | 8P, 8SN |
| HCS301 | 66 | 32 | 64 | 32 | 3.5 to 13.0 | No | 15 | No | PWM | LED Drive, Overflow bits, Time-out, Battery-low indicator | 8P, 8SN |
| HCS320 | 66 | 32 | 64 | 32 | 3.5 to 13.0 | No | 16 | No | PWM | Shift Operation, LED Drive, Overflow bits, Time-out, Battery-low indicator | 8P, 8SN |
| HCS360 | 67 | 32 | 64 | 48 | 2.0 to 6.3 | No | 15 | ✓ | IR Mode, PWM and Manchester | 2 independent counters | 8P, 8SN |
| HCS361 | 67 | 32 | 64 | 48 | 2.0 to 6.3 | No | 15 | ✓ | IR Mode, PWM and VPWM | 2 independent counters | 8P, 8SN |
| HCS362 | 69 | 32 | 2 x 64 | 60 | 2.0 to 6.3 | ✓ | 15 | ✓ | PWM and Manchester | Queue counter, PLL interface, Timer bits, Programmable time-out | 8P, 8SN, 8ST |
| HCS365 | 69 | 32 | 2 x 64 | 2 x 60 | 2.05 to 5.5 | Factory | 15 | ✓ | PWM, VPWM PPM and Manchester | Dual Encoder Operation, 4 inputs, Queue counter | 8P, 8SM |
| HCS370 | 69 | 32 | 2 x 64 | 2 x 60 | 2.05 to 5.5 | Factory | 15 | ✓ | PWM, VPWM PPM and Manchester | Step-up voltage regulation, Dual Encoder Operation, 6 inputs, Queue counter | 14P, 14SL |
| HCS410 | 69 | 32 | 2 x 64 | 60 | 2.0 to 6.6 | ✓ | 7 | ✓ | PWM and Manchester | Self-powered transponder and encoder, Bidirectional authentication, User EEPROM, Queue counter | 8P, 8SN, 8ST |

**KEELOQ® Decoder Devices**

| Product | Reception Length Bits | Encoders Supported** | Transmitters Supported | Operating Voltage (V) | Functions | Other Features | Packages |
|---|---|---|---|---|---|---|---|
| HCS500 | 66 | HCS200, HCS201, HCS300, HCS301, HCS320, HCS360, HCS361, HCS362, HCS365, HCS370, HCS410, HCS412, HCS473 | Up to 7 | 3.0 to 5.5 | S0, 15 Serial Functions | Full-featured decoder with serial interface to microcontrollers | 8P, 8SM |
| HCS512 | 66 | HCS200, HCS201, HCS300, HCS301, HCS320, HCS360, HCS361, HCS362, HCS365, HCS370, HCS410, HCS412, HCS473 | Up to 4 | 4.0 to 6.0 | S0, S1, S2, S3; VLOW, 15 Serial Functions | Single-chip decoder with secure learning | 18P, 18SO |
| HCS515 | 66 | HCS200, HCS201, HCS300, HCS301, HCS320, HCS360, HCS361, HCS362, HCS365, HCS370, HCS410, HCS412, HCS473 | Up to 7 | 4.5 to 5.5 | S0, S1, 15 Serial Functions | Full-featured decoder with serial and parallel interface. On-chip 1K transmitter and 1K user EEPROM. | 14P, 14SL |

**KEELOQ® Programmable Encoder/Decoder Flash Devices (x14), ICSP™**

| Product | Program Memory Bytes & Type (Words) | EEPROM Data Memory (Bytes) | RAM Bytes | I/O Pins | Analog | | Digital | | Max. Speed MHz | IntOSC | BOR/ PBOR/ PLVD | ICD # of Breakpoints | nW | Other Features | Packages |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ADC Channels | Comparators | Timers/WDT | Serial I/O | | | | | | | |
| PIC12F635 | 1792 EnhFl (1024) | 128 | 64 | 6 | — | 1 | 1-16 bit, 1-8 bit, 1-WDT | — | 20 | 8 MHz | BOR/ PLVD | 1** | ✓ | | 8P, 8SN, 8MF |
| PIC16F636 | 3584 EnhFl (2048) | 256 | 128 | 12 | — | 2 | 1-16 bit, 1-8 bit, 1-WDT | — | 20 | 8 MHz | BOR/ PLVD | 1** | ✓ | | 14P, 14SL, 14ST |
| PIC16F639* | 3584 EnhFl (2048) | 256 | 128 | 12 | — | 2 | 1-16 bit, 1-8 bit, 1-WDT | — | 20 | 8 MHz | BOR/ PLVD | 1** | ✓ | Transponder Analog Front End | 20P, 20SO, 20SS |

*** Contact Microchip Technology for availability date.**
**** Requires ICD specific device with header module – refer to Development Tools.**
**Abbreviations are found on the last page of the Selector Guide.**

# ANALOG/INTERFACE PRODUCTS

**Lead-free versions of many devices are currently offered. Check Microchip's website for availability.**

| THERMAL MANAGEMENT PRODUCTS – Temperature Sensors | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Part #** | **Typical Accuracy (°C)** | **Maximum Accuracy @ 25°C (°C)** | **Maximum Temperature Range (°C)** | **Vcc Range (V)** | **Maximum Supply Current (μA)** | **Features** | **Packages** |
| **Logic Output Temperature Sensors** | | | | | | | |
| TC6501 | ±0.5 | ±3 | -55 to +125 | +2.7 to +5.5 | 40 | Cross to MAX6501, Open-drain | 5-Pin SOT-23A |
| TC6502 | ±0.5 | ±3 | -55 to +125 | +2.7 to +5.5 | 40 | Cross to MAX6502, Push-pull | 5-Pin SOT-23A |
| TC6503 | ±0.5 | ±3 | -55 to +125 | +2.7 to +5.5 | 40 | Cross to MAX6503, Open-drain | 5-Pin SOT-23A |
| TC6504 | ±0.5 | ±3 | -55 to +125 | +2.7 to +5.5 | 40 | Cross to MAX6504, Push-pull | 5-Pin SOT-23A |
| TC620 | ±1 | ±3 | -40 to +125 | +4.5 to +18 | 400 | Two resistor-programmable trip points | 8-Pin PDIP, 8-Pin SOIC |
| TC621 | **Note 1** | **Note 1** | -40 to +85 | +4.5 to +18 | 400 | Requires external thermistor, resistor-programmable trip points | 8-Pin PDIP, 8-Pin SOIC |
| TC622 | ±1 | ±5 | -40 to +125 | +4.5 to +18 | 600 | Dual output, TO-220 for heat sink mounting, resistor-programmable trip points | 8-Pin PDIP, 8-Pin SOIC, 5-Pin TO-220 |
| TC623 | ±1 | ±3 | -40 to +125 | +2.7 to +4.5 | 250 | Two resistor-programmable trip points | 8-Pin PDIP, 8-Pin SOIC |
| TC624 | ±1 | ±5 | -40 to +125 | +2.7 to +4.5 | 300 | Dual output, resistor-programmable trip points | 8-Pin PDIP, 8-Pin SOIC |
| **Voltage Output Temperature Sensors** | | | | | | | |
| MCP9700 | ±1 | ±4 | -40 to +125 | +2.3 to +5.5 | 12 | Temperature slope: 10 mV/°C | 5-pin SC-70 |
| MCP9701 | ±1 | ±4 | -10 to +125 | +3.1 to +5.5 | 12 | Temperature slope: 19.53 mV/°C, cross to MAX6612 | 5-pin SC-70 |
| TC1046 | ±0.5 | ±2 | -40 to +125 | +2.7 to +4.4 | 60 | High precision temperature-to-voltage converter, 6.25 mV/°C | 3-Pin SOT-23B |
| TC1047 | ±0.5 | ±2 | -40 to +125 | +2.7 to +4.4 | 60 | High precision temperature-to-voltage converter, 10 mV/°C | 3-Pin SOT-23B |
| TC1047A | ±0.5 | ±2 | -40 to +125 | +2.5 to +5.5 | 60 | High precision temperature-to-voltage converter, 10 mV/°C | 3-Pin SOT-23B |
| **Serial Output Temperature Sensors** | | | | | | | |
| MCP9800 | ±0.5 | ±1 | -55 to +125 | +2.7 to +5.5 | 400 | SMBus/$I^2C$™ compatible interface, 0.0625°C to 0.5°C adj. resolution, power-saving one-shot temperature measurement | 5-Pin SOT-23 |
| MCP9801 | ±0.5 | ±1 | -55 to +125 | +2.7 to +5.5 | 400 | SMBus/$I^2C$™ compatible interface, 0.0625°C to 0.5°C adj. resolution, power-saving one-shot temperature measurement, multi-drop capability | 8-Pin MSOP, 8-pin SOIC |
| MCP9802 | ±0.5 | ±1 | -55 to +125 | +2.7 to +5.5 | 400 | SMBus/$I^2C$™ compatible interface with time out, 0.0625°C to 0.5°C adj. resolution, power-saving one-shot temperature measurement | 5-Pin SOT-23 |

**NOTE 1: These devices use an external temperature sensor. Accuracy of the total solution is a function of the accuracy of the external sensor.**
**2: TCN75 idle current is 250 μA. This device also has a Software Shutdown mode that reduces supply current to <1 μA.**

| THERMAL MANAGEMENT PRODUCTS – Temperature Sensors | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Part #** | **Typical Accuracy (°C)** | **Maximum Accuracy @ 25°C (°C)** | **Maximum Temperature Range (°C)** | **Vcc Range (V)** | **Maximum Supply Current (µA)** | **Features** | **Packages** |
| **Serial Output Temperature Sensors (continued)** | | | | | | | |
| MCP9803 | ±0.5 | ±1 | -55 to +125 | +2.7 to +5.5 | 400 | SMBus/I²C™ compatible interface with time out, 0.0625°C to 0.5°C adj. resolution, power-saving one-shot temperature measurement, multi-drop capability | 8-Pin MSOP, 8-Pin SOIC |
| TC77 | ±0.5 | ±1 | -55 to +125 | +2.7 to +5.5 | 400 | SPI™ compatible interface, 0.0625°C temperature resolution | 5-Pin SOT-23A, 8-Pin SOIC |
| TC72 | ±0.5 | ±1 | -55 to +125 | +2.65 to +5.5 | 400 | SPI™ compatible interface, power saving one-shot temperature measurement, 0.25°C temperature resolution | 8-Pin MSOP, 8-Pin 3x3 DFN |
| TC74 | ±0.5 | ±2 | -40 to +125 | +2.7 to +5.5 | 350 | SMBus/I²C™ compatible interface, 1°C temperature resolution | 5-Pin SOT-23A, 5-Pin TO-220 |
| TCN75A | ±0.5 | ±2 | -40 to +125 | +2.7 to +5.5 | 500 | SMBus/I²C™ compatible interface, adjustable resolutoin, power-saving one-shot temperature measurement, multi-drop capability, 0.0625°C to 0.5°C temperature resolution | 8-Pin SOIC, 8-Pin MSOP |
| TCN75 | ±0.5 | ±2 | -55 to +125 | +2.7 to +5.5 | 1,000(2) | SMBus/I²C™ compatible interface, multi-drop capability, interrupt output, 0.5°C temperature resolution | 8-Pin MSOP, 8-Pin SOIC |

**NOTE 1: These devices use an external temperature sensor. Accuracy of the total solution is a function of the accuracy of the external sensor.**
**2: TCN75 idle current is 250 µA. This device also has a Software Shutdown Mode that reduces supply current to <1 µA.**

| THERMAL MANAGEMENT PRODUCTS – Brushless DC Fan Controllers and Fan Fault Detectors | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Part #** | **Description** | **Typical Accuracy (°C)** | **Maximum Accuracy @ 25°C (°C)** | **Maximum Temperature Range (°C)** | **Vcc Range (V)** | **Maximum Supply Current (µA)** | **Features** | **Packages** |
| TC642 | Fan Manager | **Note 1** | **Note 1** | -40 to +85 | +3.0 to +5.5 | 1,000 | FanSense™ Fan Monitor, minimum fan speed control | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| TC642B | Fan Manager | **Note 1** | **Note 1** | -40 to +85 | +3.0 to +5.5 | 400 | FanSense™ Fan Monitor, minimum fan speed control, fan auto-restart | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| TC646 | Fan Manager | **Note 1** | **Note 1** | -40 to +85 | +3.0 to +5.5 | 1,000 | FanSense™ Fan Monitor, auto-shutdown | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| TC646B | Fan Manager | **Note 1** | **Note 1** | -40 to +85 | +3.0 to +5.5 | 400 | FanSense™ Fan Monitor, auto-shutdown, fan auto-restart | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| TC647 | Fan Manager | **Note 1** | **Note 1** | -40 to +85 | +3.0 to +5.5 | 1,000 | FanSense™ Fan Monitor, minimum fan speed control | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| TC647B | Fan Manager | **Note 1** | **Note 1** | -40 to +85 | +3.0 to +5.5 | 400 | FanSense™ Fan Monitor, minimum fan speed control, fan auto-restart | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| TC648 | Fan Manager | **Note 1** | **Note 1** | -40 to +85 | +3.0 to +5.5 | 1,000 | Over-temperature alert, auto-shutdown | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |

**NOTE 1: These devices use an external temperature sensor. Accuracy of the total solution is a function of the accuracy of the external sensor.**

## THERMAL MANAGEMENT PRODUCTS – Brushless DC Fan Controllers and Fan Fault Detectors

| Part # | Description | Typical Accuracy (°C) | Maximum Accuracy @ 25°C (°C) | Maximum Temperature Range (°C) | Vcc Range (V) | Maximum Supply Current (µA) | Features | Packages |
|---|---|---|---|---|---|---|---|---|
| TC648B | Fan Manager | **Note 1** | **Note 1** | -40 to +85 | +3.0 to +5.5 | 400 | Over-temperature alert, auto-shutdown, fan auto-restart | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| TC649 | Fan Manager | **Note 1** | **Note 1** | -40 to +85 | +3.0 to +5.5 | 1,000 | FanSense™ Fan Monitor, auto-shutdown | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| TC649B | Fan Manager | **Note 1** | **Note 1** | -40 to +85 | +3.0 to +5.5 | 400 | FanSense™ Fan Monitor, auto-shutdown, fan auto-restart | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| TC650 | Fan Manager | ±1 | ±3 | -40 to +125 | +2.8 to +5.5 | 90 | Over-temperature alert | 8-Pin MSOP |
| TC651 | Fan Manager | ±1 | ±3 | -40 to +125 | +2.8 to +5.5 | 90 | Over-temperature alert, auto-shutdown | 8-Pin MSOP |
| TC652 | Fan Manager | ±1 | ±3 | -40 to +125 | +2.8 to +5.5 | 90 | FanSense™ Fan Monitor, over-temperature alert | 8-Pin MSOP |
| TC653 | Fan Manager | ±1 | ±3 | -40 to +125 | +2.8 to +5.5 | 90 | FanSense™ Fan Monitor, over-temperature alert, auto-shutdown | 8-Pin MSOP |
| TC654 | Dual SMBus Fan Manager | **Note 1** | **Note 1** | -40 to +85 | +3.0 to +5.5 | 320 | FanSense™ Fan Monitor, RPM data | 10-Pin MSOP |
| TC655 | Dual SMBus Fan Manager | **Note 1** | **Note 1** | -40 to +85 | +3.0 to +5.5 | 320 | FanSense™ Fan Monitor, RPM data, over-temperature alert | 10-Pin MSOP |
| TC664 | Single SMBus Fan Manager | **Note 1** | **Note 1** | -40 to +85 | +3.0 to +5.5 | 320 | FanSense™ Fan Monitor, RPM data | 10-Pin MSOP |
| TC665 | Single SMBus Fan Manager | **Note 1** | **Note 1** | -40 to +85 | +3.0 to +5.5 | 320 | FanSense™ Fan Monitor, RPM data, over-temperature alert | 10-Pin MSOP |
| TC670 | Predictive Fan Fault Detector | N/A | N/A | -40 to +85 | +3.0 to +5.5 | 150 | FanSense™ Fan Monitor, programmable threshold | 6-Pin SOT-23 |

**NOTE 1: These devices use an external temperature sensor. Accuracy of the total solution is a function of the accuracy of the external sensor.**

## POWER MANAGEMENT – Voltage References

| Part # | Vcc Range (V) | Output Voltage (V) | Max. Load Current (mA) | Initial Accuracy (max.%) | Temperature Coefficient (ppm/°C) | Max. Supply Current (µA @ 25°C) | Packages |
|---|---|---|---|---|---|---|---|
| MCP1525 | 2.7 to 5.5 | 2.5 | ±2 | ±1 | 50 | 100 | 3-Pin TO-92, 3-Pin SOT-23B |
| MCP1541 | 4.3 to 5.5 | 4.096 | ±2 | ±1 | 50 | 100 | 3-Pin TO-92, 3-Pin SOT-23B |

| POWER MANAGEMENT – Linear Regulators | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Part #** | **Max. Input Voltage (V)** | **Output Voltage (V)** | **Output Current (mA)** | **Junction Temperature Range (°C)** | **Typical Active Current (μA)** | **Typical Dropout Voltage @ Max. IOUT (mV)** | **Typical Output Voltage Accuracy (%)** | **Features** | **Packages** |
| **50 mA to 250 mA Low Dropout Linear Regulators** | | | | | | | | | |
| TC2014 | 6.0 | 1.8, 2.7, 2.8, 3.0, 3.3 | 50 | -40 to +125 | 55 | 45 | ±0.4 | Shutdown, Reference bypass input | 5-Pin SOT-23A |
| TC1014 | 6.0 | 1.8, 2.5, 2.7, 2.8, 2.85, 3.0, 3.3, 3.6, 4.0, 5.0 | 50 | -40 to +125 | 50 | 85 | ±0.5 | Shutdown, Reference bypass input | 5-Pin SOT-23A |
| TC2054 | 6.0 | 1.8, 2.7, 2.8, 3.0, 3.3 | 50 | -40 to +125 | 55 | 45 | ±0.4 | Shutdown, Error output | 5-Pin SOT-23A |
| TC1054 | 6.0 | 1.8, 2.5, 2.7, 2.8, 2.85, 3.0, 3.3, 3.6, 4.0, 5.0 | 50 | -40 to +125 | 50 | 85 | ±0.5 | Shutdown, Error output | 5-Pin SOT-23A |
| TC1070 | 6.0 | 1.23 → VIN | 50 | -40 to +125 | 50 | 85 | — | Shutdown, Adjustable | 5-Pin SOT-23A |
| TC1072 | 6.0 | 2.5, 2.7, 2.8, 2.85, 3.0, 3.3, 3.6, 4.0, 5.0 | 50 | -40 to +125 | 50 | 85 | ±0.5 | Shutdown, Reference bypass input, Error output | 6-Pin SOT-23A |
| TC1223 | 6.0 | 2.5, 2.7, 2.8, 3.0, 3.3, 3.6, 4.0, 5.0 | 50 | -40 to +125 | 50 | 85 | ±0.5 | Shutdown | 5-Pin SOT-23A |
| TC1016 | 6.0 | 1.8, 2.7, 2.8, 3.0 | 80 | -40 to +125 | 50 | 150 | ±0.5 | Shutdown | 5-Pin SC-70 |
| TC2015 | 6.0 | 1.8, 2.7, 2.8, 3.0, 3.3 | 100 | -40 to +125 | 55 | 90 | ±0.4 | Shutdown, Reference bypass input | 5-Pin SOT-23A |
| TC1015 | 6.0 | 1.8, 2.5, 2.7, 2.8, 2.85, 3.0, 3.3, 3.6, 4.0, 5.0 | 100 | -40 to +125 | 50 | 180 | ±0.5 | Shutdown, Reference bypass input | 5-Pin SOT-23A |
| TC2055 | 6.0 | 1.8, 2.7, 2.8, 3.0, 3.3 | 100 | -40 to +125 | 55 | 90 | ±0.4 | Shutdown, Error output | 5-Pin SOT-23A |
| TC1055 | 6.0 | 1.8, 2.5, 2.7, 2.8, 2.85, 3.0, 3.3, 3.6, 4.0, 5.0 | 100 | -40 to +125 | 50 | 180 | ±0.5 | Shutdown, Error output | 5-Pin SOT-23A |
| TC1071 | 6.0 | 1.23 → VIN | 100 | -40 to +125 | 50 | 180 | — | Shutdown, Adjustable | 5-Pin SOT-23A |
| TC1073 | 6.0 | 2.5, 2.7, 2.8, 2.85, 3.0, 3.3, 3.6, 4.0, 5.0 | 100 | -40 to +125 | 50 | 180 | ±0.5 | Shutdown, Reference bypass input, Error output | 6-Pin SOT-23A |
| TC1224 | 6.0 | 2.5, 2.7, 2.8, 3.0, 3.3, 3.6, 4.0, 5.0 | 100 | -40 to +125 | 50 | 180 | ±0.5 | Shutdown | 5-Pin SOT-23A |
| TC1188 | 6.0 | 1.8, 2.8, 2.84, 3.15 | 120 | -40 to +125 | 50 | 130 | ±0.5 | Shutdown | 5-Pin SOT-23A |
| TC1189 | 6.0 | 1.8, 2.8, 2.84, 3.15 | 120 | -40 to +125 | 50 | 130 | ±0.5 | Shutdown | 5-Pin SOT-23A |
| TC2185 | 6.0 | 1.8, 2.7, 2.8, 3.0, 3.3 | 150 | -40 to +125 | 55 | 140 | ±0.4 | Shutdown, Reference bypass input | 5-Pin SOT-23A |
| TC1185 | 6.0 | 1.8, 2.5, 2.7, 2.8, 2.85, 3.0, 3.3, 3.6, 4.0, 5.0 | 150 | -40 to +125 | 50 | 270 | ±0.5 | Shutdown, Reference bypass input | 5-Pin SOT-23A |
| TC2186 | 6.0 | 1.8, 2.7, 2.8, 3.0, 3.3 | 150 | -40 to +125 | 55 | 140 | ±0.4 | Shutdown, Error output | 5-Pin SOT-23A |
| TC1186 | 6.0 | 1.8, 2.5, 2.7, 2.8, 2.85, 3.0, 3.3, 3.6, 4.0, 5.0 | 150 | -40 to +125 | 50 | 270 | ±0.5 | Shutdown, Error output | 5-Pin SOT-23A |
| TC1187 | 6.0 | 1.23 → VIN | 150 | -40 to +125 | 50 | 270 | — | Shutdown, Adjustable | 5-Pin SOT-23A |
| TC1017 | 6.0 | 1.8, 2.6, 2.7, 2.8, 2.85, 2.9, 3.3, 3.4 | 150 | -40 to +125 | 53 | 285 | ±0.5 | Shutdown | 5-Pin SOT-23A, 5-Pin SC-70 |
| MCP1700 | 6.0 | 1.2, 1.8, 2.5, 3.0, 3.3, 5.0 | 250 | -40 to +125 | 1.0 | 300 | ±0.4 | 1.0 μF ceramic cap stable, Short-circuit protection | 3-Pin TO-92, 3-Pin SOT-23A, 3-Pin SOT-89 |
| MCP1701 | 10 | 1.8, 2.5, 3.0, 3.3, 5.0 | 250 | -40 to +85 | 1.1 | 380 | ±0.5 | 10V max. input voltage | 3-Pin SOT-23A, 3-Pin SOT-89, 3-Pin TO-92 |

**NOTE 1: Depending on external transistor configuration.**
**2: Each channel (for Dual and Quad LDOs).**
**3: LDOs with shutdown (except Power-Management Combination Products as indicated) have typical shutdown currents of 0.05 μA.**

## POWER MANAGEMENT – Linear Regulators

| Part # | Max. Input Voltage (V) | Output Voltage (V) | Output Current (mA) | Junction Temperature Range (°C) | Typical Active Current (µA) | Typical Dropout Voltage @ Max. IOUT (mV) | Typical Output Voltage Accuracy (%) | Features | Packages |
|---|---|---|---|---|---|---|---|---|---|
| **300 mA Low Dropout Linear Regulators** | | | | | | | | | |
| TC1107 | 6.0 | 2.5, 2.7, 2.8, 3.0, 3.3, 5.0 | 300 | -40 to +125 | 50 | 240 | ±0.5 | Shutdown, Reference bypass input | 8-Pin MSOP, 8-Pin SOIC |
| TC1108 | 6.0 | 2.5, 2.7, 2.8, 3.0, 3.3, 5.0 | 300 | -40 to +125 | 50 | 240 | ±0.5 | | 3-Pin SOT-223 |
| TC1173 | 6.0 | 2.5, 2.7, 2.8, 3.0, 3.3, 5.0 | 300 | -40 to +125 | 50 | 240 | ±0.5 | Shutdown, Reference bypass input, Error output | 8-Pin MSOP, 8-Pin SOIC |
| TC1174 | 6.0 | 1.23 → VIN | 300 | -40 to +125 | 50 | 240 | — | Shutdown, Reference bypass input, Adjustable | 8-Pin MSOP, 8-Pin SOIC |
| TC1269 | 6.0 | 2.5, 2.8, 3.0, 3.3, 5.0 | 300 | -40 to +125 | 50 | 240 | ±0.5 | Shutdown, Reference bypass input | 8-Pin MSOP |
| **500 mA to 800 mA Low Dropout Linear Regulators** | | | | | | | | | |
| TC1262 | 6.0 | 2.5, 2.8, 3.0, 3.3, 5.0 | 500 | -40 to +125 | 80 | 350 | ±0.5 | | 3-Pin TO-220, 3-Pin DDPAK, 3-Pin SOT-223 |
| TC1263 | 6.0 | 2.5, 2.8, 3.0, 3.3, 5.0 | 500 | -40 to +125 | 80 | 350 | ±0.5 | Shutdown, Reference bypass input, Error output | 8-Pin SOIC, 5-Pin TO-220, 5-Pin DDPAK |
| TC1268 | 6.0 | 2.5 | 500 | -40 to +125 | 80 | 350 | ±0.5 | Shutdown, Reference bypass input, Error output | 8-Pin SOIC |
| TC1264 | 6.0 | 1.8, 2.5, 3.0, 3.3 | 800 | -40 to +125 | 80 | 450 | ±0.5 | | 3-Pin TO-220, 3-Pin DDPAK, 3-Pin SOT-223 |
| TC1265 | 6.0 | 1.8, 2.5, 3.0, 3.3 | 800 | -40 to +125 | 80 | 450 | ±0.5 | Shutdown, Reference bypass input, Error output | 8-Pin SOIC, 5-Pin TO-220, 5-Pin DDPAK |
| TC2117 | 6.0 | 1.8, 2.5, 3.0, 3.3 | 800 | -40 to +125 | 80 | 600 | ±0.5 | | 3-Pin SOT-223, 3-Pin DDPAK |
| **1A and Above Low Dropout Linear Regulators** | | | | | | | | | |
| MCP1726 | 6.0 | Fixed: 5, 3.3, 3, 2.5, 1.8, 1.2, 0.8 Adjustable: .8 to 5.0 | 1000 | -40 to +125 | 140 | 300 | ±0.4 | Ceramic output capacitor stable, Shutdown, Cdelay, Power-Good | 8-Pin 3x3 DFN, 8-Pin SOIC |
| **Application Specific Low Dropout Linear Regulators** | | | | | | | | | |
| TC1266 | 6.0 | 3.3 | 200 | -5 to +70 | 230 | 200 | ±1.0 | PCI compliant | 8-Pin SOIC, 8-Pin MSOP |
| TC1267 | 6.0 | 3.3 | 400 | -5 to +70 | 230 | 300 | ±1.0 | PCI compliant | 5-Pin DDPAK |
| TC57 | 8 | 2.5, 3.0, 3.3 | 4,000(1) | -40 to +85 | 50 | 100(1) | ±2.0 | Shutdown, External transistor | 5-Pin SOT-23A |
| TC59 | -10 | -3.0, -5.0 | 100 | -40 to +85 | 3 | 380 | ±0.5 | Negative LDO | 3-Pin SOT-23A |
| **Power-Management Combination Products** | | | | | | | | | |
| TC1300(3) | 6.0 | 2.5, 2.7, 2.8, 2.85, 3.0, 3.3 | 300 | -40 to +125 | 80 | 210 | ±0.5 | Shutdown, Reference bypass input, LDO plus Reset output | 8-Pin MSOP |
| TC1301A(3) | 6.0 | LDO1: 1.5-3.3<br>LDO2: 1.5-3.3 | LDO1: 300<br>LDO2: 150 | -40 to +125 | 103 | LDO1: 104<br>LDO2: 150 | ±0.5 | Dual LDO plus Reset output, Shutdown, Reference bypass, Voltage detect | 8-Pin MSOP, 8-Pin 3x3 DFN |
| TC1301B(3) | 6.0 | LDO1: 1.5-3.3<br>LDO2: 1.5-3.3 | LDO1: 300<br>LDO2: 150 | -40 to +125 | 114 | LDO1: 104<br>LDO2: 150 | ±0.5 | Dual LDO plus Reset, Per channel output shutdown, Reference bypass | 8-Pin MSOP, 8-Pin 3x3 DFN |
| TC1302A(3) | 6.0 | LDO1: 1.5-3.3<br>LDO2: 1.5-3.3 | LDO1: 300<br>LDO2: 150 | -40 to +125 | 103 | LDO1: 104<br>LDO2: 150 | ±0.5 | Dual LDO, Output shutdown reference bypass, Voltage detect | 8-Pin MSOP, 8-Pin 3x3 DFN |

**NOTE 1: Depending on external transistor configuration.**
**2: Each channel (for Dual and Quad LDOs).**
**3: LDOs with shutdown (except Power-Management Combination Products as indicated) have typical shutdown currents of 0.05 µA.**

## POWER MANAGEMENT – Linear Regulators

| Part # | Max. Input Voltage (V) | Output Voltage (V) | Output Current (mA) | Junction Temperature Range (°C) | Typical Active Current (µA) | Typical Dropout Voltage @ Max. IOUT (mV) | Typical Output Voltage Accuracy (%) | Features | Packages |
|---|---|---|---|---|---|---|---|---|---|
| **Power-Management Combination Products (continued)** | | | | | | | | | |
| TC1302B(3) | 6.0 | LDO1: 1.5-3.3<br>LDO2: 1.5-3.3 | LDO1: 300<br>LDO2: 150 | -40 to +125 | 114 | LDO1: 104<br>LDO2: 150 | ±0.5 | Dual LDO, Per channel output shutdown, Reference bypass | 8-Pin MSOP, 8-Pin 3x3 DFN |
| TC1305 | 6.0 | 2.5, 2.8, 3.0 | 150(2) | -40 to +125 | 120 | 240 | ±0.5 | Dual LDO plus Reset output, Reference bypass input, Shutdown, Select Mode™ selectable output voltages | 10-Pin MSOP |
| TC1306 | 6.0 | 1.8, 2.8, 3.0 | 150(2) | -40 to +125 | 120 | 240 | ±0.5 | Dual LDO plus Reset output, Shutdown, Select Mode™ selectable output voltages | 8-Pin MSOP |
| TC1307(3) | 6.0 | 1.8, 2.5, 2.8, 3.0 | 150(2) | -40 to +125 | 220 | 200 | ±0.5 | Quad LDO plus Reset output, Shutdown, Select Mode™ selectable output voltage | 16-Pin QSOP |

**NOTE 1: Depending on external transistor configuration.**
**2: Each channel (for Dual and Quad LDOs).**
**3: LDOs with shutdown (except Power-Management Combination Products as indicated) have typical shutdown currents of 0.05 µA.**

## POWER MANAGEMENT – Switching Regulators

| Part # | Description | Input Voltage Range (V) | Output Voltage (V) | Operating Temperature Range (°C) | Control Scheme | Switching Frequency (kHz) | Typical Active Current (µA) | Output Current (mA) | Features | Packages |
|---|---|---|---|---|---|---|---|---|---|---|
| MCP1601 | Synchronous Buck Regulator | 2.7 to 5.5 | 0.9V to VIN | -40 to +85 | PFM/PWM/LDO | 750 | 825 (PWM)<br>125 (PFM) | 500 | UVLO, Auto-switching, LDO | 8-Pin MSOP |
| MCP1612 | Synchronous Buck DC/DC Regulator | 2.7 to 5.5 | 0.8 to 5.5 | -40 to +85 | Constant frequency PWM | 1400 | 10,000 | 1000 | Overall efficiency >94% soft start, over-temperature and over-current protection | 8-Pin MSOP,<br>8-Pin 3x3 DFN |
| MCP1650 | Step-up DC/DC controller | 2.7 to 5.5 | 2.5 to ext. tx limited | -40 to +125 | Constant frequency, 2 fixed DC | 750 | 120 | 560/440 | 2 duty cycles for min. and max. loads, shutdown control, UVLO, soft start | 8-Pin MSOP |
| MCP1651 | Step-up DC/DC controller | 2.7 to 5.5 | 2.5 to ext. tx limited | -40 to +125 | Constant frequency, 2 fixed DC | 750 | 120 | 560/440 | 2 duty cycles for min. and max. loads, shutdown control, low battery detect, UVLO, soft start | 8-Pin MSOP |
| MCP1652 | Step-up DC/DC controller | 2.7 to 5.5 | 2.5 to ext. tx limited | -40 to +125 | Constant frequency, 2 fixed DC | 750 | 120 | 560/440 | 2 duty cycles for min. and max. loads, shutdown control, power-good indicator, UVLO, soft start | 8-Pin MSOP |
| MCP1653 | Step-up DC/DC controller | 2.7 to 5.5 | 2.5 to ext. tx limited | -40 to +125 | Constant frequency, 2 fixed DC | 750 | 120 | 560/440 | 2 duty cycles for min. and max. loads, shutdown control, low battery detect, power-good indicator, UVLO, soft start | 10-Pin MSOP |
| TC105 | Step-down DC/DC Controller | 2.2 to 10 | 3.0, 3.3, 5.0 | -40 to +85 | PFM/PWM | 300 | 57 | 1,000 | Low-Power Shutdown mode | 5-Pin SOT-23A |
| TC120 | Step-down Regulator/Controller Combination | 1.8 to 10 | 3.0, 3.3, 5.0 | -40 to +85 | PFM/PWM | 300 | 52 | 2,000 | Soft-start, Low-Power Shutdown mode | 8-Pin SOP |
| TC125 | Step-up DC/DC Regulator | 0.9 to 10 | 3.0, 3.3, 5.0 | -40 to +85 | PFM | 100 | 20 | 80 | Low-Power Shutdown mode | 5-Pin SOT-23A |
| TC126 | Step-up DC/DC Regulator | 0.9 to 10 | 3.0, 3.3, 5.0 | -40 to +85 | PFM | 100 | 20 | 80 | Feedback voltage sensing | 5-Pin SOT-23A |
| TC115 | Step-up DC/DC Regulator | 0.9 to 10 | 3.0, 3.3, 5.0 | -40 to +85 | PFM/PWM | 100 | 80 | 140 | Feedback voltage sensing, Low-Power Shutdown mode | 5-Pin SOT-89 |
| TC110 | Step-up DC/DC Controller | 2.0 to 10 | 3.0, 3.3, 5.0 | -40 to +85 | PFM/PWM | 100/300 | 50/120 | 300 | Soft-start, Low-Power Shutdown mode | 5-Pin SOT-23A |

## POWER MANAGEMENT – PWM Controllers

| Part # | Description | Input Voltage Range (V) | Output Voltage (V) | Operating Temperature Range (°C) | Control Scheme | Switching Frequency (kHz) | Typical Active Supply (µA) | Output Current (mA) | Features | Packages |
|---|---|---|---|---|---|---|---|---|---|---|
| MCP1630 | High speed PWM to use with PIC® MCUs | 2.7 to 5.5 | VSS + 0.2V to VDD - 0.2V | -40 to +125 | Cycle-by-Cycle DC control | 1000 | 3.5 | ±10 | UVLO, current sense to VEXT, response <25 ns | 8-Pin MSOP |

## POWER MANAGEMENT – Charge Pump DC-to-DC Converters

| Part # | Input Voltage Range (V) | Output Voltage (V) | Operating Temperature Range (°C) | Maximum Input Current(1) (µA) | Typical Active Output Current (mA) | Features | Packages |
|---|---|---|---|---|---|---|---|
| **Inverting or Doubling Charge Pumps** | | | | | | | |
| TC1044S | 1.5 to 12 | VOUT = -VIN or VOUT = 2 VIN | -40 to +85 | 160 | 20 | 85 kHz oscillator, Boost mode | 8-Pin PDIP, 8-Pin SOIC |
| TC7660 | 1.5 to 10 | VOUT = -VIN or VOUT = 2 VIN | -40 to +85 | 180 | 20 | 10 kHz oscillator | 8-Pin PDIP, 8-Pin SOIC |
| TC7660H | 1.5 to 10 | VOUT = -VIN or VOUT = 2 VIN | -40 to +85 | 1,000 | 20 | 120 kHz oscillator | 8-Pin PDIP, 8-Pin SOIC |
| TC7660S | 1.5 to 12 | VOUT = -VIN or VOUT = 2 VIN | -40 to +85 | 160 | 20 | 45 kHz oscillator, Boost mode | 8-Pin PDIP, 8-Pin SOIC |
| TC7662B | 1.5 to 15 | VOUT = -VIN or VOUT = 2 VIN | -40 to +85 | 180 | 20 | 35 kHz oscillator, Boost mode | 8-Pin PDIP, 8-Pin SOIC |
| TC1219 | 1.5 to 5.5 | VOUT = -VIN or VOUT = 2 VIN | -40 to +85 | 115 | 25 | 12 kHz oscillator, Low-Power Shutdown mode | 6-Pin SOT-23A |
| TC1220 | 1.5 to 5.5 | VOUT = -VIN or VOUT = 2 VIN | -40 to +85 | 325 | 25 | 35 kHz oscillator, Low-Power Shutdown mode | 6-Pin SOT-23A |
| TC1221 | 1.8 to 5.5 | VOUT = -VIN or VOUT = 2 VIN | -40 to +85 | 600 | 25 | Shutdown, 125 kHz oscillator | 6-Pin SOT-23A |
| TC1222 | 1.8 to 5.5 | VOUT = -VIN or VOUT = 2 VIN | -40 to +85 | 2,800 | 25 | Shutdown, 750 kHz oscillator | 6-Pin SOT-23A |
| TCM828 | 1.5 to 5.5 | VOUT = -VIN or VOUT = 2 VIN | -40 to +85 | 90 | 25 | 12 kHz oscillator | 5-Pin SOT-23A |
| TCM829 | 1.5 to 5.5 | VOUT = -VIN or VOUT = 2 VIN | -40 to +85 | 260 | 25 | 35 kHz oscillator | 5-Pin SOT-23A |
| TC1240 | 2.5 to 4.0 | VOUT = 2 VIN | -40 to +85 | 900 | 40 | Shutdown, 160 kHz oscillator | 6-Pin SOT-23A |
| TC1240A | 2.5 to 5.5 | VOUT = 2 VIN | -40 to +85 | 900 | 40 | Shutdown, 160 kHz oscillator | 6-Pin SOT-23A |
| TC7662A | 3 to 18 | VOUT = -VIN or VOUT = 2VIN | -40 to +85 | 200 | 40 | 12 kHz oscillator | 8-Pin PDIP |
| TC962 | 3 to 18 | VOUT = -VIN or VOUT = 2 VIN | -40 to +85 | 200 | 80 | | 8-Pin PDIP, 16-Pin SOIC |
| TC1121 | 2.4 to 5.5 | VOUT = -VIN or VOUT = 2 VIN | -40 to +85 | 100 | 100 | Low-Power Shutdown mode | 8-Pin MSOP, 8-Pin PDIP, 8-Pin SOIC |
| **Multi-Function Charge Pumps** | | | | | | | |
| TCM680 | 2.0 to 5.5 | VOUT = ±2 VIN | -40 to +85 | 1,000 | ±10 | Generates ±6V from +3V or ±10V from +5V | 8-Pin PDIP, 8-Pin SOIC |
| **Inverting and Doubling Charge Pumps** | | | | | | | |
| TC682 | 2.4 to 5.5 | VOUT = -2 VIN | -40 to +85 | 400 | 10 | 12 kHz oscillator | 8-Pin PDIP, 8-Pin SOIC |
| **Regulated Charge Pumps** | | | | | | | |
| TC1142 | 2.5 to 5.5 | -3V to -5V | -40 to +85 | 400 | 20 | Regulated GaAs FET supply, Internal 200 kHz oscillator, External clock 3 kHz to 500 kHz, Low-Power Shutdown mode | 8-Pin MSOP |
| MCP1252 | 2.1/2.7 to 5.5<br>2.0 to 5.5 | Selectable 3.3V or 5.0V or Adjustable 1.5V to 5.5V | -40 to +85 | 120 | 120 mA for VIN>3.0V | Power-Good output, 650 kHz oscillator | 8-Pin MSOP |
| MCP1253 | 2.1/2.7 to 5.5<br>2.0 to 5.5 | Selectable 3.3V or 5.0V or Adjustable 1.5V to 5.5V | -40 to +85 | 120 | 120 mA for VIN>3.0V | Power-Good output, 1 MHz oscillator | 8-Pin MSOP |

**NOTE 1: Measured at VDD = 5.0V at 25°C and no load.**

## POWER MANAGEMENT – CPU/System Supervisors

| Part # | VCC Range (V) | Operating Temperature Range (°C) | Nominal Reset Voltage (V) | Reset Type | Output | Typical Reset Pulse Width (ms) | Typical Supply Current (µA) | Additional Features | Packages | Bond Options |
|---|---|---|---|---|---|---|---|---|---|---|
| MCP102 | 1.0-5.5 | -40 to 125 | 1.9, 2.32, 2, 63, 2.93, 3.08, 4.38, 4.63 | Active Low | CMOS Push-Pull | 120 | 1 | | 3-Pin SOT-23B, 3-Pin SC-70, 3-Pin TO-92 | N/A |
| MCP103 | 1.0-5.5 | -40 to 125 | 1.9, 2.32, 2, 63, 2.93, 3.08, 4.38, 4.63 | Active Low | CMOS Push-Pull | 120 | 1 | Max. 809 Pinout | 3-Pin SOT-23B, 3-Pin SC-70, 3-Pin TO-92 | N/A |
| TC1272 | 1.2-5.5 | -40 to +85 | 4.62, 4.37, 4.12 | Active Low | CMOS Push-Pull | 200 | 17 | | 3-Pin SOT-23B | N/A |
| TC1275 | 1.2-5.5 | -40 to +85 | 3.06, 2.88, 2.55 | Active Low | CMOS Push-Pull | 200 | 20 | | 3-Pin SOT-23B | N/A |
| TCM809 | 1.2-5.5 | -40 to +85 | 4.63, 4.38, 4.00, 3.08, 2.93, 2.63, 2.32 | Active Low | CMOS Push-Pull | 240 | 12 | | 3-Pin SOT-23B, 3-Pin SC-70 | N/A |
| TC1270 | 1.2-5.5 | -40 to +85 | 4.63, 4.38, 3.08, 2.93, 2.63, 1.75 | Active Low | CMOS Push-Pull | 280 | 7 | Manual Reset | 4-Pin SOT-143 | N/A |
| TCM811 | 1.0-5.5 | -40 to +85 | 4.63, 4.38, 3.08, 2.93, 2.63, 1.75 | Active Low | CMOS Push-Pull | 280 | 6 | Manual Reset | 4-Pin SOT-143 | N/A |
| MCP100 | 1.0-5.5 | -40 to +85 | 4.72, 4.62, 4.47, 4.37, 3.075, 2.92, 2.62 | Active Low | CMOS Push-Pull | 350 | 45 | | 3-Pin TO-92, 3-Pin SOT-23B | D, H |
| MCP809 | 1.0-5.5 | -40 to +85 | 4.72, 4.62, 4.47, 4.37, 3.075, 2.92, 2.62 | Active Low | CMOS Push-Pull | 350 | 45 | | 3-Pin SOT-23B | N/A |
| TC1274 | 1.8-5.5 | -40 to +85 | 4.62, 4.37, 4.13 | Active High | CMOS Push-Pull | 200 | 17 | | 3-Pin SOT-23B | N/A |
| TC1277 | 1.8-5.5 | -40 to +85 | 3.06, 2.88, 2.55 | Active High | CMOS Push-Pull | 200 | 20 | | 3-Pin SOT-23B | N/A |
| TCM810 | 1.2-5.5 | -40 to +85 | 4.63, 4.38, 3.08, 2.93, 2.63, 2.32 | Active High | CMOS Push-Pull | 240 | 12 | | 3-Pin SOT-23B, 3-Pin SC-70 | N/A |
| TC1271 | 1.2-5.5 | -40 to +85 | 4.63, 4.38, 3.08, 2.93, 2.63, 1.75 | Active High | CMOS Push-Pull | 280 | 7 | Manual Reset | 4-Pin SOT-143 | N/A |
| TCM812 | 1.1-5.5 | -40 to +85 | 4.63, 4.38, 3.08, 2.93, 2.63, 1.75 | Active High | CMOS Push-Pull | 280 | 6 | Manual Reset | 4-Pin SOT-143 | N/A |
| MCP101 | 1.0-5.5 | -40 to +85 | 4.72, 4.62, 4.47, 4.37, 3.075, 2.92, 2.62 | Active High | CMOS Push-Pull | 350 | 45 | | 3-Pin TO-92, 3-Pin SOT-23B | D, H |
| MCP810 | 1.0-5.5 | -40 to +85 | 4.72, 4.62, 4.47, 4.37, 3.075, 2.92, 2.62 | Active High | CMOS Push-Pull | 350 | 45 | | 3-Pin SOT-23B | N/A |
| MCP121 | 1.0-5.5 | -40 to 125 | 1.9, 2.32, 2, 63, 2.93, 3.08, 4.38, 4.63 | Active Low | Open-drain | 120 | 1 | | 3-Pin SOT-23B, 3-Pin SC-70, 3-Pin TO-92 | N/A |
| TC1273 | 1.2-5.5 | -40 to +85 | 4.62, 4.37, 4.12 | Active Low | Open-drain | 200 | 17 | | 3-Pin SOT-23B | N/A |
| TC1276 | 1.2-5.5 | -40 to +85 | 3.06, 2.88, 2.55 | Active Low | Open-drain | 200 | 20 | | 3-Pin SOT-23B | N/A |
| MCP120 | 1.0-5.5 | -40 to +85 | 4.72, 4.62, 4.47, 4.37, 3.075, 2.92, 2.62 | Active Low | Open-drain | 350 | 45 | | 3-Pin TO-92, 3-Pin SOT-23, 8-Pin SOIC | D, G, H |
| TC1279 | 1.2-5.5 | -40 to +85 | 4.62, 4.37, 4.125 | Active Low | Open-drain | 350 | 900 | | 3-Pin SOT-23B | N/A |
| MCP131 | 1.0-5.5 | -40 to 125 | 1.9, 2.32, 2, 63, 2.93, 3.08, 4.38, 4.63 | Active Low | Open-drain | 120 | 1 | 100kΩ Internal Pull-up Resistor | 3-Pin SOT-23B, 3-Pin SC-70, 3-Pin TO-92 | N/A |
| MCP130 | 1.0-5.5 | -40 to +85 | 4.72, 4.62, 4.47, 4.37, 3.075, 2.92, 2.62 | Active Low | Open-drain w/ 5 kOhm Pull-up | 350 | 45 | | 3-Pin TO-92, 3-Pin SOT-23, 8-Pin SOIC | D, F, H |
| TC1278 | 1.2-5.5 | -40 to +85 | 4.62, 4.37, 4.125 | Active High | Open-drain | 350 | 900 | | 3-Pin SOT-23B | N/A |
| TC1232 | 4.5-5.5 | -40 to +85 | 4.62, 4.37 | Active Low/High | Open-drain | 610 | 50 | Watchdog Timer | 8-Pin PDIP, 8-Pin SOIC, 16-Pin SOIC | N/A |
| TC32M | 4.5-5.5 | -40 to +85 | 4.5 | Active Low | Open-drain | 700 | 50 | Watchdog Timer | 3-Pin TO-92, 3-Pin SOT-223 | N/A |

## POWER MANAGEMENT – Voltage Detectors

| Part # | $V_{CC}$ Range (V) | Operating Temperature Range (°C) | Nominal Reset Voltage (V) | Reset Type | Output | Minimum Reset Pulse Width (ms) | Typical Supply Current (µA) | Features | Packages |
|---|---|---|---|---|---|---|---|---|---|
| MCP111 | 1.0 to 5.5 | -40 to +125 | 4.63, 4.38, 3.08, 2.93, 2.63, 2.32, 1.90 | Active Low | Open-drain | — | 1 | | 3-Pin SOT-23B, 3-Pin TO-92, 3-Pin SC-70, 3-Pin SOT-89 |
| MCP112 | 1.0 to 5.5 | -40 to +125 | 4.63, 4.38, 3.08, 2.93, 2.63, 2.32, 1.90 | Active Low | CMOS Push-Pull | — | 1 | | 3-Pin SOT-23B, 3-Pin TO-92, 3-Pin SC-70, 3-Pin SOT-89 |
| TC51 | 0.7 to 10 | -40 to +85 | 3.0, 2.7, 2.2 | Active Low | Open-drain | 50 | 1 | Reset delay | 3-Pin SOT-23A |
| TC52 | 1.5 to 10 | -40 to +85 | 4.5/2.7, 3.0/2.7 | Active Low | Open-drain | — | 2 | Dual channel | 5-Pin SOT-23A |
| TC53 | 1.5 to 10 | -40 to +85 | 2.9, 2.7, 2.2 | Active Low | CMOS Push-Pull or Open-drain | — | 1 | | 5-Pin SOT-23A |
| TC54 | 0.7 to 10 | -40 to +85 | 7.7, 4.3, 4.2, 3.0, 2.9, 2.7, 2.1, 1.4 | Active Low | CMOS Push-Pull or Open-drain | — | 1 | | 3-Pin SOT-23A, 3-Pin SOT-89, 3-Pin TO-92 |

## POWER MANAGEMENT – Power MOSFET Drivers

| Part # | Configuration | Operating Temperature Range (°C) | Peak Output Current (A) | Output Resistance ($R_H$/$R_L$) (Max. Ω @ 25°C) | Max. Supply Voltage (V) | Input/Output Delay (td1, td2)[1] (ns) | Packages |
|---|---|---|---|---|---|---|---|
| **Low-Side Drivers, 0.5A to 1.2A Peak Output Current** | | | | | | | |
| TC1410 | Single, Inverting | -40 to +85 | 0.5 | 22/22 | 16 | 30/30 | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| TC1410N | Single, Non-inverting | -40 to +85 | 0.5 | 22/22 | 16 | 30/30 | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| TC1411 | Single, Inverting | -40 to +85 | 1 | 11/11 | 16 | 30/30 | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| TC1411N | Single, Non-inverting | -40 to +85 | 1 | 11/11 | 16 | 30/30 | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| TC1426 | Dual, Inverting | 0 to +70 | 1.2 | 18/18 | 16 | 75/75 | 8-Pin PDIP, 8-Pin SOIC |
| TC1427 | Dual, Non-inverting | 0 to +70 | 1.2 | 18/18 | 16 | 75/75 | 8-Pin PDIP, 8-Pin SOIC |
| TC1428 | Dual, Inverting and Non-inverting | 0 to +70 | 1.2 | 18/18 | 16 | 75/75 | 8-Pin PDIP, 8-Pin SOIC |
| TC4467 | Quad, Inverting | -40 to +85 | 1.2 | 15/15 | 18 | 40/40 | 14-Pin PDIP, 16-Pin SOIC (W) |
| TC4468 | Quad, Non-inverting | -40 to +85 | 1.2 | 15/15 | 18 | 40/40 | 14-Pin PDIP, 16-Pin SOIC (W) |
| TC4469 | Quad, Non-inverting | -40 to +85 | 1.2 | 15/15 | 18 | 40/40 | 14-Pin PDIP, 16-Pin SOIC (W) |
| **Low-Side Drivers, 1.5A Peak Output Current** | | | | | | | |
| TC4403 | Single, Non-inverting Floating Load Driver | -40 to +85 | 1.5 | 5/5 | 18 | 33/38 | 8-Pin PDIP |
| TC4426A | Dual, Inverting | -40 to +125 | 1.5 | 9/9 | 18 | 30/30 | 8-Pin PDIP, 8-Pin SOIC, 8-Pin DFN |
| TC4427A | Dual, Non-inverting | -40 to +125 | 1.5 | 9/9 | 18 | 30/30 | 8-Pin PDIP, 8-Pin SOIC, 8-Pin DFN |
| TC4428A | Dual, Inverting and Non-inverting | -40 to +125 | 1.5 | 9/9 | 18 | 30/30 | 8-Pin PDIP, 8-Pin SOIC, 8-Pin DFN |
| TC4426 | Dual, Inverting | -40 to +125 | 1.5 | 10/10 | 18 | 20/40 | 8-Pin PDIP, 8-Pin SOIC, 8-Pin DFN, 8-Pin MSOP |
| TC4427 | Dual, Non-inverting | -40 to +125 | 1.5 | 10/10 | 18 | 20/40 | 8-Pin PDIP, 8-Pin SOIC, 8-Pin DFN, 8-Pin MSOP |
| TC4428 | Dual, Inverting and Non-inverting | -40 to +125 | 1.5 | 10/10 | 18 | 20/40 | 8-Pin PDIP, 8-Pin SOIC, 8-Pin DFN, 8-Pin MSOP |

**NOTE 1: *$t_{D1}$ = delay time from input low-to-high transition to output transition. $t_{D2}$ = delay time from input high-to-low transition to output transition.**

| POWER MANAGEMENT – Power MOSFET Drivers | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Part #** | **Configuration** | **Operating Temperature Range (°C)** | **Peak Output Current (A)** | **Output Resistance ($R_H$/$R_L$) (Max. Ω @ 25°C)** | **Max. Supply Voltage (V)** | **Input/Output Delay (td1, td2)[1] (ns)** | **Packages** |
| **Low-Side Drivers, 1.5A Peak Output Current (continued)** | | | | | | | |
| TC426 | Dual, Inverting | -40 to +85 | 1.5 | 15/10 | 18 | 50/75 | 8-Pin PDIP, 8-Pin SOIC |
| TC427 | Dual, Non-inverting | -40 to +85 | 1.5 | 15/10 | 18 | 50/75 | 8-Pin PDIP, 8-Pin SOIC |
| TC428 | Dual, Inverting and Non-inverting | -40 to +85 | 1.5 | 15/10 | 18 | 50/75 | 8-Pin PDIP, 8-Pin SOIC |
| TC4404 | Dual, Inverting | -40 to +85 | 1.5 | 10/10 | 18 | 15/32 | 8-Pin PDIP, 8-Pin SOIC |
| TC4405 | Dual, Non-inverting | -40 to +85 | 1.5 | 10/10 | 18 | 15/32 | 8-Pin PDIP, 8-Pin SOIC |
| **Low-Side Drivers, 2.0A to 9.0A Peak Output Current** | | | | | | | |
| TC1412 | Single, Inverting | -40 to +85 | 2 | 6/6 | 16 | 35/35 | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| TC1412N | Single, Non-inverting | -40 to +85 | 2 | 6/6 | 16 | 35/35 | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| TC1413 | Single, Inverting | -40 to +85 | 3 | 4/4 | 16 | 35/35 | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| TC1413N | Single, Non-inverting | -40 to +85 | 3 | 4/4 | 16 | 35/35 | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| TC4423 | Dual, Inverting | -40 to +125 | 3 | 5/5 | 18 | 33/38 | 8-Pin PDIP, 16-Pin SOIC (W), 8-Pin DFN |
| TC4424 | Dual, Non-inverting | -40 to +125 | 3 | 5/5 | 18 | 33/38 | 8-Pin PDIP, 16-Pin SOIC (W), 8-Pin DFN |
| TC4425 | Dual, Inverting and Non-inverting | -40 to +125 | 3 | 5/5 | 18 | 33/38 | 8-Pin PDIP, 16-Pin SOIC (W), 8-Pin DFN |
| TC429 | Single, Inverting | -40 to +85 | 6 | 2.5/2.5 | 18 | 53/60 | 8-Pin PDIP, 8-Pin DFN, 8-Pin SOIC |
| TC4420 | Single, Non-inverting | -40 to +125 | 6 | 2.8/2.5 | 18 | 55/55 | 8-Pin PDIP, 8-Pin SOIC, 5-Pin TO-220, 8-Pin DFN |
| TC4429 | Single, Inverting | -40 to +125 | 6 | 2.8/2.5 | 18 | 55/55 | 8-Pin PDIP, 8-Pin SOIC, 5-Pin TO-220, 8-Pin DFN |
| TC4421 | Single, Inverting | -40 to +125 | 9 | 1.4 (typ)/1.7 | 18 | 30/33 | 8-Pin PDIP, 5-Pin TO-220, 8-Pin DFN |
| TC4422 | Single, Non-inverting | -40 to +125 | 9 | 1.4 (typ)/1.7 | 18 | 30/33 | 8-Pin PDIP, 5-Pin TO-220, 8-Pin DFN |
| **High-Side/Low-Side Drivers** | | | | | | | |
| TC4626 | Single, Inverting | -40 to +85 | 1.5 | 15/10 | 6 | 35/45 | 8-Pin PDIP, 16-Pin SOIC (W) |
| TC4627 | Single, Non-inverting | -40 to +85 | 1.5 | 15/10 | 6 | 35/45 | 8-Pin PDIP, 16-Pin SOIC (W) |
| TC4431 | Single, Inverting | -40 to +85 | 1.5 | 10/10 | 30 | 62/78 | 8-Pin PDIP, 8-Pin SOIC |
| TC4432 | Single, Non-inverting | -40 to +85 | 1.5 | 10/10 | 30 | 62/78 | 8-Pin PDIP, 8-Pin SOIC |

**NOTE 1: *$t_{D1}$ = delay time from input low-to-high transition to output transition. $t_{D2}$ = delay time from input high-to-low transition to output transition.**

## POWER MANAGEMENT – Battery Chargers

| Part # | Mode | Cell Type | # of Cells | Vcc Range (V) | Max. Voltage Regulation (%) | Int/Ext FET | Features | Packages |
|---|---|---|---|---|---|---|---|---|
| MCP73826 | Linear | Li Ion/Li Polymer | 1 | 4.5 to 5.5 | ±1.0 | Ext | Small size | 6-Pin SOT-23 |
| MCP73827 | Linear | Li Ion/Li Polymer | 1 | 4.5 to 5.5 | ±1.0 | Ext | Mode indicator, Charge Current monitor | 8-Pin MSOP |
| MCP73828 | Linear | Li Ion/Li Polymer | 1 | 4.5 to 5.5 | ±1.0 | Ext | Temperature monitor | 8-Pin MSOP |
| MCP73841 | Linear | Li Ion/Li Polymer | 1 | 4.5 to 12 | ±0.5 | Ext | Safety charge timers, Temperature monitor | 10-Pin MSOP |
| MCP73842 | Linear | Li Ion/Li Polymer | 2 | 8.7 to 12 | ±0.5 | Ext | Safety charge timers, Temperature monitor | 10-Pin MSOP |
| MCP73843 | Linear | Li Ion/Li Polymer | 1 | 4.5 to 12 | ±0.5 | Ext | Safety charge timers | 8-Pin MSOP |
| MCP73844 | Linear | Li Ion/Li Polymer | 2 | 8.7 to 12 | ±0.5 | Ext | Safety charge timers | 8-Pin MSOP |
| MCP73853 | Linear | Li-Ion/Li-Polymer | 1 | 4.5 to 5.5 | ±0.5 | Int | USB control, safety charge timers, temperature monitor, thermal regulation | 16-Pin QFN (4x4) |
| MCP73855 | Linear | Li-Ion/Li-Polymer | 1 | 4.5 to 5.5 | ±0.5 | Int | USB control, safety charge timers, thermal regulation | 10-Pin DFN (3x3) |
| MCP73861 | Linear | Li Ion/Li Polymer | 1 | 4.5 to 12 | ±0.5 | Int | Safety charge timers, Temperature monitor, Thermal regulation | 16-pin 4x4 QFN |
| MCP73862 | Linear | Li Ion/Li Polymer | 2 | 8.7 to 12 | ±0.5 | Int | Safety charge timers, Temperature monitor, Thermal regulation | 16-pin 4x4 QFN |

## POWER MANAGEMENT – Hot Swap Controllers

| Part # | Number of Outputs | Vpos to Vneg Differential Voltage (V) | Junction Temperature Range (°C) | OVLO | UVLO | Power Good | Int/Ext FET | Applications | Packages |
|---|---|---|---|---|---|---|---|---|---|
| MCP18480 | 1 | -0.3 to +15.0 | -40 to +85 | Adjustable | Adjustable | Adjustable | Ext | -48V Telecom/Datacom, Bus/Backplane | 20-Pin SSOP |

## LINEAR – Op Amps

| Part # | # per Package | GBWP | Iq Typical (µA) | Vos Max (mV) | Input Voltage Noise Density (nV/rtHz) | Operating Voltage (V) | Temp. Range (°C) | Features | Packages |
|---|---|---|---|---|---|---|---|---|---|
| TC1034 | 1 | 90 kHz | 6 | 1.5 | 125(1) | 1.8 to 5.5 | -40 to +85 | Rail-to-Rail Input/Output | 5-Pin SOT-23A |
| TC1035 | 1 | 90 kHz | 6 | 1.5 | 125(1) | 1.8 to 5.5 | -40 to +85 | Rail-to-Rail Input/Output, Shutdown pin | 6-Pin SOT-23A |
| TC1029 | 2 | 90 kHz | 6 | 1.5 | 125(1) | 1.8 to 5.5 | -40 to +85 | Rail-to-Rail Input/Output | 8-Pin PDIP, 8-Pin MSOP, 8-Pin SOIC |
| TC1030 | 4 | 90 kHz | 5 | 1.5 | 125(1) | 1.8 to 5.5 | -40 to +85 | Rail-to-Rail Input/Output, Shutdown pins | 16-Pin QSOP |
| MCP6041 | 1 | 14 kHz | 0.6 | 3 | 170(1) | 1.4 to 5.5 | -40 to +85 | Rail-to-Rail Input/Output | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP, 5-Pin SOT-23 |
| MCP6042 | 2 | 14 kHz | 0.6 | 3 | 170(1) | 1.4 to 5.5 | -40 to +85 | Rail-to-Rail Input/Output | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| MCP6043 | 1 | 14 kHz | 0.6 | 3 | 170(1) | 1.4 to 5.5 | -40 to +85 | Rail-to-Rail Input/Output, Chip Select | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| MCP6044 | 4 | 14 kHz | 0.6 | 3 | 170(1) | 1.4 to 5.5 | -40 to +85 | Rail-to-Rail Input/Output | 14-Pin PDIP, 14-Pin SOIC, 14-Pin TSSOP |

**NOTE 1: Values are typical at 1 KHz**
**2: Values are typical at 10 KHz**

## LINEAR – Op Amps

| Part # | # per Package | GBWP | IQ Typical (µA) | VOS Max (mV) | Input Voltage Noise Density (nV/rtHz) | Operating Voltage (V) | Temp. Range (°C) | Features | Packages |
|---|---|---|---|---|---|---|---|---|---|
| MCP6141 | 1 | 100 kHz | 0.6 | 3 | 170(1) | 1.4 to 5.5 | -40 to +85 | Rail-to-Rail Input/Output, G>10 stable | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| MCP6142 | 2 | 100 kHz | 0.6 | 3 | 170(1) | 1.4 to 5.5 | -40 to +85 | Rail-to-Rail Input/Output, G>10 stable | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| MCP6143 | 1 | 100 kHz | 0.6 | 3 | 170(1) | 1.4 to 5.5 | -40 to +85 | Rail-to-Rail Input/Output, G>10 stable, Chip Select | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| MCP6144 | 4 | 100 kHz | 0.6 | 3 | 170(1) | 1.4 to 5.5 | -40 to +85 | Rail-to-Rail Input/Output, G>10 stable | 14-Pin PDIP, 14-Pin SOIC, 14-Pin TSSOP |
| MCP606 | 1 | 155 kHz | 19 | 0.25 | 38(1) | 2.5 to 5.5 | -40 to +85 | Rail-to-Rail Output | 8-Pin PDIP, 8-Pin SOIC, 8-Pin TSSOP, 5-Pin SOT23 |
| MCP607 | 2 | 155 kHz | 19 | 0.25 | 38(1) | 2.5 to 5.5 | -40 to +85 | Rail-to-Rail Output | 8-Pin PDIP, 8-Pin SOIC, 8-Pin TSSOP |
| MCP608 | 1 | 155 kHz | 19 | 0.25 | 38(1) | 2.5 to 5.5 | -40 to +85 | Rail-to-Rail Output, Chip Select | 8-Pin PDIP, 8-Pin SOIC, 8-Pin TSSOP |
| MCP609 | 4 | 155 kHz | 19 | 0.25 | 38(1) | 2.5 to 5.5 | -40 to +85 | Rail-to-Rail Output | 14-Pin PDIP, 14-Pin SOIC, 14-Pin TSSOP |
| MCP616 | 1 | 190 kHz | 19 | 0.15 | 32(1) | 2.3 to 5.5 | -40 to +85 | Rail-to-Rail Output, PNP Input | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| MCP617 | 2 | 190 kHz | 19 | 0.15 | 32(1) | 2.3 to 5.5 | -40 to +85 | Rail-to-Rail Output, PNP | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| MCP618 | 1 | 190 kHz | 19 | 0.15 | 32(1) | 2.3 to 5.5 | -40 to +85 | Rail-to-Rail Output, Chip Select, PNP Input | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| MCP619 | 4 | 190 kHz | 19 | 0.15 | 32(1) | 2.3 to 5.5 | -40 to +85 | Rail-to-Rail Output, PNP Input | 14-Pin PDIP, 14-Pin SOIC, 14-Pin TSSOP |
| MCP6231 | 1 | 300 kHz | 20 | 7 | 52(1) | 1.8 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output | 5-Pin SC-70, 5-Pin SOT-23, 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| MCP6232 | 2 | 300 kHz | 20 | 7 | 52(1) | 1.8 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| MCP6241 | 1 | 650 kHz | 50 | 7 | 45(1) | 1.8 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output | 5-Pin SC-70, 5-Pin SOT-23, 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| MCP6242 | 2 | 650 kHz | 50 | 7 | 45(1) | 1.8 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| MCP6001 | 1 | 1 MHz | 140 | 4.5 | 28(1) | 1.8 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output | 5-Pin SOT-23, 5-Pin SC-70 |
| MCP6002 | 2 | 1 MHz | 140 | 4.5 | 28(1) | 1.8 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| MCP6004 | 4 | 1 MHz | 140 | 4.5 | 28(1) | 1.8 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output | 14-Pin PDIP, 14-Pin SOIC, 14-Pin TSSOP |
| MCP6271 | 1 | 2 MHz | 170 | 3 | 20(1) | 2.0 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| MCP6272 | 2 | 2 MHz | 170 | 3 | 20(1) | 2.0 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| MCP6273 | 1 | 2 MHz | 170 | 3 | 20(1) | 2.0 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output, Chip Select | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| MCP6274 | 4 | 2 MHz | 170 | 3 | 20(1) | 2.0 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output | 14-Pin PDIP, 14-Pin SOIC, 14-Pin TSSOP |
| MCP6275 | 2 | 2 MHz | 150 | 3 | 20(1) | 2.0 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output, Dual connected, Chip Select | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| MCP601 | 1 | 2.8 MHz | 230 | 2 | 29(1) | 2.7 to 5.5 | -40 to +125 | Rail-to-Rail Output | 8-Pin PDIP, 8-Pin SOIC, 8-Pin TSSOP, 5-Pin SOT-23 |
| MCP602 | 2 | 2.8 MHz | 230 | 2 | 29(1) | 2.7 to 5.5 | -40 to +125 | Rail-to-Rail Output | 8-Pin PDIP, 8-Pin SOIC, 8-Pin TSSOP |

**NOTE 1: Values are typical at 1 KHz**
**2: Values are typical at 10 KHz**

## LINEAR – Op Amps

| Part # | # per Package | GBWP | IQ Typical (µA) | VOS Max (mV) | Input Voltage Noise Density (nV/rtHz) | Operating Voltage (V) | Temp. Range (°C) | Features | Packages |
|---|---|---|---|---|---|---|---|---|---|
| MCP603 | 1 | 2.8 MHz | 230 | 2 | 29(1) | 2.7 to 5.5 | -40 to +125 | Rail-to-Rail Output, Chip Select | 8-Pin PDIP, 8-Pin SOIC, 8-Pin TSSOP |
| MCP604 | 4 | 2.8 MHz | 230 | 2 | 29(1) | 2.7 to 5.5 | -40 to +125 | Rail-to-Rail Output | 14-Pin PDIP, 14-Pin SOIC, 14-Pin TSSOP |
| MCP6281 | 1 | 5 MHz | 445 | 3 | 16(1) | 2.2 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| MCP6282 | 2 | 5 MHz | 445 | 3 | 16(1) | 2.2 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| MCP6283 | 1 | 5 MHz | 445 | 3 | 16(1) | 2.2 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output, Chip Select | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| MCP6284 | 4 | 5 MHz | 445 | 3 | 16(1) | 2.2 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output | 14-Pin PDIP, 14-Pin SOIC, 14-Pin TSSOP |
| MCP6285 | 2 | 5 MHz | 400 | 3 | 16(1) | 2.2 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output, Dual connected, Chip Select | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| MCP6291 | 1 | 10 MHz | 1000 | 3 | 8.7(2) | 2.4 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| MCP6292 | 2 | 10 MHz | 1000 | 3 | 8.7(2) | 2.4 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| MCP6293 | 1 | 10 MHz | 1000 | 3 | 8.7(2) | 2.4 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output, Chip Select | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| MCP6294 | 4 | 10 MHz | 1000 | 3 | 8.7(2) | 2.4 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output | 14-Pin PDIP, 14-Pin SOIC, 14-Pin TSSOP |
| MCP6295 | 2 | 10 MHz | 1100 | 3 | 8.7(2) | 2.4 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output, Dual connected, Chip Select | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| MCP6021 | 1 | 10 MHz | 1000 | 0.5 | 8.7(2) | 2.5 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output, 1/2 VCC VREF | 8-Pin PDIP, 8-Pin SOIC, 8-Pin TSSOP |
| MCP6022 | 2 | 10 MHz | 1000 | 0.5 | 8.7(2) | 2.5 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output | 8-Pin PDIP, 8-Pin SOIC, 8-Pin TSSOP |
| MCP6023 | 1 | 10 MHz | 1000 | 0.5 | 8.7(2) | 2.5 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output, Chip Select | 8-Pin PDIP, 8-Pin SOIC, 8-Pin TSSOP |
| MCP6024 | 4 | 10 MHz | 1000 | 0.5 | 8.7(2) | 2.5 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output | 14-Pin PDIP, 14-Pin SOIC, 14-Pin TSSOP |

**NOTE 1: Values are typical at 1 KHz**
**2: Values are typical at 10 KHz**

## LINEAR – High Precision Operational Amplifiers

| Part # | # per Package | GBWP | IQ MAX (mA) | Typical VOS (µV) | VOS Drift Max (µV/°C) | Operating Voltage (V) | Temp. Range (°C) | Features | Packages |
|---|---|---|---|---|---|---|---|---|---|
| **Chopper Stabilized** | | | | | | | | | |
| TC7650 | 1 | 2.0 MHz | 3.5 | 5 | 0.05 | 4.5 to 16 | 0 to 70 | Single and Split Supply | 8-Pin PDIP, 14-Pin PDIP |
| TC7652 | 1 | 0.4 MHz | 3 | 5 | 0.05 | 5 to 16 | 0 to 70 | Single and Split Supply, Low Noise | 8-Pin PDIP, 14-Pin PDIP |
| **Auto-Zero** | | | | | | | | | |
| TC913 | 2 | 1.5 MHz | 1.1 | 15 | 0.15 | 6.5 to 16 | 0 to 70 | Single and Split Supply | 8-Pin PDIP, 8-Pin SOIC |

## LINEAR – Programmable Gain Amplifiers (PGA)

| Part # | Channels | -3dB BW (MHz) | IQ Typ. | VOS (µV) | Operating Voltage (V) | Temp. Range (°C) | Features | Packages |
|---|---|---|---|---|---|---|---|---|
| MCP6S21 | 1 | 2 to 12 | 1.1 mA | 275 | 2.5 to 5.5 | -40 to +85 | SPI, 8 Gain Steps, Software Shutdown | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| MCP6S22 | 2 | 2 to 12 | 1.1 mA | 275 | 2.5 to 5.5 | -40 to +85 | SPI, 8 Gain Steps, Software Shutdown | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| MCP6S26 | 6 | 2 to 12 | 1.1 mA | 275 | 2.5 to 5.5 | -40 to +85 | SPI, 8 Gain Steps, Software Shutdown | 14-Pin PDIP, 14-Pin SOIC, 14-Pin TSSOP |
| MCP6S28 | 8 | 2 to 12 | 1.1 mA | 275 | 2.5 to 5.5 | -40 to +85 | SPI, 8 Gain Steps, Software Shutdown | 16-Pin PDIP, 16-Pin SOIC |
| MCP6S91 | 1 | 1 to 18 | 1.0 mA | 4000 | 2.5 to 5.5 | -40 to +125 | SPI, 8 Gain Steps, Software Shutdown | 8-Pin PDIP, 8-Pin SSOIC, 8-Pin MSOP |
| MCP6S92 | 2 | 1 to 18 | 1.0 mA | 4000 | 2.5 to 5.5 | -40 to +125 | SPI, 8 Gain Steps, Software Shutdown | 8-Pin PDIP, 8-Pin SSOIC, 8-Pin MSOP |
| MCP6S93 | 2 | 1 to 18 | 1.0 mA | 4000 | 2.5 to 5.5 | -40 to +125 | SPI, 8 Gain Steps, Software Shutdown | 10-Pin MSOP |

## LINEAR – Integrated Devices

| Part # | # of Op Amps per Package | # of Comparators per Package | IQ Typical (µA) | VREF (V) | Operating Voltage (V) | Temp. Range (°C) | Features | Packages |
|---|---|---|---|---|---|---|---|---|
| TC1026C | 1 | 1 | 12 | 1.2 | 1.8 to 5.5 | -40 to +85 | On-board VREF | 8-Pin PDIP, 8-Pin MSOP, 8-Pin SOIC |
| TC1043C | 2 | 2 | 16 | 1.2 | 1.8 to 5.5 | -40 to +85 | On-board VREF, Shutdown pin | 16-Pin QSOP |

## LINEAR – Comparators

| Part # | # per Package | VREF (V) | Typical Propagation Delay (µs) | IQ Typical (µA) | VOS Max (mV) | Operating Voltage (V) | Temp. Range (°C) | Features | Packages |
|---|---|---|---|---|---|---|---|---|---|
| TC1027 | 4 | 1.2 | 4 | 18 | 5 | 1.8 to 5.5 | -40 to +85 | On-board VREF | 16-Pin PDIP, 16-Pin QSOP, 16-Pin SOIC |
| TC1037 | 1 | — | 4 | 4 | 5 | 1.8 to 5.5 | -40 to +85 | | 5-Pin SOT-23A |
| TC1038 | 1 | — | 4 | 4 | 5 | 1.8 to 5.5 | -40 to +85 | Shutdown pin | 6-Pin SOT-23A |
| TC1039 | 1 | 1.2 | 4 | 6 | 5 | 1.8 to 5.5 | -40 to +85 | On-board VREF | 6-Pin SOT-23A |
| TC1041 | 2 | 1.2 | 4 | 10 | 5 | 1.8 to 5.5 | -40 to +85 | On-board VREF, Programmable hysteresis | 8-Pin MSOP, 8-Pin SOIC |
| MCP6541 | 1 | — | 4 | 1 | 5 | 1.6 to 5.5 | -40 to +85 | Push-Pull, Rail-to-Rail Input/Output | 5-Pin SOT-23, 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| MCP6542 | 2 | — | 4 | 1 | 5 | 1.6 to 5.5 | -40 to +85 | Push-Pull, Rail-to-Rail Input/Output | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| MCP6543 | 1 | — | 4 | 1 | 5 | 1.6 to 5.5 | -40 to +85 | Push-Pull, Rail-to-Rail Input/Output, Chip Select | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| MCP6544 | 4 | — | 4 | 1 | 5 | 1.6 to 5.5 | -40 to +85 | Push-Pull, Rail-to-Rail Input/Output | 14-Pin PDIP, 14-Pin SOIC, 14-Pin TSSOP |
| MCP6546 | 1 | — | 4 | 1 | 5 | 1.6 to 5.5 | -40 to +85 | Open-drain, 9V, Rail-to-Rail Input/Output | 5-Pin SOT-23, 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| MCP6547 | 2 | — | 4 | 1 | 5 | 1.6 to 5.5 | -40 to +85 | Open-drain, 9V, Rail-to-Rail Input/Output | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| MCP6548 | 1 | — | 4 | 1 | 5 | 1.6 to 5.5 | -40 to +85 | Open-drain, 9V, Rail-to-Rail Input/Output, Chip Select | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| MCP6549 | 4 | — | 4 | 1 | 5 | 1.6 to 5.5 | -40 to +85 | Open-drain, 9V, Rail-to-Rail Input/Output | 14-Pin PDIP, 14-Pin SOIC, 14-Pin TSSOP |

**NOTE: All Comparators have rail-to-rail inputs and outputs.**

## MIXED SIGNAL – Successive Approximation Register (SAR) A/D Converters

| Part # | Resolution (bits) | Maximum Sampling Rate (ksamples/sec) | # of Input Channels | Input Type | Interface | Input Voltage Range (V) | Max. Supply Current (μA) | Max. INL | Temp. Range (°C) | Packages |
|---|---|---|---|---|---|---|---|---|---|---|
| MCP3021 | 10 | 22 | 1 | Single-ended | $I^2C$ | 2.7 to 5.5 | 250 | +1 LSB | -40 to +125 | 5-Pin SOT-23A |
| MCP3001 | 10 | 200 | 1 | Single-ended | SPI | 2.7 to 5.5 | 500 | ±1 LSB | -40 to +85 | 8-Pin PDIP, 8-Pin SOIC, 8-Pin TSSOP |
| MCP3002 | 10 | 200 | 2 | Single-ended | SPI | 2.7 to 5.5 | 650 | ±1 LSB | -40 to +85 | 8-Pin PDIP, 8-Pin SOIC, 8-Pin TSSOP |
| MCP3004 | 10 | 200 | 4 | Single-ended | SPI | 2.7 to 5.5 | 550 | ±1 LSB | -40 to +85 | 14-Pin PDIP, 14-Pin SOIC, 14-Pin TSSOP |
| MCP3008 | 10 | 200 | 8 | Single-ended | SPI | 2.7 to 5.5 | 550 | ±1 LSB | -40 to +85 | 16-Pin PDIP, 16-Pin SOIC |
| MCP3221 | 12 | 22 | 1 | Single-ended | $I^2C$ | 2.7 to 5.5 | 250 | ±2 LSB | -40 to +125 | 5-Pin SOT-23A |
| MCP3201 | 12 | 100 | 1 | Single-ended | SPI | 2.7 to 5.5 | 400 | ±1 LSB | -40 to +85 | 8-Pin PDIP, 8-Pin SOIC, 8-Pin TSSOP |
| MCP3202 | 12 | 100 | 2 | Single-ended | SPI | 2.7 to 5.5 | 550 | ±1 LSB | -40 to +85 | 8-Pin PDIP, 8-Pin SOIC, 8-Pin TSSOP |
| MCP3204 | 12 | 100 | 4 | Single-ended | SPI | 2.7 to 5.5 | 400 | ±1 LSB | -40 to +85 | 14-Pin PDIP, 14-Pin SOIC, 14-Pin TSSOP |
| MCP3208 | 12 | 100 | 8 | Single-ended | SPI | 2.7 to 5.5 | 400 | ±1 LSB | -40 to +85 | 16-Pin PDIP, 16-Pin SOIC |
| MCP3301 | 13 | 100 | 1 | Differential | SPI | 2.7 to 5.5 | 450 | ±1 LSB | -40 to +85 | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| MCP3302 | 13 | 100 | 2 | Differential | SPI | 2.7 to 5.5 | 450 | ±1 LSB | -40 to +85 | 14-Pin PDIP, 14-Pin SOIC, 14-Pin TSSOP |
| MCP3304 | 13 | 100 | 4 | Differential | SPI | 2.7 to 5.5 | 450 | ±1 LSB | -40 to +85 | 16-Pin PDIP, 16-Pin SOIC |

## MIXED SIGNAL – Sigma-Delta A/D Converters

| Part # | Resolution (bits) | Maximum Sampling Rate (samples/sec) | # of Input Channels | Interface | Supply Voltage Range (V) | Typical Supply Current (μA) | Typical INL (%FSR) | Temp. Range (°C) | Features | Packages |
|---|---|---|---|---|---|---|---|---|---|---|
| TC3400(1) | 10 to 16 | >400 | 1 Diff | 2-Wire | 1.8 to 5.5 | 260 | 0.0038 | 0 to +85 | | 8-Pin PDIP, 8-Pin SOIC |
| TC3401(1) | 10 to 16 | >400 | 2 Diff | 2-Wire | 1.8 to 5.5 | 300 | 0.0038 | 0 to +85 | Enable mode, Reset monitor, Power-fail monitor | 16-Pin PDIP, 16-Pin QSOP |
| TC3402(1) | 10 to 16 | >400 | 4 Diff | 2-Wire | 1.8 to 5.5 | 250 | 0.0038 | 0 to +85 | | 16-Pin PDIP, 16-Pin QSOP |
| TC3405(1) | 10 to 16 | >400 | 3 Single-ended, 1 Diff | 2-Wire | 1.8 to 5.5 | 250 | 0.0038 | 0 to +85 | Enable mode, Reset monitor | 16-Pin PDIP, 16-Pin QSOP |

**NOTE 1: All TC340X are not recommended for new designs.**

## MIXED SIGNAL – Dual Slope A/D Converters

| Part # | Supply Voltage (V) | Input Voltage Range (V) | Resolution | Sampling Rate (Conv/s) | Input Channels | Data Interface | Temp. Range (°C) | Features | Packages |
|---|---|---|---|---|---|---|---|---|---|
| TC500 | ±4.5 to ±7.5 | $V_{SS}$ + 1.5V to $V_{DD}$ – 1.5V | Up to 16 bits | 4 to 10 | 1 | 3-Wire | 0 to +70 | Differential input range, Programmable resolution/ conversion time | 16-Pin PDIP, 16-Pin SOIC, 16-Pin CerDIP |
| TC500A | ±4.5 to ±7.5 | $V_{SS}$ + 1.5V to $V_{DD}$ – 1.5V | Up to 17 bits | 4 to 10 | 1 | 3-Wire | 0 to +70 | Differential input range, Programmable resolution/ conversion time | 16-Pin PDIP, 16-Pin SOIC, 16-Pin CerDIP |
| TC510 | +4.5 to +5.5 | $V_{SS}$ + 1.5V to $V_{DD}$ – 1.5V | Up to 17 bits | 4 to 10 | 1 | 3-Wire | 0 to +70 | Differential input range, Programmable resolution/ conversion time, Charge pump (-V) output pin | 24-Pin PDIP, 24-Pin SOIC |

## MIXED SIGNAL – Dual Slope A/D Converters

| Part # | Supply Voltage (V) | Input Voltage Range (V) | Resolution | Sampling Rate (Conv/s) | Input Channels | Data Interface | Temp. Range (°C) | Features | Packages |
|---|---|---|---|---|---|---|---|---|---|
| TC514 | +4.5 to +5.5 | $V_{SS}$ + 1.5V to $V_{DD}$ – 1.5V | Up to 17 bits | 4 to 10 | 4 | 3-Wire | 0 to +70 | Differential input range, Programmable resolution/ conversion time, Charge pump (-V) output pin | 28-Pin PDIP, 28-Pin SOIC |
| TC520A | +4.5 to +5.5 | — | — | — | — | Serial port | 0 to +70 | Optional serial interface adapter for TC500/500A/510/514 | 14-Pin PDIP, 16-Pin SOIC |
| TC530 | +4.5 to +5.5 | $V_{SS}$ + 1.5V to $V_{DD}$ – 1.5V | Up to 17 bits | 3 to 10 | 1 | Serial port | 0 to +70 | Differential input range, Programmable resolution/ conversion time, Charge pump (-V) output pin | 28-Pin PDIP, 28-Pin SOIC |
| TC534 | +4.5 to +5.5 | $V_{SS}$ + 1.5V to $V_{DD}$ – 1.5V | Up to 17 bits | 3 to 10 | 4 | Serial port | 0 to +70 | Differential input range, Programmable resolution/ conversion time, Charge pump (-V) output pin | 40-Pin PDIP, 44-Pin MQFP |
| TC7109 | ±4.5 to ±5.5 | $V_{SS}$ + 1.5V to $V_{DD}$ – 1.0V | 12 bits plus sign bit | 2 to 10 | 1 | Parallel or Serial port | -25 to +85 | Differential input range | 40-Pin PDIP, 40-Pin CerDip, 44-Pin PLCC, 44-Pin MQFP |
| TC7109A | ±4.5 to ±5.5 | $V_{SS}$ + 1.5V to $V_{DD}$ – 1.0V | 12 bits plus sign bit | 2 to 10 | 1 | Parallel or Serial port | -25 to +85 | Differential input range | 40-Pin PDIP, 40-Pin CerDip, 44-Pin PLCC, 44-Pin MQFP |

## MIXED SIGNAL – Binary and BCD A/D Converters

| Part # | Description | Supply Voltage (V) | Input Voltage Range (V) | Resolution (Digits) | Resolution (Counts) | Max Power (mW) | Data Interface | Temp. Range (°C) | Features | Packages |
|---|---|---|---|---|---|---|---|---|---|---|
| TC835 | BCD A/D | ±5 | $V_{SS}$ + 1.0V to $V_{DD}$ – 0.5V | 4½ | ±20,000 | 30 | MUXed BCD | 0 to +70 | Upgrade to TC7135 | 64-Pin MQFP, 44-Pin MQFP, 28-Pin PDIP |
| TC850 | Binary A/D | ±5 | $V_{SS}$ + 1.5V to $V_{DD}$ – 1.5V | 15-bit | ±32,768 | 35 | 8-bit parallel | -25 to +70 | Highest conversion speed (40 conv/sec) | 44-Pin PLCC, 40-Pin PDIP, 40-Pin CerDIP |
| TC7135 | BCD A/D | ±5 | $V_{SS}$ + 1.0V to $V_{DD}$ – 1.0V | 4½ | ±20,000 | 30 | MUXed BCD | 0 to +70 | For DMM, DPM, Data loggers | 28-Pin PLCC, 28-Pin PDIP, 64-Pin MQFP |
| TC14433 | BCD A/D | ±4.5 to ±8 | ±199.9 mV to 1.999V | 3½ | ±2,000 | 20 | MUXed BCD | -40 to +85 | For DMM, DPM, Data loggers | 24-Pin SOIC, 24-Pin PDIP, 28-Pin PLCC, 24-Pin CerDIP |
| TC14433A | BCD A/D | ±4.5 to ±8 | ±199.9 mV to 1.999V | 3½ | ±2,000 | 20 | MUXed BCD | -40 to +85 | For DMM, DPM, Data loggers | 24-Pin PDIP, 28-Pin PLCC, 24-Pin CerDIP |

## MIXED SIGNAL – Display A/D Converters

| Part # | Display Type | Supply Voltage (V) | Resolution (Digits) | Resolution (Counts) | Power (mW) | Temp. Range (°C) | Features | Packages |
|---|---|---|---|---|---|---|---|---|
| TC820 | LCD | 9 | 3¾ | ±4,000 | 10 | 0 to +70 | DMM plus frequency counter and logic probe | 40-Pin PDIP, 44-Pin PLCC, 44-Pin MQFP |
| TC7106 | LCD | 9 | 3½ | ±2,000 | 10 | -25 to +85 | For DMM, DPM, Data logger applications | 40-Pin PDIP, 44-Pin PLCC, 44-Pin MQFP, 40-Pin CerDIP |
| TC7106A | LCD | 9 | 3½ | ±2,000 | 10 | -25 to +85 | For DMM, DPM, Data logger applications | 40-Pin PDIP, 44-Pin PLCC, 44-Pin MQFP, 40-Pin CerDIP |
| TC7107 | LED | ±5 | 3½ | ±2,000 | 10 | -25 to +85 | For DMM, DPM, Data logger applications | 40-Pin PDIP, 44-Pin PLCC, 44-Pin MQFP, 40-Pin CerDIP |
| TC7107A | LED | ±5 | 3½ | ±2,000 | 10 | -25 to +85 | For DMM, DPM, Data logger applications | 40-Pin PDIP, 44-Pin PLCC, 44-Pin MQFP, 40-Pin CerDIP |
| TC7116 | LCD | 9 | 3½ | ±2,000 | 10 | -25 to +85 | Hold function | 40-Pin PDIP, 44-Pin PLCC, 44-Pin MQFP, 40-Pin CerDIP |
| TC7116A | LCD | 9 | 3½ | ±2,000 | 10 | -25 to +85 | Hold function | 40-Pin PDIP, 44-Pin PLCC, 44-Pin MQFP, 40-Pin CerDIP |

## MIXED SIGNAL – Display A/D Converters

| Part # | Display Type | Supply Voltage (V) | Resolution (Digits) | Resolution (Counts) | Power (mW) | Temp. Range (°C) | Features | Packages |
|---|---|---|---|---|---|---|---|---|
| TC7117 | LED | ±5 | 3½ | ±2,000 | 10 | -25 to +85 | Hold function | 40-Pin PDIP, 44-Pin PLCC, 44-Pin MQFP, 40-Pin CerDIP |
| TC7117A | LED | ±5 | 3½ | ±2,000 | 10 | -25 to +85 | Hold function | 40-Pin PDIP, 44-Pin PLCC, 44-Pin MQFP, 40-Pin CerDIP |
| TC7126 | LCD | 9 | 3½ | ±2,000 | 0.5 | -25 to +85 | Low-power TC7106 | 40-Pin PDIP, 44-Pin PLCC, 44-Pin MQFP, 40-Pin CerDIP |
| TC7126A | LCD | 9 | 3½ | ±2,000 | 0.5 | -25 to +85 | Low-power TC7106 | 40-Pin PDIP, 44-Pin PLCC, 44-Pin MQFP, 40-Pin CerDIP |
| TC7129 | LCD | 9 | 4½ | ±20,000 | 4.5 | 0 to +70 | Lowest noise ±3 mV sensitivity | 40-Pin PDIP, 44-Pin PLCC, 44-Pin MQFP |

## MIXED SIGNAL – Digital Potentiometers

| Part # | Number of Taps | Memory | Number per Package | Interface | Resistance (ohms) | INL (max) | DNL (max) | Temp. Range (°C) | Comments | Packages |
|---|---|---|---|---|---|---|---|---|---|---|
| MCP4021 | 64 | Non-volatile | 1 | Up/Down | 2, 5, 10, 50 | 0.5 | 0.5 | -40 to +125 | Potentiometer mode, Shutdown, WiperLock™ Technology | 6-Pin SOT-23, 8-Pin SOIC, 8-Pin MSOP, 8-Pin 3x2 DFN |
| MCP4022 | 64 | Non-volatile | 1 | Up/Down | 2, 5, 10, 50 | 0.5 | 0.5 | -40 to +125 | Rheostat mode, Shutdown, WiperLock™ Technology | 6-Pin SOT-23 |
| MCP4023 | 64 | Non-volatile | 1 | Up/Down | 2, 5, 10, 50 | 0.5 | 0.5 | -40 to +125 | Potentiometer to VSS, WiperLock™ Technology | 6-Pin SOT-23 |
| MCP4024 | 64 | Non-volatile | 1 | Up/Down | 2, 5, 10, 50 | 0.5 | 0.5 | -40 to +125 | Rheostat to VSS, Shutdown, WiperLock™ Technology | 5-Pin SOT-23 |
| MCP41010 | 256 | Volatile | 1 | SPI™ | 10 | 1 | 1 | -40 to +85 | Potentiometer mode, Shutdown | 8-Pin PDIP, 8-Pin SOIC |
| MCP41050 | 256 | Volatile | 1 | SPI™ | 50 | 1 | 1 | -40 to +85 | Potentiometer mode, Shutdown | 8-Pin PDIP, 8-Pin SOIC |
| MCP41100 | 256 | Volatile | 1 | SPI™ | 100 | 1 | 1 | -40 to +85 | Potentiometer mode, Shutdown | 8-Pin PDIP, 8-Pin SOIC |
| MCP42010 | 256 | Volatile | 2 | SPI™ | 10 | 1 | 1 | -40 to +85 | Potentiometer mode, Shutdown | 14-Pin PDIP, 14-Pin SOIC, 14-Pin TSSOP |
| MCP42050 | 256 | Volatile | 2 | SPI™ | 50 | 1 | 1 | -40 to +85 | Potentiometer mode, Shutdown | 14-Pin PDIP, 14-Pin SOIC, 14-Pin TSSOP |
| MCP42100 | 256 | Volatile | 2 | SPI™ | 100 | 1 | 1 | -40 to +85 | Potentiometer mode, Shutdown | 14-Pin PDIP, 14-Pin SOIC, 14-Pin TSSOP |

## MIXED SIGNAL – Frequency-to-Voltage/Voltage-to-Frequency Converters

| Part # | Frequency Range (kHz) | Full Scale (ppm FS/°C) | Non-linearity (%FS) | Temp. Range (°C) | Packages |
|---|---|---|---|---|---|
| TC9400 | 100 | ±40 | ±0.05 | -40 to +85 | 14-Pin PDIP, 14-Pin SOIC |
| TC9401 | 100 | ±40 | ±0.02 | -40 to +85 | 14-Pin PDIP, 14-Pin SOIC |
| TC9402 | 100 | ±100 | ±0.25 | -40 to +85 | 14-Pin PDIP, 14-Pin SOIC |

## MIXED SIGNAL – System D/A Converters

| Part # | Resolution (Bits) | DACs per Package | Interface | VREF | Output Settling Time (µs) | DNL (LSB) | Typical Standby Current (µA) | Typical Operating Current (µA) | Temp. Range (°C) | Packages |
|---|---|---|---|---|---|---|---|---|---|---|
| TC1320 | 8 | 1 | SMBus | Ext | 10 | ±0.8 | 0.1 | 350 | -40 to +85 | 8-Pin MSOP, 8-Pin SOIC |
| TC1321 | 10 | 1 | SMBus | Ext | 10 | ±2 | 0.1 | 350 | -40 to +85 | 8-Pin MSOP, 8-Pin SOIC |
| MCP4921 | 12 | 1 | SPI | Ext | 4.5 | 0.75 | 1 | 175 | -40 to +125 | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| MCP4922 | 12 | 2 | SPI | Ext | 4.5 | 0.75 | 1 | 350 | -40 to +125 | 14-Pin PDIP, 14-Pin SOIC, 14-Pin TSSOP |

**NOTE: The analog output is voltage.**

## INTERFACE – Controller Area Network (CAN) Products

| Part # | Operating Voltage (V) | Temperature Range (°C) | Tx Buffers | Rx Buffers | Filters | Masks | Interrupt Output | Unique Features | Packages |
|---|---|---|---|---|---|---|---|---|---|
| MCP2510(1) | 2.7 to 5.5 | -40 to +125 | 3 | 2 | 6 | 2 | Yes | CAN 2.0B Active controller with SPI interface to MCU, 3 transmit buffers, 2 receive buffers, HW and SW message triggers | 18-Pin PDIP, 18-Pin SOIC, 20-Pin TSSOP |
| MCP2515 | 2.7 to 5.5 | -40 to +125 | 3 | 2 | 6 | 2 | Yes | MCP2510 pin compatible upgrade with enhanced features including higher throughput and data byte filtering | 18-Pin PDIP, 18-Pin SOIC, 20-Pin TSSOP |
| MCP25020 | 2.7 to 5.5 | -40 to +125 | 3 | 2 | 2 | 1 | N/A | CAN 2.0B Active I/O Expander, Configurable I/O, 2 PWM outputs | 14-Pin PDIP, 14-Pin SOIC |
| MCP25025 | 2.7 to 5.5 | -40 to +85 | 3 | 2 | 2 | 1 | N/A | CAN 2.0B Active I/O Expander, Configurable I/O, 2 PWM outputs, One-wire CAN option | 14-Pin PDIP, 14-Pin SOIC |
| MCP25050 | 2.7 to 5.5 | -40 to +125 | 3 | 2 | 2 | 1 | N/A | Mixed-Signal CAN 2.0B Active I/O Expander, Configurable I/O, 4 10-bit ADCs, 2 PWM outputs | 14-Pin PDIP, 14-Pin SOIC |
| MCP25055 | 2.7 to 5.5 | -40 to +85 | 3 | 2 | 2 | 1 | N/A | Mixed-Signal CAN 2.0B Active I/O Expander, Configurable I/O, 4 10-bit ADCs, 2 PWM outputs, One-wire CAN option | 14-Pin PDIP, 14-Pin SOIC |
| MCP2551 | 4.5 to 5.5 | -40 to +125 | n/a | n/a | n/a | n/a | N/A | High-speed CAN Transceiver (1 Mbps max. CAN bus speed), ISO11898 compatible, Industry standard pinout | 8-Pin PDIP, 8-Pin SOIC |

**NOTE 1: Not recommended for new designs.**

## INTERFACE – Infrared Products

| Part # | Operating Voltage (V) | Operating Temperature Range (°C) | Max. Baud Rate (Kbaud) | Unique Features | Packages |
|---|---|---|---|---|---|
| MCP2120 | 2.5 to 5.5 | -40 to +85 | 325 | UART to IR encoder/decoder with both hardware and software baud rate selection | 14-Pin PDIP, 14-Pin SOIC |
| MCP2122 | 1.8 to 5.5 | -40 to +85 | 16x less than clock input | UART to IR encoder/decoder | 8-Pin PDIP, 8-Pin SOIC |
| MCP2140 | 2.7 to 5.5 | -40 to +85 | 9.6 | IrDA® Standard protocol handler plus bit encoder/decoder, Fixed baud rate, Low-cost | 18-Pin PDIP, 18-Pin SOIC, 20-Pin SSOP |

**NOTE: IrDA® is a registered trademark of Infrared Data Association.**

## INTERFACE – Infrared Products

| Part # | Operating Voltage (V) | Operating Temperature Range (°C) | Max. Baud Rate (Kbaud) | Unique Features | Packages |
|---|---|---|---|---|---|
| MCP2150 | 3.0 to 5.5 | -40 to +85 | 115.2 | IrDA® Standard protocol handler plus bit encoder/decoder on one chip for DTE applications, Programmable ID | 18-Pin PDIP, 18-Pin SOIC, 20-Pin SSOP |
| MCP2155 | 3.0 to 5.5 | -40 to +85 | 115.2 | IrDA® Standard protocol handler plus bit encoder/decoder on one chip for DCE applications, Programmable ID | 18-Pin PDIP, 18-Pin SOIC, 20-Pin SSOP |

**NOTE: IrDA® is a registered trademark of Infrared Data Association.**

## INTERFACE – LIN Transceiver Products

| Part # | Description | Vreg Output Voltage (V) | Operating Temperature Range (°C) | Vreg Output Current (mA) | Vcc Range (V) | Max Baud Rate | LIN Specification Supported | Packages |
|---|---|---|---|---|---|---|---|---|
| MCP201 | LIN Transceiver with integrated VREG | 4.75 to 5.25 | -40 to +125 | 50 | 7.4 to 18(1) | 20 Kbaud | Revision 1.2 | 8-pin PDIP, 8-pin SOIC, 8-Pin DFN |

**NOTE 1: Can withstand 40V load dump.**

## INTERFACE – Serial Peripherals

| Part # | Description | Operating Voltage (V) | Operating Temperature Range (°C) | Bus Type | Max. Bus Frequency (kHz) | Features | Packages |
|---|---|---|---|---|---|---|---|
| MCP23008 | 8-bit I/O Port Expander | 1.8 to 5.5 | -40 to +85 | $I^2C$™ | 3400 | 3 HW address pins, HW interrupt, 25 mA source/sink capability per I/O | 18-Pin PDIP, 18-Pin SOIC, 20-Pin SSOP |
| MCP23S08 | 8-bit I/O Port Expander | 1.8 to 5.5 | -40 to +85 | SPI™ | 10000 | 2 HW address pins, HW interrupt, 25 mA source/sink capability per I/O | 18-Pin PDIP, 18-Pin SOIC, 20-Pin SSOP |
| MCP23016 | 16-bit I/O Port Expander | 2.0 to 5.5 | -40 to +85 | $I^2C$™ | 400 | 3 H/W address inputs, HW interrupt, 25 mA source/sink capability per I/O | 28-Pin PDIP, 28-Pin SOIC, 28-Pin SSOP, 28-Pin 6x6 QFN |

# SERIAL ELECTRICALLY ERASABLE PROMS (EEPROM)

| Product | E/W Cycles | Density (Organization) | Write Speed | Max. Clock Freq. | Operating Voltage (V) | Temps | Max. Standby Current | Unique Features | Packages[1] |
|---|---|---|---|---|---|---|---|---|---|
| **Microwire Compatible Serial EEPROM Family – Automatic ERAL before WRAL, self-timed erase and write cycle, power on/off data protection circuitry, sequential read function and industry standard 3-wire serial I/O** | | | | | | | | | |
| 93C46A | 1M | 1 Kbits (x8) | 2 ms | 2 MHz | 4.5 to 5.5 | C, I, E | 5 µA | 93Cx6A and 93Cx6B devices have no ORG pin. 93Cx6A parts have x8 organization; | P, SN, ST, MS, OT, X/SN, MC |
| 93C46B | 1M | 1 Kbits (x16) | 2 ms | 2 MHz | 4.5 to 5.5 | C, I, E | 5 µA | 93Cx6B parts are x16. Devices in this family include POR ($V_{DD}$ detect) feature. | P, SN, ST, MS, OT, X/SN, MC |
| 93C56A | 1M | 2 Kbits (x8) | 2 ms | 2 MHz | 4.5 to 5.5 | I, E | 5 µA | | P, SN, ST, MS, OT, MC |
| 93C56B | 1M | 2 Kbits (x16) | 2 ms | 2 MHz | 4.5 to 5.5 | I, E | 5 µA | | P, SN, ST, MS, OT, MC |
| 93C66A | 1M | 4 Kbits (x8) | 2 ms | 2 MHz | 4.5 to 5.5 | I, E | 5 µA | | P, SN, ST, MS, OT, MC |
| 93C66B | 1M | 4 Kbits (x16) | 2 ms | 2 MHz | 4.5 to 5.5 | I, E | 5 µA | | P, SN, ST, MS, OT, MC |
| 93C76A | 1M | 8 Kbits (x8) | 2 ms | 3 MHz | 4.5 to 5.5 | I, E | 5 µA | Use 93C76C or 93C86C devices for P, SN, ST or MS packages. | OT |
| 93C76B | 1M | 8 Kbits (x16) | 2 ms | 3 MHz | 4.5 to 5.5 | I, E | 5 µA | Use 93C76C or 93C86C devices for P, SN, ST or MS packages. | OT |
| 93C86A | 1M | 16 Kbits (x8) | 2 ms | 3 MHz | 4.5 to 5.5 | I, E | 5 µA | Use 93C76C or 93C86C devices for P, SN, ST or MS packages. | OT |
| 93C86B | 1M | 16 Kbits (x16) | 2 ms | 3 MHz | 4.5 to 5.5 | I, E | 5 µA | Use 93C76C or 93C86C devices for P, SN, ST or MS packages. | OT |
| 93LC46A | 1M | 1 Kbits (x8) | 6 ms | 2 MHz | 2.5 to 5.5 | C, I, E | 5 µA | 93LCx6A and 93LCx6B devices have no ORG pin. 93LCx6A parts have x8 | P, SN, ST, MS, OT, X/SN, MC |
| 93LC46B | 1M | 1 Kbits (x16) | 6 ms | 2 MHz | 2.5 to 5.5 | C, I, E | 5 µA | organization; 93Cx6B parts are x16. | P, SN, ST, MS, OT, X/SN, MC |
| 93LC56A | 1M | 2 Kbits (x8) | 6 ms | 2 MHz | 2.5 to 5.5 | C, I, E | 5 µA | | P, SN, ST, MS, OT, X/SN, MC |
| 93LC56B | 1M | 2 Kbits (x16) | 6 ms | 2 MHz | 2.5 to 5.5 | C, I, E | 5 µA | | P, SN, ST, MS, OT, X/SN, MC |
| 93LC66A | 1M | 4 Kbits (x8) | 6 ms | 2 MHz | 2.5 to 5.5 | C, I, E | 5 µA | | P, SN, ST, MS, OT, X/SN, MC |
| 93LC66B | 1M | 4 Kbits (x16) | 6 ms | 2 MHz | 2.5 to 5.5 | C, I, E | 5 µA | | P, SN, ST, MS, OT, X/SN, MC |
| 93LC76A | 1M | 8 Kbits (x8) | 6 ms | 3 MHz | 2.5 to 5.5 | I, E | 5 µA | Use 93LC76C or 93LC86C devices for P, SN, ST or MS packages. | OT |
| 93LC76B | 1M | 8 Kbits (x16) | 6 ms | 3 MHz | 2.5 to 5.5 | I, E | 5 µA | Use 93LC76C or 93LC86C devices for P, SN, ST or MS packages. | OT |
| 93LC86A | 1M | 16 Kbits (x8) | 6 ms | 3 MHz | 2.5 to 5.5 | I, E | 5 µA | Use 93LC76C or 93LC86C devices for P, SN, ST or MS packages. | OT |
| 93LC86B | 1M | 16 Kbits (x16) | 6 ms | 3 MHz | 2.5 to 5.5 | I, E | 5 µA | Use 93LC76C or 93LC86C devices for P, SN, ST or MS packages. | OT |
| 93AA46A | 1M | 1 Kbits (x8) | 6 ms | 2 MHz | 1.8 to 5.5 | I | 5 µA | 93AAx6A and 93AAx6B devices have no ORG pin. 93AAx6A parts have x8 | P, SN, ST, MS, OT, MC |
| 93AA46B | 1M | 1 Kbits (x16) | 6 ms | 2 MHz | 1.8 to 5.5 | I | 5 µA | organization; 93Cx6B parts are x16. | P, SN, ST, MS, OT, MC |
| 93AA56A | 1M | 2 Kbits (x8) | 6 ms | 2 MHz | 1.8 to 5.5 | I | 5 µA | | P, SN, ST, MS, OT, MC |
| 93AA56B | 1M | 2 Kbits (x16) | 6 ms | 2 MHz | 1.8 to 5.5 | I | 5 µA | | P, SN, ST, MS, OT, MC |
| 93AA66A | 1M | 4 Kbits (x8) | 6 ms | 2 MHz | 1.8 to 5.5 | I | 5 µA | | P, SN, ST, MS, OT, MC |
| 93AA66B | 1M | 4 Kbits (x16) | 6 ms | 2 MHz | 1.8 to 5.5 | I | 5 µA | | P, SN, ST, MS, OT, MC |
| 93AA76A | 1M | 8 Kbits (x8) | 6 ms | 3 MHz | 1.8 to 5.5 | I | 5 µA | Use 93AA76C or 93AA86C devices for P, SN, ST or MS packages. | OT |
| 93AA76B | 1M | 8 Kbits (x16) | 6 ms | 3 MHz | 1.8 to 5.5 | I | 5 µA | Use 93AA76C or 93AA86C devices for P, SN, ST or MS packages. | OT |
| 93AA86A | 1M | 16 Kbits (x8) | 6 ms | 3 MHz | 1.8 to 5.5 | I | 5 µA | Use 93AA76C or 93AA86C devices for P, SN, ST or MS packages. | OT |
| 93AA86B | 1M | 16 Kbits (x16) | 6 ms | 3 MHz | 1.8 to 5.5 | I | 5 µA | Use 93AA76C or 93AA86C devices for P, SN, ST or MS packages. | OT |
| 93C46C | 1M | 1 Kbits (x8 or x16) | 2 ms | 3 MHz | 4.5 to 5.5 | I, E | 5 µA | 93Cx6C devices can be used in either x8 or x16 organization via the ORG pin. Devices | P, SN, ST, MS, MC |
| 93C56C | 1M | 2 Kbits (x8 or x16) | 2 ms | 3 MHz | 4.5 to 5.5 | I, E | 5 µA | in this family include POR ($V_{DD}$ detect) feature. | P, SN, ST, MS, MC |
| 93C66C | 1M | 4 Kbits (x8 or x16) | 2 ms | 3 MHz | 4.5 to 5.5 | I, E | 5 µA | | P, SN, ST, MS, MC |
| 93C76C | 1M | 8 Kbits (x8 or x16) | 2 ms | 3 MHz | 4.5 to 5.5 | I, E | 5 µA | | P, SN, ST, MS, MC |
| 93C86C | 1M | 16 Kbits (x8 or x16) | 2 ms | 3 MHz | 4.5 to 5.5 | I, E | 5 µA | | P, SN, ST, MS, MC |
| 93LC46C | 1M | 1 Kbits (x8 or x16) | 6 ms | 3 MHz | 2.5 to 5.5 | I, E | 5 µA | 93LCx6C devices can be used in either x8 or x16 organization via the ORG pin. | P, SN, ST, MS, X/SN, MC |
| 93LC56C | 1M | 2 Kbits (x8 or x16) | 6 ms | 3 MHz | 2.5 to 5.5 | I, E | 5 µA | | P, SN, ST, MS, X/SN, MC |
| 93LC66C | 1M | 4 Kbits (x8 or x16) | 6 ms | 3 MHz | 2.5 to 5.5 | I, E | 5 µA | | P, SN, ST, MS, X/SN, MC |
| 93LC76C | 1M | 8 Kbits (x8 or x16) | 6 ms | 3 MHz | 2.5 to 5.5 | I, E | 5 µA | | P, SN, ST, MS, MC |
| 93LC86C | 1M | 16 Kbits (x8 or x16) | 6 ms | 3 MHz | 2.5 to 5.5 | I, E | 5 µA | | P, SN, ST, MS, MC |
| 93AA46C | 1M | 1 Kbits (x8 or x16) | 6 ms | 3 MHz | 1.8 to 5.5 | I | 5 µA | 93AAx6C devices can be used in either x8 or x16 organization via the ORG pin. | P, SN, ST, MS, X/SN, MC |
| 93AA56C | 1M | 2 Kbits (x8 or x16) | 6 ms | 3 MHz | 1.8 to 5.5 | I | 5 µA | | P, SN, ST, MS, X/SN, MC |
| 93AA66C | 1M | 4 Kbits (x8 or x16) | 6 ms | 3 MHz | 1.8 to 5.5 | I | 5 µA | | P, SN, ST, MS, X/SN, MC |
| 93AA76C | 1M | 8 Kbits (x8 or x16) | 6 ms | 3 MHz | 1.8 to 5.5 | I | 5 µA | | P, SN, ST, MS, MC |
| 93AA86C | 1M | 16 Kbits (x8 or x16) | 6 ms | 3 MHz | 1.8 to 5.5 | I | 5 µA | | P, SN, ST, MS, MC |

**NOTE 1. X/SN package code denotes rotated pinouts.**

| Product | E/W Cycles | Density (Organization) | Write Speed | Max. Clock Frequency | Operating Voltage (V) | Temps | Unique Features | Packages |
|---|---|---|---|---|---|---|---|---|
| **2-Wire I²C™ Compatible Serial EEPROM Family – Self-timed write cycle and Page Write mode** | | | | | | | | |
| 24C00<br>24LC00<br>24AA00 | 1M<br>1M<br>1M | 128 bits (x8)<br>128 bits (x8)<br>128 bits (x8) | 4 ms<br>4 ms<br>4 ms | 400 kHz<br>400 kHz<br>400 kHz | 4.5 to 5.5<br>2.5 to 6.0<br>1.8 to 6.0 | C, I, E<br>C, I<br>C, I | 100 kHz operation for voltages from 1.8V to 4.5V. | P, SN, ST, OT, MC<br>P, SN, ST, OT, MC<br>P, SN, ST, OT, MC |
| 24C01C<br>24C02C | 1M<br>1M | 1 Kbits (x8)<br>2 Kbits (x8) | 1 ms<br>1 ms | 400 kHz<br>400 kHz | 4.5 to 5.5<br>4.5 to 5.5 | C, I, E<br>C, I, E | The 24C01C and 24C02C are for applications which require fast byte write and/or extended temperature. Three address pins. | P, SN, ST, MS, MC<br>P, SN, ST, MS, MC |
| 24LC014<br>24AA014 | 1M<br>1M | 1 Kbit (x8)<br>1 Kbit (x8) | 10 ms<br>10 ms | 400 MHz<br>400 MHz | 2.5 to 5.5<br>1.8 to 5.5 | I<br>I | Three address pins. | P, SN, ST, MS, MC<br>P, SN, ST, MS, MC |
| 24LC01B<br>24LC02B<br>24LC04B<br>24LC08B<br>24LC16B | 1M<br>1M<br>1M<br>1M<br>1M | 1 Kbits (x8)<br>2 Kbits (x8)<br>4 Kbits (x8)<br>8 Kbits (x8)<br>16 Kbits (x8) | 5 ms<br>5 ms<br>5 ms<br>5 ms<br>5 ms | 400 kHz<br>400 kHz<br>400 kHz<br>400 kHz<br>400 kHz | 2.5 to 5.5<br>2.5 to 5.5<br>2.5 to 5.5<br>2.5 to 5.5<br>2.5 to 5.5 | I, E<br>I, E<br>I, E<br>I, E<br>I, E | Hardware write protect. Schmitt trigger inputs.<br>2.5V operation @ extended temperatures.<br>100 kHz operation @ extended temperatures.<br><br>B version on 2-wire devices designates that address pins A0, A1, A2 are no-connect. | P, SN, ST, MS, OT, MC<br>P, SN, ST, MS, OT, MC<br>P, SN, ST, MS, OT, MC<br>P, SN, ST, MS, OT, MC<br>P, SN, ST, MS, OT, MC |
| 24AA01<br>24AA02<br>24AA04<br>24AA08<br>24AA16 | 1M<br>1M<br>1M<br>1M<br>1M | 1 Kbits (x8)<br>2 Kbits (x8)<br>4 Kbits (x8)<br>8 Kbits (x8)<br>16 Kbits (x8) | 5 ms<br>5 ms<br>5 ms<br>5 ms<br>5 ms | 400 kHz<br>400 kHz<br>400 kHz<br>400 kHz<br>400 kHz | 1.8 to 5.5<br>1.8 to 5.5<br>1.8 to 5.5<br>1.8 to 5.5<br>1.8 to 5.5 | I<br>I<br>I<br>I<br>I | Hardware write protect. Schmitt trigger inputs.<br>100 kHz operation for voltages from 1.8V to 2.5V.<br>For all devices in this section (24AA01 through 24AA16), pins A0, A1, A2 are no-connect. | P, SN, ST, MS, OT, MC<br>P, SN, ST, MS, OT, MC<br>P, SN, ST, MS, OT, MC<br>P, SN, ST, MS, OT, MC<br>P, SN, ST, MS, OT, MC |
| 24LC32A<br>24AA32A | 1M<br>1M | 32 Kbits (x8)<br>32 Kbits (x8) | 5 ms<br>5 ms | 400 kHz<br>400 kHz | 2.5 to 5.5<br>1.8 to 5.5 | I, E<br>I | 100 kHz operation for voltages from 1.8V to 2.5V. | P, SN, SM, ST, MS, MC<br>P, SN, SM, ST, MS, MC |
| 24LC64<br>24AA64 | 1M<br>1M | 64 Kbits (x8)<br>64 Kbits (x8) | 5 ms<br>5 ms | 400 kHz<br>400 kHz | 2.5 to 5.5<br>1.8 to 5.5 | I, E<br>I | 32-byte page. 100 kHz operation for voltages from 1.8V to 2.5V. | P, SN, SM, ST, MS, MC<br>P, SN, SM, ST, MS, MC |
| 24LC65<br>24AA65<br>24C65 | 1 M/10 M<br>1 M/10 M<br>1 M/10 M | 64 Kbits (x8)<br>64 Kbits (x8)<br>64 Kbits (x8) | 5 ms<br>5 ms<br>5 ms | 400 kHz<br>400 kHz<br>400 kHz | 2.5 to 5.5<br>1.8 to 5.5<br>4.5 to 5.5 | C, I<br>C<br>C, I, E | 8-byte page, 64-byte input buffer, high-endurance block, write protectable in 4K blocks.<br>Smart Serial™ EEPROM. | P, SM<br>P, SM<br>P, SM |
| 24LC128<br>24AA128<br>24FC128 | 1M<br>1M<br>1M | 128 Kbits (x8)<br>128 Kbits (x8)<br>128 Kbits (x8) | 5 ms<br>5 ms<br>5 ms | 400 kHz<br>400 kHz<br>1 MHz | 2.5 to 5.5<br>1.8 to 5.5<br>2.5 to 5.5 | I, E<br>I<br>I | 64-byte page. 100 kHz operation for voltages from 1.8V to 2.5V.<br><br>400 kHz operation for voltages below 4.5V (24FC128). | P, SN, SM, ST, MS, MF<br>P, SN, SM, ST, MS, MF<br>P, SN, SM, ST, MS, MF |
| 24LC256<br>24AA256<br>24FC256 | 1M<br>1M<br>1M | 256 Kbits (x8)<br>256 Kbits (x8)<br>256 Kbits (x8) | 5 ms<br>5 ms<br>5 ms | 400 kHz<br>400 kHz<br>1 MHz | 2.5 to 5.5<br>1.8 to 5.5<br>2.5 to 5.5 | I, E<br>I<br>I | 64-byte page. 100 kHz operation for voltages from 1.8V to 2.5V.<br><br>400 kHz operation for voltages below 4.5V (24FC256). | P, SM, SN, ST, MS, MF<br>P, SM, SN, ST, MS, MF<br>P, SN, SM, ST, MS, MF |
| 24LC512<br>24AA512<br>24FC512 | 1M<br>1M<br>1M | 512 Kbits (x8)<br>512 Kbits (x8)<br>512 Kbits (x8) | 5 ms<br>5 ms<br>5 ms | 400 kHz<br>400 kHz<br>1 MHz | 2.5 to 5.5<br>1.8 to 5.5<br>2.5 to 5.5 | I, E<br>I<br>I | 128-byte page, cascadeable up to 8 devices (4 Mbits).<br>100 kHz operation for voltages from 1.8 to 2.5V.<br>400 kHz operation for voltages below 4.5V. (24FC512). | P, MF, ST14, SM<br>P, MF, ST14, SM<br>P, MF, ST14, SM |
| 24LC515<br>24AA515<br>24FC515 | 1M<br>1M<br>1M | 512 Kbits (x8)<br>512 Kbits (x8)<br>512 Kbits (x8) | 5 ms<br>5 ms<br>5 ms | 400 kHz<br>400 kHz<br>1 MHz | 2.5 to 5.5<br>1.8 to 5.5<br>2.5 to 5.5 | I<br>I<br>I | Cascadeable up to 4 devices (2 Mbits).<br>100 kHz operation for voltages from 1.8V to 2.5V. | P, SM<br>P, SM<br>P, SM |

| Product | E/W Cycles | Density (Organization) | Write Speed | Max. Clock Frequency | Operating Voltage (V) | Temps | Unique Features | Packages |
|---|---|---|---|---|---|---|---|---|
| **ISO Smart Card Family – Self-timed write cycle and Page Write mode. All devices meet ISO7816 pinout requirements.** | | | | | | | | |
| 24LC01SC | 1M | 1 Kbits (x8) | 5 ms | 400 kHz | 2.5 to 5.5 | C, I | | S, W, WF |
| 24LC02SC | 1M | 2 Kbits (x8) | 5 ms | 400 kHz | 2.5 to 5.5 | C, I | | S, W, WF |
| 24LC04SC | 1M | 4 Kbits (x8) | 5 ms | 400 kHz | 2.5 to 5.5 | C, I | | S, W, WF |
| 24LC08SC | 1M | 8 Kbits (x8) | 5 ms | 400 kHz | 2.5 to 5.5 | C, I | | S, W, WF |
| 24LC16SC | 1M | 16 Kbits (x8) | 5 ms | 400 kHz | 2.5 to 5.5 | C, I | | S, W, WF |
| 24LC32ASC | 1M | 32 Kbits (x8) | 5 ms | 400 kHz | 2.5 to 5.5 | C, I | | S, W, WF |
| 24LC64SC | 1M | 64 Kbits (x8) | 5 ms | 400 kHz | 2.5 to 5.5 | C, I | | S, W, WF |
| 24LC128SC | 1M | 128 Kbits (x8) | 5 ms | 400 kHz | 2.5 to 5.5 | C, I | | S, W, WF |
| 24LC256SC | 1M | 256 Kbits (x8) | 5 ms | 400 kHz | 2.5 to 5.5 | C, I | | S, W, WF |
| 24LC512SC | 1M | 512 Kbits (x8) | 5 ms | 400 kHz | 2.5 to 5.5 | C, I | | S, W, WF |
| 24AA01SC | 1M | 1 Kbits (x8) | 5 ms | 400 kHz | 1.8 to 5.5 | C | | S, W, WF |
| 24AA02SC | 1M | 2 Kbits (x8) | 5 ms | 400 kHz | 1.8 to 5.5 | C | | S, W, WF |
| 24AA04SC | 1M | 4 Kbits (x8) | 5 ms | 400 kHz | 1.8 to 5.5 | C | | S, W, WF |
| 24AA08SC | 1M | 8 Kbits (x8) | 5 ms | 400 kHz | 1.8 to 5.5 | C | | S, W, WF |
| 24AA16SC | 1M | 16 Kbits (x8) | 5 ms | 400 kHz | 1.8 to 5.5 | C | | S, W, WF |
| 24AA32ASC | 1M | 32 Kbits (x8) | 5 ms | 400 kHz | 1.8 to 5.5 | C | | S, W, WF |
| 24AA64SC | 1M | 64 Kbits (x8) | 5 ms | 400 kHz | 1.8 to 5.5 | C | | S, W, WF |
| 24AA128SC | 1M | 128 Kbits (x8) | 5 ms | 400 kHz | 1.8 to 5.5 | C | | S, W, WF |
| 24AA256SC | 1M | 256 Kbits (x8) | 5 ms | 400 kHz | 1.8 to 5.5 | C | | S. W, WF |
| 24AA512SC | 1M | 512 Kbits (x8) | 5 ms | 400 kHz | 1.8 to 5.5 | C | | S, W, WF |

| Product | E/W Cycles | Density (Organization) | Page Size | Write Speed | Max. Clock Frequency | Operating Voltage (V) | Temps | Unique Features | Packages[1] |
|---|---|---|---|---|---|---|---|---|---|
| **SPI™ Compatible Serial EEPROM Family – Page Write mode, HOLD pin, software enabled block write protection and hardware write-protect pin. Supports SPI™ modes 0, 3.** | | | | | | | | | |
| 25C040 | 1M | 4 Kbits (x8) | 16B | 5 ms | 3 MHz | 4.5 to 5.5 | I, E | | P, SN, X/ST |
| 25LC040 | 1M | 4 Kbits (x8) | 16B | 5 ms | 2 MHz | 2.5 to 5.5 | I | | P, SN, X/ST |
| 25AA040 | 1M | 4 Kbits (x8) | 16B | 5 ms | 1 MHz | 1.8 to 5.5 | I | | P, SN, X/ST |
| 25LC080A | 1M | 8 Kbits (x8) | 16B | 5 ms | 10 MHz | 2.5 to 5.5 | I, E | | P, SN, ST, MS, MC |
| 25AA080A | 1M | 8 Kbits (x8) | 16B | 5 ms | 10 MHz | 1.8 to 5.5 | I | | P, SN, ST, MS, MC |
| 25LC080B | 1M | 8 Kbits (x8) | 32B | 5 ms | 10 MHz | 2.5 to 5.5 | I, E | | P, SN, ST, MS, MC |
| 25AA080B | 1M | 8 Kbits (x8) | 32B | 5 ms | 10 MHz | 1.8 to 5.5 | I | | P, SN, ST, MS, MC |

**NOTE 1. X/ST package code denotes rotated pinout.**

| Product | E/W Cycles | Density (Organization) | Page Size | Write Speed | Max. Clock Frequency | Operating Voltage (V) | Temps | Unique Features | Packages[1] |
|---|---|---|---|---|---|---|---|---|---|
| **SPI™ Compatible Serial EEPROM Family – Page Write mode, HOLD pin, software enabled block write protection and hardware write-protect pin. Supports SPI™ modes 0, 3. (continued)** | | | | | | | | | |
| 25LC160A | 1M | 16 Kbits (x8) | 16B | 5 ms | 10 MHz | 2.5 to 5.5 | I, E | | P, SN, ST, MS, MC |
| 25AA160A | 1M | 16 Kbits (x8) | 16B | 5 ms | 10 MHz | 1.8 to 5.5 | I | | P, SN, ST, MS, MC |
| 25LC160B | 1M | 16 Kbits (x8) | 32B | 5 ms | 10 MHz | 2.5 to 5.5 | I, E | | P, SN, ST, MS, MC |
| 25AA160B | 1M | 16 Kbits (x8) | 32B | 5 ms | 10 MHz | 1.8 to 5.5 | I | | P, SN, ST, MS, MC |
| 25C320 | 100K | 32 Kbits (x8) | 32B | 5 ms | 3 MHz | 4.5 to 5.5 | I, E | | P, SN |
| 25LC320 | 1M | 32 Kbits (x8) | 32B | 5 ms | 2 MHz | 2.5 to 5.5 | I, E | | P, SN, X/ST |
| 25AA320 | 1M | 32 Kbits (x8) | 32B | 5 ms | 1 MHz | 1.8 to 5.5 | I | | P, SN, X/ST |
| 25LC640 | 1M | 64 Kbits (x8) | 32B | 5 ms | 3 MHz | 2.5 to 5.5 | I, E | | P, SN, X/ST |
| 25AA640 | 1M | 64 Kbits (x8) | 32B | 5 ms | 1 MHz | 1.8 to 5.5 | I | | P, SN, X/ST |
| 25LC256[3] | 1M | 256 Kbits (x8) | 64B | 5 ms | 10 MHz | 2.5 to 5.5 | I. E | | P, SN, ST, MF |
| 25AA256[3] | 1M | 256 Kbits (x8) | 64B | 5 ms | 10 MHz | 1.8 to 5.5 | I | | P, SN, ST, MF |

**NOTE 1. X/ST package code denotes rotated pinout.**

| Product | E/W Cycles | Density (Organization) | Write Speed | Max. Clock Frequency | Operating Voltage (V) | Temps | Unique Features | Packages |
|---|---|---|---|---|---|---|---|---|
| **Identification Products (Application-Specific Products for Monitors, DRAM Modules, ACR Risers and Other Plug-And-Play Applications)** | | | | | | | | |
| 24LC21 | 1M | 1 Kbits (x8) | 10 ms | 400 kHz | 2.5 to 5.5 | C, I | Completely implements DDC1™/DDC2™ interface for VESA monitor identification. Improved noise filter. Write protection pin. Not recommended for new designs. Use 24LC21A or 24LCS21A. | P, SN |
| 24LCS21 | 1M | 1 Kbits (x8) | 10 ms | 400 kHz | 2.5 to 5.5 | C, I | Same as 24LC21 plus software enabled write-protect pin. Not recommended for new designs. Use 24LC21A or 24LCS21A. | P, SN |
| 24LC21A | 1M | 1 Kbits (x8) | 10 ms | 400 kHz | 2.5 to 5.5 | C, I | Same as 24LC21 plus “return to DDC1” feature. | P, SN |
| 24LCS21A | 1M | 1 Kbits (x8) | 10 ms | 400 kHz | 2.5 to 5.5 | C, I | Same as 24LC21A plus software enabled write-protect pin. | P, SN |
| 24LCS22A | 1M | 2 Kbits (x8) | 10 ms | 400 kHz | 2.5 to 5.5 | I | Implements VESA E-EDID 1.3 for flat panels and projectors. Includes “return to DDC1” feature and software - enabled write protect pin. | P, SN |
| 24LC024 | 1M | 2 Kbits (x8) | 10 ms | 400 kHz | 2.5 to 5.5 | C, I | Addressable, hardware write protection for DRAM DIMM modules and other applications. | P, SN, ST, MS |
| 24LC025 | 1M | 2 Kbits (x8) | 10 ms | 400 kHz | 2.5 to 5.5 | C, I | Addressable. No write-protect. | P, SN, ST, MS |
| 24AA52 | 1M | 2 Kbits (x8) | 10 ms | 400 kHz | 1.8 to 5.5 | I | Addressable, hardware write protection and software write protection for lower half of the array. Designed for DRAM DIMM modules. | P, SN, ST, MS |
| 24LCS52 | 1M | 2 Kbits (x8) | 10 ms | 400 kHz | 2.5 to 5.5 | I | | P, SN, ST, MS |

# DEVELOPMENT SYSTEMS

## MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems

**HOW DO I ORDER MPLAB® ICE?**

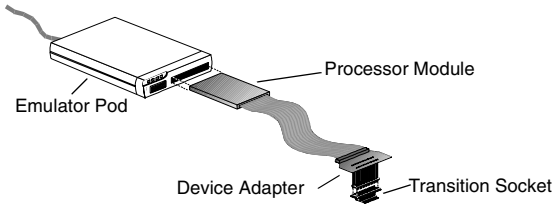
Ordering MPLAB® ICE is as easy as 1, 2, and 3!

**NOTE 1:** Choose your PICmicro® MCU.
**2:** Choose your PICmicro® MCU package.
**3:** Find the right line on the next few pages for MPLAB® ICE part numbers. You're ready to order.

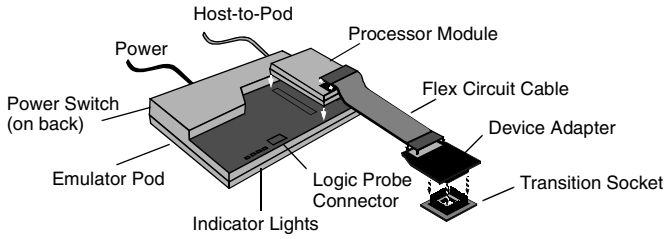
**A COMPLETE MPLAB® ICE SYSTEM**

MPLAB® ICE is a modular emulator system with interchangeable components allowing the system to be easily configured to emulate different PICmicro® MCUs. Since this emulator supports package-specific emulation, customers need to know which device and package they intend to emulate. Then, the customer can use the *Cross Reference Parts List* on the following pages to identify the part numbers required to complete an MPLAB® ICE system. A complete system consists of:

**NOTE 1:** An emulator pod (including among other things the host-to-pod parallel cable and power supply)
**2:** A processor module
**3:** A device adapter
**4:** A transition socket




**MPLAB® ICE 2000 Emulator**




**MPLAB® ICE 4000 Emulator**

An MPLAB® ICE emulator system is ordered as separate components. Knowing the terms will make it easy to order and use the MPLAB® ICE emulator system. Read more about each component:

1. **Emulator Pod**

   The MPLAB® ICE 2000 and MPLAB® ICE 4000 are full-featured emulator pods containing a main board with an additional board for expanded trace memory and complex control logic. The pods come with a standard parallel interface cable that connects the pods to the parallel port of the PC and a power supply. MPLAB® ICE 4000 also includes a USB interface cable that connects the pod to the USB port.

2. **Processor Module**

   The processor module is a PICmicro®, device-specific module that is inserted into the emulator pod. The processor module contains the emulator chip, logic, and low-voltage circuitry. A flex cable extends from the processor module and is connected to the device adapter at the target application.

3. **Device Adapter**

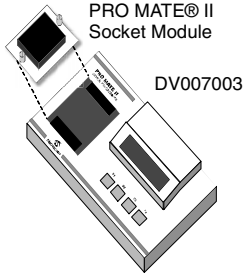
   The device adapter provides a common interface for the PICmicro® MCU being emulated. This adapter contains a special device that provides an oscillator clock allowing the user to accurately emulate the RC characteristics of the PICmicro® MCU. The device adapter provides emulation support for standard DIP and PLCC styles. For emulation support of other packages, a transition socket is needed along with the device adapter.

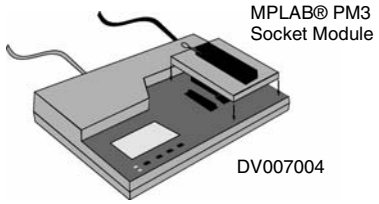
4. **Transition Socket**

   The transition sockets are available in various styles to allow the common device adapter to be translated to support surface-mount packages, such as SOIC, SSOP, PQFP, TQFP and MLF.

## PRO MATE® II and MPLAB® PM3 Programmers

The PRO MATE® II Programmer (DV007003) and the MPLAB® PM3 Programmer (DV007004) are Microchip's production rated programmers, which can be operated stand-alone or with a PC using MPLAB® IDE (included free). They come complete with accessories needed to connect to a host system, including a power supply and cables, giving the developer complete control over the programming session. Each programmer requires a socket module (to be purchased separately), which can be selected from the following chart by identifying the devices for programming and then picking the appropriate part number from their respective columns. In-Circuit Serial Programming™ (ICSP™) can be added to the PRO MATE® II Programmer by ordering Socket Module AC004004. MPLAB® PM3 has built-in ICSP™ programming capability.




## In-Circuit Debuggers: MPLAB® ICD 2

MPLAB® ICD 2 is a low cost, flash-based development tool that connects between the PC and the designer's target board allowing direct in-circuit debugging of the PICmicro® target microcontroller. Programs can be executed in real time or single step, watch variables established, break points set, memory read/writes accomplished and more. The MPLAB® ICD 2 can also be used as a development programmer for the microcontrollers.

## MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger, Software Tools, Programmers and Demonstration Boards

| | | MPLAB® ICE 2000 System (1) | | | MPLAB® ICE 4000 System (2) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Part Number** | **Lead Count/ Pkg Type** | **Processor Module** | **Device Adapters** | **Transition Socket** | **Processor Module** | **Device Adapters** | **Transition Socket** | **PRO MATE® II Socket Module (3,4)** | **MPLAB® PM3 Socket Module (8)** | **PICSTART® Plus (5)** | **MPLAB® ICD 2 (6)** | **MPLAB® CXX Compiler** | **Demonstration Boards or Evaluation Kits** |
| **Analog Interface Development Tools** | | | | | | | | | | | | | |
| MCP2120 | 14P | | | | | | | | | | | | DM163008 |
| MCP2150 | 18P | | | | | | | | | | | | DM163008 |
| MCP250XX | 14P | | | | | | | AC254001 | AC164301* | | | | DV250501 |
| MCP250XX | 14SO | | | | | | | AC254001 | AC164302* | | | | |
| MCP2510 | 18P | | | | | | | | | | | | DV251001 |
| MCP2515 | 18P | | | | | | | | | | | | DV251001 |
| **PICmicro® Microcontroller Development Tools** | | | | | | | | | | | | | |
| PIC10F200 | 6OT | | | | | | | AC164037 | AC164321 | ✓ | AC162059* +XLT06SOT | | DV164101 +AC163020 |
| PIC10F200 | 8P | | | | | | | AC164037 | AC164301 | ✓ | AC162059* | | DV164101 |
| PIC10F202 | 6OT | | | | | | | AC164037 | AC164321 | ✓ | AC162059* +XLT06SOT | | DV164101 +AC163020 |
| PIC10F202 | 8P | | | | | | | AC164037 | AC164301 | ✓ | AC162059* | | DV164101 |
| PIC10F204 | 6OT | | | | | | | AC164037 | AC164321 | ✓ | AC162059* +XLT06SOT | | DV164101 +AC163020 |
| PIC10F204 | 8P | | | | | | | AC164037 | AC164301 | ✓ | AC162059* | | DV164101 |
| PIC10F206 | 6OT | | | | | | | AC164037 | AC164321 | ✓ | AC162059* +XLT06SOT | | DV164101 +AC163020 |
| PIC10F206 | 8P | | | | | | | AC164037 | AC164301 | ✓ | AC162059* | | DV164101 |
| PIC12C508 | 8P, 8JW | PCM16XA0 | DVA12XP080 | | | | | AC124001 | AC164301 | ✓ | | | DM163001, DVMCPA |
| PIC12C508 | 8SM | PCM16XA0 | DVA12XP080 | XLT08SO | | | | AC124001 | AC164312 | | | | |
| PIC12C508A | 8P, 8JW | PCM16XA0 | DVA12XP080 | | | | | AC124001 | AC164301 | ✓ | | | DM163001, DVMCPA |
| PIC12C508A | 8SM | PCM16XA0 | DVA12XP080 | XLT08SO | | | | AC124001 | AC164312 | | | | |
| PIC12C508A | 8SN | PCM16XA0 | DVA12XP080 | XLT08SO | | | | AC164026 | AC164302 | | | | |
| PIC12C508A | 8MF | PCM16XA0 | DVA12XP080 | XLT08DFN or XLT08DFN2 | | | | AC124001 +AC164032 | AC164301 +AC164032 | AC164032 | | | |
| PIC12C509 | 8P, 8JW | PCM16XA0 | DVA12XP080 | | | | | AC124001 | AC164301 | ✓ | | | DM163001, DVMCPA |
| PIC12C509 | 8SM | PCM16XA0 | DVA12XP080 | XLT08SO | | | | AC124001 | AC164312 | | | | |
| PIC12C509A | 8P, 8JW | PCM16XA0 | DVA12XP080 | | | | | AC124001 | AC164301 | ✓ | | | DM163001, DVMCPA |
| PIC12C509A | 8SM | PCM16XA0 | DVA12XP080 | XLT08SO | | | | AC124001 | AC164312 | | | | |
| PIC12C509A | 8SN | PCM16XA0 | DVA12XP080 | XLT08SO | | | | AC164026 | AC164302 | | | | |
| PIC12C509A | 8MF | PCM16XA0 | DVA12XP080 | XLT08DFN or XLT08DFN2 | | | | AC124001 +AC164032 | AC164301 +AC164032 | AC164032 | | | |

**NOTE:** **See complete list of notes on page 80.**

## MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger, Software Tools, Programmers and Demonstration Boards

| | | MPLAB® ICE 2000 System (1) | | | MPLAB® ICE 4000 System (2) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Part Number** | **Lead Count/ Pkg Type** | **Processor Module** | **Device Adapters** | **Transition Socket** | **Processor Module** | **Device Adapters** | **Transition Socket** | **PRO MATE® II Socket Module (3,4)** | **MPLAB® PM3 Socket Module (8)** | **PICSTART® Plus (5)** | **MPLAB® ICD 2 (6)** | **MPLAB® CXX Compiler** | **Demonstration Boards or Evaluation Kits** |
| **PICmicro® Microcontroller Development Tools (continued)** | | | | | | | | | | | | | |
| PIC12C671 | 8P, 8JW | PCM12XA0 | DVA12XP081 | | | | | AC124001 | AC164301 | ✓ | | | |
| PIC12C671 | 8SM | PCM12XA0 | DVA12XP081 | XLT08SO | | | | AC124001 | AC164312 | | | | |
| PIC12C671 | 8MF | PCM12XA0 | DVA12XP081 | XLT08DFN or XLT08DFN2 | | | | AC124001 +AC164032 | AC164301 +AC164032 | AC164032 | | | |
| PIC12C672 | 8P, 8JW | PCM12XA0 | DVA12XP081 | | | | | AC124001 | AC164301 | ✓ | | | |
| PIC12C672 | 8SM | PCM12XA0 | DVA12XP081 | XLT08SO | | | | AC124001 | AC164312 | | | | |
| PIC12C672 | 8MF | PCM12XA0 | DVA12XP081 | XLT08DFN or XLT08DFN2 | | | | AC124001 +AC164032 | AC164301 +AC164032 | AC164032 | | | |
| PIC12CE518 | 8P, 8JW | PCM16XA0 | DVA12XP080 | | | | | AC124001 | AC164301 | ✓ | | | |
| PIC12CE518 | 8SM | PCM16XA0 | DVA12XP080 | XLT08SO | | | | AC124001 | AC164312 | | | | |
| PIC12CE518 | 8SN | PCM16XA0 | DVA12XP080 | XLT08SO | | | | AC164026 | AC164302 | | | | |
| PIC12CE519 | 8P, 8JW | PCM16XA0 | DVA12XP080 | | | | | AC124001 | AC164301 | ✓ | | | |
| PIC12CE519 | 8SM | PCM16XA0 | DVA12XP080 | XLT08SO | | | | AC124001 | AC164312 | | | | |
| PIC12CE519 | 8SN | PCM16XA0 | DVA12XP080 | XLT08SO | | | | AC164026 | AC164302 | | | | |
| PIC12CE673 | 8P, 8JW | PCM12XA0 | DVA12XP081 | | | | | AC124001 | AC164301 | ✓ | | | |
| PIC12CE674 | 8P, 8JW | PCM12XA0 | DVA12XP081 | | | | | AC124001 | AC164301 | ✓ | | | |
| PIC12F508 | 8P | PCM16XA0 | DVA12XP080 | | | | | AC124001 | AC164301 | ✓ | AC162059* | | DM163014, DV164101 |
| PIC12F508 | 8SN | PCM16XA0 | DVA12XP080 | XLT08SO | | | | AC164026 | AC164302 | | AC162059* +XLT08SO | | |
| PIC12F508 | 8ST | PCM16XA0 | DVA12XP080 | | | | | | AC164306 | | | | |
| PIC12F508 | 8MS | PCM16XA0 | DVA12XP080 | | | | | | | | | | |
| PIC12F509 | 8P | PCM16XA0 | DVA12XP080 | | | | | AC124001 | AC164301 | ✓ | AC162059* | | DM163014, DV164101 |
| PIC12F509 | 8SN | PCM16XA0 | DVA12XP080 | XLT08SO | | | | AC164026 | AC164302 | | AC162059* +XLT08SO | | |
| PIC12F509 | 8ST | PCM16XA0 | DVA12XP080 | | | | | | AC164306 | | | | |
| PIC12F509 | 8MS | PCM16XA0 | DVA12XP080 | | | | | | | | | | |
| PIC12F629 | 8P | PCM12XB0 | DVA12XP081 | | | | | AC124001 | AC164301 | ✓ | AC162050 | | DM163014, DV164101* |
| PIC12F629 | 8SN | PCM12XB0 | DVA12XP081 | XLT08SO | | | | AC164026 | AC164302 | | AC162050 +XLT08SO | | |
| PIC12F629 | 8MF | PCM12XB0 | DVA12XP081 | XLT08DFN or XLT08DFN2 | | | | AC124001 +AC164032 | AC164301 +AC164032 | AC164032 | AC162050 +XLT08DFN or XLT08DFN2 | | |

**NOTE:** **See complete list of notes on page 80.**

## MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger, Software Tools, Programmers and Demonstration Boards

| | | MPLAB® ICE 2000 System (1) | | | MPLAB® ICE 4000 System (2) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Part Number** | **Lead Count/ Pkg Type** | **Processor Module** | **Device Adapters** | **Transition Socket** | **Processor Module** | **Device Adapters** | **Transition Socket** | **PRO MATE® II Socket Module (3,4)** | **MPLAB® PM3 Socket Module (8)** | **PICSTART® Plus (5)** | **MPLAB® ICD 2 (6)** | **MPLAB® CXX Compiler** | **Demonstration Boards or Evaluation Kits** |
| **PICmicro® Microcontroller Development Tools (continued)** | | | | | | | | | | | | | |
| PIC12F635 | 8P | PCM16YM0 | DVA1002 | ACICE0201 | | | | AC124001 | AC164301 | ✓ | AC162057 | | DM163014, DV164101 |
| PIC12F635 | 8SN | PCM16YM0 | DVA1002 | XLT08SO | | | | AC164026 | AC164302 | | AC162057 +XLT08SO | | |
| PIC12F635 | 8MF | PCM16YM0 | DVA1002 | XLT08DFN or XLT08DFN2 | | | | AC124001 +AC164032 | AC164301 +AC164032 | AC164032 | AC162050 +XLT08DFN or XLT08DFN2 | | |
| PIC12F675 | 8P | PCM12XB0 | DVA12XP081 | | | | | AC124001 | AC164301 | ✓ | AC162050 | | DM163014, DV164101 |
| PIC12F675 | 8SN | PCM12XB0 | DVA12XP081 | XLT08SO | | | | AC164026 | AC164302 | | AC162050 +XLT08SO | | |
| PIC12F675 | 8MF | PCM12XB0 | DVA12XP081 | XLT08DFN or XLT08DFN2 | | | | AC124001 +AC164032 | AC164301 +AC164032 | AC164032 | AC162050 +XLT08DFN or XLT08DFN2 | | |
| PIC12F683 | 8P | PCM12XC0 | DVA1002 | ACICE0201 | | | | AC124001 | AC164301 | ✓ | AC162058 | | DM163014, DV164101 |
| PIC12F683 | 8SN | PCM12XC0 | DVA1002 | XLT08SO | | | | AC164026 | AC164302 | | AC162058 +XLT08SO | | |
| PIC12F683 | 8MF | PCM12XC0 | DVA1002 | XLT08DFN or XLT08DFN2 | | | | AC124001 +AC164032 | AC164301 +AC164032 | AC164032 | AC162058 +XLT08DFN or XLT08DFN2 | | |
| PIC14000 | 28SP, 28JW | PCM14XA0 | DVA14XP280 | | | | | AC144001 | AC164301 | ✓ | | | DM143001 |
| PIC14000 | 28SO | PCM14XA0 | DVA14XP280 | XLT28SO | | | | AC144002 | AC164302 | | | | |
| PIC14000 | 28SS | PCM14XA0 | DVA14XP280 | XLT28SS | | | | AC144002 | AC164307 | | | | |
| PIC16C52 | 18P | PCM16XA0 | DVA16XP180 | | | | | AC164001 | AC164301 | ✓ | | | DM163001 |
| PIC16C52 | 18SO | PCM16XA0 | DVA16XP180 | XLT18SO | | | | AC164002 | AC164302 | | | | |
| PIC16C54/54A/ 54C | 18P, 18JW | PCM16XA0 | DVA16XP180 | | | | | AC164001 | AC164301 | ✓ | | | DM163001 |
| PIC16C54/54A/ 54C | 18SO | PCM16XA0 | DVA16XP180 | XLT18SO | | | | AC164002 | AC164302 | | | | |
| PIC16C54/54A/ 54C | 20SS | PCM16XA0 | DVA16XP180 | XLT20SS | | | | AC164015 | AC164307 | | | | |
| PIC16C55/55A | 28P, 28JW | PCM16XA0 | DVA16XP280 | XLT28XP | | | | AC164001 | AC164301 | ✓ | | | DM163001 |
| PIC16C55/55A | 28SP | PCM16XA0 | DVA16XP280 | | | | | AC164001 | AC164301 | ✓ | | | DM163001 |
| PIC16C55/55A | 28SO | PCM16XA0 | DVA16XP280 | XLT28SO | | | | AC164002 | AC164302 | | | | |
| PIC16C55/55A | 28SS | PCM16XA0 | DVA16XP280 | XLT28SS2 | | | | AC164015 | AC164307 | | | | |
| PIC16C56/56A | 18P, 18JW | PCM16XA0 | DVA16XP180 | | | | | AC164001 | AC164301 | ✓ | | | DM163001 |
| PIC16C56/56A | 18SO | PCM16XA0 | DVA16XP180 | XLT18SO | | | | AC164002 | AC164302 | | | | |
| PIC16C56/56A | 20SS | PCM16XA0 | DVA16XP180 | XLT20SS | | | | AC164015 | AC164307 | | | | |

**NOTE:** **See complete list of notes on page 80.**

## MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger, Software Tools, Programmers and Demonstration Boards

| | | MPLAB® ICE 2000 System (1) | | | MPLAB® ICE 4000 System (2) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Part Number** | **Lead Count/ Pkg Type** | **Processor Module** | **Device Adapters** | **Transition Socket** | **Processor Module** | **Device Adapters** | **Transition Socket** | **PRO MATE® II Socket Module (3,4)** | **MPLAB® PM3 Socket Module (8)** | **PICSTART® Plus (5)** | **MPLAB® ICD 2 (6)** | **MPLAB® CXX Compiler** | **Demonstration Boards or Evaluation Kits** |
| **PICmicro® Microcontroller Development Tools (continued)** | | | | | | | | | | | | | |
| PIC16C57/57C | 28P, 28JW | PCM16XA0 | DVA16XP280 | XLT28XP | | | | AC164001 | AC164301 | ✓ | | | DM163001 |
| PIC16C57/57C | 28SP | PCM16XA0 | DVA16XP280 | | | | | AC164001 | AC164301 | ✓ | | | DM163001 |
| PIC16C57/57C | 28SO | PCM16XA0 | DVA16XP280 | XLT28SO | | | | AC164002 | AC164302 | | | | |
| PIC16C57/57C | 28SS | PCM16XA0 | DVA16XP280 | XLT28SS2 | | | | AC164015 | AC164307 | | | | |
| PIC16C58A/58B | 18P, 18JW | PCM16XA0 | DVA16XP180 | | | | | AC164001 | AC164301 | ✓ | | | DM163001 |
| PIC16C58A/58B | 18SO | PCM16XA0 | DVA16XP180 | XLT18SO | | | | AC164002 | AC164302 | | | | |
| PIC16C58A/58B | 20SS | PCM16XA0 | DVA16XP180 | XLT20SS | | | | AC164015 | AC164307 | | | | |
| PIC16C62A | 28P, 28JW | PCM16XB1 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | | | DM163022 |
| PIC16C62A | 28SO | PCM16XB1 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | | | |
| PIC16C62A | 28SS | PCM16XB1 | DVA16XP282 | XLT28SS | | | | AC164021 | AC164307 | | | | |
| PIC16C62B | 28SP, 28JW | PCM16XE1 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | | | DM163022 |
| PIC16C62B | 28ML | PCM16XE1 | DVA16XP282 | XLT28QFN4* | | | | AC164012 +AC164031 | AC164301 +AC164031 | AC164031 | | | |
| PIC16C62B | 28SO | PCM16XE1 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | | | |
| PIC16C62B | 28SS | PCM16XE1 | DVA16XP282 | XLT28SS | | | | AC164021 | AC164307 | | | | |
| PIC16C63 | 28SP, 28JW | PCM16XB1 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | | | DM163022, DVMCPA |
| PIC16C63 | 28SO | PCM16XB1 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | | | |
| PIC16C63A | 28SP, 28JW | PCM16XE1 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | | | DM163022 |
| PIC16C63A | 28ML | PCM16XE1 | DVA16XP282 | XLT28QFN4* | | | | AC164012 +AC164031 | AC164301 +AC164031 | AC164031 | | | |
| PIC16C63A | 28SO | PCM16XE1 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | | | |
| PIC16C63A | 28SS | PCM16XE1 | DVA16XP282 | XLT28SS | | | | AC164021 | AC164307 | | | | |
| PIC16C64A | 40P, 40JW | PCM16XB1 | DVA16XP401 | | | | | AC164012 | AC164301 | ✓ | | | DM163022 |
| PIC16C64A | 44L | PCM16XB1 | DVA16XL441 | | | | | AC164013 | AC164309 | | | | |
| PIC16C64A | 44PQ | PCM16XB1 | DVA16PQ441 | XLT44PT or XLT44PT3 | | | | AC164014 | AC164311 | | | | |
| PIC16C64A | 44PT | PCM16XB1 | DVA16PQ441 | XLT44PT or XLT44PT3 | | | | AC164020 | AC164305 | | | | |

**NOTE:** **See complete list of notes on page 80.**

## MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger, Software Tools, Programmers and Demonstration Boards

| | | MPLAB® ICE 2000 System (1) | | | MPLAB® ICE 4000 System (2) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Part Number** | **Lead Count/ Pkg Type** | **Processor Module** | **Device Adapters** | **Transition Socket** | **Processor Module** | **Device Adapters** | **Transition Socket** | **PRO MATE® II Socket Module (3,4)** | **MPLAB® PM3 Socket Module (8)** | **PICSTART® Plus (5)** | **MPLAB® ICD 2 (6)** | **MPLAB® CXX Compiler** | **Demonstration Boards or Evaluation Kits** |
| **PICmicro® Microcontroller Development Tools (continued)** | | | | | | | | | | | | | |
| PIC16C65A | 40P, 40JW | PCM16XB1 | DVA16XP401 | | | | | AC164012 | AC164301 | ✓ | | | DM163022 |
| PIC16C65A | 44L | PCM16XB1 | DVA16XL441 | | | | | AC164013 | AC164309 | | | | |
| PIC16C65A | 44PQ | PCM16XB1 | DVA16PQ441 | XLT44PT or XLT44PT3 | | | | AC164014 | AC164311 | | | | |
| PIC16C65A | 44PT | PCM16XB1 | DVA16PQ441 | XLT44PT or XLT44PT3 | | | | AC164020 | AC164305 | | | | |
| PIC16C65B | 40P, 40JW | PCM16XE1 | DVA16XP401 | | | | | AC164012 | AC164301 | ✓ | | | DM163022 |
| PIC16C65B | 44L | PCM16XE1 | DVA16XL441 | | | | | AC164013 | AC164309 | | | | |
| PIC16C65B | 44PQ | PCM16XE1 | DVA16PQ441 | XLT44PT or XLT44PT3 | | | | AC164014 | AC164311 | | | | |
| PIC16C65B | 44PT | PCM16XE1 | DVA16PQ441 | XLT44PT or XLT44PT3 | | | | AC164020 | AC164305 | | | | |
| PIC16C66 | 28SP, 28JW | PCM16XE1 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | | | DM163022 |
| PIC16C66 | 28SO | PCM16XE1 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | | | |
| PIC16C67 | 40P, 40JW | PCM16XE1 | DVA16XP401 | | | | | AC164012 | AC164301 | ✓ | | | DM163022 |
| PIC16C67 | 44L | PCM16XE1 | DVA16XL441 | | | | | AC164013 | AC164309 | | | | |
| PIC16C67 | 44PQ | PCM16XE1 | DVA16PQ441 | XLT44PT or XLT44PT3 | | | | AC164014 | AC164311 | | | | |
| PIC16C67 | 44PT | PCM16XE1 | DVA16PQ441 | XLT44PT or XLT44PT3 | | | | AC164020 | AC164305 | | | | |
| PIC16C71 | 18P, 18JW | PCM16XF0 | DVA16XP180 | | | | | AC164010 | AC164301 | ✓ | | | DM163001 |
| PIC16C71 | 18SO | PCM16XF0 | DVA16XP180 | XLT18SO | | | | AC164010 | AC164302 | | | | |
| PIC16C72 | 28SP, 28JW | PCM16XB1 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | | | DM163022 |
| PIC16C72 | 28SO | PCM16XB1 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | | | |
| PIC16C72 | 28SS | PCM16XB1 | DVA16XP282 | XLT28SS | | | | AC164021 | AC164307 | | | | |
| PIC16C72A | 28SP, 28JW | PCM16XE1 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | | | DM163022 |
| PIC16C72A | 28ML | PCM16XE1 | DVA16XP282 | XLT28QFN4* | | | | AC164012 +AC164031 | AC164301 +AC164031 | AC164031 | | | |
| PIC16C72A | 28SO | PCM16XE1 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | | | |
| PIC16C72A | 28SS | PCM16XE1 | DVA16XP282 | XLT28SS | | | | AC164021 | AC164307 | | | | |
| PIC16C73A | 28SP, 28JW | PCM16XB1 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | | | DM163022 |
| PIC16C73A | 28SO | PCM16XB1 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | | | |

**NOTE: See complete list of notes on page 80.**

## MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger, Software Tools, Programmers and Demonstration Boards

| | | MPLAB® ICE 2000 System (1) | | | MPLAB® ICE 4000 System (2) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Part Number** | **Lead Count/ Pkg Type** | **Processor Module** | **Device Adapters** | **Transition Socket** | **Processor Module** | **Device Adapters** | **Transition Socket** | **PRO MATE® II Socket Module (3,4)** | **MPLAB® PM3 Socket Module (8)** | **PICSTART® Plus (5)** | **MPLAB® ICD 2 (6)** | **MPLAB® CXX Compiler** | **Demonstration Boards or Evaluation Kits** |
| **PICmicro® Microcontroller Development Tools (continued)** | | | | | | | | | | | | | |
| PIC16C73B | 28SP, 28JW | PCM16XE1 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | | | DM163022 |
| PIC16C73B | 28ML | PCM16XE1 | DVA16XP282 | XLT28QFN4* | | | | AC164012 +AC164031 | AC164301 +AC164031 | AC164031 | | | |
| PIC16C73B | 28SO | PCM16XE1 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | | | |
| PIC16C73B | 28SS | PCM16XE1 | DVA16XP282 | XLT28SS | | | | AC164021 | AC164307 | | | | |
| PIC16C74A | 40P, 40JW | PCM16XB1 | DVA16XP401 | | | | | AC164012 | AC164301 | ✓ | | | DM163022 |
| PIC16C74A | 44L | PCM16XB1 | DVA16XL441 | | | | | AC164013 | AC164309 | | | | |
| PIC16C74A | 44PQ | PCM16XB1 | DVA16PQ441 | XLT44PT or XLT44PT3 | | | | AC164014 | AC164311 | | | | |
| PIC16C74A | 44PT | PCM16XB1 | DVA16PQ441 | XLT44PT or XLT44PT3 | | | | AC164020 | AC164305 | | | | |
| PIC16C74B | 40P, 40JW | PCM16XE1 | DVA16XP401 | | | | | AC164012 | AC164301 | ✓ | | | DM163022 |
| PIC16C74B | 44L | PCM16XE1 | DVA16XL441 | | | | | AC164013 | AC164309 | | | | |
| PIC16C74B | 44PQ | PCM16XE1 | DVA16PQ441 | XLT44PT or XLT44PT3 | | | | AC164014 | AC164311 | | | | |
| PIC16C74B | 44PT | PCM16XE1 | DVA16PQ441 | XLT44PT or XLT44PT3 | | | | AC164020 | AC164305 | | | | |
| PIC16C76 | 28SP, 28JW | PCM16XE1 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | | | DM163022 |
| PIC16C76 | 28SO | PCM16XE1 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | | | |
| PIC16C77 | 40P, 40JW | PCM16XE1 | DVA16XP401 | | | | | AC164012 | AC164301 | ✓ | | | DM163022 |
| PIC16C77 | 44L | PCM16XE1 | DVA16XL441 | | | | | AC164013 | AC164309 | | | | |
| PIC16C77 | 44PQ | PCM16XE1 | DVA16PQ441 | XLT44PT or XLT44PT3 | | | | AC164014 | AC164311 | | | | |
| PIC16C77 | 44PT | PCM16XE1 | DVA16PQ441 | XLT44PT or XLT44PT3 | | | | AC164020 | AC164305 | | | | |
| PIC16C432 | 20P, 20JW | PCM16YB0 | DVA16XP201 | | | | | AC164029 | AC164301 | | | | DM163005 |
| PIC16C432 | 20SS | PCM16YB0 | DVA16XP201 | XLT20SS1 | | | | AC164029 | AC164307 | | | | DM163007, DM163011 |
| PIC16C433 | 18P, 18JW | PCM16YC0 | DVA16XP185 | | | | | AC164030 | AC164301 | | | | DM163005 |
| PIC16C433 | 18SO | PCM16YC0 | DVA16XP185 | XLT18SO | | | | AC164030 | AC164307 | | | | |
| PIC16C505 | 14P, 14JW | PCM16XA0 | DVA16XP140 | | | | | AC124001 | AC164301 | ✓ | | | |
| PIC16C505 | 14SL | PCM16XA0 | DVA16XP140 | XLT14SO | | | | AC164026 | AC164302 | | | | |
| PIC16C554 | 18P, 18JW | PCM16XC0 | DVA16XP180 | | | | | AC164010 | AC164301 | ✓ | | | DM163001 |
| PIC16C554 | 18SO | PCM16XC0 | DVA16XP180 | XLT18SO | | | | AC164010 | AC164302 | | | | |
| PIC16C554 | 20SS | PCM16XC0 | DVA16XP180 | XLT20SS | | | | AC164018 | AC164307 | | | | |

**NOTE:** **See complete list of notes on page 80.**

## MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger, Software Tools, Programmers and Demonstration Boards

| | | MPLAB® ICE 2000 System (1) | | | MPLAB® ICE 4000 System (2) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Part Number** | **Lead Count/ Pkg Type** | **Processor Module** | **Device Adapters** | **Transition Socket** | **Processor Module** | **Device Adapters** | **Transition Socket** | **PRO MATE® II Socket Module (3,4)** | **MPLAB® PM3 Socket Module (8)** | **PICSTART® Plus (5)** | **MPLAB® ICD 2 (6)** | **MPLAB® CXX Compiler** | **Demonstration Boards or Evaluation Kits** |
| **PICmicro® Microcontroller Development Tools (continued)** | | | | | | | | | | | | | |
| PIC16C557 | 28P | | | | | | | AC164001 | AC164301 | | | | |
| PIC16C557 | 28SO | | | | | | | AC164002 | AC164302 | | | | |
| PIC16C558 | 18P, 18JW | PCM16XC0 | DVA16XP180 | | | | | AC164010 | AC164301 | ✓ | | | DM163001 |
| PIC16C558 | 18SO | PCM16XC0 | DVA16XP180 | XLT18SO | | | | AC164010 | AC164302 | | | | |
| PIC16C558 | 20SS | PCM16XC0 | DVA16XP180 | XLT20SS | | | | AC164018 | AC164307 | | | | |
| PIC16C620/ 620A | 18P, 18JW | PCM16XC0 | DVA16XP180 | | | | | AC164010 | AC164301 | ✓ | | | DM163001 |
| PIC16C620/ 620A | 18SO | PCM16XC0 | DVA16XP180 | XLT18SO | | | | AC164010 | AC164302 | | | | |
| PIC16C620/ 620A | 20SS | PCM16XC0 | DVA16XP180 | XLT20SS | | | | AC164018 | AC164307 | | | | |
| PIC16C621/ 621A | 18P, 18JW | PCM16XC0 | DVA16XP180 | | | | | AC164010 | AC164301 | ✓ | | | DM163001 |
| PIC16C621/ 621A | 18SO | PCM16XC0 | DVA16XP180 | XLT18SO | | | | AC164010 | AC164302 | | | | |
| PIC16C621/ 621A | 20SS | PCM16XC0 | DVA16XP180 | XLT20SS | | | | AC164018 | AC164307 | | | | |
| PIC16C622/ 622A | 18P, 18JW | PCM16XC0 | DVA16XP180 | | | | | AC164010 | AC164301 | ✓ | | | DM163001 |
| PIC16C622/ 622A | 18SO | PCM16XC0 | DVA16XP180 | XLT18SO | | | | AC164010 | AC164302 | | | | |
| PIC16C622/ 622A | 20SS | PCM16XC0 | DVA16XP180 | XLT20SS | | | | AC164018 | AC164307 | | | | |
| PIC16C642 | 28SP, 28JW | PCM16XD0 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | | | DM163022 |
| PIC16C642 | 28SO | PCM16XD0 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | | | |
| PIC16C662 | 40P, 40JW | PCM16XD0 | DVA16XP401 | | | | | AC164012 | AC164301 | ✓ | | | DM163022 |
| PIC16C662 | 44L | PCM16XD0 | DVA16XL441 | | | | | AC164013 | AC164309 | | | | |
| PIC16C662 | 44PQ | PCM16XD0 | DVA16PQ441 | XLT44PT or XLT44PT3 | | | | AC164014 | AC164311 | | | | |
| PIC16C662 | 44PT | PCM16XD0 | DVA16PQ441 | XLT44PT or XLT44PT3 | | | | AC164020 | AC164305 | | | | |
| PIC16C710 | 18P, 18JW | PCM16XF0 | DVA16XP180 | | | | | AC164010 | AC164301 | ✓ | | | DM163001 |
| PIC16C710 | 18SO | PCM16XF0 | DVA16XP180 | XLT18SO | | | | AC164010 | AC164302 | | | | |
| PIC16C710 | 20SS | PCM16XF0 | DVA16XP180 | XLT20SS | | | | AC164018 | AC164307 | | | | |

**NOTE: See complete list of notes on page 80.**

## MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger, Software Tools, Programmers and Demonstration Boards

| | | MPLAB® ICE 2000 System (1) | | | MPLAB® ICE 4000 System (2) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Part Number | Lead Count/ Pkg Type | Processor Module | Device Adapters | Transition Socket | Processor Module | Device Adapters | Transition Socket | PRO MATE® II Socket Module (3,4) | MPLAB® PM3 Socket Module (8) | PICSTART® Plus (5) | MPLAB® ICD 2 (6) | MPLAB® CXX Compiler | Demonstration Boards or Evaluation Kits |
| **PICmicro® Microcontroller Development Tools (continued)** | | | | | | | | | | | | | |
| PIC16C711 | 18P, 18JW | PCM16XF0 | DVA16XP180 | | | | | AC164010 | AC164301 | ✓ | | | DM163001 |
| PIC16C711 | 18SO | PCM16XF0 | DVA16XP180 | XLT18SO | | | | AC164010 | AC164302 | | | | |
| PIC16C711 | 20SS | PCM16XF0 | DVA16XP180 | XLT20SS | | | | AC164018 | AC164307 | | | | |
| PIC16C712 | 18P, 18JW | PCM16XE1 | DVA16XP182 | | | | | AC164010 | AC164301 | ✓ | | | DM163001 |
| PIC16C712 | 18SO | PCM16XE1 | DVA16XP182 | XLT18SO | | | | AC164010 | AC164302 | | | | |
| PIC16C712 | 20SS | PCM16XE1 | DVA16XP182 | XLT20SS | | | | AC164018 | AC164307 | | | | |
| PIC16C715 | 18P, 18JW | PCM16XG0 | DVA16XP180 | | | | | AC164010 | AC164301 | ✓ | | | DM163001 |
| PIC16C715 | 18SO | PCM16XG0 | DVA16XP180 | XLT18SO | | | | AC164010 | AC164302 | | | | |
| PIC16C715 | 20SS | PCM16XG0 | DVA16XP180 | XLT20SS | | | | AC164018 | AC164307 | | | | |
| PIC16C716 | 18P, 18JW | PCM16XE1 | DVA16XP182 | | | | | AC164010 | AC164301 | ✓ | | | DM163001 |
| PIC16C716 | 18SO | PCM16XE1 | DVA16XP182 | XLT18SO | | | | AC164010 | AC164302 | | | | |
| PIC16C716 | 20SS | PCM16XE1 | DVA16XP182 | XLT20SS | | | | AC164018 | AC164307 | | | | |
| PIC16C717 | 18P, 18JW | PCM16XN1 | DVA18XP180 | | | | | AC164010 | AC164301 | ✓ | | | DM163001 |
| PIC16C717 | 18SO | PCM16XN1 | DVA18XP180 | XLT18SO | | | | AC164010 | AC164302 | | | | |
| PIC16C717 | 20SS | PCM16XN1 | DVA18XP180 | XLT20SS | | | | AC164018 | AC164307 | | | | |
| PIC16C745 | 28SP, 28JW | PCM16XQ1 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | | | DM163010 |
| PIC16C745 | 28SO | PCM16XQ1 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | | | |
| PIC16C765 | 40P, 40JW | PCM16XQ1 | DVA16XP401 | | | | | AC164012 | AC164301 | ✓ | | | DM163010 |
| PIC16C765 | 44L | PCM16XQ1 | DVA16XL441 | | | | | AC164013 | AC164309 | | | | |
| PIC16C765 | 44PT | PCM16XQ1 | DVA16PQ441 | XLT44PT or XLT44PT3 | | | | AC164020 | AC164305 | | | | |
| PIC16C770 | 20P, 20JW | PCM16XN1 | DVA16XP200 | | | | | AC164028 | AC164301 | ✓ | | | DM163001 |
| PIC16C770 | 20SO | PCM16XN1 | DVA16XP200 | XLT20SO1 | | | | AC164028 | AC164302 | | | | |
| PIC16C770 | 20SS | PCM16XN1 | DVA16XP200 | XLT20SS1 | | | | AC164018 | AC164307 | | | | |
| PIC16C771 | 20P, 20JW | PCM16XN1 | DVA16XP200 | | | | | AC164028 | AC164301 | ✓ | | | DM163001 |
| PIC16C771 | 20SO | PCM16XN1 | DVA16XP200 | XLT20SO1 | | | | AC164028 | AC164302 | | | | |
| PIC16C771 | 20SS | PCM16XN1 | DVA16XP200 | XLT20SS1 | | | | AC164018 | AC164307 | | | | |
| PIC16C773 | 28SP, 28JW | PCM16XL0 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | | | DM163022 |
| PIC16C773 | 28SO | PCM16XL0 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | | | |
| PIC16C773 | 28SS | PCM16XL0 | DVA16XP282 | XLT28SS | | | | AC164021 | AC164307 | | | | |

**NOTE:** **See complete list of notes on page 80.**

## MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger, Software Tools, Programmers and Demonstration Boards

| | | MPLAB® ICE 2000 System (1) | | | MPLAB® ICE 4000 System (2) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Part Number** | **Lead Count/ Pkg Type** | **Processor Module** | **Device Adapters** | **Transition Socket** | **Processor Module** | **Device Adapters** | **Transition Socket** | **PRO MATE® II Socket Module (3,4)** | **MPLAB® PM3 Socket Module (8)** | **PICSTART® Plus (5)** | **MPLAB® ICD 2 (6)** | **MPLAB® CXX Compiler** | **Demonstration Boards or Evaluation Kits** |
| **PICmicro® Microcontroller Development Tools (continued)** | | | | | | | | | | | | | |
| PIC16C774 | 40P, 40JW | PCM16XL0 | DVA16XP401 | | | | | AC164012 | AC164301 | ✓ | | | DM163022 |
| PIC16C774 | 44L | PCM16XL0 | DVA16XL441 | | | | | AC164013 | AC164309 | | | | |
| PIC16C774 | 44PQ | PCM16XL0 | DVA16PQ441 | XLT44PT or XLT44PT3 | | | | AC164014 | AC164311 | | | | |
| PIC16C774 | 44PT | PCM16XL0 | DVA16PQ441 | XLT44PT or XLT44PT3 | | | | AC164020 | AC164305 | | | | |
| PIC16C781 | 20P, 20JW | PCM16XW0 | DVA16XP202 | | | | | AC164028 | AC164301 | ✓ | | | DM163012 |
| PIC16C781 | 20SO | PCM16XW0 | DVA16XP202 | XLT20SO1 | | | | AC164028 | AC164302 | | | | |
| PIC16C781 | 20SS | PCM16XW0 | DVA16XP202 | XLT20SS1 | | | | AC164018 | AC164307 | | | | |
| PIC16C782 | 20P, 20JW | PCM16XW0 | DVA16XP202 | | | | | AC164028 | AC164301 | ✓ | | | DM163012 |
| PIC16C782 | 20SO | PCM16XW0 | DVA16XP202 | XLT20SO1 | | | | AC164028 | AC164302 | | | | |
| PIC16C782 | 20SS | PCM16XW0 | DVA16XP202 | XLT20SS1 | | | | AC164018 | AC164307 | | | | |
| PIC16C923 | 64SP | PCM16XJ0 | DVA16XP640 | | | | | AC164025 | | ✓ | | | |
| PIC16C923 | 64PT | PCM16XJ0 | DVA16PQ640 | XLT64PT1 | | | | AC164023 | AC164319 | | | | |
| PIC16C923 | 68L, 68CL | PCM16XJ0 | DVA16XL680 | | | | | AC164022 | AC164308 | AC164024 | | | DM163003 |
| PIC16C924 | 64SP | PCM16XJ0 | DVA16XP640 | | | | | AC164025 | | ✓ | | | |
| PIC16C924 | 64PT | PCM16XJ0 | DVA16PQ640 | XLT64PT1 | | | | AC164023 | AC164319 | | | | |
| PIC16C924 | 68L, 68CL | PCM16XJ0 | DVA16XL680 | | | | | AC164022 | AC164308 | AC164024 | | | DM163003 |
| PIC16C925 | 64PT | PCM16XT0 | DVA16PQ640 | XLT64PT1 | | | | AC164023 | AC164319 | | | | |
| PIC16C925 | 68L, 68CL | PCM16XT0 | DVA16XL680 | | | | | AC164022 | AC164308 | AC164024 | | | DM163003 |
| PIC16C926 | 64PT | PCM16XT0 | DVA16PQ640 | XLT64PT1 | | | | AC164023 | AC164319 | | | | |
| PIC16C926 | 68L, 68CL | PCM16XT0 | DVA16XL680 | | | | | AC164022 | AC164308 | AC164024 | | | DM163003 |
| PIC16CE623 | 18P, 18JW | PCM16XC0 | DVA16XP180 | | | | | AC164010 | AC164301 | ✓ | | | DM163001 |
| PIC16CE623 | 18SO | PCM16XC0 | DVA16XP180 | XLT18SO | | | | AC164010 | AC164302 | | | | |
| PIC16CE623 | 20SS | PCM16XC0 | DVA16XP180 | XLT20SS | | | | AC164018 | AC164307 | | | | |
| PIC16CE624 | 18P, 18JW | PCM16XC0 | DVA16XP180 | | | | | AC164010 | AC164301 | ✓ | | | DM163001 |
| PIC16CE624 | 18SO | PCM16XC0 | DVA16XP180 | XLT18SO | | | | AC164010 | AC164302 | | | | |
| PIC16CE624 | 20SS | PCM16XC0 | DVA16XP180 | XLT20SS | | | | AC164018 | AC164307 | | | | |
| PIC16CE625 | 18P, 18JW | PCM16XC0 | DVA16XP180 | | | | | AC164010 | AC164301 | ✓ | | | DM163001 |
| PIC16CE625 | 18SO | PCM16XC0 | DVA16XP180 | XLT18SO | | | | AC164010 | AC164302 | | | | |
| PIC16CE625 | 20SS | PCM16XC0 | DVA16XP180 | XLT20SS | | | | AC164018 | AC164307 | | | | |

**NOTE: See complete list of notes on page 80.**

## MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger, Software Tools, Programmers and Demonstration Boards

| | | MPLAB® ICE 2000 System (1) | | | MPLAB® ICE 4000 System (2) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Part Number** | **Lead Count/ Pkg Type** | **Processor Module** | **Device Adapters** | **Transition Socket** | **Processor Module** | **Device Adapters** | **Transition Socket** | **PRO MATE® II Socket Module (3,4)** | **MPLAB® PM3 Socket Module (8)** | **PICSTART® Plus (5)** | **MPLAB® ICD 2 (6)** | **MPLAB® CXX Compiler** | **Demonstration Boards or Evaluation Kits** |
| **PICmicro® Microcontroller Development Tools (continued)** | | | | | | | | | | | | | |
| PIC16F54 | 18P | PCM16XA0 | DVA16XP180 | | | | | AC164001 | AC164301 | ✓ | ✓* | | DM163001 |
| PIC16F54 | 18SO | PCM16XA0 | DVA16XP180 | XLT18SO | | | | AC164002 | AC164302 | ✓ | ✓* | | |
| PIC16F54 | 20SS | PCM16XA0 | DVA16XP180 | XLT20SS | | | | AC164015 | AC164307 | ✓ | ✓* | | |
| PIC16F57 | 28P | PCM16XA0 | DVA16XP280 | XLT28XP | | | | AC164001 | AC164301 | ✓ | ✓* | | |
| PIC16F57 | 28SP | PCM16XA0 | DVA16XP280 | | | | | AC164001 | AC164301 | ✓ | ✓* | | DM163001 |
| PIC16F57 | 28SO | PCM16XA0 | DVA16XP280 | XLT28SO | | | | AC164002 | AC164302 | ✓ | ✓* | | |
| PIC16F57 | 28SS | PCM16XA0 | DVA16XP280 | XLT28SS2 | | | | AC164015 | AC164307 | ✓ | ✓* | | |
| PIC16F72 | 28SP, 28JW | PCM16XS2 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | | | DM163022 |
| PIC16F72 | 28SO | PCM16XS2 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | | | |
| PIC16F72 | 28SS | PCM16XS2 | DVA16XP282 | XLT28SS | | | | AC164021 | AC164307 | | | | |
| PIC16F72 | 28ML | PCM16XS2 | DVA16XP282 | XLT28QFN4* | | | | AC164012 +AC164031 | AC164301 +AC164031 | AC164031 | | | |
| PIC16F73 | 28SP, 28JW | PCM16XS2 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | ✓* | | DM163022 |
| PIC16F73 | 28ML | PCM16XS2 | DVA16XP282 | XLT28QFN4* | | | | AC164012 +AC164031 | AC164301 +AC164031 | AC164031 | ✓* | | |
| PIC16F73 | 28SO | PCM16XS2 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | ✓* | | |
| PIC16F73 | 28SS | PCM16XS2 | DVA16XP282 | XLT28SS | | | | AC164021 | AC164307 | | ✓* | | |
| PIC16F74 | 40P | PCM16XS2 | DVA16XP401 | | | | | AC164012 | AC164301 | ✓ | ✓* | | DM163022 |
| PIC16F74 | 44L | PCM16XS2 | DVA16XL441 | | | | | AC164013 | AC164309 | | ✓* | | |
| PIC16F74 | 44PT | PCM16XS2 | DVA16PQ441 | XLT44PT or XLT44PT3 | | | | AC164020 | AC164305 | | ✓* | | |
| PIC16F74 | 44ML | PCM16XS2 | DVA16XL441 | XLT44QFN2 | | | | AC164012 +AC164034 | AC164301 +AC164034 | AC164034 | ✓* | | |
| PIC16F76 | 28SP, 28JW | PCM16XS2 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | ✓* | | DM163022 |
| PIC16F76 | 28ML | PCM16XS2 | DVA16XP282 | XLT28QFN4* | | | | AC164012 +AC164031 | AC164301 +AC164031 | AC164031 | ✓* | | |
| PIC16F76 | 28SO | PCM16XS2 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | ✓* | | |
| PIC16F76 | 28SS | PCM16XS2 | DVA16XP282 | XLT28SS | | | | AC164021 | AC164307 | | ✓* | | |
| PIC16F77 | 40P, 40JW | PCM16XS2 | DVA16XP401 | | | | | AC164012 | AC164301 | ✓ | ✓* | | DM163022 |
| PIC16F77 | 44L | PCM16XS2 | DVA16XL441 | | | | | AC164013 | AC164309 | | ✓* | | |
| PIC16F77 | 44ML | PCM16XS2 | DVA16XL441 | XLT44QFN2 | | | | AC164012 +AC164034 | AC164301 +AC164034 | AC164034 | ✓* | | |
| PIC16F77 | 44PT | PCM16XS2 | DVA16PQ441 | XLT44PT or XLT44PT3 | | | | AC164020 | AC164305 | | ✓* | | |

**NOTE: See complete list of notes on page 80.**

## MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger, Software Tools, Programmers and Demonstration Boards

| | | MPLAB® ICE 2000 System (1) | | | MPLAB® ICE 4000 System (2) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Part Number** | **Lead Count/ Pkg Type** | **Processor Module** | **Device Adapters** | **Transition Socket** | **Processor Module** | **Device Adapters** | **Transition Socket** | **PRO MATE® II Socket Module (3,4)** | **MPLAB® PM3 Socket Module (8)** | **PICSTART® Plus (5)** | **MPLAB® ICD 2 (6)** | **MPLAB® CXX Compiler** | **Demonstration Boards or Evaluation Kits** |
| **PICmicro® Microcontroller Development Tools (continued)** | | | | | | | | | | | | | |
| PIC16F83 | 18P | PCM16XH1 | DVA16XP180 | | | | | AC164010 | AC164301 | ✓ | | | DM163001 |
| PIC16F83 | 18SO | PCM16XH1 | DVA16XP180 | XLT18SO | | | | AC164010 | AC164302 | | | | |
| PIC16F84 | 18P | PCM16XH1 | DVA16XP180 | | | | | AC164010 | AC164301 | ✓ | | | DM163001 |
| PIC16F84 | 18SO | PCM16XH1 | DVA16XP180 | XLT18SO | | | | AC164010 | AC164302 | | | | |
| PIC16F84A | 18P | PCM16XH1 | DVA16XP180 | | | | | AC164010 | AC164301 | ✓ | | | DM163001 |
| PIC16F84A | 18SO | PCM16XH1 | DVA16XP180 | XLT18SO | | | | AC164010 | AC164302 | | | | |
| PIC16F84A | 20SS | PCM16XH1 | DVA16XP180 | XLT20SS | | | | AC164018 | AC164307 | | | | |
| PIC16F87 | 18P | PCM16YG0 | DVA16XP186 | | | | | AC164010 | AC164301 | ✓ | ✓ | | DM163014 |
| PIC16F87 | 18SO | PCM16YG0 | DVA16XP186 | XLT18SO | | | | AC164010 | AC164302 | | ✓ | | |
| PIC16F87 | 20SS | PCM16YG0 | DVA16XP186 | XLT20SS | | | | AC164018 | AC164307 | | ✓ | | |
| PIC16F87 | 28ML | PCM16YG0 | DVA16XP186 | XLT28QFN3 | | | | AC164010 +AC164033 | AC164301 +AC164031 | AC164033 | ✓ | | |
| PIC16F88 | 18P | PCM16YG0 | DVA16XP186 | | | | | AC164010 | AC164301 | ✓ | ✓ | | DM163014 |
| PIC16F88 | 18SO | PCM16YG0 | DVA16XP186 | XLT18SO | | | | AC164010 | AC164302 | | ✓ | | |
| PIC16F88 | 20SS | PCM16YG0 | DVA16XP186 | XLT20SS | | | | AC164018 | AC164307 | | ✓ | | |
| PIC16F88 | 28ML | PCM16YG0 | DVA16XP186 | XLT28QFN3 | | | | AC164010 +AC164033 | AC164301 +AC164031 | AC164033 | ✓ | | |
| PIC16F505 | 14P, 14JW | PCM16XA0 | DVA16XP140 | | | | | AC124001 | AC164301 | ✓ | AC162059 | | DM163014, DV164101* |
| PIC16F505 | 14SL | PCM16XA0 | DVA16XP140 | XLT14SO | | | | AC164026 | AC164302 | | AC162059 +XLT14SO | | |
| PIC16F505 | 14ST | PCM16XA0 | DVA16XP140 | | | | | | AC164306 | | | | |
| PIC16F627 | 18P, 18JW | PCM16XP0 | DVA16XP183 | | | | | AC164010 | AC164301 | ✓ | | | DM163001 |
| PIC16F627 | 18SO | PCM16XP0 | DVA16XP183 | XLT18SO | | | | AC164010 | AC164302 | | | | |
| PIC16F627 | 20SS | PCM16XP0 | DVA16XP183 | XLT20SS | | | | AC164018 | AC164307 | | | | |
| PIC16F627A | 18P | PCM16YF0 | DVA16XP186 | | | | | AC164010 | AC164301 | ✓ | AC162053 | | DM163014 |
| PIC16F627A | 18SO | PCM16YF0 | DVA16XP186 | XLT18SO | | | | AC164010 | AC164302 | | AC162053 +XLT18SO | | |
| PIC16F627A | 20SS | PCM16YF0 | DVA16XP186 | XLT20SS | | | | AC164018 | AC164307 | | AC162053 +XLT20SS | | |
| PIC16F627A | 28ML | PCM16YF0 | DVA16XP186 | XLT28QFN3 | | | | AC164010 +AC164033 | AC164301 +AC164031 | AC164033 | AC162053 +XLT28QFN3 | | |
| PIC16F628 | 18P, 18JW | PCM16XP0 | DVA16XP183 | | | | | AC164010 | AC164301 | ✓ | | | DM163001 |
| PIC16F628 | 18SO | PCM16XP0 | DVA16XP183 | XLT18SO | | | | AC164010 | AC164302 | | | | |
| PIC16F628 | 20SS | PCM16XP0 | DVA16XP183 | XLT20SS | | | | AC164018 | AC164307 | | | | |

**NOTE:** **See complete list of notes on page 80.**

## MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger, Software Tools, Programmers and Demonstration Boards

| | | MPLAB® ICE 2000 System (1) | | | MPLAB® ICE 4000 System (2) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Part Number** | **Lead Count/ Pkg Type** | **Processor Module** | **Device Adapters** | **Transition Socket** | **Processor Module** | **Device Adapters** | **Transition Socket** | **PRO MATE® II Socket Module (3,4)** | **MPLAB® PM3 Socket Module (8)** | **PICSTART® Plus (5)** | **MPLAB® ICD 2 (6)** | **MPLAB® CXX Compiler** | **Demonstration Boards or Evaluation Kits** |
| **PICmicro® Microcontroller Development Tools (continued)** | | | | | | | | | | | | | |
| PIC16F628A | 18P | PCM16YF0 | DVA16XP186 | | | | | AC164010 | AC164301 | ✓ | AC162053 | | DM163014 |
| PIC16F628A | 18SO | PCM16YF0 | DVA16XP186 | XLT18SO | | | | AC164010 | AC164302 | | AC162053 +XLT18SO | | |
| PIC16F628A | 20SS | PCM16YF0 | DVA16XP186 | XLT20SS | | | | AC164018 | AC164307 | | AC162053 +XLT20SS | | |
| PIC16F628A | 28ML | PCM16YF0 | DVA16XP186 | XLT28QFN3 | | | | AC164010 +AC164033 | AC164301 +AC164031 | AC164033 | AC162053 +XLT28QFN3 | | |
| PIC16F630 | 14P | PCM16YD0 | DVA16XP141 | | | | | AC124001 | AC164301 | ✓ | AC162052 | | DM163014, DV164101* |
| PIC16F630 | 14SL | PCM16YD0 | DVA16XP141 | XLT14SO | | | | AC164026 | AC164302 | | AC162052 +XLT14SO | | |
| PIC16F630 | 14ST | PCM16YD0 | DVA16XP141 | XLT14SS | | | | AC164026 | AC164306 | | AC162052 +XLT14SS | | |
| PIC16F636 | 14P | PCM16YM0 | DVA1002 | ACICE0207 | | | | AC124001 | AC164301 | ✓ | AC162057 | | |
| PIC16F636 | 14SL | PCM16YM0 | DVA1002 | XLT14SO | | | | AC164026 | AC164302 | | AC162057 +XLT14SO | | |
| PIC16F636 | 14ST | PCM16YM0 | DVA1002 | XLT14SS | | | | AC164026 | AC164306 | | AC162057 +XLT14SS | | |
| PIC16F639 | 20P | PCM16YM0* | DVA1002 | ACICE0203 | | | | TBD | AC164301* | ✓* | AC162066* | | DV164101*, DM163014 |
| PIC16F639 | 20SO | PCM16YM0* | DVA1002 | XLT20SO1 | | | | TBD | AC164302* | | AC162066* +XLT20SO1 | | |
| PIC16F639 | 20SS | PCM16YM0* | DVA1002 | XLT20SS1 | | | | TBD | AC164307* | | AC162066* +XLT20SS1 | | |
| PIC16F648A | 18P | PCM16YF0 | DVA16XP186 | | | | | AC164010 | AC164301 | ✓ | AC162053 | | DM163014 |
| PIC16F648A | 18SO | PCM16YF0 | DVA16XP186 | XLT18SO | | | | AC164010 | AC164302 | | AC162053 +XLT18SO | | |
| PIC16F648A | 20SS | PCM16YF0 | DVA16XP186 | XLT20SS | | | | AC164018 | AC164307 | | AC162053 +XLT20SS | | |
| PIC16F648A | 28ML | PCM16YF0 | DVA16XP186 | XLT28QFN3 | | | | AC164010 +AC164033 | AC164301 +AC164031 | AC164033 | AC162053 +XLT28QFN3 | | |
| PIC16F676 | 14P | PCM16YD0 | DVA16XP141 | | | | | AC124001 | AC164301 | ✓ | AC162052 | | DM163014, DV164101* |
| PIC16F676 | 14SL | PCM16YD0 | DVA16XP141 | XLT14SO | | | | AC164026 | AC164302 | | AC162052 +XLT14SO | | |
| PIC16F676 | 14ST | PCM16YD0 | DVA16XP141 | XLT14SS | | | | AC164026 | AC164306 | | AC162052 +XLT14SS | | |

**NOTE:** **See complete list of notes on page 80.**

## MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger, Software Tools, Programmers and Demonstration Boards

| | | MPLAB® ICE 2000 System (1) | | | MPLAB® ICE 4000 System (2) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Part Number** | **Lead Count/ Pkg Type** | **Processor Module** | **Device Adapters** | **Transition Socket** | **Processor Module** | **Device Adapters** | **Transition Socket** | **PRO MATE® II Socket Module (3,4)** | **MPLAB® PM3 Socket Module (8)** | **PICSTART® Plus (5)** | **MPLAB® ICD 2 (6)** | **MPLAB® CXX Compiler** | **Demonstration Boards or Evaluation Kits** |
| **PICmicro® Microcontroller Development Tools (continued)** | | | | | | | | | | | | | |
| PIC16F684 | 14P | PCM16YK0 | DVA1002 | ACICE0207 | | | | AC124001 | AC164301 | ✓ | AC162055 | | DV164101* |
| PIC16F684 | 14SL | PCM16YK0 | DVA1002 | XLT14SO | | | | AC164026 | AC164302 | | AC162055 +XLT14SO | | |
| PIC16F684 | 14ST | PCM16YK0 | DVA1002 | XLT14SS | | | | AC164026 | AC164306 | | AC162055 +XLT14SS | | |
| PIC16F688 | 14P | PCM16YL0 | DVA1002 | ACICE0207 | | | | AC124001 | AC164301 | ✓ | AC162056 | | DV164101* |
| PIC16F688 | 14SL | PCM16YL0 | DVA1002 | XLT14SO | | | | AC164026 | AC164302 | | AC162056 +XLT14SO | | |
| PIC16F688 | 14ST | PCM16YL0 | DVA1002 | XLT14SS | | | | AC164026 | AC164306 | | AC162056 +XLT14SS | | |
| PIC16F716 | 18P | PCM16YJ0 | DVA16XP187 | | | | | AC164010 | AC164301 | ✓ | AC162054 | | DM163001 |
| PIC16F716 | 18SO | PCM16YJ0 | DVA16XP187 | XLT18SO | | | | AC164010 | AC164302 | | AC162054 +XLT18SO | | |
| PIC16F716 | 20SS | PCM16YJ0 | DVA16XP187 | XLT20SS | | | | AC164018 | AC164307 | | AC162054 +XLT20SS | | |
| PIC16F737 | 28SP | PCM16YH0 | DVA18XP280 | | | | | AC164012 | AC164301 | ✓ | ✓ | | |
| PIC16F737 | 28SO | PCM16YH0 | DVA18XP280 | XLT28SO | | | | AC164017 | AC164302 | | ✓ | | |
| PIC16F737 | 28SS | PCM16YH0 | DVA18XP280 | XLT28SS | | | | AC164021 | AC164307 | | ✓ | | |
| PIC16F737 | 28ML | PCM16YH0 | DVA18XP280 | XLT28QFN4* | | | | AC164012 +AC164031 | AC164301 +AC164031 | AC164031 | ✓ | | |
| PIC16F747 | 40P | PCM16YH0 | DVA18XP400 | | | | | AC164012 | AC164301 | ✓ | ✓ | | |
| PIC16F747 | 44PT | PCM16YH0 | DVA18PQ440 | XLT44PT or XLT44PT3 | | | | AC164020 | AC164305 | | ✓ | | |
| PIC16F747 | 44ML | PCM16YH0 | DVA18XP400 | XLT44QFN2 | | | | AC164012 +AC164034 | AC164301 +AC164034 | AC164034 | ✓ | | |
| PIC16F767 | 28P | PCM16YH0 | DVA18XP280 | | | | | AC164012 | AC164301 | ✓ | ✓ | | |
| PIC16F767 | 28SO | PCM16YH0 | DVA18XP280 | XLT28SO | | | | AC164017 | AC164302 | | ✓ | | |
| PIC16F767 | 28SS | PCM16YH0 | DVA18XP280 | XLT28SS | | | | AC164021 | AC164307 | | ✓ | | |
| PIC16F767 | 28ML | PCM16YH0 | DVA18XP280 | XLT28QFN4* | | | | AC164012 +AC164031 | AC164301 +AC164031 | AC164031 | ✓ | | |
| PIC16F777 | 40P | PCM16YH0 | DVA18XP400 | | | | | AC164012 | AC164301 | ✓ | ✓ | | |
| PIC16F777 | 44PT | PCM16YH0 | DVA18PQ440 | XLT44PT or XLT44PT3 | | | | AC164020 | AC164305 | | ✓ | | |
| PIC16F777 | 44ML | PCM16YH0 | DVA18XP400 | XLT44QFN2 | | | | AC164012 +AC164034 | AC164301 +AC164034 | AC164034 | ✓ | | |

**NOTE:** **See complete list of notes on page 80.**

## MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger, Software Tools, Programmers and Demonstration Boards

| | | MPLAB® ICE 2000 System (1) | | | MPLAB® ICE 4000 System (2) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Part Number** | **Lead Count/ Pkg Type** | **Processor Module** | **Device Adapters** | **Transition Socket** | **Processor Module** | **Device Adapters** | **Transition Socket** | **PRO MATE® II Socket Module (3,4)** | **MPLAB® PM3 Socket Module (8)** | **PICSTART® Plus (5)** | **MPLAB® ICD 2 (6)** | **MPLAB® CXX Compiler** | **Demonstration Boards or Evaluation Kits** |
| **PICmicro® Microcontroller Development Tools (continued)** | | | | | | | | | | | | | |
| PIC16F785 | 20P | PCM16YN0* | DVA1004* | ACICE0203 | | | | TBD | AC164301 | ✓* | AC162060* | | |
| PIC16F785 | 20SO | PCM16YN0* | DVA1004* | XLT20SO1 | | | | TBD | AC164302 | | AC162060* +XLT20SO1 | | |
| PIC16F785 | 20SS | PCM16YN0* | DVA1004* | XLT20SS1 | | | | TBD | AC164307 | | AC162060* +XLT20SS1 | | |
| PIC16F818 | 18P | PCM16YE0 | DVA16XP186 | | | | | AC164010 | AC164301 | ✓ | ✓ | | DM163014 |
| PIC16F818 | 18SO | PCM16YE0 | DVA16XP186 | XLT18SO | | | | AC164010 | AC164302 | | ✓ | | |
| PIC16F818 | 20SS | PCM16YE0 | DVA16XP186 | XLT20SS | | | | AC164018 | AC164307 | | ✓ | | |
| PIC16F818 | 28ML | PCM16YE0 | DVA16XP186 | XLT28QFN3 | | | | AC164010 +AC164033 | AC164301 +AC164031 | AC164033 | ✓ | | |
| PIC16F819 | 18P | PCM16YE0 | DVA16XP186 | | | | | AC164010 | AC164301 | ✓ | ✓ | | DM163014 |
| PIC16F819 | 18SO | PCM16YE0 | DVA16XP186 | XLT18SO | | | | AC164010 | AC164302 | | ✓ | | |
| PIC16F819 | 20SS | PCM16YE0 | DVA16XP186 | XLT20SS | | | | AC164018 | AC164307 | | ✓ | | |
| PIC16F819 | 28ML | PCM16YE0 | DVA16XP186 | XLT28QFN3 | | | | AC164010 +AC164033 | AC164301 +AC164031 | AC164033 | ✓ | | |
| PIC16F870 | 28SP, 28JW | PCM16XR1 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | ✓ | | DM163022 |
| PIC16F870 | 28SO | PCM16XR1 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | ✓ | | |
| PIC16F870 | 28SS | PCM16XR1 | DVA16XP282 | XLT28SS | | | | AC164021 | AC164307 | | ✓ | | |
| PIC16F871 | 40P | PCM16XR1 | DVA16XP401 | | | | | AC164012 | AC164301 | ✓ | ✓ | | DM163022 |
| PIC16F871 | 44L | PCM16XR1 | DVA16XL441 | | | | | AC164013 | AC164309 | | ✓ | | |
| PIC16F871 | 44PT | PCM16XR1 | DVA16PQ441 | XLT44PT or XLT44PT3 | | | | AC164020 | AC164305 | | ✓ | | |
| PIC16F872 | 28SP | PCM16XK1 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | ✓ | | DM163022 |
| PIC16F872 | 28SO | PCM16XK1 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | ✓ | | |
| PIC16F872 | 28SS | PCM16XK1 | DVA16XP282 | XLT28SS | | | | AC164021 | AC164307 | | ✓ | | |
| PIC16F873 | 28SP | PCM16XK1 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | ✓ | | DM163022 |
| PIC16F873 | 28SO | PCM16XK1 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | ✓ | | |
| PIC16F873A | 28SP | PCM16XV0 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | ✓ | | DM163022 |
| PIC16F873A | 28SO | PCM16XV0 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | ✓ | | |
| PIC16F873A | 28SS | PCM16XV0 | DVA16XP282 | XLT28SS | | | | AC164021 | AC164307 | | ✓ | | |
| PIC16F873A | 28ML | PCM16XV0 | DVA16XP282 | XLT28QFN4* | | | | AC164012 +AC164031 | AC164301 +AC164031 | AC164031 | ✓ | | |

**NOTE: See complete list of notes on page 80.**

## MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger, Software Tools, Programmers and Demonstration Boards

| | | MPLAB® ICE 2000 System (1) | | | MPLAB® ICE 4000 System (2) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Part Number** | **Lead Count/ Pkg Type** | **Processor Module** | **Device Adapters** | **Transition Socket** | **Processor Module** | **Device Adapters** | **Transition Socket** | **PRO MATE® II Socket Module (3,4)** | **MPLAB® PM3 Socket Module (8)** | **PICSTART® Plus (5)** | **MPLAB® ICD 2 (6)** | **MPLAB® CXX Compiler** | **Demonstration Boards or Evaluation Kits** |
| **PICmicro® Microcontroller Development Tools (continued)** | | | | | | | | | | | | | |
| PIC16F874 | 40P | PCM16XK1 | DVA16XP401 | | | | | AC164012 | AC164301 | ✓ | ✓ | | DM163022 |
| PIC16F874 | 44L | PCM16XK1 | DVA16XL441 | | | | | AC164013 | AC164309 | | ✓ | | |
| PIC16F874 | 44PQ | PCM16XK1 | DVA16PQ441 | XLT44PT or XLT44PT3 | | | | AC164014 | AC164311 | | ✓ | | |
| PIC16F874 | 44PT | PCM16XK1 | DVA16PQ441 | XLT44PT or XLT44PT3 | | | | AC164020 | AC164305 | | ✓ | | |
| PIC16F874A | 40P | PCM16XV0 | DVA16XP401 | | | | | AC164012 | AC164301 | ✓ | ✓ | | DM163022 |
| PIC16F874A | 44L | PCM16XV0 | DVA16XL441 | | | | | AC164013 | AC164309 | | ✓ | | |
| PIC16F874A | 44PT | PCM16XV0 | DVA16PQ441 | XLT44PT or XLT44PT3 | | | | AC164020 | AC164305 | | ✓ | | |
| PIC16F874A | 44ML | PCM16XV0 | DVA16XP401 | XLT44QFN2 | | | | AC164012 +AC164034 | AC164301 +AC164034 | AC164034 | ✓ | | |
| PIC16F876 | 28SP | PCM16XK1 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | ✓ | | DM163022 |
| PIC16F876 | 28SO | PCM16XK1 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | ✓ | | |
| PIC16F876A | 28SP | PCM16XV0 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | ✓ | | DM163022 |
| PIC16F876A | 28SO | PCM16XV0 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | ✓ | | |
| PIC16F876A | 28SS | PCM16XV0 | DVA16XP282 | XLT28SS | | | | AC164021 | AC164307 | | ✓ | | |
| PIC16F876A | 28ML | PCM16XV0 | DVA16XP282 | XLT28QFN4* | | | | AC164012 +AC164031 | AC164301 +AC164031 | AC164031 | ✓ | | |
| PIC16F877 | 40P | PCM16XK1 | DVA16XP401 | | | | | AC164012 | AC164301 | ✓ | ✓ | | DM163022 |
| PIC16F877 | 44L | PCM16XK1 | DVA16XL441 | | | | | AC164013 | AC164309 | | ✓ | | |
| PIC16F877 | 44PQ | PCM16XK1 | DVA16PQ441 | XLT44PT or XLT44PT3 | | | | AC164014 | AC164311 | | ✓ | | |
| PIC16F877 | 44PT | PCM16XK1 | DVA16PQ441 | XLT44PT or XLT44PT3 | | | | AC164020 | AC164305 | | ✓ | | |
| PIC16F877A | 40P | PCM16XV0 | DVA16XP401 | | | | | AC164012 | AC164301 | ✓ | ✓ | | DM163022 |
| PIC16F877A | 44L | PCM16XV0 | DVA16XL441 | | | | | AC164013 | AC164309 | | ✓ | | |
| PIC16F877A | 44PT | PCM16XV0 | DVA16PQ441 | XLT44PT or XLT44PT3 | | | | AC164020 | AC164305 | | ✓ | | |
| PIC16F877A | 44ML | PCM16XV0 | DVA16XP401 | XLT44QFN2 | | | | AC164012 +AC164034 | AC164301 +AC164034 | AC164034 | ✓ | | |
| PIC16F913 | 28P | PCM16YP0* | DVA18XP280 | | | | | AC164012 | AC164301 | ✓* | ✓* | | |
| PIC16F913 | 28SO | PCM16YP0* | DVA18XP280 | XLT28SO | | | | AC164017 | AC164302 | | ✓* | | |
| PIC16F913 | 28SS | PCM16YP0* | DVA18XP280 | XLT28SS | | | | AC164021 | AC164307 | | ✓* | | |
| PIC16F913 | 28ML | PCM16YP0* | DVA18XP280 | XLT28QFN4* | | | | AC164012 +AC164031 | AC164301 +AC164031 | AC164031* | ✓* | | |

**NOTE: See complete list of notes on page 80.**

## MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger, Software Tools, Programmers and Demonstration Boards

| | | MPLAB® ICE 2000 System (1) | | | MPLAB® ICE 4000 System (2) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Part Number** | **Lead Count/ Pkg Type** | **Processor Module** | **Device Adapters** | **Transition Socket** | **Processor Module** | **Device Adapters** | **Transition Socket** | **PRO MATE® II Socket Module (3,4)** | **MPLAB® PM3 Socket Module (8)** | **PICSTART® Plus (5)** | **MPLAB® ICD 2 (6)** | **MPLAB® CXX Compiler** | **Demonstration Boards or Evaluation Kits** |
| **PICmicro® Microcontroller Development Tools (continued)** | | | | | | | | | | | | | |
| PIC16F914 | 40P | PCM16YP0* | DVA18XP400 | | | | | AC164012 | AC164301 | ✓* | ✓* | | |
| PIC16F914 | 44PT | PCM16YP0* | DVA18PQ440 | XLT44PT or XLT44PT3 | | | | AC164020 | AC164305 | | ✓* | | |
| PIC16F914 | 44ML | PCM16YP0* | DVA18XP400 | XLT44QFN2 | | | | AC164012 +AC164034 | AC164301 +AC164034 | AC164034* | ✓* | | |
| PIC16F916 | 28P | PCM16YP0* | DVA18XP280 | | | | | AC164012 | AC164301 | ✓ | ✓ | | |
| PIC16F916 | 28SO | PCM16YP0* | DVA18XP280 | XLT28SO | | | | AC164017 | AC164302 | | ✓ | | |
| PIC16F916 | 28SS | PCM16YP0* | DVA18XP280 | XLT28SS | | | | AC164021 | AC164307 | | ✓ | | |
| PIC16F916 | 28ML | PCM16YP0* | DVA18XP280 | XLT28QFN4* | | | | AC164012 +AC164031 | AC164301 +AC164031 | AC164031 | ✓ | | |
| PIC16F917 | 40P | PCM16YP0* | DVA18XP400 | | | | | AC164012 | AC164301 | ✓ | ✓ | | |
| PIC16F917 | 44PT | PCM16YP0* | DVA18PQ440 | XLT44PT or XLT44PT3 | | | | AC164020 | AC164305 | | ✓ | | |
| PIC16F917 | 44ML | PCM16YP0* | DVA18XP400 | XLT44QFN2 | | | | AC164012 +AC164034 | AC164301 +AC164034 | AC164034 | ✓ | | |
| PIC16HV540 | 18P, 18JW | | | | | | | AC164001 | AC164301 | ✓ | | | |
| PIC16HV540 | 18SO | | | | | | | AC164002 | AC164302 | | | | |
| PIC16HV540 | 20SS | | | | | | | AC164015 | AC164307 | | | | |
| PIC17C42A | 40P, 40JW | PCM17XA0 | DVA17XP401 | | | | | AC174001 | AC164301 | ✓ | | | DM163001 |
| PIC17C42A | 44L | PCM17XA0 | DVA17XL441 | | | | | AC174002 | AC164317 | | | | |
| PIC17C42A | 44PQ | PCM17XA0 | DVA17PQ441 | XLT44PT or XLT44PT3 | | | | AC174004 | AC164316 | | | | |
| PIC17C42A | 44PT | PCM17XA0 | DVA17PQ441 | XLT44PT or XLT44PT3 | | | | AC174005 | AC164315 | | | | |
| PIC17C43 | 40P, 40JW | PCM17XA0 | DVA17XP401 | | | | | AC174001 | AC164301 | ✓ | | | DM163001 |
| PIC17C43 | 44L | PCM17XA0 | DVA17XL441 | | | | | AC174002 | AC164317 | | | | |
| PIC17C43 | 44PQ | PCM17XA0 | DVA17PQ441 | XLT44PT or XLT44PT3 | | | | AC174004 | AC164316 | | | | |
| PIC17C43 | 44PT | PCM17XA0 | DVA17PQ441 | XLT44PT or XLT44PT3 | | | | AC174005 | AC164315 | | | | |

**NOTE:** **See complete list of notes on page 80.**

## MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger, Software Tools, Programmers and Demonstration Boards

| | | MPLAB® ICE 2000 System (1) | | | MPLAB® ICE 4000 System (2) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Part Number** | **Lead Count/ Pkg Type** | **Processor Module** | **Device Adapters** | **Transition Socket** | **Processor Module** | **Device Adapters** | **Transition Socket** | **PRO MATE® II Socket Module (3,4)** | **MPLAB® PM3 Socket Module (8)** | **PICSTART® Plus (5)** | **MPLAB® ICD 2 (6)** | **MPLAB® CXX Compiler** | **Demonstration Boards or Evaluation Kits** |
| **PICmicro® Microcontroller Development Tools (continued)** | | | | | | | | | | | | | |
| PIC17C44 | 40P, 40JW | PCM17XA0 | DVA17XP401 | | | | | AC174001 | AC164301 | ✓ | | | DM163001 |
| PIC17C44 | 44L | PCM17XA0 | DVA17XL441 | | | | | AC174002 | AC164317 | | | | |
| PIC17C44 | 44PQ | PCM17XA0 | DVA17PQ441 | XLT44PT or XLT44PT3 | | | | AC174004 | AC164316 | | | | |
| PIC17C44 | 44PT | PCM17XA0 | DVA17PQ441 | XLT44PT or XLT44PT3 | | | | AC174005 | AC164315 | | | | |
| PIC17C752 | 68L | PCM17XA0 | DVA17XL681 | | | | | AC174007 | AC164308* | AC164024 | | | DM173001 |
| PIC17C752 | 64PT | PCM17XA0 | DVA17PQ641 | XLT64PT2 or XLT64PT5 | | | | AC174008 | AC164319* | | | | |
| PIC17C756/ 756A | 68L, 68CL | PCM17XA0 | DVA17XL681 | | | | | AC174007 | AC164308* | AC164024 | | | DM173001 |
| PIC17C756/ 756A | 64PT | PCM17XA0 | DVA17PQ641 | XLT64PT2 or XLT64PT5 | | | | AC174008 | AC164319* | | | | |
| PIC17C762 | 84L | PCM17XA0 | DVA17XL841 | | | | | AC174012 | AC164318 | AC164027 | | | DM173001 |
| PIC17C762 | 80PT | PCM17XA0 | DVA17PQ801 | XLT80PT or XLT80PT3 | | | | AC174011 | AC164320 | | | | |
| PIC17C766 | 84L, 84CL | PCM17XA0 | DVA17XL841 | | | | | AC174012 | AC164318 | AC164027 | | | DM173001 |
| PIC17C766 | 80PT | PCM17XA0 | DVA17PQ801 | XLT80PT or XLT80PT3 | | | | AC174011 | AC164320 | | | | |
| PIC18C242 | 28SP, 28JW | PCM18XA0 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | | SW006011 | DM163022 |
| PIC18C242 | 28SO | PCM18XA0 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | | SW006011 | |
| PIC18C252 | 28SP | PCM18XA0 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | | SW006011 | DM163022 |
| PIC18C252 | 28JW | PCM18XA0 | DVA16XP282 | XLT28XP | | | | AC164012 | AC164301 | | | SW006011 | DM163022 |
| PIC18C252 | 28SO | PCM18XA0 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | | SW006011 | |
| PIC18C442 | 40P, 40JW | PCM18XA0 | DVA16XP401 | | | | | AC164012 | AC164301 | ✓ | | SW006011 | DM163022 |
| PIC18C442 | 44L | PCM18XA0 | DVA16XL441 | | | | | AC164013 | AC164309 | | | SW006011 | |
| PIC18C442 | 44PT | PCM18XA0 | DVA16PQ441 | XLT44PT or XLT44PT3 | | | | AC164020 | AC164305 | | | SW006011 | |
| PIC18C452 | 40P, 40JW | PCM18XA0 | DVA16XP401 | | | | | AC164012 | AC164301 | ✓ | | SW006011 | DM163022 |
| PIC18C452 | 44L | PCM18XA0 | DVA16XL441 | | | | | AC164013 | AC164309 | | | SW006011 | |
| PIC18C452 | 44PT | PCM18XA0 | DVA16PQ441 | XLT44PT or XLT44PT3 | | | | AC164020 | AC164305 | | | SW006011 | |
| PIC18C601 | 68L | | | | PMF18WB1 | DAF18-1 | XLT68L1 | AC174007 | AC164308 | | ✓ | SW006011 | DM163006 |
| PIC18C601 | 64PT | | | | PMF18WB1 | DAF18-1 | XLT64PT2 or XLT64PT5 | AC174008 | AC164303 | | ✓ | SW006011 | |

**NOTE:** **See complete list of notes on page 80.**

## MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger, Software Tools, Programmers and Demonstration Boards

| | | MPLAB® ICE 2000 System (1) | | | MPLAB® ICE 4000 System (2) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Part Number** | **Lead Count/ Pkg Type** | **Processor Module** | **Device Adapters** | **Transition Socket** | **Processor Module** | **Device Adapters** | **Transition Socket** | **PRO MATE® II Socket Module (3,4)** | **MPLAB® PM3 Socket Module (8)** | **PICSTART® Plus (5)** | **MPLAB® ICD 2 (6)** | **MPLAB® CXX Compiler** | **Demonstration Boards or Evaluation Kits** |
| **PICmicro® Microcontroller Development Tools (continued)** | | | | | | | | | | | | | |
| PIC18C658 | 68L | PCM18XB0 | DVA18XL680 | | | | | AC174007 | AC164308 | ✓**(8)** | | SW006011 | DM163007 |
| PIC18C658 | 64PT | PCM18XB0 | DVA18PQ640 | XLT64PT2 or XLT64PT5 | | | | AC174008 | AC164303 | | | SW006011 | |
| PIC18C801 | 80PT | | | | PMF18WB1 | DAF18-1 | XLT80PT or XLT80PT3 | AC174011 | AC164304 | | ✓ | SW006011 | |
| PIC18C801 | 84L | | | | PMF18WB1 | DAF18-1 | XLT84L1 | AC174012 | AC164310 | | ✓ | SW006011 | DM163006 |
| PIC18C858 | 84L | PCM18XB0 | DVA18XL840 | | | | | AC174012 | AC164310 | ✓**(8)** | | SW006011 | DM163007 |
| PIC18C858 | 80PT | PCM18XB0 | DVA18PQ800 | XLT80PT or XLT80PT3 | | | | AC174011 | AC164304 | | | SW006011 | |
| PIC18F242 | 28SP | PCM18XH0 or PCM18XC1 | DVA16XP282 or DVA18XP280 | | PMF18WC0 | DAF18-2 | ACICE0204 | AC164012 | AC164301 | ✓ | ✓ | SW006011 | DM163022 |
| PIC18F242 | 28SO | PCM18XH0 or PCM18XC1 | DVA16XP282 or DVA18XP280 | XLT28SO | PMF18WC0 | DAF18-2 | XLT28SO | AC164017 | AC164302 | | ✓ | SW006011 | |
| PIC18F248 | 28SP | PCM18XD1 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | ✓ | SW006011 | DM163011 |
| PIC18F248 | 28SO | PCM18XD1 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | ✓ | SW006011 | |
| PIC18F252 | 28SP | PCM18XH0 or PCM18XC1 | DVA16XP282 or DVA18XP280 | | PMF18WC0 | DAF18-2 | ACICE0204 | AC164012 | AC164301 | ✓ | ✓ | SW006011 | DM163022 |
| PIC18F252 | 28SO | PCM18XH0 or PCM18XC1 | DVA16XP282 or DVA18XP280 | XLT28SO | PMF18WC0 | DAF18-2 | XLT28SO | AC164017 | AC164302 | | ✓ | SW006011 | |
| PIC18F258 | 28SP | PCM18XD1 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | ✓ | SW006011 | DM163011 |
| PIC18F258 | 28SO | PCM18XD1 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | ✓ | SW006011 | |
| PIC18F442 | 40P | PCM18XH0 or PCM18XC1 | DVA16XP401 or DVA18XP400 | | PMF18WC0 | DAF18-2 | ACICE0206 | AC164012 | AC164301 | ✓ | ✓ | SW006011 | DM163022 |
| PIC18F442 | 44L | PCM18XH0 or PCM18XC1 | DVA16XL441 | | PMF18WC0 | DAF18-3 | XLT44L2 | AC164013 | AC164309 | | ✓ | SW006011 | |
| PIC18F442 | 44PT | PCM18XH0 or PCM18XC1 | DVA16PQ441 or DVA18PQ440 | XLT44PT or XLT44PT3 | PMF18WC0 | DAF18-3 | XLT44PT or XLT44PT3 | AC164020 | AC164305 | | ✓ | SW006011 | |
| PIC18F448 | 40P | PCM18XD1 | DVA16XP401 | | | | | AC164012 | AC164301 | ✓ | ✓ | SW006011 | DM163011 |
| PIC18F448 | 44L | PCM18XD1 | DVA16XL441 | | | | | AC164013 | AC164309 | | ✓ | SW006011 | |
| PIC18F448 | 44PT | PCM18XD1 | DVA16PQ441 | XLT44PT or XLT44PT3 | | | | AC164020 | AC164305 | | ✓ | SW006011 | |
| PIC18F452 | 40P | PCM18XH0 or PCM18XC1 | DVA16XP401 | | PMF18WC0 | DAF18-2 | ACICE0206 | AC164012 | AC164301 | ✓ | ✓ | SW006011 | DM163022 |
| PIC18F452 | 44L | PCM18XH0 or PCM18XC1 | DVA16XL441 | | PMF18WC0 | DAF18-3 | XLT44L2 | AC164013 | AC164309 | | ✓ | SW006011 | |
| PIC18F452 | 44PT | PCM18XH0 or PCM18XC1 | DVA16PQ441 | XLT44PT or XLT44PT3 | PMF18WC0 | DAF18-3 | XLT44PT or XLT44PT3 | AC164020 | AC164305 | | ✓ | SW006011 | |

**NOTE:** **See complete list of notes on page 80.**

## MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger, Software Tools, Programmers and Demonstration Boards

| | | MPLAB® ICE 2000 System (1) | | | MPLAB® ICE 4000 System (2) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Part Number** | **Lead Count/ Pkg Type** | **Processor Module** | **Device Adapters** | **Transition Socket** | **Processor Module** | **Device Adapters** | **Transition Socket** | **PRO MATE® II Socket Module (3,4)** | **MPLAB® PM3 Socket Module (8)** | **PICSTART® Plus (5)** | **MPLAB® ICD 2 (6)** | **MPLAB® CXX Compiler** | **Demonstration Boards or Evaluation Kits** |
| **PICmicro® Microcontroller Development Tools (continued)** | | | | | | | | | | | | | |
| PIC18F458 | 40P | PCM18XD1 | DVA16XP401 | | | | | AC164012 | AC164301 | ✓ | ✓ | SW006011 | DM163011 |
| PIC18F458 | 44L | PCM18XD1 | DVA16XL441 | | | | | AC164013 | AC164309 | | ✓ | SW006011 | |
| PIC18F458 | 44PT | PCM18XD1 | DVA16PQ441 | XLT44PT or XLT44PT3 | | | | AC164020 | AC164305 | | ✓ | SW006011 | |
| PIC18F1220 | 18P | PCM18XJ0 | DVA18XP180 | | PMF18WD0 | DAF18-2 | ACICE0202 | AC164010 | AC164301 | ✓* | ✓ | SW006011 | DM163014 |
| PIC18F1220 | 18SO | PCM18XJ0 | DVA18XP180 | XLT18SO | PMF18WD0 | DAF18-2 | XLT18SO | AC164010 | AC164302 | | ✓ | SW006011 | |
| PIC18F1220 | 20SS | PCM18XJ0 | DVA18XP180 | XLT20SS | PMF18WD0 | DAF18-2 | XLT20SS | AC164018 | AC164307 | | ✓ | SW006011 | |
| PIC18F1220 | 28ML | PCM18XJ0 | DVA18XP180 | XLT28QFN3 | PMF18WD0 | DAF18-2 | XLT28QFN3 | AC164010 +AC164033 | AC164301 +AC164031 | AC164033* | ✓ | SW006011 | |
| PIC18F1320 | 18P | PCM18XJ0 | DVA18XP180 | | PMF18WD0 | DAF18-2 | ACICE0202 | AC164010 | AC164301 | ✓* | ✓ | SW006011 | DM163014 |
| PIC18F1320 | 18SO | PCM18XJ0 | DVA18XP180 | XLT18SO | PMF18WD0 | DAF18-2 | XLT18SO | AC164010 | AC164302 | | ✓ | SW006011 | |
| PIC18F1320 | 20SS | PCM18XJ0 | DVA18XP180 | XLT20SS | PMF18WD0 | DAF18-2 | XLT20SS | AC164018 | AC164307 | | ✓ | SW006011 | |
| PIC18F1320 | 28ML | PCM18XJ0 | DVA18XP180 | XLT28QFN3 | PMF18WD0 | DAF18-2 | XLT28QFN3 | AC164010 +AC164033 | AC164301 +AC164031 | AC164033* | ✓ | SW006011 | |
| PIC18F2220 | 28SP | PCM18XH0 | DVA18XP280 | | PMF18WC1 | DAF18-2 | ACICE0204 | AC164012 | AC164301 | ✓* | ✓ | SW006011 | |
| PIC18F2220 | 28SO | PCM18XH0 | DVA18XP280 | XLT28SO | PMF18WC1 | DAF18-2 | XLT28SO | AC164017 | AC164302 | | ✓ | SW006011 | |
| PIC18F2320 | 28SP | PCM18XH0 | DVA18XP280 | | PMF18WC1 | DAF18-2 | ACICE0204 | AC164012 | AC164301 | ✓* | ✓ | SW006011 | |
| PIC18F2320 | 28SO | PCM18XH0 | DVA18XP280 | XLT28SO | PMF18WC1 | DAF18-2 | XLT28SO | AC164017 | AC164302 | | ✓ | SW006011 | |
| PIC18F2331 | 28SP | PCM18XL0 | DVA18XP280 | | PMF18WF0* | DAF18-4 | ACICE0204 | AC164035 | AC164301 | ✓* | ✓ | SW006011 | DM183011 |
| PIC18F2331 | 28SO | PCM18XL0 | DVA18XP280 | XLT28SO | PMF18WF0* | DAF18-4 | XLT28SO | AC164036 | AC164302 | | ✓ | SW006011 | |
| PIC18F2331 | 28MM | PCM18XL0 | DVA18XP280 | XLT28QFN4* | PMF18WF0* | DAF18-4 | XLT28QFN4* | AC164035 +AC164031 | AC164322* | AC164031 | ✓ | SW006011 | |
| PIC18F2410 | 28SP | PCM18XN0 | DVA18XP280 | | PCM18WH0 | DAF18-4 | ACICE0204 | AC164035* | AC164301* | ✓* | ✓* | SW006011 | |
| PIC18F2410 | 28SO | PCM18XN0 | DVA18XP280 | XLT28SO | PCM18WH0 | DAF18-4 | XLT28SO | AC164036* | AC164302* | | ✓* | SW006011 | |
| PIC18F2410 | 28ML | PCM18XN0 | DVA18XP280 | XLT28QFN4* | PCM18WH0 | DAF18-4 | XLT28QFN4* | AC164035* +AC164031 | AC164322* | AC164031* | ✓* | SW006011 | |
| PIC18F2420 | 28SP | PCM18XN0 | DVA18XP280 | | PCM18WH0 | DAF18-4 | ACICE0204 | AC164035* | AC164301* | ✓* | ✓* | SW006011 | |
| PIC18F2420 | 28SO | PCM18XN0 | DVA18XP280 | XLT28SO | PCM18WH0 | DAF18-4 | XLT28SO | AC164036* | AC164302* | | ✓* | SW006011 | |
| PIC18F2420 | 28ML | PCM18XN0 | DVA18XP280 | XLT28QFN4* | PCM18WH0 | DAF18-4 | XLT28QFN4* | AC164035* +AC164031 | AC164322* | AC164031* | ✓* | SW006011 | |
| PIC18F2431 | 28SP | PCM18XL0 | DVA18XP280 | | PMF18WF0* | DAF18-4 | ACICE0204 | AC164035 | AC164301 | ✓* | ✓ | SW006011 | DM183011 |
| PIC18F2431 | 28SO | PCM18XL0 | DVA18XP280 | XLT28SO | PMF18WF0* | DAF18-4 | XLT28SO | AC164036 | AC164302 | | ✓ | SW006011 | |
| PIC18F2431 | 28MM | PCM18XL0 | DVA18XP280 | XLT28QFN4* | PMF18WF0* | DAF18-4 | XLT28QFN4* | AC164035 +AC164031 | AC164322* | AC164031* | ✓ | SW006011 | |

**NOTE:** **See complete list of notes on page 80.**

## MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger, Software Tools, Programmers and Demonstration Boards

| | | MPLAB® ICE 2000 System (1) | | | MPLAB® ICE 4000 System (2) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Part Number** | **Lead Count/ Pkg Type** | **Processor Module** | **Device Adapters** | **Transition Socket** | **Processor Module** | **Device Adapters** | **Transition Socket** | **PRO MATE® II Socket Module (3,4)** | **MPLAB® PM3 Socket Module (8)** | **PICSTART® Plus (5)** | **MPLAB® ICD 2 (6)** | **MPLAB® CXX Compiler** | **Demonstration Boards or Evaluation Kits** |
| **PICmicro® Microcontroller Development Tools (continued)** | | | | | | | | | | | | | |
| PIC18F2439 | 28P | | | | | | | AC164012 | AC164301* | ✓* | ✓ | SW006011 | |
| PIC18F2439 | 28SO | | | | | | | AC164017 | AC164302* | | ✓ | SW006011 | |
| PIC18F2455 | 28SP | PCM18XR0 | DVA18XP280 | | PMF18WL0 | DAF18-4 | ACICE0204 | AC164012* | AC164301* | ✓* | AC162063* | SW006011 | DM163025 |
| PIC18F2455 | 28SO | PCM18XR0 | DVA18XP280 | XLT28SO | PMF18WL0 | DAF18-4 | XLT28SO | AC164036* | AC164302* | | AC162063* +XLT28SO | SW006011 | DM163025 |
| PIC18F2480 | 28SP | PCM18XP0* | DVA18XP280 | | PMF18WJ0* | DAF18-4 | ACICE0204 | AC164012* | AC164301* | ✓* | ✓* | SW006011 | DM163011 |
| PIC18F2480 | 28SO | PCM18XP0* | DVA18XP280 | XLT28SO | PMF18WJ0* | DAF18-4 | XLT28SO | AC164017* | AC164302* | | ✓* | SW006011 | |
| PIC18F2480 | 28MM | PCM18XP0* | DVA18XP280 | XLT28QFN4* | PMF18WJ0* | DAF18-4 | XLT28QFN4* | AC164012* +AC164031 | AC164322* | AC164031* | ✓* | SW006011 | |
| PIC18F2510 | 28SP | PCM18XN0 | DVA18XP280 | | PMF18WH0 | DAF18-4 | ACICE0204 | AC164012* | AC164301* | ✓* | ✓* | SW006011 | DM163022 |
| PIC18F2510 | 28SO | PCM18XN0 | DVA18XP280 | XLT28SO | PMF18WH0 | DAF18-4 | XLT28SO | AC164017* | AC164302* | | ✓* | SW006011 | |
| PIC18F2510 | 28ML | PCM18XN0 | DVA18XP280 | XLT28QFN4* | PMF18WH0 | DAF18-4 | XLT28QFN4* | AC164012* +AC164031 | AC164322* | AC164031* | ✓* | SW006011 | |
| PIC18F2515 | 28SP | PCM18XN0 | DVA18XP280 | | PMF18WH0 | DAF18-4 | ACICE0204 | AC164012* | AC164301* | ✓ | ✓ | SW006011 | |
| PIC18F2515 | 28SO | PCM18XN0 | DVA18CP280 | XLT28SO | PMF18WH0 | DAF18-4 | XLT28SO | AC164017* | AC164302* | | ✓ | SW006011 | |
| PIC18F2520 | 28SP | PCM18XN0 | DVA18XP280 | | PMF18WH0 | DAF18-4 | ACICE0204 | AC164012* | AC164301* | ✓ | ✓ | SW006011 | DM163022 |
| PIC18F2520 | 28SO | PCM18XN0 | DVA18XP280 | XLT28SO | PMF18WH0 | DAF18-4 | XLT28SO | AC164017* | AC164302* | | ✓ | SW006011 | |
| PIC18F2520 | 28ML | PCM18XN0 | DVA18XP280 | XLT28QFN4* | PMF18WH0 | DAF18-4 | XLT28QFN4* | AC164012* +AC164031 | AC164322* | AC164031 | ✓ | SW006011 | |
| PIC18F2525 | 28SP | PCM18XN0 | DVA18XP280 | | PMF18WH0 | DAF18-4 | ACICE0204 | AC164012* | AC164301* | ✓ | ✓ | SW006011 | |
| PIC18F2525 | 28SO | PCM18XN0 | DVA18XP280 | XLT28SO | PMF18WH0 | DAF18-4 | XLT28SO | AC164017* | AC164302* | | ✓ | SW006011 | |
| PIC18F2539 | 28P | | | | | | | AC164012 | AC164301* | ✓* | ✓ | SW006011 | |
| PIC18F2539 | 28SO | | | | | | | AC164017 | AC164302* | | ✓ | SW006011 | |
| PIC18F2550 | 28SP | PCM18XR0 | DVA18XP280 | | PMF18WL0 | DAF18-4 | ACICE0204 | AC164012* | AC164301* | ✓* | AC162063* | SW006011 | DM163025 |
| PIC18F2550 | 28SO | PCM18XR0 | DVA18XP280 | XLT28SO | PMF18WL0 | DAF18-4 | XLT28SO | AC164036* | AC164302* | | AC162063* +XLT28SO | SW006011 | DM163025 |
| PIC18F2580 | 28SP | PCM18XP0* | DVA18XP280 | | PMF18WJ0* | DAF18-4 | ACICE0204 | AC164012* | AC164301* | ✓* | ✓* | SW006011 | DM163011 |
| PIC18F2580 | 28SO | PCM18XP0* | DVA18XP280 | XLT28SO | PMF18WJ0* | DAF18-4 | XLT28SO | AC164017* | AC164302* | | ✓* | SW006011 | |
| PIC18F2580 | 28MM | PCM18XP0* | DVA18XP280 | XLT28QFN4* | PMF18WJ0* | DAF18-4 | XLT28QFN4* | AC164012* +AC164031 | AC164322* | AC164031* | ✓* | SW006011 | |
| PIC18F2585 | 28SP | PCM18XP0* | DVA18XP280 | | PMF18WJ0* | DAF18-4 | ACICE0204 | AC164012 | AC164301 | ✓ | ✓ | SW006011 | DM163011 |
| PIC18F2585 | 28SO | PCM18XP0* | DVA18XP280 | XLT28SO | PMF18WJ0* | DAF18-4 | XLT28SO | AC164017 | AC164302 | | ✓ | SW006011 | |

**NOTE:** **See complete list of notes on page 80.**

## MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger, Software Tools, Programmers and Demonstration Boards

| | | MPLAB® ICE 2000 System (1) | | | MPLAB® ICE 4000 System (2) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Part Number** | **Lead Count/ Pkg Type** | **Processor Module** | **Device Adapters** | **Transition Socket** | **Processor Module** | **Device Adapters** | **Transition Socket** | **PRO MATE® II Socket Module (3,4)** | **MPLAB® PM3 Socket Module (8)** | **PICSTART® Plus (5)** | **MPLAB® ICD 2 (6)** | **MPLAB® CXX Compiler** | **Demonstration Boards or Evaluation Kits** |
| **PICmicro® Microcontroller Development Tools (continued)** | | | | | | | | | | | | | |
| PIC18F2610 | 28SP | PCM18XN0 | DVA18XP280 | | PMF18WH0 | DAF18-4 | ACICE0204 | AC164012* | AC164301* | ✓* | ✓ | SW006011 | |
| PIC18F2610 | 28SO | PCM18XN0 | DVA18XP280 | XLT28SO | PMF18WH0 | DAF18-4 | XLT28SO | AC164017* | AC164302* | | ✓ | SW006011 | |
| PIC18F2620 | 28SP | PCM18XN0 | DVA18XP280 | | PMF18WH0 | DAF18-4 | ACICE0204 | AC164012* | AC164301* | ✓* | ✓ | SW006011 | |
| PIC18F2620 | 28SO | PCM18XN0 | DVA18XP280 | XLT28SO | PMF18WH0 | DAF18-4 | XLT28SO | AC164017* | AC164302* | | ✓ | SW006011 | |
| PIC18F2680 | 28SP | PCM18XP0* | DVA18XP280 | | PMF18WJ0* | DAF18-4 | ACICE0204 | AC164012 | AC164301 | ✓* | ✓ | SW006011 | DM163011 |
| PIC18F2680 | 28SO | PCM18XP0* | DVA18XP280 | XLT28SO | PMF18WJ0* | DAF18-4 | XLT28SO | AC164017 | AC164302 | | ✓ | SW006011 | |
| PIC18F4220 | 40P | PCM18XH0 | DVA18XP400 | | PMF18WC1 | DAF18-2 | ACICE0206 | AC164012 | AC164301 | ✓* | ✓ | SW006011 | |
| PIC18F4220 | 44ML | PCM18XH0 | DVA18XP400 | XLT44QFN2 | PMF18WC1 | DAF18-2 | XLT44QFN2 | AC164012 +AC164034 | AC164301 +AC164034 | AC164034* | ✓ | SW006011 | |
| PIC18F4220 | 44PT | PCM18XH0 | DVA18PQ440 | XLT44PT or XLT44PT3 | PMF18WC1 | DAF18-3 | XLT44PT or XLT44PT3 | AC164020 | AC164305 | | ✓ | SW006011 | |
| PIC18F4320 | 40P | PCM18XH0 | DVA18XP400 | | PMF18WC1 | DAF18-2 | ACICE0206 | AC164012 | AC164301 | ✓* | ✓ | SW006011 | |
| PIC18F4320 | 44ML | PCM18XH0 | DVA18XP400 | XLT44QFN2 | PMF18WC1 | DAF18-2 | XLT44QFN2 | AC164012 +AC164034 | AC164301 +AC164034 | AC164034* | ✓ | SW006011 | |
| PIC18F4320 | 44PT | PCM18XH0 | DVA18PQ440 | XLT44PT or XLT44PT3 | PMF18WC1 | DAF18-3 | XLT44PT or XLT44PT3 | AC164020 | AC164305 | | ✓ | SW006011 | |
| PIC18F4331 | 40P | PCM18XL0 | DVA18XP400 | | PMF18WF0* | DAF18-4 | ACICE0206 | AC164012 | AC164301 | ✓ | ✓ | SW006011 | DM183011 |
| PIC18F4331 | 44PT | PCM18XL0 | DVA18PQ440 | XLT44PT or XLT44PT3 | PMF18WF0* | DAF18-5 | XLT44PT or XLT44PT3 | AC164020 | AC164305 | | ✓ | SW006011 | |
| PIC18F4331 | 44ML | PCM18XL0 | DVA18XP400 | XLT44QFN2 | PMF18WF0* | DAF18-4 | XLT44QFN2 | AC164012 +AC164034 | AC164301 +AC164034 | AC164034 | ✓ | SW006011 | |
| PIC18F4410 | 40P | PCM18XN0 | DVA18XP400 | | PCM18WH0 | DAF18-4 | ACICE0206 | AC164012* | AC164301* | ✓* | ✓* | SW006011 | |
| PIC18F4410 | 44PT | PCM18XN0 | DVA18PQ440 | XLT44PT or XLT44PT3 | PCM18WH0 | DAF18-5 | XLT44PT or XLT44PT3 | AC164020* | AC164305* | | ✓* | SW006011 | |
| PIC18F4410 | 44ML | PCM18XN0 | DVA18XP400 | XLT44QFN2 | PCM18WH0 | DAF18-4 | XLT44QFN2 | AC164012* +AC164034 | AC164322* | AC164034* | ✓* | SW006011 | |
| PIC18F4420 | 40P | PCM18XN0 | DVA18XP400 | | PCM18WH0 | DAF18-4 | ACICE0206 | AC164012* | AC164301* | ✓* | ✓* | SW006011 | |
| PIC18F4420 | 44PT | PCM18XN0 | DVA18PQ440 | XLT44PT or XLT44PT3 | PCM18WH0 | DAF18-5 | XLT44PT or XLT44PT3 | AC164020* | AC164305* | | ✓* | SW006011 | |
| PIC18F4420 | 44ML | PCM18XN0 | DVA18XP400 | XLT44QFN2 | PCM18WH0 | DAF18-4 | XLT44QFN2 | AC164012* +AC164034 | AC164322* | AC164034* | ✓* | SW006011 | |
| PIC18F4431 | 40P | PCM18XL0 | DVA18XP400 | | PMF18WF0* | DAF18-4 | ACICE0206 | AC164012 | AC164301 | ✓ | ✓ | SW006011 | DM183011 |
| PIC18F4431 | 44PT | PCM18XL0 | DVA18PQ440 | XLT44PT or XLT44PT3 | PMF18WF0* | DAF18-5 | XLT44PT or XLT44PT3 | AC164020 | AC164305 | | ✓ | SW006011 | |
| PIC18F4431 | 44ML | PCM18XL0 | DVA18XP400 | XLT44QFN2 | PMF18WF0* | DAF18-4 | XLT44QFN2 | AC164012 +AC164034 | AC164301 +AC164034 | AC164034 | ✓ | SW006011 | |

**NOTE:** **See complete list of notes on page 80.**

## MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger, Software Tools, Programmers and Demonstration Boards

| | | MPLAB® ICE 2000 System (1) | | | MPLAB® ICE 4000 System (2) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Part Number** | **Lead Count/ Pkg Type** | **Processor Module** | **Device Adapters** | **Transition Socket** | **Processor Module** | **Device Adapters** | **Transition Socket** | **PRO MATE® II Socket Module (3,4)** | **MPLAB® PM3 Socket Module (8)** | **PICSTART® Plus (5)** | **MPLAB® ICD 2 (6)** | **MPLAB® CXX Compiler** | **Demonstration Boards or Evaluation Kits** |
| **PICmicro® Microcontroller Development Tools (continued)** | | | | | | | | | | | | | |
| PIC18F4439 | 40P | | | | | | | AC164012 | AC164301* | ✓* | ✓ | SW006011 | |
| PIC18F4439 | 44ML | | | | | | | AC164012 +AC164034 | AC164301* +AC164034 | AC164034* | ✓ | SW006011 | |
| PIC18F4439 | 44PT | | | | | | | AC164020 | AC164305* | | ✓ | SW006011 | |
| PIC18F4455 | 40P | PCM18XR0 | DVA18XP400 | | PMF18WL0 | DAF18-4 | ACICE0206 | AC164012* | AC164301* | ✓* | AC162063* | SW006011 | DM163025 |
| PIC18F4455 | 44ML | PCM18XR0 | DVA18XP400 | XLT44QFN2 | PMF18WL0 | DAF18-4 | XLT44QFN2 | AC164012* +AC164034 | AC164322* | AC164034* | AC162063* +XLT44QFN2 | SW006011 | DM163025 |
| PIC18F4455 | 44PT | PCM18XR0 | DVA18PQ440 | XLT44PT or XLT44PT3 | PMF18WL0 | DAF18-5 | XLT44PT or XLT44PT3 | AC164020* | AC164305* | | AC162063* +XLT44PT or XLT44PT3 | SW006011 | DM163025 |
| PIC18F4480 | 40P | PCM18XP0* | DVA18XP400 | | PMF18WJ0* | DAF18-4 | ACICE0206 | AC164012* | AC164301* | ✓* | ✓* | SW006011 | DM163011 |
| PIC18F4480 | 44PT | PCM18XP0* | DVA18PQ440 | XLT44PT or XLT44PT3 | PMF18WJ0* | DAF18-5 | XLT44PT or XLT44PT3 | AC164020* | AC164305* | | ✓* | SW006011 | |
| PIC18F4480 | 44ML | PCM18XP0* | DVA18XP400 | XLT44QFN2 | PMF18WJ0* | DAF18-4 | XLT44QFN2 | AC164012* +AC164034 | AC164322* | AC164034* | ✓* | SW006011 | |
| PIC18F4510 | 40P | PCM18XN0 | DVA18XP400 | | PMF18WH0 | DAF18-4 | ACICE0206 | AC164012* | AC164301* | ✓* | ✓* | SW006011 | DM163022 |
| PIC18F4510 | 44PT | PCM18XN0 | DVA18PQ440 | XLT44PT or XLT44PT3 | PMF18WH0 | DAF18-5 | XLT44PT or XLT44PT3 | AC164020* | AC164305* | | ✓* | SW006011 | |
| PIC18F4510 | 44ML | PCM18XN0 | DVA18XP400 | XLT44QFN2 | PMF18WH0 | DAF18-4 | XLT44QFN2 | AC164012* +AC164034 | AC164301* +AC164034 | AC164034* | ✓* | SW006011 | |
| PIC18F4515 | 40P | PCM18XN0 | DVA18XP400 | | PMF18WH0 | DAF18-4 | ACICE0206 | AC164012 | AC164301* | ✓ | ✓ | SW006011 | |
| PIC18F4515 | 44PT | PCM18XN0 | DVA18PQ440 | XLT44PT or XLT44PT3 | PMF18WH0 | DAF18-5 | XLT44PT or XLT44PT3 | AC164020 | AC164305* | | ✓ | SW006011 | |
| PIC18F4515 | 44ML | PCM18XN0 | DVA18XP400 | XLT44QFN2 | PMF18WH0 | DAF18-4 | XLT44QFN2 | AC164012 +AC164034 | AC164301* +AC164034 | AC164034 | ✓ | SW006011 | |
| PIC18F4520 | 40P | PCM18XN0 | DVA18XP400 | | PMF18WH0 | DAF18-4 | ACICE0206 | AC164012 | AC164301* | ✓ | ✓* | SW006011 | DM163022 |
| PIC18F4520 | 44PT | PCM18XN0 | DVA18PQ440 | XLT44PT or XLT44PT3 | PMF18WH0 | DAF18-5 | XLT44PT or XLT44PT3 | AC164020 | AC164305* | | ✓* | SW006011 | |
| PIC18F4520 | 44ML | PCM18XN0 | DVA18XP400 | XLT44QFN2 | PMF18WH0 | DAF18-4 | XLT44QFN2 | AC164012 +AC164034 | AC164301* +AC164034 | AC164034 | ✓* | SW006011 | |
| PIC18F4525 | 40P | PCM18XN0 | DVA18XP400 | | PMF18WH0 | DAF18-4 | ACICE0206 | AC164012* | AC164301* | ✓ | ✓ | SW006011 | |
| PIC18F4525 | 44PT | PCM18XN0 | DVA18PQ440 | XLT44PT or XLT44PT3 | PMF18WH0 | DAF18-5 | XLT44PT or XLT44PT3 | AC164020* | AC164305* | | ✓ | SW006011 | |
| PIC18F4525 | 44ML | PCM18XN0 | DVA18XP400 | XLT44QFN2 | PMF18WH0 | DAF18-4 | XLT44QFN2 | AC164012* +AC164034 | AC164301* +AC164034 | AC164034 | ✓ | SW006011 | |

**NOTE:** **See complete list of notes on page 80.**

## MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger, Software Tools, Programmers and Demonstration Boards

| | | MPLAB® ICE 2000 System (1) | | | MPLAB® ICE 4000 System (2) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Part Number** | **Lead Count/ Pkg Type** | **Processor Module** | **Device Adapters** | **Transition Socket** | **Processor Module** | **Device Adapters** | **Transition Socket** | **PRO MATE® II Socket Module (3,4)** | **MPLAB® PM3 Socket Module (8)** | **PICSTART® Plus (5)** | **MPLAB® ICD 2 (6)** | **MPLAB® CXX Compiler** | **Demonstration Boards or Evaluation Kits** |
| **PICmicro® Microcontroller Development Tools (continued)** | | | | | | | | | | | | | |
| PIC18F4539 | 40P | | | | | | | AC164012 | AC164301* | ✓* | ✓ | SW006011 | |
| PIC18F4539 | 44ML | | | | | | | AC164012 +AC164034 | AC164301* +AC164034 | AC164034* | ✓ | SW006011 | |
| PIC18F4539 | 44PT | | | | | | | AC164020 | AC164305* | | ✓ | SW006011 | |
| PIC18F4550 | 40P | PCM18XR0 | DVA18XP400 | | PMF18WL0 | DAF18-4 | ACICE0206 | AC164012* | AC164301* | ✓* | AC162063* | SW006011 | DM163025 |
| PIC18F4550 | 44ML | PCM18XR0 | DVA18XP400 | XLT44QFN2 | PMF18WL0 | DAF18-4 | XLT44QFN2 | AC164012* +AC164034 | AC164322* | AC164034* | AC162063* +XLT44QFN2 | SW006011 | DM163025 |
| PIC18F4550 | 44PT | PCM18XR0 | DVA18PQ440 | XLT44PT or XLT44PT3 | PMF18WL0 | DAF18-5 | XLT44PT or XLT44PT3 | AC164020* | AC164305* | | AC162063* +XLT44PT or XLT44PT3 | SW006011 | DM163025 |
| PIC18F4580 | 40P | PCM18XP0* | DVA18XP400 | | PMF18WJ0* | DAF18-4 | ACICE0206 | AC164012* | AC164301* | ✓* | ✓* | SW006011 | |
| PIC18F4580 | 44PT | PCM18XP0* | DVA18PQ440 | XLT44PT or XLT44PT3 | PMF18WJ0* | DAF18-5 | XLT44PT or XLT44PT3 | AC164020* | AC164305* | | ✓* | SW006011 | |
| PIC18F4580 | 44ML | PCM18XP0* | DVA18XP400 | XLT44QFN2 | PMF18WJ0* | DAF18-4 | XLT44QFN2 | AC164012* +AC164034 | AC164322* | AC164034* | ✓* | SW006011 | |
| PIC18F4585 | 40P | PCM18XP0* | DVA18XP400 | | PMF18WJ0* | DAF18-4 | ACICE0206 | AC164012 | AC164301 | ✓ | ✓ | SW006011 | DM163011 |
| PIC18F4585 | 44PT | PCM18XP0* | DVA18PQ440 | XLT44PT or XLT44PT3 | PMF18WJ0* | DAF18-5 | XLT44PT or XLT44PT3 | AC164020 | AC164305 | | ✓ | SW006011 | |
| PIC18F4585 | 44ML | PCM18XP0* | DVA18XP400 | XLT44QFN2 | PMF18WJ0* | DAF18-4 | XLT44QFN2 | AC164012 +AC164034 | AC164301 +AC164034 | AC164034 | ✓ | SW006011 | |
| PIC18F4610 | 40P | PCM18XN0 | DVA18XP400 | | PMF18WH0 | DAF18-4 | ACICE0206 | AC164012* | AC164301* | ✓* | ✓ | SW006011 | |
| PIC18F4610 | 44PT | PCM18XN0 | DVA18PQ440 | XLT44PT or XLT44PT3 | PMF18WH0 | DAF18-5 | XLT44PT or XLT44PT3 | AC164020* | AC164305* | | ✓ | SW006011 | |
| PIC18F4610 | 44ML | PCM18XN0 | DVA18XP400 | XLT44QFN2 | PMF18WH0 | DAF18-4 | XLT44QFN2 | AC164012* +AC164034 | AC164301* +AC164034 | AC164034* | ✓ | SW006011 | |
| PIC18F4620 | 40P | PCM18XN0 | DVA18XP400 | | PMF18WH0 | DAF18-4 | ACICE0206 | AC164012 | AC164301* | ✓ | ✓ | SW006011 | DM163026, DM163027-2 |
| PIC18F4620 | 44PT | PCM18XN0 | DVA18PQ440 | XLT44PT or XLT44PT3 | PMF18WH0 | DAF18-5 | XLT44PT or XLT44PT3 | AC164020 | AC164305* | | ✓ | SW006011 | |
| PIC18F4620 | 44ML | PCM18XN0 | DVA18XP400 | XLT44QFN2 | PMF18WH0 | DAF18-4 | XLT44QFN2 | AC164012 +AC164034 | AC164301* +AC164034 | AC164034 | ✓ | SW006011 | |
| PIC18F4680 | 40P | PCM18XP0* | DVA18XP400 | | PMF18WJ0* | DAF18-4 | ACICE0206 | AC164012 | AC164301 | ✓ | ✓ | SW006011 | DM163011 |
| PIC18F4680 | 44PT | PCM18XP0* | DVA18PQ440 | XLT44PT or XLT44PT3 | PMF18WJ0* | DAF18-5 | XLT44PT or XLT44PT3 | AC164020 | AC164305 | | ✓ | SW006011 | |
| PIC18F4680 | 44ML | PCM18XP0* | DVA18XP400 | XLT44QFN2 | PMF18WJ0* | DAF18-4 | XLT44QFN2 | AC164012 +AC164034 | AC164301 +AC164034 | AC164034 | ✓ | SW006011 | |
| PIC18F6310 | 64PT | PCM18XQ0 | DVA1003 | XLT64PT2 or XLT64PT5 | PMF18WK0 | DAF18-6 | XLT64PT2 or XLT64PT5 | TBD | AC164303* | | ✓* | SW006011 | |

**NOTE:** **See complete list of notes on page 80.**

## MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger, Software Tools, Programmers and Demonstration Boards

| | | MPLAB® ICE 2000 System (1) | | | MPLAB® ICE 4000 System (2) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Part Number** | **Lead Count/ Pkg Type** | **Processor Module** | **Device Adapters** | **Transition Socket** | **Processor Module** | **Device Adapters** | **Transition Socket** | **PRO MATE® II Socket Module (3,4)** | **MPLAB® PM3 Socket Module (8)** | **PICSTART® Plus (5)** | **MPLAB® ICD 2 (6)** | **MPLAB® CXX Compiler** | **Demonstration Boards or Evaluation Kits** |
| **PICmicro® Microcontroller Development Tools (continued)** | | | | | | | | | | | | | |
| PIC18F6390 | 64PT | PCM18XQ0 | DVA1003 | XLT64PT2 or XLT64PT5 | PMF18WK0 | DAF18-6 | XLT64PT2 or XLT64PT5 | TBD | AC164303* | | ✓* | SW006011 | DM163028 |
| PIC18F6410 | 64PT | PCM18XQ0 | DVA1003 | XLT64PT2 or XLT64PT5 | PMF18WK0 | DAF18-6 | XLT64PT2 or XLT64PT5 | AC174008 | AC164303 | | ✓ | SW006011 | |
| PIC18F6490 | 64PT | PCM18XQ0 | DVA1003 | XLT64PT2 or XLT64PT5 | PMF18WK0 | DAF18-6 | XLT64PT2 or XLT64PT5 | AC174008 | AC164303 | | ✓ | SW006011 | DM163028 |
| PIC18F6520 | 64PT | PCM18XE1 | DVA18PQ640 | XLT64PT2 or XLT64PT5 | PMF18WA1 or PMF18WA2 | DAF18-1 or DAF18-6 | XLT64PT2 or XLT64PT5 | AC174008 | AC164303 | ✓(7)* | ✓ | SW006011 | DM183020 |
| PIC18F6525 | 64PT | PCM18XK0 | DVA18PQ802 | XLT64PT2 or XLT64PT5 | PMF18WE0 | DAF18-1 | XLT64PT2 or XLT64PT5 | AC174008 | AC164303 | ✓(7)* | ✓ | SW006011 | |
| PIC18F6585 | 68L | PCM18XK0 | DVA18PQ802 | XLT68L1 | PMF18WE0 | DAF18-1 | XLT68L1 | AC174007 | AC164308 | ✓(7)* | ✓ | SW006011 | |
| PIC18F6585 | 64PT | PCM18XK0 | DVA18PQ802 | XLT64PT2 or XLT64PT5 | PMF18WE0 | DAF18-1 | XLT64PT2 or XLT64PT5 | AC174008 | AC164303 | ✓(7)* | ✓ | SW006011 | DM163015 |
| PIC18F6620 | 64PT | PCM18XE1 | DVA18PQ640 | XLT64PT2 or XLT64PT5 | PMF18WA1 or PMF18WA2 | DAF18-1 or DAF18-6 | XLT64PT2 or XLT64PT5 | AC174008 | AC164303 | ✓(7)* | ✓ | SW006011 | DM183020 |
| PIC18F6621 | 64PT | PCM18XK0 | DVA18PQ802 | XLT64PT2 or XLT64PT5 | PMF18WE0 | DAF18-1 | XLT64PT2 or XLT64PT5 | AC174008 | AC164303 | ✓(7)* | ✓ | SW006011 | |
| PIC18F6627 | 64PT | PCM18XS0* | DVA1003 | XLT64PT2 or XLT64PT5 | PMF18WS0 | DAF18-6 | XLT64PT2 or XLT64PT5 | AC174008* | AC164303* | ✓(7)* | ✓* | SW006011 | DM183022* |
| PIC18F6680 | 68L | PCM18XK0 | DVA18PQ802 | XLT68L1 | PMF18WE0 | DAF18-1 | XLT68L1 | AC174007 | AC164308 | ✓(7)* | ✓ | SW006011 | |
| PIC18F6680 | 64PT | PCM18XK0 | DVA18PQ802 | XLT64PT2 or XLT64PT5 | PMF18WE0 | DAF18-1 | XLT64PT2 or XLT64PT5 | AC174008 | AC164303 | ✓(7)* | ✓ | SW006011 | DM163015 |
| PIC18F6720 | 64PT | PCM18XE1 | DVA18PQ640 | XLT64PT2 or XLT64PT5 | PMF18WA1 or PMF18WA2 | DAF18-1 or DAF18-6 | XLT64PT2 or XLT64PT5 | AC174008 | AC164303 | ✓(7)* | ✓ | SW006011 | DM183020 |
| PIC18F6722 | 64PT | PCM18XS0* | DVA1003 | XLT64PT2 or XLT64PT5 | PMF18WS0 | DAF18-6 | XLT64PT2 or XLT64PT5 | AC174008* | AC164303* | ✓(7)* | ✓* | SW006011 | DM183022* |
| PIC18F8310 | 80PT | PCM18XQ0 | DVA1003 | XLT80PT or XLT80PT3 | PMF18WK0 | DAF18-6 | XLT80PT or XLT80PT3 | TBD | AC164304* | | ✓* | SW006011 | |
| PIC18F8390 | 80PT | PCM18XQ0 | DVA1003 | XLT80PT or XLT80PT3 | PMF18WK0 | DAF18-6 | XLT80PT or XLT80PT3 | TBD | AC164304* | | ✓* | SW006011 | DM163028 |
| PIC18F8410 | 80PT | PCM18XQ0 | DVA1003 | XLT80PT or XLT80PT3 | PMF18WK0 | DAF18-6 | XLT80PT or XLT80PT3 | AC174011* | AC164304 | | ✓* | SW006011 | |
| PIC18F8490 | 80PT | PCM18XQ0 | DVA1003 | XLT80PT or XLT80PT3 | PMF18WK0 | DAF18-6 | XLT80PT or XLT80PT3 | AC174011 | AC164304 | | ✓ | SW006011 | DM163028 |
| PIC18F8520 | 80PT | PCM18XE1 | DVA18PQ800 | XLT80PT or XLT80PT3 | PMF18WA1 or PMF18WA2 | DAF18-1 or DAF18-6 | XLT80PT or XLT80PT3 | AC174011 | AC164304 | ✓(7)* | ✓ | SW006011 | DM183020 |
| PIC18F8525 | 80PT | PCM18XK0 | DVA18PQ802 | XLT80PT or XLT80PT3 | PMF18WE0 | DAF18-1 | XLT80PT or XLT80PT3 | AC174011 | AC164304 | ✓(7)* | ✓ | SW006011 | |

**NOTE:** **See complete list of notes on page 80.**

## MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger, Software Tools, Programmers and Demonstration Boards

| | | MPLAB® ICE 2000 System (1) | | | MPLAB® ICE 4000 System (2) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Part Number** | **Lead Count/ Pkg Type** | **Processor Module** | **Device Adapters** | **Transition Socket** | **Processor Module** | **Device Adapters** | **Transition Socket** | **PRO MATE® II Socket Module (3,4)** | **MPLAB® PM3 Socket Module (8)** | **PICSTART® Plus (5)** | **MPLAB® ICD 2 (6)** | **MPLAB® CXX Compiler** | **Demonstration Boards or Evaluation Kits** |
| **PICmicro® Microcontroller Development Tools (continued)** | | | | | | | | | | | | | |
| PIC18F8585 | 80PT | PCM18XK0 | DVA18PQ802 | XLT80PT or XLT80PT3 | PMF18WE0 | DAF18-1 | XLT80PT or XLT80PT3 | AC174011 | AC164304 | ✓(7)* | ✓ | SW006011 | DM163015 |
| PIC18F8620 | 80PT | PCM18XE1 | DVA18PQ800 | XLT80PT or XLT80PT3 | PMF18WA1 or PMF18WA2 | DAF18-1 or DAF18-6 | XLT80PT or XLT80PT3 | AC174011 | AC164304 | ✓(7) | ✓ | SW006011 | DM183020 |
| PIC18F8621 | 80PT | PCM18XK0 | DVA18PQ802 | XLT80PT or XLT80PT3 | PMF18WE0 | DAF18-1 | XLT80PT or XLT80PT3 | AC174011 | AC164304 | ✓(7)* | ✓ | SW006011 | |
| PIC18F8627 | 80PT | PCM18XS0* | DVA1003 | XLT80PT or XLT80PT3 | PMF18WM0* | DAF18-6 | XLT80PT or XLT80PT3 | AC174011* | AC164304* | ✓(7)* | ✓* | SW006011 | DM183022* |
| PIC18F8680 | 80PT | PCM18XK0 | DVA18PQ802 | XLT80PT or XLT80PT3 | PMF18WE0 | DAF18-1 | XLT80PT or XLT80PT3 | AC174011 | AC164304 | ✓(7)* | ✓ | SW006011 | DM163015 |
| PIC18F8720 | 80PT | PCM18XE1 | DVA18PQ800 | XLT80PT or XLT80PT3 | PMF18WA1 or PMF18WA2 | DAF18-1 or DAF18-6 | XLT80PT or XLT80PT3 | AC174011 | AC164304 | ✓(7) | ✓ | SW006011 | DM183020 |
| PIC18F8722 | 80PT | PCM18XS0* | DVA1003 | XLT80PT or XLT80PT3 | PMF18WM0* | DAF18-6 | XLT80PT or XLT80PT3 | AC174011* | AC164304* | ✓(7)* | ✓* | SW006011 | DM183022* |
| **rfPIC® Microcontroller Development Tools** | | | | | | | | | | | | | |
| rfPIC12C509AF | 20JW | PCM16XA0 | DVA12XP080 | | | | | AC124001 | AC164301 | ✓ | | | |
| rfPIC12C509AF | 20SS | PCM16XA0 | DVA12XP080 | XLT20SS | | | | AC124002 | AC164307 | | | | |
| rfPIC12C509AG | 18JW | PCM16XA0 | DVA12XP080 | | | | | AC124001 | AC164301 | ✓ | | | |
| rfPIC12C509AG | 18SO | PCM16XA0 | DVA12XP080 | XLT18SO | | | | AC124002 | AC164302 | ✓(7) | | | |
| rfPIC12F675F | 20SS | PCM12XB0 | DVA12XP081 | XLT20SS | | | | AC124002 | AC164307 | ✓(7)* | | | DV164102 AC164101 AC164103 |
| rfPIC12F675H | 20SS | PCM12XB0 | DVA12XP081 | XLT20SS | | | | AC124002 | AC164307 | ✓(7)* | | | |
| rfPIC12F675K | 20SS | PCM12XB0 | DVA12XP081 | XLT20SS | | | | AC124002 | AC164307 | ✓(7)* | | | DV164102 AC164102 AC164104 |
| rfRXD0420 | 32LQ | | | | | | | | | | | | DV164102 |
| rfRXD0920 | 32LQ | | | | | | | | | | | | |
| **dsPIC® DSC Development Tools** | | | | | | | | | | | | | |
| dsPIC30F2010 | 28SO | | | | PMF30XA1 | DAF30-4 | XLT28SO | AC30F004 | AC164302 | | ✓ | SW006012 | DM300017 |
| dsPIC30F2010 | 28SP | | | | PMF30XA1 | DAF30-4 | ACICE0204 | AC30F004 | AC164301 | | ✓ | SW006012 | DM300017 |
| dsPIC30F2010 | 28MM | | | | PMF30XA1 | DAF30-4 | XLT28QFN4* | | AC164322* | | ✓ | SW006012 | |
| dsPIC30F2011 | 18SO | | | | PMF30XA1* | DAF30-4 | XLT18SO | AC30F005* | AC164302* | | ✓* | SW006012 | DM300017 |
| dsPIC30F2011 | 18P | | | | PMF30XA1* | DAF30-4 | ACICE0202 | AC30F005* | AC164301* | | ✓* | SW006012 | DM300017 |
| dsPIC30F2012 | 28SO | | | | PMF30XA1* | DAF30-4 | XLT28SO | AC30F004* | AC164302* | | ✓* | SW006012 | DM300017 |
| dsPIC30F2012 | 28SP | | | | PMF30XA1* | DAF30-4 | ACICE0204 | AC30F004* | AC164301* | | ✓* | SW006012 | DM300017 |

**NOTE:** **See complete list of notes on page 80.**

## MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger, Software Tools, Programmers and Demonstration Boards

| | | MPLAB® ICE 2000 System (1) | | | MPLAB® ICE 4000 System (2) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Part Number** | **Lead Count/ Pkg Type** | **Processor Module** | **Device Adapters** | **Transition Socket** | **Processor Module** | **Device Adapters** | **Transition Socket** | **PRO MATE® II Socket Module (3,4)** | **MPLAB® PM3 Socket Module (8)** | **PICSTART® Plus (5)** | **MPLAB® ICD 2 (6)** | **MPLAB® CXX Compiler** | **Demonstration Boards or Evaluation Kits** |
| **dsPIC® DSC Development Tools (continued)** | | | | | | | | | | | | | |
| dsPIC30F3010 | 28SO | | | | PMF30XA1 | DAF30-4 | XLT28SO | AC30F004* | AC164302 | | ✓* | SW006012 | DM300017 |
| dsPIC30F3010 | 28SP | | | | PMF30XA1 | DAF30-4 | ACICE0204 | AC30F004* | AC164301 | | ✓* | SW006012 | DM300017 |
| dsPIC30F3011 | 40P | | | | PMF30XA1 | DAF30-4 | ACICE0206 | AC30F003* | AC164301 | | ✓* | SW006012 | |
| dsPIC30F3011 | 44PT | | | | PMF30XA1 | DAF30-3 | XLT44PT or XLT44PT3 | AC30F006* | AC164305 | | ✓* | SW006012 | |
| dsPIC30F3011 | 44ML | | | | PMF30XA1 | DAF30-4 | XLT44QFN2 | | AC164322* | | ✓* | SW006012 | |
| dsPIC30F3012 | 18SO | | | | PMF30XA1 | DAF30-4 | XLT18SO | AC30F005* | AC164302* | | ✓* | SW006012 | |
| dsPIC30F3012 | 18P | | | | PMF30XA1 | DAF30-4 | ACICE0202 | AC30F005* | AC164301* | | ✓* | SW006012 | |
| dsPIC30F3013 | 28SO | | | | PMF30XA1 | DAF30-4 | XLT28SO | AC30F004* | AC164302* | | ✓* | SW006012 | |
| dsPIC30F3013 | 28SP | | | | PMF30XA1 | DAF30-4 | ACICE0204 | AC30F004* | AC164301* | | ✓* | SW006012 | |
| dsPIC30F3013 | 44ML | | | | PMF30XA1 | DAF30-4 | XLT44QFN3* | | AC164322* | | ✓* | SW006012 | |
| dsPIC30F3014 | 40P | | | | PMF30XA1 | DAF30-4 | ACICE0206 | AC30F003* | AC164301* | | ✓ | SW006012 | |
| dsPIC30F3014 | 44PT | | | | PMF30XA1 | DAF30-3 | XLT44PT or XLT44PT3 | AC30F006* | AC164305* | | ✓ | SW006012 | |
| dsPIC30F3014 | 44ML | | | | PMF30XA1 | DAF30-4 | XLT44QFN2 | | AC164322* | | ✓ | SW006012 | |
| dsPIC30F4011 | 40P | | | | PMF30XA1 | DAF30-4 | ACICE0206 | AC30F003 | AC164301 | | ✓ | SW006012 | |
| dsPIC30F4011 | 44PT | | | | PMF30XA1 | DAF30-3 | XLT44PT or XLT44PT3 | AC30F006 | AC164305 | | ✓ | SW006012 | |
| dsPIC30F4011 | 44ML | | | | PMF30XA1 | DAF30-4 | XLT44QFN2 | | AC164322* | | ✓ | SW006012 | |
| dsPIC30F4012 | 28SO | | | | PMF30XA1 | DAF30-4 | XLT28SO | AC30F004 | AC164302 | | ✓ | SW006012 | DM300017 |
| dsPIC30F4012 | 28SP | | | | PMF30XA1 | DAF30-4 | ACICE0204 | AC30F004 | AC164301 | | ✓ | SW006012 | DM300017 |
| dsPIC30F4013 | 40P | | | | PMF30XA1 | DAF30-4 | ACICE0206 | AC30F003* | AC164301* | | ✓ | SW006012 | |
| dsPIC30F4013 | 44PT | | | | PMF30XA1 | DAF30-3 | XLT44PT or XLT44PT3 | AC30F006* | AC164305* | | ✓ | SW006012 | |
| dsPIC30F4013 | 44ML | | | | PMF30XA1 | DAF30-4 | XLT44QFN2 | | AC164322* | | ✓ | SW006012 | |
| dsPIC30F5011 | 64PT | | | | PMF30XA1 | DAF30-2 | XLT64PT2 or XLT64PT5 | AC30F008* | AC164319* | | ✓ | SW006012 | DM300016 |
| dsPIC30F5013 | 80PT | | | | PMF30XA1 | DAF30-2 | XLT80PT or XLT80PT3 | AC30F007* | AC164320* | | ✓ | SW006012 | DM300014, DM300004-1, DM300004-2 |
| dsPIC30F5015 | 64PT | | | | PMF30XA1* | DAF30-2 | XLT64PT2 or XLT64PT5 | AC30F008* | AC164319* | | ✓* | SW006012* | |
| dsPIC30F5016 | 80PT | | | | PMF30XA1* | DAF30-2 | XLT80PT or XLT80PT3 | | AC164320* | | ✓* | SW006012* | |

**NOTE:** **See complete list of notes on page 80.**

## MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger, Software Tools, Programmers and Demonstration Boards

| | | MPLAB® ICE 2000 System (1) | | | MPLAB® ICE 4000 System (2) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Part Number** | **Lead Count/ Pkg Type** | **Processor Module** | **Device Adapters** | **Transition Socket** | **Processor Module** | **Device Adapters** | **Transition Socket** | **PRO MATE® II Socket Module (3,4)** | **MPLAB® PM3 Socket Module (8)** | **PICSTART® Plus (5)** | **MPLAB® ICD 2 (6)** | **MPLAB® CXX Compiler** | **Demonstration Boards or Evaluation Kits** |
| **dsPIC® DSC Development Tools (continued)** | | | | | | | | | | | | | |
| dsPIC30F6010 | 80PF | | | | PMF30XA1 | DAF30-2 | XLT80PT2 | AC30F001 | AC164314 | | ✓ | SW006012 | DM300020 |
| dsPIC30F6010A | 80PF | | | | PMF30XA1* | DAF30-2 | XLT80PT2 | | AC164314* | | ✓* | SW006012* | |
| dsPIC30F6010A | 80PT | | | | PMF30XA1* | DAF30-2 | XLT80PT or XLT80PT3 | AC30F007* | AC164304* | | ✓* | SW006012 | DM300020 |
| dsPIC30F6011 | 64PF | | | | PMF30XA1 | DAF30-2 | XLT64PT2 or XLT64PT5 | AC30F002 | AC164313 | | ✓ | SW006012 | DM300016 |
| dsPIC30F6011A | 64PF | | | | PMF30XA1* | DAF30-2 | TBD | AC30F008* | AC164313* | | ✓* | SW006012 | |
| dsPIC30F6011A | 64PT | | | | PMF30XA1* | DAF30-2 | XLT64PT2 or XLT64PT5 | AC30F008* | AC164319* | | ✓* | SW006012 | DM300016 |
| dsPIC30F6012 | 64PF | | | | PMF30XA1 | DAF30-2 | XLT64PT3 or XLT64PT4 | AC30F002* | AC164313 | | ✓ | SW006012 | DM300016 |
| dsPIC30F6012A | 64PF | | | | PMF30XA1* | DAF30-2 | TBD | AC30F002* | AC164313* | | ✓* | SW006012 | |
| dsPIC30F6012A | 64PT | | | | PMF30XA1* | DAF30-2 | XLT64PT2 or XLT64PT5 | AC30F008* | AC164319* | | ✓* | SW006012 | DM300016 |
| dsPIC30F6013 | 80PF | | | | PMF30XA1 | DAF30-2 | XLT80PT2 | AC30F001 | AC164314 | | ✓ | SW006012 | DM300014 |
| dsPIC30F6013A | 80PF | | | | PMF30XA1* | DAF30-2 | XLT80PT2 | AC30F001* | AC164314* | | ✓* | SW006012 | |
| dsPIC30F6013A | 80PT | | | | PMF30XA1* | DAF30-2 | XLT80PT or XLT80PT3 | AC30F007* | AC164320* | | ✓* | SW006012 | DM300014 |
| dsPIC30F6014 | 80PF | | | | PMF30XA1 | DAF30-2 | XLT80PT2 | AC30F001 | AC164314 | | ✓ | SW006012 | DM300014, DM300004-1, DM300004-2 |
| dsPIC30F6014A | 80PF | | | | PMF30XA1* | DAF30-2 | XLT80PT2 | AC30F001* | AC164314* | | ✓* | SW006012 | |
| dsPIC30F6014A | 80PT | | | | PMF30XA1* | DAF30-2 | XLT80PT or XLT80PT3 | AC30F007* | AC164304* | | ✓* | SW006012 | DM300014, DM300004-1, DM300004-2 |
| dsPIC30F6015 | 64PT | | | | PMF30XA1* | DAF30-2 | XLT64PT2 or XLT64PT5 | | AC164319* | | ✓* | SW006012* | |

**NOTE:** **See complete list of notes on page 80.**

## MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger, Software Tools, Programmers and Demonstration Boards - NOTES

**NOTES 1:** MPLAB® ICE 2000 pod available separately. (ICE2000)
**2:** MPLAB® ICE 4000 pod available separately. (ICE4000)
**3:** PRO MATE® II Programmer unit (no longer available). (DV007003)
**4:** Optional In-Circuit Serial Programming™ (ICSP™) Socket for PRO MATE® II available separately. (AC004004)
**5:** PICSTART® Plus (DV003001)
**6:** MPLAB® ICD 2 In-Circuit Debugger. Configurations are:
(DV164005) ICD 2 module, USB cable and ICD cable.
(DV164006) ICD 2 module, USB cable, ICD cable, serial cable, PICDEM™ 2 Plus and power supply.
(DV164007) ICD 2 module, USB cable, ICD cable, serial cable and power supply;
(DV164030) ICD 2 module, USB cable, ICD cable, serial cable and dsPICDEM™ Starter Demo Board;
(AC162049) ICD 2 Universal Programming Module;
(AC162051) ICD or ICD 2 28/40 PDIP Header Interface Board.
**7:** Custom adapter required; not available from Microchip. See “Readme” for PICSTART® Plus.
**8:** MPLAB® PM3 Programmer Unit available separately. (DV007004). ICSP™ function is built-in with MPLAB® PM3 Programmer.
(AC164350) MPLAB® PM3 Adapter for PRO MATE® II Socket modules.

***** New product or future support. Contact Microchip web site at www.microchip.com for availability.

✓ Supported with basic configuration. If a part number is listed in the column, that part is required and available separately.

| Demonstration Boards and Evaluation Kits | |
|---|---|
| **Part Number** | **Description** |
| **PICmicro® Demonstration Kits** | |
| DM143001 | PICDEM™ 14A Demo Board for PIC14C000 |
| DM163001 | PICDEM™ 1 Demo Board for PIC16C5X, 55X, 62X, CE62X, 71, 710, 711, 715, 770, 771, 83, 84, and PIC17C42, 43, 44 |
| DM163003 | PICDEM™ 3 Demo Board for PIC16C923, 924 |
| DM163006 | PICDEM™ 18R Demo Board for PIC18C601/801 |
| DM163014 | PICDEM™ 4 Demo Board for PIC12F629, 675, PIC16F630, 676, 684, 627A, 628A, 648A, 818, 819, 87, 88, PIC18F1220, 1320 |
| DM163022 | PICDEM™ 2 Plus Demo Board for PIC16C62, 63, 64, 65, 66, 67, 72, 73, 74, 76, 77, 87X, 773, 774 and PIC18CXX2, 642, 662, and PIC18FXXX |
| DM163026 | Low-Power Solutions Demo Board |
| DM163028 | PICDEM™ LCD Demo Board (uses 64L/80L PIC18FXX90 and 28L/40L PIC16F91X family) |
| DV164101 | PICkit™ 1 8/14P Flash Development Kit for PIC12F629, 675 and PIC16F630, 676 |
| DV164102 | rfPIC® Development Kit 1 |
| AC164101 | rfPIC® Transmitter Module (433.92 MHz) |
| AC164102 | rfPIC® Transmitter Module (315 MHz) |
| AC164103 | rfRXD Receiver Module (433.92 MHz) |
| AC164104 | rfRXD Receiver Module (315 MHz) |
| AC164120 | Signal Analysis PICtail™ Daughter Board |
| AC163020 | PIC10F2XX Programmer Adapter |
| AC163021 | 6L SOT-23 to 8P DIP Adapter Kit |
| DM173001 | PICDEM™ 17 Demo Board for PIC17CXX |
| DM183011 | PICDEM™ MC Development Board (uses 28L/40L PIC18FXX31 family) |
| DM183020 | PIC18FXX20 64/80L TQFP Demo Board for PIC18F6620, 6720, 8620, 8720, 6520, 8520 |
| DM183022* | PICDEM™ HPC Explorer Board |
| **Connectivity Demonstration Kits** | |
| DM163004-LT | PICDEM.net™ TCP/IP Demo Board (with no text book) |
| DM163005 | PICDEM™ LIN Demo Board for PIC16C432/433 LIN bus |
| DM163007 | PICDEM™ CAN-LIN 1 Demo Board (uses 68L/84L PIC18CXX8 family) |
| DM163010 | PICDEM™ USB Demo Board for PIC16C7X5 |
| DM163011 | PICDEM™ CAN-LIN 2 Demo Board (uses 28L/40L PIC18FXX8 and PIC18FXX8X family) |
| DM163015 | PICDEM™ CAN-LIN 3 Demo Board (uses 64L/80L PIC18FXX8X family) |
| DM163025 | PICDEM™ FS USB Demo Board |
| DM163027-2 | PICDEM™ Z 2.4 GHz Demonstration Kit |
| AC163027-1 | PICDEM™ Z Motherboard |
| AC163027-2 | PICDEM™ Z 2.4 GHz Daughter Card |

*** Contact Microchip web site at www.microchip.com for availability.**

## Demonstration Boards and Evaluation Kits

| Part Number | Description |
|---|---|
| **Mixed Signal Control Demonstration Kits** | |
| AC163001 | PICDEM™ MSC 1 Voltage Boost Demo Board; requires DM163012 |
| AC163002 | PICDEM™ MSC 1 High Power IR Demo Board; requires DM163012 |
| AC163003 | PICDEM™ MSC 1 Delta Sigma Demo Board; requires DM163012 |
| AC163004 | PICDEM™ MSC 1 Flow Rate Sensor Demo Board; requires DM163012 |
| DM163012 | PICDEM™ MSC 1 Mixed Signal Controller Demo Board for PIC16C781/782 |
| **dsPIC® 16-bit DSC Demonstration Kits** | |
| DM300004-1 | dsPICDEM.net™ 1 FCC/JATE PSTN Support, Ethernet NIC Demo Board |
| DM300004-2 | dsPICDEM.net™ 2 CTR-21 PSTN Support, Ethernet NIC Demo Board |
| DM300014 | dsPICDEM™ 1.1 General Purpose Demo Board |
| DM300016 | dsPICDEM™ Starter Demo Board |
| DM300017 | dsPICDEM™ 28-Pin Starter Demo Board |
| DM300020 | dsPICDEM™ MC1 Motor Control Development Board |
| DM300021 | dsPICDEM™ MC1H 3-Phase High Voltage Power Module |
| DM300022 | dsPICDEM™ MC1L 3-Phase Low Voltage Power Module |
| **dsPIC® 16-bit DSC Software Tools** | |
| SW300001 | Digital Filter Design |
| SW300002 | dsPIC® V.22/V.22bis Soft Modem Library (free download: www.microchip.com) |
| SW300003-EVAL | dsPIC® V.32 Soft Modem Library (Eval Copy) |
| SW300003, 04, 05 | dsPIC® V.32 Soft Modem Library (5K, 25K, 100K licenses, respectively) |
| SW300006* | dsPIC® V.22/V.22bis Soft Modem Library by Vocal Technology |
| SW300010-EVAL | dsPIC® Speech Recognition (Eval Copy) |
| SW300010, 11, 12* | dsPIC® Speech Recognition (5K, 25K, 100K licenses, respectively) |
| SW300020 | dsPIC30 Math Library: Double-Precision Floating Point Routines |
| SW300021 | dsPIC30 Peripheral Library: Peripheral Initialization and Control Routines |
| SW300022 | dsPIC30 DSP Library: Data Signal Processing Library Suite (FFT, Filters) |
| SW300023 | dsPICworks™ Visual Algorithm Analyzer: Data Analyzer and Converter Tool |
| SW300030 | dsPIC® CMX Scheduler: Multi-tasking, Preemptive Scheduler for dsPIC30F |
| SW300060-5K, 25K, 100K | Acoustic Echo Cancellation Library |
| SW300031 | CMX-RTX for dsPIC® DSC: Fully Preemptive RTOS |
| SW300032 | CMX-Tiny+ for dsPIC® DSC: Preemptive RTOS |
| SW300040-EVAL, 5K, 25K, 100K | Noise Suppression Library (Eval, 5K, 25K, 100K licenses, respectively) |
| SW300050-EVAL, 5K, 25K, 100K | dsPIC® Symmetric Embedded Encryption Library (Eval, 5K, 25K, 100K licenses, respectively) |
| SW300055-EVAL, 5K, 25K, 100K | dsPIC® Asymmetric Embedded Encryption Library (Eval, 5K, 25K, 100K licenses, respectively) |
| SW300060-EVAL, 5K, 25K, 100K | Acoustic Echo Cancellation Library (Eval, 5K, 25K, 100K licenses, respectively) |

*** Contact Microchip web site at www.microchip.com for availability.**

## PowerSmart® Systems

| Model Name/ Part Number | Description |
|---|---|
| PS042 | PS401 PowerCal™ Board |
| PS051 | PowerInfo™ 2 Configuration Interface Board for use with PS70X and PS50X |
| PS052 | PowerCal™ 2 Configuration Interface Board for use with PS70X and PS50X |
| PS070* | PowerMate™ Development Software for PS700 Applications |
| PS2070* | PS200 Configurable Battery Charger Evaluation Board |
| PS2070EV* | PS200 Configurable Battery Charger Evaluation Board with PS051 PowerInfo™ 2 |
| PS5100 | PS501 6-12 cell NiMH Module |
| PS5100EV | PS501 6-12 cell NiMH Module with PS051 |
| PS5162 | 2-cell Li-Ion/Poly Fuel Gauge with safety |
| PS5162EV | 2-cell Li-Ion/Poly Fuel Gauge with safety and PS051 PowerInfo™ 2 |
| PS5163 | 3-cell Li-Ion/Poly Fuel Gauge with safety |
| PS5163EV | 3-cell Li-Ion/Poly Fuel Gauge with safety and PS051 PowerInfo™ 2 |
| PS5164 | 4-cell Li-Ion/Poly Fuel Gauge with safety |
| PS5164EV | 4-cell Li-Ion/Poly Fuel Gauge with safety and PS051 PowerInfo™ 2 |
| PS7051 | Single Cell Li-Ion Battery Monitor with safety |
| PS7052 | Two Cell Li-Ion Battery Monitor with safety |
| PS7070 | PS700 Battery Monitor Evaluation Board |
| PS7070EV | PS700 Battery Monitor Evaluation Board with PS051 PowerInfo™ 2 |
| PS8070* | PS8X0 Li-Ion/Poly Single Cell Fuel Gauge |
| PS8070EV* | PS8X0 Li-Ion/Poly Single Cell Fuel Gauge with PS051 PowerInfo™ 2 |

*** Contact Microchip web site at www.microchip.com for availability.**

## Memory Evaluation/Developer's Kits

| | | |
|---|---|---|
| SEEVAL® 32 Serial EEPROM Developer's Kit | DV243002 | All serial EEPROMS, 24XX, 93XX, 25XX series |

## KEELOQ® Evaluation Kits

| | HCS101 | HCS200/201 | HCS300/301/320 | HCS360/361 | HCS362 | HCS365/370 | HCS410/412 | HCS473 | HCS500/515 | HCS512 |
|---|---|---|---|---|---|---|---|---|---|---|
| KEELOQ® Transponder Evaluation Kit* | – | – | – | – | – | – | DM303005 | – | – | |
| KEELOQ® Evaluation Kit II* | DM303006 | DM303006 | DM303006 | DM303006 | DM303006 | DM303006 | DM303006 | DM303006 | DM303006 | |
| PRO MATE® II Universal Programmer for SOIC* | AC004002 | AC004002 | AC004002 | AC004002 | AC004002 | AC004003 | AC004002 | AC004003 | – | AC164002 |
| PRO MATE® II Universal Programmer for DIP* | AC004001 | AC004001 | AC004001 | AC004001 | AC004001 | AC004007 | AC004001 | AC004007 | – | AC164001 |
| PRO MATE® II Universal Programmer for ICSP™* | AC004004 | AC004004 | AC004004 | AC004004 | AC004004 | AC004004 | AC004004 | AC004004 | AC004004 | |

*** Support is limited to PRO MATE® II using MPLAB® IDE release 5.70.**

## RFID Evaluation/Developer's Kits

| | MCRF355 | MCRF450/452 |
|---|---|---|
| 13.56 MHz Anti-Collision microID® Developer's Kit | DV103003, DV103006 | DV103006 |
| microID® Programmer Kit only for MCRF355 | PG103003 | – |

## Analog / Interface Demo/Eval/Developer's Kits

| **Interface** | **Part Number** | **Devices Supported** |
|---|---|---|
| MCP2140 IrDA® Wireless Temp. Demo | MCP2140DM-TMPSNS | MCP2140 |
| MCP215X Data Logger Demo Board | MCP215XDM | MCP2150/55 |
| MCP250XX CAN I/O Expanders Developer's Kit | DV250501 | MCP25020, MCP25025, MCP25050, MCP25055 |
| MCP2510/2515 CAN Developer's Kit | DV251001 | MCP2510, MCP2515 |
| MCP2120/2150 Developer's Kit | DM163008 | MCP2120, MCP2150 |
| MCP23X08 Evaluation Board | MCP23X08EV | MCP23008, MCP23S08 |
| **Linear** | **Part Number** | **Devices Supported** |
| MCP6S22 PGA PICtail™ Demo Board | MCP6S22DM-PICTL | MCP6S22/92 |
| MCP6SX2 PGA Photodiode PICtail™ Demo Board | MCP6SX2DM-PCTLPD | MCP6S22/92 |
| MCP6SX2 PGA Thermistor PICtail™ Demo Board | MCP6SX2DM-PCTLTH | MCP6S22/92 |
| MCP6S2X PGA Evaluation Board | MCP6S2XEV | MCP6S2X |
| **Mixed Signal** | **Part Number** | **Devices Supported** |
| Mixed Signal PICtail™ Demo Board | MXSIGDM | TX132X, MCP330X, MCP320X, MCP494X, MCP3221, MCP3201, MCP1525, MCP1541 |
| Evaluation Kit for Sigma-Delta A/D Converter Family | TX3400EV | TX3400X |
| Single-Dual A/D | DV3201A | MCP3001, MCP3002, MCP3201, MCP3202 |
| MCP3201/02 Evaluation System Daughter Board | DV3201A | MCP3201/02 |
| MXDEV Analog Evaluation System | DVMCPA | MCP3001/02, MCP3004,/08, MCP3201/02, MCP3204/08 |
| MCP3204/08 Evluation System Daughter Board | DV3204A | MCP3204, MCP3208 |
| MCP42XXX Digital Pot Evaluation Kit | DV42XXX | MCP42010, MCP42050, MCP42100 |
| **Power Management** | **Part Number** | **Devices Supported** |
| MCP1612 Synchronous Buck Regulator Evaluation Board | MCP1612EV | MCP1612 |
| MCP1630 +12V Dual Output Buck Converter Ref. Design | MCP1630RD-DDBK1 | MCP1630 |
| MCP1630 Li-Ion Multi Bay Battery Charger Ref. Design | MCP1630RD-LIC1 | MCP1630 |
| MCP1630 NiMH Battery Charger Demo Board | MCP1630DM-NMC1 | MCP1630 |
| MCP1601 Buck Regulator Evaluation Board | MCP1601EV | MCP1601 |
| Voltage Supervisor Evaluation Board | VSUPEV | SOT-23 packages |
| MCP7386X Li-Ion Battery Charger Evaluation Board | MCP7386XEV | MCP73861/62 |
| MCP165X 3W White LED Demo Board | MCP1650DM-LED1 | MCP1650/51 |
| MCP1650 Boost Controller Evaluation Board | MCP1650EV | MCP1650 |
| MCP7384X Li-Ion Battery Charger | MCP7384XEV | MCP7384X |
| MCP7382X Li-Ion Battery Charger | MCP7382XEV | MCP7382X |
| MCP73855 Evaluation Board | MCP73855EV | MCP73855 |
| Voltage Supervisor SOT23-5/6 Evaluation Board | VSUPEV2 | SOT23-5/6-lead packages |

| Analog / Interface Demo/Eval/Developer's Kits | | |
|---|---|---|
| **Thermal Management Tools** | **Part Number** | **Devices Supported** |
| MCP9800 Thermal Sensor PICtail™ Demo Board | MCP9800DM-PCTL | MCP9800 |
| Demo Board for Tiny Serial Digital Thermal Sensor | TC74DEMO | TC74 |
| Fan Controller Demo Board for TC652 | TC652DEMO | TC652 |
| Fan Controller Demo Board for TC650 | TC650DEMO | TC650 |
| Evaluation Kit for the Fan Speed Controllers | TC642EV | |
| TC72 Digital Temperature Sensor | TC72DM-PICTL | TC72 |
| TC77 Thermal Sensor PICtail™ Demo | TC77DM-PICTL | TC77 |
| Demo Board for Fan Speed Controllers | TC642DEMO | TC642 |
| TC1047A Temperature to Voltage | TC1047ADM-PICTL | |

# FUTURE MICROCHIP MICROCONTROLLER PRODUCTS

## Baseline 8-Bit PICmicro® Microcontroller Family (12-bit Instruction Set)

| Product | Program Memory: Bytes & Type (Words) | EEPROM Data Memory Bytes | RAM Bytes | I/O Pins | Packages | Analog | | Digital | | Max. Speed MHz | IntOSC | ICSP™ | BOR/ PBOR/ PLVD | ICD # of Breakpoints | CCP/ ECCP | nW | Other Features |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | ADC Channels | Comp. | Timers/WDT | Serial I/O | | | | | | | | |
| **PIC10FXXX: 500 ns Instruction Execution, 33 Instructions** | | | | | | | | | | | | | | | | | |
| PIC10F220 | 384 StdFl (256) | — | 16 | 4 | 8P, 6OT | 3 | — | 1-8 bit, 1-WDT | — | 8 | 8 MHz | ✓ | — | 1** | — | — | Band gap reference |
| PIC10F222 | 768 StdFl (512) | — | 24 | 4 | 8P, 6OT | 3 | — | 1-8 bit, 1-WDT | — | 8 | 8 MHz | ✓ | — | 1** | — | — | Band gap reference |
| **PIC12FXXX: 500 ns Instruction Execution, 33 Instructions** | | | | | | | | | | | | | | | | | |
| PIC12F510 | 1536 StdFl (1024) | — | 38 | 6 | 8P, 8SN, 8MS | 3x8-bit | 1 | 1-8 bit, 1-WDT | — | 8 | 8 MHz | ✓ | — | 1** | — | — | Band gap reference |
| **PIC16FXXX: Upwardly Compatible with PIC16C5X/PIC12CXXX, 4-12 Interrupts, 200 ns Instruction Execution, 35 Instructions, 20 mA source and 25 mA sink per I/O** | | | | | | | | | | | | | | | | | |
| PIC16F506 | 1536 StdFl (1024) | — | 67 | 12 | 14P, 14SO, 14ST | 3x8-bit | 2 | 1-8 bit, 1-WDT | — | 20 | 8 MHz | ✓ | — | 1** | — | — | Band gap reference |

**** Requires ICD specific device with header module – refer to Development Tools.**
**Abbreviations are found on the last page of the Selector Guide.**

## Mid-Range 8-Bit PICmicro® Microcontroller Family (14-bit Instruction Set)

| Product | Program Memory: Bytes & Type (Words) | EEPROM Data Memory Bytes | RAM Bytes | I/O Pins | Packages | Analog | | Digital | | Max. Speed MHz | IntOSC | BOR/PBOR/ PLVD | ICD # of Breakpoints | CCP/ ECCP | nW | Other Features |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | ADC Channels | Comp. | Timers/WDT | Serial I/O | | | | | | | |
| **PIC16FXXX: Upwardly Compatible with PIC16C5X/PIC12CXXX, 4-12 Interrupts, 200 ns Instruction Execution, 35 Instructions, ICSP™** | | | | | | | | | | | | | | | | |
| PIC16F631 | 1792 StdFl (1024) | 128 | 64 | 18 | 20P, 20SO, 20SS | — | 2 | 1-16 bit, 1-8 bit, 1-WDT | — | 20 | 8 MHz | BOR | 1** | — | ✓ | |
| PIC16F677 | 3584 StdFl (2048) | 256 | 128 | 18 | 20P, 20SO, 20SS | 12x10-bit | 2 | 1-16 bit, 1-8 bit, 1-WDT | — | 20 | 8 MHz | BOR | 1** | — | ✓ | |

**** Requires ICD specific device with header module – refer to Development Tools.**
**Abbreviations are found on the last page of the Selector Guide.**

## High Performance 8-Bit PICmicro® Microcontroller Family (16-bit Instruction Set)

| Product | Program Memory: Bytes & Type (Words) | EEPROM Data Memory Bytes | RAM Bytes | I/O Pins | Packages | Analog | | Digital | | Max. Speed MHz | IntOSC | BOR/PBOR/ PLVD | ICD # of Breakpoints | CCP/ ECCP | nW | Other Features |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | ADC Ch | Comp. | Timers/WDT | Serial I/O | | | | | | | |
| **PIC18FXXX: Upwardly Compatible with PIC17C7XX/PIC16CXX/PIC16C5X/PIC12CXXX, 77 Instructions, C Compiler Efficient Instruction Set, Software Stack Capability, Table Read/Write, Switchable Oscillator Sources, 4x PLL, 10-12 MIPS, ICSP™** | | | | | | | | | | | | | | | | |
| PIC18F2221 | 4096 EnhFl (2048) | 256 | 512 | 25 | 28SP, 28SO, 28ML | 10x10-bit, 100 ksps | 2 | 3-16 bit, 1-8 bit, 1-WDT | EUSART, MI$^2$C/SPI | 40 | 8 MHz | PBOR/PLVD | 3 | 2/0 | ✓ | PSP |
| PIC18F2321 | 8192 EnhFl (4096) | 256 | 512 | 25 | 28SP, 28SO, 28ML | 10x10-bit, 100 ksps | 2 | 3-16 bit, 1-8 bit, 1-WDT | EUSART, MI$^2$C/SPI | 40 | 8 MHz | PBOR/PLVD | 3 | 2/0 | ✓ | PSP |
| PIC18F4221 | 4096 EnhFl (2048) | 256 | 512 | 36 | 40P, 44ML, 44PT | 13x10-bit, 100 ksps | 2 | 3-16 bit, 1-8 bit, 1-WDT | EUSART, MI$^2$C/SPI | 40 | 8 MHz | PBOR/PLVD | 3 | 1/1 | ✓ | PSP |
| PIC18F4321 | 8192 EnhFl (4096) | 256 | 512 | 36 | 40P, 44ML, 44PT | 13x10-bit, 100 ksps | 2 | 3-16 bit, 1-8 bit, 1-WDT | EUSART, MI$^2$C/SPI | 40 | 8 MHz | PBOR/PLVD | 3 | 1/1 | ✓ | PSP |
| PIC18F24J10 | 16,384 StdFl (8192) | — | 1024 | 21 | 28SP, 28SO, 28SS | 10x10-bit, 100 ksps | 2 | 2-16 bit, 1-8 bit, 1-WDT | EUSART, MI$^2$C/SPI | 40 | 32 kHz | — | 3 | 2/0 | ✓ | PSP |

**Abbreviations are found on the last page of the Selector Guide.**

FUTURE

| Product | Program Memory: Bytes & Type (Words) | EEPROM Data Memory Bytes | RAM Bytes | I/O Pins | Packages | Analog | | Digital | | Max. Speed MHz | IntOSC | BOR/PBOR/ PLVD | ICD # of Breakpoints | CCP/ ECCP | nW | Other Features |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | ADC Ch | Comp. | Timers/WDT | Serial I/O | | | | | | | |
| **PIC18FXXX: Upwardly Compatible with PIC17C7XX/PIC16CXX/PIC16C5X/PIC12CXXX, 77 Instructions, C Compiler Efficient Instruction Set, Software Stack Capability, Table Read/Write, Switchable Oscillator Sources, 4x PLL, 10-12 MIPS, ICSP™ (continued)** | | | | | | | | | | | | | | | | |
| PIC18F25J15 | 32,768 StdFl (16384) | — | 1024 | 21 | 28SP, 28SO, 28SS | 10x10-bit, 100 ksps | 2 | 2-16 bit, 1-8 bit, 1-WDT | EUSART, MI$^2$C/SPI | 40 | 32 kHz | — | 3 | 2/0 | ✓ | PSP |
| PIC18F44J10 | 16,384 StdFl (8192) | — | 1024 | 32 | 40P, 44ML, 44PT | 13x10-bit, 100 ksps | 2 | 2-16 bit, 1-8 bit, 1-WDT | EUSART, 2x MI$^2$C/SPI | 40 | 32 kHz | — | 3 | 1/1 | ✓ | PSP |
| PIC18F45J15 | 32,768 StdFl (16384) | — | 1024 | 32 | 40P, 44ML, 44PT | 13x10-bit, 100 ksps | 2 | 2-16 bit, 1-8 bit, 1-WDT | EUSART, 2x MI$^2$C/SPI | 40 | 32 kHz | — | 3 | 1/1 | ✓ | PSP |
| PIC18F65J10 | 32,768 StdFl (16384) | — | 2048 | 51 | 64PT | 11x10-bit, 100 ksps | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI$^2$C/SPI | 40 | 32 kHz | BOR | 3 | 2/3 | ✓ | PSP |
| PIC18R65J10 | 32,768 ROM (16384) | — | 2048 | 51 | 64PT | 11x10-bit, 100 ksps | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI$^2$C/SPI | 40 | 32 kHz | BOR | 3 | 2/3 | ✓ | PSP |
| PIC18F65J15 | 49,152 StdFl (24576) | — | 2048 | 51 | 64PT | 11x10-bit, 100 ksps | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI$^2$C/SPI | 40 | 32 kHz | BOR | 3 | 2/3 | ✓ | PSP |
| PIC18F66J10 | 65,536 StdFl (32768) | — | 2048 | 51 | 64PT | 11x10-bit, 100 ksps | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI$^2$C/SPI | 40 | 32 kHz | BOR | 3 | 2/3 | ✓ | PSP |
| PIC18R66J10 | 65,536 ROM (32768) | — | 2048 | 51 | 64PT | 11x10-bit, 100 ksps | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI$^2$C/SPI | 40 | 32 kHz | BOR | 3 | 2/3 | ✓ | PSP |
| PIC18F66J60 | 65,536 StdFl (32768) | — | 3808 | 39 | 64PT | 11x10-bit, 100 ksps | 2 | 3-16 bit, 2-8 bit, 1-WDT | 1x EUSART, 1x MI$^2$C/SPI | 42 | 32 kHz | BOR | 3 | 2/3 | ✓ | 10 BASE-T Ethernet |
| PIC18F66J65 | 98,304 StdFl (49152) | — | 3808 | 39 | 64PT | 11x10-bit, 100 ksps | 2 | 3-16 bit, 2-8 bit, 1-WDT | 1x EUSART, 1x MI$^2$C/SPI | 42 | 32 kHz | BOR | 3 | 2/3 | ✓ | 10 BASE-T Ethernet |
| PIC18R67J10 | 131,072 ROM (65536) | — | 3936 | 51 | 64PT | 11x10-bit, 100 ksps | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI$^2$C/SPI | 40 | 32 kHz | BOR | 3 | 2/3 | ✓ | PSP |
| PIC18F67J60 | 131,072 StdFl (65536) | — | 3808 | 39 | 64PT | 11x10-bit, 100 ksps | 2 | 3-16 bit, 2-8 bit, 1-WDT | 1x EUSART, 1x MI$^2$C/SPI | 42 | 32 kHz | BOR | 3 | 2/3 | ✓ | 10 BASE-T Ethernet |
| PIC18F85J10 | 32,768 StdFl (16384) | — | 2048 | 67 | 80PT | 15x10-bit, 100 ksps | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI$^2$C/SPI | 40 | 32 kHz | BOR | 3 | 2/3 | ✓ | PSP, EMA |
| PIC18R85J10 | 32,768 ROM (16384) | — | 2048 | 67 | 80PT | 15x10-bit, 100 ksps | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI$^2$C/SPI | 40 | 32 kHz | BOR | 3 | 2/3 | ✓ | PSP, EMA |
| PIC18F85J15 | 49,152 StdFl (24576) | — | 2048 | 67 | 80PT | 15x10-bit, 100 ksps | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI$^2$C/SPI | 40 | 32 kHz | BOR | 3 | 2/3 | ✓ | PSP, EMA |
| PIC18F86J10 | 65,536 StdFl (32768) | — | 3936 | 67 | 80PT | 15x10-bit, 100 ksps | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI$^2$C/SPI | 40 | 32 kHz | BOR | 3 | 2/3 | ✓ | PSP, EMA |
| PIC18R86J10 | 65,536 ROM (32768) | — | 3936 | 67 | 80PT | 15x10-bit, 100 ksps | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI$^2$C/SPI | 40 | 32 kHz | BOR | 3 | 2/3 | ✓ | PSP, EMA |
| PIC18F86J60 | 65,536 StdFl (32768) | — | 3808 | 55 | 80PT | 15x10-bit, 100 ksps | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 1x MI$^2$C/SPI | 42 | 32 kHz | BOR | 3 | 2/3 | ✓ | 10 BASE-T Ethernet |
| PIC18F86J65 | 98,304 StdFl (49152) | — | 3808 | 55 | 80PT | 15x10-bit, 100 ksps | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 1x MI$^2$C/SPI | 42 | 32 kHz | BOR | 3 | 2/3 | ✓ | 10 BASE-T Ethernet |
| PIC18R87J10 | 131,072 ROM (65536) | — | 3936 | 67 | 80PT | 15x10-bit, 100 ksps | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI$^2$C/SPI | 40 | 32 kHz | BOR | 3 | 2/3 | ✓ | PSP, EMA |
| PIC18F87J60 | 131,072 StdFl (65536) | — | 3808 | 55 | 80PT | 15x10-bit, 100 ksps | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 1x MI$^2$C/SPI | 42 | 32 kHz | BOR | 3 | 2/3 | ✓ | 10 BASE-T Ethernet |

**Abbreviations are found on the last page of the Selector Guide.**



**Future Products**

| Product | Program Memory: Bytes & Type (Words) | EEPROM Data Memory Bytes | RAM Bytes | I/O Pins | Packages | Analog | | Digital | | Max. Speed MHz | IntOSC | BOR/PBOR/ PLVD | ICD # of Breakpoints | CCP/ ECCP | nW | Other Features |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | ADC Ch | Comp. | Timers/WDT | Serial I/O | | | | | | | |
| **PIC18FXXX: Upwardly Compatible with PIC17C7XX/PIC16CXX/PIC16C5X/PIC12CXXX, 77 Instructions, C Compiler Efficient Instruction Set, Software Stack Capability, Table Read/Write, Switchable Oscillator Sources, 4x PLL, 10-12 MIPS, ICSP™ (continued)** | | | | | | | | | | | | | | | | |
| PIC18F6522 | 32,768 EnhFl (16384) | 1024 | 2048 | 54 | 64PT | 12x10-bit, 100 ksps | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI$^2$C/SPI | 40 | 8 MHz | PBOR | 3 | 2/3 | ✓ | PSP |
| PIC18F8522 | 32,768 EnhFl (16384) | 1024 | 2048 | 70 | 80PT | 16x10-bit, 100 ksps | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI$^2$C/SPI | 40 | 8 MHz | PBOR | 3 | 2/3 | ✓ | PSP, EMA |
| PIC18F96J60 | 65,536 StdFl (32768) | — | 3808 | 70 | 100PT | 16x10-bit, 100 ksps | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI$^2$C/SPI | 42 | 32 kHz | BOR | 3 | 2/3 | ✓ | PSP, EMA, 10 BASE-T Ethernet |
| PIC18F96J65 | 98,304 StdFl (49152) | — | 3808 | 70 | 100PT | 16x10-bit, 100 ksps | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI$^2$C/SPI | 42 | 32 kHz | BOR | 3 | 2/3 | ✓ | PSP, EMA, 10 BASE-T Ethernet |
| PIC18F97J60 | 131,072 StdFl (65536) | — | 3808 | 70 | 100PT | 16x10-bit, 100 ksps | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI$^2$C/SPI | 42 | 32 kHz | BOR | 3 | 2/3 | ✓ | PSP, EMA, 10 BASE-T Ethernet |

**Abbreviations are found on the last page of the Selector Guide.**

## dsPIC® DIGITAL SIGNAL CONTROLLER (DSC) PRODUCTS

| Product | Program (FLASH) Kbytes | Memory (FLASH) K Words | EE Bytes | SRAM Bytes | I/O Pins (max.) | Packages | A/D 12-bit 100 ksps | A/D 10-bit 500 ksps | Timer 16-bit | Input Cap | Output Comp/ Std PWM | Motor Control PWM | Quad Enc. | UART | SPI™ | I$^2$C™ | CAN | Codec Interface |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **dsPIC30F Motor Control and Power Conversion Family** | | | | | | | | | | | | | | | | | | |
| dsPIC30F5015 | 66 | 22 | 1024 | 2048 | 52 | 64PT | — | 16 ch | 5 | 4 | 4 | 8 | ✓ | 1 | 2 | 1 | 1 | — |
| dsPIC30F6015 | 144 | 48 | 4096 | 8192 | 52 | 64PT | — | 16 ch | 5 | 6 | 6 | 8 | ✓ | 2 | 2 | 1 | 1 | — |
| dsPIC30F5016 | 66 | 22 | 1024 | 2048 | 68 | 80PT | — | 16 ch | 5 | 4 | 4 | 8 | ✓ | 1 | 2 | 1 | 1 | — |
| dsPIC30F6010A | 144 | 48 | 4096 | 8192 | 68 | 80PF (14x14), 80PT (12x12) | — | 16 ch | 5 | 8 | 8 | 8 | ✓ | 2 | 2 | 1 | 2 | — |
| **dsPIC30F General Purpose Family** | | | | | | | | | | | | | | | | | | |
| dsPIC30F6011A | 132 | 44 | 2048 | 6144 | 52 | 64PF (12x12), 64PT (10x10) | 16 ch | — | 5 | 8 | 8 | — | — | 2 | 2 | 1 | 2 | — |
| dsPIC30F6012A | 144 | 48 | 4096 | 8192 | 52 | 64PF (12x12), 64PT (10x10) | 16 ch | — | 5 | 8 | 8 | — | — | 2 | 2 | 1 | 2 | AC97, I$^2$S |
| dsPIC30F6013A | 132 | 44 | 2048 | 6144 | 68 | 80PF (14x14), 80PT (12x12) | 16 ch | — | 5 | 8 | 8 | — | — | 2 | 2 | 1 | 2 | — |
| dsPIC30F6014A | 144 | 48 | 4096 | 8192 | 68 | 80PF (14x14), 80PT (12x12) | 16 ch | — | 5 | 8 | 8 | — | — | 2 | 2 | 1 | 2 | AC97, I$^2$S |

**Abbreviations are found on the last page of the Selector Guide.**

FUTURE

## Battery Management Family Products

| Product | Battery Chemistry | # of Cells | Interface | A/D Converter | Programmable Memory | Programmable I/O Functions | Accuracy | Time Base | Safety | Temp. Sensor | Packaging | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Battery Fuel Gauge ICs** | | | | | | | | | | | | |
| PS830 | Li-Ion | 1 | SMBus/SPS | 16-bit Sigma Delta | 4k x 16 Flash | 3 GPIO | 1% | On-chip | Internal | On-chip | 14ST, 16ML | Single cell Li-Ion fuel gauge with integrated safety provides battery status such as run time to empty, run time to full, relative state-of-charge and battery state-of-health |

**Abbreviations are found on the last page of the Selector Guide.**

## SERIAL ELECTRICALLY ERASABLE PROMS (EEPROM)

| Part # | E/W Cycles | Density (Organization) | Page Size | Write Speed | Max. Clock Freq. | Operating Voltage (V) | Temps | Unique Features | Packages[(Note)] |
|---|---|---|---|---|---|---|---|---|---|
| **SPI™ Compatible Serial EEPROM Family – Page Write mode, HOLD pin, software enabled block write protection and hardware write-protect pin** | | | | | | | | | |
| 25LC010A | 1M | 1 Kbit (x8) | 16B | 5 ms | 10 MHz | 2.5 to 5.5 | I, E | | P, SN, ST, MS, MC, OT |
| 25AA010A | 1M | 1 Kbit (x8) | 16B | 5 ms | 10 MHz | 1.8 to 5.5 | I | | P, SN, ST, MS, MC, OT |
| 25LC020A | 1M | 2 Kbit (x8) | 16B | 5 ms | 10 MHz | 2.5 to 5.5 | I, E | | P, SN, ST, MS, MC, OT |
| 25AA020A | 1M | 2 Kbit (x8) | 16B | 5 ms | 10 MHz | 1.8 to 5.5 | I | | P, SN, ST, MS, MC, OT |
| 25LC040A | 1M | 4 Kbit (x8) | 16B | 5 ms | 10 MHz | 2.5 to 5.5 | I, E | | P, SN, ST, MS, MC, OT |
| 25AA040A | 1M | 4 Kbit (x8) | 16B | 5 ms | 10 MHz | 1.8 to 5.5 | I | | P, SN, ST, MS, MC, OT |
| 25LC320A | 1M | 32 Kbits (x8) | 32B | 5 ms | 10 MHz | 2.5 to 5.5 | I, E | | P, SN, ST, MS |
| 25AA320A | 1M | 32 Kbits (x8) | 32B | 5 ms | 10 MHz | 1.8 to 5.5 | I, E | | P, SN, ST, MS |
| 25LC640A | 1M | 64 Kbits (x8) | 32B | 5 ms | 10 MHz | 2.5 to 5.5 | I, E | | P, SN, ST, MS |
| 25AA640A | 1M | 64 Kbits (x8) | 32B | 5 ms | 10 MHz | 1.8 to 5.5 | I | | P, SN, ST, MS |
| 25LC128 | 1M | 128 Kbits (x8) | 64B | 5 ms | 10 MHz | 2.5 to 5.5 | I, E | | P, SN, ST, MS |
| 25AA128 | 1M | 128 Kbits (x8) | 64B | 5 ms | 10 MHz | 1.8 to 5.5 | I | | P, SN, ST, MS |
| 25LC1024 | 1M | 1 Mbit (x8) | 256B | 5 ms | 20 MHz | 2.5 to 5.5 | I, E | | P, SM, MF |
| 25AA1024 | 1M | 1 Mbit (x8) | 256B | 5 ms | 20 MHz | 1.8 to 5.5 | I | | P, SM, MF |
| **I²C™ Compatible Serial EEPROM Family** | | | | | | | | | |
| 24LC1025 | 1M | 1 Mbit (x8) | — | 5 ms | 400 kHz | 2.5 to 5.5 | I, E | Cascade up to 4 devices, 100 kHz @ 1.8V-2.5V | P, SM |
| 24AA1025 | 1M | 1 Mbit (x8) | — | 5 ms | 400 kHz | 1.8 to 5.5 | I | Cascade up to 4 devices, 100 kHz @ 1.8V-2.5V | P, SM |

**NOTE: All packaging for these products will be Pb-free.**

FUTURE

## ANALOG/INTERFACE PRODUCTS

### Power Management – Switching Regulators

| Part # | Description | Input Voltage Range (V) | Output Voltage Range (V) | Operating Temperature Range (°C) | Control Scheme | Switching Frequency (kHz) | Typical Active Current (mA) | Output Current (mA) | Features | Packages |
|---|---|---|---|---|---|---|---|---|---|---|
| MCP1603 | Synchronous Buck Regulator | 2.5 to 5.5 | 0.8 to 4.5 | -40 to +85 | PFM/PWM | 2000 | 0.035 | 500 | Auto switching PWM to PFM, adjustable and fixed output versions | 5-Pin SOT-23, 8-Pin 3x2 DFN |
| MCP1614 | Dual Synchronous Buck DC-DC converter | 2.7 to 5.5 | 0.8 to 5.5 | -40 to +85 | Constant frequency PWM | 1400 | 18 | 1000/ 1000 | Overall efficiency > 94%, soft start, over-temperature and over current protection | 16-Pin QSOP |

### Power Management – CPU/System Supervisors

| Part # | Vcc Range (V) | Operating Temperature Range (°C) | Nominal Reset Voltage (V) | Reset Type | Output | Typical Reset Pulse Width (ms) | Typical Supply Current (µA) | Features | Packages |
|---|---|---|---|---|---|---|---|---|---|
| MCP1316 | 1.0 to 5.5 | -40 to +125 | 2.9, 4.6 | Active Low | CMOS Push-Pull | 200 | 5 | Watchdog Input (WDI timeout = 1.6s), Manual Reset | 5-Pin SOT-23 |
| MCP1317 | 1.0 to 5.5 | -40 to +125 | 2.9, 4.6 | Active High | CMOS Push-Pull | 200 | 5 | Watchdog Input (WDI timeout = 1.6s), Manual Reset | 5-Pin SOT-23 |
| MCP1318 | 1.0 to 5.5 | -40 to +125 | 4.6 | Active Low/High | CMOS Push-Pull | 200 | 5 | Watchdog Input (WDI timeout = 1.6s) | 5-Pin SOT-23 |
| MCP1319 | 1.0 to 5.5 | -40 to +125 | 4.6 | Active Low/High | CMOS Push-Pull | 200 | 1 | Manual Reset | 5-Pin SOT-23 |
| MCP1320 | 1.0 to 5.5 | -40 to +125 | 2.9, 4.6 | Active Low | Open Drain | 200 | 5 | Watchdog Input (WDI timeout = 1.6x), Manual Reset | 5-Pin SOT-23 |
| MCP1321 | 1.0 to 5.5 | -40 to +125 | 4.6 | Active Low | Open Drain/ CMOS Push-Pull | 200 | 5 | Watchdog Input (WDI timeout = 1.6s), Two reset outputs (Active Low Open-Drain, Active High Push-Pull) | 5-Pin SOT-23 |
| MCP1322 | 1.0 to 5.5 | -40 to +125 | 4.6 | Active High | Open Drain/ CMOS Push-Pull | 200 | 1 | Manual Reset, Two reset outputs (Active Low Open-Drain, Active High Push-Pull) | 5-Pin SOT-23 |

### Linear – Operational Amplifiers

| Part # | Channels | GBWP | IQ Typ. | VOS | Operating Voltage (V) | Temperature Range (°C) | Features | Packages |
|---|---|---|---|---|---|---|---|---|
| MCP6234 | 4 | 300 kHz | 20 µA | 7 mV | 1.8 to 5.5 | -40° to +125 | Rail-to-Rail Input/Output | 14-Pin PDIP, 14-Pin SOIC, 14-Pin TSSOP |
| MCP6244 | 4 | 650 kHz | 50 µA | 7 mV | 1.8 to 5.5 | -40° to +125 | Rail-to-Rail Input/Output | 14-Pin PDIP, 14-Pin SOIC, 14-Pin TSSOP |

FUTURES

**Linear – Linear Gain Blocks**

| Part # | Channels | -3dB BW (kHz) | $I_Q$ (µA) | VOS (mV) | Operating Voltage (V) | Temperature Range (°C) | Gain Steps (V/V) | Packages |
|---|---|---|---|---|---|---|---|---|
| MCP6G01 | 1 | 1 | 120 | 3 | 1.8 to 5.5 | -40 to +125 | 1, 10, 50 | 8-Pin PDIP, 8-Pin SOIC, 8-Pin TSSOP |
| MCP6G02 | 2 | 1 | 120 | 3 | 1.8 to 5.5 | -40 to +125 | 1, 10, 50 | 8-Pin PDIP, 8-Pin SOIC, 8-Pin TSSOP |
| MCP6G04 | 4 | 1 | 120 | 3 | 1.8 to 5.5 | -40 to +125 | 1, 10, 50 | 14-Pin PDIP, 14-Pin SOIC, 14-Pin TSSOP |
| MCP6G41 | 1 | 14 to 100 | 2 | 3 | 1.8 to 5.5 | -40 to +125 | 1, 10, 50 | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| MCP6G42 | 2 | 14 to 100 | 2 | 3 | 1.8 to 5.5 | -40 to +125 | 1, 10, 50 | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| MCP6G44 | 4 | 14 to 100 | 2 | 3 | 1.8 to 5.5 | -40 to +125 | 1, 10, 50 | 14-Pin PDIP, 14-Pin SOIC, 14-Pin TSSOP |

**Mixed Signal - SAR A/D Converters**

| Part # | Resolution (bits) | Maximum Sampling Rate (ksamples/sec) | # of Input Channels | Input Type | Interface | Input Voltage Range (V) | Maximum Supply current (mA) | Maximum INL (LSB) | Temperature Range (°C) | Packages |
|---|---|---|---|---|---|---|---|---|---|---|
| MCP3601 | 16 | 100 | 1 | Single-ended | SPI | 2.7 to 5.5 | 750 | ±3 | -40 to +125 | 8-Pin PDIP, 8-Pin MSOP, 8-Pin SOIC |
| MCP3602 | 16 | 100 | 2 | Single-ended | SPI | 2.7 to 5.5 | 1000 | ±3 | -40 to +125 | 8-Pin PDIP, 8-Pin MSOP, 8-Pin SOIC |
| MCP3604 | 16 | 100 | 4 | Single-ended | SPI | 2.7 to 5.5 | 750 | ±3 | -40 to +125 | 14-Pin PDIP, 14-Pin SOIC, 14-Pin TSSOP |
| MCp3608 | 16 | 100 | 8 | Single-ended | SPI | 2.7 to 5.5 | 750 | ±3 | -40 to +125 | 16-Pin PDIP, 16-Pin SOIC |

**Mixed Signal – Delta-Sigma A/D Converters**

| Part # | Resolution (bits) | Maximum Sampling Rate (samples/sec) | # Input Channels | Interface | Typical Supply Current (µA) | Supply Voltage Range (V) | Packages |
|---|---|---|---|---|---|---|---|
| MCP3551 | 22 | 15 | 1 | SPI™ | 150 | 2.7 to 5.5 | 8-Pin SOIC, 8-Pin MSOP |

**Mixed Signal - D/A Converters**

| Part # | Resolution (bits) | DACs per package | Interface | Internal VREF | Output Settling Time (µs) | DNL (LSB) | Typical Standby Current (µA) | Typical Operating Current (µA) | Packages |
|---|---|---|---|---|---|---|---|---|---|
| MCP4821 | 12 | 1 | SPI | Y | 4.5 | 1 | 1 | 200 | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |
| MCP4822 | 12 | 2 | SPI | Y | 4.5 | 1 | 1 | 400 | 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP |

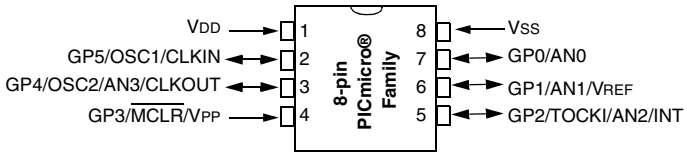
FUTURE

| Interface – Serial Products | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Part #** | **Description** | **Operating Voltage (V)** | **Operating Temperature Range (°C)** | **Bus Type** | **Max. Bus Frequency (kHz)** | **Unique Features** | **Packages** |
| MCP23017 | 16-bit I/O expander | 1.8 to 5.5 | -40 to +125 | $I^2C$™ | 1,700 | 3 HW address pins, 25 mA sink/source per I/O, 100 kHz, 400 kHz and 3-4 MHz I2C supported, Interrupt output | 28-Pin PDIP, 28-Pin SOIC, 28-Pin SSOP, 28-Pin QFN |
| MCP23S17 | 16-bit I/O expander | 1.8 to 5.5 | -40 to +125 | SPI™ | 10,000 | 3 HW address pins, 25 mZ sink/source per I/O, Interrupt output | 28-Pin PDIP, 28-Pin SOIC, 28-Pin SSOP, 28-Pin QFN |

FUTURES

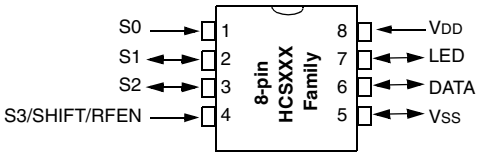
# PIN AND CODE COMPATIBILITY CHART

## 8-pin PICmicro® MCU Family



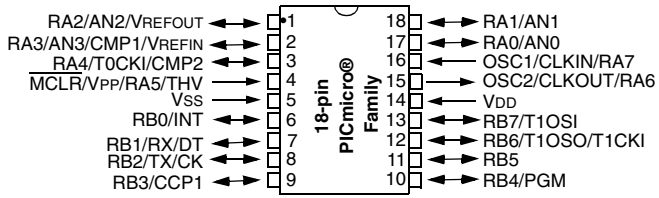

| | | |
|---|---|---|
| PIC12C508A | PIC12C671 | PIC12F509 |
| PIC12C509A | PIC12C672 | PIC12F629 |
| PIC12CR509A | PIC12CE673 | PIC12F635 |
| PIC12CE518 | PIC12CE674 | PIC12F675 |
| PIC12CE519 | PIC12F508 | PIC12F683 |

## 8-pin KEELOQ® Family



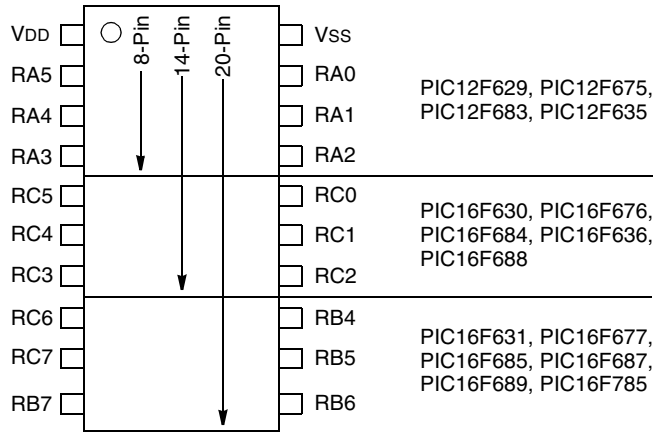

| | | |
|---|---|---|
| HCS101 | HCS300 | HCS360 |
| HCS200 | HCS301 | HCS361 |
| HCS201 | HCS320 | HCS362 |
| | | HCS365 |

## 18-pin PICmicro® MCU Family

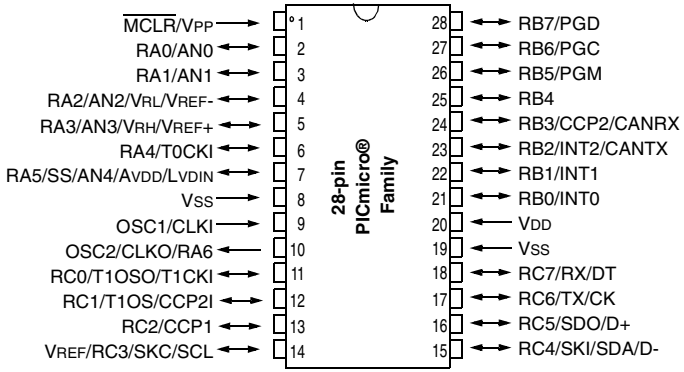



| | | | |
|---|---|---|---|
| PIC16C620A | PIC16CE625 | PIC16C710 | PIC16F84A |
| PIC16CR620A | PIC16F627 | PIC16C711 | PIC16F818 |
| PIC16C621A | PIC16F628 | PIC16C712 | PIC16F819 |
| PIC16C622A | PIC16F627A | PIC16C715 | PIC16F87 |
| PIC16CE623 | PIC16F628A | PIC16C716 | PIC16F88 |
| PIC16CE624 | PIC16F648A | PIC16F716 | PIC16F54 |
| PIC16C54C | PIC16C56A | PIC16C58B | PIC16HV540 |

## 8/14/20-pin PICmicro® MCU Family

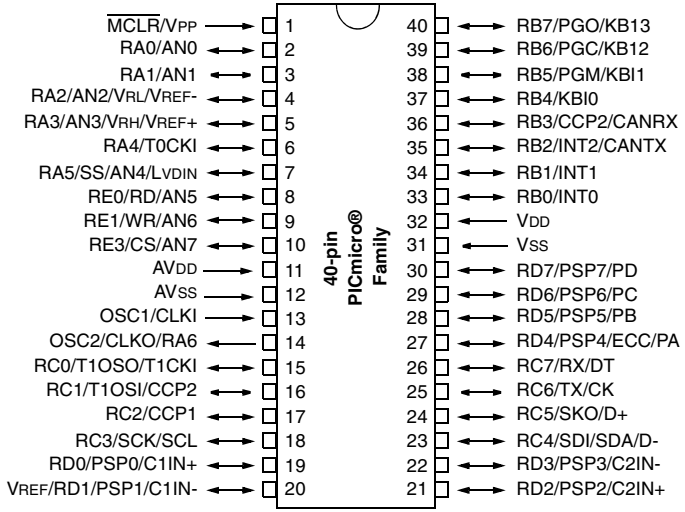


## 28-pin PICmicro® MCU Family



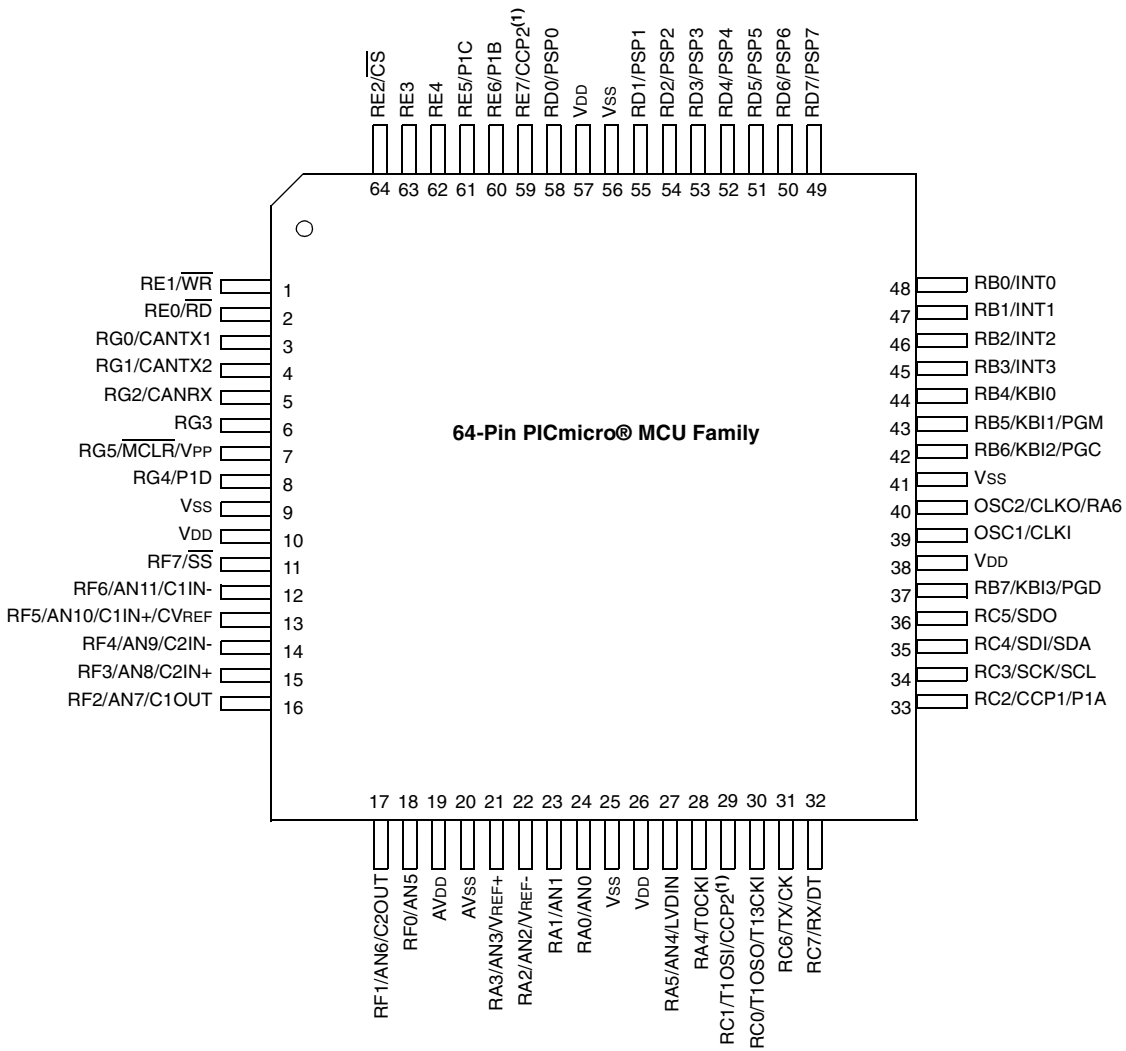

| | | |
|---|---|---|
| PIC16C62B | PIC16F72 | PIC18C242 |
| PIC16CR63 | PIC16F73 | PIC18C252 |
| PIC16C63A | PIC16F737 | PIC18F242 |
| PIC16C642 | PIC16F76 | PIC18F248 |
| PIC16C66 | PIC16F767 | PIC18F252 |
| PIC16CR72 | PIC16F870 | PIC18F258 |
| PIC16C72A | PIC16F872 | PIC18F2220 |
| PIC16C73B | PIC16F873 | PIC18F2320 |
| PIC16C745 | PIC16F873A | PIC18F2455 |
| PIC16C76 | PIC16F876 | PIC18F2525 |
| PIC16C773 | PIC16F876A | PIC18F2550 |
| | | PIC18F2620 |

## 40-pin PICmicro® MCU Family




| | | |
|---|---|---|
| PIC16CR65 | PIC16F77 | PIC18F448 |
| PIC16C65B | PIC16F777 | PIC18F452 |
| PIC16C662 | PIC16F871 | PIC18F458 |
| PIC16C67 | PIC16F874 | PIC18F4220 |
| PIC16C74B | PIC16F874A | PIC18F4320 |
| PIC16C765 | PIC16F877 | PIC18F4455 |
| PIC16C77 | PIC16F877A | PIC18F4525 |
| PIC16C774 | PIC18C442 | PIC18F4550 |
| PIC16F74 | PIC18C452 | PIC18F4620 |
| PIC16F747 | PIC18F442 | |

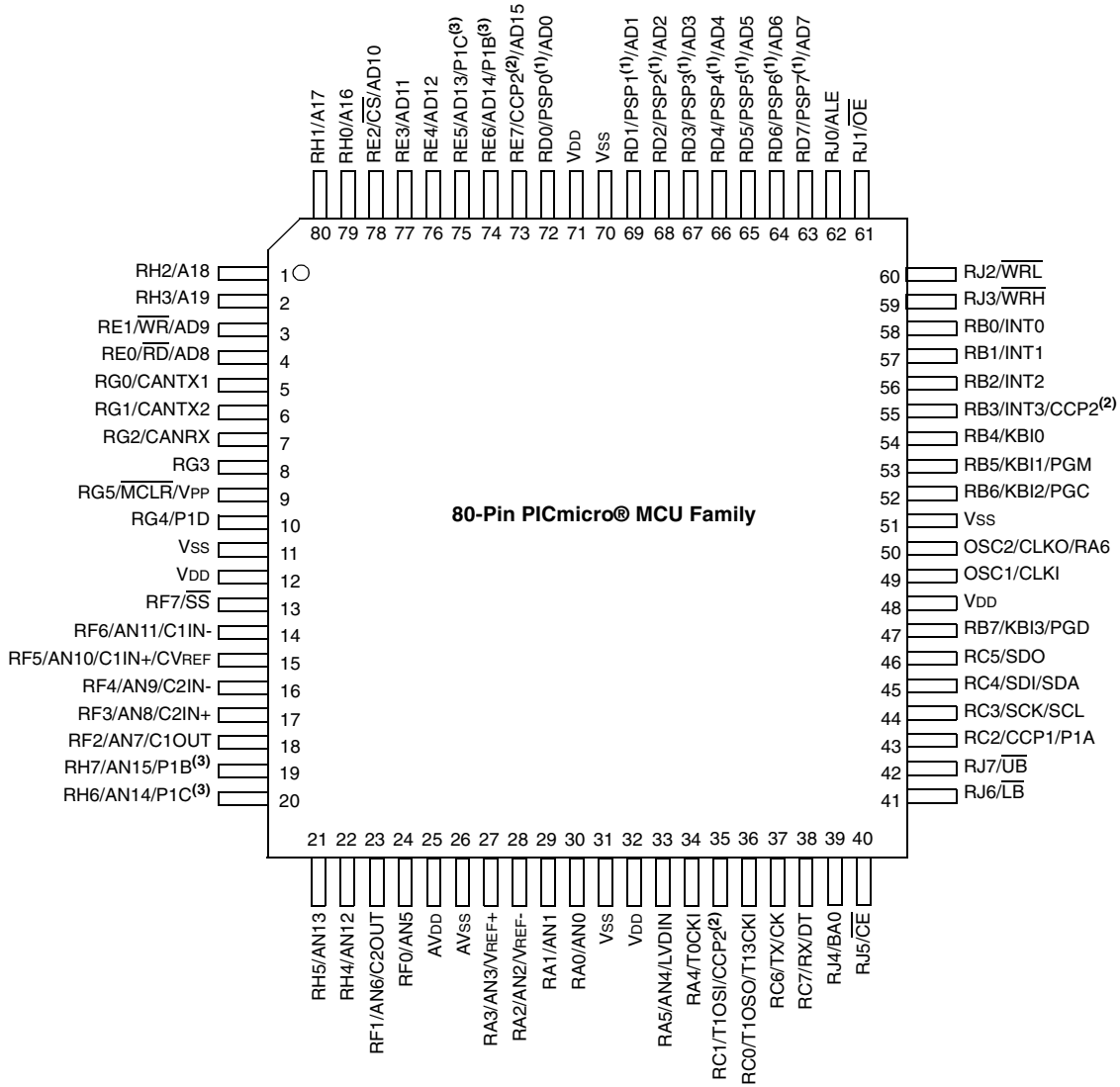
## 64-pin PICmicro® MCU Family




| | | |
|---|---|---|
| PIC18F6310 | PIC18F6525 | PIC18F6621 |
| PIC18F6410 | PIC18F6585 | PIC18F6680 |
| PIC18F6520 | PIC18F6620 | PIC18F6720 |

**Note 1: CCP2 pin placement depends on CCP2MX setting.**

## 80-pin PICmicro® MCU Family




**Note 1:** **PSP is available only in Microcontroller mode.**

**2:** **CCP2 pin placement depends on CCP2MX and Processor mode settings.**

**3:** **P1B and P1C pin placement depends on ECCPMX setting.**

PIC18F8310
PIC18F8410
PIC18F8520
PIC18F8525
PIC18F8585
PIC18F8620
PIC18F8621
PIC18F8680
PIC18F8720

## CERAMIC DUAL IN-LINE CERDIP

18-LEAD CERDIP
"JW"

20-LEAD CERDIP
"JW"

28-LEAD CERDIP
"JW"

40-LEAD CERDIP
"JW"

## PLASTIC DUAL IN-LINE PDIP

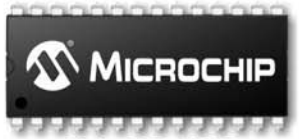
8-LEAD PDIP
"P" OR "PA"

14-LEAD PDIP
"P" OR "PD"

18-LEAD PDIP
"P"

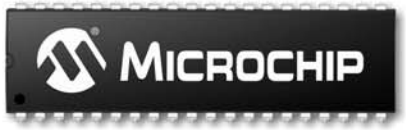
20-LEAD PDIP
"P"

24-LEAD PDIP
"P" OR "PG"



28-LEAD PDIP
"P" OR "PI"

28-LEAD SKINNY PDIP
"SP" OR "PJ"



40-LEAD PDIP
"P" OR "PL"

## PLASTIC LEADED CHIP CARRIER PLCC

32-LEAD PLCC
"L"

44-LEAD PLCC
"L" OR "W"

68-LEAD PLCC
"L" OR "LS"

84-LEAD PLCC
"L"

## CERAMIC CHIP CARRIER CERQUAD

68-LEAD CERQUAD
"CL"

84-LEAD CERQUAD
"CL"

## PLASTIC QUAD FLATPACK "QFP"

32-LEAD LQFP
"LQ"

44-LEAD MQFP
"PQ"

**PACKAGES ARE APPROXIMATE SIZE**

## PLASTIC SMALL OUTLINE "SOIC"

8-LEAD SOIC
(.150") "SN" OR "OA"

8-LEAD SOIC
(.208") "SM"

14-LEAD SOIC
(.150") "SL" OR "OD"

16-LEAD SOIC
(.150") "SL"

18-LEAD SOIC
"SO"

20-LEAD SOIC
"SO"

28-LEAD SOIC
"SO" OR "OI"

## PLASTIC SHRINK SMALL OUTLINE "SSOP"

20-LEAD SSOP
"SS"

28-LEAD SSOP
"SS"

16-LEAD QSOP

8-LEAD MSOP
"MS" OR "UA"

10-LEAD MSOP
"UN"

## PLASTIC THIN QUAD FLATPACK "TQFP"

44-LEAD TQFP 10x10
"PT"

64-LEAD TQFP 10x10
"PT"

80-LEAD TQFP 12x12
"PT"

80-LEAD TQFP 14x14
"PF"

## SIDE BRAZED DUAL-IN-LINE "JW"

8-LEAD SIDE BRAZED
"JW"

14-LEAD SIDE BRAZED
"JW"

20-LEAD SIDE BRAZED
"JW"

28-LEAD SIDE BRAZED
(.300") "JW"

## PLASTIC THIN SHRINK SMALL OUTLINE "TSOP"

8-LEAD TSSOP
(4.4MM) "ST"

14-LEAD TSSOP
(4.4MM) "ST" (PICmicro MCU)
(4.4MM) "ST14" (Memory)

20-LEAD TSSOP
(4.4MM) "ST"

## CHIP SCALE PACKAGES

8-LEAD DFN
3X3
"MF"

16-LEAD QFN
4X4
"ML"

8-LEAD DFN
6X5
"MF"

28-LEAD QFN
6X6
"ML" or "MM"

44-LEAD QFN
8X8
"ML"

3-LEAD DDPAK
"EB"

5-LEAD DDPAK
"ET"

## SMALL OUTLINE TRANSISTOR

3-LEAD TRANSISTOR
"TO" OR "ZB"

3-LEAD SC-89
"MB"

SOT-223
"DB"



6-LEAD SOT-23
"CH"



3-LEAD SOT-23
"TT" or "CB"



SOT-143 "RC"

5-LEAD TO-220 "AT"



5-LEAD SOT-23
"OT" or "CT"



5-LEAD SC-70
"LT"



3-LEAD SC-70
"LB"

**PACKAGES ARE APPROXIMATE SIZE**

# Part Number Suffix Designations

**Ordering Information for all Microchip PICmicro®, KEELOQ®, RFID, rfHCS and Memory Products**

XXXXXXXXXX - XX X/XX XXX

**QTP, SQTP or ROM Code; Special Requirements**

**Package:**

| | | |
|---|---|---|
| 1M | = | 1000pF COB Module |
| 3M | = | 330pF COB Module |
| 7M | = | 2x68pF COB Module (IOA2) |
| CB | = | Chip on Board (COB) |
| CL | = | Windowed CERQUAD |
| G | = | Lead Free |
| JW | = | Windowed CERDIP |
| L | = | Plastic Leaded Chip Carrier (PLCC) |
| LQ | = | Plastic Low Quad Flatpack (LQFP) |
| MC | = | Dual Flat-No Leads (DFN) 2x3 |
| MF | = | Dual Flat - No Leads (DFN) |
| ML | = | Quad Flat - No Leads (QFN) |
| MM | = | Quad Flat - No Leads (DFN) |
| MS | = | Micro Small Outline (MSOP) |
| OT | = | 5-Lead or 6-Lead SOT-23 |
| P | = | Plastic DIP |
| PF | = | Plastic Thin Quad Flatpack (TQFP 14x14) |
| PQ | = | Plastic Quad Flatpack (PQFP) |
| PT | = | Plastic Thin Quad Flatpack (TQFP) |
| S | = | Die in Waffle Pack |
| SB | = | Bumped Die in Waffle Pack |
| SL | = | 14-lead Small Outline (150 mil) |
| SM | = | 8-lead Small Outline (207 mil) |
| SN | = | 8-lead Small Outline (150 mil) |
| SO | = | Plastic Small Outline (SOIC) (300 mil) |
| SP | = | Plastic Skinny DIP |
| SS | = | Plastic Shrink Small Outline (SSOP) |
| ST | = | Thin Shrink Small Outline (TSSOP 4.4 mm) |
| ST14 | = | 14-lead Thin Shrink Small Outline (TSSOP-14) |
| TO-92 | = | Transistor Outline |
| TS | = | Thin Small Outline (8mm x 20mm) |
| TT | = | SOT-23-3 Small Outline Transistor |
| VS | = | Very Small Outline (8mm x 12mm) |
| W | = | Uncut Wafer |
| WB | = | Bumped Wafer |
| WF | = | Sawed Wafer on Frame |
| WFB | = | Bumped, Sawed Wafer on Frame |
| WM | = | SOT385 Leadless Module |

**Process Temperature:**

Blank = 0°C to +70°C
I (Industrial) = -40°C to +85°C
E (Extended = -40°C to +125°C

**Speed:**

| | | |
|---|---|---|
| -90 | = | 90 ns |
| -10 | = | 100 ns |
| -12 | = | 120 ns |
| -15 | = | 150 ns |
| -17 | = | 170 ns |
| -20 | = | 200 ns or 20 MIPS |
| -25 | = | 250 ns or 30 MIPS |
| -30 | = | 300 ns |

**OR**

**Crystal Frequency Designator for PICmicro® MCUs**

| | | |
|---|---|---|
| LP | = | DC to 40 kHz, Low Power Crystal Oscillator |
| RC | = | DC to 4 MHz, Resistor/Capacitor Oscillator |
| XT | = | DC to 4 MHz, Standard Crystal Resonator Oscillator |
| HS | = | DC to 20 MHz, High Speed Crystal Oscillator |
| 02 | = | DC to 2 MHz, XT and RC Oscillator Support |
| 04 | = | DC to 4 MHz Internal, XT and RC Oscillator Support |
| 04 | = | DC to 4 MHz, HS Oscillator Support |
| 08 | = | DC to 200 kHz, LP Oscillator Support |
| 10 | = | DC to 8 MHz, HS Oscillator Support |
| 16 | = | DC to 10 MHz, HS Oscillator Support |
| 20 | = | DC to 16 MHz, XT Oscillator Support |
| 25 | = | DC to 20 MHz, HS Oscillator Support |
| 30 | = | DC to 25 MHz, XT Oscillator Support |
| 33 | = | DC to 30 MHz, HS Oscillator Support |
| 40 | = | DC to 33 MHz, XT Oscillator Support |
| | | DC to 40 MHz, HS Oscillator Support |

**Option:**

T = Tape and Reel Shipments
X = Rotated pinout

**Device Type: (Up to 10 digits)**

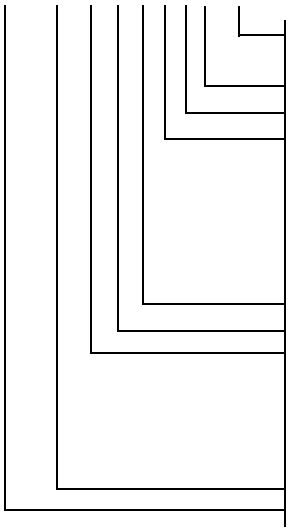
| | | |
|---|---|---|
| AA | = | 1.8V Serial EEPROM |
| C | = | CMOS EPROM/ROMless MCU |
| C | = | 5V Serial EEPROM |
| CE | = | CMOS EPROM/EEPROM MCU |
| CR | = | CMOS ROM MCU |
| F | = | Flash MCU |
| FC | = | High Speed serial EEPROM |
| HC | = | High Speed |
| HV | = | High Voltage |
| LC | = | Low Voltage CMOS EPROM MCU |
| LC | = | Low Voltage (2.5V) Serial EEPROM |
| LCE | = | Low Voltage CMOS EPROM/EEPROM MCU |
| LCR | = | Low Voltage CMOS ROM MCU |
| LCS | = | Low Voltage Security |
| LF | = | Low Voltage FLASH MCU |
| LV | = | Low Voltage |
| 24 | = | 2-Wire ($I^2C$) |
| 25 | = | SPI |
| 93 | = | 3-Wire (Microwire) |

**Note:** Microchip offers a wide variety of lead-free package options. Contact your local sales office for availability or refer to the list on Microchip's web site.

## Part Number Suffix Designations

**Ordering Information for all Microchip Analog Products beginning with "TC" (formerly TelCom Semiconductor Products)**

TC 7106 A-60 1 C P L 713



**Taping Direction:**
TR or 713: Standard Taping, blank: no tape and reel
**Number of Package Pins (See specific data sheet)**
**Package Type**
**Operating Temperature Range:**
C: Commercial Range (O°C to +70°C)
E: Extended Industrial Range (-40°C to +85°C)
I: Industrial Range (-25°C to +85°C)
M: Military Range (-55°C to +125°C)
V: See Data Sheet for Specific Temperature Range
**(Extra Feature Code and/or Tolerance)*** (See specific data sheet)
**(Output Voltage or Detect Voltage)*** (If applicable, see specific data sheet)
**Electrical Performance Grade Option (Variation/Option)*** (If applicable, see specific data sheet)
A: Test Selection Criteria (See specific data sheet)
B:
R: Reversed Pin Layout

**Product Part Number** (2 to 6 characters, see specific data sheet)
**Product Prefix**

**NOTE:** ( )* Used for voltage regulators and detectors.

| Package | Description | # of Pins |
|---|---|---|
| AB | TO-220 | 3 |
| AK | TO-220 | 7 |
| AT | TO-220 | 5 |
| AV | TO-220 (Formed) | 5 |
| BB | TO-220B | 3 |
| CB | SOT-23A | 3 |
| CH | SOT-23A | 6 |
| CT | SOT-23A | 5 |
| DB | SOT-223 | 3 |
| EB | DDPAK | 3 |
| EK | DDPAK | 7 |
| ET | DDPAK | 5 |
| HA | SOP | 8 |
| JA | CDIP (N) | 8 |
| JD | CDIP (N) | 14 |
| JE | CDIP (N) | 16 |
| JG | CDIP (W) | 24 |
| JI | CDIP (W) | 28 |
| JL | CDIP (W) | 40 |
| KU | MQFP | 64 |
| KW | MQFP | 44 |
| LB | SC-70 | 3 |
| LI | PLCC | 28 |
| LS | PLCC | 68 |
| LT | SC-70 | 5 |
| LW | PLCC | 44 |

| Package | Description | # of Pins |
|---|---|---|
| MB | SOT-89 | 3 |
| MF | DFN (3x3) | 8 |
| MT | SOT-89 | 5 |
| NB | SOT-23B | 3 |
| OA | SOIC (N) | 8 |
| OD | SOIC (N) | 14 |
| OE | SOIC (W) | 16 |
| OG | SOIC (W) | 24 |
| OI | SOIC (W) | 28 |
| OR | SOIC (N) | 16 |
| PA | PDIP (N) | 8 |
| PD | PDIP (N) | 14 |
| PE | PDIP (N) | 16 |
| PF | PDIP (N) | 24 |
| PG | PDIP (W) | 24 |
| PI | PDIP (W) | 28 |
| PJ | PDIP (W) | 28 |
| PL | PDIP (W) | 40 |
| QR | QSOP (N) | 16 |
| RC | SOT-143 | 4 |
| SI | SSOP (W) | 28 |
| UA | MSOP | 8 |
| UN | MSOP | 10 |
| VB | DPAK | 3 |
| ZB | TO-92 | 3 |
| ZM | TO-92 | 2 |

MCP xxxxx T - yyy z h / qq

**Package (see table below)**

**Operating Temperature Range:**
- blank: Commercial Range (0°C to +70°C)
I: Industrial (-40°C to +85°C)
E: Extended Industrial Range (-40°C to +125°C)

**Supervisor Bond Options:**
D:
F:
H:
blank: Not Applicable

**Reset Voltage Thresholds or Performance Grade Options (1-3 characters, see specific data sheets)**
270: 2.7V reset threshold
300: 3.0V reset threshold
315: 3.15V reset threshold
450: 4.5V reset threshold
460: 4.6V reset threshold
475: 4.7V reset threshold
485: 4.85V reset threshold
or
B: Grade (see specific data sheet)
C: Grade (see specific data sheet)
or
blank: not applicable

**Tape and Reel**
T: Tape and Reel
blank: no Tape and Reel

**Product Part Number (3-6 characters, see specific data sheet)**

**Product Prefix**

| Package | Description | # of Pins | Tube/Bag Qty. | Reel Qty. |
|---|---|---|---|---|
| TO | TO-92 | 3 | 1000 | n/a |
| TT | SOT-23 | 3 | n/a | 3000 |
| OT | SOT-23 | 5 | n/a | 3000 |
| P | PDIP | 8 | 60 | n/a |
| SN | SOIC | 8 | 100 | 3300 |
| ST | TSSOP | 8 | 100 | 2500 |
| MS | MSOP | 8 | 100 | 2500 |
| MF | DFN (3x3) | 8 | 50 | 3300 |
| MF | DFN (3x3, 10-Pin) | 10 | 120 | 3300 |
| ST | TSSOP | 14 | 96 | 2500 |
| P | PDIP | 14 | 30 | n/a |
| SL | SOIC | 14 | 57 | 2600 |
| P | PDIP | 18 | 25 | n/a |
| SO | SOIC | 18 | 42 | 1100 |
| ST | TSSOP | 20 | 74 | 2500 |
| SS | SSOP | 20 | 67 | 1600 |
| ML | QFN (6x6) | 28 | 50 | 1600 |
| ML | QFN (4x4) | 16 | 91 | 3300 |

| ABBREVIATIONS | |
|---|---|
| ADC | Analog-to-Digital Converter |
| ASK | Amplitude Shift Key |
| AUSART | Addressable USART (RS-232, RS-485) |
| BOR | Brown-Out Detection/Reset |
| CAN | Controller Area Network |
| CAP | Capture |
| CCP | Capture/Compare/1 PWM output |
| CRC | Cyclic Redundancy Check |
| DAC | Digital-to-Analog Converter |
| 3φ | 3 Phase PWMs |
| 4φ | 4 Phase PWMs |
| E2 | EEPROM (Reprogrammable) |
| ECAN | Enhanced Controller Area Network |
| ECCP | Enhanced Capture/Compare/4 PWM outputs with program dead time |
| EMA | External Memory Addressing |
| EnhFI | Enhanced Flash: look erase/write cycles, 40 year retention, self-programmable in socket from 2V to 5.5V, ICSP at 5V or 12V; data EE available with up to 1 million erase/write cycles |
| EUSART | Enhanced USART (RS232, RS485, LIN) |
| FSK | Frequency Shift Key |
| $I^2C$ | Inter-integrated Circuit Bus |
| ICSP™ | In-Circuit Serial Programming™ |
| ICD | # of In-Circuit Debug Breakpoints |
| IntOSC | Internal Oscillator |
| LNA | Low Noise Amplifier |
| LVD | Low Voltage Detection |
| LIN XCVR | Local Interconnection Network Transceiver |
| $MI^2C$/SPI | Master $I^2C$/SPI |
| nW | nanoWatt |
| OTP | One-Time Programmable |
| PBOR | Programmable Brown-Out Detection/Reset |
| PLVD | Programmable Low-Voltage Detection |
| PSMC | Programmable Switch Mode Controller |
| PSP | Parallel Slave Port |
| PSMC | Programmable Switch Mode Controller |
| PWM | Pulse Width Modulator |
| ROM-less | External ROM necessary |
| RSSI | Received Signal Strength Indicator |
| SLAC | Slope A/D Converter, up to 16 bits |
| SMB | System Management Bus |
| SPI | Serial Peripheral Interface |
| StdFI | Standard Flash: up to 10,000 erase/write cycles, 40 year retention, ICSP capability at 12V |
| ULPW | Ultra Low Power Wake-up |
| USART | Universal Synchronous/Asynchronous Receiver/Transmitter |
| USB | Universal Serial Bus |
| VREF | Voltage Reference |
| WDT | Watchdog Timer |
| ✓P | Programmable |
| x12 | 12-bit Instruction Width |
| x14 | 14-bit Instruction Width |
| x16 | 16-bit Instruction Width |

# Microchip Technology's Quality Policy

**In order to meet or exceed customer expectations at a reduced cost, we encourage our employees to support continuous improvement, anticipate problems and implement root cause solutions.**

**Aggregate Approach**
Microchip has instituted an "aggregate" approach to understand, align, integrate and unite all company resources. Microchip consciously designed the enterprise as an aggregate system in which company culture, systems, practices, policies and employees work in unison to achieve Microchip's mission and goals. This aggregate system and culture is taught in the Microchip Culture class required for all new hires and taught by Executive Staff members.

The Quality Culture of Microchip is that every organization, business unit and individual owns the quality of their output, whether it is product, process, software or service.

A company must aggressively pursue continuous improvement, employee development, team deployment and statistical techniques to successfully achieve individual accountability of quality.

**Continuous Improvement**
Microchip promotes a culture of continuous improvement. As stated above, each employee is measured on how they contribute to improvement. Continuous improvement teams are constantly looking to solve problems, allowing us to maximize our value to our customers.

**Employee Development and Team Deployment**
Every employee has access to a full suite of training. Each employee is measured on Quality and Quantity of work, Teamwork, Continuous Improvement and Customer Satisfaction. Supervisors are measured on how their employees improve and learn. Employees have regular One-on-Ones with their supervisors and open door is a policy that is really practiced.

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Microchip uses statistical process techniques in all aspects of our business. Decision-making, experiment definition and process control are a few areas where these techniques are applied. Every manufacturing employee is trained in SPC before they start their job, since they are the people closest to the product quality.

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**Quality Systems and Reliability Information**
Visit www.microchip.com for detailed Quality Systems and Reliability information.

Microchip's Quality System is fully described in the *Microchip Overview, Quality Systems and Customer Interface Systems Handbook* (DS00169) available on our web site.

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