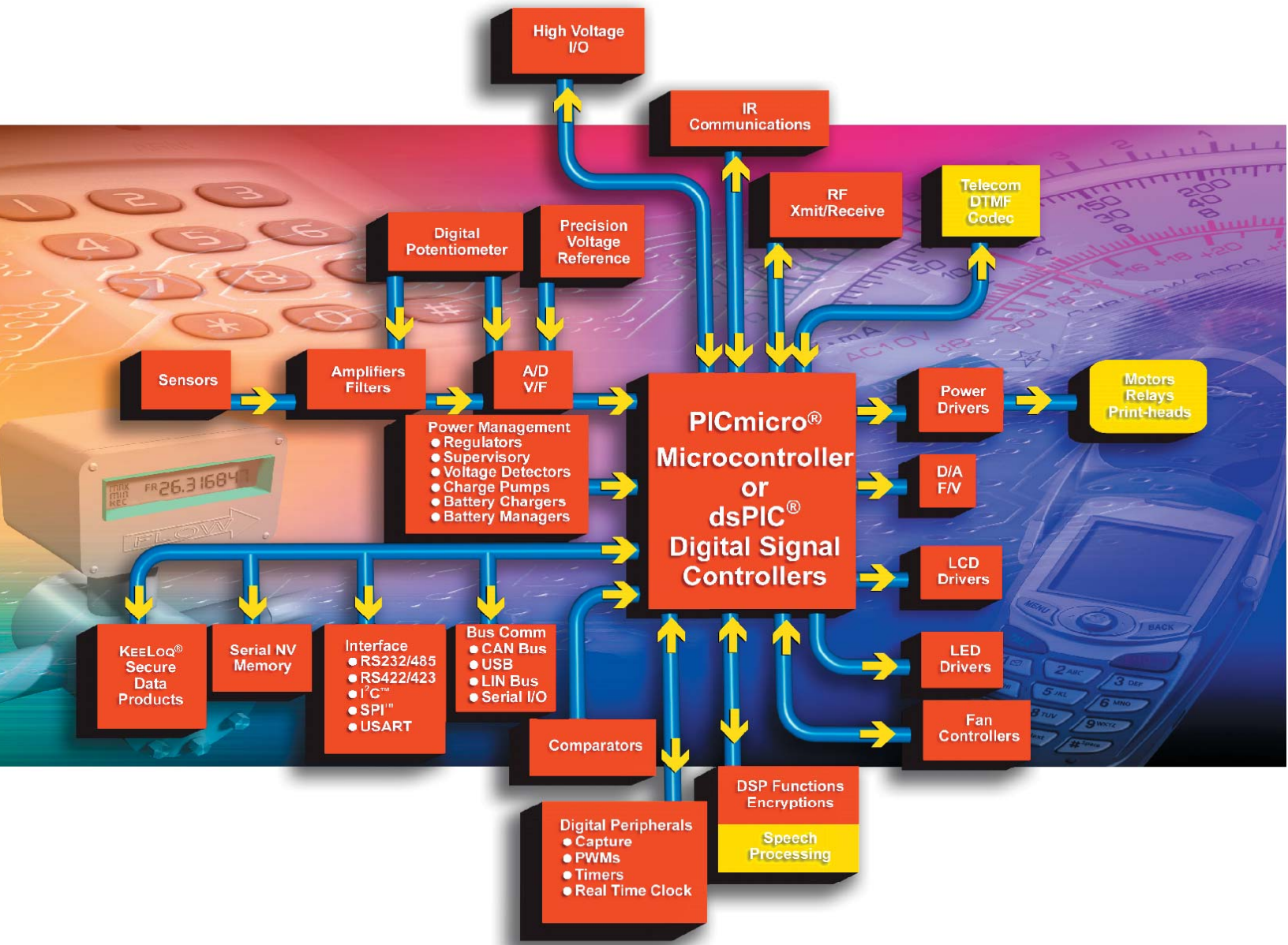




2004 Product Selector Guide



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 8 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 (I²C™/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)

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 (I²C™, 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.

dsPIC® Digital Signal Controllers

The dsPIC® family of Digital Signal Controllers features a fully-implemented digital signal processor (DSP) engine, 30 MIPS non-pipe lined performance, C compiler friendly design, and a familiar microcontroller architecture and design environment. These 20 new dsPIC30FXXX 16-bit FLASH microcontrollers provide the industry's highest performance and target motor control and power conversion, sensor processing, and general-purpose applications.

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 Starter Kit, SEEVAL® Serial EEPROM Evaluation Kit and various demonstration boards. Microchip has shipped more than 300,000+ development systems worldwide.

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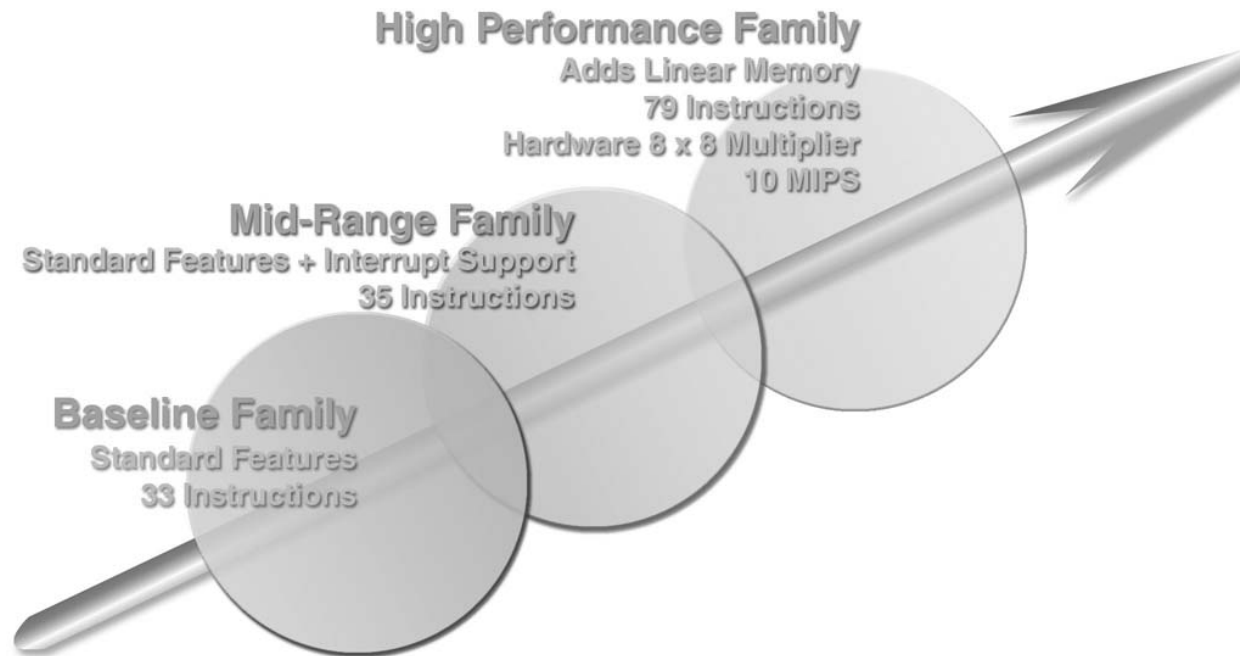
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PICmicro[®] MICROCONTROLLER FAMILIES



Baseline Product Family:

The Baseline product family is comprised of the PIC10 family and portions of the PIC12 and PIC16 families. These devices utilize a 12-bit program word architecture with 6- to 28-pin package options.

Mid-Range Product Family:

The Mid-Range product family is comprised of portions of the PIC12 and PIC16 families. These devices feature a 14-bit program word architecture with 8- to 64-pin package options.

High Performance Product Family:

The High Performance product family features the PIC18 family of devices. These microcontrollers utilize a 16-bit program word architecture with 18- to 80-pin package options.

**Current PICmicro® MCU
Family Products**

CURRENT MICROCONTROLLER FAMILY PRODUCTS

Baseline 8-Bit PICmicro® Microcontroller Family

| Product | Program Memory (Bytes) | RAM Bytes | I/O Pins | Packages | Analog | | Digital | Max. Speed MHz | IntOSC | ICSP™ | BOR/PBOR/PLVD | ICD # of Breakpoints | Operating Voltage (V) |
|---|------------------------|-----------|----------|-----------------------------|--------|-------|----------------|----------------|--------|-------|---------------|----------------------|-----------------------|
| | | | | | ADC | Comp. | Timers/WDT | | | | | | |
| PIC10FXXX: 200 ns Instruction Execution, 33 Instructions | | | | | | | | | | | | | |
| PIC10F200 | 384 StdFI | 16 | 4 | 6OT, 8P | — | — | 1-8 bit, 1-WDT | 4 | 4 MHz | ✓ | — | 1** | 2.0 - 5.5 |
| PIC10F202 | 768 StdFI | 24 | 4 | 6OT, 8P | — | — | 1-8 bit, 1-WDT | 4 | 4 MHz | ✓ | — | 1** | 2.0 - 5.5 |
| PIC10F204 | 384 StdFI | 16 | 4 | 6OT, 8P | — | 1 | 1-8 bit, 1-WDT | 4 | 4 MHz | ✓ | — | 1** | 2.0 - 5.5 |
| PIC10F206 | 768 StdFI | 24 | 4 | 6OT, 8P | — | 1 | 1-8 bit, 1-WDT | 4 | 4 MHz | ✓ | — | 1** | 2.0 - 5.5 |
| PIC12C/FXXX (x12): 1 µs Instruction Execution, 33 Instructions, 4 Oscillator Selections | | | | | | | | | | | | | |
| PIC12C508A | 768 OTP | 25 | 6 | 8P, 8SM, 8JW, 8SN, 8MF | — | — | 1-8 bit, 1-WDT | 4 | 4 MHz | ✓ | — | — | 2.5 - 5.5 |
| PIC12C509A | 1536 OTP | 41 | 6 | 8P, 8SM, 8JW, 8SN, 8MF | — | — | 1-8 bit, 1-WDT | 4 | 4 MHz | ✓ | — | — | 2.5 - 5.5 |
| PIC12F508 | 768 StdFI | 25 | 6 | 8P, 8SN, 8MS | — | — | 1-8 bit, 1-WDT | 4 | 4 MHz | ✓ | — | 1** | 2.0 - 5.5 |
| PIC12F509 | 1536 StdFI | 41 | 6 | 8P, 8SN, 8MS | — | — | 1-8 bit, 1-WDT | 4 | 4 MHz | ✓ | — | 1** | 2.0 - 5.5 |
| PIC16C/F5X (x12): Upwardly Compatible with PIC16C5X/PIC12CXXX, 100-200 ns Instruction Execution, 33/35 Instructions, 4/5 Oscillator Selections | | | | | | | | | | | | | |
| PIC16C55A | 768 OTP | 24 | 20 | 28P, 28JW, 28SP, 28SO, 28SS | — | — | 1-8 bit, 1-WDT | 40 | — | — | — | — | 2.5 - 5.5 |
| PIC16C56A | 1536 OTP | 25 | 12 | 18P, 18JW, 18SO, 20SS | — | — | 1-8 bit, 1-WDT | 40 | — | — | — | — | 2.5 - 5.5 |
| PIC16CR56A | 1536 ROM | 25 | 12 | 18P, 18SO, 20SS | — | — | 1-8 bit, 1-WDT | 20 | — | — | — | — | 2.5 - 5.5 |
| PIC16C58B | 3072 OTP | 73 | 12 | 18P, 18JW, 18SO, 20SS | — | — | 1-8 bit, 1-WDT | 40 | — | — | — | — | 2.5 - 5.5 |
| PIC16CR58B | 3072 ROM | 73 | 12 | 18P, 18SO, 20SS | — | — | 1-8 bit, 1-WDT | 20 | — | — | — | — | 2.5 - 5.5 |
| PIC16HV540 | 768 OTP | 25 | 12 | 18P, 18JW, 18SO, 20SS | — | — | 1-8 bit, 1-WDT | 20 | — | — | BOR | — | 3.5 - 15 |
| PIC16F505 | 1536 StdFI | 72 | 12 | 14P, 14JW, 14SL | — | — | 1-8 bit, 1-WDT | 20 | 4 MHz | ✓ | — | 1** | 2.0 - 5.5 |
| PIC16F54 | 768 StdFI | 25 | 12 | 18P, 18SO, 20SS | — | — | 1-8 bit, 1-WDT | 20 | — | ✓ | — | — | 2.0 - 5.5 |
| PIC16F57 | 3072 StdFI | 72 | 20 | 28P, 28SO, 28SS, 28SP | — | — | 1-8 bit, 1-WDT | 20 | — | ✓ | — | — | 2.0 - 5.5 |
| PIC16F59 | 3072 StdFI | 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.

Mid-Range 8-Bit PICmicro® Microcontroller Family

| Product | Program Memory (Bytes) | EEPROM Data Memory Bytes | RAM Bytes | I/O Pins | Packages | Analog | | Digital | | Max. Speed MHz | IntOSC | BOR/PBOR/PLVD | ICD # of Breakpoints | CCP/ECCP |
|---|------------------------|--------------------------|-----------|----------|------------------------------|----------|-------|--------------------------|-----------------------------|----------------|--------|---------------|----------------------|----------|
| | | | | | | ADC Ch | Comp. | Timers/WDT | Serial I/O | | | | | |
| PIC12FXXX (x14): Upwardly Compatible with PIC12CXXX, 200 ns – 1 µs Instruction Execution, 35 Instructions, 4/5 Oscillator Selections, ICSP™ | | | | | | | | | | | | | | |
| PIC12F629 | 1792 StdFI | 128 | 64 | 6 | 8P, 8SN, 8MF | — | 1 | 1-8 bit, 1-16 bit, 1-WDT | — | 20 | 4 MHz | BOR | 1** | — |
| PIC12F635 | 1792 StdFI | 128 | 64 | 6 | 8P, 8SN, 8MF | — | 1 | 1-8 bit, 1-16 bit, 1-WDT | — | 20 | 8 MHz | BOR/PLVD | 1** | — |
| PIC12F675 | 1792 StdFI | 128 | 64 | 6 | 8P, 8SN, 8MF | 4x10-bit | 1 | 1-8 bit, 1-16 bit, 1-WDT | — | 20 | 4 MHz | BOR | 1** | — |
| PIC12F683 | 3584 StdFI | 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 (x14): Upwardly Compatible with PIC16C5X/PIC12CXXX, 4-12 Interrupts, 100-200 ns Instruction Executions, 35 Instructions, 4/5 Oscillator Selections, ICSP™ (except F) | | | | | | | | | | | | | | |
| PIC14000 | 7168 OTP | — | 192 | 20 | 28SP, 28SO, 28SS, 28JW | 8 SLAC | 2 | 1-8 bit, 1-16 bit, 1-WDT | I ² C™/SMB | 20 | 4 MHz | — | — | — |
| PIC16C432 | 3584 OTP | — | 128 | 12 | 20SS, 20P, 20JW | — | 2 | 1-8 bit, 1-WDT | LIN | 20 | — | BOR | — | — |
| PIC16C433 | 3584 OTP | — | 128 | 6 | 18SO, 18P, 18JW | 4x8-bit | — | 1-8 bit, 1-WDT | LIN | 10 | 4 MHz | — | — | — |
| PIC16C554 | 896 OTP | — | 80 | 13 | 18P, 18SO, 18JW, 20SS | — | — | 1-8 bit, 1-WDT | — | 20 | — | — | — | — |
| PIC16C558 | 3584 OTP | — | 128 | 13 | 18P, 18SO, 18JW, 20SS | — | — | 1-8 bit, 1-WDT | — | 20 | — | — | — | — |
| PIC16C62B | 3584 OTP | — | 128 | 22 | 28SP, 28SO, 28SS, 28JW, 28ML | — | — | 1-16 bit, 2-8 bit, 1-WDT | I ² C/SPI™ | 20 | — | BOR | — | 1/0 |
| PIC16C620A | 896 OTP | — | 96 | 13 | 18P, 18SO, 18JW, 20SS | — | 2 | 1-8 bit, 1-WDT | — | 40 | — | BOR | — | — |
| PIC16CR620A | 896 OTP | — | 96 | 13 | 18P, 18SO, 20SS | — | 2 | 1-8 bit, 1-WDT | — | 20 | — | BOR | — | — |
| PIC16C621A | 1792 OTP | — | 96 | 13 | 18P, 18SO, 18JW, 20SS | — | 2 | 1-8 bit, 1-WDT | — | 40 | — | BOR | — | — |
| PIC16C622A | 3584 OTP | — | 128 | 13 | 18P, 18SO, 18JW, 20SS | — | 2 | 1-8 bit, 1-WDT | — | 40 | — | BOR | — | — |
| PIC16C63A | 7168 OTP | — | 192 | 22 | 28SP, 28SO, 28SS, 28JW, 28ML | — | — | 1-16 bit, 2-8 bit, 1-WDT | USART, I ² C/SPI | 20 | — | BOR | — | 2/0 |
| PIC16CR63 | 7168 OTP | — | 192 | 22 | 28SP, 28SO, 28SS | — | — | 1-16 bit, 2-8 bit, 1-WDT | USART, I ² C/SPI | 20 | — | BOR | — | 2/0 |
| PIC16C65B | 7168 OTP | — | 192 | 33 | 40P, 40JW, 44L, 44PQ, 44PT | — | — | 1-16 bit, 2-8 bit, 1-WDT | USART, I ² C/SPI | 20 | — | BOR | — | 2/0 |
| PIC16CR65 | 7168 OTP | — | 192 | 33 | 40P, 44L, 44PQ, 44PT | — | — | 1-16 bit, 2-8 bit, 1-WDT | USART, I ² C/SPI | 20 | — | BOR | — | 2/0 |
| PIC16C717 | 3584 OTP | — | 256 | 16 | 18P, 18SO, 18JW, 20SS | 6x10-bit | — | 1-16 bit, 2-8 bit, 1-WDT | M ² C/SPI | 20 | 4 MHz | PBOR/PLVD | — | 0/1 |
| PIC16C72A | 3584 OTP | — | 128 | 22 | 28SP, 28SO, 28JW, 28SS, 28ML | 5x8-bit | — | 1-16 bit, 2-8 bit, 1-WDT | I ² C/SPI | 20 | — | BOR | — | 1/0 |
| PIC16CR72 | 3584 OTP | — | 128 | 22 | 28SP, 28SO, 28SS | 5x8-bit | — | 1-16 bit, 2-8 bit, 1-WDT | I ² C/SPI | 20 | — | BOR | — | 1/0 |
| PIC16C73B | 7168 OTP | — | 192 | 22 | 28SP, 28SO, 28JW, 28SS, 28ML | 5x8-bit | — | 1-16 bit, 2-8 bit, 1-WDT | USART, I ² C/SPI | 20 | — | BOR | — | 2/0 |
| PIC16C74B | 7168 OTP | — | 192 | 33 | 40P, 40JW, 44L, 44PQ, 44PT | 8x8-bit | — | 1-16 bit, 2-8 bit, 1-WDT | USART, I ² C/SPI | 20 | — | BOR | — | 2/0 |
| PIC16C745 | 14336 OTP | — | 256 | 22 | 28SP, 28SO, 28JW | 5x8-bit | — | 1-16 bit, 2-8 bit, 1-WDT | USART, low speed USB | 24 | — | BOR | — | 2/0 |

Current PICmicro® MCU Family Products

Mid-Range 8-Bit PICmicro® Microcontroller Family

| Product | Program Memory (Bytes) | EEPROM Data Memory Bytes | RAM Bytes | I/O Pins | Packages | Analog | | Digital | | Max. Speed MHz | IntOSC | BOR/PBOR/PLVD | ICD # of Breakpoints | CCP/ECCP |
|---|------------------------|--------------------------|-----------|----------|----------------------------|-----------|-------|--------------------------|-------------------------------|----------------|--------|---------------|----------------------|----------|
| | | | | | | ADC Ch | Comp. | Timers/WDT | Serial I/O | | | | | |
| PIC16CXXX (x14): Upwardly Compatible with PIC16C5X/PIC12CXXX, 4-12 Interrupts, 100-200 ns Instruction Executions, 35 Instructions, 4/5 Oscillator Selections, ICSP™ (except ROM) | | | | | | | | | | | | | | |
| PIC16C765 | 14336 OTP | — | 256 | 33 | 40P, 40JW, 44L, 44PT | 8x8-bit | — | 1-16 bit, 2-8 bit, 1-WDT | USART, low speed USB | 24 | — | BOR | — | 2/0 |
| PIC16C770 | 3584 OTP | — | 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 | — | 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 | — | 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 | — | 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 |
| PIC16C781 | 1792 OTP | — | 128 | 16 | 20P, 20SO, 20SS, 20JW | 8x8-bit | 2 | 1-16 bit, 2-8 bit, 1-WDT | — | 20 | 4 MHz | PBOR | — | — |
| PIC16C782 | 3584 OTP | — | 128 | 16 | 20P, 20SO, 20SS, 20JW | 8x8-bit | 2 | 1-16 bit, 2-8 bit, 1-WDT | — | 20 | 4 MHz | PBOR/PLVD | — | — |
| PIC16C925 | 7168 OTP | — | 176 | 52 | 68CL, 68L, 64PT | 5x10-bit | — | 1-16 bit, 2-8 bit, 1-WDT | I ² C/SPI | 20 | — | BOR | — | 1/0 |
| PIC16C926 | 14336 OTP | — | 336 | 52 | 68CL, 68L, 64PT | 5x10-bit | — | 1-16 bit, 2-8 bit, 1-WDT | I ² C/SPI | 20 | — | BOR | — | 1/0 |
| PIC16FXXX (x14): Migration to PIC16CXXX/PIC16C5X/PIC12CXXX, 17 Interrupts, 200 ns Instruction Execution, 33/35 Instructions, 4 Oscillator Selections, ICSP™ (except ROM) | | | | | | | | | | | | | | |
| PIC16F627A | 1792 StdFI | 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 StdFI | 128 | 224 | 16 | 18P, 18SO, 20SS, 28ML | — | 2 | 1-16 bit, 2-8 bit, 1-WDT | AUSART | 20 | 4 MHz | BOR | 1** | 1/0 |
| PIC16F630 | 1792 StdFI | 128 | 64 | 12 | 14P, 14SL, 14ST | — | 1 | 1-8 bit, 1-16 bit, 1-WDT | — | 20 | 4 MHz | BOR | 1** | — |
| PIC16F636 | 3584 StdFI | 256 | 128 | 12 | 14P, 14SL, 14ST | — | 2 | 1-8 bit, 1-16 bit, 1-WDT | — | 20 | 8 MHz | BOR/PLVD | 1** | — |
| PIC16F684 | 3584 StdFI | 256 | 128 | 12 | 14P, 14SL, 14ST | 8x10-bit | 2 | 1-16 bit, 2-8 bit, 1-WDT | — | 20 | 8 MHz | BOR | 1** | 0/1 |
| PIC16F648A | 7168 StdFI | 256 | 256 | 16 | 18P, 18SO, 20SS, 28ML | — | 2 | 1-16 bit, 2-8 bit, 1-WDT | AUSART | 20 | 4 MHz | BOR | 1** | 1/0 |
| PIC16F676 | 1792 StdFI | 128 | 64 | 12 | 14P, 14SL, 14ST | 8x10-bit | 1 | 1-8 bit, 1-16 bit, 1-WDT | — | 20 | 4 MHz | BOR | 1** | — |
| PIC16F688 | 7168 StdFI | 256 | 256 | 12 | 14P, 14SL, 14ST | 8x10-bit | 2 | 1-8 bit, 1-16 bit, 1-WDT | EUSART | 20 | 8 MHz | BOR | 1** | — |
| PIC16F716 | 3584 StdFI | — | 128 | 13 | 18P, 18SO, 20SS | 4x8-bit | — | 1-16 bit, 2-8 bit, 1-WDT | — | 20 | — | BOR | 1** | 0/1 |
| PIC16F72 | 3584 StdFI | — | 128 | 22 | 28SP, 28SO, 28SS, 28ML | 5x8-bit | — | 1-16 bit, 2-8 bit, 1-WDT | I ² C/SPI | 20 | — | BOR | — | 1/0 |
| PIC16F73 | 7168 StdFI | — | 192 | 22 | 28SP, 28SO, 28SS, 28ML | 5x8-bit | — | 1-16 bit, 2-8 bit, 1-WDT | USART, I ² C/SPI | 20 | — | BOR | — | 2/0 |
| PIC16F737 | 7168 StdFI | — | 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 StdFI | — | 192 | 33 | 40P, 44ML, 44L, 44PT | 8x8-bit | — | 1-16 bit, 2-8 bit, 1-WDT | USART, I ² C/SPI | 20 | — | BOR | — | 2/0 |

Mid-Range 8-Bit PICmicro® Microcontroller Family

| Product | Program Memory (Bytes) | EEPROM Data Memory Bytes | RAM Bytes | I/O Pins | Packages | Analog | | Digital | | Max. Speed MHz | IntOSC | BOR/PBOR/PLVD | ICD # of Breakpoints | CCP/ECCP |
|---|------------------------|--------------------------|-----------|----------|------------------------|-----------|-------|--------------------------|-------------------------------|----------------|--------|---------------|----------------------|----------|
| | | | | | | ADC Ch | Comp. | Timers/WDT | Serial I/O | | | | | |
| PIC16FXXX (x14): Migration to PIC16CXXX/PIC16C5X/PIC12CXXX, 17 Interrupts, 200 ns Instruction Execution, 33/35 Instructions, 4 Oscillator Selections, ICSP™ (except ROM) (continued) | | | | | | | | | | | | | | |
| PIC16F747 | 7168 StdFI | — | 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 |
| PIC16F76 | 14336 StdFI | — | 368 | 22 | 28SP, 28SO, 28SS, 28ML | 5x8-bit | — | 1-16 bit, 2-8 bit, 1-WDT | USART, I ² C/SPI | 20 | — | BOR | — | 2/0 |
| PIC16F767 | 14336 StdFI | — | 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 StdFI | — | 368 | 33 | 40P, 44ML, 44L, 44PT | 8x8-bit | — | 1-16 bit, 2-8 bit, 1-WDT | USART, I ² C/SPI | 20 | — | BOR | — | 2/0 |
| PIC16F777 | 14336 StdFI | — | 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 |
| PIC16F818 | 1792 EnhFI | 128 | 128 | 16 | 18P, 18SO, 20SS, 28ML | 5x10-bit | — | 1-16 bit, 2-8 bit, 1-WDT | I ² C/SPI | 20 | 8 MHz | BOR | 1 | 1/0 |
| PIC16F819 | 3584 EnhFI | 256 | 256 | 16 | 18P, 18SO, 20SS, 28ML | 5x10-bit | — | 1-16 bit, 2-8 bit, 1-WDT | I ² C/SPI | 20 | 8 MHz | BOR | 1 | 1/0 |
| PIC16F84A | 1792 StdFI | 64 | 68 | 13 | 18P, 18SO, 20SS | — | — | 1-8 bit, 1-WDT | — | 20 | — | — | — | — |
| PIC16F87 | 7168 EnhFI | 256 | 368 | 16 | 18P, 18SO, 20SS, 28ML | — | 2 | 1-16 bit, 2-8 bit, 1-WDT | AUSART, I ² C/SPI | 20 | 8 MHz | BOR | 1 | 1/0 |
| PIC16F870 | 3584 EnhFI | 64 | 128 | 22 | 28SP, 28SO, 28SS | 5x10-bit | — | 1-16 bit, 2-8 bit, 1-WDT | AUSART | 20 | — | BOR | 1 | 1/0 |
| PIC16F871 | 3584 EnhFI | 64 | 128 | 33 | 40P, 44L, 44PT | 8x10-bit | — | 1-16 bit, 2-8 bit, 1-WDT | AUSART | 20 | — | BOR | 1 | 1/0 |
| PIC16F872 | 3584 EnhFI | 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 EnhFI | 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 EnhFI | 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 |
| PIC16F876A | 14336 EnhFI | 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 EnhFI | 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 |
| PIC16F88 | 7168 EnhFI | 256 | 368 | 16 | 18P, 18SO, 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 |

*Contact Microchip Technology for availability date.

** Requires ICD specific device with header module – refer to Development Tools.

**Current PICmicro[®] MCU
Family Products**

High Performance 8-Bit PICmicro[®] Microcontroller Family

| Product | Program Memory (Bytes) | EEPROM Data Memory Bytes | RAM Bytes | I/O Pins | Packages | Analog | | Digital | | Max. Speed MHz | IntOSC | BOR/PBOR/PLVD | ICD # of Breakpoints | CCP |
|--|------------------------|--------------------------|-----------|----------|-----------------------|--------------------|-------|--------------------------|---|----------------|--------|---------------|----------------------|-----|
| | | | | | | 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, Software 4x PLL, Switchable Oscillator Sources, 25 mA Source/Sink per I/O, ICSP™ (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 |
| PIC18C801 | ROM-less | — | 1536 | 37 | 80PT, 84L | 12x10-bit | — | 3-16 bit, 1-8 bit, 1-WDT | AUSART, MI ² C/SPI | 25 | — | — | — | 2 |
| PIC18F1220 | 4096 EnhFI | 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 |
| PIC18F1320 | 8192 EnhFI | 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 |
| PIC18F2220 | 4096 EnhFI | 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 |
| PIC18F2320 | 8192 EnhFI | 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 |
| PIC18F2331 | 8192 EnhFI | 256 | 768 | 24 | 28SP, 28SO | 5x10-bit, 200 ksps | — | 3-16 bit, 1-8 bit, 1-WDT | EUSART, I ² C/SPI | 40 | 8 MHz | PBOR/PLVD | 1 | 2 |
| PIC18F2410 | 16384 StdFI | — | 768 | 25 | 28SP, 28SO, 28ML | 10x10-bit | 2 | 3-16 bit, 1-8 bit, 1-WDT | EUSART, MI ² C/SPI | 40 | 8 MHz | PBOR/PLVD | 3 | 2 |
| PIC18F2420 | 16384 EnhFI | 256 | 768 | 25 | 28SP, 28SO, 28ML | 10x10-bit | 2 | 3-16 bit, 1-8 bit, 1-WDT | EUSART, MI ² C/SPI | 40 | 8 MHz | PBOR/PLVD | 3 | 2 |
| PIC18F2431 | 16384 EnhFI | 256 | 768 | 24 | 28SP, 28SO | 5x10-bit, 200 ksps | — | 3-16 bit, 1-8 bit, 1-WDT | EUSART, I ² C/SPI | 40 | 8 MHz | PBOR/PLVD | 1 | 2 |
| PIC18F2439 | 12288 EnhFI | 256 | 640 | 21 | 28SP, 28SO | 5x10-bit | — | 3-16 bit, 1-8 bit, 1-WDT | AUSART, MI ² C/SPI | 40 | — | PBOR/PLVD | 1 | — |
| PIC18F2455* | 24576 EnhFI | 256 | 2048 | 24 | 28SP, 28SO | 11x10-bit | 2 | 3-16 bit, 1-8 bit, 1-WDT | USB 2.0, MI ² C/SPI, EUSART | 48 | 8 MHz | PBOR/PLVD | 3 | 1 |
| PIC18F248 | 16384 EnhFI | 256 | 768 | 23 | 28SP, 28SO | 5x10-bit | — | 3-16 bit, 1-8 bit, 1-WDT | AUSART, MI ² C/SPI, CAN 2.0B | 40 | — | PBOR/PLVD | 1 | 1 |
| PIC18F2480* | 16384 EnhFI | 256 | 768 | 25 | 28SP, 28SO, 28ML | 8x10-bit | — | 3-16 bit, 1-8 bit, 1-WDT | CAN 2.0B, MI ² C/SPI, EUSART | 40 | 8 MHz | PBOR/PLVD | 3 | 1 |
| PIC18F2510 | 32768 StdFI | — | 1536 | 25 | 28SP, 28SO, 28ML | 10x10-bit | 2 | 3-16 bit, 1-8 bit, 1-WDT | EUSART, MI ² C/SPI | 40 | 8 MHz | PBOR/PLVD | 3 | 2 |
| PIC18F2515 | 49152 StdFI | — | 3968 | 25 | 28SP, 28SO | 10x10-bit | 2 | 3-16 bit, 1-8 bit, 1-WDT | EUSART, MI ² C/SPI | 40 | 8 MHz | PBOR/PLVD | 3 | 2 |
| PIC18F2520 | 32768 EnhFI | 256 | 1536 | 25 | 28SP, 28SO, 28ML | 10x10-bit | 2 | 3-16 bit, 1-8 bit, 1-WDT | EUSART, MI ² C/SPI | 40 | 8 MHz | PBOR/PLVD | 3 | 2 |
| PIC18F2525 | 49152 EnhFI | 1024 | 3968 | 25 | 28SP, 28SO | 10x10-bit | 2 | 3-16 bit, 1-8 bit, 1-WDT | EUSART, MI ² C/SPI | 40 | 8 MHz | PBOR/PLVD | 3 | 2 |
| PIC18F2539 | 24576 EnhFI | 256 | 1408 | 21 | 28SP, 28SO | 5x10-bit | — | 3-16 bit, 1-8 bit, 1-WDT | EUSART, MI ² C/SPI | 40 | — | PBOR/PLVD | 1 | — |

High Performance 8-Bit PICmicro® Microcontroller Family

| Product | Program Memory (Bytes) | EEPROM Data Memory Bytes | RAM Bytes | I/O Pins | Packages | Analog | | Digital | | Max. Speed MHz | IntOSC | BOR/ PBOR/ PLVD | ICD # of Breakpoints | CCP |
|--|------------------------|--------------------------|-----------|----------|------------------|-------------------|-------|--------------------------|---|----------------|--------|-----------------|----------------------|-----|
| | | | | | | 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, Software 4x PLL, Switchable Oscillator Sources, 25 mA Source/Sink per I/O, ICSP™ (except ROM) (continued) | | | | | | | | | | | | | | |
| PIC18F2550* | 32768 EnhFI | 256 | 2048 | 24 | 28SP, 28SO | 11x10-bit | 2 | 3-16 bit, 1-8 bit, 1-WDT | USB 2.0, MI ² C/SPI, EUSART | 48 | 8 MHz | PBOR/ PLVD | 3 | 1 |
| PIC18F258 | 32768 EnhFI | 256 | 1536 | 23 | 28SP, 28SO | 5x10-bit | — | 3-16 bit, 1-8 bit, 1-WDT | AUSART, MI ² C/SPI, CAN 2.0B | 40 | — | PBOR/ PLVD | 1 | 1 |
| PIC18F2580* | 32768 EnhFI | 256 | 1536 | 25 | 28SP, 28SO, 28ML | 8x10-bit | — | 3-16 bit, 1-8 bit, 1-WDT | CAN 2.0B, MI ² C/SPI, EUSART | 40 | 8 MHz | PBOR/ PLVD | 3 | 1 |
| PIC18F2585 | 49152 EnhFI | 1024 | 3328 | 25 | 28SP, 28SO | 8x10-bit | — | 3-16 bit, 1-8 bit, 1-WDT | EUSART, MI ² C/SPI | 40 | 8 MHz | PBOR/ PLVD | 3 | 1 |
| PIC18F2610 | 65536 StdFI | — | 3968 | 25 | 28SP, 28SO | 10x10-bit | 2 | 3-16 bit, 1-8 bit, 1-WDT | EUSART, MI ² C/SPI | 40 | 8 MHz | PBOR/ PLVD | 3 | 2 |
| PIC18F2620 | 65536 EnhFI | 1024 | 3968 | 25 | 28SP, 28SO | 10x10-bit | 2 | 3-16 bit, 1-8 bit, 1-WDT | EUSART, MI ² C/SPI | 40 | 8 MHz | PBOR/ PLVD | 3 | 2 |
| PIC18F2680 | 65536 EnhFI | 1024 | 3328 | 25 | 28SP, 28SO | 8x10-bit | — | 3-16 bit, 1-8 bit, 1-WDT | CAN 2.0B, MI ² C/SPI, EUSART | 40 | 8 MHz | PBOR/ PLVD | 3 | 1 |
| PIC18F4220 | 4096 EnhFI | 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 |
| PIC18F4320 | 8192 EnhFI | 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 |
| PIC18F4331 | 8192 EnhFI | 256 | 768 | 36 | 40P, 44ML, 44PT | 9x10-bit 200 ksps | — | 3-16 bit, 1-8 bit, 1-WDT | EUSART, I ² C/SPI | 40 | 8 MHz | PBOR/ PLVD | 1 | 2 |
| PIC18F4410 | 16384 StdFI | — | 768 | 36 | 40P, 44ML, 44PT | 13x10-bit | 2 | 3-16 bit, 1-8 bit, 1-WDT | EUSART, MI ² C/SPI | 40 | 8 MHz | PBOR/ PLVD | 3 | 1 |
| PIC18F4420 | 16384 EnhFI | 256 | 768 | 36 | 40P, 44ML, 44PT | 13x10-bit | 2 | 3-16 bit, 1-8 bit, 1-WDT | EUSART, MI ² C/SPI | 40 | 8 MHz | PBOR/ PLVD | 3 | 1 |
| PIC18F4431 | 16384 EnhFI | 256 | 768 | 36 | 40P, 44ML, 44PT | 9x10-bit 200 ksps | — | 3-16 bit, 1-8 bit, 1-WDT | EUSART, I ² C/SPI | 40 | 8 MHz | PBOR/ PLVD | 1 | 2 |
| PIC18F4439 | 12288 EnhFI | 256 | 640 | 32 | 40P, 44ML, 44PT | 8x10-bit | — | 3-16 bit, 1-8 bit, 1-WDT | AUSART, MI ² C/SPI | 40 | — | PBOR/ PLVD | 1 | — |
| PIC18F4455* | 24576 EnhFI | 256 | 2048 | 35 | 40P, 44ML, 44PT | 13x10-bit | 2 | 3-16 bit, 1-8 bit, 1-WDT | USB 2.0, MI ² C/SPI, EUSART | 48 | 8 MHz | PBOR/ PLVD | 3 | 2 |
| PIC18F448 | 16384 EnhFI | 256 | 768 | 34 | 40P, 44L, 44PT | 8x10-bit | 2 | 3-16 bit, 1-8 bit, 1-WDT | AUSART, MI ² C/SPI, CAN 2.0B | 40 | — | PBOR/ PLVD | 1 | 1 |
| PIC18F4480* | 16384 EnhFI | 256 | 768 | 36 | 40P, 44ML, 44PT | 11x10-bit | 2 | 3-16 bit, 1-8 bit, 1-WDT | CAN 2.0B, MI ² C/SPI, EUSART | 40 | 8 MHz | PBOR/ PLVD | 3 | 1 |
| PIC18F4520 | 32768 EnhFI | 256 | 1536 | 36 | 40P, 44ML, 44PT | 13x10-bit | 2 | 3-16 bit, 1-8 bit, 1-WDT | EUSART, MI ² C/SPI | 40 | 8 MHz | PBOR/ PLVD | 3 | 1 |

Current PICmicro® MCU Family Products

High Performance 8-Bit PICmicro® Microcontroller Family

| Product | Program Memory (Bytes) | EEPROM Data Memory Bytes | RAM Bytes | I/O Pins | Packages | Analog | | Digital | | Max. Speed MHz | IntOSC | BOR/PBOR/PLVD | ICD # of Breakpoints | CCP |
|---|------------------------|--------------------------|-----------|----------|-----------------|-----------|-------|--------------------------|---|----------------|--------|---------------|----------------------|-----|
| | | | | | | 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, Software 4x PLL, Switchable Oscillator Sources, 25 mA Source/Sink per I/O, ICSP™ (except ROM) (continued) | | | | | | | | | | | | | | |
| PIC18F4510 | 32768 StdFI | — | 1536 | 36 | 40P, 44ML, 44PT | 13x10-bit | 2 | 3-16 bit, 1-8 bit, 1-WDT | EUSART, Mi ² C/SPI | 40 | 8 MHz | PBOR/PLVD | 3 | 1 |
| PIC18F4515 | 49152 StdFI | — | 3968 | 36 | 40P, 44ML, 44PT | 13x10-bit | 2 | 3-16 bit, 1-8 bit, 1-WDT | EUSART, Mi ² C/SPI | 40 | 8 MHz | PBOR/PLVD | 3 | 1 |
| PIC18F4525 | 49152 EnhFI | 1024 | 3968 | 36 | 40P, 44ML, 44PT | 13x10-bit | 2 | 3-16 bit, 1-8 bit, 1-WDT | EUSART, Mi ² C/SPI | 40 | 8 MHz | PBOR/PLVD | 3 | 1 |
| PIC18F4539 | 24576 EnhFI | 256 | 1408 | 32 | 40P, 44ML, 44PT | 8x10-bit | — | 3-16 bit, 1-8 bit, 1-WDT | AUSART, Mi ² C/SPI | 40 | — | PBOR/PLVD | 1 | — |
| PIC18F458 | 32768 EnhFI | 256 | 1536 | 34 | 40P, 44L, 44PT | 8x10-bit | 2 | 3-16 bit, 1-8 bit, 1-WDT | AUSART, Mi ² C/SPI, CAN 2.0B | 40 | — | PBOR/PLVD | 1 | 1 |
| PIC18F4580* | 32768 EnhFI | 256 | 1536 | 36 | 40P, 44ML, 44PT | 11x10-bit | 2 | 3-16 bit, 1-8 bit, 1-WDT | CAN 2.0B, Mi ² C/SPI, EUSART | 40 | 8 MHz | PBOR/PLVD | 3 | 1 |
| PIC18F4550* | 32768 EnhFI | 256 | 2048 | 35 | 40P, 44ML, 44PT | 13x10-bit | 2 | 3-16 bit, 1-8 bit, 1-WDT | USB 2.0, Mi ² C/SPI, EUSART | 48 | 8 MHz | PBOR/PLVD | 3 | 1 |
| PIC18F4585 | 49152 EnhFI | 1024 | 3328 | 36 | 40P, 44ML, 44PT | 11x10-bit | 2 | 3-16 bit, 1-8 bit, 1-WDT | CAN 2.0B, Mi ² C/SPI, EUSART | 40 | 8 MHz | PBOR/PLVD | 3 | 1 |
| PIC18F4610 | 65536 StdFI | — | 3968 | 36 | 40P, 44ML, 44PT | 13x10-bit | 2 | 3-16 bit, 1-8 bit, 1-WDT | EUSART, Mi ² C/SPI | 40 | 8 MHz | PBOR/PLVD | 3 | 1 |
| PIC18F4620 | 65536 EnhFI | 1024 | 3968 | 36 | 40P, 44ML, 44PT | 13x10-bit | 2 | 3-16 bit, 1-8 bit, 1-WDT | EUSART, Mi ² C/SPI | 40 | 8 MHz | PBOR/PLVD | 3 | 1 |
| PIC18F4680 | 65536 EnhFI | 1024 | 3328 | 36 | 40P, 44ML, 44PT | 11x10-bit | 2 | 3-16 bit, 1-8 bit, 1-WDT | CAN 2.0B, Mi ² C/SPI, EUSART | 40 | 8 MHz | PBOR/PLVD | 3 | 1 |
| PIC18F6310 | 8192 StdFI | — | 768 | 54 | 64PT | 12x10-bit | 2 | 3-16 bit, 1-8 bit, 1-WDT | Mi ² C/SPI, EUSART, AUSART | 40 | 8 MHz | PBOR/PLVD | 3 | 3 |
| PIC18F6410 | 16384 StdFI | — | 768 | 54 | 64PT | 12x10-bit | 2 | 3-16 bit, 1-8 bit, 1-WDT | Mi ² C/SPI, EUSART, AUSART | 40 | 8 MHz | PBOR/PLVD | 3 | 3 |
| PIC18F6390 | 8192 StdFI | — | 768 | 50 | 64PT | 12x10-bit | 2 | 3-16 bit, 1-8 bit, 1-WDT | Mi ² C/SPI, EUSART, AUSART | 40 | 8 MHz | PBOR/PLVD | 3 | 2 |
| PIC18F6490 | 16384 StdFI | — | 768 | 50 | 64PT | 12x10-bit | 2 | 3-16 bit, 1-8 bit, 1-WDT | Mi ² C/SPI, EUSART, AUSART | 40 | 8 MHz | PBOR/PLVD | 3 | 2 |
| PIC18F6520 | 32768 EnhFI | 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 |
| PIC18F6525 | 49152 EnhFI | 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 |

High Performance 8-Bit PICmicro® Microcontroller Family

| Product | Program Memory (Bytes) | EEPROM Data Memory Bytes | RAM Bytes | I/O Pins | Packages | Analog | | Digital | | Max. Speed MHz | IntOSC | BOR/ PBOR/ PLVD | ICD # of Breakpoints | CCP |
|--|------------------------|--------------------------|-----------|----------|-----------|-----------|-------|--------------------------|---|----------------|--------|-----------------|----------------------|-----|
| | | | | | | 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, Software 4x PLL, Switchable Oscillator Sources, 25 mA Source/Sink per I/O, ICSP™ (except ROM) (continued) | | | | | | | | | | | | | | |
| PIC18F6585 | 49152 EnhFI | 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 |
| PIC18F6621 | 65536 EnhFI | 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 |
| PIC18F6627* | 98304 EnhFI | 1024 | 3936 | 54 | 64PT | 12x10-bit | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI ² C/SPI | 40 | 8 MHz | PBOR/ PLVD | 3 | 2 |
| PIC18F6680 | 65536 EnhFI | 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 |
| PIC18F6720 | 131072 EnhFI | 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 |
| PIC18F6722* | 131072 EnhFI | 1024 | 3936 | 54 | 64PT | 12x10-bit | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI ² C/SPI | 40 | 8 MHz | PBOR/ PLVD | 3 | 2 |
| PIC18F8310 | 8192 StdFI | — | 768 | 70 | 80PT | 12x10-bit | 2 | 3-16 bit, 1-8 bit, 1-WDT | MI ² C/SPI, EUSART, AUSART | 40 | 8 MHz | PBOR/ PLVD | 3 | 3 |
| PIC18F8410 | 16384 StdFI | — | 768 | 70 | 80PT | 12x10-bit | 2 | 3-16 bit, 2-8 bit, 1-WDT | MI ² C/SPI, EUSART, AUSART | 40 | 8 MHz | PBOR/ PLVD | 3 | 3 |
| PIC18F8390 | 8192 StdFI | — | 768 | 66 | 80PT | 12x10-bit | 2 | 3-16 bit, 1-8 bit, 1-WDT | MI ² C/SPI, EUSART, AUSART | 40 | 8 MHz | PBOR/ PLVD | 3 | 2 |
| PIC18F8490 | 16384 StdFI | — | 768 | 66 | 80PT | 12x10-bit | 2 | 3-16 bit, 2-8 bit, 1-WDT | MI ² C/SPI, EUSART, AUSART | 40 | 8 MHz | PBOR/ PLVD | 3 | 2 |
| PIC18F8520 | 32768 EnhFI | 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 |
| PIC18F8525 | 49152 EnhFI | 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 |
| PIC18F8585 | 49152 EnhFI | 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 |
| PIC18F8621 | 65536 EnhFI | 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 |
| PIC18F8627* | 98304 EnhFI | 1024 | 3936 | 70 | 80PT | 16x10-bit | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI ² C/SPI | 40 | 8 MHz | PBOR/ PLVD | 3 | 2 |
| PIC18F8680 | 65536 EnhFI | 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 |
| PIC18F8720 | 131072 EnhFI | 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 |
| PIC18F8722* | 131072 EnhFI | 1024 | 3936 | 70 | 80PT | 16x10-bit | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI ² C/SPI | 40 | 8 MHz | PBOR/ PLVD | 3 | 2 |

*Contact Microchip Technology for availability date.

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FOCUSED SOLUTIONS - PICmicro[®] MICROCONTROLLER FAMILY

| Product | Program Memory (Bytes) | EEPROM Data Memory Bytes | RAM Bytes | I/O Pins | Packages | Analog Peripherals | Digital Peripherals | Max. Speed MHz | ICD # of Breakpoints | Function-Specific Features | | | | | |
|-------------------------------------|------------------------|--------------------------|-----------|----------|------------------|--------------------|---------------------|----------------|----------------------|----------------------------|------------------|-----------------|--------------------|------------|--|
| | | | | | | | | | | ISO-16845 Tested | Transmit Buffers | Receive Buffers | Configurable RX/TX | Acc Filter | |
| Connectivity Solutions - CAN | | | | | | | | | | | | | | | |
| PIC18F248 | 16384 EnhFI | 256 | 768 | 23 | 28SP, 28SO | ADC | AUSART, CCP | 40 | 1 | Yes | 3 | 2 | — | | |
| PIC18F2480* | 16384 EnhFI | 256 | 768 | 25 | 28SP, 28SO, 28ML | ADC | EUSART, CCP | 40 | 3 | Planned | 3 | 2 | 6 | | |
| PIC18F258 | 32768 EnhFI | 256 | 1536 | 23 | 28SP, 28SO | ADC | AUSART, CCP | 40 | 1 | Yes | 3 | 2 | — | | |
| PIC18F2580* | 32768 EnhFI | 256 | 1536 | 25 | 28SP, 28SO, 28ML | ADC | EUSART, CCP | 40 | 3 | Planned | 3 | 2 | 6 | | |
| PIC18F2585 | 49152 EnhFI | 1024 | 3328 | 25 | 28SP, 28SO | ADC | EUSART, CCP | 40 | 3 | Planned | 3 | 2 | 6 | | |
| PIC18F2680 | 65536 EnhFI | 1024 | 3328 | 25 | 28SP, 28SO | ADC | EUSART, CCP | 40 | 3 | Planned | 3 | 2 | 6 | | |
| PIC18F448 | 16384 EnhFI | 256 | 768 | 34 | 40P, 44PT, 44L | ADC/Comp | EUSART, CCP/ECCP | 40 | 1 | Yes | 3 | 2 | — | | |
| PIC18F4480* | 16384 EnhFI | 256 | 768 | 36 | 44PT, 44ML | ADC/Comp | EUSART, CCP/ECCP | 40 | 3 | Planned | 3 | 2 | 6 | | |
| PIC18F458 | 32768 EnhFI | 256 | 1536 | 34 | 40P, 44PT, 44L | ADC/Comp | EUSART, CCP/ECCP | 40 | 1 | Yes | 3 | 2 | — | | |
| PIC18F4580* | 32768 EnhFI | 256 | 1536 | 36 | 44PT, 44ML | ADC/Comp | EUSART, CCP/ECCP | 40 | 3 | Planned | 3 | 2 | 6 | | |
| PIC18F4585 | 49152 EnhFI | 1024 | 3328 | 36 | 40P, 44PT, 44ML | ADC/Comp | EUSART, CCP/ECCP | 40 | 3 | Planned | 3 | 2 | 6 | | |
| PIC18F4680 | 65536 EnhFI | 1024 | 3328 | 36 | 40P, 44PT, 44ML | ADC/Comp | EUSART, CCP/ECCP | 40 | 3 | Planned | 3 | 2 | 6 | | |
| PIC18F6585 | 49152 EnhFI | 1024 | 3328 | 53 | 64PT, 68L | ADC/Comp | EUSART, CCP/ECCP | 40 | 1 | Yes | 3 | 2 | 6 | | |
| PIC18F6680 | 65536 EnhFI | 1024 | 3328 | 53 | 64PT, 68L | ADC/Comp | EUSART, CCP/ECCP | 40 | 1 | Yes | 3 | 2 | 6 | | |
| PIC18F8585 | 49152 EnhFI | 1024 | 3328 | 69 | 80PT | ADC/Comp | EUSART, CCP/ECCP | 40 | 1 | Yes | 3 | 2 | 6 | | |
| PIC18F8680 | 65536 EnhFI | 1024 | 3328 | 69 | 80PT | ADC/Comp | EUSART, CCP/ECCP | 40 | 1 | Yes | 3 | 2 | 6 | | |

Refer to Design pages on www.microchip.com for further detail.

| Product | MAC | PHY | TX/RX Dual Port RAM Buffer | Interrupts | LEDs | Operating Voltage (V) | Temp. Range (°C) | Max. Speed MHz | Serial | Features | Package |
|-----------------|-----|-----|----------------------------|------------|------|-----------------------|------------------|----------------|--------|-------------------------------------|---------------------|
| Ethernet | | | | | | | | | | | |
| MCP22S80* | Yes | Yes | 8KB | 2 | 2 | 3.3 | -40 to +85 | 25 | SPI | Loop back test modes, auto-polarity | 28-Pin SO, 28-Pin M |

*Contact Microchip Technology Inc. for availability.

| Product | Program Memory (Bytes) | EEPROM Data Memory Bytes | RAM Bytes | I/O Pins | Packages | Analog Peripherals | Digital Peripherals | Max. Speed MHz | ICD # of Breakpoints | Function-Specific Features | | | |
|-------------------------------------|------------------------|--------------------------|-----------|----------|----------------------|--------------------|-------------------------------|----------------|----------------------|----------------------------|-----------------------|----------------|--------------------|
| | | | | | | | | | | Compliant | Speed | # of Endpoints | USB Buffer (bytes) |
| Connectivity Solutions - USB | | | | | | | | | | | | | |
| PIC16C745 | 14336 OTP | — | 256 | 22 | 28SP, 28SO, 28JW | ADC | UART | 24 | — | USB 1.1 | Low Speed (1.5Mbit/s) | 16 | 64 |
| PIC16C765 | 14336 OTP | — | 256 | 33 | 40P, 40JW, 44L, 44PT | ADC | UART | 24 | — | USB 1.1 | Low Speed (1.5Mbit/s) | 16 | 64 |
| PIC18F2455* | 24576 EnhFI | 256 | 2048 | 24 | 28SP, 28SO, 28ML | ADC/Comp | EUSART, MI ² C/SPI | 48 | 3 | USB 2.0 | Full Speed (12Mbit/s) | 16 | 1024 |
| PIC18F2550* | 32768 EnhFI | 256 | 2048 | 24 | 28SP, 28SO, 28ML | ADC/Comp | EUSART, MI ² C/SPI | 48 | 3 | USB 2.0 | Full Speed (12Mbit/s) | 16 | 1024 |
| PIC18F4455* | 24576 EnhFI | 256 | 2048 | 36 | 40P, 44PT, 44ML | ADC/Comp | EUSART, MI ² C/SPI | 48 | 3 | USB 2.0 | Full Speed (12Mbit/s) | 16 | 1024 |
| PIC18F4550* | 32768 EnhFI | 256 | 2048 | 36 | 40P, 44PT, 44ML | ADC/Comp | EUSART, MI ² C/SPI | 48 | 3 | USB 2.0 | Full Speed (12Mbit/s) | 16 | 1024 |

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Refer to Design pages on www.microchip.com for further details.

Connectivity Solutions - ACTIVE RF

rfPIC[®] Microcontrollers with UHF RF Transmitter, ICSP[™]

| Product | Program Memory (Bytes) | EEPROM Data Memory Bytes | RAM Bytes | I/O Pins | Packages | Analog Peripherals | Digital Peripherals | Max. Speed (MHz) | Function-Specific Specifications | | | | |
|---------------|------------------------|--------------------------|-----------|----------|------------|--------------------|------------------------------|------------------|----------------------------------|------------------|--------------------|-----------------------|-------------------|
| | | | | | | | | | Modulation | Data Rate (kbps) | Output Power (dBm) | Operating Voltage (V) | Freq. Range (MHz) |
| rfPIC12C509AF | 1536 OTP | — | 41 | 6 | 20JW, 20SS | — | 1-8 bit Timer, WDT | 4 | FSK, ASK | 40 | 2 | 2.5-5.5 | 315-470 |
| rfPIC12C509AG | 1536 OTP | — | 41 | 6 | 18JW, 18SO | — | 1-8 bit Timer, WDT | 4 | ASK | 40 | 2 | 2.5-5.5 | 315-470 |
| rfPIC12F675F | 1792 StdFI | 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 | 315-470 |
| rfPIC12F675H | 1792 StdFI | 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 | 800-900 |
| rfPIC12F675K | 1792 StdFI | 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 | 2400-2484 |

rfHCS KEELoc[®] 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 | | | |
|-----------|-------------------------------|-------------------|----------------------------------|----------|-----------------|----------------|-------------|-----|----------------------------------|--------------------|-----------------------|-------------------|
| | | | | | | | | | Modulation | Output Power (dBm) | Operating Voltage (V) | Freq. Range (MHz) |
| rfHCS362F | 69 | 32 | 2 x 64 | 20SS | PWM, Manchester | 4 x 15 | ✓ | ✓ | FSK, ASK | 2 | 2.2-5.5 | 315-470 |
| rfHCS362G | 69 | 32 | 2 x 64 | 18SO | PWM, Manchester | 4 x 15 | ✓ | ✓ | ASK | 2 | 2.2-5.5 | 315-470 |

UHF RF Receiver

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

Refer to Design pages on www.microchip.com for further details.

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

*Contact Microchip Technology Inc. for availability.
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| Product | Program Memory Bytes | EEPROM Data Memory Bytes | RAM Bytes | I/O Pins | Packages | Analog Peripherals | Digital Peripherals | Max. Speed MHz | ICD # of Breakpoints | Function-Specific Features | | | | |
|--------------------------------|----------------------|--------------------------|-----------|----------|------------------------|--------------------|-------------------------------|----------------|----------------------|----------------------------|---------------|---------------------|-------------------|-------|
| | | | | | | | | | | Timers | Input Capture | Output Comp/Std PWM | Motor Control PWM | Qu... |
| Motor Control Solutions | | | | | | | | | | | | | | |
| PIC12F683 | 3584 StdFI | 256 | 128 | 6 | 8P, 8SN, 8MF | ADC/Comp | — | 20 | 1 | 1-16 bit, 2-8 bit, WDT | 1 | 1x10 bit | — | |
| PIC16F684 | 3584 EnhFI | 256 | 128 | 12 | 14P, 14SL, 14ST | ADC/Comp | — | 20 | 1 | 1-16 bit, 2-8 bit, WDT | 1 | 4x10 bit | — | |
| PIC16F716 | 3584 StdFI | — | 128 | 13 | 18P, 18SO, 20SS | ADC | — | 20 | 1 | 1-16 bit, 2-8 bit, WDT | 1 | 4x10 bit | — | |
| PIC16F737 | 7168 StdFI | — | 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 | — | |
| PIC16F747 | 7168 StdFI | — | 368 | 36 | 40P, 44PT, 44ML | ADC/Comp | USART, MI ² C/SPI | 20 | 1 | 1-16 bit, 2-8 bit, WDT | 3 | 3x10 bit | — | |
| PIC16F767 | 14336 StdFI | — | 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 | — | |
| PIC16F777 | 14336 StdFI | — | 368 | 36 | 40P, 44PT, 44ML | ADC/Comp | USART, MI ² C/SPI | 20 | 1 | 1-16 bit, 2-8 bit, WDT | 3 | 3x10 bit | — | |
| PIC18F1230* | 4096 EnhFI | 128 | 256 | 16 | 18P, 18SO, 20SS, 28ML | ADC/Comp | EUSART | 40 | 3 | 2-16 bit, WDT | — | — | 6 | |
| PIC18F1330* | 8192 EnhFI | 128 | 256 | 16 | 18P, 18SO, 20SS, 28ML | ADC/Comp | EUSART | 40 | 3 | 2-16 bit, WDT | — | — | 6 | |
| PIC18F2331 | 8192 EnhFI | 256 | 768 | 22 | 28SP, 28SO | 200 ksps ADC | EUSART, I ² C/SPI | 40 | 1 | 3-16 bit, 1-8 bit, WDT | 3 | 2x10 bit | 6 | |
| PIC18F2431 | 16384 EnhFI | 256 | 768 | 22 | 28SP, 28SO | 200 ksps ADC | EUSART, I ² C/SPI | 40 | 1 | 3-16 bit, 1-8 bit, WDT | 3 | 2x10 bit | 6 | |
| PIC18F2439 | 12288 EnhFI | 256 | 640 | 21 | 28SP, 28SO | ADC | AUSART, MI ² C/SPI | 40 | 1 | 3-16 bit, WDT | — | 2x10 bit | — | |
| PIC18F2539 | 24576 EnhFI | 256 | 1408 | 21 | 28SP, 28SO | ADC | AUSART, MI ² C/SPI | 40 | 1 | 3-16 bit, WDT | — | 2x10 bit | — | |
| PIC18F4331 | 8192 EnhFI | 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 | |
| PIC18F4431 | 16384 EnhFI | 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 | |
| PIC18F4439 | 12228 EnhFI | 256 | 640 | 32 | 40P, 44PT, 44ML | ADC | AUSART, MI ² C/SPI | 40 | 1 | 3-16 bit, WDT | — | 2x10 bit | — | |
| PIC18F4539 | 24576 EnhFI | 256 | 1408 | 32 | 40P, 44PT, 44ML | ADC | AUSART, MI ² C/SPI | 40 | 1 | 3-16 bit, WDT | — | 2x10 bit | — | |

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Power Managed Solutions Featuring *nanoWatt* Technology

| Minimum nanoWatt Feature Set | 6-20 Pin | 28-40 Pin |
|--|---|---|
| Internal Oscillator | PIC16F627A, PIC16F628A, PIC16F648A | |
| Quick Start-up (4 MHz) | | |
| Power Managed Modes | | |
| Sleep | | |
| Low Power Timer1 | | |
| Low Power Watchdog | | |
| Additional Features to Minimum | | |
| IntOSC: Quick Start-up (Two-speed) and Clock Divide (8 MHz) BOR | PIC16F818, PIC16F819 | |
| IntOSC: Quick Start-up (Two-speed), Fail-safe Clock Monitor and Clock Divide (8 MHz) Ultra Low Power Wake-up | PIC12F683 PIC16F684, PIC16F688 | |
| IntOSC: Quick Start-up (Two-speed), Fail-safe Clock Monitor and Clock Divide (8 MHz) Ultra Low Power Wake-up Low Power Watchdog – Enhanced Software Controlled BOR | PIC16F631, PIC16F677, PIC16F685, PIC16F687, PIC16F689, PIC16F785 | |
| IntOSC: Quick Start-up (Two-speed), Fail-safe Clock Monitor and Clock Divide (8 MHz) Ultra Low Power Wake-up Wake-up Reset Low Power Watchdog – Enhanced PLVD Software Controlled BOR | PIC12F635 PIC16F636, PIC16F639 | |
| IntOSC: Quick Start-up (Two-speed), Fail-safe Clock Monitor and Selectable Clock (31 kHz-8 MHz) Power Managed Modes: RC Run Modes PLVD PBOR | PIC16F88, PIC16F87 | PIC16F777, PIC16F767, PIC16F747, PIC16F737, PIC16F917, PIC16F916, PIC16F914, PIC16F913 |
| IntOSC: Quick Start-up (Two-speed), Fail-safe clock monitor and Selectable Clock (31 kHz-8 MHz) Power Managed Modes: Multiple Idle Modes and RC Run Modes PLVD PBOR | PIC18F1320, PIC18F1220 | PIC18F4220, PIC18F4320, PIC18F2220, PIC18F2320, PIC18F4620, PIC18F4610, PIC18F4525, PIC18F4515, PIC18F2620, PIC18F2610, PIC18F2525, PIC18F2515, PIC18F4520, PIC18F4510, PIC18F2520, PIC18F2510, PIC18F4420, PIC18F4410, PIC18F2420, PIC18F2410, PIC18F2331, PIC18F2431, PIC18F4431, PIC18F4331, PIC18F2550, PIC18F2585, PIC18F2680, PIC18F4455, PIC18F4550, PIC18F4585, PIC18F4680, PIC18F4580, PIC18F2680, PIC18F2580 |

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

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Not recommended for new designs.

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| Product | Program Memory (Bytes) | Package Size | Recommended Design-In Device | Product | Program Memory (Bytes) | Package Size |
|-------------|------------------------|--------------|------------------------------|------------|------------------------|--------------|
| PIC12C508 | 768 | 8 | PIC12F508 | PIC16C77 | 14336 | 40 |
| PIC12C509 | 1536 | 8 | PIC12F509 | PIC16C923 | 7168 | 68 |
| PIC12C671 | 1536 | 8 | PIC12F675 | PIC16C924 | 7168 | 68 |
| PIC12C672 | 3584 | 8 | PIC12F683 | PIC16CE623 | 896 | 18 |
| PIC12CE673 | 1792 | 8 | PIC12F675 | PIC16CE624 | 1792 | 18 |
| PIC12CE674 | 3584 | 8 | PIC12F683 | PIC16CE625 | 3584 | 18 |
| PIC12CE518 | 768 | 8 | PIC12F629 | PIC16CR54A | 768 | 18 |
| PIC12CE519 | 1536 | 8 | PIC12F629 | PIC16CR54C | 768 | 18 |
| PIC12CR509A | 1536 | 8 | PIC12F509 | PIC16CR57C | 3072 | 28 |
| PIC16C54 | 768 | 18 | PIC16F54 | PIC16CR83 | 896 | 18 |
| PIC16C54A | 768 | 18 | PIC16F54 | PIC16CR84 | 1792 | 18 |
| PIC16C55 | 768 | 28 | PIC16C55A | PIC16F627 | 1792 | 18 |
| PIC16C56 | 1536 | 18 | PIC16C56A | PIC16F628 | 3584 | 18 |
| PIC16C57 | 3072 | 28 | PIC16F57 | PIC16F83 | 896 | 18 |
| PIC16C62A | 3584 | 28 | PIC16C62B or PIC16F72 | PIC16F84 | 1792 | 18 |
| PIC16C620 | 896 | 18 | PIC16C620A | PIC16F873 | 7168 | 28 |
| PIC16C621 | 1792 | 18 | PIC16C621A | PIC16F874 | 7168 | 28 |
| PIC16C622 | 3584 | 18 | PIC16C622A | PIC16F876 | 14336 | 40 |
| PIC16C63 | 7168 | 28 | PIC16C63B or PIC16F73 | PIC16F877 | 14336 | 40 |
| PIC16C64A | 3584 | 40 | PIC16F74 | PIC17C42A | 4096 | 40 |
| PIC16C642 | 7168 | 28 | PIC16F72 | PIC17C43 | 8192 | 40 |
| PIC16C65A | 7168 | 40 | PIC16C65B or PIC16F74 | PIC17C44 | 16384 | 40 |
| PIC16C66 | 14336 | 28 | PIC16F76 | PIC17C752 | 16384 | 68 |
| PIC16C662 | 7168 | 40 | PIC16F74 | PIC17C756A | 32768 | 68 |
| PIC16C67 | 14336 | 40 | PIC16F77 | PIC17C762 | 16384 | 84 |
| PIC16C71 | 1792 | 18 | PIC16F716 | PIC17C766 | 32768 | 84 |
| PIC16C72 | 3584 | 28 | PIC16C72A or PIC16F72 | PIC18C242 | 16384 | 28 |
| PIC16C710 | 896 | 18 | PIC16F716 | PIC18C252 | 32768 | 28 |
| PIC16C711 | 1792 | 18 | PIC16F716 | PIC18C442 | 16384 | 40 |
| PIC16C712 | 1792 | 18 | PIC16F716 | PIC18C452 | 32768 | 40 |
| PIC16C715 | 3584 | 18 | PIC16F716 | PIC18C658 | 32768 | 68 |
| PIC16C716 | 3584 | 18 | PIC16F716 | PIC18C858 | 32768 | 84 |
| PIC16C73A | 7168 | 28 | PIC16C73B or PIC16F73 | PIC18F6620 | 65536 | 64 |
| PIC16C74A | 7168 | 40 | PIC16C74B or PIC16F74 | PIC18F8620 | 65536 | 80 |
| PIC16C76 | 14336 | 28 | PIC16F76 | PIC18F242 | 16384 | 28 |
| PIC16C505 | 1536 | 14 | PIC16F505 | PIC18F252 | 32768 | 28 |
| PIC16C54C | 768 | 18 | PIC16F54 | PIC18F442 | 16384 | 40 |
| PIC16C57C | 3072 | 28 | PIC16F57 | PIC18F452 | 32768 | 40 |

**Battery Management
Family Products**

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 |
|---------|-------------------|-------------|------------|----------|-----------------------|--------------------------------------|---|----------|-----------|-------------------------|-------------|
| PS501 | Li-Ion NimH | 2-4 6-12 | SMBus | > 1% | 16-bit Sigma-Delta | 16-Kbytes Flash, 256 bytes EEPROM | 12 GPIO | N/A | On-chip | On-chip external | 28-pin SSOP |
| 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 | 8-pin TSOP |

Supporting Development Tools are listed in the Development Systems Products Section.

dsPIC[®] DIGITAL SIGNAL CONTROLLER (DSC) PRODUCTS

| Product | Program (FLASH) KBytes | Memory (FLASH) KWords | EE Bytes | SRAM Bytes | 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. | UA |
|---|------------------------|-----------------------|----------|------------|---------------------|---------------------|---------------------|--------------|-----------|---------------------|-------------------|-----------|----|
| dsPIC30F Motor Control and Power Conversion Family | | | | | | | | | | | | | |
| dsPIC30F2010 | 12 | 4 | 1024 | 512 | 28SOG, 28SPG, 28MMG | — | 6 ch | 3 | 4 | 2 | 6 | ✓ | |
| dsPIC30F4011 | 48 | 16 | 1024 | 2048 | 40PG, 44PTG, 44MMG | — | 6 ch | 5 | 4 | 4 | 6 | ✓ | |
| dsPIC30F4012 | 48 | 16 | 1024 | 2048 | 28SOG, 28SPG | — | 6 ch | 5 | 4 | 2 | 6 | ✓ | |
| dsPIC30F6010 | 144 | 48 | 4096 | 8192 | 80PF | — | 16 ch | 5 | 8 | 8 | 8 | ✓ | |
| dsPIC30F General Purpose Family | | | | | | | | | | | | | |
| dsPIC30F3014 | 24 | 8 | 1024 | 2048 | 40PG, 44PTG | 13 ch | — | 3 | 2 | 2 | No | No | |
| dsPIC30F4013 | 48 | 16 | 1024 | 2048 | 40PG, 44PTG | 13 ch | — | 5 | 4 | 4 | No | No | |
| dsPIC30F5011 | 66 | 22 | 1024 | 4096 | 64PTG | 16 ch | — | 5 | 8 | 8 | No | No | |
| dsPIC30F5013 | 66 | 22 | 1024 | 4096 | 80PTG | 16 ch | — | 5 | 8 | 8 | No | No | |
| dsPIC30F6011 | 132 | 44 | 2048 | 6144 | 64PF | 16 ch | — | 5 | 8 | 8 | No | No | |
| dsPIC30F6012 | 144 | 48 | 4096 | 8192 | 64PF | 16 ch | — | 5 | 8 | 8 | No | No | |
| dsPIC30F6013 | 132 | 44 | 2048 | 6144 | 80PF | 16 ch | — | 5 | 8 | 8 | No | No | |
| dsPIC30F6014 | 144 | 48 | 4096 | 8192 | 80PF | 16 ch | — | 5 | 8 | 8 | No | No | |
| dsPIC30F Sensor Family | | | | | | | | | | | | | |
| dsPIC30F2011 | 12 | 4 | 0 | 1024 | 18SOG, 18PG | 8 ch | — | 3 | 2 | 2 | No | No | |
| dsPIC30F2012 | 12 | 4 | 0 | 1024 | 28SOG, 28SPG | 10 ch | — | 3 | 2 | 2 | No | No | |
| dsPIC30F3012 | 24 | 8 | 1024 | 2048 | 18SOG, 18PG | 8 ch | — | 3 | 2 | 2 | No | No | |
| dsPIC30F3013 | 24 | 8 | 1024 | 2048 | 28SOG, 28SPG | 10 ch | — | 3 | 2 | 2 | No | No | |

**Radio Frequency
Products**

RADIO FREQUENCY PRODUCTS

PASSIVE

microID® RFID Tagging Devices

| Product | Carrier Frequency | Programming | Anticollision | Memory Type | Memory Size | Protocols | P |
|---------|-------------------|-----------------|---------------|-------------|-------------|--|-----------------|
| MCRF200 | 100-150 kHz | Factory | No | OTP | 96/128 bits | PSK, FSK, ASK, bi-phase, Manchester, NRZ | W, WF, S, WB, W |
| MCRF202 | 100-150 kHz | Factory | Yes | OTP | 96/128 bits | FSK, ASK, bi-phase, Manchester, NRZ | W, WF, S, W |
| MCRF250 | 100-150 kHz | Factory | Yes | OTP | 96/128 bits | PSK, FSK, ASK, bi-phase, Manchester, NRZ | W, WF, S, WB, W |
| MCRF355 | 13.56 MHz | Contact/Factory | Yes | R/W | 154 bits | ASK Manchester | W, WF, S, WB, W |
| MCRF360 | 13.56 MHz | Contact/Factory | Yes | R/W | 154 bits | ASK Manchester | W, WF, S, W |
| MCRF450 | 13.56 MHz | Contactless | Yes | R/W | 1 Kbit | PPM, ASK Manchester | W, WF, S, WB, W |
| MCRF451 | 13.56 MHz | Contactless | Yes | R/W | 1 Kbit | PPM, ASK Manchester | W, WF, S, WB, W |
| MCRF452 | 13.56 MHz | Contactless | Yes | R/W | 1 Kbit | PPM, ASK Manchester | W, WF, S, WB, W |
| MCRF455 | 13.56 MHz | Contactless | Yes | R/W | 1 Kbit | PPM, ASK Manchester | W, WF, S, WB, W |

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 |
|---------|-------------------------------|-------------------|----------------------------------|-------------|-----------------------|--------------|----------------|-----|------------------------------|---|
| HCS101 | 66 | — | — | — | 3.5 to 13.0 | ✓ | 7 | No | PWM | Fixed code support for non-secure applications |
| HCS200 | 66 | 32 | 64 | 32 | 3.5 to 13.0 | No | 7 | No | PWM | Entry level, Fixed code support, Battery operation |
| HCS201 | 66 | 32 | 64 | 32 | 3.5 to 13.0 | ✓ | 7 | No | PWM | Entry level, Fixed code support, Battery operation |
| HCS300 | 66 | 32 | 64 | 32 | 2.0 to 6.3 | No | 15 | No | PWM | LED Drive, Overflow bits, Time-out, Battery operation |
| HCS301 | 66 | 32 | 64 | 32 | 3.5 to 13.0 | No | 15 | No | PWM | LED Drive, Overflow bits, Time-out, Battery operation |
| HCS320 | 66 | 32 | 64 | 32 | 3.5 to 13.0 | No | 16 | No | PWM | Shift Operation, LED Drive, Overflow bits |
| HCS360 | 67 | 32 | 64 | 48 | 2.0 to 6.3 | No | 15 | ✓ | IR Mode, PWM and Manchester | 2 independent counters |
| HCS361 | 67 | 32 | 64 | 48 | 2.0 to 6.3 | No | 15 | ✓ | IR Mode, PWM and VPWM | 2 independent counters |
| HCS362 | 69 | 32 | 2 x 64 | 60 | 2.0 to 6.3 | ✓ | 15 | ✓ | PWM and Manchester | Queue counter, PLL interface, Timer bits |
| 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 |
| 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 counter |
| HCS410 | 69 | 32 | 2 x 64 | 60 | 2.0 to 6.6 | ✓ | 7 | ✓ | PWM and Manchester | Self-powered transponder and encoder, EEPROM, Queue counter |

KEELOQ® Decoder Devices

| Product | Reception Length Bits | Encoders Supported** | Transmitters Supported | Operating Voltage (V) | Functions | Other Features |
|---------|-----------------------|--|------------------------|-----------------------|---|--|
| 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 |
| 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 |
| 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 transmitter and 1K user EEPROM. |

* Contact Microchip Technology for availability date.

** Requires ICD specific device with header module – refer to Development Tools.

KEELoQ® Secure Data Products

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

| Product | Program Memory (Bytes) | EEPROM Data Memory (Bytes) | RAM Bytes | I/O Pins | Analog | | Digital | | Max. Speed MHz | IntOSC | BOR/PBOR/PLVD | ICD # of Breakpoints | nW | Other Features |
|------------|------------------------|----------------------------|-----------|----------|--------------|-------------|--------------------------|------------|----------------|--------|---------------|----------------------|----|--------------------|
| | | | | | ADC Channels | Comparators | Timers/WDT | Serial I/O | | | | | | |
| PIC12F635 | 1792 EnhFI | 128 | 64 | 6 | — | 1 | 1-16 bit, 1-8 bit, 1-WDT | — | 20 | 8 MHz | BOR/PLVD | 1** | ✓ | |
| PIC16F636 | 3584 EnhFI | 256 | 128 | 12 | — | 2 | 1-16 bit, 1-8 bit, 1-WDT | — | 20 | 8 MHz | BOR/PLVD | 1** | ✓ | |
| PIC16F639* | 3584 EnhFI | 256 | 128 | 12 | — | 2 | 1-16 bit, 1-8 bit, 1-WDT | — | 20 | 8 MHz | BOR/PLVD | 1** | ✓ | Transponder Analog |

* Contact Microchip Technology for availability date.

** Requires ICD specific device with header module – refer to Development Tools.

ANALOG/INTERFACE PRODUCTS

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

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 |
|---|-----------------------|------------------------------|--------------------------------|---------------|-----------------------------|---|
| Logic Output Temperature Sensors | | | | | | |
| TC6501 | ±0.5 | ±3 | -55 to +125 | +2.7 to +5.5 | 40 | Cross to MAX6501, Open-drain |
| TC6502 | ±0.5 | ±3 | -55 to +125 | +2.7 to +5.5 | 40 | Cross to MAX6502, Push-pull |
| TC6503 | ±0.5 | ±3 | -55 to +125 | +2.7 to +5.5 | 40 | Cross to MAX6503, Open-drain |
| TC6504 | ±0.5 | ±3 | -55 to +125 | +2.7 to +5.5 | 40 | Cross to MAX6504, Push-pull |
| TC620 | ±1 | ±3 | -40 to +125 | +4.5 to +18 | 400 | Two resistor-programmable trip points |
| TC621 | Note 1 | Note 1 | -40 to +85 | +4.5 to +18 | 400 | Uses external temperature sensor, resistor-programmable trip points |
| TC622 | ±1 | ±5 | -40 to +125 | +4.5 to +18 | 600 | Dual output, TO-220 for heat sink mounting, resistor-programmable trip points |
| TC623 | ±1 | ±3 | -40 to +125 | +2.7 to +4.5 | 250 | Two resistor-programmable trip points |
| TC624 | ±1 | ±5 | -40 to +125 | +2.7 to +4.5 | 300 | Dual output, resistor-programmable trip points |
| Voltage Output Temperature Sensors | | | | | | |
| TC1046 | ±0.5 | ±2 | -40 to +125 | +2.7 to +4.4 | 60 | High precision temperature-to-voltage converter, 6.25 mV/°C |
| TC1047 | ±0.5 | ±2 | -40 to +125 | +2.7 to +4.4 | 60 | High precision temperature-to-voltage converter, 10 mV/°C |
| TC1047A | ±0.5 | ±2 | -40 to +125 | +2.5 to +5.5 | 60 | High precision temperature-to-voltage converter, 10 mV/°C |
| Serial Output Temperature Sensors | | | | | | |
| MCP9800 | ±0.5 | ±1 | -55 to +125 | +2.7 to +5.5 | 400 | SMBus/I ² C™ compatible interface, 0.0625°C to 0.5°C adj. resolution, power-saving one-shot temperature measurement |
| MCP9801 | ±0.5 | ±1 | -55 to +125 | +2.7 to +5.5 | 400 | SMBus/I ² C™ compatible interface, 0.0625°C to 0.5°C adj. resolution, power-saving one-shot temperature measurement, multi-drop capability |
| MCP9802 | ±0.5 | ±1 | -55 to +125 | +2.7 to +5.5 | 400 | SMBus/I ² C™ compatible interface with time out, 0.0625°C to 0.5°C adj. resolution, power-saving one-shot temperature measurement |

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

NOTE 2: TCN75 idle current is 250 µA. This device also has a Software Shutdown mode that reduces supply current to <1 µA.

Analog/Interface Family Products

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 |
|--|-----------------------|------------------------------|--------------------------------|---------------|-----------------------------|---|
| Serial Output Temperature Sensors (continued) | | | | | | |
| MCP9803 | ±0.5 | ±1 | -55 to +125 | +2.7 to +5.5 | 400 | SMBus/I ² C™ compatible interface with time out, 0.0625°C to 0.5°C adj. resolution, power-saving one-shot temperature measurement, multi-drop capability |
| TC77 | ±0.5 | ±1 | -55 to +125 | +2.7 to +5.5 | 400 | SPI™ compatible interface, 0.0625°C temperature resolution |
| 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 |
| TC74 | ±0.5 | ±2 | -40 to +125 | +2.7 to +5.5 | 350 | SMBus/I ² C™ compatible interface, 1°C temperature resolution |
| TCN75 | ±0.5 | ±2 | -55 to +125 | +2.7 to +5.5 | 1,000 ⁽²⁾ | SMBus/I ² C™ compatible interface, multi-drop capability, interrupt output, 0.5°C temperature resolution |

NOTE 1: These devices use an external temperature sensor. Accuracy of the total solution is a function of the accuracy of the external sensor.
NOTE 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 |
|--------|-------------|-----------------------|------------------------------|--------------------------------|---------------|-----------------------------|--|
| TC642 | Fan Manager | Note 1 | Note 1 | -40 to +85 | +3.0 to +5.5 | 1,000 | FanSense™ Fan Monitor, minimum fan speed control |
| TC642B | Fan Manager | Note 1 | Note 1 | -40 to +85 | +3.0 to +5.5 | 400 | FanSense™ Fan Monitor, minimum fan speed control, auto-restart |
| TC646 | Fan Manager | Note 1 | Note 1 | -40 to +85 | +3.0 to +5.5 | 1,000 | FanSense™ Fan Monitor, auto-shutdown |
| TC646B | Fan Manager | Note 1 | Note 1 | -40 to +85 | +3.0 to +5.5 | 400 | FanSense™ Fan Monitor, auto-shutdown, fan alarm |
| TC647 | Fan Manager | Note 1 | Note 1 | -40 to +85 | +3.0 to +5.5 | 1,000 | FanSense™ Fan Monitor, minimum fan speed control |
| TC647B | Fan Manager | Note 1 | Note 1 | -40 to +85 | +3.0 to +5.5 | 400 | FanSense™ Fan Monitor, minimum fan speed control, auto-restart |
| TC648 | Fan Manager | Note 1 | Note 1 | -40 to +85 | +3.0 to +5.5 | 1,000 | Over-temperature alert, auto-shutdown |
| TC648B | Fan Manager | Note 1 | Note 1 | -40 to +85 | +3.0 to +5.5 | 400 | Over-temperature alert, auto-shutdown, fan alarm |
| TC649 | Fan Manager | Note 1 | Note 1 | -40 to +85 | +3.0 to +5.5 | 1,000 | FanSense™ Fan Monitor, auto-shutdown |

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 |
|--------|-------------------------------|-----------------------|------------------------------|--------------------------------|---------------|-----------------------------|--|
| TC649B | Fan Manager | Note 1 | Note 1 | -40 to +85 | +3.0 to +5.5 | 400 | FanSense™ Fan Monitor, auto-shutdown, fan speed data |
| TC650 | Fan Manager | ±1 | ±3 | -40 to +125 | +2.8 to +5.5 | 90 | Over-temperature alert, auto-shutdown |
| TC651 | Fan Manager | ±1 | ±3 | -40 to +125 | +2.8 to +5.5 | 90 | Over-temperature alert, auto-shutdown |
| TC652 | Fan Manager | ±1 | ±3 | -40 to +125 | +2.8 to +5.5 | 90 | FanSense™ Fan Monitor, over-temperature alert |
| TC653 | Fan Manager | ±1 | ±3 | -40 to +125 | +2.8 to +5.5 | 90 | FanSense™ Fan Monitor, over-temperature alert, auto-shutdown |
| TC654 | Dual SMBus Fan Manager | Note 1 | Note 1 | -40 to +85 | +3.0 to +5.5 | 320 | FanSense™ Fan Monitor, RPM data |
| 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 |
| TC664 | Single SMBus Fan Manager | Note 1 | Note 1 | -40 to +85 | +3.0 to +5.5 | 320 | FanSense™ Fan Monitor, RPM data |
| 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 |
| TC670 | Predictive Fan Fault Detector | N/A | N/A | -40 to +85 | +3.0 to +5.5 | 150 | FanSense™ Fan Monitor, programmable threshold |

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) |
|---------|---------------|--------------------|------------------------|--------------------------|----------------------------------|---------------------------------|
| MCP1525 | 2.7 to 5.5 | 2.5 | ±2 | ±1 | 50 | 100 |
| MCP1541 | 4.3 to 5.5 | 4.096 | ±2 | ±1 | 50 | 100 |

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. I _{OUT} (mV) | Typical Output Voltage Accuracy (%) | Features |
|--|------------------------|---|---------------------|---------------------------------|-----------------------------|--|-------------------------------------|---------------------|
| 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 |
| 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 |
| TC2054 | 6.0 | 1.8, 2.7, 2.8, 3.0, 3.3 | 50 | -40 to +125 | 55 | 45 | ±0.4 | Shutdown, Error |

NOTE 1: Depending on external transistor configuration.
NOTE 2: Each channel (for Dual and Quad LDOs).
NOTE 3: LDOs with shutdown except TC56 and TC57 have typical shutdown currents of 0.05 µA.

Analog/Interface Family Products

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. I _{OUT} (mV) | Typical Output Voltage Accuracy (%) | Features |
|--|------------------------|---|---------------------|---------------------------------|-----------------------------|--|-------------------------------------|--|
| 50 mA to 250 mA Low Dropout Linear Regulators (continued) | | | | | | | | |
| 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 |
| TC1070 | 6.0 | 1.23 → V _{IN} | 50 | -40 to +125 | 50 | 85 | — | Shutdown, Adjustable output |
| 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 input, Error output |
| 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 |
| TC1016 | 6.0 | 1.8, 2.7, 2.8, 3.0 | 80 | -40 to +125 | 50 | 150 | ±0.5 | Shutdown |
| TC2015 | 6.0 | 1.8, 2.7, 2.8, 3.0, 3.3 | 100 | -40 to +125 | 55 | 90 | ±0.4 | Shutdown, Reference input |
| 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 input |
| TC2055 | 6.0 | 1.8, 2.7, 2.8, 3.0, 3.3 | 100 | -40 to +125 | 55 | 90 | ±0.4 | Shutdown, Error output |
| 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 |
| TC1071 | 6.0 | 1.23 → V _{IN} | 100 | -40 to +125 | 50 | 180 | — | Shutdown, Adjustable output |
| 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 input, Error output |
| 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 |
| TC1188 | 6.0 | 1.8, 2.8, 2.84, 3.15 | 120 | -40 to +125 | 50 | 130 | ±0.5 | Shutdown |
| TC1189 | 6.0 | 1.8, 2.8, 2.84, 3.15 | 120 | -40 to +125 | 50 | 130 | ±0.5 | Shutdown |
| TC2185 | 6.0 | 1.8, 2.7, 2.8, 3.0, 3.3 | 150 | -40 to +125 | 55 | 140 | ±0.4 | Shutdown, Reference input |
| 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 input |
| TC2186 | 6.0 | 1.8, 2.7, 2.8, 3.0, 3.3 | 150 | -40 to +125 | 55 | 140 | ±0.4 | Shutdown, Error output |
| 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 |
| TC1187 | 6.0 | 1.23 → V _{IN} | 150 | -40 to +125 | 50 | 270 | — | Shutdown, Adjustable output |
| 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 |
| TC56 ⁽³⁾ | 10 | 2.5, 3.0, 3.3 | 180 | -40 to +85 | 11 | 330 | ±0.5 | Shutdown |
| 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 capacitor, Short-circuit protection |
| 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 |

- NOTE** 1: Depending on external transistor configuration.
2: Each channel (for Dual and Quad LDOs).
3: LDOs with shutdown except TC56 and TC57 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. I _{OUT} (mV) | Typical Output Voltage Accuracy (%) | Features |
|---|------------------------|--|------------------------|---------------------------------|-----------------------------|--|-------------------------------------|--|
| 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, Refer |
| TC1108 | 6.0 | 2.5, 2.7, 2.8, 3.0, 3.3, 5.0 | 300 | -40 to +125 | 50 | 240 | ±0.5 | |
| TC1173 | 6.0 | 2.5, 2.7, 2.8, 3.0, 3.3, 5.0 | 300 | -40 to +125 | 50 | 240 | ±0.5 | Shutdown, Refer input, Error output |
| TC1174 | 6.0 | 1.23 → V _{IN} | 300 | -40 to +125 | 50 | 240 | — | Shutdown, Refer input, Adjustable |
| TC1269 | 6.0 | 2.5, 2.8, 3.0, 3.3, 5.0 | 300 | -40 to +125 | 50 | 240 | ±0.5 | Shutdown, Refer |
| 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 | |
| TC1263 | 6.0 | 2.5, 2.8, 3.0, 3.3, 5.0 | 500 | -40 to +125 | 80 | 350 | ±0.5 | Shutdown, Refer input, Error output |
| TC1268 | 6.0 | 2.5 | 500 | -40 to +125 | 80 | 350 | ±0.5 | Shutdown, Refer input, Error output |
| TC1264 | 6.0 | 1.8, 2.5, 3.0, 3.3 | 800 | -40 to +125 | 80 | 450 | ±0.5 | |
| TC1265 | 6.0 | 1.8, 2.5, 3.0, 3.3 | 800 | -40 to +125 | 80 | 450 | ±0.5 | Shutdown, Refer input, Error output |
| TC2117 | 6.0 | 1.8, 2.5, 3.0, 3.3 | 800 | -40 to +125 | 80 | 600 | ±0.5 | |
| 1A and Above Low Dropout Linear Regulators | | | | | | | | |
| MCP1726 | 6.0 | Fixed: 5, 3.3, 3, 2.5, 1.8, 1.2 Adjustable: .8 to 5.0 | 1000 | -40 to +125 | 140 | 300 | ±0.4 | Shutdown, Cdelat |
| Application Specific Low Dropout Linear Regulators | | | | | | | | |
| TC1266 | 6.0 | 3.3 | 200 | -5 to +70 | 230 | 200 | ±1.0 | PCI compliant |
| TC1267 | 6.0 | 3.3 | 400 | -5 to +70 | 230 | 300 | ±1.0 | PCI compliant |
| TC57 ⁽³⁾ | 8 | 2.5, 3.0, 3.3 | 4,000 ⁽¹⁾ | -40 to +85 | 50 | 100 ⁽¹⁾ | ±2.0 | Shutdown, Extern |
| TC59 | -10 | -3.0, -5.0 | 100 | -40 to +85 | 3 | 380 | ±0.5 | Negative LDO |
| Power Management Combination Products | | | | | | | | |
| TC1300 | 6.0 | 2.5, 2.7, 2.8, 2.85, 3.0, 3.3 | 300 | -40 to +125 | 80 | 210 | ±0.5 | Shutdown, Refer input, LDO plus F |
| TC1301A | 6.0 | LDO1: 1.5-3.3 LDO2: 1.5-3.3 | LDO1: 300 LDO2: 150 | -40 to +125 | 103 | LDO1: 104 LDO2: 150 | ±0.5 | Dual LDO plus R Shutdown, Refer Voltage detect |
| TC1301B | 6.0 | LDO1: 1.5-3.3 LDO2: 1.5-3.3 | LDO1: 300 LDO2: 150 | -40 to +125 | 114 | LDO1: 104 LDO2: 150 | ±0.5 | Dual LDO plus R output shutdown, |

- NOTE**
- 1: Depending on external transistor configuration.
 - 2: Each channel (for Dual and Quad LDOs).
 - 3: LDOs with shutdown except TC56 and TC57 have typical shutdown currents of 0.05 µA.

Analog/Interface Family Products

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. I _{OUT} (mV) | Typical Output Voltage Accuracy (%) | Features |
|--|------------------------|--------------------------------|------------------------|---------------------------------|-----------------------------|--|-------------------------------------|---|
| Power Management Combination Products (continued) | | | | | | | | |
| TC1302A | 6.0 | LDO1: 1.5-3.3 LDO2: 1.5-3.3 | LDO1: 300 LDO2: 150 | -40 to +125 | 103 | LDO1: 104 LDO2: 150 | ±0.5 | Dual LDO, Output reference bypass |
| TC1302B | 6.0 | LDO1: 1.5-3.3 LDO2: 1.5-3.3 | LDO1: 300 LDO2: 150 | -40 to +125 | 114 | LDO1: 104 LDO2: 150 | ±0.5 | Dual LDO, Per channel shutdown, Reference |
| TC1305 | 6.0 | 2.5, 2.8, 3.0 | 150 ⁽²⁾ | -40 to +125 | 120 | 240 | ±0.5 | Dual LDO plus Reference bypass, Select Mode™ selectable output voltages |
| TC1306 | 6.0 | 1.8, 2.8, 3.0 | 150 ⁽²⁾ | -40 to +125 | 120 | 240 | ±0.5 | Dual LDO plus Reference bypass, Shutdown, Selectable output |
| TC1307 | 6.0 | 1.8, 2.5, 2.8, 3.0 | 150 ⁽²⁾ | -40 to +125 | 220 | 200 | ±0.5 | Quad LDO plus Reference bypass, Shutdown, Selectable output |

NOTE 1: Depending on external transistor configuration.
 2: Each channel (for Dual and Quad LDOs).
 3: LDOs with shutdown except TC56 and TC57 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 Supply (µA) | Output Current (mA) | Features |
|---------|--|-------------------------|-------------------------|----------------------------------|--------------------------------|---------------------------|----------------------------|---------------------|---|
| MCP1601 | Synchronous Buck Regulator | 2.7 to 5.5 | 0.9V to V _{IN} | -40 to +85 | PFM/PWM/LDO | 750 | 825 (PWM) 125 (PFM) | 500 | UVLO, Auto-switching, LD |
| 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 | 0.12 | 560/440 | 2 duty cycles for min. and control, UVLO, soft start |
| 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 | 0.12 | 560/440 | 2 duty cycles for min. and control, low battery detect, UVLO |
| 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 | 0.12 | 560/440 | 2 duty cycles for min. and control, power-good indicator, UVLO |
| 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 | 0.12 | 560/440 | 2 duty cycles for min. and control, low battery detect, indicator, UVLO, soft start |
| 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 |
| 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 |
| 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 |
| 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 |
| 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, Shutdown mode |

POWER MANAGEMENT – Switching Regulators

| 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 |
|--------|--------------------------|-------------------------|--------------------|----------------------------------|----------------|---------------------------|----------------------------|---------------------|----------------------------|
| 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 Shut |

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 |
|---------|--------------------------------------|-------------------------|--|----------------------------------|---------------------------|---------------------------|----------------------------|---------------------|--------------------------|
| MCP1630 | High speed PWM to use with PIC® MCUs | 2.7 to 5.5 | V _{SS} + 0.2V to V _{DD} - 0.2V | -40 to +125 | Cycle-by-Cycle DC control | 1000 | 3.5 | ±10 | UVLO, current sense to V |

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 |
|---|-------------------------|---|----------------------------------|---|------------------------------------|---------------------------------------|
| Inverting or Doubling Charge Pumps | | | | | | |
| TC1044S | 1.5 to 12 | V _{OUT} = -V _{IN} or V _{OUT} = 2 V _{IN} | -40 to +85 | 160 | 20 | 85 kHz oscillator, Boost mode |
| TC7660 | 1.5 to 10 | V _{OUT} = -V _{IN} or V _{OUT} = 2 V _{IN} | -40 to +85 | 180 | 20 | 10 kHz oscillator |
| TC7660H | 1.5 to 10 | V _{OUT} = -V _{IN} or V _{OUT} = 2 V _{IN} | -40 to +85 | 1,000 | 20 | 120 kHz oscillator |
| TC7660S | 1.5 to 12 | V _{OUT} = -V _{IN} or V _{OUT} = 2 V _{IN} | -40 to +85 | 160 | 20 | 45 kHz oscillator, Boost mode |
| TC7662B | 1.5 to 15 | V _{OUT} = -V _{IN} or V _{OUT} = 2 V _{IN} | -40 to +85 | 180 | 20 | 35 kHz oscillator, Boost mode |
| TC1219 | 1.5 to 5.5 | V _{OUT} = -V _{IN} or V _{OUT} = 2 V _{IN} | -40 to +85 | 115 | 25 | 12 kHz oscillator, Low-Power Shutdown |
| TC1220 | 1.5 to 5.5 | V _{OUT} = -V _{IN} or V _{OUT} = 2 V _{IN} | -40 to +85 | 325 | 25 | 35 kHz oscillator, Low-Power Shutdown |
| TC1221 | 1.8 to 5.5 | V _{OUT} = -V _{IN} or V _{OUT} = 2 V _{IN} | -40 to +85 | 600 | 25 | Shutdown, 125 kHz oscillator |
| TC1222 | 1.8 to 5.5 | V _{OUT} = -V _{IN} or V _{OUT} = 2 V _{IN} | -40 to +85 | 2,800 | 25 | Shutdown, 750 kHz oscillator |
| TCM828 | 1.5 to 5.5 | V _{OUT} = -V _{IN} or V _{OUT} = 2 V _{IN} | -40 to +85 | 90 | 25 | 12 kHz oscillator |
| TCM829 | 1.5 to 5.5 | V _{OUT} = -V _{IN} or V _{OUT} = 2 V _{IN} | -40 to +85 | 260 | 25 | 35 kHz oscillator |
| TC1240 | 2.5 to 4.0 | V _{OUT} = 2 V _{IN} | -40 to +85 | 900 | 40 | Shutdown, 160 kHz oscillator |
| TC1240A | 2.5 to 5.5 | V _{OUT} = 2 V _{IN} | -40 to +85 | 900 | 40 | Shutdown, 160 kHz oscillator |
| TC7662A | 3 to 18 | V _{OUT} = -V _{IN} or V _{OUT} = 2V _{IN} | -40 to +85 | 200 | 40 | 12 kHz oscillator |
| TC962 | 3 to 18 | V _{OUT} = -V _{IN} or V _{OUT} = 2 V _{IN} | -40 to +85 | 200 | 80 | |
| TC1121 | 2.4 to 5.5 | V _{OUT} = -V _{IN} or V _{OUT} = 2 V _{IN} | -40 to +85 | 100 | 100 | Low-Power Shutdown mode |
| Multi-Function Charge Pumps | | | | | | |
| TCM680 | 2.0 to 5.5 | V _{OUT} = ±2 V _{IN} | -40 to +85 | 1,000 | ±10 | Generates ±6V from +3V or ±10V from |

NOTE 1: Measured at V_{DD} = 5.0V at 25°C and no load.

Analog/Interface Family Products

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 |
|--|------------------------------|--|----------------------------------|---|------------------------------------|--|
| Inverting and Doubling Charge Pumps | | | | | | |
| TC682 | 2.4 to 5.5 | V _{OUT} = -2 V _{IN} | -40 to +85 | 400 | 10 | 12 kHz oscillator |
| Regulated Charge Pumps | | | | | | |
| TC1142 | 2.5 to 5.5 | -3V to -5V | -40 to +85 | 400 | 20 | Regulated GaAs FET supply, Internal 2 oscillator, External clock 3 kHz to 500 kHz, Low-Power Shutdown mode |
| MCP1252 | 2.1/2.7 to 5.5 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 V _{IN} >3.0V | Power-Good output, 650 kHz oscillator |
| MCP1253 | 2.1/2.7 to 5.5 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 V _{IN} >3.0V | Power-Good output, 1 MHz oscillator |

NOTE 1: Measured at V_{DD} = 5.0V at 25°C and no load.

POWER MANAGEMENT – CPU/System Supervisors

| Part # | V _{CC} Range (V) | Operating Temperature Range (°C) | Nominal Reset Voltage (V) | Reset Type | Output | Typical Reset Pulse Width (ms) | Typical Supply Current (µA) | Additional Features | |
|--------|---------------------------|----------------------------------|---|-------------|----------------|--------------------------------|-----------------------------|---------------------|------------|
| MCP102 | 1V-5.5V | -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-P 3-P |
| MCP103 | 1V-5.5V | -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-P 3-P |
| TC1272 | 1.2-5.5 | -40 to +85 | 4.62, 4.37, 4.12 | Active Low | CMOS Push-Pull | 200 | 17 | | 3-P |
| TC1275 | 1.2-5.5 | -40 to +85 | 3.06, 2.88, 2.55 | Active Low | CMOS Push-Pull | 200 | 20 | | 3-P |
| 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-P |
| 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-P |
| 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-P |
| 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-P |
| 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-P |
| TC1274 | 1.8-5.5 | -40 to +85 | 4.62, 4.37, 4.13 | Active High | CMOS Push-Pull | 200 | 17 | | 3-P |
| TC1277 | 1.8-5.5 | -40 to +85 | 3.06, 2.88, 2.55 | Active High | CMOS Push-Pull | 200 | 20 | | 3-P |
| 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-P |
| 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-P |
| 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-P |
| 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-P |
| 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-P |
| MCP121 | 1V-5.5V | -40 to 125 | 1.9, 2.32, 2, 63, 2.93, 3.08, 4.38, 4.63 | Active Low | Open-drain | 120 | 1 | | 3-P 3-P |
| TC1273 | 1.2-5.5 | -40 to +85 | 4.62, 4.37, 4.12 | Active Low | Open-drain | 200 | 17 | | 3-P |

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 | |
|--------|---------------|----------------------------------|---|-----------------|----------------------------|--------------------------------|-----------------------------|---------------------------------|------------|
| TC1276 | 1.2-5.5 | -40 to +85 | 3.06, 2.88, 2.55 | Active Low | Open-drain | 200 | 20 | | 3-B |
| 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-B |
| TC1279 | 1.2-5.5 | -40 to +85 | 4.62, 4.37, 4.125 | Active Low | Open-drain | 350 | 900 | | 3-B |
| MCP131 | 1V-5.5V | -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-B 3-B |
| 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 kΩ Pull-up | 350 | 45 | | 3-B |
| TC1278 | 1.2-5.5 | -40 to +85 | 4.62, 4.37, 4.125 | Active High | Open-drain | 350 | 900 | | 3-B |
| TC1232 | 4.5-5.5 | -40 to +85 | 4.62, 4.37 | Active Low/High | Open-drain | 610 | 50 | Watchdog Timer | 8-B |
| TC32M | 4.5-5.5 | -40 to +85 | 4.5 | Active Low | Open-drain | 700 | 50 | Watchdog Timer | 3-B |

POWER MANAGEMENT – Voltage Detectors

| Part # | Vcc Range (V) | Operating Temperature Range (°C) | Nominal Reset Voltage (V) | Reset Type | Output | Minimum Reset Pulse Width (ms) | Typical Supply Current (µA) | Features |
|--------|---------------|----------------------------------|--|------------|------------------------------|--------------------------------|-----------------------------|--------------|
| 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 | |
| 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 | |
| TC51 | 0.7 to 10 | -40 to +85 | 3.0, 2.7, 2.2 | Active Low | Open-drain | 50 | 1 | Reset delay |
| TC52 | 1.5 to 10 | -40 to +85 | 4.5/2.7, 3.0/2.7 | Active Low | Open-drain | — | 2 | Dual channel |
| TC53 | 1.5 to 10 | -40 to +85 | 2.9, 2.7, 2.2 | Active Low | CMOS Push-Pull or Open-drain | — | 1 | |
| 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 | |

POWER MANAGEMENT – Power MOSFET Drivers

| Part # | Configuration | Operating Temperature Range (°C) | Peak Output Current (A) | Output Resistance (RH/RL) (Max. Ω @ 25°C) | Max. Supply Voltage (V) | Input/Output Delay (td1, td2) ⁽¹⁾ (ns) | |
|---|-----------------------|----------------------------------|-------------------------|---|-------------------------|---|-----|
| 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-B |
| TC1410N | Single, Non-inverting | -40 to +85 | 0.5 | 22/22 | 16 | 30/30 | 8-B |
| TC1411 | Single, Inverting | -40 to +85 | 1 | 11/11 | 16 | 30/30 | 8-B |
| TC1411N | Single, Non-inverting | -40 to +85 | 1 | 11/11 | 16 | 30/30 | 8-B |
| TC1426 | Dual, Inverting | 0 to +70 | 1.2 | 18/18 | 16 | 75/75 | 8-B |
| TC1427 | Dual, Non-inverting | 0 to +70 | 1.2 | 18/18 | 16 | 75/75 | 8-B |

NOTE 1: *td1 = delay time from input low-to-high transition to output transition. td2 = delay time from input high-to-low transition to output transition.

Analog/Interface Family Products

POWER MANAGEMENT – Power MOSFET Drivers

| Part # | Configuration | Operating Temperature Range (°C) | Peak Output Current (A) | Output Resistance (RH/RL) (Max. Ω @ 25°C) | Max. Supply Voltage (V) | Input/Output Delay (td1, td2) ⁽¹⁾ (ns) | |
|---|--|----------------------------------|-------------------------|---|-------------------------|--|------|
| Low-Side Drivers, 0.5A to 1.2A Peak Output Current (continued) | | | | | | | |
| TC1428 | Dual, Inverting and Non-inverting | 0 to +70 | 1.2 | 18/18 | 16 | 75/75 | 8-F |
| TC4467 | Quad, Inverting | -40 to +85 | 1.2 | 15/15 | 18 | 40/40 | 14-F |
| TC4468 | Quad, Non-inverting | -40 to +85 | 1.2 | 15/15 | 18 | 40/40 | 14-F |
| TC4469 | Quad, Non-inverting | -40 to +85 | 1.2 | 15/15 | 18 | 40/40 | 14-F |
| 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-F |
| TC4426A | Dual, Inverting | -40 to +125 | 1.5 | 9/9 | 18 | 30/30 | 8-F |
| TC4427A | Dual, Non-inverting | -40 to +125 | 1.5 | 9/9 | 18 | 30/30 | 8-F |
| TC4428A | Dual, Inverting and Non-inverting | -40 to +125 | 1.5 | 9/9 | 18 | 30/30 | 8-F |
| TC4426 | Dual, Inverting | -40 to +125 | 1.5 | 10/10 | 18 | 20/40 | 8-F |
| TC4427 | Dual, Non-inverting | -40 to +125 | 1.5 | 10/10 | 18 | 20/40 | 8-F |
| TC4428 | Dual, Inverting and Non-inverting | -40 to +125 | 1.5 | 10/10 | 18 | 20/40 | 8-F |
| TC426 | Dual, Inverting | -40 to +85 | 1.5 | 15/10 | 18 | 50/75 | 8-F |
| TC427 | Dual, Non-inverting | -40 to +85 | 1.5 | 15/10 | 18 | 50/75 | 8-F |
| TC428 | Dual, Inverting and Non-inverting | -40 to +85 | 1.5 | 15/10 | 18 | 50/75 | 8-F |
| TC4404 | Dual, Inverting | -40 to +85 | 1.5 | 10/10 | 18 | 15/32 | 8-F |
| TC4405 | Dual, Non-inverting | -40 to +85 | 1.5 | 10/10 | 18 | 15/32 | 8-F |
| Low-Side Drivers, 2.0A to 9.0A Peak Output Current | | | | | | | |
| TC1412 | Single, Inverting | -40 to +85 | 2 | 6/6 | 16 | 35/35 | 8-F |
| TC1412N | Single, Non-inverting | -40 to +85 | 2 | 6/6 | 16 | 35/35 | 8-F |
| TC1413 | Single, Inverting | -40 to +85 | 3 | 4/4 | 16 | 35/35 | 8-F |
| TC1413N | Single, Non-inverting | -40 to +85 | 3 | 4/4 | 16 | 35/35 | 8-F |
| TC4423 | Dual, Inverting | -40 to +125 | 3 | 5/5 | 18 | 33/38 | 8-F |
| TC4424 | Dual, Non-inverting | -40 to +125 | 3 | 5/5 | 18 | 33/38 | 8-F |
| TC4425 | Dual, Inverting and Non-inverting | -40 to +125 | 3 | 5/5 | 18 | 33/38 | 8-F |
| TC429 | Single, Inverting | -40 to +85 | 6 | 2.5/2.5 | 18 | 53/60 | 8-F |
| TC4420 | Single, Non-inverting | -40 to +125 | 6 | 2.8/2.5 | 18 | 55/55 | 8-F |
| TC4429 | Single, Inverting | -40 to +125 | 6 | 2.8/2.5 | 18 | 55/55 | 8-F |
| TC4421 | Single, Inverting | -40 to +125 | 9 | 1.4 (typ)/1.7 | 18 | 30/33 | 8-F |
| TC4422 | Single, Non-inverting | -40 to +125 | 9 | 1.4 (typ)/1.7 | 18 | 30/33 | 8-F |

NOTE 1: *td1 = delay time from input low-to-high transition to output transition. td2 = 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 (RH/RL) (Max. Ω @ 25°C) | Max. Supply Voltage (V) | Input/Output Delay (td1, td2) ⁽¹⁾ (ns) | |
|-----------------------------------|-----------------------|----------------------------------|-------------------------|--|-------------------------|---|----|
| High-Side/Low-Side Drivers | | | | | | | |
| TC4626 | Single, Inverting | -40 to +85 | 1.5 | 15/10 | 6 | 35/45 | 8- |
| TC4627 | Single, Non-inverting | -40 to +85 | 1.5 | 15/10 | 6 | 35/45 | 8- |
| TC4431 | Single, Inverting | -40 to +85 | 1.5 | 10/10 | 30 | 62/78 | 8- |
| TC4432 | Single, Non-inverting | -40 to +85 | 1.5 | 10/10 | 30 | 62/78 | 8- |

NOTE 1: *td1 = delay time from input low-to-high transition to output transition. td2 = 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 |
|----------|--------|-------------------|------------|---------------|-----------------------------|-------------|--|
| MCP73826 | Linear | Li Ion/Li Polymer | 1 | 4.5 to 5.5 | ± 1.0 | Ext | Small size |
| MCP73827 | Linear | Li Ion/Li Polymer | 1 | 4.5 to 5.5 | ± 1.0 | Ext | Mode indicator, Charge Current monitor |
| MCP73828 | Linear | Li Ion/Li Polymer | 1 | 4.5 to 5.5 | ± 1.0 | Ext | Temperature monitor |
| MCP73841 | Linear | Li Ion/Li Polymer | 1 | 4.5 to 12 | ± 0.5 | Ext | Safety charge timers, Temperature monitor |
| MCP73842 | Linear | Li Ion/Li Polymer | 2 | 8.7 to 12 | ± 0.5 | Ext | Safety charge timers, Temperature monitor |
| MCP73843 | Linear | Li Ion/Li Polymer | 1 | 4.5 to 12 | ± 0.5 | Ext | Safety charge timers |
| MCP73844 | Linear | Li Ion/Li Polymer | 2 | 8.7 to 12 | ± 0.5 | Ext | Safety charge timers |
| MCP73861 | Linear | Li Ion/Li Polymer | 1 | 4.5 to 12 | ± 0.5 | Int | Safety charge timers, Temperature monitor, T |
| MCP73862 | Linear | Li Ion/Li Polymer | 2 | 8.7 to 12 | ± 0.5 | Int | Safety charge timers, Temperature monitor, T |

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 | Applica |
|----------|-------------------|---------------------------------------|---------------------------------|------------|------------|------------|-------------|----------------------|
| MCP18480 | 1 | -0.3 to +15.0 | -40 to +85 | Adjustable | Adjustable | Adjustable | Ext | -48V Telecom/Datacom |

LINEAR – Op Amps

| Part # | # per Package | GBWP | Iq Typical (μ A) | Vos Max (mV) | Operating Voltage (V) | Temp. Range (°C) | Features |
|--------|---------------|--------|-----------------------|--------------|-----------------------|------------------|---------------|
| TC1034 | 1 | 90 kHz | 6 | 1.5 | 1.8 to 5.5 | -40 to +85 | |
| TC1035 | 1 | 90 kHz | 6 | 1.5 | 1.8 to 5.5 | -40 to +85 | Shutdown pin |
| TC1029 | 2 | 90 kHz | 6 | 1.5 | 1.8 to 5.5 | -40 to +85 | |
| TC1030 | 4 | 90 kHz | 5 | 1.5 | 1.8 to 5.5 | -40 to +85 | Shutdown pins |

NOTE: All TC10XX Op Amps have rail-to-rail inputs and outputs.

Analog/Interface Family Products

| LINEAR – Op Amps | | | | | | | |
|------------------|---------------|---------|-----------------------------|--------------------------|-----------------------|------------------|--|
| Part # | # per Package | GBWP | I _q Typical (μA) | V _{os} Max (mV) | Operating Voltage (V) | Temp. Range (°C) | Features |
| MCP6041 | 1 | 14 kHz | 0.6 | 3 | 1.4 to 5.5 | -40 to +85 | Rail-to-Rail Input/Output |
| MCP6042 | 2 | 14 kHz | 0.6 | 3 | 1.4 to 5.5 | -40 to +85 | Rail-to-Rail Input/Output |
| MCP6043 | 1 | 14 kHz | 0.6 | 3 | 1.4 to 5.5 | -40 to +85 | Rail-to-Rail Input/Output, Chip Select |
| MCP6044 | 4 | 14 kHz | 0.6 | 3 | 1.4 to 5.5 | -40 to +85 | Rail-to-Rail Input/Output |
| MCP6141 | 1 | 100 kHz | 0.6 | 3 | 1.4 to 5.5 | -40 to +85 | Rail-to-Rail Input/Output, G>10 stable |
| MCP6142 | 2 | 100 kHz | 0.6 | 3 | 1.4 to 5.5 | -40 to +85 | Rail-to-Rail Input/Output, G>10 stable |
| MCP6143 | 1 | 100 kHz | 0.6 | 3 | 1.4 to 5.5 | -40 to +85 | Rail-to-Rail Input/Output, G>10 stable, Chip Select |
| MCP6144 | 4 | 100 kHz | 0.6 | 3 | 1.4 to 5.5 | -40 to +85 | Rail-to-Rail Input/Output, G>10 stable |
| MCP606 | 1 | 155 kHz | 19 | 0.25 | 2.5 to 5.5 | -40 to +85 | Rail-to-Rail Output |
| MCP607 | 2 | 155 kHz | 19 | 0.25 | 2.5 to 5.5 | -40 to +85 | Rail-to-Rail Output |
| MCP608 | 1 | 155 kHz | 19 | 0.25 | 2.5 to 5.5 | -40 to +85 | Rail-to-Rail Output, Chip Select |
| MCP609 | 4 | 155 kHz | 19 | 0.25 | 2.5 to 5.5 | -40 to +85 | Rail-to-Rail Output |
| MCP616 | 1 | 190 kHz | 19 | 0.15 | 2.3 to 5.5 | -40 to +85 | Rail-to-Rail Output, PNP Input |
| MCP617 | 2 | 190 kHz | 19 | 0.15 | 2.3 to 5.5 | -40 to +85 | Rail-to-Rail Output, PNP |
| MCP618 | 1 | 190 kHz | 19 | 0.15 | 2.3 to 5.5 | -40 to +85 | Rail-to-Rail Output, Chip Select, PNP Input |
| MCP619 | 4 | 190 kHz | 19 | 0.15 | 2.3 to 5.5 | -40 to +85 | Rail-to-Rail Output, PNP Input |
| MCP6231 | 1 | 300 kHz | 20 | 7 | 1.8 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output |
| MCP6232 | 2 | 300 kHz | 20 | 7 | 1.8 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output |
| MCP6241 | 1 | 650 kHz | 50 | 7 | 1.8 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output |
| MCP6242 | 2 | 650 kHz | 50 | 7 | 1.8 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output |
| MCP6001 | 1 | 1 MHz | 140 | 7 | 1.8 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output |
| MCP6002 | 2 | 1 MHz | 140 | 7 | 1.8 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output |
| MCP6004 | 4 | 1 MHz | 140 | 7 | 1.8 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output |
| MCP6271 | 1 | 2 MHz | 170 | 3 | 2.0 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output |
| MCP6272 | 2 | 2 MHz | 170 | 3 | 2.0 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output |
| MCP6273 | 1 | 2 MHz | 170 | 3 | 2.0 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output, Chip Select |
| MCP6274 | 4 | 2 MHz | 170 | 3 | 2.0 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output |
| MCP6275 | 2 | 2 MHz | 150 | 3 | 2.0 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output, Dual connected, Chip Select |
| MCP601 | 1 | 2.8 MHz | 230 | 2 | 2.7 to 5.5 | -40 to +125 | Rail-to-Rail Output |

NOTE: All TC10XX Op Amps have rail-to-rail inputs and outputs.

LINEAR – Op Amps

| Part # | # per Package | GBWP | Iq Typical (µA) | Vos Max (mV) | Operating Voltage (V) | Temp. Range (°C) | Features |
|---------|---------------|---------|-----------------|--------------|-----------------------|------------------|--|
| MCP602 | 2 | 2.8 MHz | 230 | 2 | 2.7 to 5.5 | -40 to +125 | Rail-to-Rail Output |
| MCP603 | 1 | 2.8 MHz | 230 | 2 | 2.7 to 5.5 | -40 to +125 | Rail-to-Rail Output, Chip Select |
| MCP604 | 4 | 2.8 MHz | 230 | 2 | 2.7 to 5.5 | -40 to +125 | Rail-to-Rail Output |
| MCP6281 | 1 | 5 MHz | 445 | 3 | 2.2 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output |
| MCP6282 | 2 | 5 MHz | 445 | 3 | 2.2 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output |
| MCP6283 | 1 | 5 MHz | 445 | 3 | 2.2 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output, Chip Select |
| MCP6284 | 4 | 5 MHz | 445 | 3 | 2.2 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output |
| MCP6285 | 2 | 5 MHz | 400 | 3 | 2.2 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output, Dual connected, Chip Select |
| MCP6291 | 1 | 10 MHz | 1000 | 3 | 2.4 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output |
| MCP6292 | 2 | 10 MHz | 1000 | 3 | 2.4 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output |
| MCP6293 | 1 | 10 MHz | 1000 | 3 | 2.4 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output, Chip Select |
| MCP6294 | 4 | 10 MHz | 1000 | 3 | 2.4 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output |
| MCP6295 | 2 | 10 MHz | 1100 | 3 | 2.4 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output, Dual connected, Chip Select |
| MCP6021 | 1 | 10 MHz | 1000 | 0.5 | 2.5 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output, 1/2 VCC VREF |
| MCP6022 | 2 | 10 MHz | 1000 | 0.5 | 2.5 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output |
| MCP6023 | 1 | 10 MHz | 1000 | 0.5 | 2.5 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output, Chip Select |
| MCP6024 | 4 | 10 MHz | 1000 | 0.5 | 2.5 to 5.5 | -40 to +125 | Rail-to-Rail Input/Output |

NOTE: All TC10XX Op Amps have rail-to-rail inputs and outputs.

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 |
|---------------------------|---------------|---------|-------------|------------------|-----------------------|-----------------------|------------------|------------------------------------|
| Chopper Stabilized | | | | | | | | |
| TC7650 | 1 | 2.0 MHz | 3.5 | 5 | 0.05 | 4.5 to 16 | 0 to 70 | Single and Split Supply |
| TC7652 | 1 | 0.4 MHz | 3 | 5 | 0.05 | 5 to 16 | 0 to 70 | Single and Split Supply, Low Noise |
| Auto-Zero | | | | | | | | |
| TC913 | 2 | 1.5 MHz | 1.1 | 15 | 0.15 | 6.5 to 16 | 0 to 70 | Single and Split Supply |

Analog/Interface Family Products

LINEAR – Programmable Gain Amplifiers (PGA)

| Part # | Channels | -3dB BW (MHz) | Iq Typ. | Vos (μ V) | Operating Voltage (V) | Temp. Range ($^{\circ}$ C) | Features | |
|---------|----------|---------------|---------|----------------|-----------------------|-----------------------------|--------------------------------------|---|
| MCP6S21 | 1 | 2 to 12 | 1.1 mA | 275 | 2.5 to 5.5 | -40 to +85 | SPI, 8 Gain Steps, Software Shutdown | 8 |
| MCP6S22 | 2 | 2 to 12 | 1.1 mA | 275 | 2.5 to 5.5 | -40 to +85 | SPI, 8 Gain Steps, Software Shutdown | 8 |
| MCP6S26 | 6 | 2 to 12 | 1.1 mA | 275 | 2.5 to 5.5 | -40 to +85 | SPI, 8 Gain Steps, Software Shutdown | 1 |
| MCP6S28 | 8 | 2 to 12 | 1.1 mA | 275 | 2.5 to 5.5 | -40 to +85 | SPI, 8 Gain Steps, Software Shutdown | 1 |

LINEAR – Integrated Devices

| Part # | # of Op Amps per Package | # of Comparators per Package | Iq Typical (μ A) | VREF (V) | Operating Voltage (V) | Temp. Range ($^{\circ}$ C) | Features | |
|---------|--------------------------|------------------------------|-----------------------|----------|-----------------------|-----------------------------|-----------------------------|---|
| TC1026C | 1 | 1 | 12 | 1.2 | 1.8 to 5.5 | -40 to +85 | On-board VREF | 8 |
| TC1043C | 2 | 2 | 16 | 1.2 | 1.8 to 5.5 | -40 to +85 | On-board VREF, Shutdown pin | 1 |

LINEAR – Comparators

| Part # | # per Package | VREF (V) | Typical Propagation Delay (μ s) | Iq Typical (μ A) | Vos Max (mV) | Operating Voltage (V) | Temp. Range ($^{\circ}$ C) | Features | |
|---------|---------------|----------|--------------------------------------|-----------------------|--------------|-----------------------|-----------------------------|--|--|
| TC1025 | 2 | — | 4 | 8 | 5 | 1.8 to 5.5 | -40 to +85 | | |
| TC1027 | 4 | 1.2 | 4 | 18 | 5 | 1.8 to 5.5 | -40 to +85 | On-board VREF | |
| TC1028 | 2 | 1.2 | 4 | 10 | 5 | 1.8 to 5.5 | -40 to +85 | Shutdown pins, On-board VREF | |
| TC1031 | 1 | 1.2 | 4 | 6 | 5 | 1.8 to 5.5 | -40 to +85 | On-board VREF, Programmable hysteresis, Shutdown pin | |
| TC1037 | 1 | — | 4 | 4 | 5 | 1.8 to 5.5 | -40 to +85 | | |
| TC1038 | 1 | — | 4 | 4 | 5 | 1.8 to 5.5 | -40 to +85 | Shutdown pin | |
| TC1039 | 1 | 1.2 | 4 | 6 | 5 | 1.8 to 5.5 | -40 to +85 | On-board VREF | |
| TC1040 | 2 | 1.2 | 4 | 10 | 5 | 1.8 to 5.5 | -40 to +85 | On-board VREF, Shutdown pin | |
| TC1041 | 2 | 1.2 | 4 | 10 | 5 | 1.8 to 5.5 | -40 to +85 | On-board VREF, Programmable hysteresis | |
| MCP6541 | 1 | — | 4 | 1 | 5 | 1.6 to 5.5 | -40 to +85 | Push-Pull, Rail-to-Rail Input/Output | |
| MCP6542 | 2 | — | 4 | 1 | 5 | 1.6 to 5.5 | -40 to +85 | Push-Pull, Rail-to-Rail Input/Output | |
| MCP6543 | 1 | — | 4 | 1 | 5 | 1.6 to 5.5 | -40 to +85 | Push-Pull, Rail-to-Rail Input/Output, Chip Select | |
| MCP6544 | 4 | — | 4 | 1 | 5 | 1.6 to 5.5 | -40 to +85 | Push-Pull, Rail-to-Rail Input/Output | |
| MCP6546 | 1 | — | 4 | 1 | 5 | 1.6 to 5.5 | -40 to +85 | Open-drain, 9V, Rail-to-Rail Input/Output | |
| MCP6547 | 2 | — | 4 | 1 | 5 | 1.6 to 5.5 | -40 to +85 | Open-drain, 9V, Rail-to-Rail Input/Output | |
| MCP6548 | 1 | — | 4 | 1 | 5 | 1.6 to 5.5 | -40 to +85 | Open-drain, 9V, Rail-to-Rail Input/Output, Chip Select | |
| MCP6549 | 4 | — | 4 | 1 | 5 | 1.6 to 5.5 | -40 to +85 | Open -drain, 9V, Rail-to-Rail Input/Output | |

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 (μ A) | Max. INL | Temp. Range ($^{\circ}$ C) | |
|---------|-------------------|--------------------------------------|---------------------|--------------|------------------|-------------------------|--------------------------------|-------------|-----------------------------|--------|
| MCP3021 | 10 | 22 | 1 | Single-ended | I ² C | 2.7 to 5.5 | 250 | +1 LSB | -40 to +125 | 5-Pin |
| MCP3001 | 10 | 200 | 1 | Single-ended | SPI | 2.7 to 5.5 | 500 | \pm 1 LSB | -40 to +85 | 8-Pin |
| MCP3002 | 10 | 200 | 2 | Single-ended | SPI | 2.7 to 5.5 | 650 | \pm 1 LSB | -40 to +85 | 8-Pin |
| MCP3004 | 10 | 200 | 4 | Single-ended | SPI | 2.7 to 5.5 | 550 | \pm 1 LSB | -40 to +85 | 14-Pin |
| MCP3008 | 10 | 200 | 8 | Single-ended | SPI | 2.7 to 5.5 | 550 | \pm 1 LSB | -40 to +85 | 16-Pin |
| MCP3221 | 12 | 22 | 1 | Single-ended | I ² C | 2.7 to 5.5 | 250 | \pm 2 LSB | -40 to +125 | 5-Pin |
| MCP3201 | 12 | 100 | 1 | Single-ended | SPI | 2.7 to 5.5 | 400 | \pm 1 LSB | -40 to +85 | 8-Pin |
| MCP3202 | 12 | 100 | 2 | Single-ended | SPI | 2.7 to 5.5 | 550 | \pm 1 LSB | -40 to +85 | 8-Pin |
| MCP3204 | 12 | 100 | 4 | Single-ended | SPI | 2.7 to 5.5 | 400 | \pm 1 LSB | -40 to +85 | 14-Pin |
| MCP3208 | 12 | 100 | 8 | Single-ended | SPI | 2.7 to 5.5 | 400 | \pm 1 LSB | -40 to +85 | 16-Pin |
| MCP3301 | 13 | 100 | 1 | Differential | SPI | 2.7 to 5.5 | 450 | \pm 1 LSB | -40 to +85 | 8-Pin |
| MCP3302 | 13 | 100 | 2 | Differential | SPI | 2.7 to 5.5 | 450 | \pm 1 LSB | -40 to +85 | 14-Pin |
| MCP3304 | 13 | 100 | 4 | Differential | SPI | 2.7 to 5.5 | 450 | \pm 1 LSB | -40 to +85 | 16-Pin |

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 (μ A) | Typical INL (%FSR) | Temp. Range ($^{\circ}$ C) | Features |
|-----------------------|-------------------|-------------------------------------|------------------------|-----------|--------------------------|-----------------------------------|--------------------|-----------------------------|---------------------------------------|
| TC3400 ⁽¹⁾ | 10 to 16 | >400 | 1 Diff | 2-Wire | 1.8 to 5.5 | 260 | 0.0038 | 0 to +85 | |
| 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, F monitor |
| TC3402 ⁽¹⁾ | 10 to 16 | >400 | 4 Diff | 2-Wire | 1.8 to 5.5 | 250 | 0.0038 | 0 to +85 | |
| 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 |

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 ($^{\circ}$ C) | Features |
|--------|------------------------|--|---------------|------------------------|----------------|----------------|-----------------------------|--|
| TC500 | \pm 4.5 to \pm 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 |
| TC500A | \pm 4.5 to \pm 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 |
| 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 |

Analog/Interface Family Products

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 |
|---------|--------------------|--|-----------------------|------------------------|----------------|-------------------------|------------------|---|
| 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 |
| TC520A | +4.5 to +5.5 | — | — | — | — | Serial port | 0 to +70 | Optional serial interface adapter for TC500/500A/510/514 |
| 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 |
| 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 |
| 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 |
| 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 |

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 |
|----------|-------------|--------------------|--|---------------------|---------------------|----------------|----------------|------------------|--|
| 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 |
| 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) |
| 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 |
| 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 |
| 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 |

MIXED SIGNAL – Display A/D Converters

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

NOTE 1: This product is on "End-of-Life" status.

MIXED SIGNAL – Display A/D Converters

| Part # | Display Type | Supply Voltage (V) | Resolution (Digits) | Resolution (Counts) | Power (mW) | Temp. Range (°C) | Features |
|---------|--------------|--------------------|---------------------|---------------------|------------|------------------|--------------------------------|
| TC7117 | LED | ±5 | 3½ | ±2,000 | 10 | -25 to +85 | Hold function |
| TC7117A | LED | ±5 | 3½ | ±2,000 | 10 | -25 to +85 | Hold function |
| TC7126 | LCD | 9 | 3½ | ±2,000 | 0.5 | -25 to +85 | Low-power TC7106 |
| TC7126A | LCD | 9 | 3½ | ±2,000 | 0.5 | -25 to +85 | Low-power TC7106 |
| TC7129 | LCD | 9 | 4½ | ±20,000 | 4.5 | 0 to +70 | Lowest noise ±3 mV sensitivity |
| TC7136 | LCD | 9 | 3½ | ±2,000 | 0.5 | 0 to +70 | Low-power/noise TC7106 |
| TC7136A | LCD | 9 | 3½ | ±2,000 | 0.5 | 0 to +70 | Low-power/noise TC7106 |

NOTE 1: This product is on “End-of-Life” status.

MIXED SIGNAL – Digital Potentiometers

| Part # | Number of Taps | Number per Package | Interface | Resistance (ohms) | INL (max) | DNL (max) | Temp. Range (°C) | |
|----------|----------------|--------------------|-----------|-------------------|-----------|-----------|------------------|------------|
| MCP41010 | 256 | 1 | SPI | 10K | ±1 LSB | ±1 LSB | -40 to +85 | 8-Pin PDIP |
| MCP41050 | 256 | 1 | SPI | 50K | ±1 LSB | ±1 LSB | -40 to +85 | 8-Pin PDIP |
| MCP41100 | 256 | 1 | SPI | 100K | ±1 LSB | ±1 LSB | -40 to +85 | 8-Pin PDIP |
| MCP42010 | 256 | 2 | SPI | 10K | ±1 LSB | ±1 LSB | -40 to +85 | 14-Pin PDI |
| MCP42050 | 256 | 2 | SPI | 50K | ±1 LSB | ±1 LSB | -40 to +85 | 14-Pin PDI |
| MCP42100 | 256 | 2 | SPI | 100K | ±1 LSB | ±1 LSB | -40 to +85 | 14-Pin PDI |

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

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

Analog/Interface Family Products

MIXED SIGNAL – System D/A Converters

| Part # | Resolution (Bits) | DACs per Package | Interface | VREF | Output Settling Time (μ s) | DNL (LSB) | Typical Standby Current (μ A) | Typical Operating Current (μ A) | Temp. Range ($^{\circ}$ C) |
|---------|-------------------|------------------|-----------|------|---------------------------------|-----------|------------------------------------|--------------------------------------|-----------------------------|
| TC1320 | 8 | 1 | SMBus | Ext | 10 | ± 0.8 | 0.1 | 350 | -40 to +85 |
| TC1321 | 10 | 1 | SMBus | Ext | 10 | ± 2 | 0.1 | 350 | -40 to +85 |
| MCP4921 | 12 | 1 | SPI™ | Ext. | 8 | 1 | 1 | 450 | -40 to +125 |
| MCP4922 | 12 | 2 | SPI | Ext | 8 | 1 | 1 | 450 | -40 to +125 |

NOTE: The analog output is voltage.

INTERFACE – Controller Area Network (CAN) Products

| Part # | Operating Voltage (V) | Temperature Range ($^{\circ}$ C) | Tx Buffers | Rx Buffers | Filters | Masks | Interrupt Output | Unique Features |
|------------------------|-----------------------|-----------------------------------|------------|------------|---------|-------|------------------|---|
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |

NOTE 1: Not recommended for new designs.

INTERFACE – Infrared Products

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

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 S |
|--------|--------------------------------------|-------------------------|----------------------------------|--------------------------|--------------------------|---------------|-------|
| MCP201 | LIN Transceiver with integrated VREG | 4.75 to 5.25 | -40 to +125 | 50 ⁽¹⁾ | 6.0 to 18 ⁽²⁾ | 20 Kbaud | Re |

NOTE 1: Output current can be increased with external pass transistor.
2: Can withstand 40V load dump.

INTERFACE – Serial Peripherals

| Part # | Description | Operating Voltage (V) | Operating Temperature Range (°C) | Bus Type | Max. Bus Frequency (kHz) | Features |
|----------|--------------------------|-----------------------|----------------------------------|-------------------|--------------------------|--|
| MCP23008 | 8-bit I/O Port Expander | 1.8 to 5.5 | -40 to +85 | I ² C™ | 3400 | 3 HW address pins, HW interrupt, 25 mA source/sink capability per I/O |
| 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 |
| MCP23016 | 16-bit I/O Port Expander | 2.0 to 5.5 | -40 to +85 | I ² C™ | 400 | 3 H/W address inputs, HW interrupt, 25 mA source/sink capability per I/O |

**Memory
Family Products**

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 |
|---|------------|------------------------|-------------|------------------|-----------------------|---------|----------------------|--|
| 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 | | | | | | | | |
| 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 93Cx6B parts are x16. Devices in this family include POR (VDD detect) feature. Use 93C76C or 93C86C devices for P, SN, ST or MS packages. Use 93C76C or 93C86C devices for P, SN, ST or MS packages. Use 93C76C or 93C86C devices for P, SN, ST or MS packages. |
| 93C46B | 1M | 1 Kbits (x16) | 2 ms | 2 MHz | 4.5 to 5.5 | C, I, E | 5 µA | |
| 93C56A | 1M | 2 Kbits (x8) | 2 ms | 2 MHz | 4.5 to 5.5 | I, E | 5 µA | |
| 93C56B | 1M | 2 Kbits (x16) | 2 ms | 2 MHz | 4.5 to 5.5 | I, E | 5 µA | |
| 93C66A | 1M | 4 Kbits (x8) | 2 ms | 2 MHz | 4.5 to 5.5 | I, E | 5 µA | |
| 93C66B | 1M | 4 Kbits (x16) | 2 ms | 2 MHz | 4.5 to 5.5 | I, E | 5 µA | |
| 93C76A | 1M | 8 Kbits (x8) | 2 ms | 3 MHz | 4.5 to 5.5 | I, E | 5 µA | |
| 93C76B | 1M | 8 Kbits (x16) | 2 ms | 3 MHz | 4.5 to 5.5 | I, E | 5 µA | |
| 93C86A | 1M | 16 Kbits (x8) | 2 ms | 3 MHz | 4.5 to 5.5 | I, E | 5 µA | |
| 93C86B | 1M | 16 Kbits (x16) | 2 ms | 3 MHz | 4.5 to 5.5 | I, E | 5 µA | |
| 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 93LCx6B parts are x16. Use 93LC76C or 93LC86C devices for P, SN, ST or MS packages. Use 93LC76C or 93LC86C devices for P, SN, ST or MS packages. Use 93LC76C or 93LC86C devices for P, SN, ST or MS packages. Use 93LC76C or 93LC86C devices for P, SN, ST or MS packages. |
| 93LC46B | 1M | 1 Kbits (x16) | 6 ms | 2 MHz | 2.5 to 5.5 | C, I, E | 5 µA | |
| 93LC56A | 1M | 2 Kbits (x8) | 6 ms | 2 MHz | 2.5 to 5.5 | C, I, E | 5 µA | |
| 93LC56B | 1M | 2 Kbits (x16) | 6 ms | 2 MHz | 2.5 to 5.5 | C, I, E | 5 µA | |
| 93LC66A | 1M | 4 Kbits (x8) | 6 ms | 2 MHz | 2.5 to 5.5 | C, I, E | 5 µA | |
| 93LC66B | 1M | 4 Kbits (x16) | 6 ms | 2 MHz | 2.5 to 5.5 | C, I, E | 5 µA | |
| 93LC76A | 1M | 8 Kbits (x8) | 6 ms | 3 MHz | 2.5 to 5.5 | I, E | 5 µA | |
| 93LC76B | 1M | 8 Kbits (x16) | 6 ms | 3 MHz | 2.5 to 5.5 | I, E | 5 µA | |
| 93LC86A | 1M | 16 Kbits (x8) | 6 ms | 3 MHz | 2.5 to 5.5 | I, E | 5 µA | |
| 93LC86B | 1M | 16 Kbits (x16) | 6 ms | 3 MHz | 2.5 to 5.5 | I, E | 5 µA | |
| 93AA46A | 1M | 1 Kbits (x8) | 6 ms | 2 MHz | 1.8 to 5.5 | I | 5 µA | 93AAx6A and 93LCx6B devices have no ORG pin. 93AAx6A parts have 93Cx6B parts are x16. Use 93AA76C or 93AA86C devices for P, SN, ST or MS packages. Use 93AA76C or 93AA86C devices for P, SN, ST or MS packages. Use 93AA76C or 93AA86C devices for P, SN, ST or MS packages. Use 93AA76C or 93AA86C devices for P, SN, ST or MS packages. |
| 93AA46B | 1M | 1 Kbits (x16) | 6 ms | 2 MHz | 1.8 to 5.5 | I | 5 µA | |
| 93AA56A | 1M | 2 Kbits (x8) | 6 ms | 2 MHz | 1.8 to 5.5 | I | 5 µA | |
| 93AA56B | 1M | 2 Kbits (x16) | 6 ms | 2 MHz | 1.8 to 5.5 | I | 5 µA | |
| 93AA66A | 1M | 4 Kbits (x8) | 6 ms | 2 MHz | 1.8 to 5.5 | I | 5 µA | |
| 93AA66B | 1M | 4 Kbits (x16) | 6 ms | 2 MHz | 1.8 to 5.5 | I | 5 µA | |
| 93AA76A | 1M | 8 Kbits (x8) | 6 ms | 3 MHz | 1.8 to 5.5 | I | 5 µA | |
| 93AA76B | 1M | 8 Kbits (x16) | 6 ms | 3 MHz | 1.8 to 5.5 | I | 5 µA | |
| 93AA86A | 1M | 16 Kbits (x8) | 6 ms | 3 MHz | 1.8 to 5.5 | I | 5 µA | |
| 93AA86B | 1M | 16 Kbits (x16) | 6 ms | 3 MHz | 1.8 to 5.5 | I | 5 µA | |
| 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 this family include POR (VDD detect) feature. |
| 93C56C | 1M | 2 Kbits (x8 or x16) | 2 ms | 3 MHz | 4.5 to 5.5 | I, E | 5 µA | |
| 93C66C | 1M | 4 Kbits (x8 or x16) | 2 ms | 3 MHz | 4.5 to 5.5 | I, E | 5 µA | |
| 93C76C | 1M | 8 Kbits (x8 or x16) | 2 ms | 3 MHz | 4.5 to 5.5 | I, E | 5 µA | |
| 93C86C | 1M | 16 Kbits (x8 or x16) | 2 ms | 3 MHz | 4.5 to 5.5 | I, E | 5 µA | |
| 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 this family include POR (VDD detect) feature. |
| 93LC56C | 1M | 2 Kbits (x8 or x16) | 6 ms | 3 MHz | 2.5 to 5.5 | I, E | 5 µA | |
| 93LC66C | 1M | 4 Kbits (x8 or x16) | 6 ms | 3 MHz | 2.5 to 5.5 | I, E | 5 µA | |
| 93LC76C | 1M | 8 Kbits (x8 or x16) | 6 ms | 3 MHz | 2.5 to 5.5 | I, E | 5 µA | |
| 93LC86C | 1M | 16 Kbits (x8 or x16) | 6 ms | 3 MHz | 2.5 to 5.5 | I, E | 5 µA | |
| 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 this family include POR (VDD detect) feature. |
| 93AA56C | 1M | 2 Kbits (x8 or x16) | 6 ms | 3 MHz | 1.8 to 5.5 | I | 5 µA | |
| 93AA66C | 1M | 4 Kbits (x8 or x16) | 6 ms | 3 MHz | 1.8 to 5.5 | I | 5 µA | |
| 93AA76C | 1M | 8 Kbits (x8 or x16) | 6 ms | 3 MHz | 1.8 to 5.5 | I | 5 µA | |
| 93AA86C | 1M | 16 Kbits (x8 or x16) | 6 ms | 3 MHz | 1.8 to 5.5 | I | 5 µA | |

NOTE: All 93-series parts are available with Pb-free packages. Order with "G" suffix. Example: 93LC46BT-I/OTG. X/SN package code denotes rotated pinouts.

| Product | E/W Cycles | Density (Organization) | Write Speed | Max. Clock Frequency | Operating Voltage (V) | Temps | Unique Features |
|--|------------|------------------------|-------------|----------------------|-----------------------|---------|---|
| 2-Wire I²C™ Compatible Serial EEPROM Family – Self-timed write cycle and Page Write mode | | | | | | | |
| 24C00 | 1M | 128 bits (x8) | 4 ms | 400 kHz | 4.5 to 5.5 | C, I, E | 100 kHz operation for voltages from 1.8V to 4.5V. |
| 24LC00 | 1M | 128 bits (x8) | 4 ms | 400 kHz | 2.5 to 6.0 | C, I | |
| 24AA00 | 1M | 128 bits (x8) | 4 ms | 400 kHz | 1.8 to 6.0 | C, I | |
| 24C01C | 1M | 1 Kbits (x8) | 1 ms | 400 kHz | 4.5 to 5.5 | C, I, E | The 24C01C and 24C02C are for applications which require fast byte write temperature. Three address pins. |
| 24C02C | 1M | 2 Kbits (x8) | 1 ms | 400 kHz | 4.5 to 5.5 | C, I, E | |
| 24LC014 | 1M | 1 Kbit (x8) | 10 ms | 400 MHz | 2.5 to 5.5 | I | Three address pins. |
| 24AA014 | 1M | 1 Kbit (x8) | 10 ms | 400 MHz | 1.8 to 5.5 | I | |
| 24LC01B | 1M | 1 Kbits (x8) | 5 ms | 400 kHz | 2.5 to 5.5 | I, E | Hardware write protect. Schmitt trigger inputs. 2.5V operation @ extended temperatures. 100 kHz operation @ extended temperatures. B version on 2-wire devices designates that address pins A0, A1, A2 are |
| 24LC02B | 1M | 2 Kbits (x8) | 5 ms | 400 kHz | 2.5 to 5.5 | I, E | |
| 24LC04B | 1M | 4 Kbits (x8) | 5 ms | 400 kHz | 2.5 to 5.5 | I, E | |
| 24LC08B | 1M | 8 Kbits (x8) | 5 ms | 400 kHz | 2.5 to 5.5 | I, E | |
| 24LC16B | 1M | 16 Kbits (x8) | 5 ms | 400 kHz | 2.5 to 5.5 | I, E | |
| 24AA01 | 1M | 1 Kbits (x8) | 5 ms | 400 kHz | 1.8 to 5.5 | I | |
| 24AA02 | 1M | 2 Kbits (x8) | 5 ms | 400 kHz | 1.8 to 5.5 | I | Hardware write protect. Schmitt trigger inputs. 100 kHz operation for voltages from 1.8V to 2.5V. |
| 24AA04 | 1M | 4 Kbits (x8) | 5 ms | 400 kHz | 1.8 to 5.5 | I | |
| 24AA08 | 1M | 8 Kbits (x8) | 5 ms | 400 kHz | 1.8 to 5.5 | I | |
| 24AA16 | 1M | 16 Kbits (x8) | 5 ms | 400 kHz | 1.8 to 5.5 | I | |
| 24LC32A | 1M | 32 Kbits (x8) | 5 ms | 400 kHz | 2.5 to 5.5 | I, E | |
| 24AA32A | 1M | 32 Kbits (x8) | 5 ms | 400 kHz | 1.8 to 5.5 | I | 100 kHz operation for voltages from 1.8V to 2.5V. |
| 24LC64 | 1M | 64 Kbits (x8) | 5 ms | 400 kHz | 2.5 to 5.5 | I, E | 32-byte page. 100 kHz operation for voltages from 1.8V to 2.5V. |
| 24AA64 | 1M | 64 Kbits (x8) | 5 ms | 400 kHz | 1.8 to 5.5 | I | |
| 24LC65 | 1 M/10 M | 64 Kbits (x8) | 5 ms | 400 kHz | 2.5 to 5.5 | C, I | 8-byte page, 64-byte input buffer, high-endurance block, write protectable Smart Serial™ EEPROM. |
| 24AA65 | 1 M/10 M | 64 Kbits (x8) | 5 ms | 400 kHz | 1.8 to 5.5 | C | |
| 24C65 | 1 M/10 M | 64 Kbits (x8) | 5 ms | 400 kHz | 4.5 to 5.5 | C, I, E | |
| 24LC128 | 1M | 128 Kbits (x8) | 5 ms | 400 kHz | 2.5 to 5.5 | I, E | 64-byte page. 100 kHz operation for voltages from 1.8V to 2.5V. |
| 24AA128 | 1M | 128 Kbits (x8) | 5 ms | 400 kHz | 1.8 to 5.5 | I | |
| 24FC128 | 1M | 128 Kbits (x8) | 5 ms | 1 MHz | 2.5 to 5.5 | I | 400 kHz operation for voltages below 4.5V (24FC128). |
| 24LC256 | 1M | 256 Kbits (x8) | 5 ms | 400 kHz | 2.5 to 5.5 | I, E | 64-byte page. 100 kHz operation for voltages from 1.8V to 2.5V. |
| 24AA256 | 1M | 256 Kbits (x8) | 5 ms | 400 kHz | 1.8 to 5.5 | I | |
| 24FC256 | 1M | 256 Kbits (x8) | 5 ms | 1 MHz | 2.5 to 5.5 | I | |
| 24LC512 | 1M | 512 Kbits (x8) | 5 ms | 400 kHz | 2.5 to 5.5 | I, E | 128-byte page, cascadeable up to 8 devices (4 Mbits). 100 kHz operation for voltages from 1.8 to 2.5V. 400 kHz operation for voltages below 4.5V. (24FC512). |
| 24AA512 | 1M | 512 Kbits (x8) | 5 ms | 400 kHz | 1.8 to 5.5 | I | |
| 24FC512 | 1M | 512 Kbits (x8) | 5 ms | 1 MHz | 2.5 to 5.5 | I | |
| 24LC515 | 1M | 512 Kbits (x8) | 5 ms | 400 kHz | 2.5 to 5.5 | I | Cascadeable up to 4 devices (2 Mbits). 100 kHz operation for voltages from 1.8V to 2.5V. |
| 24AA515 | 1M | 512 Kbits (x8) | 5 ms | 400 kHz | 1.8 to 5.5 | I | |
| 24FC515 | 1M | 512 Kbits (x8) | 5 ms | 1 MHz | 2.5 to 5.5 | I | |

NOTE: All 24-series parts in this section are available with Pb-free packages. Order with "G" suffix. Example: 24LC01BT-I/OTG.

Memory Family Products

| Product | E/W Cycles | Density (Organization) | Write Speed | Max. Clock Frequency | Operating Voltage (V) | Temps | Unique Features |
|--|------------|------------------------|-------------|----------------------|-----------------------|-------|-----------------|
| 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 | |
| 24LC02SC | 1M | 2 Kbits (x8) | 5 ms | 400 kHz | 2.5 to 5.5 | C, I | |
| 24LC04SC | 1M | 4 Kbits (x8) | 5 ms | 400 kHz | 2.5 to 5.5 | C, I | |
| 24LC08SC | 1M | 8 Kbits (x8) | 5 ms | 400 kHz | 2.5 to 5.5 | C, I | |
| 24LC16SC | 1M | 16 Kbits (x8) | 5 ms | 400 kHz | 2.5 to 5.5 | C, I | |
| 24LC32ASC | 1M | 32 Kbits (x8) | 5 ms | 400 kHz | 2.5 to 5.5 | C, I | |
| 24LC64SC | 1M | 64 Kbits (x8) | 5 ms | 400 kHz | 2.5 to 5.5 | C, I | |
| 24LC128SC | 1M | 128 Kbits (x8) | 5 ms | 400 kHz | 2.5 to 5.5 | C, I | |
| 24LC256SC | 1M | 256 Kbits (x8) | 5 ms | 400 kHz | 2.5 to 5.5 | C, I | |
| 24LC512SC | 1M | 512 Kbits (x8) | 5 ms | 400 kHz | 2.5 to 5.5 | C, I | |
| 24AA01SC | 1M | 1 Kbits (x8) | 5 ms | 400 kHz | 1.8 to 5.5 | C | |
| 24AA02SC | 1M | 2 Kbits (x8) | 5 ms | 400 kHz | 1.8 to 5.5 | C | |
| 24AA04SC | 1M | 4 Kbits (x8) | 5 ms | 400 kHz | 1.8 to 5.5 | C | |
| 24AA08SC | 1M | 8 Kbits (x8) | 5 ms | 400 kHz | 1.8 to 5.5 | C | |
| 24AA16SC | 1M | 16 Kbits (x8) | 5 ms | 400 kHz | 1.8 to 5.5 | C | |
| 24AA32ASC | 1M | 32 Kbits (x8) | 5 ms | 400 kHz | 1.8 to 5.5 | C | |
| 24AA64SC | 1M | 64 Kbits (x8) | 5 ms | 400 kHz | 1.8 to 5.5 | C | |
| 24AA128SC | 1M | 128 Kbits (x8) | 5 ms | 400 kHz | 1.8 to 5.5 | C | |
| 24AA256SC | 1M | 256 Kbits (x8) | 5 ms | 400 kHz | 1.8 to 5.5 | C | |
| 24AA512SC | 1M | 512 Kbits (x8) | 5 ms | 400 kHz | 1.8 to 5.5 | C | |

| Product | E/W Cycles | Density (Organization) | Page Size | Write Speed | Max. Clock Frequency | Operating Voltage (V) | Temps | Unique Features |
|--|------------|------------------------|-----------|-------------|----------------------|-----------------------|-------|-----------------|
| 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 | |
| 25LC040 | 1M | 4 Kbits (x8) | 16B | 5 ms | 2 MHz | 2.5 to 5.5 | I | |
| 25AA040 | 1M | 4 Kbits (x8) | 16B | 5 ms | 1 MHz | 1.8 to 5.5 | I | |
| 25LC080A | 1M | 8 Kbits (x8) | 16B | 5 ms | 10 MHz | 2.5 to 5.5 | I, E | |
| 25AA080A | 1M | 8 Kbits (x8) | 16B | 5 ms | 10 MHz | 1.8 to 5.5 | I | |
| 25LC080B | 1M | 8 Kbits (x8) | 32B | 5 ms | 10 MHz | 2.5 to 5.5 | I, E | |
| 25AA080B | 1M | 8 Kbits (x8) | 32B | 5 ms | 10 MHz | 1.8 to 5.5 | I | |

NOTE: All 25-series products are available in Pb-free packages. Order with "G" suffix. Example: 25LC080AT-I/MSG. 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 |
|---|------------|------------------------|-----------|-------------|----------------------|-----------------------|-------|-----------------|
| 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. (cont) | | | | | | | | |
| 25LC160A | 1M | 16 Kbits (x8) | 16B | 5 ms | 10 MHz | 2.5 to 5.5 | I, E | |
| 25AA160A | 1M | 16 Kbits (x8) | 16B | 5 ms | 10 MHz | 1.8 to 5.5 | I | |
| 25LC160B | 1M | 16 Kbits (x8) | 32B | 5 ms | 10 MHz | 2.5 to 5.5 | I, E | |
| 25AA160B | 1M | 16 Kbits (x8) | 32B | 5 ms | 10 MHz | 1.8 to 5.5 | I | |
| 25C320 | 100K | 32 Kbits (x8) | 32B | 5 ms | 3 MHz | 4.5 to 5.5 | I, E | |
| 25LC320 | 1M | 32 Kbits (x8) | 32B | 5 ms | 2 MHz | 2.5 to 5.5 | I, E | |
| 25AA320 | 1M | 32 Kbits (x8) | 32B | 5 ms | 1 MHz | 1.8 to 5.5 | I | |
| 25LC640 | 1M | 64 Kbits (x8) | 32B | 5 ms | 3 MHz | 2.5 to 5.5 | I, E | |
| 25AA640 | 1M | 64 Kbits (x8) | 32B | 5 ms | 1 MHz | 1.8 to 5.5 | I | |

NOTE: All 25-series products are available in Pb-free packages. Order with "G" suffix. Example: 25LC080AT-I/MSG. X/ST package code denotes rotated pinout.

| Product | E/W Cycles | Density (Organization) | Write Speed | Max. Clock Frequency | Operating Voltage (V) | Temps | Unique Features |
|--|------------|------------------------|-------------|----------------------|-----------------------|-------|---|
| 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 monitor identification. Improved noise filter. Write-protect pin. Not recommended for new designs. Use 24LC21A or 24LCS21A. |
| 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. Recommended for new designs. Use 24LC21A or 24LCS21A. |
| 24LC21A | 1M | 1 Kbits (x8) | 10 ms | 400 kHz | 2.5 to 5.5 | C, I | Same as 24LC21 plus "return to DDC1" feature. |
| 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. |
| 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 includes "return to DDC1" feature and software-enabled write-protect pin. |
| 24LC024 | 1M | 2 Kbits (x8) | 10 ms | 400 kHz | 2.5 to 5.5 | C, I | Addressable, hardware write protection for DRAM modules and other applications. |
| 24LC025 | 1M | 2 Kbits (x8) | 10 ms | 400 kHz | 2.5 to 5.5 | C, I | Addressable. No write-protect. |
| 24AA52 | 1M | 2 Kbits (x8) | 10 ms | 400 kHz | 1.8 to 5.5 | I | Addressable, hardware write protection and software write-protect for lower half of the array. Designed for DIMM modules. |
| 24LCS52 | 1M | 2 Kbits (x8) | 10 ms | 400 kHz | 2.5 to 5.5 | I | |

NOTE: Pb-free packages also available. Order with "G" suffix. Example: 24LCS52T-I/STG.

DEVELOPMENT SYSTEMS

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A COMPLETE MPLAB® ICE SYSTEM

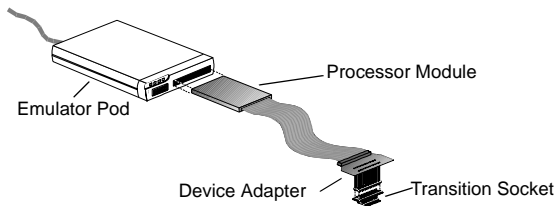
MPLAB® ICE is a modular emulator system with interchangeable components allowing the system to be easily configured to emulate different PICmicro® MCUs. Since this emulator supports package-specific emulation, customers need to know which device and package they intend to emulate. Then, the customer 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)

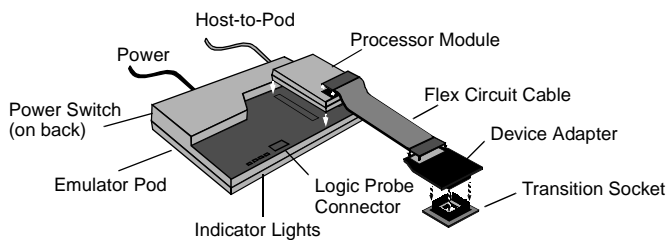
2: A processor module

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. Read more about ordering and use the MPLAB® ICE emulator system. Read more about ordering.

1. Emulator Pod

The MPLAB® ICE 2000 and MPLAB® ICE 4000 are full-featured emulators. The MPLAB® ICE 2000 includes an additional board for expanded trace memory and complex code. The MPLAB® ICE 4000 includes a parallel interface cable that connects the pods to the parallel port and a USB interface cable that connects the pod to a PC.

2. Processor Module

The processor module is a PICmicro®, device-specific module that provides the emulation. The processor module contains the emulator chip, logic, and low-voltage regulator. The processor module is connected to the device adapter at the device adapter.

3. Device Adapter

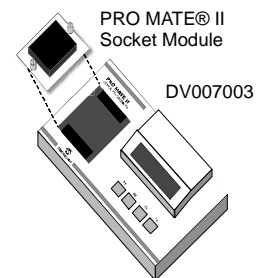
The device adapter provides a common interface for the PICmicro® MCU. The device adapter contains a special device that provides an oscillator clock allowing the emulator to emulate the characteristics of the PICmicro® MCU. The device adapter provides a common interface for PLCC styles. For emulation support of other packages, a transition socket is required.

4. Transition Socket

The transition sockets are available in various styles to allow the emulator to emulate different PICmicro® MCU packages, such as SOIC, SSOP, PQFP, and PLCC.

PRO MATE® II and MPLAB® PM3 Programmers

The PRO MATE® II Programmer (DV007003) and the MPLAB® PM3 Programmer (DV007004) are high-speed, production rated programmers, which can be operated stand-alone or connected to a PC (free). They come complete with accessories needed to connect to a target board, giving the developer complete control over the programming process. The PRO MATE® II Programmer (DV007003) can be selected from the PRO MATE® II Programmer (DV007003) and the MPLAB® PM3 Programmer (DV007004) can be selected from the PRO MATE® II Programmer (DV007003). The PRO MATE® II Programmer (DV007003) can be added to the PRO MATE® II Programmer (DV007003) and the MPLAB® PM3 Programmer (DV007004) can be added to the PRO MATE® II Programmer (DV007003). MPLAB® PM3 has built-in ICSP™ programming capabilities.



In-Circuit Debuggers: MPLAB® ICD 2

MPLAB® ICD 2 is a low cost, flash-based development tool that can be used to debug a target board allowing direct in-circuit debugging of the PICmicro® target. It can be executed in real time or single step, watch variables established, breakpoints established, and more. The MPLAB® ICD 2 can also be used as a programmer for PIC microcontrollers.

MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger 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® (6) |
| Analog Interface Development Tools | | | | | | | | | | | |
| MCP2120 | 14P | | | | | | | | | | |
| MCP2150 | 18P | | | | | | | | | | |
| MCP250XX | 14P | | | | | | | AC254001 | | | |
| MCP250XX | 14SO | | | | | | | AC254001 | | | |
| MCP2510 | 18P | | | | | | | | | | |
| MCP2515 | 18P | | | | | | | | | | |
| PICmicro® Microcontroller Development Tools | | | | | | | | | | | |
| PIC10F200 | 6OT | | | | | | | AC164037 | AC164321 | ✓ | AC1 |
| PIC10F200 | 8P | | | | | | | AC164037 | AC164301 | ✓ | AC1 |
| PIC10F202 | 6OT | | | | | | | AC164037 | AC164321 | ✓ | AC1 |
| PIC10F202 | 8P | | | | | | | AC164037 | AC164301 | ✓ | AC1 |
| PIC10F204 | 6OT | | | | | | | AC164037 | AC164321 | ✓ | AC1 |
| PIC10F204 | 8P | | | | | | | AC164037 | AC164301 | ✓ | AC1 |
| PIC10F206 | 6OT | | | | | | | AC164037 | AC164321 | ✓ | AC1 |
| PIC10F206 | 8P | | | | | | | AC164037 | AC164301 | ✓ | AC1 |
| PIC12C508 | 8P, 8JW | PCM16XA0 | DVA12XP080 | | | | | AC124001 | AC164301 | ✓ | |
| PIC12C508 | 8SM | PCM16XA0 | DVA12XP080 | XLT08SO | | | | AC124001 | AC164312 | | |
| PIC12C508A | 8P, 8JW | PCM16XA0 | DVA12XP080 | | | | | AC124001 | AC164301 | ✓ | |
| PIC12C508A | 8SM | PCM16XA0 | DVA12XP080 | XLT08SO | | | | AC124001 | AC164312 | | |
| PIC12C508A | 8SN | PCM16XA0 | DVA12XP080 | XLT08SO | | | | AC164026 | AC164302 | | |
| PIC12C508A | 8MF | PCM16XA0 | DVA12XP080 | XLT08DFN | | | | AC124001 +AC164032 | AC164301 +AC164032 | AC164032 | |
| PIC12C509 | 8P, 8JW | PCM16XA0 | DVA12XP080 | | | | | AC124001 | AC164301 | ✓ | |
| PIC12C509 | 8SM | PCM16XA0 | DVA12XP080 | XLT08SO | | | | AC124001 | AC164312 | | |
| PIC12C509A | 8P, 8JW | PCM16XA0 | DVA12XP080 | | | | | AC124001 | AC164301 | ✓ | |
| PIC12C509A | 8SM | PCM16XA0 | DVA12XP080 | XLT08SO | | | | AC124001 | AC164312 | | |
| PIC12C509A | 8SN | PCM16XA0 | DVA12XP080 | XLT08SO | | | | AC164026 | AC164302 | | |
| PIC12C509A | 8MF | PCM16XA0 | DVA12XP080 | XLT08DFN | | | | AC124001 +AC164032 | AC164301 +AC164032 | AC164032 | |

MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger 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® (6) |
| PICmicro® Microcontroller Development Tools (continued) | | | | | | | | | | | |
| PIC12C671 | 8P, 8JW | PCM12XA0 | DVA12XP081 | | | | | AC124001 | AC164301 | ✓ | |
| PIC12C671 | 8SM | PCM12XA0 | DVA12XP081 | XLT08SO | | | | AC124001 | AC164312 | | |
| PIC12C671 | 8MF | PCM12XA0 | DVA12XP081 | XLT08DFN | | | | AC124001 +AC164032 | AC164301 +AC164032 | AC164032 | |
| PIC12C672 | 8P, 8JW | PCM12XA0 | DVA12XP081 | | | | | AC124001 | AC164301 | ✓ | |
| PIC12C672 | 8SM | PCM12XA0 | DVA12XP081 | XLT08SO | | | | AC124001 | AC164312 | | |
| PIC12C672 | 8MF | PCM12XA0 | DVA12XP081 | XLT08DFN | | | | 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* | ✓ | AC1 |
| PIC12F508 | 8SO | PCM16XA0 | DVA12XP080 | XLT08SO | | | | AC164026 | AC164302* | | AC1 |
| PIC12F508 | 8ST | PCM16XA0 | DVA12XP080 | | | | | | AC164306* | | AC1 |
| PIC12F508 | 8MS | PCM16XA0 | DVA12XP080 | | | | | | | | AC1 |
| PIC12F509 | 8P | PCM16XA0 | DVA12XP080 | | | | | AC124001 | AC164301* | ✓ | AC1 |
| PIC12F509 | 8SO | PCM16XA0 | DVA12XP080 | XLT08SO | | | | AC164026 | AC164302* | | AC1 |
| PIC12F509 | 8ST | PCM16XA0 | DVA12XP080 | | | | | | AC164306* | | AC1 |
| PIC12F509 | 8MS | PCM16XA0 | DVA12XP080 | | | | | | | | AC1 |
| PIC12F629 | 8P | PCM12XB0 | DVA12XP081 | | | | | AC124001 | AC164301 | ✓ | AC1 |
| PIC12F629 | 8SN | PCM12XB0 | DVA12XP081 | XLT08SO | | | | AC164026 | AC164302 | | AC1 |
| PIC12F629 | 8MF | PCM12XB0 | DVA12XP081 | XLT08DFN | | | | AC124001 +AC164032 | AC164301 +AC164032 | AC164032 | AC1 |
| PIC12F635 | 8P | PCM16YM0* | DVA1002 | ACICE0201 | | | | AC164321 | AC164301 | ✓ | AC1 |
| PIC12F635 | 8SO | PCM16YM0* | DVA1002 | XLT08SO +ACICE0201 | | | | AC164321 | AC164302 | | AC1 |

MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger 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® (6) |
| PICmicro® Microcontroller Development Tools (continued) | | | | | | | | | | | |
| PIC12F675 | 8P | PCM12XB0 | DVA12XP081 | | | | | AC124001 | AC164301 | ✓ | AC1 |
| PIC12F675 | 8SN | PCM12XB0 | DVA12XP081 | XLT08SO | | | | AC164026 | AC164302 | | AC1 |
| PIC12F675 | 8MF | PCM12XB0 | DVA12XP081 | XLT08DFN | | | | AC124001 +AC164032 | AC164301 +AC164032 | AC164032 | AC1 |
| PIC12F683 | 8P | PCM12XC0* | DVA1002 | ACICE0201 | | | | AC124001 | AC164301 | ✓ | AC1 |
| PIC12F683 | 8SO | PCM12XC0* | DVA1002 | XLT08SO +ACICE0201 | | | | AC164026 | AC164302 | | AC1 |
| PIC12F683 | 8MF | PCM12XC0* | DVA1002 | XLT08DFN +ACICE0201 | | | | | AC164301 +AC164032 | | AC1 |
| PIC14000 | 28SP, 28JW | PCM14XA0 | DVA14XP280 | | | | | AC144001 | AC164301 | ✓ | |
| PIC14000 | 28SO | PCM14XA0 | DVA14XP280 | XLT28SO | | | | AC144002 | AC164302 | | |
| PIC14000 | 28SS | PCM14XA0 | DVA14XP280 | XLT28SS | | | | AC144002 | AC164307 | | |
| PIC16C52 | 18P | PCM16XA0 | DVA16XP180 | | | | | AC164001 | AC164301 | ✓ | |
| PIC16C52 | 18SO | PCM16XA0 | DVA16XP180 | XLT18SO | | | | AC164002 | AC164302 | | |
| PIC16C54/54A/ 54C | 18P, 18JW | PCM16XA0 | DVA16XP180 | | | | | AC164001 | AC164301 | ✓ | |
| 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 | ✓ | |
| PIC16C55/55A | 28SP | PCM16XA0 | DVA16XP280 | | | | | AC164001 | AC164301 | ✓ | |
| PIC16C55/55A | 28SO | PCM16XA0 | DVA16XP280 | XLT28SO | | | | AC164002 | AC164302 | | |
| PIC16C55/55A | 28SS | PCM16XA0 | DVA16XP280 | XLT28SS2 | | | | AC164015 | AC164307 | | |
| PIC16C56/56A | 18P, 18JW | PCM16XA0 | DVA16XP180 | | | | | AC164001 | AC164301 | ✓ | |
| PIC16C56/56A | 18SO | PCM16XA0 | DVA16XP180 | XLT18SO | | | | AC164002 | AC164302 | | |
| PIC16C56/56A | 20SS | PCM16XA0 | DVA16XP180 | XLT20SS | | | | AC164015 | AC164307 | | |
| PIC16C57/57C | 28P, 28JW | PCM16XA0 | DVA16XP280 | XLT28XP | | | | AC164001 | AC164301 | ✓ | |
| PIC16C57/57C | 28SP | PCM16XA0 | DVA16XP280 | | | | | AC164001 | AC164301 | ✓ | |
| PIC16C57/57C | 28SO | PCM16XA0 | DVA16XP280 | XLT28SO | | | | AC164002 | AC164302 | | |
| PIC16C57/57C | 28SS | PCM16XA0 | DVA16XP280 | XLT28SS2 | | | | AC164015 | AC164307 | | |

MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger 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® (6) |
| PICmicro® Microcontroller Development Tools (continued) | | | | | | | | | | | |
| PIC16C58A/ 58B | 18P, 18JW | PCM16XA0 | DVA16XP180 | | | | | AC164001 | AC164301 | ✓ | |
| PIC16C58A/ 58B | 18SO | PCM16XA0 | DVA16XP180 | XLT18SO | | | | AC164002 | AC164302 | | |
| PIC16C58A/ 58B | 20SS | PCM16XA0 | DVA16XP180 | XLT20SS | | | | AC164015 | AC164307 | | |
| PIC16C62A | 28P, 28JW | PCM16XB1 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | |
| PIC16C62A | 28SO | PCM16XB1 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | |
| PIC16C62A | 28SS | PCM16XB1 | DVA16XP282 | XLT28SS | | | | AC164021 | AC164307 | | |
| PIC16C62B | 28SP, 28JW | PCM16XE1 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | |
| PIC16C62B | 28ML | PCM16XE1 | DVA16XP282 | XLT28QFN | | | | 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 | ✓ | |
| PIC16C63 | 28SO | PCM16XB1 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | |
| PIC16C63A | 28SP, 28JW | PCM16XE1 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | |
| PIC16C63A | 28ML | PCM16XE1 | DVA16XP282 | XLT28QFN | | | | 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 | ✓ | |
| PIC16C64A | 44L | PCM16XB1 | DVA16XL441 | | | | | AC164013 | AC164309 | | |
| PIC16C64A | 44PQ | PCM16XB1 | DVA16PQ441 | XLT44PT | | | | AC164014 | AC164311 | | |
| PIC16C64A | 44PT | PCM16XB1 | DVA16PQ441 | XLT44PT | | | | AC164020 | AC164305 | | |
| PIC16C65A | 40P, 40JW | PCM16XB1 | DVA16XP401 | | | | | AC164012 | AC164301 | ✓ | |
| PIC16C65A | 44L | PCM16XB1 | DVA16XL441 | | | | | AC164013 | AC164309 | | |
| PIC16C65A | 44PQ | PCM16XB1 | DVA16PQ441 | XLT44PT | | | | AC164014 | AC164311 | | |
| PIC16C65A | 44PT | PCM16XB1 | DVA16PQ441 | XLT44PT | | | | AC164020 | AC164305 | | |
| PIC16C65B | 40P, 40JW | PCM16XE1 | DVA16XP401 | | | | | AC164012 | AC164301 | ✓ | |
| PIC16C65B | 44L | PCM16XE1 | DVA16XL441 | | | | | AC164013 | AC164309 | | |
| PIC16C65B | 44PQ | PCM16XE1 | DVA16PQ441 | XLT44PT | | | | AC164014 | AC164311 | | |
| PIC16C65B | 44PT | PCM16XE1 | DVA16PQ441 | XLT44PT | | | | AC164020 | AC164305 | | |

MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger 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® (6) |
| PICmicro® Microcontroller Development Tools (continued) | | | | | | | | | | | |
| PIC16C66 | 28SP, 28JW | PCM16XE1 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | |
| PIC16C66 | 28SO | PCM16XE1 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | |
| PIC16C67 | 40P, 40JW | PCM16XE1 | DVA16XP401 | | | | | AC164012 | AC164301 | ✓ | |
| PIC16C67 | 44L | PCM16XE1 | DVA16XL441 | | | | | AC164013 | AC164309 | | |
| PIC16C67 | 44PQ | PCM16XE1 | DVA16PQ441 | XLT44PT | | | | AC164014 | AC164311 | | |
| PIC16C67 | 44PT | PCM16XE1 | DVA16PQ441 | XLT44PT | | | | AC164020 | AC164305 | | |
| PIC16C71 | 18P, 18JW | PCM16XF0 | DVA16XP180 | | | | | AC164010 | AC164301 | ✓ | |
| PIC16C71 | 18SO | PCM16XF0 | DVA16XP180 | XLT18SO | | | | AC164010 | AC164302 | | |
| PIC16C72 | 28SP, 28JW | PCM16XB1 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | |
| PIC16C72 | 28SO | PCM16XB1 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | |
| PIC16C72 | 28SS | PCM16XB1 | DVA16XP282 | XLT28SS | | | | AC164021 | AC164307 | | |
| PIC16C72A | 28SP, 28JW | PCM16XE1 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | |
| PIC16C72A | 28ML | PCM16XE1 | DVA16XP282 | XLT28QFN | | | | 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 | ✓ | |
| PIC16C73A | 28SO | PCM16XB1 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | |
| PIC16C73B | 28SP, 28JW | PCM16XE1 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | |
| PIC16C73B | 28ML | PCM16XE1 | DVA16XP282 | XLT28QFN | | | | 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 | ✓ | |
| PIC16C74A | 44L | PCM16XB1 | DVA16XL441 | | | | | AC164013 | AC164309 | | |
| PIC16C74A | 44PQ | PCM16XB1 | DVA16PQ441 | XLT44PT | | | | AC164014 | AC164311 | | |
| PIC16C74A | 44PT | PCM16XB1 | DVA16PQ441 | XLT44PT | | | | AC164020 | AC164305 | | |
| PIC16C74B | 40P, 40JW | PCM16XE1 | DVA16XP401 | | | | | AC164012 | AC164301 | ✓ | |
| PIC16C74B | 44L | PCM16XE1 | DVA16XL441 | | | | | AC164013 | AC164309 | | |
| PIC16C74B | 44PQ | PCM16XE1 | DVA16PQ441 | XLT44PT | | | | AC164014 | AC164311 | | |
| PIC16C74B | 44PT | PCM16XE1 | DVA16PQ441 | XLT44PT | | | | AC164020 | AC164305 | | |

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| | | 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® (6) |
| PICmicro® Microcontroller Development Tools (continued) | | | | | | | | | | | |
| PIC16C76 | 28SP, 28JW | PCM16XE1 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | |
| PIC16C76 | 28SO | PCM16XE1 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | |
| PIC16C77 | 40P, 40JW | PCM16XE1 | DVA16XP401 | | | | | AC164012 | AC164301 | ✓ | |
| PIC16C77 | 44L | PCM16XE1 | DVA16XL441 | | | | | AC164013 | AC164309 | | |
| PIC16C77 | 44PQ | PCM16XE1 | DVA16PQ441 | XLT44PT | | | | AC164014 | AC164311 | | |
| PIC16C77 | 44PT | PCM16XE1 | DVA16PQ441 | XLT44PT | | | | AC164020 | AC164305 | | |
| PIC16C432 | 20P, 20JW | PCM16YB0 | DVA16XP201 | | | | | AC164029 | AC164301 | | |
| PIC16C432 | 20SS | PCM16YB0 | DVA16XP201 | XLT20SS1 | | | | AC164029 | AC164307 | | |
| PIC16C433 | 18P, 18JW | PCM16YC0 | DVA16XP185 | | | | | AC164030 | AC164301 | | |
| PIC16C433 | 18SS | 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 | ✓ | |
| PIC16C554 | 18SO | PCM16XC0 | DVA16XP180 | XLT18SO | | | | AC164010 | AC164302 | | |
| PIC16C554 | 18SS | PCM16XC0 | DVA16XP180 | XLT20SS | | | | AC164018 | AV164307 | | |
| PIC16C557 | 28P | | | | | | | AC164001 | AC164301 | | |
| PIC16C557 | 28SO | | | | | | | AC164002 | AC164302 | | |
| PIC16C558 | 18P, 18JW | PCM16XC0 | DVA16XP180 | | | | | AC164010 | AC164301 | ✓ | |
| PIC16C558 | 18SO | PCM16XC0 | DVA16XP180 | XLT18SO | | | | AC164010 | AC164302 | | |
| PIC16C558 | 18SS | PCM16XC0 | DVA16XP180 | XLT20SS | | | | AC164018 | AC164307 | | |
| PIC16C620/ 620A | 18P, 18JW | PCM16XC0 | DVA16XP180 | | | | | AC164010 | AC164301 | ✓ | |
| PIC16C620/ 620A | 18SO | PCM16XC0 | DVA16XP180 | XLT18SO | | | | AC164010 | AC164302 | | |
| PIC16C620/ 620A | 20SS | PCM16XC0 | DVA16XP180 | XLT20SS | | | | AC164018 | AC164307 | | |
| PIC16C621/ 621A | 18P, 18JW | PCM16XC0 | DVA16XP180 | | | | | AC164010 | AC164301 | ✓ | |
| PIC16C621/ 621A | 18SO | PCM16XC0 | DVA16XP180 | XLT18SO | | | | AC164010 | AC164302 | | |
| PIC16C621/ 621A | 20SS | PCM16XC0 | DVA16XP180 | XLT20SS | | | | AC164018 | AC164307 | | |

MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger 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® (6) |
| PICmicro® Microcontroller Development Tools (continued) | | | | | | | | | | | |
| PIC16C622/ 622A | 18P, 18JW | PCM16XC0 | DVA16XP180 | | | | | AC164010 | AC164301 | ✓ | |
| PIC16C622/ 622A | 18SO | PCM16XC0 | DVA16XP180 | XLT18SO | | | | AC164010 | AC164302 | | |
| PIC16C622/ 622A | 20SS | PCM16XC0 | DVA16XP180 | XLT20SS | | | | AC164018 | AC164307 | | |
| PIC16C642 | 28SP, 28JW | PCM16XD0 | DVA16XP282 | | | | | AC164012 | AC164301* | ✓ | |
| PIC16C642 | 28SO | PCM16XD0 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302* | | |
| PIC16C662 | 40P, 40JW | PCM16XD0 | DVA16XP401 | | | | | AC164012 | AC164301* | ✓ | |
| PIC16C662 | 44L | PCM16XD0 | DVA16XL441 | | | | | AC164013 | AC164309* | | |
| PIC16C662 | 44PQ | PCM16XD0 | DVA16PQ441 | XLT44PT | | | | AC164014 | AC164311* | | |
| PIC16C662 | 44PT | PCM16XD0 | DVA16PQ441 | XLT44PT | | | | AC164020 | AC164305* | | |
| PIC16C710 | 18P, 18JW | PCM16XF0 | DVA16XP180 | | | | | AC164010 | AC164301 | ✓ | |
| PIC16C710 | 18SO | PCM16XF0 | DVA16XP180 | XLT18SO | | | | AC164010 | AC164302 | | |
| PIC16C710 | 20SS | PCM16XF0 | DVA16XP180 | XLT20SS | | | | AC164018 | AC164307 | | |
| PIC16C711 | 18P, 18JW | PCM16XF0 | DVA16XP180 | | | | | AC164010 | AC164301 | ✓ | |
| PIC16C711 | 18SO | PCM16XF0 | DVA16XP180 | XLT18SO | | | | AC164010 | AC164302 | | |
| PIC16C711 | 20SS | PCM16XF0 | DVA16XP180 | XLT20SS | | | | AC164018 | AC164307 | | |
| PIC16C712 | 18P, 18JW | PCM16XE1 | DVA16XP182 | | | | | AC164010 | AC164301 | ✓ | |
| PIC16C712 | 18SO | PCM16XE1 | DVA16XP182 | XLT18SO | | | | AC164010 | AC164302 | | |
| PIC16C712 | 20SS | PCM16XE1 | DVA16XP182 | XLT20SS | | | | AC164018 | AC164307 | | |
| PIC16C715 | 18P, 18JW | PCM16XG0 | DVA16XP180 | | | | | AC164010 | AC164301* | ✓ | |
| PIC16C715 | 18SO | PCM16XG0 | DVA16XP180 | XLT18SO | | | | AC164010 | AC164302* | | |
| PIC16C715 | 20SS | PCM16XG0 | DVA16XP180 | XLT20SS | | | | AC164018 | AC164307* | | |
| PIC16C716 | 18P, 18JW | PCM16XE1 | DVA16XP182 | | | | | AC164010 | AC164301 | ✓ | |
| PIC16C716 | 18SO | PCM16XE1 | DVA16XP182 | XLT18SO | | | | AC164010 | AC164302 | | |
| PIC16C716 | 20SS | PCM16XE1 | DVA16XP182 | XLT20SS | | | | AC164018 | AC164307 | | |
| PIC16C717 | 18P, 18JW | PCM16XN1 | DVA18XP180 | | | | | AC164010 | AC164301 | ✓ | |
| PIC16C717 | 18SO | PCM16XN1 | DVA18XP180 | XLT18SO | | | | AC164010 | AC164302 | | |
| PIC16C717 | 20SS | PCM16XN1 | DVA18XP180 | XLT20SS | | | | AC164018 | AC164307 | | |
| PIC16C745 | 28SP, 28JW | PCM16XQ1 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | |
| PIC16C745 | 28SO | PCM16XQ1 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | |

MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger 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® (6) |
| PICmicro® Microcontroller Development Tools (continued) | | | | | | | | | | | |
| PIC16C765 | 40P | PCM16XQ1 | DVA16XP401 | | | | | AC164012 | AC164301 | ✓ | |
| PIC16C765 | 44L | PCM16XQ1 | DVA16XL441 | | | | | AC164013 | AC164309 | | |
| PIC16C765 | 44PT | PCM16XQ1 | DVA16PQ441 | XLT44PT | | | | AC164020 | AC164305 | | |
| PIC16C770 | 20P | PCM16XN1 | DVA16XP200 | | | | | AC164028 | AC164301 | ✓ | |
| PIC16C770 | 20SO | PCM16XN1 | DVA16XP200 | XLT20SO1 | | | | AC164028 | AC164302 | | |
| PIC16C770 | 20SS | PCM16XN1 | DVA16XP200 | XLT20SS1 | | | | AC164018 | AC164307 | | |
| PIC16C771 | 20P | PCM16XN1 | DVA16XP200 | | | | | AC164028 | AC164301 | ✓ | |
| PIC16C771 | 20SO | PCM16XN1 | DVA16XP200 | XLT20SO1 | | | | AC164028 | AC164302 | | |
| PIC16C771 | 20SS | PCM16XN1 | DVA16XP200 | XLT20SS1 | | | | AC164018 | AC164307 | | |
| PIC16C773 | 28SP, 28JW | PCM16XL0 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | |
| PIC16C773 | 28SO | PCM16XL0 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | |
| PIC16C773 | 28SS | PCM16XL0 | DVA16XP282 | XLT28SS | | | | AC164021 | AC164307 | | |
| PIC16C774 | 40P, 40JW | PCM16XL0 | DVA16XP401 | | | | | AC164012 | AC164301 | ✓ | |
| PIC16C774 | 44L | PCM16XL0 | DVA16XL441 | | | | | AC164013 | AC164309 | | |
| PIC16C774 | 44PQ | PCM16XL0 | DVA16PQ441 | XLT44PT | | | | AC164014 | AC164311 | | |
| PIC16C774 | 44PT | PCM16XL0 | DVA16PQ441 | XLT44PT | | | | AC164020 | AC164305 | | |
| PIC16C781 | 20P, 20JW | PCM16XW0 | DVA16XP202 | | | | | AC164028 | AC164301 | ✓ | |
| PIC16C781 | 20SO | PCM16XW0 | DVA16XP202 | XLT20SO1 | | | | AC164028 | AC164302 | | |
| PIC16C781 | 20SS | PCM16XW0 | DVA16XP202 | XLT20SS1 | | | | AC164018 | AC164307 | | |
| PIC16C782 | 20P, 20JW | PCM16XW0 | DVA16XP202 | | | | | AC164028 | AC164301 | ✓ | |
| 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 | |
| PIC16C924 | 64SP | PCM16XJ0 | DVA16XP640 | | | | | AC164025 | | ✓ | |
| PIC16C924 | 64PT | PCM16XJ0 | DVA16PQ640 | XLT64PT1 | | | | AC164023 | AC164319 | | |
| PIC16C924 | 68L, 68CL | PCM16XJ0 | DVA16XL680 | | | | | AC164022 | AC164308 | AC164024 | |
| PIC16C925 | 64PT | PCM16XT0 | DVA16PQ640 | XLT64PT1 | | | | AC164023 | AC164319 | | |
| PIC16C925 | 68L | PCM16XT0 | DVA16XL680 | | | | | AC164022 | AC164308 | AC164024 | |
| PIC16C926 | 64PT | PCM16XT0 | DVA16PQ640 | XLT64PT1 | | | | AC164023 | AC164319 | | |
| PIC16C926 | 68L | PCM16XT0 | DVA16XL680 | | | | | AC164022 | AC164308 | AC164024 | |

MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger 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® (6) |
| PICmicro® Microcontroller Development Tools (continued) | | | | | | | | | | | |
| PIC16CE623 | 18P, 18JW | PCM16XC0 | DVA16XP180 | | | | | AC164010 | AC164301 | ✓ | |
| PIC16CE623 | 18SO | PCM16XC0 | DVA16XP180 | XLT18SO | | | | AC164010 | AC164302 | | |
| PIC16CE623 | 20SS | PCM16XC0 | DVA16XP180 | XLT20SS | | | | AC164018 | AC164307 | | |
| PIC16CE624 | 18P, 18JW | PCM16XC0 | DVA16XP180 | | | | | AC164010 | AC164301 | ✓ | |
| PIC16CE624 | 18SO | PCM16XC0 | DVA16XP180 | XLT18SO | | | | AC164010 | AC164302 | | |
| PIC16CE624 | 20SS | PCM16XC0 | DVA16XP180 | XLT20SS | | | | AC164018 | AC164307 | | |
| PIC16CE625 | 18P, 18JW | PCM16XC0 | DVA16XP180 | | | | | AC164010 | AC164301 | ✓ | |
| PIC16CE625 | 18SO | PCM16XC0 | DVA16XP180 | XLT18SO | | | | AC164010 | AC164302 | | |
| PIC16CE625 | 20SS | PCM16XC0 | DVA16XP180 | XLT20SS | | | | AC164018 | AC164307 | | |
| PIC16F54 | 18P | PCM16XA0 | DVA16XP180 | | | | | AC164001 | AC164301 | ✓ | |
| PIC16F54 | 18SO | PCM16XA0 | DVA16XP180 | XLT18SO | | | | AC164002 | AC164302 | | |
| PIC16F54 | 20SS | PCM16XA0 | DVA16XP180 | XLT20SS | | | | AC164015 | AC164307 | | |
| PIC16F57 | 28SP | PCM16XA0 | DVA16XP280 | | | | | AC164001 | AC164301 | ✓ | |
| PIC16F57 | 28SO | PCM16XA0 | DVA16XP280 | XLT28SO | | | | AC164002 | AC164302 | | |
| PIC16F57 | 28SS | PCM16XA0 | DVA16XP280 | XLT28SS2 | | | | AC164015 | AC164307 | | |
| PIC16F72 | 28SP, 28JW | PCM16XS2 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | |
| PIC16F72 | 28SO | PCM16XS2 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | |
| PIC16F72 | 28SS | PCM16XS2 | DVA16XP282 | XLT28SS | | | | AC164021 | AC164307 | | |
| PIC16F73 | 28SP, 28JW | PCM16XS2 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | |
| PIC16F73 | 28ML | PCM16XS2 | DVA16XP282 | XLT28QFN | | | | 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 | ✓ | |
| PIC16F74 | 44L | PCM16XS2 | DVA16XL441 | | | | | AC164013 | AC164309 | | |
| PIC16F74 | 44PT | PCM16XS2 | DVA16PQ441 | XLT44PT | | | | AC164020 | AC164305 | | |
| PIC16F76 | 28SP, 28JW | PCM16XS2 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | |
| PIC16F76 | 28ML | PCM16XS2 | DVA16XP282 | XLT28QFN | | | | AC164012 +AC164031 | AC164301 +AC164031 | AC164031 | |
| PIC16F76 | 28SO | PCM16XS2 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | |

MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger 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® (6) |
| PICmicro® Microcontroller Development Tools (continued) | | | | | | | | | | | |
| PIC16F77 | 40P, 40JW | PCM16XS2 | DVA16XP401 | | | | | AC164012 | AC164301 | ✓ | ✓ |
| PIC16F77 | 44L | PCM16XS2 | DVA16XL441 | | | | | AC164013 | AC164309 | | ✓ |
| PIC16F77 | 44PQ | PCM16XS2 | DVA16PQ441 | XLT44PT | | | | AC164014 | AC164311 | | ✓ |
| PIC16F77 | 44PT | PCM16XS2 | DVA16PQ441 | XLT44PT | | | | AC164020 | AC164305 | | ✓ |
| PIC16F83 | 18P | PCM16XH1 | DVA16XP180 | | | | | AC164010 | AC164301 | ✓ | |
| PIC16F83 | 18SO | PCM16XH1 | DVA16XP180 | XLT18SO | | | | AC164010 | AC164302 | | |
| PIC16F84 | 18P | PCM16XH1 | DVA16XP180 | | | | | AC164010 | AC164301 | ✓ | |
| PIC16F84 | 18SO | PCM16XH1 | DVA16XP180 | XLT18SO | | | | AC164010 | AC164302 | | |
| PIC16F84A | 18P | PCM16XH1 | DVA16XP180 | | | | | AC164010 | AC164301 | ✓ | |
| PIC16F84A | 18SO | PCM16XH1 | DVA16XP180 | XLT18SO | | | | AC164010 | AC164302 | | |
| PIC16F84A | 20SS | PCM16XH1 | DVA16XP180 | XLT20SS | | | | AC164018 | AC164307 | | |
| PIC16F87 | 18P | PCM16YG0 | DVA16XP186 | | | | | AC164010 | AC164301 | ✓ | ✓ |
| PIC16F87 | 18SO | PCM16YG0 | DVA16XP186 | XLT18SO | | | | AC164010 | AC164302 | | ✓ |
| PIC16F87 | 20SS | PCM16YG0 | DVA16XP186 | XLT20SS | | | | AC164018 | AC164307 | | ✓ |
| PIC16F87 | 28ML | PCM16YG0 | DVA16XP186 | XLT28QFN2 | | | | AC164010 +AC164033 | AC164301 +AC164031 | AC164033 | ✓ |
| PIC16F88 | 18P | PCM16YG0 | DVA16XP186 | | | | | AC164010 | AC164301 | ✓ | ✓ |
| PIC16F88 | 18SO | PCM16YG0 | DVA16XP186 | XLT18SO | | | | AC164010 | AC164302 | | ✓ |
| PIC16F88 | 20SS | PCM16YG0 | DVA16XP186 | XLT20SS | | | | AC164018 | AC164307 | | ✓ |
| PIC16F88 | 28ML | PCM16YG0 | DVA16XP186 | XLT28QFN2 | | | | AC164010 +AC164033 | AC164301 +AC164031 | AC164033 | ✓ |
| PIC16F505 | 14P | PCM16XA0 | DVA16XP140 | | | | | AC124001 | AC164301 | ✓ | AC164301 |
| PIC16F505 | 14SO | PCM16XA0 | DVA16XP140 | XLT14SO | | | | AC164026 | AC164302 | | AC164302 |
| PIC16F505 | 14ST | PCM16XA0 | DVA16XP140 | | | | | | AC164306 | | AC164306 |
| PIC16F627 | 18P, 18JW | PCM16XP0 | DVA16XP183 | | | | | AC164010 | AC164301 | ✓ | |
| PIC16F627 | 18SO | PCM16XP0 | DVA16XP183 | XLT18SO | | | | AC164010 | AC164302 | | |
| PIC16F627 | 20SS | PCM16XP0 | DVA16XP183 | XLT20SS | | | | AC164018 | AC164307 | | |

MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger 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® (6) |
| PICmicro® Microcontroller Development Tools (continued) | | | | | | | | | | | |
| PIC16F627A | 18P | PCM16YF0 | DVA16XP186 | | | | | AC164010 | AC164301 | ✓ | AC164033 |
| PIC16F627A | 18SO | PCM16YF0 | DVA16XP186 | XLT18SO | | | | AC164010 | AC164302 | | AC164033 |
| PIC16F627A | 20SS | PCM16YF0 | DVA16XP186 | XLT20SS | | | | AC164018 | AC164307 | | AC164033 |
| PIC16F627A | 28ML | PCM16YF0 | DVA16XP186 | XLT28QFN2 | | | | AC164010 +AC164033 | AC164301 +AC164031 | AC164033 | AC164033 |
| PIC16F628 | 18P, 18JW | PCM16XP0 | DVA16XP183 | | | | | AC164010 | AC164301 | ✓ | AC164033 |
| PIC16F628 | 18SO | PCM16XP0 | DVA16XP183 | XLT18SO | | | | AC164010 | AC164302 | | AC164033 |
| PIC16F628 | 20SS | PCM16XP0 | DVA16XP183 | XLT20SS | | | | AC164018 | AC164307 | | AC164033 |
| PIC16F628A | 18P | PCM16YF0 | DVA16XP186 | | | | | AC164010 | AC164301 | ✓ | AC164033 |
| PIC16F628A | 18SO | PCM16YF0 | DVA16XP186 | XLT18SO | | | | AC164010 | AC164302 | | AC164033 |
| PIC16F628A | 20SS | PCM16YF0 | DVA16XP186 | XLT20SS | | | | AC164018 | AC164307 | | AC164033 |
| PIC16F628A | 28ML | PCM16YF0 | DVA16XP186 | XLT28QFN2 | | | | AC164010 +AC164033 | AC164301 +AC164031 | AC164033 | AC164033 |
| PIC16F630 | 14P | PCM16YD0 | DVA16XP141 | | | | | AC124001 | AC164301 | ✓ | AC164033 |
| PIC16F630 | 14SO | PCM16YD0 | DVA16XP141 | XLT14SO | | | | AC164026 | AC164302 | | AC164033 |
| PIC16F630 | 14ST | PCM16YD0 | DVA16XP141 | XLT14SS | | | | AC164026 | AC164306 | | AC164033 |
| PIC16F636 | 14P | PCM16YM0 | DVA1002 | ACICE0207 | | | | AC124001 | AC164301 | ✓ | AC164033 |
| PIC16F636 | 14SO | PCM16YM0 | DVA1002 | XLT14SO +ACICE0207 | | | | AC164026 | AC164302 | | AC164033 |
| PIC16F636 | 14ST | PCM16YM0 | DVA1002 | XLT14SS +ACICE0207 | | | | AC164026 | AC164306 | | AC164033 |
| PIC16F648A | 18P | PCM16YF0 | DVA16XP186 | | | | | AC164010 | AC164301 | ✓ | AC164033 |
| PIC16F648A | 18SO | PCM16YF0 | DVA16XP186 | XLT18SO | | | | AC164010 | AC164302 | | AC164033 |
| PIC16F648A | 20SS | PCM16YF0 | DVA16XP186 | XLT20SS | | | | AC164018 | AC164307 | | AC164033 |
| PIC16F648A | 28ML | PCM16YF0 | DVA16XP186 | XLT28QFN2 | | | | AC164010 +AC164033 | AC164301 +AC164031 | AC164033 | AC164033 |
| PIC16F676 | 14P | PCM16YD0 | DVA16XP141 | | | | | AC124001 | AC164301 | ✓ | AC164033 |
| PIC16F676 | 14SO | PCM16YD0 | DVA16XP141 | XLT14SO | | | | AC164026 | AC164302 | | AC164033 |
| PIC16F676 | 14ST | PCM16YD0 | DVA16XP141 | XLT14SS | | | | AC164026 | AC164306 | | AC164033 |
| PIC16F684 | 14P | PCM16YK0 | DVA1002 | ACICE0207 | | | | AC124001 | AC164301 | ✓ | AC164033 |
| PIC16F684 | 14SO | PCM16YK0 | DVA1002 | XLT14SO +ACICE0207 | | | | AC164026 | AC164302 | | AC164033 |
| PIC16F684 | 14ST | PCM16YK0 | DVA1002 | XLT14SS +ACICE0207 | | | | AC164026 | AC164306 | | AC164033 |

MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger 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® (6) |
| PICmicro® Microcontroller Development Tools (continued) | | | | | | | | | | | |
| PIC16F688 | 14P | PCM16YL0 | DVA1002 | ACICE0207 | | | | AC124001 | AC164301 | ✓ | AC164301 |
| PIC16F688 | 14SO | PCM16YL0 | DVA1002 | XLT14SO +ACICE0207 | | | | AC164026 | AC164302 | | AC164302 |
| PIC16F688 | 14ST | PCM16YL0 | DVA1002 | XLT14SS +ACICE0207 | | | | AC164026 | AC164306 | | AC164306 |
| PIC16F716 | 18P | PCM16YJ0 | DVA16XP187 | | | | | AC164010 | AC164301 | ✓ | AC164301 |
| PIC16F716 | 18SO | PCM16YJ0 | DVA16XP187 | XLT18SO | | | | AC164010 | AC164302 | | AC164302 |
| PIC16F716 | 20SS | PCM16YJ0 | DVA16XP187 | XLT20SS | | | | AC164018 | AC164307 | | AC164307 |
| PIC16F737 | 28P | PCM16YH0 | DVA18XP280 | | | | | AC164012 | AC164301 | ✓ | AC164301 |
| PIC16F737 | 28SO | PCM16YH0 | DVA18XP280 | XLT28SO | | | | AC164017 | AC164302 | | AC164302 |
| PIC16F737 | 28SS | PCM16YH0 | DVA18XP280 | XLT28SS | | | | AC164021 | AC164307 | | AC164307 |
| PIC16F737 | 28ML | PCM16YH0 | DVA18XP280 | XLT28QFN | | | | AC164012 +AC164031 | AC164301 +AC164031 | | AC164301 +AC164031 |
| PIC16F747 | 40P | PCM16YH0 | DVA18XP400 | | | | | AC164012 | AC164301 | ✓ | AC164301 |
| PIC16F747 | 44PT | PCM16YH0 | DVA18PQ440 | XLT44PT | | | | AC164020 | AC164305 | | AC164305 |
| PIC16F747 | 44ML | PCM16YH0 | DVA18XP400 | XLT44QFN | | | | AC164012 +AC164034 | AC164301 +AC164034 | | AC164301 +AC164034 |
| PIC16F767 | 28P | PCM16YH0 | DVA18XP280 | | | | | AC164012 | AC164301 | ✓ | AC164301 |
| PIC16F767 | 28SO | PCM16YH0 | DVA18XP280 | XLT28SO | | | | AC164017 | AC164302 | | AC164302 |
| PIC16F767 | 28SS | PCM16YH0 | DVA18XP280 | XLT28SS | | | | AC164021 | AC164307 | | AC164307 |
| PIC16F767 | 28ML | PCM16YH0 | DVA18XP280 | XLT28QFN | | | | AC164012 +AC164031 | AC164301 +AC164031 | | AC164301 +AC164031 |
| PIC16F777 | 40P | PCM16YH0 | DVA18XP400 | | | | | AC164012 | AC164301 | ✓ | AC164301 |
| PIC16F777 | 44PT | PCM16YH0 | DVA18PQ440 | XLT44PT | | | | AC164020 | AC164305 | | AC164305 |
| PIC16F777 | 44ML | PCM16YH0 | DVA18XP400 | XLT44QFN | | | | AC164012 +AC164034 | AC164301 +AC164034 | | AC164301 +AC164034 |
| PIC16F818 | 18P | PCM16YE0 | DVA16XP186 | | | | | AC164010 | AC164301 | ✓ | AC164301 |
| PIC16F818 | 18SO | PCM16YE0 | DVA16XP186 | XLT18SO | | | | AC164010 | AC164302 | | AC164302 |
| PIC16F818 | 20SS | PCM16YE0 | DVA16XP186 | XLT20SS | | | | AC164018 | AC164307 | | AC164307 |
| PIC16F818 | 28ML | PCM16YE0 | DVA16XP186 | XLT28QFN2 | | | | AC164010 +AC164033 | AC164301 +AC164031 | AC164033 | AC164301 +AC164031 |
| PIC16F819 | 18P | PCM16YE0 | DVA16XP186 | | | | | AC164010 | AC164301 | ✓ | AC164301 |
| PIC16F819 | 18SO | PCM16YE0 | DVA16XP186 | XLT18SO | | | | AC164010 | AC164302 | | AC164302 |
| PIC16F819 | 20SS | PCM16YE0 | DVA16XP186 | XLT20SS | | | | AC164018 | AC164307 | | AC164307 |

MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger 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® (6) |
| PICmicro® Microcontroller Development Tools (continued) | | | | | | | | | | | |
| PIC16F819 | 28ML | PCM16YE0 | DVA16XP186 | XLT28QFN2 | | | | AC164010 +AC164033 | AC164301 +AC164031 | AC164033 | |
| PIC16F870 | 28SP, 28JW | PCM16XR1 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | |
| PIC16F870 | 28SO | PCM16XR1 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | |
| PIC16F870 | 28SS | PCM16XR1 | DVA16XP282 | XLT28SS | | | | AC164021 | AC164307 | | |
| PIC16F871 | 40P | PCM16XR1 | DVA16XP401 | | | | | AC164012 | AC164301 | ✓ | |
| PIC16F871 | 44L | PCM16XR1 | DVA16XL441 | | | | | AC164013 | AC164309 | | |
| PIC16F871 | 44PT | PCM16XR1 | DVA16PQ441 | XLT44PT | | | | AC164020 | AC164305 | | |
| PIC16F872 | 28SP | PCM16XK1 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | |
| PIC16F872 | 28SO | PCM16XK1 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | |
| PIC16F872 | 28SS | PCM16XK1 | DVA16XP282 | XLT28SS | | | | AC164021 | AC164307 | | |
| PIC16F873 | 28SP | PCM16XK1 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | |
| PIC16F873 | 28SO | PCM16XK1 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | |
| PIC16F873A | 28SP | PCM16XV0 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | |
| PIC16F873A | 28SO | PCM16XV0 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | |
| PIC16F873A | 28SS | PCM16XV0 | DVA16XP282 | XLT28SS | | | | AC164021 | AC164307 | | |
| PIC16F873A | 28ML | PCM16XV0 | DVA16XP282 | XLT28QFN | | | | AC164012 +AC164031 | AC164301 +AC164031 | AC164031 | |
| PIC16F874 | 40P | PCM16XK1 | DVA16XP401 | | | | | AC164012 | AC164301 | ✓ | |
| PIC16F874 | 44L | PCM16XK1 | DVA16XL441 | | | | | AC164013 | AC164309 | | |
| PIC16F874 | 44PQ | PCM16XK1 | DVA16PQ441 | XLT44PT | | | | AC164014 | AC164311 | | |
| PIC16F874 | 44PT | PCM16XK1 | DVA16PQ441 | XLT44PT | | | | AC164020 | AC164305 | | |
| PIC16F874A | 40P | PCM16XV0 | DVA16XP401 | | | | | AC164012 | AC164301 | ✓ | |
| PIC16F874A | 44L | PCM16XV0 | DVA16XL441 | | | | | AC164013 | AC164309 | | |
| PIC16F874A | 44PT | PCM16XV0 | DVA16PQ441 | XLT44PT | | | | AC164020 | AC164305 | | |
| PIC16F876 | 28SP | PCM16XK1 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | |
| PIC16F876 | 28SO | PCM16XK1 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | |
| PIC16F876A | 28SP | PCM16XV0 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | |
| PIC16F876A | 28SO | PCM16XV0 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | |
| PIC16F876A | 28SS | PCM16XV0 | DVA16XP282 | XLT28SS | | | | AC164021 | AC164307 | | |
| PIC16F876A | 28ML | PCM16XV0 | DVA16XP282 | XLT28QFN | | | | AC164012 +AC164031 | AC164301 +AC164031 | AC164031 | |

MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger 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® (6) |
| PICmicro® Microcontroller Development Tools (continued) | | | | | | | | | | | |
| PIC16F877 | 40P | PCM16XK1 | DVA16XP401 | | | | | AC164012 | AC164301 | ✓ | |
| PIC16F877 | 44L | PCM16XK1 | DVA16XL441 | | | | | AC164013 | AC164309 | | |
| PIC16F877 | 44PQ | PCM16XK1 | DVA16PQ441 | XLT44PT | | | | AC164014 | AC164311 | | |
| PIC16F877 | 44PT | PCM16XK1 | DVA16PQ441 | XLT44PT | | | | AC164020 | AC164305 | | |
| PIC16F877A | 40P | PCM16XV0 | DVA16XP401 | | | | | AC164012 | AC164301 | ✓ | |
| PIC16F877A | 44L | PCM16XV0 | DVA16XL441 | | | | | AC164013 | AC164309 | | |
| PIC16F877A | 44PT | PCM16XV0 | DVA16PQ441 | XLT44PT | | | | AC164020 | AC164305 | | |
| PIC16F877A | 44ML | PCM16XV0 | DVA16XP401 | XLT44QFN | | | | AC164012 +AC164034 | AC164301 +AC164034 | AC164034 | |
| PIC16HV540 | 18P | | | | | | | AC164001 | AC164301 | ✓ | |
| PIC16HV540 | 18SO | | | | | | | AC164002 | AC164302 | | |
| PIC16HV540 | 18SS | | | | | | | AC164015 | AC164307 | | |
| PIC17C42A | 40P, 40JW | PCM17XA0 | DVA17XP401 | | | | | AC174001 | AC164301 | ✓ | |
| PIC17C42A | 44L | PCM17XA0 | DVA17XL441 | | | | | AC174002 | AC164317 | | |
| PIC17C42A | 44PQ | PCM17XA0 | DVA17PQ441 | XLT44PT | | | | AC174004 | AC164316 | | |
| PIC17C42A | 44PT | PCM17XA0 | DVA17PQ441 | XLT44PT | | | | AC174005 | AC164315 | | |
| PIC17C43 | 40P, 40JW | PCM17XA0 | DVA17XP401 | | | | | AC174001 | AC164301 | ✓ | |
| PIC17C43 | 44L | PCM17XA0 | DVA17XL441 | | | | | AC174002 | AC164317 | | |
| PIC17C43 | 44PQ | PCM17XA0 | DVA17PQ441 | XLT44PT | | | | AC174004 | AC164316 | | |
| PIC17C43 | 44PT | PCM17XA0 | DVA17PQ441 | XLT44PT | | | | AC174005 | AC164315 | | |
| PIC17C44 | 40P, 40JW | PCM17XA0 | DVA17XP401 | | | | | AC174001 | AC164301 | ✓ | |
| PIC17C44 | 44L | PCM17XA0 | DVA17XL441 | | | | | AC174002 | AC164317 | | |
| PIC17C44 | 44PQ | PCM17XA0 | DVA17PQ441 | XLT44PT | | | | AC174004 | AC164316 | | |
| PIC17C44 | 44PT | PCM17XA0 | DVA17PQ441 | XLT44PT | | | | AC174005 | AC164315 | | |
| PIC17C752 | 68L | PCM17XA0 | DVA17XL681 | | | | | AC174007 | AC164308* | AC164024 | |
| PIC17C752 | 64PT | PCM17XA0 | DVA17PQ641 | XLT64PT2 | | | | AC174008 | AC164319* | | |
| PIC17C756/ 756A | 68L, 68CL | PCM17XA0 | DVA17XL681 | | | | | AC174007 | AC164308* | AC164024 | |
| PIC17C756/ 756A | 64PT | PCM17XA0 | DVA17PQ641 | XLT64PT2 | | | | AC174008 | AC164319* | | |
| PIC17C762 | 84L | PCM17XA0 | DVA17XL841 | | | | | AC174012 | AC164318 | AC164027 | |
| PIC17C762 | 80PT | PCM17XA0 | DVA17PQ801 | XLT80PT | | | | AC174011 | AC164320 | | |

MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger 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® (6) |
| PICmicro® Microcontroller Development Tools (continued) | | | | | | | | | | | |
| PIC17C766 | 84L, 84CL | PCM17XA0 | DVA17XL841 | | | | | AC174012 | AC164318 | AC164027 | |
| PIC17C766 | 80PT | PCM17XA0 | DVA17PQ801 | XLT80PT | | | | AC174011 | AC164320 | | |
| PIC18C242 | 28SP, 28JW | PCM18XA0 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | |
| PIC18C242 | 28SO | PCM18XA0 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | |
| PIC18C252 | 28SP | PCM18XA0 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | |
| PIC18C252 | 28JW | PCM18XA0 | DVA16XP282 | XLT28XP | | | | AC164012 | AC164301 | | |
| PIC18C252 | 28SO | PCM18XA0 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | |
| PIC18C442 | 40P, 40JW | PCM18XA0 | DVA16XP401 | | | | | AC164012 | AC164301 | ✓ | |
| PIC18C442 | 44L | PCM18XA0 | DVA16XL441 | | | | | AC164013 | AC164309 | | |
| PIC18C442 | 44PT | PCM18XA0 | DVA16PQ441 | XLT44PT | | | | AC164020 | AC164305 | | |
| PIC18C452 | 40P, 40JW | PCM18XA0 | DVA16XP401 | | | | | AC164012 | AC164301 | ✓ | |
| PIC18C452 | 44L | PCM18XA0 | DVA16XL441 | | | | | AC164013 | AC164309 | | |
| PIC18C452 | 44PT | PCM18XA0 | DVA16PQ441 | XLT44PT | | | | AC164020 | AC164305 | | |
| PIC18C601 | 68L | | | | PMF18WB1 | DAF18-1 | XLT68L1 | AC174007 | AC164308 | | |
| PIC18C601 | 64PT | | | | PMF18WB1 | DAF18-1 | XLT64PT2 | AC174008 | AC164303 | | |
| PIC18C658 | 68L | PCM18XB0 | DVA18XL680 | | | | | AC174007 | AC164308 | ✓ (8) | |
| PIC18C658 | 64PT | PCM18XB0 | DVA18PQ640 | XLT64PT2 | | | | AC174008 | AC164303 | | |
| PIC18C801 | 80PT | | | | PMF18WB1 | DAF18-1 | XLT80PT | AC174011 | AC164304 | | |
| PIC18C801 | 84L | | | | PMF18WB1 | DAF18-1 | XLT84L1 | AC174012 | AC164310 | | |
| PIC18C858 | 84L | PCM18XB0 | DVA18XL840 | | | | | AC174012 | AC164310 | ✓ (8) | |
| PIC18C858 | 80PT | PCM18XB0 | DVA18PQ800 | XLT80PT | | | | AC174011 | AC164304 | | |
| PIC18F242 | 28SP | PCM18XH0 | DVA16XP282 or DVA18XP280 | | PMF18WC0 | DAF18-2 | ACICE0204 | AC164012 | AC164301 | ✓ | |
| PIC18F242 | 28SO | PCM18XH0 | DVA16XP282 or DVA18XP280 | XLT28SO | PMF18WC0 | DAF18-2 | XLT28SO | AC164017 | AC164302 | | |
| PIC18F248 | 28SP | PCM18XD1 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | |
| PIC18F248 | 28SO | PCM18XD1 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | |
| PIC18F252 | 28SP | PCM18XH0 | DVA16XP282 or DVA18XP280 | | PMF18WC0 | DAF18-2 | ACICE0204 | AC164012 | AC164301 | ✓ | |
| PIC18F252 | 28SO | PCM18XH0 | DVA16XP282 or DVA18XP280 | XLT28SO | PMF18WC0 | DAF18-2 | XLT28SO | AC164017 | AC164302 | | |
| PIC18F258 | 28SP | PCM18XD1 | DVA16XP282 | | | | | AC164012 | AC164301 | ✓ | |
| PIC18F258 | 28SO | PCM18XD1 | DVA16XP282 | XLT28SO | | | | AC164017 | AC164302 | | |

MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger 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® (6) |
| PICmicro® Microcontroller Development Tools (continued) | | | | | | | | | | | |
| PIC18F442 | 40P | PCM18XH0 | DVA16XP401 or DVA18XP400 | | PMF18WC0 | DAF18-2 | ACICE0206 | AC164012 | AC164301 | ✓ | |
| PIC18F442 | 44L | PCM18XH0 | DVA16XL441 | | PMF18WC0 | DAF18-3* | XLT44L2 | AC164013 | AC164309 | | |
| PIC18F442 | 44PT | PCM18XH0 | DVA16PQ441 or DVA18PQ440 | XLT44PT | PMF18WC0 | DAF18-3* | XLT44PT | AC164020 | AC164305 | | |
| PIC18F448 | 40P | PCM18XD1 | DVA16XP401 | | | | | AC164012 | AC164301 | ✓ | |
| PIC18F448 | 44L | PCM18XD1 | DVA16XL441 | | | | | AC164013 | AC164309 | | |
| PIC18F448 | 44PT | PCM18XD1 | DVA16PQ441 | XLT44PT | | | | AC164020 | AC164305 | | |
| PIC18F452 | 40P | PCM18XH0 | DVA16XP401 | | PMF18WC0 | DAF18-2 | ACICE0206 | AC164012 | AC164301 | ✓ | |
| PIC18F452 | 44L | PCM18XH0 | DVA16XL441 | | PMF18WC0 | DAF18-3* | XLT44L2 | AC164013 | AC164309 | | |
| PIC18F452 | 44PT | PCM18XH0 | DVA16PQ441 | XLT44PT | PMF18WC0 | DAF18-3* | XLT44PT | AC164020 | AC164305 | | |
| PIC18F458 | 40P | PCM18XD1 | DVA16XP401 | | | | | AC164012 | AC164301 | ✓ | |
| PIC18F458 | 44L | PCM18XD1 | DVA16XL441 | | | | | AC164013 | AC164309 | | |
| PIC18F458 | 44PT | PCM18XD1 | DVA16PQ441 | XLT44PT | | | | AC164020 | AC164305 | | |
| PIC18F1220 | 18P | PCM18XJ0 | DVA18XP180 | | PMF18WD0 | DAF18-2 | ACICE0202 | AC164010 | AC164301 | ✓* | |
| PIC18F1220 | 18SO | PCM18XJ0 | DVA18XP180 | XLT18SO | PMF18WD0 | DAF18-2 | XLT18SO | AC164010 | AC164302 | | |
| PIC18F1220 | 20SS | PCM18XJ0 | DVA18XP180 | XLT20SS | PMF18WD0 | DAF18-2 | XLT20SS | AC164018 | AC164307 | | |
| PIC18F1220 | 28ML | PCM18XJ0 | DVA18XP180 | XLT28QFN2 | PMF18WD0 | DAF18-2 | XLT28QFN2 | AC164010 +AC164033 | AC164301 +AC164031 | AC164033* | |
| PIC18F1320 | 18P | PCM18XJ0 | DVA18XP180 | | PMF18WD0 | DAF18-2 | ACICE0202 | AC164010 | AC164301 | ✓* | |
| PIC18F1320 | 18SO | PCM18XJ0 | DVA18XP180 | XLT18SO | PMF18WD0 | DAF18-2 | XLT18SO | AC164010 | AC164302 | | |
| PIC18F1320 | 20SS | PCM18XJ0 | DVA18XP180 | XLT20SS | PMF18WD0 | DAF18-2 | XLT20SS | AC164018 | AC164307 | | |
| PIC18F1320 | 28ML | PCM18XJ0 | DVA18XP180 | XLT28QFN2 | PMF18WD0 | DAF18-2 | XLT28QFN2 | AC164010 +AC164033 | AC164301 +AC164031 | AC164033* | |
| PIC18F2220 | 28SP | PCM18XH0 | DVA18XP280 | | PMF18WC0 | DAF18-2 | ACICE0204 | AC164012 | AC164301 | ✓* | |
| PIC18F2220 | 28SO | PCM18XH0 | DVA18XP280 | XLT28SO | PMF18WC0 | DAF18-2 | XLT28SO | AC164017 | AC164302 | | |
| PIC18F2320 | 28SP | PCM18XH0 | DVA18XP280 | | PMF18WC0 | DAF18-2 | ACICE0204 | AC164012 | AC164301 | ✓* | |
| PIC18F2320 | 28SO | PCM18XH0 | DVA18XP280 | XLT28SO | PMF18WC0 | DAF18-2 | XLT28SO | AC164017 | AC164302 | | |
| PIC18F2331 | 28SP | PCM18XL0 | DVA18XP280 | | PMF18WF0* | DAF18-4* | ACICE0204 | AC164035 | AC164301 | ✓* | |
| PIC18F2331 | 28SO | PCM18XL0 | DVA18XP280 | XLT28SO | PMF18WF0* | DAF18-4* | XLT28SO | AC164036 | AC164302 | | |
| PIC18F2431 | 28SP | PCM18XL0 | DVA18XP280 | | PMF18WF0* | DAF18-4* | ACICE0204 | AC164035 | AC164301 | ✓* | |
| PIC18F2431 | 28SO | PCM18XL0 | DVA18XP280 | XLT28SO | PMF18WF0* | DAF18-4* | XLT28SO | AC164036 | AC164302 | | |

MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger 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® (6) |
| PICmicro® Microcontroller Development Tools (continued) | | | | | | | | | | | |
| PIC18F2439 | 28P | | | | | | | AC164012 | AC164301* | ✓* | |
| PIC18F2439 | 28SO | | | | | | | AC164017 | AC164302* | | |
| PIC18F2510 | 28SP | PCM18XN0* | DVA18XP280 | | PMF18WH0* | DAF18-4* | ACICE0204 | AC164012* | AC164301* | ✓* | |
| PIC18F2510 | 28SO | PCM18XN0* | DVA18XP280 | XLT28SO | PMF18WH0* | DAF18-4* | XLT28SO | AC164017* | AC164302* | | |
| PIC18F2510 | 28ML | PCM18XN0* | DVA18XP280 | XLT28QFN | PMF18WH0* | DAF18-4* | TBD | | AC164301* +AC164031 | | |
| PIC18F2515 | 28SP | PCM18XN0* | DVA18XP280 | | PMF18WH0* | DAF18-4* | ACICE0204 | AC164012* | AC164301* | ✓* | |
| PIC18F2515 | 28SO | PCM18XN0* | DVA18CP280 | XLT28SO | PMF18WH0* | DAF18-4* | XLT28SO | AC164017* | AC164302* | | |
| PIC18F2520 | 28SP | PCM18XN0* | DVA18XP280 | | PMF18WH0* | DAF18-4* | ACICE0204 | AC164012* | AC164301* | ✓* | |
| PIC18F2520 | 28SO | PCM18XN0* | DVA18XP280 | XLT28SO | PMF18WH0* | DAF18-4* | XLT28SO | AC164017* | AC164302* | | |
| PIC18F2520 | 28ML | PCM18XN0* | DVA18XP280 | XLT28QFN | PMF18WH0* | DAF18-4* | TBD | | AC164301* +AC164031 | | |
| PIC18F2525 | 28SP | PCM18XN0* | DVA18XP280 | | PMF18WH0* | DAF18-4* | ACICE0204 | AC164012* | AC164301* | ✓* | |
| PIC18F2525 | 28SO | PCM18XN0* | DVA18XP280 | XLT28SO | PMF18WH0* | DAF18-4* | XLT28SO | AC164017* | AC164302* | | |
| PIC18F2539 | 28P | | | | | | | AC164012 | AC164301* | ✓* | |
| PIC18F2539 | 28SO | | | | | | | AC164017 | AC164302* | | |
| PIC18F2585 | 28SP | PCM18XP0* | DVA18XP280 | | PMF18WJ0* | DAF18-4* | ACICE0204 | AC164012* | AC164301* | ✓* | |
| PIC18F2585 | 28SO | PCM18XP0* | DVA18XP280 | XLT28SO | PMF18WJ0* | DAF18-4* | XLT28SO | AC164017* | AC164302* | | |
| PIC18F2586 | 28SP | PCM18XP0* | DVA18XP280 | | PMF18WJ0* | DAF18-4* | ACICE0204 | AC164012* | AC164301* | ✓* | |
| PIC18F2586 | 28SO | PCM18XP0* | DVA18XP280 | XLT28SO | PMF18WJ0* | DAF18-4* | XLT28SO | AC164017* | AC164302* | | |
| PIC18F2610 | 28SP | PCM18XN0* | DVA18XP280 | | PMF18WH0* | DAF18-4* | ACICE0204 | AC164012* | AC164301* | ✓* | |
| PIC18F2610 | 28SO | PCM18XN0* | DVA18XP280 | XLT28SO | PMF18WH0* | DAF18-4* | XLT28SO | AC164017* | AC164302* | | |
| PIC18F2620 | 28SP | PCM18XN0* | DVA18XP280 | | PMF18WH0* | DAF18-4* | ACICE0204 | AC164012* | AC164301* | ✓* | |
| PIC18F2620 | 28SO | PCM18XN0* | DVA18XP280 | XLT28SO | PMF18WH0* | DAF18-4* | XLT28SO | AC164017* | AC164302* | | |
| PIC18F2680 | 28SP | PCM18XP0* | DVA18XP280 | | PMF18WJ0* | DAF18-4* | ACICE0204 | AC164012* | AC164301* | ✓* | |
| PIC18F2680 | 28SO | PCM18XP0* | DVA18XP280 | XLT28SO | PMF18WJ0* | DAF18-4* | XLT28SO | AC164017* | AC164302* | | |
| PIC18F2681 | 28SP | PCM18XP0* | DVA18XP280 | | PMF18WJ0* | DAF18-4* | ACICE0204 | AC164012* | AC164301* | ✓* | |
| PIC18F2681 | 28SO | PCM18XP0* | DVA18XP280 | XLT28SO | PMF18WJ0* | DAF18-4* | XLT28SO | AC164017* | AC164302* | | |
| PIC18F4220 | 40P | PCM18XH0 | DVA18XP400 | | PMF18WC0 | DAF18-2 | ACICE0206 | AC164012 | AC164301 | ✓* | |
| PIC18F4220 | 44ML | PCM18XH0 | DVA18XP400 | XLT44QFN | PMF18WC0 | DAF18-3* | XLT44QFN | AC164012 +AC164034 | AC164301 +AC164034 | AC164034* | |
| PIC18F4220 | 44PT | PCM18XH0 | DVA18PQ440 | XLT44PT | PMF18WC0 | DAF18-3* | XLT44PT | AC164020 | AC164305 | | |

MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger 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® (6) |
| PICmicro® Microcontroller Development Tools (continued) | | | | | | | | | | | |
| PIC18F4320 | 40P | PCM18XH0 | DVA18XP400 | | PMF18WC0 | DAF18-2 | ACICE0206 | AC164012 | AC164301 | ✓* | |
| PIC18F4320 | 44ML | PCM18XH0 | DVA18XP400 | XLT44QFN | PMF18WC0 | DAF18-3* | XLT44QFN | AC164012 +AC164034 | AC164301 +AC164034 | AC164034* | |
| PIC18F4320 | 44PT | PCM18XH0 | DVA18PQ440 | XLT44PT | PMF18WC0 | DAF18-3* | XLT44PT | AC164020 | AC164305 | | |
| PIC18F4331 | 40P | PCM18XL0 | DVA18XP400 | | PMF18WF0* | DAF18-4* | ACICE0206 | AC164012 | AC164301 | ✓ | |
| PIC18F4331 | 44PT | PCM18XL0 | DVA18PQ440 | XLT44PT | PMF18WF0* | DAF18-5* | XLT44PT | AC164020 | AC164305 | | |
| PIC18F4331 | 44ML | PCM18XL0 | DVA18XP400 | XLT44QFN | PMF18WF0* | DAF18-5* | XLT44QFN | AC164012 +AC164034 | AC164301 +AC164034 | | |
| PIC18F4431 | 40P | PCM18XL0 | DVA18XP400 | | PMF18WF0* | DAF18-4* | ACICE0206 | AC164012 | AC164301 | ✓ | |
| PIC18F4431 | 44PT | PCM18XL0 | DVA18PQ440 | XLT44PT | PMF18WF0* | DAF18-5* | XLT44PT | AC164020 | AC164305 | | |
| PIC18F4431 | 44ML | PCM18XL0 | DVA18XP400 | XLT44QFN | PMF18WF0* | DAF18-5* | XLT44QFN | AC164012 +AC164034 | AC164301 +AC164034 | | |
| PIC18F4439 | 40P | | | | | | | AC164012 | AC164301* | ✓* | |
| PIC18F4439 | 44ML | | | | | | | AC164012 +AC164034 | AC164301* +AC164034 | AC164034* | |
| PIC18F4439 | 44PT | | | | | | | AC164020 | AC164305* | | |
| PIC18F4510 | 40P | PCM18XN0* | DVA18XP400 | | PMF18WH0* | DAF18-4* | ACICE0206 | AC164012* | AC164301* | ✓* | |
| PIC18F4510 | 44PT | PCM18XN0* | DVA18PQ440 | XLT44PT | PMF18WH0* | DAF18-5* | XLT44PT | AC164020* | AC164305* | | |
| PIC18F4510 | 44ML | PCM18XN0* | DVA18XP400 | XLT44QFN | PMF18WH0* | DAF18-5* | XLT44QFN | AC164012* +AC164034 | AC164301* +AC164034 | | |
| PIC18F4515 | 40P | PCM18XN0* | DVA18XP400 | | PMF18WH0* | DAF18-4* | ACICE0206 | AC164012* | AC164301* | ✓* | |
| PIC18F4515 | 44PT | PCM18XN0* | DVA18PQ440 | XLT44PT | PMF18WH0* | DAF18-5* | XLT44PT | AC164020* | AC164305* | | |
| PIC18F4515 | 44ML | PCM18XN0* | DVA18XP400 | XLT44QFN | PMF18WH0* | DAF18-5* | XLT44QFN | AC164012* +AC164034 | AC164301* +AC164034 | | |
| PIC18F4520 | 40P | PCM18XN0* | DVA18XP400 | | PMF18WH0* | DAF18-4* | ACICE0206 | AC164012* | AC164301* | ✓* | |
| PIC18F4520 | 44PT | PCM18XN0* | DVA18PQ440 | XLT44PT | PMF18WH0* | DAF18-5* | XLT44PT | AC164020* | AC164305* | | |
| PIC18F4520 | 44ML | PCM18XN0* | DVA18XP400 | XLT44QFN | PMF18WH0* | DAF18-5* | XLT44QFN | AC164012* +AC164034 | AC164301* +AC164034 | | |
| PIC18F4525 | 40P | PCM18XN0* | DVA18XP400 | | PMF18WH0* | DAF18-4* | ACICE0206 | AC164012* | AC164301* | ✓* | |
| PIC18F4525 | 44PT | PCM18XN0* | DVA18PQ440 | XLT44PT | PMF18WH0* | DAF18-5* | XLT44PT | AC164020* | AC164305* | | |
| PIC18F4525 | 44ML | PCM18XN0* | DVA18XP400 | XLT44QFN | PMF18WH0* | DAF18-5* | XLT44QFN | AC164012* +AC164034 | AC164301* +AC164034 | | |
| PIC18F4539 | 40P | | | | | | | AC164012 | AC164301* | ✓* | |
| PIC18F4539 | 44ML | | | | | | | AC164012 +AC164034 | AC164301* +AC164034 | AC164034* | |
| PIC18F4539 | 44PT | | | | | | | AC164020 | AC164305* | | |

MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger 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® (6) |
| PICmicro® Microcontroller Development Tools (continued) | | | | | | | | | | | |
| PIC18F4585 | 40P | PCM18XP0* | DVA18XP400 | | PMF18WJ0* | DAF18-4* | ACICE0206 | AC164012* | AC164301* | ✓* | |
| PIC18F4585 | 44PT | PCM18XP0* | DVA18PQ440 | XLT44PT | PMF18WJ0* | DAF18-5* | XLT44PT | AC164020* | AC164305* | | |
| PIC18F4585 | 44ML | PCM18XP0* | DVA18XP400 | XLT44QFN | PMF18WJ0* | DAF18-5* | XLT44QFN | AC164012* +AC164034 | AC164301* +AC164034 | | |
| PIC18F4586 | 40P | PCM18XP0* | DVA18XP400 | | PMF18WJ0* | DAF18-4* | ACICE0206 | AC164012* | AC164301* | ✓* | |
| PIC18F4586 | 44PT | PCM18XP0* | DVA18PQ440 | XLT44PT | PMF18WJ0* | DAF18-5* | XLT44PT | AC164020* | AC164305* | | |
| PIC18F4586 | 44ML | PCM18XP0* | DVA18XP400 | XLT44QFN | PMF18WJ0* | DAF18-5* | XLT44QFN | AC164012* +AC164034 | AC164301* +AC164034 | | |
| PIC18F4610 | 40P | PCM18XN0* | DVA18XP400 | | PMF18WHO* | DAF18-4* | ACICE0206 | AC164012* | AC164301* | ✓* | |
| PIC18F4610 | 44PT | PCM18XN0* | DVA18PQ440 | XLT44PT | PMF18WHO* | DAF18-5* | XLT44PT | AC164020* | AC164305* | | |
| PIC18F4610 | 44ML | PCM18XN0* | DVA18XP400 | XLT44QFN | PMF18WHO* | DAF18-5* | XLT44QFN | AC164012* +AC164034 | AC164301* +AC164034 | | |
| PIC18F4620 | 40P | PCM18XN0* | DVA18XP400 | | PMF18WHO* | DAF18-4* | ACICE0206 | AC164012* | AC164301* | ✓* | |
| PIC18F4620 | 44PT | PCM18XN0* | DVA18PQ440 | XLT44PT | PMF18WHO* | DAF18-5* | XLT44PT | AC164020* | AC164305* | | |
| PIC18F4620 | 44ML | PCM18XN0* | DVA18XP400 | XLT44QFN | PMF18WHO* | DAF18-5* | XLT44QFN | AC164012* +AC164034 | AC164301* +AC164034 | | |
| PIC18F4680 | 40P | PCM18XP0 | DVA18XP400 | | PMF18WJ0* | DAF18-4* | ACICE0206 | AC164012* | AC164301* | ✓* | |
| PIC18F4680 | 44PT | PCM18XP0 | DVA18PQ440 | XLT44PT | PMF18WJ0* | DAF18-5* | XLT44PT | AC164020* | AC164305* | | |
| PIC18F4680 | 44ML | PCM18XP0 | DVA18XP400 | XLT44QFN | PMF18WJ0* | DAF18-5* | XLT44QFN | AC164012* +AC164034 | AC164301* +AC164034 | | |
| PIC18F4681 | 40P | PCM18XP0 | DVA18XP400 | | PMF18WJ0* | DAF18-4* | ACICE0206 | AC164012* | AC1643018* | ✓* | |
| PIC18F4681 | 44PT | PCM18XP0 | DVA18PQ440 | XLT44PT | PMF18WJ0* | DAF18-5* | XLT44PT | AC164020* | AC1643058* | | |
| PIC18F4681 | 44ML | PCM18XP0 | DVA18XP400 | XLT44QFN | PMF18WJ0* | DAF18-5* | XLT44QFN | AC164012* +AC164034 | AC164301* +AC164034 | | |
| PIC18F6310 | 64PT | PCM18XQ0* | DVA1003* | XLT64PT2 | PMF18WK0* | DAF18-6* | XLT64PT2 | TBD | AC164303* | | |
| PIC18F6390 | 64PT | PCM18XQ0* | DVA1003* | XLT64PT2 | PMF18WK0* | DAF18-6* | XLT64PT2 | TBD | AC164303* | | |
| PIC18F6410 | 64PT | PCM18XQ0* | DVA1003* | XLT64PT2 | PMF18WK0* | DAF18-6* | XLT64PT2 | AC174008* | AC164303* | | |
| PIC18F6490 | 64PT | PCM18XQ0* | DVA1003* | XLT64PT2 | PMF18WK0* | DAF18-6* | XLT64PT2 | AC174008* | AC164303* | | |
| PIC18F6520 | 64PT | PCM18XE1 | DVA18PQ640 | XLT64PT2 | PMF18WA1 | DAF18-1 | XLT64PT2 | AC174008 | AC164303 | | |
| PIC18F6525 | 64PT | PCM18XK0 | DVA18PQ802 | XLT64PT2 | PMF18WE0 | DAF18-1 | XLT64PT2 | AC174008 | AC164303 | | |
| PIC18F6585 | 68L | PCM18XK0 | DVA18PQ802 | XLT68L1 | PMF18WE0 | DAF18-1 | XLT68L1 | AC174007 | AC164308 | | |
| PIC18F6585 | 64PT | PCM18XK0 | DVA18PQ802 | XLT64PT2 | PMF18WE0 | DAF18-1 | XLT64PT2 | AC174008 | AC164303 | | |
| PIC18F6620 | 64PT | PCM18XE1 | DVA18PQ640 | XLT64PT2 | PMF18WA1 | DAF18-1 | XLT64PT2 | AC174008 | AC164303 | ✓ (7) | |

MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger 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® (6) |
| dsPIC™ Microcontroller Development Tools | | | | | | | | | | | |
| dsPIC30F2010 | 28SO | | | | PMF30XA1* | DAF30-4* | XLT28SO | AC30F004* | AC164302* | | |
| dsPIC30F2010 | 28SP | | | | PMF30XA1* | DAF30-4* | ACICE0204 | AC30F004* | AC164301* | | |
| dsPIC30F2011 | 18SO | | | | PMF30XA1* | DAF30-4* | XLT18SO | AC30F005* | AC164302* | | |
| dsPIC30F2011 | 18P | | | | PMF30XA1* | DAF30-4* | ACICE0202 | AC30F005* | AC164301* | | |
| dsPIC30F2012 | 28SO | | | | PMF30XA1* | DAF30-4* | XLT28SO | AC30F004* | AC164302* | | |
| dsPIC30F2012 | 28SP | | | | PMF30XA1* | DAF30-4* | ACICE0204 | AC30F004* | AC164301* | | |
| dsPIC30F3010 | 28SO | | | | PMF30XA1* | DAF30-4* | XLT28SO | AC30F004* | AC164302* | | |
| dsPIC30F3010 | 28SP | | | | PMF30XA1* | DAF30-4* | ACICE0204 | AC30F004* | AC164301* | | |
| dsPIC30F3011 | 40P | | | | PMF30XA1* | DAF30-4* | ACICE0206 | AC30F003* | AC164301* | | |
| dsPIC30F3011 | 44PT | | | | PMF30XA1* | DAF30-3* | XLT44PT or XLT44PT3 | AC30F006* | AC164305* | | |
| dsPIC30F3012 | 18SO | | | | PMF30XA1* | DAF30-4* | XLT18SO | AC30F005* | AC164302* | | |
| dsPIC30F3012 | 18P | | | | PMF30XA1* | DAF30-4* | ACICE0202 | AC30F005* | AC164301* | | |
| dsPIC30F3013 | 28SO | | | | PMF30XA1* | DAF30-4* | XLT28SO | AC30F004* | AC164302* | | |
| dsPIC30F3013 | 28SP | | | | PMF30XA1* | DAF30-4* | ACICE0204 | AC30F004* | AC164301* | | |
| dsPIC30F3014 | 40P | | | | PMF30XA1* | DAF30-4* | ACICE0206 | AC30F003* | AC164301* | | |
| dsPIC30F3014 | 44PT | | | | PMF30XA1* | DAF30-3* | XLT44PT or XLT44PT3 | AC30F006* | AC164305* | | |
| dsPIC30F4011 | 40P | | | | PMF30XA1* | DAF30-4* | ACICE0206 | AC30F003* | AC164301* | | |
| dsPIC30F4011 | 44PT | | | | PMF30XA1* | DAF30-3* | XLT44PT or XLT44PT3 | AC30F006* | AC164305* | | |
| dsPIC30F4012 | 28SO | | | | PMF30XA1* | DAF30-4* | XLT28SO | AC30F004* | AC164302* | | |
| dsPIC30F4012 | 28SP | | | | PMF30XA1* | DAF30-4* | ACICE0204 | AC30F004* | AC164301* | | |
| dsPIC30F4013 | 40P | | | | PMF30XA1* | DAF30-4* | ACICE0206 | AC30F003* | AC164301* | | |
| dsPIC30F4013 | 44PT | | | | PMF30XA1* | DAF30-3* | XLT44PT or XLT44PT3 | AC30F006* | AC164305* | | |
| dsPIC30F5011 | 64PT | | | | PMF30XA1* | DAF30-2 | XLT64PT2 or XLT64PT5 | AC30F008* | AC164303* | | |
| dsPIC30F5013 | 80PT | | | | PMF30XA1* | DAF30-2 | XLT80PT or XLT80PT3 | AC30F007* | AC164304* | | |
| dsPIC30F5015 | 64PT | | | | PMF30XA1* | DAF30-2 | XLT64PT2 or XLT64PT5 | AC30F008* | AC164303* | | |

MPLAB® ICE 2000 and MPLAB® ICE 4000 Emulator Systems, PRO MATE® II Programmer Socket Modules, MPLAB® In-Circuit Debugger 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® (6) |
| dsPIC™ Microcontroller Development Tools (continued) | | | | | | | | | | | |
| dsPIC30F6010 | 80PF | | | | PMF30XA1* | DAF30-2 | XLT80PT2 | AC30F001 | AC164314* | | |
| dsPIC30F6011 | 64PF | | | | PMF30XA1* | DAF30-2 | XLT64PT3 or XLT64PT4 | AC30F002* | AC164313* | | |
| dsPIC30F6012 | 64PF | | | | PMF30XA1* | DAF30-2 | XLT64PT3 or XLT64PT4 | AC30F002* | AC164313* | | |
| dsPIC30F6013 | 80PF | | | | PMF30XA1* | DAF30-2 | XLT80PT2 | AC30F001* | AC164314* | | |
| dsPIC30F6014 | 80PF | | | | PMF30XA1* | DAF30-2 | XLT80PT2 | AC30F001* | AC164314* | | |

- 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 (9)

| 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, 925, 926 |
| 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 |
| 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 Demo Board for PIC18F2331, 2431, 4331, 4431 |
| DM183020 | PIC18FXX20 64/80L TQFP Demo Board for PIC18F6620, 6720, 8620, 8720, 6520, 8520 |
| 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 |
| DM163008 | MCP2120/2150 Developer's Kit for IR Communication |
| DM163010 | PICDEM™ USB Demo Board for PIC16C7X5 |
| DM163011 | PICDEM™ CAN-LIN 2 Demo Board |
| DM163015 | PICDEM™ CAN-LIN 3 Demo Board |
| DV250501 | MCP250XX CAN Developer's Kit |
| DV251001 | MCP2510/2515 CAN Developer's Kit |

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

Demonstration Boards and Evaluation Kits (9)

| 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 | 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 |
|----------------------------|--|
| PS040* | PowerTool™ Development Software for PS401 and PS402 Applications |
| 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 |
| PS4160-3 | 3-cell Li-Ion Fuel Gauge |
| PS4160-4 | 4-cell Li-Ion Fuel Gauge |
| PS4160EV-3 | 3-cell Li-Ion Fuel Gauge with PS041 PowerInfo™ Board |
| PS4160EV-4 | 4-cell Li-Ion Fuel Gauge with PS041 PowerInfo™ Board |
| PS4200 | 6-12 cell NiMH Fuel Gauge |
| PS4200EV | 6-12 Cell NiMH Fuel Gauge with PS041 PowerInfo™ Board |
| 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 Fuel Gauge with safety |
| PS7052 | Two Cell Li-Ion Fuel Gauge with safety |
| PS7070 | PS700 Battery Monitor Evaluation Board |
| PS7070EV | PS700 Battery Monitor Evaluation Board 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, 24 |
|--|----------|------------------------|

KEELOQ® Evaluation Kits

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

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

Analog Evaluation/Developer's Kits

| | MCP3001/02 | MCP3004/08 | MCP3201/02 | MCP3204/08 | MCP60X | MCP41XXX/ 42XXX | TC64X/64XB | TC650/51 | |
|--|------------|------------|------------|------------|------------|--------------------|------------|-----------|---|
| Analog Evaluation Kits | | | | | | | | | |
| Analog Evaluation Driver Board | DVMCPA | DVMCPA | DVMCPA | DVMCPA | - | DVMCPA | | | |
| Evaluation Board | DV3201A** | DV3204A** | DV3201A** | DV3204A** | - | DV42XXX** | | | |
| FilterLab® Active Filter Design Tool | | | | | FilterLab* | | | | |
| Thermal Management Tools | | | | | | | | | |
| Fan Controller Demo Board | | | | | | | TC642Demo | TC650Demo | T |
| Fan Controller Evaluation Kit | | | | | | | TC642EV | | |
| Serial Digital Thermal Sensor Demo Board | | | | | | | | | |
| Data Converter Tools | | | | | | | | | |
| Sigma-Delta A/D Family Demo Board | | | | | | | | | |
| Sigma-Delta A/D Family Evaluation Kit | | | | | | | | | |

* Available for download from Microchip Technology Inc.'s web site at www.microchip.com.

** Must be ordered with DVMCPA.

RFID Evaluation/Developer's Kits

| | MCRF200 | MCRF250 | MCRF355 |
|--|---------|---------|----------|
| 13.56 MHz Anti-Collision microID® Developer's Kit for MCRF355, 360, 450, 452 | - | - | DV103003 |
| microID® Programmer Kit only for MCRF355 | - | - | PG10 |

FUTURE MICROCHIP MICROCONTROLLER PRODUCTS

Baseline 8-Bit PICmicro[®] Microcontroller Family

| Product | Program Memory (Bytes) | EEPROM Data Memory Bytes | RAM Bytes | I/O Pins | Packages | Analog | | Digital | | Max. Speed MHz | IntOSC | ICSP™ | BOR/PBOR/PLVD | ICD # of Breakpoints | C EC |
|--|------------------------|--------------------------|-----------|----------|-----------------|--------------|-------|----------------|------------|----------------|--------|-------|---------------|----------------------|------|
| | | | | | | ADC Channels | Comp. | Timers/WDT | Serial I/O | | | | | | |
| PIC12FXXX (x12): 200 ns Instruction Execution, 33 Instructions | | | | | | | | | | | | | | | |
| PIC12F510 | 1536 StdFI | — | 72 | 6 | 8P, 8SN, 8MS | — | 1 | 1-8 bit, 1-WDT | — | 20 | 8 MHz | ✓ | — | 1** | — |
| PIC16FXXX (x12): 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 StdFI | — | 72 | 12 | 14P, 14SO, 14ST | — | 2 | 1-8 bit, 1-WDT | — | 20 | 8 MHz | ✓ | — | 1** | — |

** Requires ICD specific device with header module – refer to Development Tools.

Mid-Range 8-Bit PICmicro[®] Microcontroller Family

| Product | Program Memory (Bytes) | EEPROM Data Memory Bytes | RAM Bytes | I/O Pins | Packages | Analog | | Digital | | Max. Speed MHz | IntOSC | BOR/PBOR/PLVD | ICD # of Breakpoints | C EC | |
|--|------------------------|--------------------------|-----------|----------|------------------------|--------------|-------|--------------------------|------------------------------|----------------|--------|---------------|----------------------|------|--|
| | | | | | | ADC Channels | Comp. | Timers/WDT | Serial I/O | | | | | | |
| PIC16FXXX (x14): Upwardly Compatible with PIC16C5X/PIC12CXXX, 4-12 Interrupts, 200 ns Instruction Execution, 35 Instructions, ICSP™ | | | | | | | | | | | | | | | |
| PIC16F631 | 1792 StdFI | 128 | 64 | 18 | 20P, 20SO, 20SS | — | 2 | 1-16 bit, 1-8 bit, 1-WDT | — | 20 | 8 MHz | BOR | 1** | — | |
| PIC16F639 | 3584 StdFI | 256 | 128 | 12 | 20P, 20SO, 20SS | — | 2 | 1-16 bit, 1-8 bit, 1-WDT | — | 20 | 8 MHz | BOR | 1** | — | |
| PIC16F677 | 3584 StdFI | 256 | 128 | 18 | 20P, 20SO, 20SS | 12 | 2 | 1-16 bit, 1-8 bit, 1-WDT | — | 20 | 8 MHz | BOR | 1** | — | |
| PIC16F685 | 7168 StdFI | 256 | 256 | 18 | 20P, 20SO, 20SS | 12 | 2 | 1-16 bit, 2-8 bit, 1-WDT | — | 20 | 8 MHz | BOR | 1** | 0 | |
| PIC16F687 | 3584 StdFI | 256 | 128 | 18 | 20P, 20SO, 20SS | 12 | 2 | 1-16 bit, 1-8 bit, 1-WDT | EUSART, I ² C/SPI | 20 | 8 MHz | BOR | 1** | — | |
| PIC16F689 | 7168 StdFI | 256 | 256 | 18 | 20P, 20SO, 20SS | 12 | 2 | 1-16 bit, 1-8 bit, 1-WDT | EUSART, I ² C/SPI | 20 | 8 MHz | BOR | 1** | — | |
| PIC16F690 | 7168 StdFI | 256 | 256 | 18 | 20P, 20SO, 20SS | 12 | 2 | 1-16 bit, 1-8 bit, 1-WDT | EUSART, I ² C/SPI | 20 | 8 MHz | BOR | 1** | 0 | |
| PIC16F785 | 3584 StdFI | 256 | 128 | 18 | 20P, 20SO, 20SS | 12 | 2 | 1-16 bit, 2-8 bit, 1-WDT | — | 20 | 8 MHz | BOR | 1** | 1 | |
| PIC16F913 | 7168 EnhFI | 256 | 256 | 25 | 28P, 28SO, 28SS, 28QFN | 4 | 1 | 2-8 bit, 1-16 bit | AUSART, I ² C/SPI | 20 | 8 MHz | BOR/PLVD | 1 | 1 | |
| PIC16F914 | 7168 EnhFI | 256 | 256 | 36 | 40P, 44TQFP, 44QFN | 8 | 2 | 2-8 bit, 1-16 bit | AUSART, I ² C/SPI | 20 | 8 MHz | BOR/PLVD | 1 | 2 | |
| PIC16F916 | 14336 EnhFI | 256 | 352 | 25 | 28P, 28SO, 28SS, 28QFN | 4 | 1 | 2-8 bit, 1-16 bit | AUSART, I ² C/SPI | 20 | 8 MHz | BOR/PLVD | 1 | 1 | |
| PIC16F917 | 14336 EnhFI | 256 | 352 | 36 | 40P, 44TQFP, 44QFN | 8 | 2 | 2-8 bit, 1-16 bit | AUSART, I ² C/SPI | 20 | 8 MHz | BOR/PLVD | 1 | 2 | |

** Requires ICD specific device with header module – refer to Development Tools.

**Future
Products**

High Performance 8-Bit PICmicro® Microcontroller Family

| Product | Program Memory (Bytes) | EEPROM Data Memory Bytes | RAM Bytes | I/O Pins | Packages | Analog | | Digital | | Max. Speed MHz | IntOSC | BOR/PBOR/PLVD | | ICD # of Breakpoints | CC |
|---|------------------------|--------------------------|-----------|----------|-----------------------|-----------|-------|--------------------------|-------------------------------------|----------------|--------|---------------|-----------|----------------------|----|
| | | | | | | ADC Ch | Comp. | Timers/WDT | Serial I/O | | | ✓ | BOR | | |
| PIC18FXXX (x16): Upwardly Compatible with PIC17C7XX/PIC16C5X/PIC12CXXX, 77 Instructions, C Compiler Efficient Instruction Set, Software Stack Capability, Table Read/Write, S | | | | | | | | | | | | | | | |
| MIPS, ICSP™ | | | | | | | | | | | | | | | |
| PIC18F1230 | 4096 EnhFI | 128 | 256 | 16 | 18P, 18SO, 20SS, 28ML | 3x10-bit | 3 | 2-16 bit, 1-WDT | EUSART | 40 | 8 MHz | ✓ | PBOR/PLVD | 3 | - |
| PIC18F1330 | 8192 EnhFI | 128 | 256 | 16 | 18P, 18SO, 20SS, 28ML | 3x10-bit | 3 | 2-16 bit, 1-WDT | EUSART | 40 | 8 MHz | ✓ | PBOR/PLVD | 3 | - |
| PIC18F65J10 | 32,768 StdFI | — | 2048 | 51 | 64PT | 11x10-bit | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI ² C/SPI | 40 | — | ✓ | BOR | 3 | 2 |
| PIC18F65J15 | 49,152 StdFI | — | 2048 | 51 | 64PT | 11x10-bit | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI ² C/SPI | 40 | — | ✓ | BOR | 3 | 2 |
| PIC18F66J10 | 65,536 StdFI | — | 2048 | 51 | 64PT | 11x10-bit | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI ² C/SPI | 40 | — | ✓ | BOR | 3 | 2 |
| PIC18F66J15 | 98,304 StdFI | — | 3936 | 51 | 64PT | 11x10-bit | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI ² C/SPI | 40 | — | ✓ | BOR | 3 | 2 |
| PIC18F67J10 | 131,072 StdFI | — | 3936 | 51 | 64PT | 11x10-bit | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI ² C/SPI | 40 | — | ✓ | BOR | 3 | 2 |
| PIC18F85J10 | 32,768 StdFI | — | 2048 | 67 | 80PT | 15x10-bit | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI ² C/SPI | 40 | — | ✓ | BOR | 3 | 2 |
| PIC18F85J15 | 49,152 StdFI | — | 2048 | 67 | 80PT | 15x10-bit | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI ² C/SPI | 40 | — | ✓ | BOR | 3 | 2 |
| PIC18F86J10 | 65,536 StdFI | — | 3936 | 67 | 80PT | 15x10-bit | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI ² C/SPI | 40 | — | ✓ | BOR | 3 | 2 |
| PIC18F86J15 | 98,304 StdFI | — | 3936 | 67 | 80PT | 15x10-bit | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI ² C/SPI | 40 | — | ✓ | BOR | 3 | 2 |
| PIC18F87J10 | 131,072 StdFI | — | 3936 | 67 | 80PT | 15x10-bit | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI ² C/SPI | 40 | — | ✓ | BOR | 3 | 2 |
| PIC18F6522 | 32,768 EnhFI | 1024 | 2048 | 54 | 64PT | 12x10-bit | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI ² C/SPI | 40 | 8 MHz | ✓ | PBOR | 3 | 2 |
| PIC18F6527 | 49,152 EnhFI | 1024 | 3936 | 54 | 64PT | 12x10-bit | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI ² C/SPI | 40 | 8 MHz | ✓ | PBOR | 3 | 2 |
| PIC18F6622 | 65,536 EnhFI | 1024 | 3936 | 54 | 64PT | 12x10-bit | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI ² C/SPI | 40 | 8 MHz | ✓ | PBOR | 3 | 2 |
| PIC18F8522 | 32,768 EnhFI | 1024 | 2048 | 70 | 80PT | 16x10-bit | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI ² C/SPI | 40 | 8 MHz | ✓ | PBOR | 3 | 2 |
| PIC18F8527 | 49,152 EnhFI | 1024 | 3936 | 70 | 80PT | 16x10-bit | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI ² C/SPI | 40 | 8 MHz | ✓ | PBOR | 3 | 2 |
| PIC18F8622 | 65,536 EnhFI | 1024 | 3936 | 70 | 80PT | 16x10-bit | 2 | 3-16 bit, 2-8 bit, 1-WDT | 2x EUSART, 2x MI ² C/SPI | 40 | 8 MHz | ✓ | PBOR | 3 | 2 |

Abbreviations:

CAN = Controller Area Network
 CCP = Capture/Compare/PWM
 DAC = Digital-to-Analog Converter
 E² = EEPROM
 ECAN = Enhanced Controller Area Network
 ECCP = Enhanced Capture/Compare/4-ch PWM with programmable dead time
 *Contact Microchip Technology for availability date.

ICSP = In-Circuit Serial Programming
 ICD = # of in-circuit debug breakpoints
 IntOSC = Internal Oscillator
 LVD = Low Voltage Detection
 LIN XCVR = Local Interconnection Network Transceiver
 MI²C/SPI = Master I²C/SPI

PSP = Parallel Slave Port
 PWM = Pulse Width Modulator
 PSMC = Programmable Switch Mode Controller
 ROM-less = External ROM necessary
 SLAC = Slope A/D Converter, up to 16 bits
 SMB = System Management Bus

BATTERY MANAGEMENT FAMILY PRODUCTS

Switching Battery Chargers

| Product | Mode | Cell Type | # of Cells | Vcc Range (V) | Max. Voltage Regulation (%) | Int/Ext FET | Features |
|---------|--------|-------------------|------------|---------------|-----------------------------|-------------|---|
| PS200 | Switch | Li-Ion/Li-Polymer | 1 - 4 | 5 - 18 | ±1% | Ext | Voltage and current regulation, safety charge timer, temperature limits, internal voltage regulator, 50 |

For Linear Battery Chargers, refer to Analog/Interface 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 | Safety | Temp. Sensor | Pack |
|---------|-------------------|------------|-----------|----------|--------------------|---------------------|----------------------------|----------|-----------|----------|--------------|----------------------|
| PS810 | Li-Ion | 1-Jan | SMBus/SI | | 16-bit Sigma-Delta | 4k x 16 Flash | 6 GPIO | 1% | On-chip | — | On-chip | 14-pin T 16-pin C |
| PS830 | Li-Ion | 1-Jan | SMBus/SI | | 16-bit Sigma-Delta | 4k x 16 Flash | 3 GPIO | 1% | On-chip | Internal | On-chip | 14-pin T 16-pin C |

dsPIC® DIGITAL SIGNAL CONTROLLER (DSC) PRODUCTS

| Product | Program (FLASH) KBytes | Memory (FLASH) KWords | EE Bytes | SRAM Bytes | 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. | U |
|---|------------------------|-----------------------|----------|------------|--------------|---------------------|---------------------|--------------|-----------|---------------------|-------------------|-----------|---|
| dsPIC30F Motor Control and Power Conversion Family | | | | | | | | | | | | | |
| dsPIC30F3010 | 24 | 8 | 1024 | 1024 | 28SOG, 28SPG | — | 6 ch | 5 | 4 | 2 | 6 | ✓ | |
| dsPIC30F3011 | 24 | 8 | 1024 | 1024 | 40PG, 44PTG | — | 9 ch | 5 | 4 | 4 | 6 | ✓ | |
| dsPIC30F5015 | 66 | 22 | 1024 | 2048 | 64PTG | — | 16 ch | 5 | 4 | 4 | 8 | ✓ | |

*Contact Microchip Technology for availability date.

**Future
Products**

**Future
Products**

SERIAL ELECTRICALLY ERASABLE PROMS (EEPROM)

| Part # | E/W Cycles | Density (Organization) | Page Size | Write Speed | Max. Clock Freq. | Operating Voltage (V) | Temps |
|---|------------|------------------------|-----------|-------------|------------------|-----------------------|-------|
| 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 |
| 25AA010A | 1M | 1 Kbit (x8) | 16B | 5 ms | 10 MHz | 1.8 to 5.5 | I |
| 25LC020A | 1M | 2 Kbit (x8) | 16B | 5 ms | 10 MHz | 2.5 to 5.5 | I, E |
| 25AA020A | 1M | 2 Kbit (x8) | 16B | 5 ms | 10 MHz | 1.8 to 5.5 | I |
| 25LC040A | 1M | 4 Kbit (x8) | 16B | 5 ms | 10 MHz | 2.5 to 5.5 | I, E |
| 25AA040A | 1M | 4 Kbit (x8) | 16B | 5 ms | 10 MHz | 1.8 to 5.5 | I |
| 25LC320A | 1M | 32 Kbits (x8) | 32B | 5 ms | 10 MHz | 2.5 to 5.5 | I, E |
| 25AA320A | 1M | 32 Kbits (x8) | 32B | 5 ms | 10 MHz | 1.8 to 5.5 | I, E |
| 25LC640A | 1M | 64 Kbits (x8) | 32B | 5 ms | 10 MHz | 2.5 to 5.5 | I, E |
| 25AA640A | 1M | 64 Kbits (x8) | 32B | 5 ms | 10 MHz | 1.8 to 5.5 | I |
| 25LC128 | 1M | 128 Kbits (x8) | 64B | 5 ms | 10 MHz | 2.5 to 5.5 | I, E |
| 25AA128 | 1M | 128 Kbits (x8) | 64B | 5 ms | 10 MHz | 1.8 to 5.5 | I |
| 25LC256 | 1M | 256 Kbits (x8) | 64B | 5 ms | 10 MHz | 2.5 to 5.5 | I, E |
| 25AA256 | 1M | 256 Kbits (x8) | 64B | 5 ms | 10 MHz | 1.8 to 5.5 | I |
| 25LC1024 | 1M | 1 Mbit (x8) | 256B | 5 ms | 20 MHz | 2.5 to 5.5 | I, E |
| 25AA1024 | 1M | 1 Mbit (x8) | 256B | 5 ms | 20 MHz | 1.8 to 5.5 | I |

NOTE: Pb-free packages will be available. Order with "G" suffix. Example: 25LC040A-I/SNG.

ANALOG/INTERFACE PRODUCTS

| Part # | Typical Accuracy (°C) | Maximum Accuracy @ 25°C (°C) | Maximum Temperature Range (°C) | Vcc Range (V) | Max. Supply Current (µA) | Features |
|--|-----------------------|------------------------------|--------------------------------|---------------|--------------------------|--|
| Thermal Management - Voltage Output Temperature Sensors | | | | | | |
| MCP9700 | ±2 | ±4 | -40 to +125 | +2.3 to +5.5 | 12 | Temperature slope: 10 mV/°C |
| MCP9700A | ±1 | ±2 | -40 to +125 | +2.3 to +5.5 | 12 | Temperature slope: 10 mV/°C |
| MCP9701 | ±2 | ±4 | -10 to +125 | +3.1 to +5.5 | 12 | Temperature slope: 19.53 mV/°C, cross to MAX6612 |
| MCP9701A | ±1 | ±2 | -10 to +125 | +3.1 to +5.5 | 12 | Temperature slope: 19.53 mV/°C, cross to MAX6612 |

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 |
|---------|---------------------------------------|-------------------------|--------------------------|----------------------------------|------------------------|---------------------------|-----------------------------|---------------------|--|
| MCP1612 | Synchronous Buck DC/DC Regulator | 2.7 to 5.5 | 0.8 to 5.5 | -40 to +85 | Constant frequency PWM | 1400 | 10 | 1000 | Overall efficiency over-temperature protection |
| 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 over-temperature protection |

Power Management - Battery Chargers

| Part # | Mode | Cell Type | # of Cells | Vcc Range (V) | Max. Voltage Regulation (%) | Int/Ext FET | Features |
|----------|--------|-------------------|------------|---------------|-----------------------------|-------------|--|
| MCP73853 | Linear | Li-Ion/Li-Polymer | 1 | 4.5 to 5.5 | ±0.5 | Int | USB control, safety charge timers, temperature monitor, thermal regulation |
| MCP73855 | Linear | Li-Ion/Li-Polymer | 1 | 4.5 to 5.5 | ±0.5 | Int | USB control, safety charge timers, temperature regulation |

Linear – Operational Amplifiers

| Part # | Channels | GBWP | I _Q Typ. | V _{OS} | Operating Voltage (V) | Temperature Range (°C) | Features |
|---------|----------|---------|---------------------|-----------------|-----------------------|------------------------|---|
| 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 |
| 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 |

Linear – Linear Gain Blocks

| Part # | Channels | -3dB BW (kHz) | I _Q (µA) | V _{OS} (mV) | Operating Voltage (V) | Temperature Range (°C) | Gain Steps (V/V) |
|---------|----------|---------------|---------------------|----------------------|-----------------------|------------------------|--|
| MCP6G01 | 1 | 1 | 120 | 3 | 1.8 to 5.5 | -40 to +125 | 1, 10, 50 8-Pin PDIP, 8-Pin SOIC, 8-Pin SSOP |
| MCP6G02 | 2 | 1 | 120 | 3 | 1.8 to 5.5 | -40 to +125 | 1, 10, 50 8-Pin PDIP, 8-Pin SOIC, 8-Pin SSOP |
| MCP6G04 | 4 | 1 | 120 | 3 | 1.8 to 5.5 | -40 to +125 | 1, 10, 50 14-Pin PDIP, 14-Pin SOIC, 14-Pin SSOP |
| 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 SSOP |
| 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 SSOP |
| 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 SSOP |

**Future
Products**

**Future
Products**

Mixed Signal - Delta-Sigma A/D Converters

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

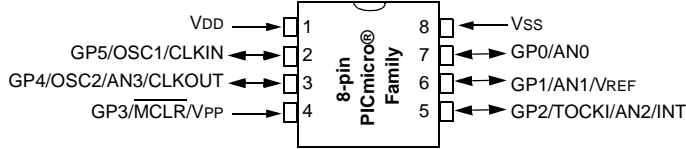
Interface – Infrared Products

| Part # | Operating Voltage (V) | Temperature Range (°C) | Max Baud Rate | Unique Features | |
|---------|-----------------------|------------------------|---------------------------|--|---------------------|
| MCP2130 | 2.7 to 5.5 | -40 to +85 | 16x less than clock input | IrDA encoder/decoder plus transceiver processing. No external IrDA transceiver required. | 14-Pin PDIP, 14-Pin |

FUTURE

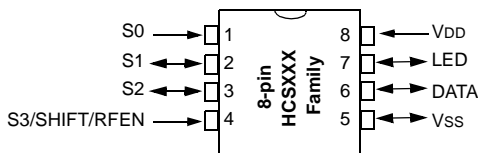
PIN AND CODE COMPATIBILITY CHART

8-pin PICmicro® MCU Family



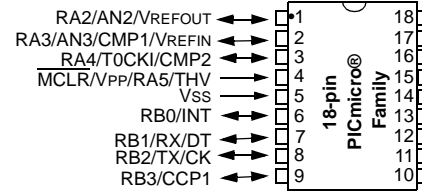
| | | |
|-------------|------------|-----------|
| PIC12C508A | PIC12C671 | PIC12F509 |
| PIC12C509A | PIC12C672 | PIC12F629 |
| PIC12CR509A | PIC12CE673 | PIC12F635 |
| PIC12CE518 | PIC12CE674 | PIC12F675 |
| PIC12CE519 | PIC12F508 | PIC12F683 |

8-pin KEELoQ® Family



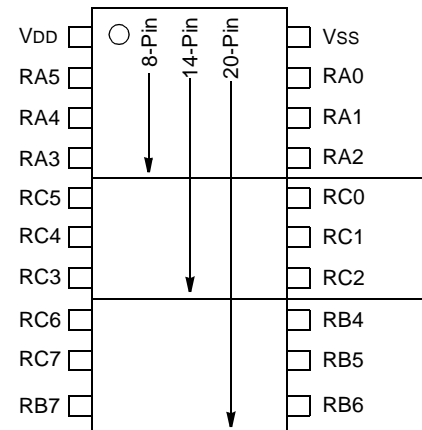
| | | |
|--------|--------|--------|
| HCS101 | HCS300 | HCS360 |
| HCS200 | HCS301 | HCS361 |
| HCS201 | HCS320 | HCS362 |
| | | HCS365 |

18-pin PICmicro® MCU Family



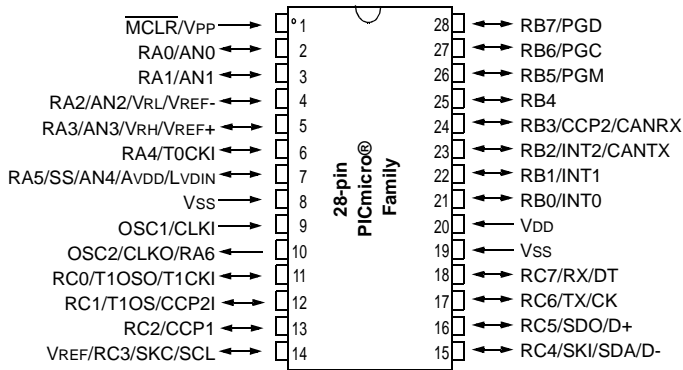
| | | |
|-------------|------------|-----------|
| PIC16C620A | PIC16CE625 | PIC16C621 |
| PIC16CR620A | PIC16F627 | PIC16C622 |
| PIC16C621A | PIC16F628 | PIC16C623 |
| PIC16C622A | PIC16F627A | PIC16C624 |
| PIC16CE623 | PIC16F628A | PIC16C625 |
| PIC16CE624 | PIC16F648A | PIC16C626 |
| PIC16C54C | PIC16C56A | PIC16C627 |

8/14/20-pin PICmicro® MCU Family



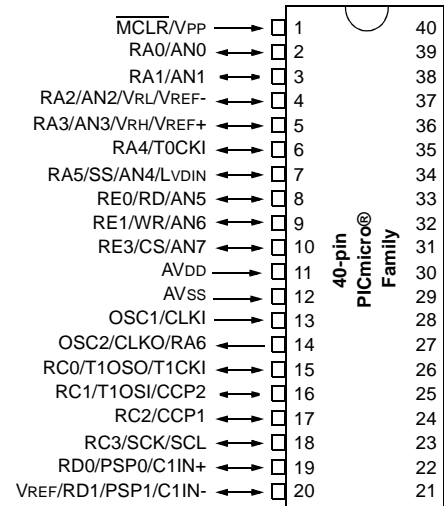
Pin Count/ Packaging

28-pin PICmicro® MCU Family



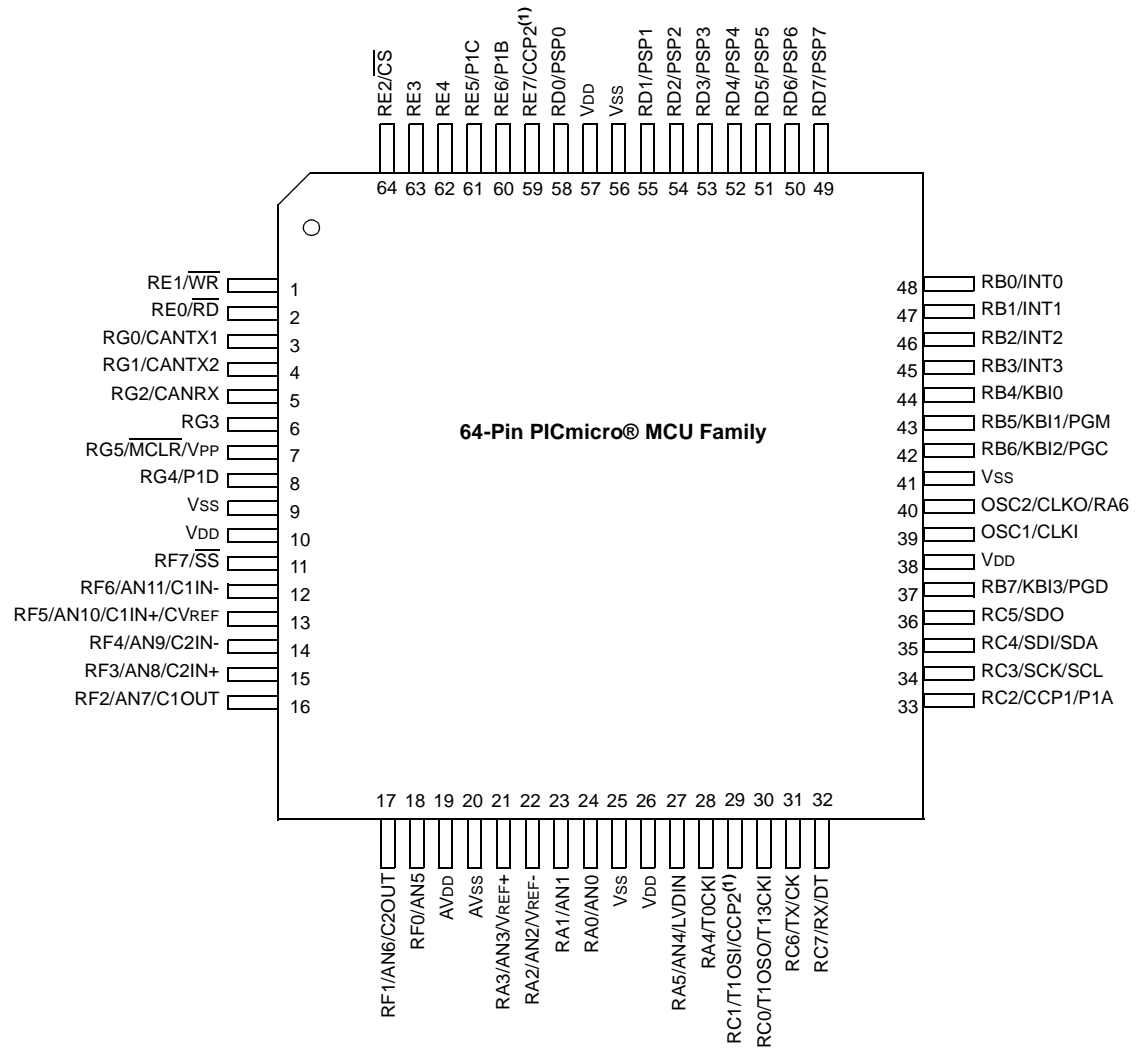
| | | |
|-----------|------------|------------|
| PIC16C62B | PIC16F72 | PIC18C242 |
| PIC16CR63 | PIC16F73 | PIC18C252 |
| PIC16C63A | PIC16F737 | PIC18F242 |
| PIC16C642 | PIC16F76 | PIC18F248 |
| PIC16C66 | PIC16F767 | PIC18F252 |
| PIC16CR72 | PIC16F870 | PIC18F258 |
| PIC16C72A | PIC16F872 | PIC18F2220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

40-pin PICmicro® MCU Family



| | |
|-----------|------------|
| PIC16CR65 | PIC16F77 |
| PIC16C65B | PIC16F777 |
| PIC16C662 | PIC16F871 |
| PIC16C67 | PIC16F874 |
| PIC16C74B | PIC16F874A |
| PIC16C765 | PIC16F877 |
| PIC16C77 | PIC16F877A |
| PIC16C774 | PIC18C442 |
| PIC16F74 | PIC18C452 |
| PIC16F747 | PIC18F442 |

64-pin PICmicro® MCU Family

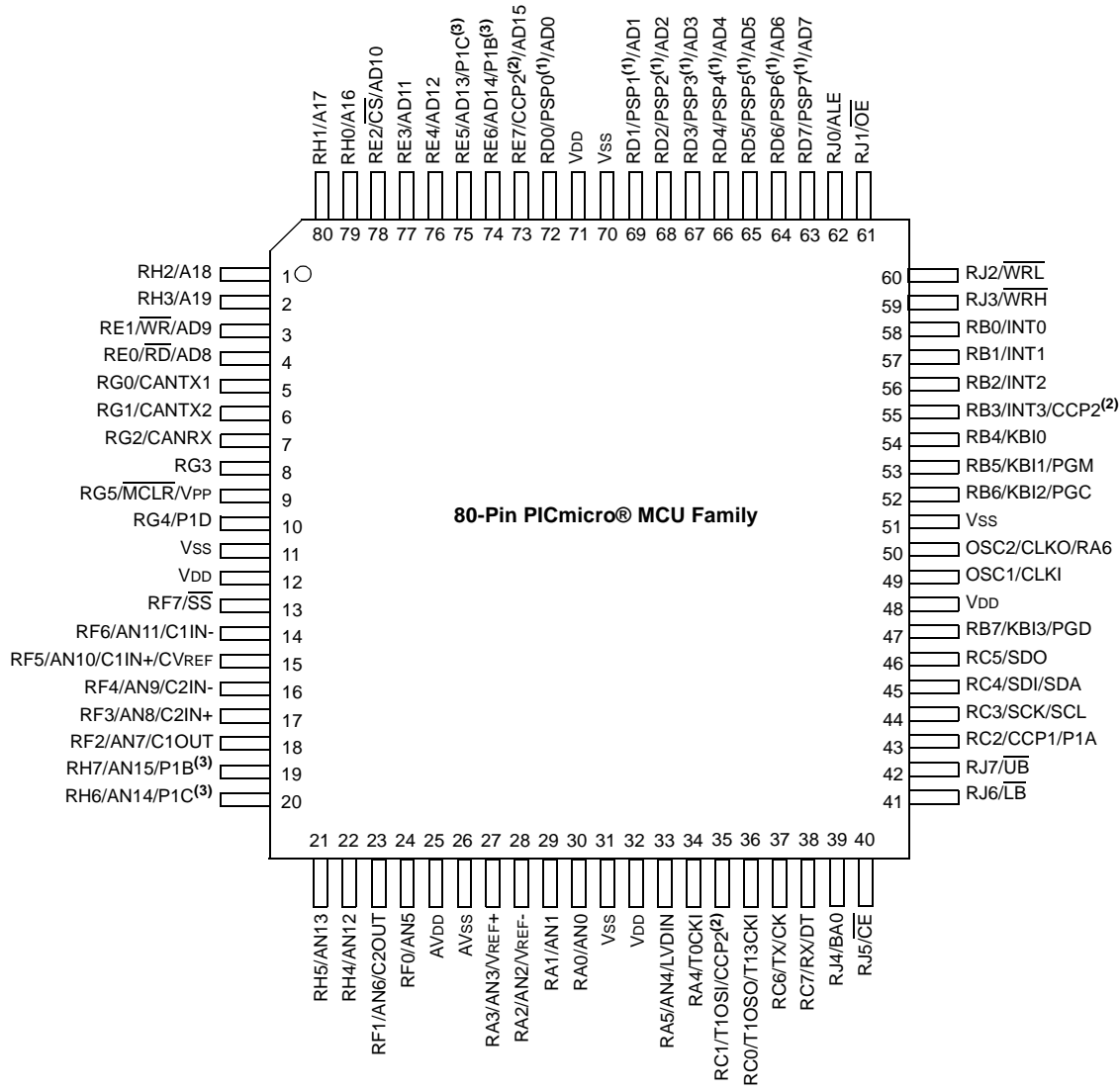


Note 1: CCP2 pin placement depends on CCP2MX setting.

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

Pin Count/ Packaging

80-pin PICmicro® MCU Family



- Note 1:** PSP is available only in Microcontroller mode.
- Note 2:** CCP2 pin placement depends on CCP2MX and Processor mode settings.
- Note 3:** P1B and P1C pin placement depends on ECCPMX setting.

**CERAMIC DUAL IN-LINE
CERDIP**



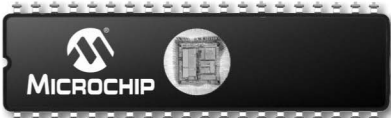
18-LEAD CERDIP
"JW"



20-LEAD CERDIP
"JW"



28-LEAD CERDIP
"JW"



40-LEAD CERDIP
"JW"

**CERAMIC CHIP CARRIER
CERQUAD**



68-LEAD CERQUAD
"CL"



84-LEAD CERQUAD
"CL"

**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 QUAD
FLATPACK
"QFP"**



32-LEAD LQFP
"LQ"



44-LEAD MQFP
"PQ"


PACKAGES

**Pin Count/
Packaging**

**PLASTIC SMALL OUTLINE
"SOIC"**


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


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


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


28-LEAD SOIC
"SO" OR "OI"


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


18-LEAD SOIC
"SO"


20-LEAD SOIC
"SO"

**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
"PT"


64-LEAD TQFP
"PT"


80-LEAD "TQFP"
"PT"


80-LEAD "TQFP"
"PF"

**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"


8-LEAD DFN
3X3
"MF"


8-LEAD DFN
6X5
"MF"


44-LEAD QFN
8X8
"ML"


16-LEAD QFN
4X4
"ML"


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

**CHIP SCALE
PACKAGES**


3-LEAD DPAK


5-LEAD DPAK

SMALL OUTLINE TRANSISTOR


3-LEAD TRANSISTOR
"TO" OR "ZB"


3-LEAD SC-89


SOT-223


6-LEAD SOT


3-LEAD SOT


SOT-14

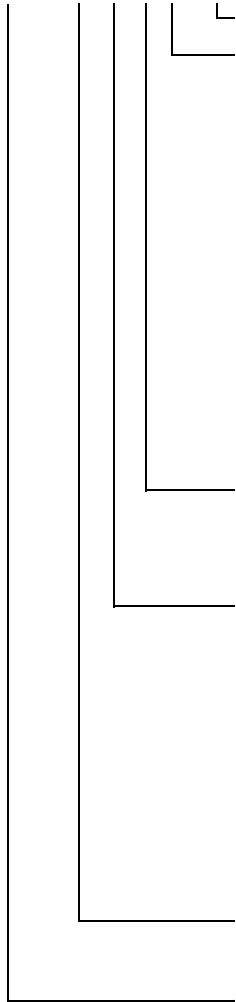

5-LEAD SOT

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, .75mm | S = Die in Waffle Pack |
| 3M = 330pF COB Module, .45mm | SB = Bumped Die in Waffle Pack |
| 6C = 2x68pF COB Module (WORLD II) | SL = 14-lead Small Outline (150 mil) |
| 7M = 2x68pF COB Module (IOA2) | SM = 8-lead Small Outline (207 mil) |
| CB = Chip on Board (COB) | SN = 8-lead Small Outline (150 mil) |
| CL = Windowed CERQUAD | SO = Plastic Small Outline (SOIC) (300 mil) |
| G = Lead Free | SP = Plastic Skinny DIP |
| JW = Windowed CERDIP | SS = Plastic Shrink Small Outline (SSOP) |
| L = Plastic Leaded Chip Carrier (PLCC) | ST = Thin Shrink Small Outline (TSSOP 4.4 mm) |
| LQ = Plastic Low Quad Flatpack (LQFP) | ST14 = 14-lead Thin Shrink Small Outline (TSSOP-14) |
| MF = Dual Flat - No Leads (DFN) | TO-92 = Transistor Outline |
| ML = Quad Flat - No Leads (QFN) | TS = Thin Small Outline (8mm x 20mm) |
| MM = Quad Flat - No Leads (DFN) | TT = SOT-23-3 Small Outline Transistor |
| MS = Micro Small Outline (MSOP) | VS = Very Small Outline (8mm x 12mm) |
| OT = 5-Lead or 6-Lead SOT-23 | W = Uncut Wafer |
| P = Plastic DIP | WB = Bumped Wafer |
| PF = Plastic Thin Quad Flatpack (TQFP 14x14) | WF = Sawed Wafer on Frame |
| PQ = Plastic Quad Flatpack (PQFP) | WFB = Bumped, Sawed Wafer on Frame |
| PT = Plastic Thin Quad Flatpack (TQFP) | 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: OR

| |
|-------------------------|
| -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 |

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 200 kHz, LP Oscillator Support |
| 08 = DC to 8 MHz, HS Oscillator Support |
| 10 = DC to 10 MHz, HS Oscillator Support |
| 16 = DC to 16 MHz, XT Oscillator Support |
| 20 = DC to 20 MHz, HS Oscillator Support |
| 25 = DC to 25 MHz, XT Oscillator Support |
| 30 = DC to 30 MHz, HS Oscillator Support |
| 33 = DC to 33 MHz, XT Oscillator Support |
| 40 = 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 | LCE = Low Voltage CMOS EPROM/EEPROM MCU |
| C = CMOS EPROM/ROMless MCU | LCR = Low Voltage CMOS ROM MCU |
| C = 5V Serial EEPROM | LCS = Low Voltage Security |
| CE = CMOS EPROM/EEPROM MCU | LF = Low Voltage FLASH MCU |
| CR = CMOS ROM MCU | LV = Low Voltage |
| F = Flash MCU | 24 = 2-Wire (I ² C) |
| FC = High Speed serial EEPROM | 25 = SPI |
| HC = High Speed | 93 = 3-Wire (Microwire) |
| HV = High Voltage | |
| LC = Low Voltage CMOS EPROM MCU | |
| LC = Low Voltage (2.5V) Serial EEPROM | |

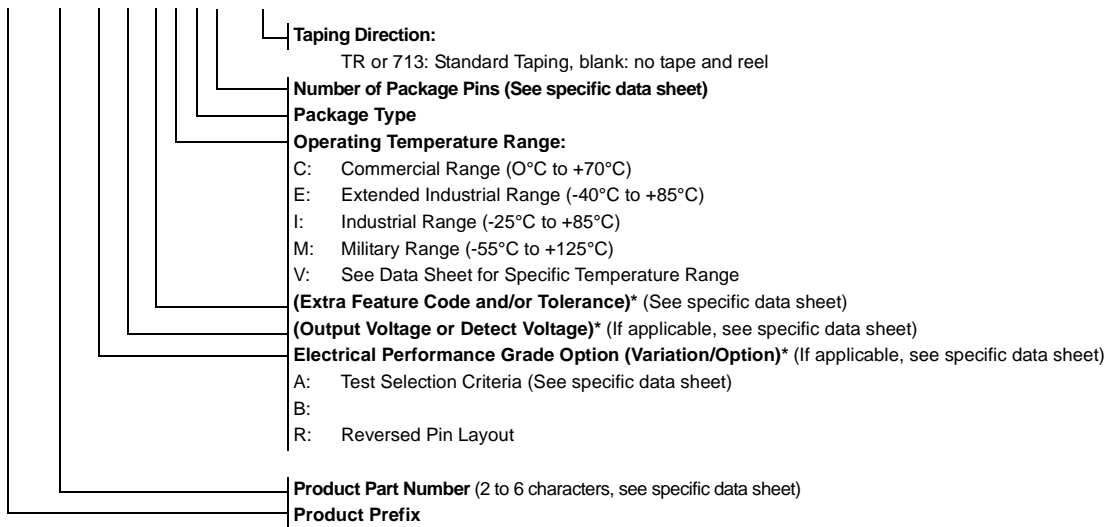
Note: Microchip offers a wide variety of lead-free package options. Contact your local sales office for availability or refer to the list on Microchip's web site. Lead-free plating is denoted by a "G" at the end of the package designation.

Pin Count/
Packaging

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



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 |

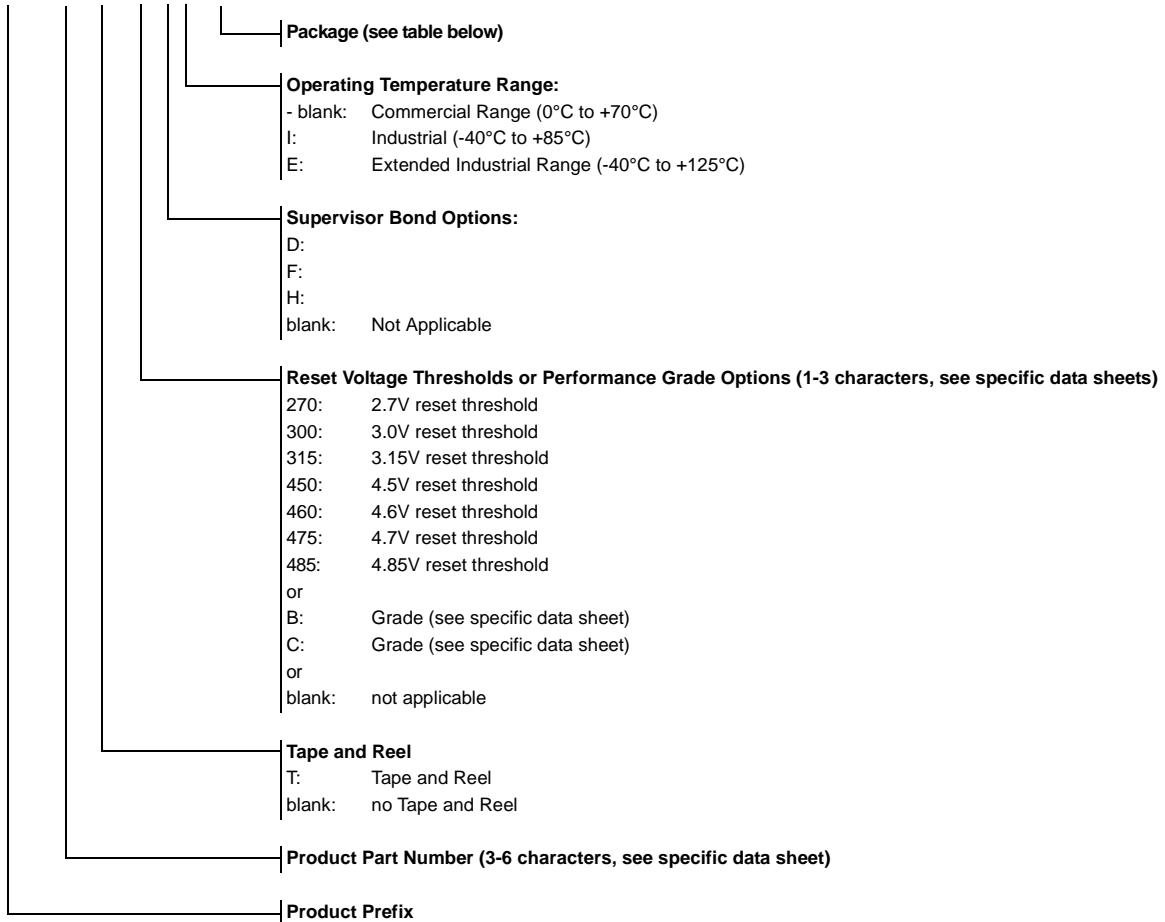
| Package | Description | # of Pins |
|---------|-------------|-----------|
| MB | SOT-89 | 3 |
| MF | DFN (3x3) | 8 |
| MT | SOT-89 | 5 |
| NB | SOT-23B | 3 |
| OA | SOIC (N) | 8 |
| OD | SOIC (N) | 14 |
| OE | SOIC (W) | 16 |
| OG | SOIC (W) | 24 |
| OI | SOIC (W) | 28 |
| OR | SOIC (N) | 16 |
| PA | 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 | DDPAK | 3 |
| ZB | TO-92 | 3 |
| ZM | TO-92 | 2 |

Pin Count/
Packaging

Part Number Suffix Designations

Ordering Information for all Microchip Analog Products beginning with "MCP" Prefix Parts

MCP xxxxx T - yyy z h / qq



| 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 |
| 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 |

Pin Count/
Packaging

| 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/PWM |
| CRC | Cyclic Redundancy Check |
| DAC | Digital-to-Analog Converter |
| 3 ϕ | 3 Phase PWMs |
| 4 ϕ | 4 Phase PWMs |
| E2 | EEPROM (Reprogrammable) |
| ECAN | Enhanced Controller Area Network |
| ECCP | Enhanced Capture/Compare/4-ch PWM with program dead time |
| EMA | External Memory Addressing |
| EnhFI | Enhanced Flash |
| EUSART | Enhanced USART (RS232, RS485, LIN) |
| FSK | Frequency Shift Key |
| I ² C | 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 ² C/SPI | Master I ² C/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 |
| 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.

Statistical Techniques

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.

QS-9000 Certification

Microchip Technology's Quality System is based on QS-9000 requirements. QS-9000 is rapidly becoming the standard Quality System for many industries including Semiconductors. All Microchip product facilities and major subcontractors are QS registered. Development Systems and Mountain View products are designed, manufactured and certified to ISO-9001 requirements.

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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