

PIC16F8X Microcontroller Family

Product Information



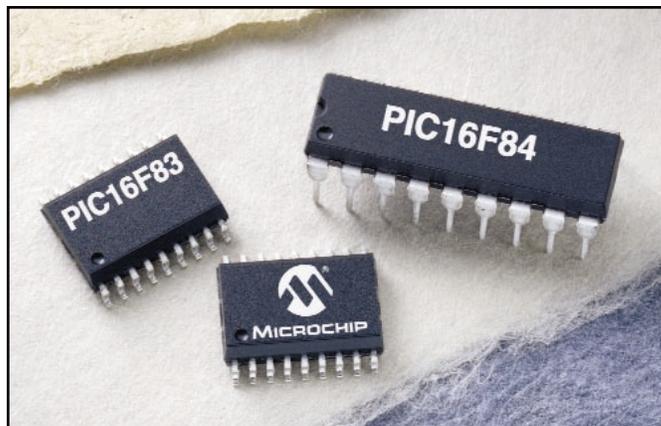
The PIC16F8X microcontroller (MCU) family offers a range of 18-pin devices with FLASH re-programmable program and data memory. This family has a 14-bit instruction set, interrupt handling capability and a deep 8-level stack. The PIC16F8X MCUs provide performance and versatility to meet the most demanding requirements of today's cost sensitive re-programmable marketplace for 8-bit applications, and is ideally suited for applications ranging from security and remote sensors to appliance motor control and automotive applications.

High Performance RISC CPU:

- Only 35 single word instructions to learn
- All instructions are single cycle (200 ns @ 20 MHz) except for program branches which are two-cycle
- Operating speed: DC - 20 MHz clock input
DC - 200 ns instruction cycle
- 512 x 14 words to 1024 x 14 words of FLASH/ROM program memory
- 36 to 68 bytes of user RAM
- 14-bit wide instructions
- Special function hardware registers
- 8-level deep hardware stack
- Direct, indirect and relative addressing modes for data and instructions
- 13 I/O pins
- 18-pin DIP, SSOP and SOIC packages

Peripheral Features:

- 13 I/O pins with individual direction control
- High current sink/source for direct LED drive
 - 25 mA sink max. per pin
 - 20 mA source max. per pin
- Timer0: 8-bit timer/counter with 8-bit programmable prescaler
- 64 bytes of EEPROM data memory
 - 100K erase/write cycle EEPROM data memory
 - EEPROM data retention > 40 years



Special Microcontroller Features:

- Power-on Reset (POR)
- Power-up Timer (PWRT) and Oscillator Start-up Timer (OST)
- Watchdog Timer (WDT) with its own on-chip RC oscillator for reliable operation
- Code protection
- Power saving SLEEP mode
- In-Circuit Serial Programming™ (ICSP™) of program memory (via two pins) for FLASH (ROM devices support only Data EEPROM programming)
- Selectable oscillator options:
 - EXTRC: External low cost RC oscillator
 - XT: Standard crystal/resonator
 - HS: High speed crystal/resonator
 - LP: Power saving, low frequency crystal

CMOS Technology:

- Low power, high speed CMOS FLASH technology
- Fully static design
- Wide operating voltage range 2.0V to 6.0V
- Commercial, Industrial and Extended temperature ranges
- Low power consumption:
 - < 2 mA @ 5V, 4 MHz
 - 15 µA typical @ 2V, 32 kHz
 - < 1 µA typical standby current @ 2V

PIC16F8X Microcontroller Family *Continued*

Additional Information:

- Microchip's web site: www.microchip.com
- Microchip's Technical Library CD-ROM, [Order No. DS00161](#)
- More than 112 Application Notes available:
 - *Embedded Control Handbook*, [Order No. DS00092](#)
 - *Embedded Control Handbook, Volume 2, Math Library*, [Order No. DS00167](#)
- Microchip's *Overview, Quality Systems and Customer Interface System*, [Order No. DS00169](#)
- Third party software and hardware support:
 - Emulators
 - Programmers
 - Gang Programmers
 - Software Tools
 - Development Boards and Accessories
 - Design Consultants
 - *Third Party Guide*, [Order No. DS00104](#)

PIC16F8X 8-bit Microcontroller Family

| Product | Program Bytes | Memory Words | Memory Type | EPROM Memory Types | Data RAM Bytes | Max. Speed Ports | I/O Pins | Timers | ICSP™ | Other Features | Pins |
|------------|---------------|--------------|-------------|--------------------|----------------|------------------|----------|----------------|-------|------------------------------------|------|
| PIC16F83 | 896 | 512x14 | FLASH | 64 | 36 | 10 | 13 | 1-8 bit, 1-WDT | Yes | 20mA source and 25 mA sink per I/O | 18 |
| PIC16F84 | 1792 | 1024x14 | FLASH | 64 | 68 | 10 | 13 | 1-8 bit, 1-WDT | Yes | 20mA source and 25 mA sink per I/O | 18 |
| PIC16F84A* | 1792 | 1024x14 | FLASH | 64 | 68 | 20 | 13 | 1-8 bit, 1-WDT | Yes | 25mA source/sink per I/O | 18 |
| PIC16CR84 | 1792 | 1024x14 | ROM | 64 | 68 | 10 | 13 | 1-8 bit, 1-WDT | — | 20mA source and 25 mA sink per I/O | 18 |
| PIC16CR83 | 896 | 512x14 | ROM | 64 | 36 | 10 | 13 | 1-8 bit, 1-WDT | — | 20mA source and 25 mA sink per I/O | 18 |

*Supports SSOP package.

Development Tools from Microchip

Resale Price*

| | | |
|---|--|---------------------|
| MPLAB® IDE | Integrated Development Environment (IDE) | FREE |
| MPASM™ Assembler | Universal PICmicro macro-assembler | FREE |
| MPLINK™ Object Linker/ MPLIB™ Object Librarian | Linker/Librarian | FREE |
| C compiler | Sold by third-party vendors (HI-TECH, IAR, CCS) | Contact Vendor |
| MPLAB® SIM | Software Simulator | FREE |
| ICEPIC™ | Low cost in-circuit emulator | Starting at \$789 |
| MPLAB® ICE 2000 | Full featured modular in-circuit emulator | Starting at \$2,045 |
| PICSTART® Plus | Entry level program loader & dev. kit with PICC Lite™ Compiler | \$199 |
| PRO MATE® II | Full featured, modular device programmer | Starting at \$854 |

*All prices are manufacturer's suggested resale for North America.

†Contact Microchip for instructions on how to use the MPLAB-ICD with PIC16C72/73/74/76/77



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