



Microcontroller and Digital Signal Controller Solutions



Do you need to add more performance or additional features to your products? External components will use valuable board space and may also require additional hardware and software. Are you concerned with tight schedules and cost goals? How do you decide which microcontroller solution will bring the most value to your overall embedded design?

Many of our current customers struggled with these same questions before they selected us. We're Microchip Technology, and we're *in the business of helping customers solve problems.*

Microchip has been #1 in 8-bit microcontroller shipments* since 2002 with a product portfolio that continues to grow to meet our customers' market needs and optimize their profits.

*Gartner Dataquest, Top Companies Revenue from Shipments of 8-bit MCU - All Applications" April 2005.

New Levels of Performance and Flexibility

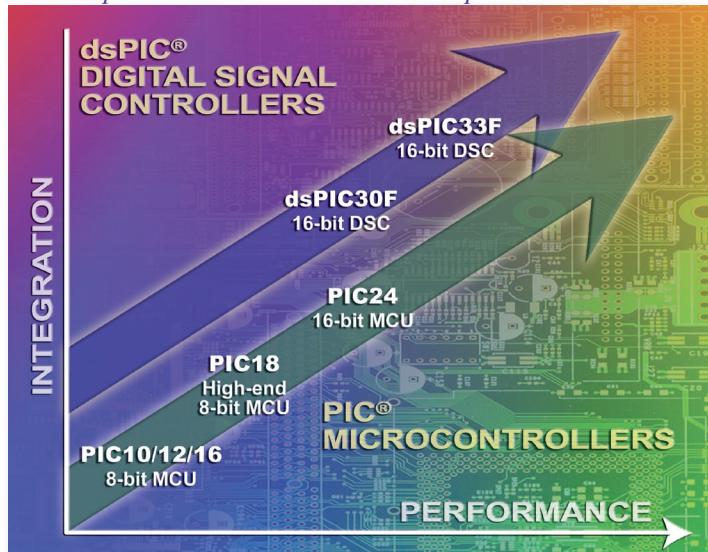
16-bit Microcontrollers and Digital Signal Controllers

Today's embedded design engineers are looking for new levels of performance and capability in their embedded systems. Our customers want:

- More product differentiation
- Lower cost
- Faster time to market
- Low risk development

To meet these requirements, Microchip has expanded its product portfolio to include new families of 16-bit PIC® microcontrollers and dsPIC® digital signal controllers. The new 16-bit PIC24 microcontroller and 16-bit dsPIC33F digital signal controller families offer a new level of performance and higher integration.

Microchip's Embedded Controller Roadmap



Very often engineers find that the development phase of their design cycle can be a costly investment in both money and engineering resources. Code reusability and pin compatibility gives them greater flexibility to migrate their designs as product specifications evolve while also minimizing their development and product costs. The code and pin compatibility between PIC24 microcontrollers and the dsPIC digital signal controller families offers the designer expanded options as their product needs change. Features supporting this compatibility include:

- A common core instruction set and architecture
- A common core peripheral set
- A common core tool set including MPLAB® IDE Integrated Development Environment, MPLAB C30 C Compiler, and PM3 programmer

The benefit is lowered overall product development risk.

The Microcontroller Portfolio

8-bit Microcontrollers

Embedded designers look for integrated functions and peripherals to help reduce their total system cost. Microchip's 8-bit PIC® microcontrollers feature:

- Advanced high performance RISC core
- 6 to 100 pins
- 0.5 to 128K bytes of program Flash
- An extensive array of peripheral and analog functions as shown on the chart below

The pin and code compatibility lowers risk and saves development cost by letting engineers migrate their application and engineering investment throughout Microchip's extensive 8-bit offering.

Integrated Analog and Digital Peripherals

Analog Functions	Communications	Specialized Functions	Software Libraries
			Libraries/Stacks
Analog-to-Digital Converters	UART, LIN	LCD Control	ZigBee™ Technology
Comparators	IrDA® Protocol	Codec Interface	TCP/IP
Op Amps	USB	Motor Control PWM	Noise Suppression
Low Voltage Detect	SPI™, I ² C™	Quadrature Encoder Interface	IrDA® Protocol
Power-on Brown-out Reset	Ethernet	KEELOQ® Data Security	Motor Control
Voltage Regulation	CAN	LED Drive	Software Modems
			Echo Cancellation
			Speech Recognition
			Voice Compression



NEW 16-bit Microcontrollers

Increasing application demands require engineers to seek greater integration and higher performance products. Microchip has expanded its microcontroller portfolio to meet these market demands with the introduction of the 16-bit PIC24 microcontroller family. The PIC24 microcontrollers build upon the high performance, wide selection of peripherals, Flash memory sizes and packaging choices found in the 8-bit PIC18F family. The PIC24 architecture paired with the optimized MPLAB C30 C Compiler provides the high throughput and C code density needed to achieve system performance goals and product launch schedules. The easy-to-learn MPLAB IDE supports the 16-bit PIC24 microcontroller for faster development time. The PIC24 family is highly compatible with dsPIC digital signal controllers for easy migration when additional performance or DSP capability is required.

The PIC24 Family Features:

- Leadership 16-bit microcontroller performance and C code efficiency
- An extension of the 8-bit PIC18 microcontroller performance, memory and peripherals
- An easy migration path to dsPIC digital signal controller with over 40 MIPS and DSP capability
- Software development tools and peripherals that are compatible with our dsPIC digital signal controller

The Digital Signal Controller Portfolio

16-bit dsPIC Digital Signal Controllers

DSP or advanced algorithm processing functionality is becoming more common in today's embedded designs. The dsPIC digital signal controllers extend the many features and capabilities of the PIC microcontroller architecture and add the high performance capabilities of a DSP onto a single-chip solution.

NEW dsPIC33 Digital Signal Controller Family

There are now two mainstream digital signal controller choices for new designs from Microchip that feature field reprogrammability, low power, a small footprint and ease of use. The dsPIC30F family is based on 5V technology while the dsPIC33F family is based on 3.3V technology.

Migration between the families is straightforward, both from a pin-compatibility and software-compatibility standpoint. If a wide operating voltage range, 125°C operation, 5V analog or integrated on-chip data EEPROM are important for the application, the dsPIC30F may be the family of choice. If large memory (RAM or Flash), or additional I/O are important considerations for the design, consider the dsPIC33F family.

*Do you have limited hardware design resources?
Is development cost a concern?*

Common core tools can reduce development time and cost.

Development Systems

Competitive market conditions force businesses to examine every aspect of their product life cycle to maximize their productivity and minimize expense.

Easy-to-learn, low-cost common development tools are one way to reduce risk and save development time.

All Products Use the Same Development Tools

Whether you are designing with the smallest 8-bit PIC microcontroller, or the high-performance 16-bit PIC24 microcontroller or dsPIC Digital Signal Controller, all share a common development environment. Microchip's MPLAB IDE serves as a single, unified graphical user interface for additional Microchip and third-party software and hardware development tools. Moving between tools, such as the included assembler, linker and visual device initializer, is seamless and upgrading is easy. Start today with the

MPLAB IDE by downloading it for free from Microchip's web site.

For rapid time to market and excellent code efficiency, there is the full-featured MPLAB C30 C compiler that can be downloaded and evaluated for free from

Microchip's web site. Numerous software libraries are also available—most are free or can be evaluated for \$5 USD.

A wide selection of PICDEM™ evaluation and development boards allows engineers to cut design time and help analyze the device in real time.

The versatile Explorer 16 board can get you started quickly with a new PIC24 or dsPIC33 design.

A Dependable Supplier

Product life cycle and product availability are high on the engineer's list of factors separating great vendors from the rest. Microchip has maintained industry-leading delivery times regardless of the market outlook. The ever expanding product portfolio, common development tool platform and leadership in product delivery help set Microchip further apart. A global sales and technical support team allows us to work with design engineers on their specific market needs which in turn helps them optimize profits. We're in the business of helping engineers solve problems.

Explorer 16 Evaluation Board



Product Portfolio

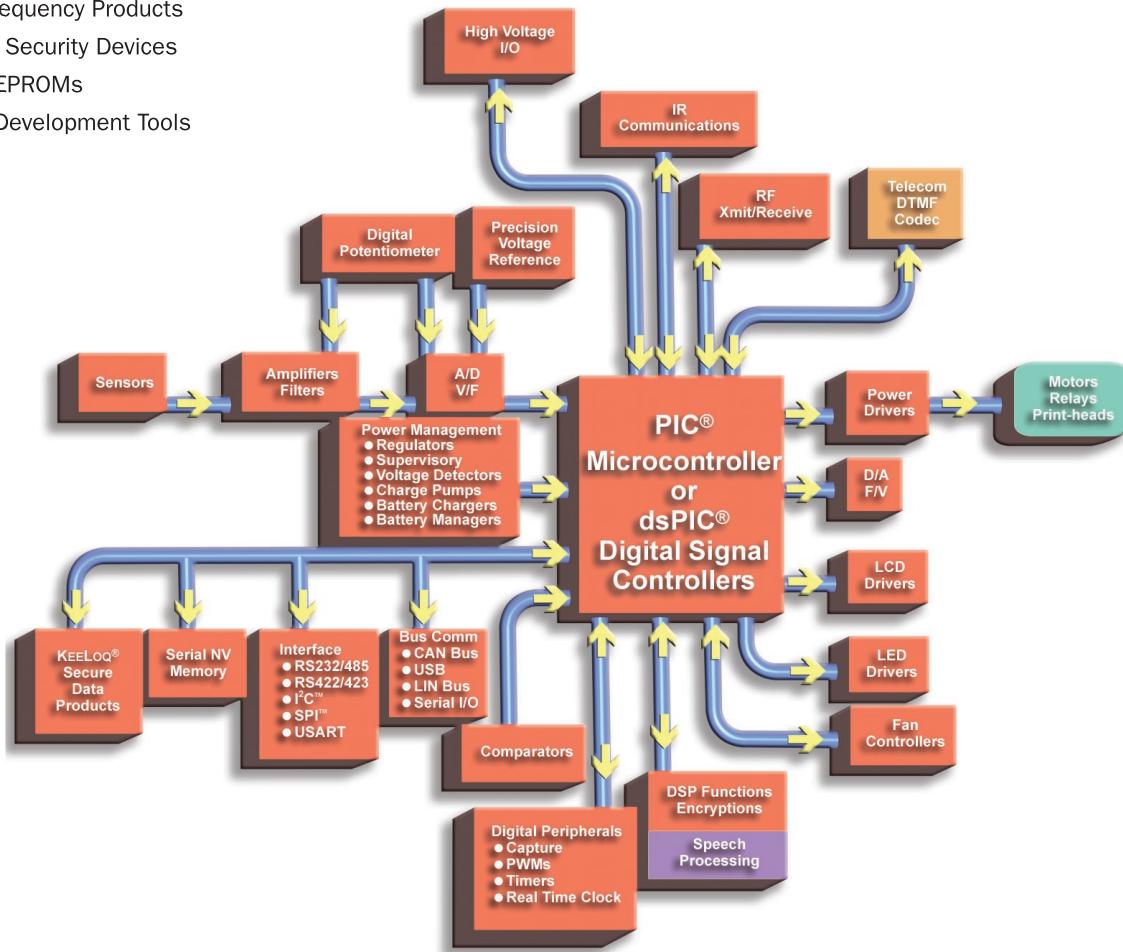
Microchip's broad product portfolio includes:

- Peripheral-rich 8- and 16-bit PIC microcontrollers
- High-performance 16-bit dsPIC digital signal controllers
- Battery Management ICs
- Thermal Management ICs
- Power Management ICs
- Linear ICs
- Mixed-Signal ICs
- Interface Devices
- Radio Frequency Products
- KEELOQ Security Devices
- Serial EEPROMS
- MPLAB Development Tools

Worldwide Sales & Service

It takes more than product specifications to create loyal customers. In addition to a broad product portfolio, Microchip understands the value of a complete design solution. That's why we maintain a worldwide network of sales and support. Our technical support is unmatched with a global network of experienced field application engineers and technical support personnel ready to provide product and system assistance to help engineers further streamline their design, prototype and production activities. Visit our technical support web site at

<http://support.microchip.com>.



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