Imagine having the advantages of a 16-bit microcontroller with the high computation speed performance of a digital signal processor (DSP) all at a 16-bit MCU price. The dsPIC family brings the familiar PICmicro® microcontroller architecture and design environment together with easy-to-use high-performance DSP functionality.

Digital Signal Control Market
The requirement for higher computational power in embedded applications is on the increase in order to control the growing number of functions and rich feature sets found in thousands of products. By combining the attributes of microcontrollers and DSP, the digital signal control market is able to address these embedded control applications.

The dsPIC family of digital signal controllers target all 16-bit microcontroller-based applications, including those requiring varied levels of DSP capability. The dsPIC devices help close the performance gap between 16-bit microcontrollers and popular low-end DSPs, a growing market that is currently not being adequately served.

The need for digital signal controller solutions is driven by several design trends and include: the demand for connecting embedded applications via Internet and other communications methods; the move to more complex motor control techniques driven by energy efficiency demands, reduced noise generation and the drive to reduce costs and size of motors; the use of signal processing in control-oriented automotive system applications for precise real-time response; added features to existing products to enhance I/O friendliness and secure access; and part of the mammoth 8-bit microcontroller market needs additional performance.

Uniting DSP Functionality with the MCU Design
The learning curve of an unfamiliar architecture, technology and tool set directly conflicts with time-to-market goals. The dsPIC family provides DSP functionality in the familiar PICmicro microcontroller Integrated Design Environment (MPLAB® IDE), offering an easy-to-implement solution to engineers familiar with microcontrollers. Rich libraries and reference designs will reduce the learning curve barrier and enhance time to market.

Microchip’s dsPIC family addresses the differences between DSPs and microcontrollers. MCUs are state centric and interrupts are considered normal activity. DSPs are flow centric and are interrupt averse. Control-oriented MCUs favor non-pipelined determinism while performance-oriented DSPs do not. In microcontrollers, execution sequence is expected to occur as programmed, while no such expectation exists with some DSPs. Microcontrollers have sophisticated emulation capability while many DSP tools lack such robustness. DSP specialization often presents obstacles to high-level language effectiveness.
Microcontrollers are driven by a horizontal base of customers requiring robust and extensive peripheral offerings, whereas DSPs are driven by major markets and customers within those markets where a narrow peripheral base is needed.

The dsPIC family has comprehended these often disparate needs to provide a unique solution to the marketplace. For example, the dsPIC family will have full access to Microchip’s extensive peripheral library. Interrupt latency and avoidance mechanisms have also been included in the dsPIC architecture.

**High-Volume, Horizontal Applications**

The dsPIC family provides a single-chip solution that can eliminate components required in similar designs, thereby reducing board space and system cost. With on-board DSP functionality in a high-performance microcontroller, the dsPIC family targets thousands of horizontal applications.

Applications include: control for several motor types (induction motors, sensorless brushless DC motors, switched reluctance motors), automotive applications (body computer, airbag, noise reduction, active vibration control), feature telephones (caller ID, noise cancellation, DTMF), digital answering machines (speech compression), low-speed software modems, line cards (echo cancellation), POS terminals (encryption, software modem for dial-up), vending machines (remote monitoring through the Internet), biometric security (such as fingerprint matching), high-end uninterruptible power supplies and power supply management.

Internet connectivity applications can utilize the digital signal controller: home security (soft modem, sophisticated sensors, voice synthesis, access technologies), power meter (soft modem, protocol converters), vending machines (soft modem, recognition events, RF baseboard processing), and other Internet connected appliances.

**dsPIC Product Overview**

Typical applications for a dsPIC device are anticipated to achieve a performance increase of 25x-100x over most 8-bit microcontrollers. Featuring a variety of pin configurations, the dsPIC family is optimized for high level languages while featuring full DSP functionality, a robust peripheral set and easy-to-use development tools.

**PRICING & AVAILABILITY**

Microchip’s dsPIC devices are expected to range from $3-$9 each in 10,000-unit quantities. Software development tools are scheduled for Q3 2001 and customer sampling is planned for Q1 2002. Volume production is expected in mid-2002. For more information, contact any Microchip sales representative or authorized worldwide distributor.

The data sheet for the dsPIC family of devices can be found at: [http://www.microchip.com/dspic](http://www.microchip.com/dspic)

---

For more information, contact Microchip’s Literature Line at 480.792.7668 or contact any authorized Microchip distributor around the world or visit Microchip’s website at [http://www.microchip.com](http://www.microchip.com).

Note: The Microchip name and logo, PIC, PICmicro, MPLAB and KEELOQ are registered trademarks of Microchip Technology Inc. in the USA and other countries. dsPIC and microID are trademarks of Microchip Technology Inc. in the USA and other countries. All other trademarks are the property of their respective owners.