Microchip to Continue Manufacturing 8051/80C51 Microcontrollers That Are 100% Compatible With NXP’s End-of-Life MCUs

Microchip announced that it will continue to manufacture legacy 8051/80C51 MCUs that provide pin-for-pin-compatible replacements for most of those recently placed under “End-of-Life” (EOL) notification by NXP. Included are drop-in replacements for NXP’s P89LV51RB2/C2/D2 and P89V51RB2/C2/D2 EOL series of 80C51 8-bit microcontrollers. Microchip’s April 2010 acquisition of Silicon Storage Technology, Inc. (SST) included a legacy 80C51 MCU business, which Microchip has continued to support.

“Microchip has a history of supporting customers with long lifetimes on all of our product lines,” said Randy Drwinga, vice president at Microchip Technology Inc. “We also have a strong presence in the industrial, automotive and medical markets, and understand that long-lifecycle product support is important to these customers. We welcome anyone currently using NXP’s 80C51 MCUs who doesn’t wish to redesign their end products to use our 100% compatible 80C51 product portfolio, and we offer them the option to migrate to our broad portfolio of 8-bit, 16-bit and 32-bit PIC® microcontrollers, at their convenience.”

Microchip has a cross-reference document available on its Web site, as well as data sheets and a product brief. NXP’s P89LV versions are 3V MCUs, and are 100% compatible with Microchip’s SST89V MCUs. Likewise, NXP’s P89V versions are 5V MCUs, and are pin-for-pin compatible with Microchip’s SST89E microcontrollers.

As with all 8051-compatible microcontrollers, Microchip’s 80C51 MCUs can be used with many third-party development tools that are widely available. Examples include programmers from Xeltek, Hi-Lo Systems, Advantech Equipment Corp., EETools and Phyton. Note that some third-party sites have these devices under “Manufacturer: SST.”

Microchip’s 8051 MCUs are available today. Samples and volume-production availability can be obtained by emailing: contact_8051@microchip.com.

Learn more about the 8051/80C51 replacements, visit: http://www.microchip.com/pagehandler/en-us/family/8051legacy/
Microchip Upgrades Enhanced Core dsPIC33E and PIC24E Devices to 70 MIPS

Additionally, Three New 64-pin Motor Control and General-Purpose Devices Added to Family

Microchip Technology Inc., a leading provider of microcontroller, analog and Flash-IP solutions, today announced the upgrade of its formerly 60 MIPS enhanced-core dsPIC33E Digital Signal Controllers (DSCs) and PIC24E microcontrollers (MCUs) to 70 MIPS performance. The devices feature 536 KB Flash memory and 52 KB RAM, greater I/O capabilities, a USB 2.0 OTG interface, and enhanced motor-control, graphics, audio and real-time embedded-control capabilities. Additionally, the family has been expanded with the release of three new non-USB 64-pin devices that are fully compatible with Microchip’s entire portfolio of dsPIC33F DSCs and PIC24H/PIC24F MCUs, software libraries and tools, providing a solid growth path for current customers.

The upgraded 70 MIPS motor-control DSCs enable designers to expand motor-control system performance in high-end industrial and commercial applications. These devices include Microchip’s industry-leading motor control PWM peripherals, enabling the generation of PWM waveforms needed to control virtually any motor, such as servos, and running dual three-phase motors in parallel. A new dead-time compensation feature reduces software overhead. Additionally, the USB 2.0 OTG peripheral enables connections to a PC, Flash drive and other USB-enabled devices, and 70 MIPS performance means the new DSCs and MCUs support computer-interfaced applications. Three on-chip analog comparators further reduce system cost and the number of external components required. These capabilities, coupled with the family’s high integration, make them some of the most capable motor control devices on the market.

Upgrading the recently-introduced portfolio of dsPIC33E and PIC24E devices to 70 MIPS allows Microchips customers to benefit from higher performance at no extra cost. The three new 64-pin devices with 536 KB Flash memory facilitate applications needing larger Flash and RAM memories, while still fitting into a small 9 mm x 9 mm QFN footprint.

Designers can use the same tools that they did for the dsPIC33 and PIC24 “E” families. This includes the dsPIC33E USB Starter Kit (part # DM330012) and the PIC24E USB Starter Kit (part # DM240012), which are both available, today. These starter kits can be used for stand-alone development, and also work with an assortment of Microchip’s daughter boards, such as its Multimedia Expansion Board (part # DM320005), which enables the development of high-impact user interfaces.

Additionally, there are several Plug-In Modules (PIMs) available for Microchip’s Explorer 16 Development Board and motor-control development kits, including the dsPICDEM™ MCHV (part # DM330023), dsPICDEM MCLV (part # DM330021) and dsPICDEM MCSM (part # DM330022) kits. PIMs include the dsPIC33E 100-pin PIM for Motor-Control, General-Purpose and Graphics Applications (part # MA330025-1); PIC24E 100-pin PIM for General-Purpose and Graphics Applications (part # MA240025-1); dsPIC33E 144-pin PIM for General-Purpose and Graphics Applications (part # MA330025-2); dsPIC33E 144-pin PIM for Motor-Control Applications (part # MA330025-3); and PIC24E 144-pin PIM for General-Purpose and Graphics Applications (part # MA240025-2). The dsPIC33E Dual Motor Control PIM (part # MA330027) enables designers to simultaneously control two motors using one dsPIC33E DSC.

To learn more about the dsPIC33E and PIC24E devices, visit: http://www.microchip.com/en_US/family/16bit/index.html
Microchip Further Expands Stand-Alone Real-Time Clock Calendar Device Family

New, Low-Cost I²C™ RTCC Device Includes 64 Bytes SRAM, Digital Trimming Circuit That Can Compensate Up to 11 Seconds Per Day for Crystal Error

Microchip announced the expansion of its family of stand-alone Real-Time Clock/Calendar (RTCC) family with the I²C™ MCP7940M RTCC device. This new device is designed for the price-competitive consumer products market, and includes 64 Bytes of SRAM as additional scratchpad memory, as well as a digital-trimming circuit that can compensate up to 11 seconds per day for crystal error. The MCP7940M devices provide accurate timekeeping at a low cost for applications in the home-appliance (e.g., microwaves, washing machines, dryers, ovens, thermostats); audio/video (e.g., radios, televisions, set-top boxes, digital recorders); and consumer-electronic markets (e.g., printers, network routers, cameras), among others.

Following the launches of Microchip’s stand-alone I²C MCP79410 and SPI MCP795WXX/BXX RTCC devices in 2010 and 2011, respectively, the MCP7940M device has a simple feature set that meets the needs of the high-volume segment of the RTCC device market. Microchip now has stand-alone RTCC devices for the low, mid and upper-mid ranges of this market. The on-chip digital trimming circuit has a wide trimming range of +/-127 ppm, enabling designers to select lower-quality crystals for their designs to reduce overall system costs.

After receiving many customer requests for low-end real-time clocks and conducting its own analysis of this market, Microchip developed the MCP7940M RTCC device. By offering a price-competitive RTCC that also includes 64 Bytes of SRAM and a digital-trimming circuit for higher accuracy, we believe that our solution will have a distinct advantage over the competition.

Microchip’s MCP79410 RTCC PICtail™ Plus Daughter Board (part # AC164140) is available today. The board works with Microchip’s Explorer 16 Development Board (part # DM240001), PIC18 Explorer Board (part # DM183032), PICkit™ Serial Analyzer (part # DV164122), and XLP 16-bit Development Board (part # DM240311).

The MCP7940M RTCC is available in 8-pin MSOP, PDIP, SOIC, TSSOP and 2 mm x 3 mm TDFN packages.

To learn more about the expanded Real Time Clock/Calendar family, visit:

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The Energizer Tech Info Website

data.energizer.com

When you have a question about batteries, where is the first place you look for an answer? Have you tried the Energizer Technical Information Website? Chances are it contains the answer you’re looking to find.

Datasheets

In the Product Index you can find datasheets for all Energizer products from button cells to lantern packs. The search tool can get you to what you need even faster. You can also find information about non-battery products.

Battery Handbooks

These are an excellent resource when your question goes beyond the datasheet. Here you can learn about internal resistance, temperature effects, shelf life and much more about each chemistry.

General Info

Also available on the site is info about environmental issues, standards, and transportation regulations. If you still cannot find what you’re looking for, don’t hesitate to contact Energizer Application Support directly:
Application.Support@Energizer.com

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Microchip Introduces General-Purpose 8-bit PIC® Microcontrollers With Next-Generation Digital and Analog Peripherals

MCUs Feature On-Chip Complementary Output Generator (COG) Peripheral and 5-bit DAC; Increase Overall System Capabilities While Reducing Costs

Microchip announced from the Embedded World Conference in Germany a new family of 8-bit microcontrollers (MCUs) featuring next-generation analog and digital peripherals, making them ideal for general-purpose applications, as well as battery charging, LED lighting, ballast-control, power-conversion and system-control applications. The PIC12F(HV)752 MCUs feature an integrated Complementary Output Generator (COG) peripheral that provides non-overlapping, complementary waveforms for inputs such as comparators and Pulse Width Modulation (PWM) peripherals, while enabling dead-band control, auto shutdown, auto reset, phase control and blanking control. Additionally, the new MCUs feature 1.75 KB of self read-write program memory, 64B of RAM, an on-chip 10-bit ADC, Capture-Compare PWM modules, high performance comparators (down to 40 ns response), and two 50 mA-capable I/O's, enabling engineers to increase overall system capabilities and reduce costs.

To view a brief presentation on these products, click here

Engineers are constantly challenged to increase system performance and efficiency while reducing system costs, especially for newer LED-lighting and battery-charging applications. With their numerous on-chip, general-purpose and specialized peripherals, including the integrated COG, high performance comparators, 50mA outputs for direct FET drive, the PIC12F(HV)725 MCUs meet these needs. The high-voltage variant in the family – the PIC12HV752 MCU – incorporates a shunt regulator that allows operation from 2V to an unspecified user-defined maximum voltage level, with less than 2mA operation current. This high-voltage variant is ideal for cost-sensitive applications with high-voltage power rails. Additionally, the 4-channel, 10-bit ADC can be used to implement various sensors and mTouch™ sensing applications, including capacitive touch.

With numerous peripheral enhancements, including the new COG and 50mA drive capabilities, PIC12F752 MCUs enable efficient power supply conversion for applications such as LED lighting and battery charging. While still remaining a general purpose product family, the PIC12F752 MCUs provide a versatile platform to incorporate intelligence into numerous applications. Whether they’re used in lighting, power supply, or home-appliance applications, these MCUs provide increased efficiencies, reduced costs and an improved user experience.

The PIC12F(HV)725 MCUs are supported by Microchip’s standard suite of world-class development tools, including the MPLAB® Integrated Development Environment (IDE), and the PICkit™ 3 (part # PG164130), MPLAB REAL ICE™ (part # DV244005), and MPLAB ICD3 (part # DV164035) debuggers/programmers. Engineers can also use Microchip’s HI-TECH C® Compiler for PIC10/12/16 MCUs (part #s SW500010 and SW500005).

The PIC12F752 MCU is available in a 8-pin 3 mm x 3 mm DFN package, as well as 8-pin PDIP and SOIC packages.

To learn more about the PIC12F family, visit: http://www.microchip.com/PIC12F
Microchip Expands Family of Low-Cost, Small-Package 32-bit PIC32 Microcontrollers

Feature-Packed 32-bit Microcontrollers Include I2S Interface for Audio Playback Applications; Plus Capacitive Touch, USB OTG and Digital Pin Remapping

Microchip announced from the Embedded World Conference in Germany a new series of low pin count 32-bit PIC32 microcontrollers (MCUs) that provide 61 DMIPS of performance in packages as small as 5 mm x 5 mm, for space-constrained and cost-sensitive designs. The PIC32 “MX1” and “MX2” MCUs are the smallest and lowest-cost PIC32 microcontrollers, and are the first PIC32 MCUs to feature dedicated audio and capacitive-sensing peripherals. These latest devices also feature USB On-the-Go (OTG) capabilities, making them ideal for developing audio accessories and other applications in the consumer, industrial, medical and automotive markets.

To view a brief presentation on these products, click here.

Rated for operation up to 105°C, the PIC32 MX1 and MX2 MCUs include up to 128 KB of Flash and 32 KB of RAM, two I²S interfaces for audio processing, an integrated hardware peripheral for adding mTouch™ capacitive touch buttons or advanced sensors, and an 8-bit Parallel Master Port (PMP) interface for graphics or external memory. Additionally, the new devices feature an on-chip 10-bit, 1 Msps, 13-channel Analog-to-Digital Converter (ADC), and serial-communications peripherals, with the PIC32 MX2 MCUs adding USB OTG. The MCUs are offered in packages from 28- to 44-pins, with sizes down to 5 mm x 5 mm, and a 0.5 mm pitch. Further easing the design effort is Microchip’s Peripheral Pin Select feature, which allows developers to “remap” most of the chip’s digital-function pins, making layout and design modifications significantly simpler. The PIC32 MX1 and MX2 devices are compatible with Microchip’s 16-bit PIC24F product line for easy migration, and are supported by the MPLAB® X IDE – the single development environment for all of Microchip’s 8-, 16- and 32-bit MCUs.

Expanding the PIC32 MX1 and MX2 family gives Microchips customers more options to seamlessly migrate their ever-changing designs. With 128K Flash, 32K Ram, the highest DMIPS per MHZ performance of any 32-bit MCU, and small packages down to 28 pins, the PIC32 MX1 and MX2 MCUs enable designers to differentiate their products in the marketplace, while keeping design size and costs low.

To start development with these new MCUs, designers can use Microchip’s MPLAB Starter Kit for PIC32MX1XX/2XX MCUs (part # DM320013). The USB-powered kit features a PIC32MX250F128D MCU with 128 KB of Flash and 32 KB RAM, as well as a 2” color TFT display (220 x 176 pixel), capacitive-touch slider and buttons, SD-card storage and 24-bit audio playback. Additionally, the Microstick II (part # DM330013-2) tool is available, as is the PIC32MX250F128D Plug-In Module (part # MA320011) for the Explorer 16 Development Board.

These new PIC32 MX1 and MX2 MCUs are available in 28-pin SOIC, SPDIP and SSOP packages; a 36-pin VTLA package; and 44-pin QFN, TQFP and VTLA packages.

To learn more about the PIC32 "MX1” and “MX2” products, visit: http://www.microchip.com/pagehandler/en-us/family/32bit/
Microchip Expands PIC24 Lite Microcontroller Portfolio With Lowest-Cost 16-bit PIC® MCU Family

New PIC24 Lite MCUs Offer Perfect Combination of Low Price, eXtreme Low Power and Low Pin Count Packages for Cost-Sensitive Consumer, Medical and Safety/Security Applications

Microchip announced from the Embedded World Conference in Germany a new addition to the 16-bit PIC24 Lite microcontroller (MCU) family that combines eXtreme Low Power (XLP) technology, low price and low pin count packages for the most cost-sensitive consumer, medical, and safety/security applications. The PIC24F “KL” family features typical sleep currents of 30 nA at 25°C, and typical run currents of 150 µA/MHz at 1.8V. In order to optimize low-cost applications, these products include flexible peripherals, such as the Master Synchronous Serial Port (MSSP), which enables designers to configure either an I²C™ or SPI interface, as well as the Enhanced Capture/Compare/PWM (ECCP) peripheral that allows designers to customize for multiple PWM and input-capture configurations. The “KL” family of products is available in 14-, 20- and 28-pin packages, starting at $0.75 each, in high-volume quantities.

Today’s manufacturers are under intense pressure to cut costs, even as they deliver more sophisticated, lower-power products. With its combination of features in low pin count packages, the PIC24 “KL” MCUs provide an ideal entry-level 16-bit solution for applications with lower I/O and memory requirements, such as low-cost electronic toys, electric shavers and portable blood-pressure monitors. The MCUs perform at up to 16 MIPS with a flexible peripheral set, enabling customers to differentiate their products in the marketplace while keeping costs low.

The PIC24F ‘KL’ family was developed for cost-sensitive applications that require 16-bit performance, extremely low power sleep and active modes, and low pin count package options. Microchips new MCUs meet these needs, at prices starting at just $0.75 each in high-volume quantities, to cater to the most cost-sensitive applications.

Customers wanting to get started on developing with the PIC24F “KL” MCUs can purchase the USB-powered Microstick for PIC24F 3V K-series (part # DM240013-1), which is available, today. This easy-to-use development platform features everything designers need to get started with PIC24F “KL” MCUs, including an on-board debugger/programmer and Device-Under-Test (DUT) socket for easy device swapping. At about half the size of a credit card, it is extremely portable, and can be plugged into a prototyping board. This Microstick ships with a USB cable, header pins for proto board use, and the PIC24F16KL402, and PIC24F16KA102 MCUs. It is supported by Microchip’s free MPLAB® Integrated Development Environment (IDE), and is compatible with all 3V PIC24F K-series MCUs in 28-pin SPDIP packages.

The PIC24F16KL402 MCUs are available in 14-, 20- and 28-pin PDIP, SOIC, SPDIP, SSOP, TSSOP and QFN packages as small as 5 mm x 5 mm.

To learn more about the PIC12 “KL” family, visit: www.microchip.com/KL402
Microchip Introduces Compact, Integrated RF Front-End Module for Wi-Fi® Applications

Microchip announced its complete, integrated RF front-end module for WLAN IEEE 802.11b/g/n and Bluetooth® systems – the SST12LF03. This device features a transmitter power amplifier, a receiver low-noise amplifier (LNA) and a low-loss antenna switch – in one integrated, compact package. It is Microchip’s smallest 802.11b/g/n-compliant front-end module. The device’s RF ports are impedance-matched to 50 Ohms, and the module requires only two external components to achieve optimum performance. It offers a high linear-transmission power of 19 dBm at 3 percent EVM, using 802.11g OFDM at 54 Mbps, and 22 dBm for IEEE 802.11b operation. The device supports Wi-Fi® and Bluetooth Tx/Rx, and enables simultaneous Wi-Fi and Bluetooth operation. The SST12LF03 is ideal for embedded applications in which small size and high performance are required, such as notebooks or other portable-electronic devices.

Many battery-powered, handheld designs require small size and high performance, and the SST12LF03 meets those needs. By integrating three RF functions into one compact, simple-to-use package, this front-end module makes designing easier and reduces board size. The device features a Bluetooth port, which allows simultaneous 802.11b/g/n WLAN and Bluetooth operation, with optimum performance for both.

Microchip already offers a broad portfolio of high-efficiency RF power amps with an integrated power detector. With the addition of the SST12LF03, Microchip now provides the same reliable power-amplifier performance, combined with a LNA that features bypass mode and a low-loss antenna switch, in a very compact package. This highly integrated module is easy to use, with all of the RF matching circuitry included in the package. This high level of integration simplifies board design and extends the range of wireless systems.

Developers can begin designing today with the SST12LF03 Evaluation Board (part # SST12LF03-Q3DE-K). This Evaluation Board is available now for purchase, by contacting your local Microchip sales office or authorized distributor.

The SST12LF03 is available in a 20-pin, 3mm x 3mm UQFN package.

To learn more about the SST12LF03, visit:
Help Protect Kids from Coin Cell Lithium Battery Ingestion

As demand grows for smaller, slimmer and sleeker electronic devices, so does demand for the coin cell lithium batteries that power them – and the risk a child will swallow one. Electronics manufacturers can get involved and help prevent potential tragedy by securing the battery compartment doors more effectively.

Coin cell lithium batteries can lodge in a child’s esophagus. The saliva immediately triggers an electrical current that causes a chemical reaction that can severely burn the esophagus in as little as two hours. Even after swallowing has occurred, the problem can go undiagnosed because very young children have difficulty communicating what has happened, they can breathe with the battery in their throat and initial symptoms mimic the flu.

After the battery is removed, the burning can continue. Repairing the damage is painful and can require feeding and breathing tubes and multiple surgeries.

Energizer and Safe Kids Worldwide are partnering with others in a campaign called The Battery Controlled to share lifesaving information with parents and other caregivers about the potential risks of swallowing coin-sized button batteries. Device manufacturers are also encouraged to get involved.

In the United States, the number of ingestions of all sizes and types of button batteries in which children have been seriously injured or have died has more than quadrupled in the past five years. In 2010 alone, more than 3,400 button battery ingestions were reported to U.S. poison control centers, according to Dr. Toby Litovitz of the National Capital Poison Center, who is an advisor to this effort. The most severe cases are associated with 20 mm coin cell lithium batteries.

Most often, the batteries have come from mini remote controls and other devices with easy-to-open battery compartments, including calculators, bathroom scales, reading lights, flameless candles and talking and singing books and greeting cards.

These batteries are often installed in the devices before purchase, making them invisible to the consumer. Parents are unaware of the risks and allow their children to play with their electronic devices.

Only one-third of parents in a recent U.S. survey knew of the potential risks associated with swallowing coin-sized lithium button batteries. In the same survey, 56 percent of parents agreed with the statement: “My son/daughter age 6 or younger seems to like my electronic devices sometimes more than his/her children’s toys.”

A survey of parents in the United Kingdom, Italy, France, Canada and Australia found awareness of button battery risk at a comparable 34 percent.

“Children are at risk of opening these devices and swallowing the batteries inside,” said Stacey Harbour, director of marketing, Energizer. “By keeping these batteries and devices away from children, this danger can be averted.”

Parents and caregivers are asked to:

- Examine devices and make sure the battery compartment is secure.
- Keep coin-sized button batteries and devices out of sight and out of reach if the battery compartments aren’t secure.
- Go to the emergency room immediately if swallowing is suspected.
- Call the National Battery Ingestion Hotline at 202-625-3333 (in the U.S.) for additional treatment information.
- Tell others about this threat, and share these steps.

Energizer’s public education efforts are part of a comprehensive response that also includes strengthening warning copy and images, improving packaging to prevent opening by young children, testing of changes in battery design and spreading the word and asking for help among electronics manufacturers.

Visit [http://www.TheBatteryControlled.com](http://www.TheBatteryControlled.com) for more information

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Recommendations to Secure the Battery Door

- Design battery compartment to prevent children from removing batteries.
- Require a tool such as screwdriver or coin to open the battery compartment.
- Require a minimum of two independent and simultaneous movements to open the battery compartment.
- Screws should remain captive with the door or cover.
mTouch™ Framework v2.0
Released

The mTouch Framework is a software package enabling designers to easily integrate touch technologies to their application. It combines high sensitivity with conducted and radiated noise immunity. The detailed configuration file allows for easy, reliable setup. Microchip also offers full source code access for more advanced touch designers.

Two-way communications now allow users to change configuration values at run-time while viewing the changes in real-time on the plotter window of the mTouch Two-Way GUI.

Processor support has greatly increased: PIC12/16F61x, PIC12/16F68x, PIC16F72x, PIC16F78x, PIC16F150x, PIC16F151x, PIC16F152x, PIC16F182x, PIC16F184x, PIC16LF190x, PIC16F193x, PIC16F194x, and PIC18FxxJ50.

The v2.0 release now supports a much larger set of features:

- Keys/Buttons for basic sensor applications
- Automatic decoding logic for Sliders and Wheels
- Proximity Sensors with additional filtering
- Matrix Keypad Layouts with coordinate outputs
- Most-Press Algorithm for high-crosstalk systems
- Guard Rings/Shields to maximize sensitivity
- Mutual Capacitance and/or Self Capacitance scan types
- Scanning modes to enable/disable sensor sampling

The mTouch Framework v2.0 can be found in the mTouch Solutions v1.40 package of the Microchip Libraries of Applications.

Development Tools Now Ship Overnight
Now Standard for In-Stock items to Domestic US locations

Details about Overnight Service:

- Order an in-stock development tool or software by 11AM Arizona time and receive it the next day
- Applies for US domestic deliveries

Reduced Freight Rates Now Available for Europe!

Go to [http://www.microchipdirect.com](http://www.microchipdirect.com) to learn more or speak with one of our microchipDIRECT team members.
Microchip Technology Presents
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Hands-on Technical Training for Embedded Design Engineers

For a limited time only
$24.50 Half Day Class
$49.50 Full Day Class

Microchip is offering technical training classes at half price.
Register for any one class and receive a 50% discount at checkout.
Hurry, this offer is only good for class registrations made before
March 31, 2012.
Limit one discounted class per person.
Use promo code: 044mf80fL at registration checkout.
(Please use the letter “O” when entering the promo code.)

Available classes include:
- MPLAB® Integrated Development Environment (IDE)
- C Programming
- Microchip’s C Compiler
- PIC12 Microcontrollers
- PIC16 Microcontrollers
- PIC18 Microcontrollers
- 16-bit PIC® Microcontrollers
- PIC32 Microcontrollers
- USB
- Ethernet
- Wireless
- Motor Control
- eXtreme Low Power (XLP)
- and More...

Instructions for Use
1. Go to www.microchip.com/training
2. Locate the course you wish to attend.
3. Logon and add the course to the “Shopping Cart”.
4. At checkout select the “MODIFY CART” button before placing the order.
5. Enter promo code 044mf80fL and select “APPLY COUPON”
   (this will reduce the course registration fee).
6. Proceed with checkout.

To learn more about Microchip’s Technical Training Discounts, visit:
http://www.microchip.com/training
Save More with Microchip


Microchip continues to introduce a wide range of innovative 8-bit products targeted at low power consumption, enabling designs with reduced component count, reductions in cost and board space and integration of enhanced features.

Save More Power With Low Active and Sleep Currents!
With each new generation of 8-bit products, Microchip has reduced quiescent current levels significantly. Microchip plans to continue doing so as evidenced by a number of recently released product families. These new products are the lowest power, lowest pin count devices with industry leading active current as low as 30 µA and sleep current for all products below 100 nA and some as low as 20 nA.

Save More Space With Small Package Options!
The miniaturization of electronic devices has gone mainstream and Microchip intends to stay ahead of the trend. For starters, Microchip has introduced Ultra Thin QFN (UQFN) packaging across our lineup. Not only are these new packages 50% thinner than the existing QFNs, they are smaller in every dimension. The UQFNs offer a very cost-effective method for reducing board size. A number of different packaging options are available in various pin counts:

- 64-pin, 9x9x0.9 mm (QFN)
- 40-pin, 5x5x0.5 mm (UQFN)
- 28-pin, 4x4x0.5 mm (UQFN)
- 14-pin, 3x3x0.9 mm (QFN)
- 6-pin, 2x3x0.9 mm (DFN)
- 6-pin, 1.6x2.9x1.2 mm (SOT-23)

Save More Money With Integrated Peripherals!
PIC® microcontrollers (MCUs) are often viewed as the most useful MCUs in the industry. This is due in no small part to the high levels of peripheral integration present in every product. These peripherals allow our customers to implement much of their system’s functionality into a single MCU saving on board space.

Several newly integrated peripherals have been introduced, including:

- **Configurable Logic Cell (CLC)** – Provides up to 16 different inputs for combinational and sequential logic (Boolean functions, Flip-flops, Latches) that is configurable under software control. A CLC Configuration Tool is available to streamline the setup process of the CLC module by simulating the functionality of the registers in a Graphical User Interface (GUI).

- **Numerically Controlled Oscillator (NCO)** – Dedicated 16-bit PWM that can be used for applications within lighting and power supplies.

- **Complementary Waveform Generator (CWG)** – Provides a complementary waveform with rising and falling edge dead band control, with auto-shutdown capability that provides improved switching efficiencies for applications such as synchronous power supplies and motor control.

- **Charge Time Measurement Unit (CTMU)** – Integrated constant current source that can be used with the ADC for capacitive, inductive or resistive, or precise time measurements and is extremely helpful in advanced sensing applications, reducing the need for external components and CPU overhead.

- **Real-Time Clock Calendar (RTCC)** – Maintains accurate time, date, day of week and year information for extended periods of time.

To learn more about Saving More with Microchip, visit:
http://www.microchip.com/8bit

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Reasons to Use Microchip PIC® MCUs for Your Next Design

PIC Microcontrollers offer a unique blend of money saving opportunities including:

- PIC MCU Exclusive Peripherals
- Internal Clock Sources
- On-board Temporary Data Storage
- On-board Analog (ADC, DAC)
- Communications Peripherals
- Digital Control modules
Analog Focus

Motor Drive

MTD6505 3-Phase BLDC Sensorless Fan Controller Demonstration Board

The MTD6505 3-Phase BLDC Sensorless Fan Controller Demonstration Board allows the control and monitoring of the MTD6505 device using PC software connected to the board via a USB connection. The included board software provides several features including VDD control and monitoring, pulse-width modulation (PWM) control, speed and current consumption monitoring. It also allows selecting the RPROG resistor value for fan fitting.

This Kit Contains:

- 1x MTD6505 3-Phase BLDC Sensorless Fan Controller Demonstration Board (ADM00345)
- 3x Plug-In Modules with soldered on MTD6505 (3x3x0.5 mm UDFN-10L)
- 1x 3-Phase BLDC fan
- 1x Mini-USB cable

Features:

- Abilities to control and monitor a 3-Phase BLDC fan or motor through the MTD6505 device
- Four selectable KM ranges through GUI software
- Advanced measurements is available for broad range of 3-Phase BLDC fan validation

MTD6505 Sinusoidal Sensorless 3-Phase Brushless DC Fan Motor Driver

The MTD6505 device is a 3-phase full-wave sensorless driver for brushless DC (BLDC) motors. It features 180° sinusoidal drive, high torque output and silent drive. With the adaptive features, parameters and wide range of power-supplies (2V to 5.5V), the MTD6505 is intended to cover a broad range of motor characteristics, while requiring minimum external components.

Speed control can be achieved through either power supply modulation (PSM) or pulse-width modulation (PWM). The compact packaging and the minimal bill-of-material make the MTD6505 device extremely cost efficient in fan applications.
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Join Microchip At The Following Worldwide Events

**Electronic Design’s Smart Grid Roundtable**

The Smart Grid is without doubt a transformative technology that will change the way consumers deal with energy suppliers over the next ten years or so. At the heart of the Smart Grid is the smart meter, which extends all the way back to the electric utility on one side and all the electric appliances throughout the home on the other. There will come a day when appliances will be imbued with “smarts” so that each can talk, to the smart meter and then to the electric utility.

But getting from here to there demands a great deal of engineering savvy. In this Smart Grid Roundtable, presented by Electronic Design, two of the leading companies in the Smart Grid space, Microchip and Freescale answer questions from a leading authority on the Smart Grid, Electronic Design’s power editor, Don Tuite, about all facets of the Smart Grid and where the U.S. and most other countries around the globe are headed in the near future.

Register now for this live webinar

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Join Microchip’s Brian Chu, Product Line Marketing Manager, as he presents "DC-DC Tradeoffs for Portable Applications".

When developing battery-powered systems, topology selection and feature set can make or break the success of a new product. New standards and battery technologies have emerged, making it difficult for designers to determine the optimal solution for their applications.

This one hour webinar will demonstrate the power system development for battery-powered applications and how to increase run time. Selected power topology advantages and battery life extension will also be presented with a real design example using Alkaline batteries.

Register online at: [http://www.advantagebusinessmedia.com/ims/EC/EC1102_Microchip_LandingPg/EC1102_Microchip_LandingPg.htm](http://www.advantagebusinessmedia.com/ims/EC/EC1102_Microchip_LandingPg/EC1102_Microchip_LandingPg.htm)

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ESC (The Embedded Systems Conference) is the global electronics industry’s leading event. With cutting edge product demonstrations, visionary speeches and hundreds of essential technical training classes and accreditation opportunities, ESC is the ideal venue for the design engineering community to learn, collaborate and recognize excellence. In addition, ESC Silicon Valley celebrates decades of unique local electronics industry culture, innovation and significant contributions to the global technology industry. Visit us in booth #1116

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Looking to Enhance Your Embedded Control Designs?

In tough economic times, companies often look for ways to trim expenses as a means to cope with a downturn in sales. One of the areas often targeted for cutbacks is employee training. There is not only the direct cost of the training to contend with, but also travel expenses and time an employee spends away from the job. During this challenging business climate, however, competitive pressures and technology changes don’t stop and it is training that can help a company be better positioned to take advantage of the potential upswing.

Microchip, with its global network of Regional Training Centers (RTCs) and third-party training partners, is here to help companies stay competitive with cost-effective, local training. To help companies deal with issues of travel expense and time, classes are given not only in Microchip’s facilities, but are also taken on the road. Customized customer premise sessions can be scheduled offering the most convenience. Time away can be managed more efficiently with the flexibility of half or full day class sessions.

To be effective in teaching, instruction must take into account the needs and expertise level of the attendee. Microchip’s Regional Training Center classes are developed to provide a coordinated flow, enabling engineers to implement a solution to their product development needs. Instruction is developed and presented in product, technology and implementation classes that are grouped into application based curriculum.

Each curriculum flow enables the individual to engage with the training at a level that meets his or her current knowledge and needs. The intent is to provide training that is relevant to each attendee while eliminating the frustration often associated with attending classes that present too much known information or assume a level of knowledge beyond what the attendee currently possesses.

Product/tool classes provide knowledge on how Microchip’s products and development tools operate. This knowledge provides the foundation upon which all application instruction is based. Attendance at one of these classes can provide significant value through the reduction in time associated with instruction manuals and data sheet review or trial and error attempts to learn individually. Market forces constantly press companies to add functionality and features to their products often outside their areas of core competence. As a result, engineers must continually broaden their knowledge base. Microchip’s technology classes are intended to help engineers gain an understanding of a new field.

Implementation classes combine elements of product and technology instruction to teach engineers how to design a real world application. Classes at this level provide how-to instruction rather than what or why instruction.

Microchip is currently offering classes in the following curriculum: DSP, Ethernet, Human Interface, Motor Control, Power Management, Signal Chain, System Design and USB. Future curriculum is expected to include CAN/LIN, IrDA®, Lighting and RF.

With a worldwide network of Regional Training Centers and certified third-party trainers, Microchip makes it easy to enhance your technical skills, with locations in nearly every metropolitan area across the world!

For those organizations who desire to have a number of employees attend a course at the same time, Microchip can customize any curriculum to meet your specific needs. Our instructors arrive at your location with all presentation materials and equipment, making it easy for your whole team to benefit from a specific course topic in one setting. In addition to the instruction, most Regional Training Center classes offer the opportunity to purchase a set of the development tools used in the class at a discounted price.

If the class you are interested in is not scheduled in your area, you can sign up to receive an alert when a session is scheduled.

For information on scheduling custom in-house training, contact your local RTC directly or visit the Microchip RTC web site: www.microchip.com/RTC
### What's New in Microchip Literature?

**Data Sheet**
- MCP47DA1 - 6-Bit Windowed Volatile DAC with Command Code
- MCP73853/55 - USB Compatible Li-Ion/Li-Polymer Charge Management Controllers
- MCP6546/6R/6U/7/8/9 - Open-Drain Output Sub-Microamp Comparators
- MCP131X/2X - Voltage Supervisor
- PIC18F66K80 Family High-Temperature Data Sheet
- PIC18F66K80 Family Data Sheet
- PIC18F66K80 Family Data Sheet
- dsPIC33FJ06GS001/101A/102A/202A and dsPIC33FJ09GS302 Data Sheet
- PIC32MX1XX/2XX Data Sheet
- dsPIC33EPXXX(GP/MC/MU)806/810/814 and PIC24EPXXX(GP/GU)810/814 Data Sheet
- PIC16(L)F1946/1947 Data Sheet
- 25AA640A Data Sheet
- PIC16(L)F1938/1939 Data Sheet
- PIC32MX1XX/2XX LIN Transceiver with Voltage Regulator Data Sheet
- PIC12(L)F1501 Errata
- PIC18(L)F23/24/43/44K22 Errata
- PIC18(L)F26/46K22 Errata
- PIC18(L)F25/45K22 Errata
- PIC16(L)F1934/36/37 Errata
- PIC16(L)F1825/29 Errata
- PIC16(L)F1526/27 Errata
- PIC16(L)F1847 Errata
- PIC18F26K20 Errata
- PIC18(L)F1KX50 Errata
- PIC16(L)F1508/1509 Errata
- PIC18F87K90 Family Errata
- PIC18F87K22 Family Errata
- PIC32MX1XX/2XX Family Silicon Errata and Data Sheet Clarification
- PIC32MX3XX/4XX Family Silicon Errata and Data Sheet Clarification
- PIC32MX575/675/695/775/795 Family Silicon Errata and Data Sheet Clarification
- PIC32MX534/564/664/764 Family Silicon Errata and Data Sheet Clarification

**Application Notes**
- High-Quality Audio Applications Using the PIC32

**Programming Specification**
- PIC16(L)F178X Programming Specification
- PIC12F529T48A Programming Specification

**User's Guide**
- Enhanced mTouch™ Capacitive Touch Evaluation Kit and Accessory Boards User's Guide

**Product Brief**
- PIC32 Family Reference Manual - Section 37. Change Time Management (CTMU)
- PIC32 Family Reference Manual Section 33. Programming and Diagnostics
- dsPIC33E/PIC24E FRM Section 33. Charge Time Measurement Unit (CTMU)
Need Some Inspiration?

View these newly released development systems from Microchip’s trusted 3rd Party Providers. All are in-stock and available on microchipDIRECT.

- Update your existing 8-bit PIC® MCU design with the Mini-32 Board from MikroElektronika.
- Need CAN help? View this powerful two-channel USB-to-CAN adapter and analyzer by Total Phase, the Komodo™ CAN Duo Interface.
- Add fast Ethernet connectivity to your PIC Tails with the W5200 Ethernet PICtail™ Board by WIZnet.
- Prototype over 250 PIC® MCU with the EasyPIC™ 7 Development System from MikroElektronika.
- Quickly add wireless monitoring and control capability to any application with the EZ Web Lynx WiFi Module by CCS.

What’s New @ microchip DIRECT

Lead Times Stretching?

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