MICROCHIP

dsPIC® Digital Signal Controllers

www.microchip.com/DSC

Digital Signal Controller Solutions

Building on the legacy of Microchip's world-leading 8-bit PIC® microcontrollers, 16-bit dsPIC® Digital Signal Controllers (DSCs) deliver a large product portfolio to make your demanding applications more competitive by providing lower system cost and improved efficiency. A Digital Signal Controller (DSC) is a single-chip embedded controller that seamlessly integrates the control attributes of a microcontroller (MCU) with the computation and throughput capabilities of a Digital Signal Processor (DSP).

Reduce Development Risk

Natural step up for 8-bit MCU users needing more performance/memory

- Industry's largest DSC portfolio for optimal product fit
- Extensive software and application design support
- Same Integrated Development Environment for 8/16/32-bit MCUs
- Extensive web seminars and training courses

Save System Cost

Simplify your design through integration and efficiency

- Best in class 'C' efficiency enables reduced Flash size
- Low pin count packages provide lower product cost
- Replace complex analog filters with digital filters
- Highly Integrated DSCs reduce external components

Discover New Design Options

Transform ideas into reality

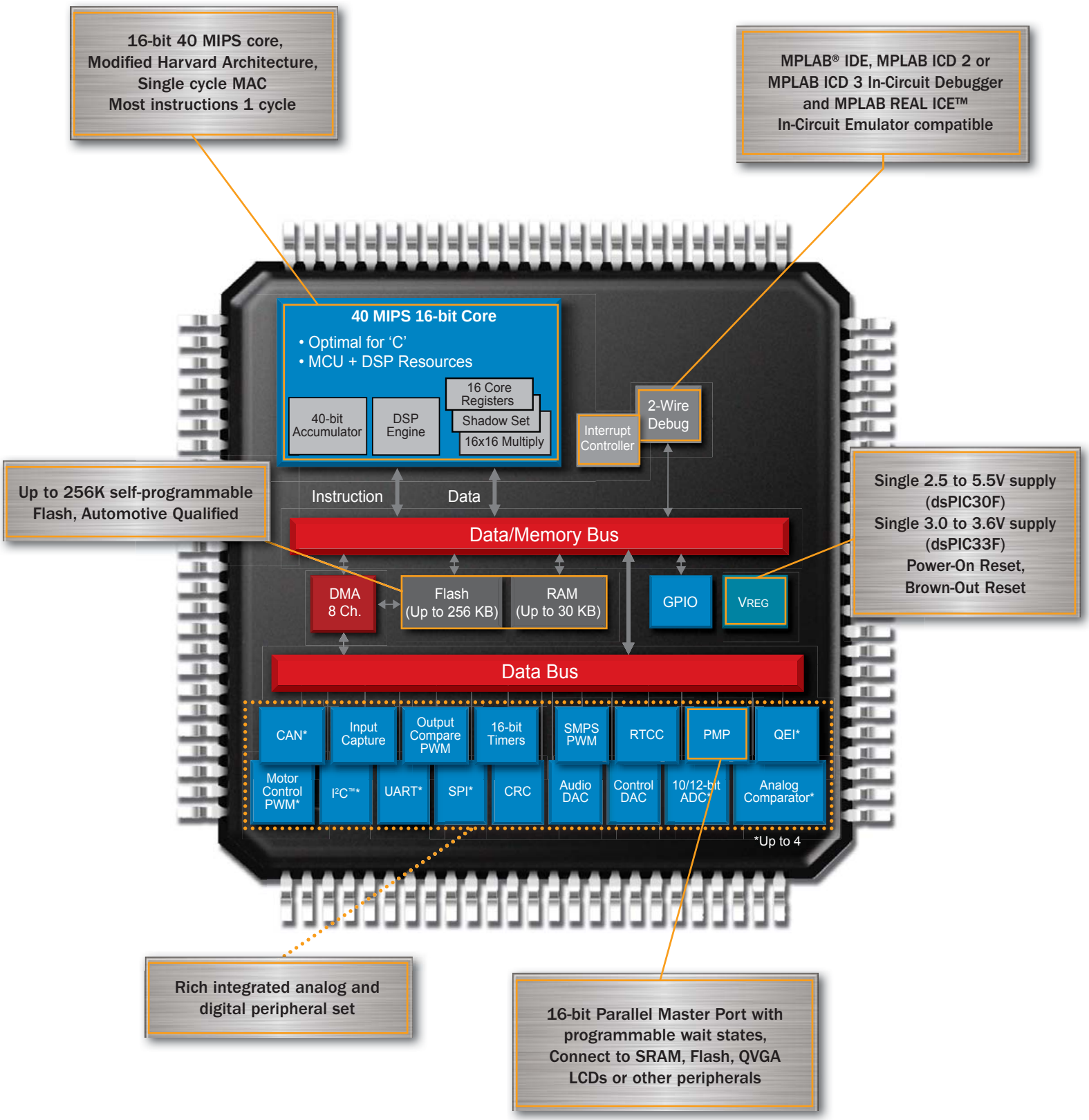
- Add powerful features with DSC capabilities
- Employ advanced algorithms to improve efficiency
- Explore innovative ways to protect your design
- Use industry's smallest DSC to shrink product size

Complete Project on Schedule

Leverage existing software, unprecedented compatibility and powerful graphical tools

- Free software, code examples and peripheral libraries
- Extensive family compatibility maximizes reuse
- Powerful graphical tools for rapid product development
- High-level application libraries provide innovative features

Inside the dsPIC® Digital Signal Controller



Products, Libraries and Reference Designs

16-Bit dsPIC® Digital Signal Controller (DSC) Products

Family	Program Memory (Kbytes)	RAM (Bytes)	Pins	Max Speed	A/D Ch.	A/D Res. (bits)	A/D Sample (ksps)	Comp	8/16/32-bit Timers (x8, x16, x32)	Communication Peripherals	PWM Ch.	PWM Type	Other Features
16-Bit DSCs – General Purpose (24-bit Instruction Word), ICSP™, Self-Write, Sensor													
dsPIC30FXXX	12-144	1K-8K	18-80	30 MIPS	8-16	12	200	–	3-5 x16	UART, I²C™, SPI, CAN, DCI (AC97/I²S)*	2-8	Standard	Flash Security, EEPROM
dsPIC33FXXX/A	12-256	1K-30K	18-100	40 MIPS	6-32	10 or 12	500 or 1.1M	0-2	3-9 x16	UART w/IrDA, I²C, SPI, ECAN, DCI	2-8	Standard	Flash Security, JTAG, DMA, PMP*, RTCC*, DAC*, CRC*
16-Bit DSCs – Motor Control (24-bit Instruction Word), ICSP, Self-Write													
dsPIC30FXXX	12-144	512-8K	28-80	30 MIPS	6-16	10	1.0M	–	3-5 x16	UART, I²C/SPI, CAN	6-8	Motor Ctrl.	Flash Security, EEPROM, QEI*
dsPIC33FXXX/A	12-256	1K-30K	20-100	40 MIPS	4-24	10 or 12	500 or 1.1M	0-2	3-9 x16	UART w/IrDA, I²C, SPI, ECAN	6-8	Motor Ctrl.	Flash Security, JTAG, DMA*, PMP*, RTCC*, CRC*, QEI*
16-Bit DSCs – SMPS and Digital Power Conversion (24-bit Instruction Word), ICSP, Self-Write													
dsPIC30FXXX	6-12	256-512	28-44	30 MIPS	6-12	10	2.0M	2-4	2-3 x16	UART, I²C, SPI	4-8	High-speed	Flash Security
dsPIC33FJXXGSXXX	6-16	256-2K	18-44	40 MIPS	6-12	10	2.0M or 4.0M	0-4	2-3 x16	UART, I²C, SPI	4-8	High-speed	Flash Security, JTAG, 10-bit DAC Output*

*Availability of listed feature dependent on product.
/A = Up to 128 KB Flash memory parts are available with extended temperature option.

Microchip Software Libraries, Application Algorithms and Reference Designs

For a complete list of software libraries visit: www.microchip.com/libraries

Digital Signal Processing	dsPICworks™ DSP Software Digital Filter Design DSP Libraries MPLAB® support of Simulink and MATLAB Filter Design Lite	Free Low-cost Free Free Free
Connectivity	Microchip TCP/IP Microchip TCP/IP with BSD Sockets IrDA® Stack ZigBee® Protocol Stack MiWi™ Protocol Stack V.22bis/V.22 Soft Modem Library V.32bis Soft Modem Library	Free Free Free Free Free Free Free Eval
USB	USB Host USB Device USB Class Drivers – HID, MSD, CDC, Custom, etc. USB On-The-Go	Free Free Free Free
Graphics	Microchip Graphic Library	Free
Motor Control	Numerous Application Solutions for BLDC, ACIM and PMSM	Free
Digital Power Conversion	Digital Power Factor Correction Software SMPS AC/DC Reference Design SMPS Topologies Application Note SMPS Buck Board Application Software SMPS Buck/Boost Application Software Power Design and Simulation Tool	Free Free Free Free Free Free
Speech & Audio	Noise Suppression Library Acoustic Echo Cancellation Library Line Echo Cancellation Library Speech Recognition System Audio Equalizer Library Speech and Audio Fast Forward Tool Speex Speech Encoding/Decoding Library G.711 Speech Encoding/Decoding Library G.726A Speech Encoding/Decoding Library	Free Eval Free Eval Free Eval Free Eval Free Eval Free Eval Free Eval Free Free Eval
Encryption	Symmetric Key Embedded Encryption Library Asymmetric Key Embedded Encryption Library Triple DES/AES Encryption Libraries	Low-cost Eval Low-cost Eval Low-cost Eval
Basic Libraries	16-bit File System Library Math Library Peripheral Library	Free Free Free

For the most up-to-date information about our 16-bit dsPIC DSC portfolio and related development tools and technical support, visit:
www.microchip.com/DSC

Developing with dsPIC® Digital Signal Controllers

Microchip is the only silicon vendor with a full 8-, 16- and 32-bit microcontroller portfolio supported by a unified development environment. Our MPLAB® IDE is free and easy to use.

dsPIC® Starter Kit (DM330011)

Getting started is easy with the fully integrated dsPIC Starter Kit featuring simple installation, getting started tutorial and dsPIC Starter Kit board with easy USB connection to your PC.

The Starter Kit features:

- MPLAB IDE and MPLAB C Compiler for dsPIC DSCs†
- dsPIC Starter Kit Board with Integrated Debugger
- Code Examples, Tutorials and Sample Projects

MPLAB® C Compiler

The MPLAB C Compiler for dsPIC DSCs is a full-featured, ANSI compliant optimizing compiler. The Compiler includes a complete ANSI C standard library, including string manipulation, dynamic memory allocation, data conversion, timekeeping and math libraries. The MPLAB C Compiler has a powerful code optimizer; other 16-bit MCUs generate as much as 165 percent larger code for the same application.

Explorer 16 Development Board (DM240001)

A low-cost modular development system for Microchip's 16- and 32-bit microcontrollers. Add MPLAB® ICD 2, MPLAB ICD 3 or MPLAB REAL ICE™ in-circuit debugger/programmer for software development.

Explorer 16 Motor Control Development System for dsPIC33F

The Explorer 16 Motor Control environment is an excellent platform to develop and prototype BLDC, PMSM and ACIM applications. Microchip offers free motor control source code to jump start your designs.

Plug-In Modules for Explorer 16 Development Board

Controller	Pin Adaptation	Part Number	Notes
dsPIC33FJ256GP710	100 pin to 100 pin	MA330011	included in DM240001
dsPIC33FJ256MC710	100 pin to 100 pin	MA330013	Purchase separately
dsPIC33FJ12MC202	28 pin to 100 pin	MA330014	Purchase separately
dsPIC33FJ12GP202	28 pin to 100 pin	MA330015	Purchase separately
dsPIC33FJ32GP204	44 pin to 100 pin	MA330016	Purchase separately
dsPIC33FJ32MC204	44 pin to 100 pin	MA330017	Purchase separately
dsPIC33FJ128GP804	44 pin to 100 pin	MA330018	Purchase separately
dsPIC33FJ128MC804	44 pin to 100 pin	MA330019	Purchase separately
dsPIC33FJ16GS504	44 pin to 100 pin	MA330020	Purchase separately

PICtail™ Plus Daughter Boards with dsPIC33F Family Supported Devices

Development Tool	Description	Part Number
PICtail Plus Daughter Boards For use with the Explorer 16 Development Board (DM240001)	Wireless Communications PICtail™ Plus Daughter Board	AC163027-4
	PICtail Plus Daughter Board for Secure Digital (SD)/Multimedia Card (MMC) to SPI interface	AC164122
	ECAN™/LIN PICtail Plus Daughter Board	AC164130
	Audio PICtail Plus Daughter Board	AC164129
	Ethernet PICtail Plus Daughter Board	AC164123
	IrDA® PICtail Plus Daughter Board	AC164124
	Speech Playback PICtail Plus Daughter Board	AC164125
	Prototype PICtail Plus Daughter Board	AC164126
	Graphic PICtail Plus Daughter Board	AC164127
	Motor Interface PICtail Plus Daughter Board	AC164128
	Buck/Boost Converter PICtail Plus Card	AC164133

†Evaluation Edition is a full feature compiler for the first 60 days.

Support

Microchip is committed to supporting its customers in developing products faster and more efficiently. We maintain a worldwide network of field applications engineers and technical support ready to provide product and system assistance. In addition, the following service areas are available at www.microchip.com:

- **Support** link provides a way to get questions answered fast: **http://support.microchip.com**
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- **Forum** link provides access to knowledge base and peer help: **http://forum.microchip.com**
- **Buy** link provides locations of Microchip Sales Channel Partners: **www.microchip.com/sales**

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