

The HEAT is On

dsPIC33C Family – Single & Dual Core DSCs from Microchip!

The dsPIC33C devices contain extensive Digital Signal Processor (DSP) functionality with a high-performance MCU architecture. **dsPIC33CK is the Single Core & dsPIC33CH is the Dual Core.**

dsPIC33CK Family: Single-Core Digital Signal Controller - Real-Time Performance

This family offers fast deterministic performance to address real-world design requirements such as high energy efficiency across variable load conditions in a power supply or controlling the precise speed and rotation of a motor.

Features

- Precision control of multiple sensorless, brushless motors, running field-oriented control algorithms and power factor correction
- Highly-adaptive algorithms for digital power conversion applications
- Sophisticated real-time filtering to improve sensors' responsiveness
- Eases functional safety compliance (operations up to 125°C with AEC Q100 Grade-1 qualification)
- CAN-FD option to support automotive communication
- Scalable solutions with memory ranging from 32KB to 256KB
- Maximum peripheral integrations in ultra-small packages which lowers BoM costs and enables smaller form factor designs

dsPIC33CH Family: Dual Core Flexibility – Design Separately, Integrate Seamlessly

This family has one core that is a master while the other is a slave. The slave core is for executing dedicated, time-critical control code while the master core is busy running the user interface, system monitoring and communications functions, customized for the end application.

Features

- Simplified firmware development with dual independent cores
- Dual cores and peripheral sets facilitate robust systems and improve functional safety
- First dsPIC33 with dual CAN-FD
- Maximum analog integration including high-speed ADCs, DACs with waveform generation, analog comparators and PGAs for increased functionality in less space
- Live update of firmware for high-availability systems for power supplies
- High resolution PWM with fine edge placement
- Higher switching frequencies facilitate higher power densities
- High torque at near zero RPM, e.g. power tools

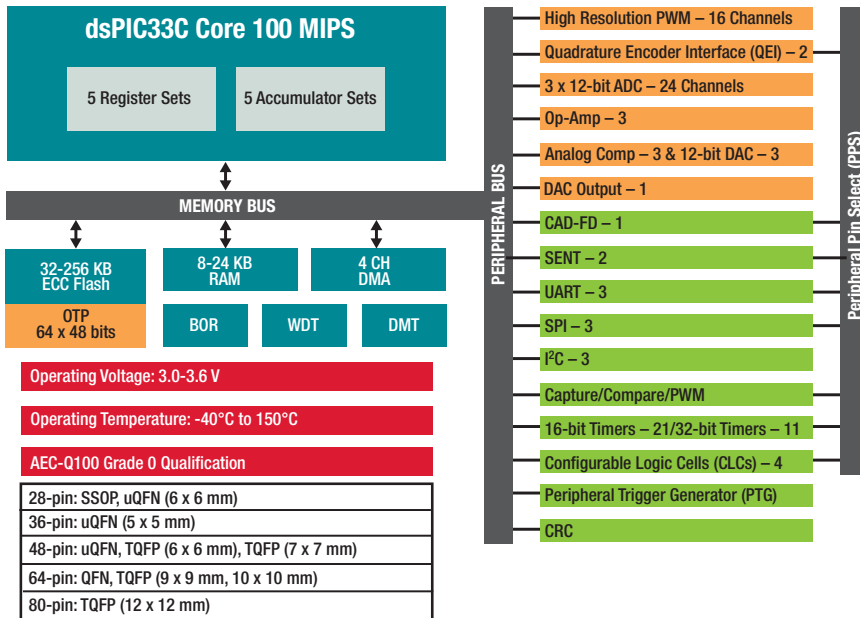
Core/Memory	dsPIC33CK64MPxxx	dsPIC33CK256MPxxx	dsPIC33CH128MPxxx	dsPIC33CH512MPxxx
Core (bits, MIPS)	Single Core 16-bit, 100 MIPS with 4 Alt. Reg. Sets		Dual Core 16-bit, 100 MIPS with 4 Alt. Reg. Sets	
Program Flash (KB)	64/32 KB	256/128/64/32 KB	128/64 KB	512/256 KB
	Self-programmable, ECC			
2nd Core Memory (KB)			24 KB ECC Zero Wait State	72 KB ECC Zero Wait State
SRAM (Bytes)	8KB	8-24KB	16K (Master) 4K (Slave)	48K (Master) 16K (Slave)
Supply Voltage	2.7V-3.6V			
Peripherals	Up to 4x, 12b, 12/18/24ch			
ADC – bits, #ch, SPS Analog Comparators	3	3	4	4
Temperature Sensor	Yes	Yes	Yes	Yes
Op-Amp/PGA	3	3	3 PGA	3 PGA
DAC (12 Bit)	3	3	4	4
DAC Output Buffer	1			
IC/OC/PWM/ MCCP/SCCP	5	9	8 Master, 4 Slave	8 Master, 4 Slave
Dedicated Timers	1	1	1 Master, 1 Slave	1 Master, 1 Slave
UART/SPI(w/I2S)	2/3	3/3	3/3	3/3
I ² C	2	3	3	3
CAN (FD)	-	1	1	2
SENT	2	2	2	2
# MC/DP/PWM Pairs	4	8	4 Master, 8 Slave	4 Master, 8 Slave
QEI	2	2	1 Master, 1 Slave	1 Master, 1 Slave
Budgetary 5k Reg Resale	\$1.90-\$3.29	\$2.52-\$4.16	\$2.87-\$4.10	\$4.06-\$4.90
Packages	28-lead uQFN/SSOP; 36-lead uQFN; 48-lead uQ/TQFP	28-lead uQ/SSOP; 36-lead uQ; 48-lead uQ/T; 66-lead uQ/T; 80-lead T	28-lead uQ/SSOP; 36-lead uQ; 48-lead uQ/T; 66-lead uQ/T; 80-lead T	48-lead uQ/T; 66-lead uQ/T; 80-lead T



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Architectural Block Diagrams

dsPIC33CK256MP508



Applications

Motor Control

Automotive: Pumps, fans
Industrial: Drones, robotics
Consumer: Appliances, toys

Digital Power Conversion

Power Automotive: Converters, chargers, inverters
Industrial: AC/DC and DC/DC
Consumer: Wireless power

High-Performance Embedded

Automotive: Electronic sensors
Industrial: Automation
Medical: Diagnostic equipment, monitors
IoT: Nodes and central processors

Boards

dsPIC33CK256MP508

- Plug-in Module (MA330042)
- dsPIC33CK Curiosity Development Board (DM330030)
- Motor Control: Plug-In Module (MA330041-1 Ext Op Amps & MA330041-2 Int Op Amps)

dsPIC33CH512MP508

- Plug-in Module (MA330046)
- dsPIC33CH Curiosity Development Board (DM330028-2)
- Motor Control Plug-In Modules (MA330045 for Ext Op Amps)

dsPIC33CH512MP508

