dsPIC® DSCs Perfrom Under Pressure
Perform Under Pressure Using dsPIC® DSCs

**Portfolio:** Find the perfect match

**Peripherals:** Optimized for tight control

**Performance:** True DSP with MCU simplicity

**Package:** Broadest range of options

*dsPIC DSCs help you perform, even in harsh environments, to meet your deadlines and application requirements*
dsPIC® DSC
Target Applications

Motor Control
HVAC
Pumps, Compressors, Fans
Appliances

Digital Power
Solar Inverters
AC/DC Power Supplies
DC/DC Converters

Medical
Pulse Oximeters
Blood Pressure Meters
Portable O₂ Concentrators

Consumer
Power Tools
Cameras
Projectors

Automotive
Fans
Sensors
Fuel Pumps

Industrial
3D Printers
Sewing Machines
CNC Machines
dsPIC® DSC Portfolio Breadth

- Perform in Noisy Environments
  - Resilient 3V Operation
  - Robust 5V Operation

- Survive Extreme Temperatures Up to 150°C
  - Standard (−40 to 85°C)
  - Extended (−40 to 125°C)
  - High (−40 to 150°C)

- Room for Growth
  - Flash Memory Ranging From 6 KB to 512 KB
  - Within Same Family / Footprint

Over 1,500 Variants in Production
Find the Perfect Fit
dsPIC® DSC
Core Independent Peripherals

- Peripherals offload CPU to accelerate real-time response
- Streamlined peripheral interoperation
- Sophisticated PWMs
  - Application-specific modes, resolution down to 1 ns
- Peripheral Trigger Generator
  - Orchestrates complex, high-speed peripheral interoperation
  - Looping, sequencing, branching, counting
- DMA frees CPU to focus on algorithmic processing

Leverage Core Independent Peripherals to Crush Real-Time System Constraints
Analog & Communication
dsPIC® DSC Peripherals

- **Integrated Intelligent Analog**
  - ADCs with multiple sample & holds
  - Dual ADCs, up to 49 channels
  - Op amps / fast analog comparators
  - Charge Time Measurement Unit (CTMU)
    - Precision measurements in the analog domain
    - Temperature, humidity, time, capacitance, inductance…

- **Integrated Communications**
  - Dual CAN modules
  - USB 2.0 with support for device, host & OTG
  - UART with LIN and IrDA® interfaces

Flexible & Integrated Connections
dsPIC® DSC Performance

- 70 MIPS (Million Instructions Per Second)
- Each instruction performs up to 8 operations
- Optimized for real-time control
- Zero overhead looping – immediate compare & branch
- Fixed point math manages overflow and rounding
- 40-bit accumulators allow for plenty of precision

True DSP, with simplicity of MCU
Performance: Highly Parallel Execution

One instruction, One clock cycle, 8 operations!

MAC \( w6 \times w7, A, [w8]+=2, w6, [w10]-=4, w7, [w13]+=2 \)

One instruction performs:

\[
\begin{align*}
A &= W6 \times W7 \quad ; \text{W6 multiplied by W7 and product added to A} \\
W6 &= (W8) \quad ; \text{load new data addressed by W8 into W6} \\
W7 &= (W10) \quad ; \text{load new data addressed by W10 into W7} \\
W8 &= W8+2 \quad ; \text{Add 2 to address in W8} \\
W10 &= W10-4 \quad ; \text{Subtract 4 from address in W10} \\
(W13) &= B \quad ; \text{Copy B (rounded) to memory specified by W13} \\
W13 &= W13+2 \quad ; \text{Increment W13 by 2}
\end{align*}
\]

Look at all the operations in 1 instruction
dsPIC® DSC Packaging

- Variants from 18–144 pins
- Same 28-pin package from 6 KB to 512 KB
- Small pin-count packages
- Reduced form factor packages
- Robust package options to ease IPC9592A qual
- Q100 Grade0 for automotive apps up to 150°C
Get Started Today: Featured Starter Kits

- **dsPIC33E USB Starter Kit** (DM330012)
- **Motor Control Starter Kit** (DM330015)
- **Digital Power Starter Kit** (DM330017)
- **Microstick II** (DM330013-2)
- **Hundreds of Code Examples & Software Libraries**
Summary

- Meet your deadline pressure
- Perform in harsh environments
- Find the perfect match for your application
- Optimized peripherals for real-time response
- Wide range of package options
- Ideal for high pressure applications
www.microchip.com/perform