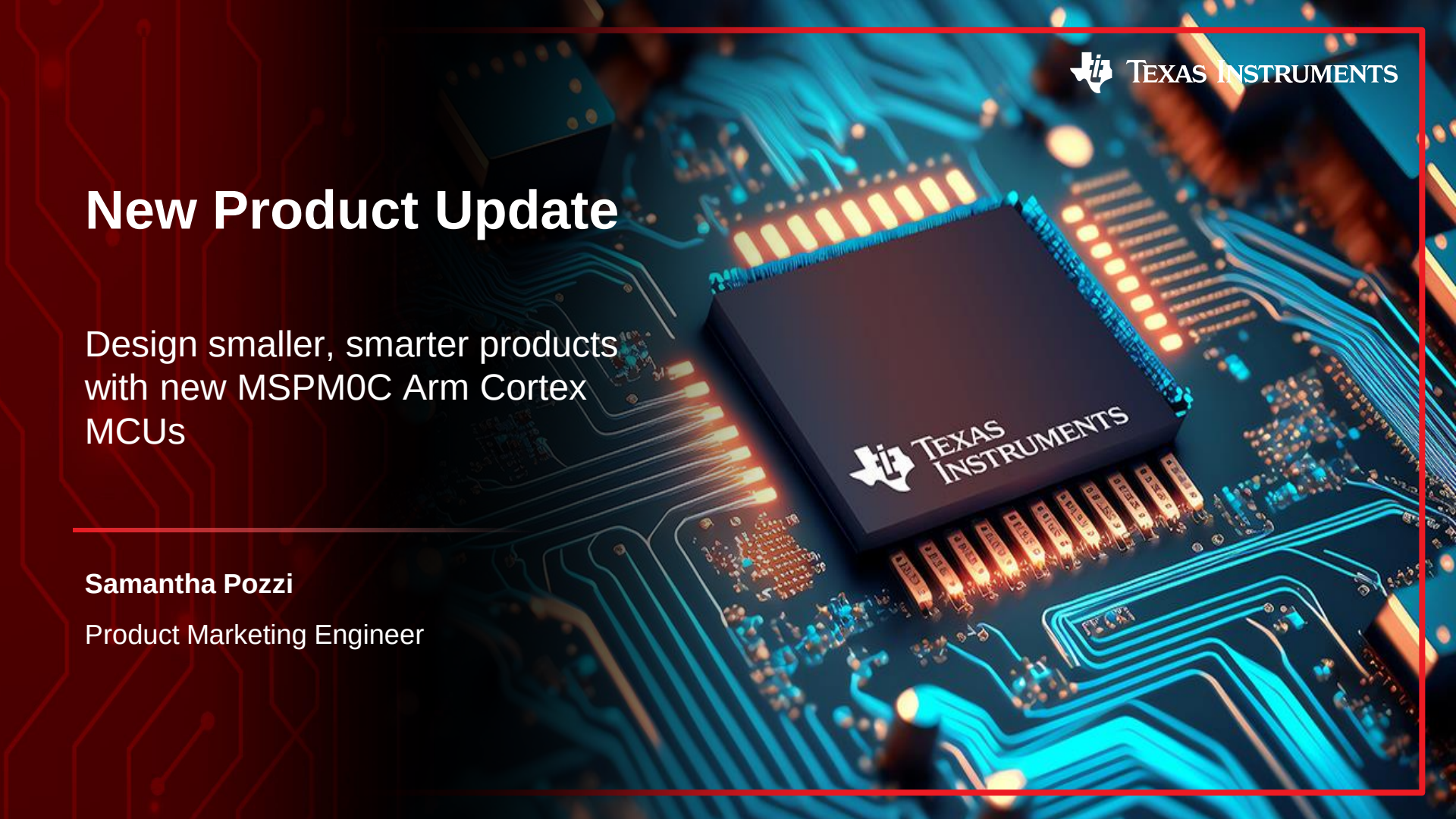
New Product Update

Design smaller, smarter products with new MSPM0C Arm Cortex MCUs



Samantha Pozzi

Product Marketing Engineer

Agenda

- ARM Cortex- M0+ MCU portfolio overview
- The 8-Bit / 16-Bit MCU market
- C-Series M0+ MCUs
- Application examples
- Getting started

MSPM0 MCUs | More options. Unlimited possibilities.

The most comprehensive portfolio of Arm® Cortex® M0+ microcontrollers that delivers the sensing and processing features you need

Cost optimized

- Leveraging TI's recent capacity and cost investments
- Industry's smallest packages enable the smallest PCB designs
- High performance integrated analog to reduce BOM cost

Scalable

- 24/32/80 MHz, 8-128 kB flash, 8-64 pins, and scalable analog
- Pin to pin compatible across wide range of memory & analog options
- 105° C, 125° C, and AEC-Q100 automotive options

Simple to use

- Fast, fully graphical device configuration with code generation
- Code size optimized drivers (1/3rd the size of competitors)
- Plug-and-play subsystems, code examples, and reference designs

MSPM0 MCUs | Reducing your system cost

TI's 65nm technology with Flash

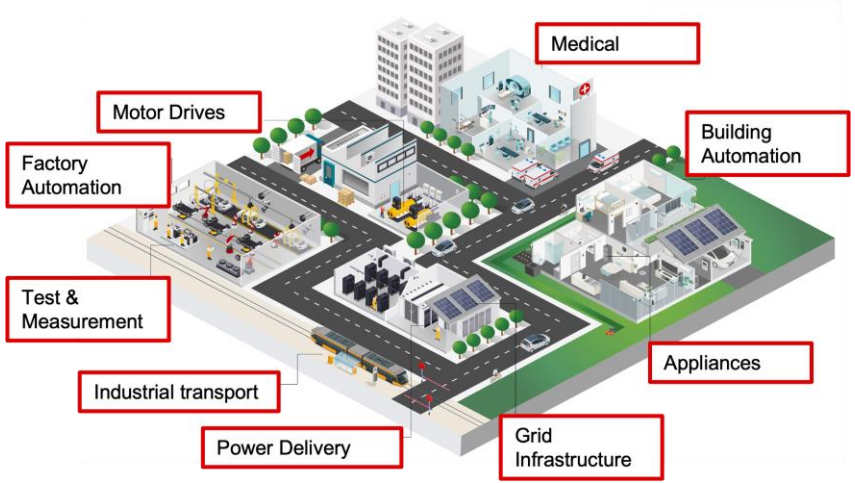
Best cost structure for microcontrollers with mix of digital, analog & memory

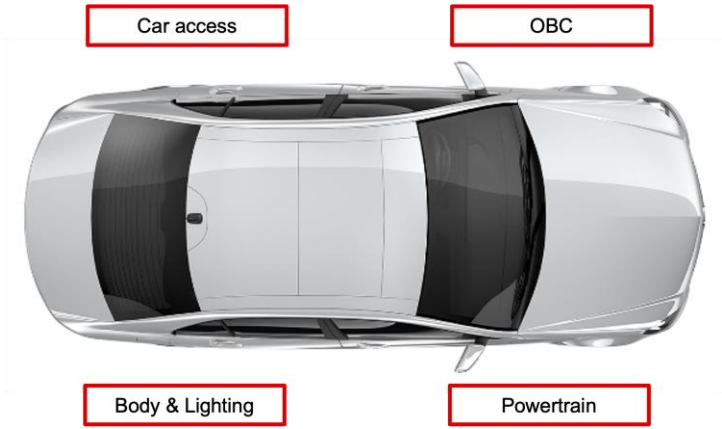
Smallest packages

Leverage the cost benefit of packages that are used by high volume analog

Advanced analog integration

Save components, board space and simplify supply chain with integrated advanced analog





Pick a device optimized for your solution from a broad, pin-2-pin portfolio

MSPM0 MCUs | Scalable portfolio

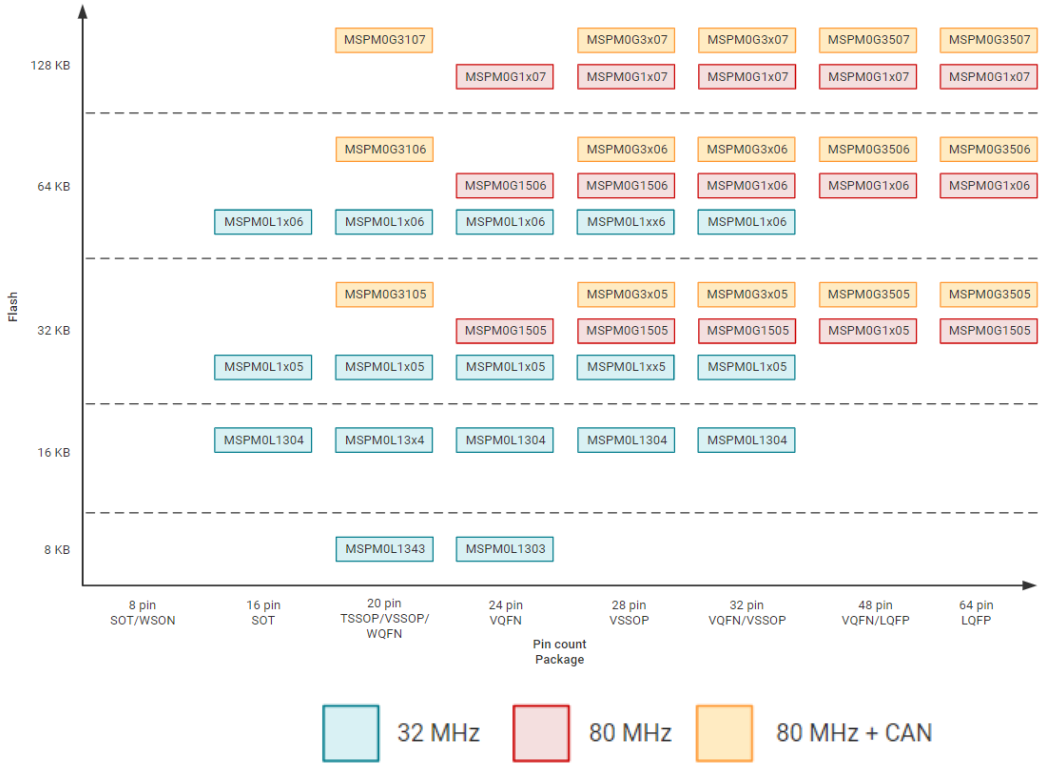
M0G *Best compute*

- 80MHz CPU
- CAN-FD options
- Fast 4Msps sim-sam ADCs
- Math accelerator

M0L *Lowest power*

- 32MHz CPU
- 71µA/MHz (CoreMark run)
- 6µA-max standby at 85 °C
- 1µA-typ standby at 25 °C

Unified software development kit & tools
Pin-to-pin compatible in 15+ packages
TI 65nm flash multi-sourced manufacturing



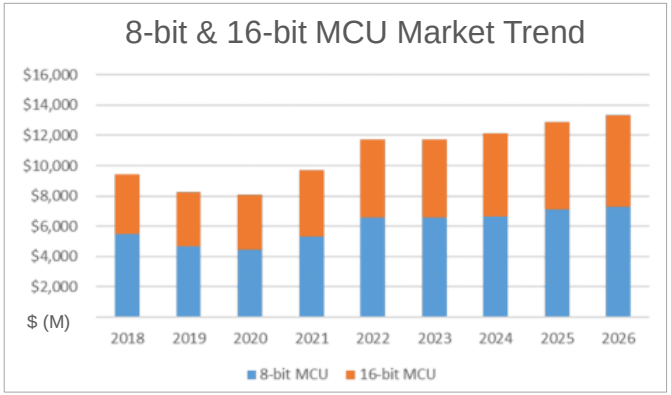
The need for small, low-cost MCUs

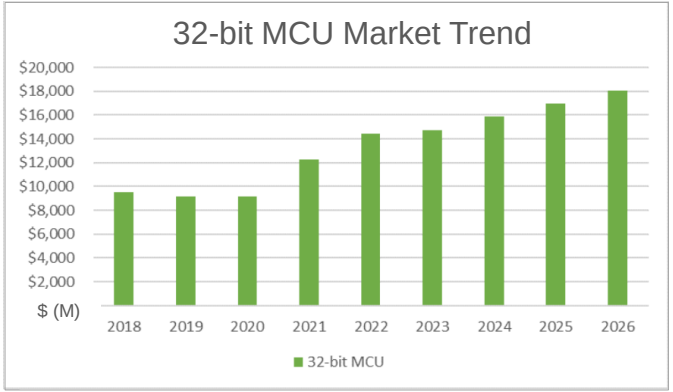
MCUs Market Trends

- Rising demand for high performance 32-bit MCUs
- Consistent demand for 8-bit & 16-bit MCUs

Problem

- Limited supply and capacity investment for 8-bit and 16-bit MCUs compared to 32-bit MCUs
- Engineers are facing performance and cost challenges with legacy 8-bit and 16-bit MCUs





MSPM0 C-Series microcontrollers

MSPM0C1103/4

1.62 - 3.6V
-40 to 125 C

CPU
ARM Cortex-M0+
24 MHz

NVIC / 1-ch Basic DMA

On-chip Memory
- 8, or 16 kB flash
- 1 kB SRAM

Data Integrity & Security
- CRC accelerator (16 bit)

Programming & Debug
- ARM SWD interface

Power & Clocking
- POR / BOR
- Internal LF 32kHz (3%)
- Internal HF 24MHz (1%)

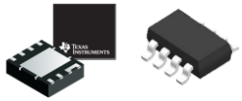
Communication
- UART w/ LIN (1)
- SPI (1)
- I2C (1) w/ FastMode+

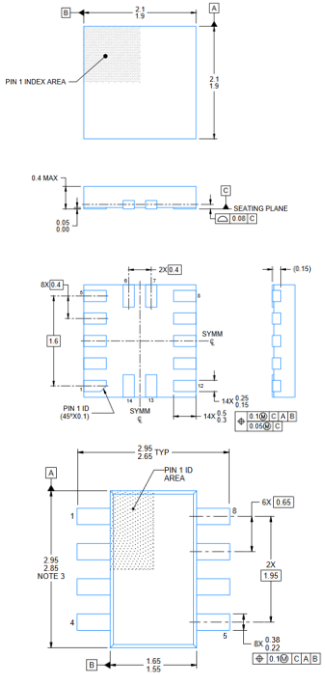
Precision Analog
- 12-bit SAR ADC (10-ch)
- Internal ADC reference (1.5%)

Timers
- Advanced control 16-bit 4 CC (1)
- General purpose 16-bit 4 CC (1)
- General purpose 16-bit 2 CC (1)
- Windowed watchdog

IO
- Up to 18 GPIO

Leaded packages: SOT-8/16, VSSOP-20, TSSOP-20
No-lead packages: WSON-8, WQFN-20





< $0.18

Starting at 1 kU

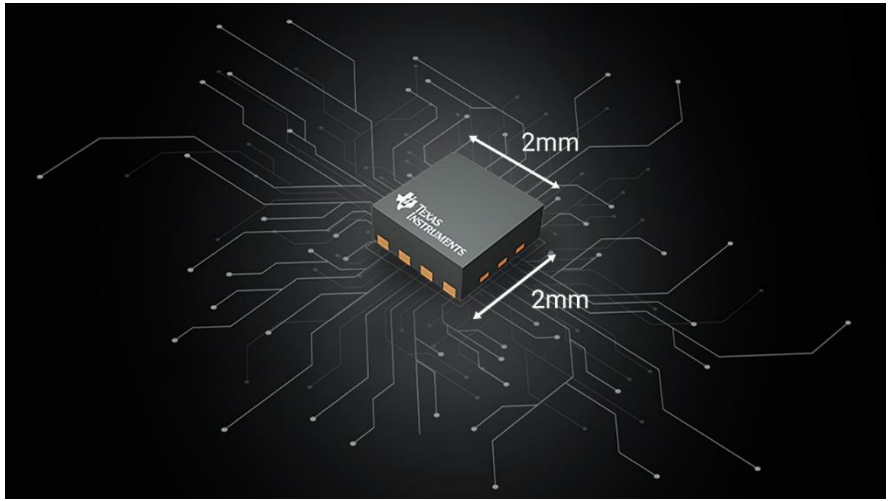
10

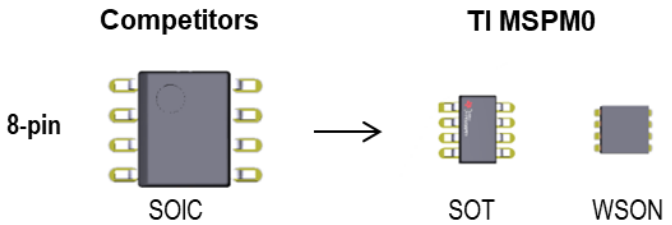
8-kB – 16-kB memory, package, peripheral options

6

Of the industry's smallest, easiest to assemble MCU Packages

MSPM0C MCUs | Room to do more





6 GPIOs

Available with 8-pin WSON-DGS package

2x2 mm²

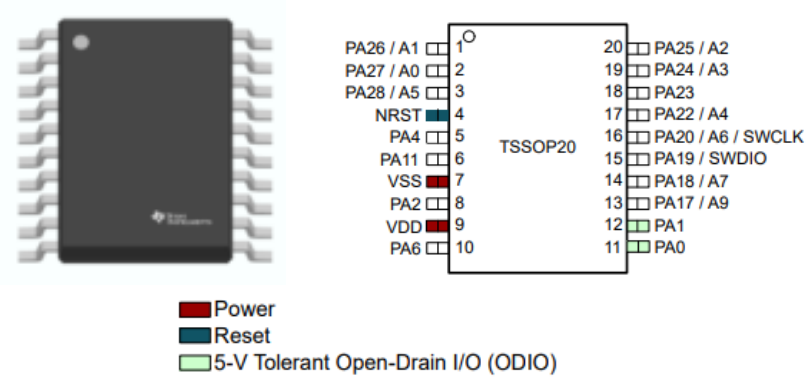
TI's smallest M0+ MCU package

7.35x Smaller

Compared to common 8-pin SOIC

Drop-in replacement | Get a cost reduction faster

MSPM0 TSSOP20 pinout (Top View)



TSSOP-20

Package is pin to pin compatible with popular devices on the market

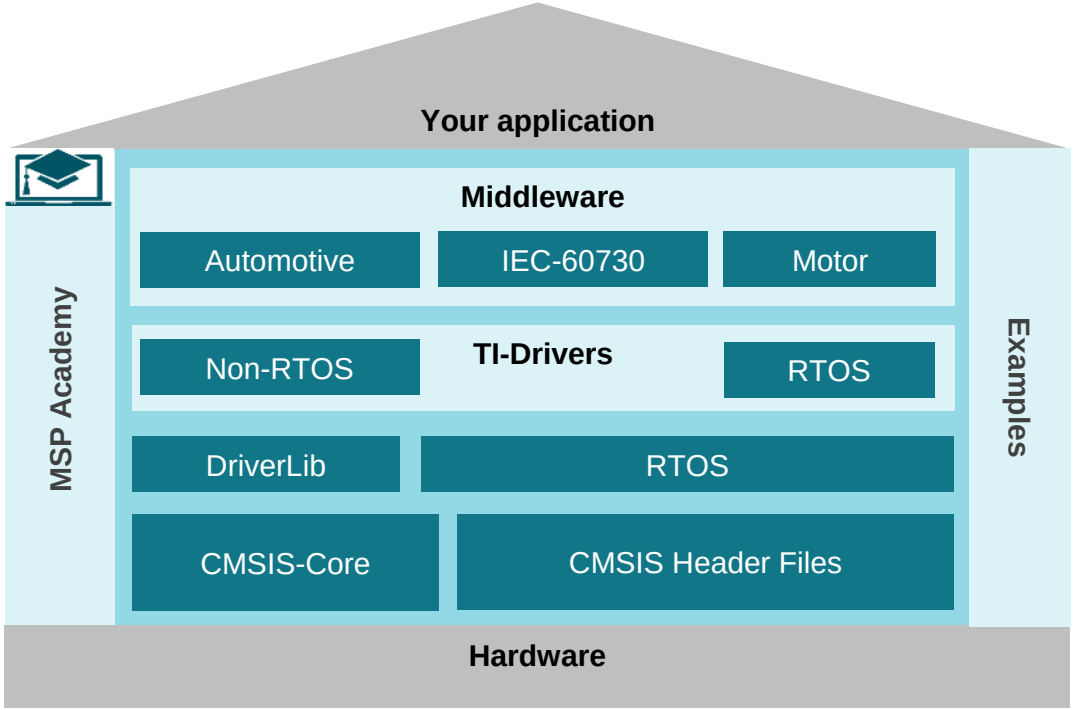
Zero code migration

Application code FULLY re-usable for select MCU vendors

Migration guide

Available to minimize the SW migration time & effort

MSPM0 MCUs | Optimized software



Rapid prototyping tools

Available Now!

MSPM0C1104
Launchpads are
$5.99

TI CCS

IAR SYSTEMS

KEIL™ Tools by ARM

freeRTOS

SEGGER

3P Tools

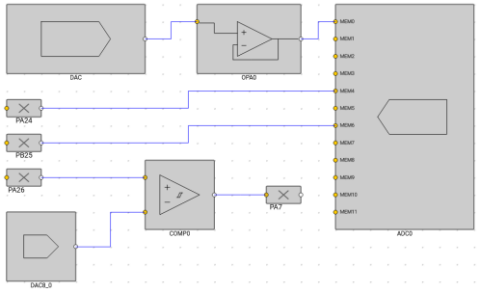
Visual development | From design to config and tuning

Get started in the TI Developer Zone dev.ti.com

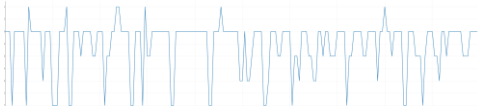
Analog design

ti.com/tool/mspm0-analog-configurator

Drag-and-drop ADCs, DACs, CMPs, amps



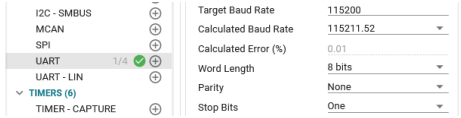
View & log data converter outputs in real time



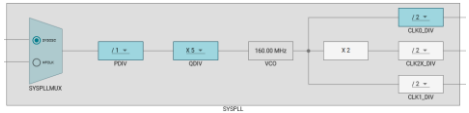
System configuration

ti.com/tool/sysconfig

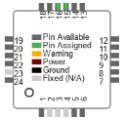
Select and set up peripherals

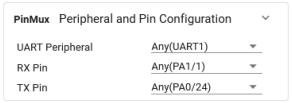


Configure & optimize clock system



Solve pin multiplexing challenges

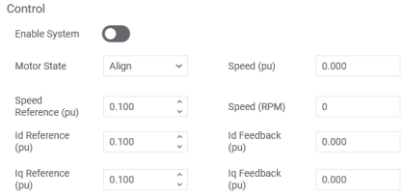




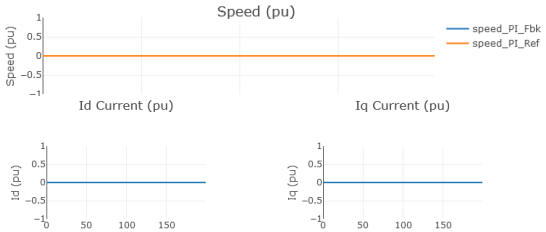
Application tuning

ti.com/tirex

Tune motor control loops



View & log motor & sensor parameters



Texas Instruments

MSPM0 C-Series MCUs | Broad applications

24 MHz low-cost MCU with up to 16kB flash, 20 pins, 12-bit ADC

BUILDING & FACTORY AUTOMATION

Smoke detector

Gas detector

PIR sensor

Garage sensor

Field transmitter

APPLIANCE

Coffee machine

Power tool

Vacuum cleaner

Dish washer

PERSONAL ELECTRONIC

TWS

Stylus

E-toothbrush

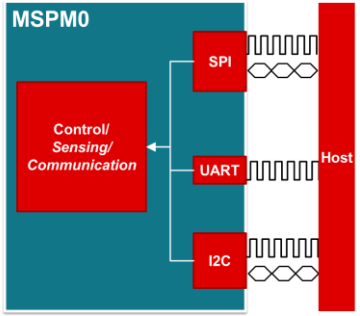
Shaver

Printer

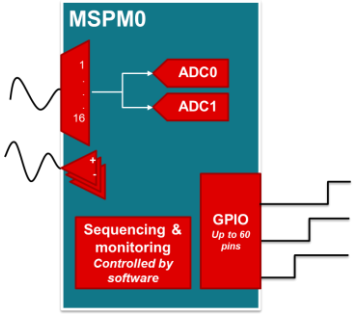
Wireless charger

SUBSYSTEM

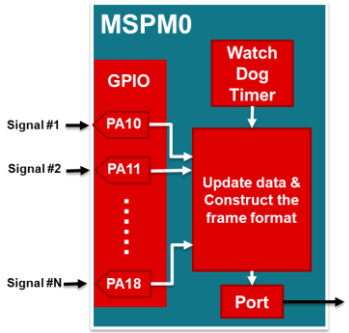
➢ IO Expander



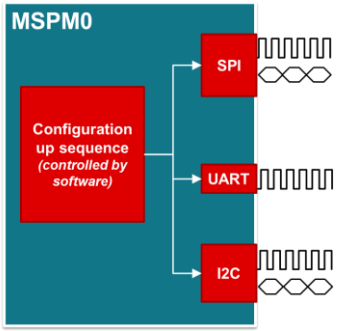
➢ Power Sequencer/Voltage Supervisor



➢ Watch Dog



➢ System startup/configuration controller



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Texas Instruments

Getting started

You can start evaluating this device leveraging the following:

Content type	Content title	Link to content or more details
Product information	MSPM0C1104 product page	MSPM0C product page
Software	MSPM0 software development kit (SDK)	MSPM0-SDK
Webinar session	The smallest package TI MSPM0 MCU enables room to do more in your design	Register for our webinar on 4/16/2024
Technical blog content or white paper	TI's Smallest M0+ MCU Package Enables Room to do More in Your Design	App Brief
Technical blog content or white paper	Low-Cost MSPM0C MCUs as an I/O Expander	App Brief
Development tool or evaluation kit	MSPM0C1104 LaunchPad™ development kit	LaunchPad development kit

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