TM4C Microcontrollers
Product Selection Guide

Texas Instruments

TM4C123x

ARM® Cortex®-M4
Up to 80 MHz

FPU		MPU
NVIC	ETM	SWD/T

Temperatures | 85°C | 105°C

Memory
Up to 256 KB F...
Up to 32 KB SR...
2 KB EEPROM
ROM
DMA (32 ch...

Power & Clocking

Debug
Real-time JTA...

Control Peripherals
2× Quadrature Encoder Inputs
16× PWM Outputs

Comms Periph...
8× UART
4× SSI/SPI
6× I²C
2× CAN
USB Full Spe...
(Host/Device/O...)

TM4C129x

ARM® Cortex®-M4
Up to 120 MHz

FPU		MPU
NVIC	ETM	SWD/T

Temperatures | 85°C | 105°C

Memory
Up to 1 MB Flash
Up to 256 KB SRAM
6 KB EEPROM
ROM
DMA (32 ch)

Power & Clocking
Precision Oscillator
RTC Battery-Backed Hibernate

System Modules
8× 32-bit Timer/PWM/CCP
EPI
LCD
Systick Timer
2× Watchdog Timer

System Management
1-Wire

Debug
Real-time JTAG

Analog
2× 12ch, 12-bit ADCs up to 2 MSPS
LDO Voltage Regulator
3× Analog Comparators
Temperature Sensor

Control Peripherals
Quadrature Encoder Inputs
8× PWM Outputs

Comms Peripherals
8× UART
4× QSSI/SPI
10× I²C
2× CAN
10/100 Ethernet MAC/PHY (IEEE 1588)
USB Full/High Speed (Host/Device/OTG)

Data Protection
4× Tamper Inputs
CRC Accelerator
AES, DES, SHA & MD5 Accelerators

TM4C123x microcontrollers

Introduction

The TM4C123x MCUs provide a broad portfolio of connected Arm® Cortex®-M4 microcontrollers running at up to 80 MHz and offering up to 256 kB of Flash memory. Designers that select the TM4C123x MCUs benefit from a variety of integrated communication, analog, and motion control peripherals that enable architecting highly responsive mixed-signal applications. TM4C123x MCUs provide a broad portfolio of memory and package size options for many industrial applications including appliances, transport, and automation.

Key highlights

- ARM Cortex-M4 core with floating point

- CPU speed up to 80 MHz

- Up to 256-KB Flash

- Up to 32-KB single-cycle SRAM and 2-KB EEPROM

- Two high-speed 12-bit ADCs up to 1 MSPS

- Up to two CAN 2.0 A/B controllers

- Optional full-speed USB 2.0 OTG/host/device

- Up to 40 PWM outputs

- Serial communication with up to:

    o 8 UARTs, 6 I²Cs, 4 SPI/SSI

- Intelligent low-power design power consumption as low as 1.6 µA

Benefits

- 12-bit ADC accuracy achievable at the full 1 MSPS rating without any hardware averaging, eliminating performance tradeoffs

- Range of pin-compatible memory and package configurations enables optimal selection of devices
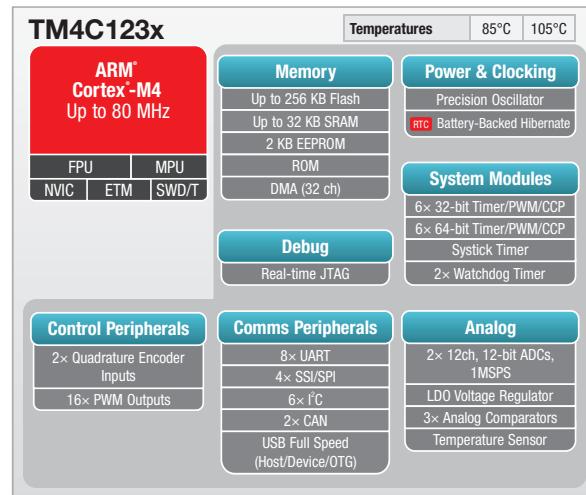
Integrated communication peripherals provide a broad array of connectivity options for many applications:

- Universal Serial Bus (USB) controller with USB 2.0 full-speed (12 Mbps) operation supporting USB OTG/Host/Device mode

- Controller Area Network (CAN) modules using CAN protocol version 2.0 part A/B and with bit rates up to 1 Mbps

- Advanced serial integration providing a multitude of UART, SPI, and I2C channels to create a highly connected system

Applications

- Appliances

- Sensor aggregation

- Security and access control

- Home and building automation

- Industrial automation

- Human machine interface

- Lighting control

- Industrial transport

- Data acquisition

- System management

TM4C129x microcontrollers

Introduction

The TM4C129x family of MCUs allow designers to develop highly connected products leveraging a powerful Arm® Cortex®-M4 MCU core running at up to 120 MHz. The TM4C129x family offers a variety of devices that provide on-chip communication peripherals including an integrated Ethernet MAC+PHY, USB 2.0 Host/Device/OTG, dual CAN, and an LCD Controller. Different packaging options and Flash

sizes of 512 kB and 1 MB further broaden the TM4C129x family. Developers will have the ability to enhance product features and communicate to industrial and IoT applications including building and factory automation and IoT gateway.

Key highlights

- ARM Cortex-M4 core with floating point

- CPU speed up to 120 MHz

- Up to 1-MB Flash

- 256-KB SRAM and 6-KB EEPROM

- 10/100 Ethernet with embedded MAC and PHY

- LCD controller

- AES, DES, SHA/MD5 and CRC hardware acceleration

- Four tamper inputs

- Two 12-bit ADCs up to 2 MSPS

- Two CAN 2.0 A/B controllers

- Full-speed USB 2.0 OTG/Host/Device and high-speed USB ULPI interface

- Serial communication with up to:

  ○ 8 UARTs, 10 I²Cs, 4 QSPI/SSI, 1-wire master interface

Benefits
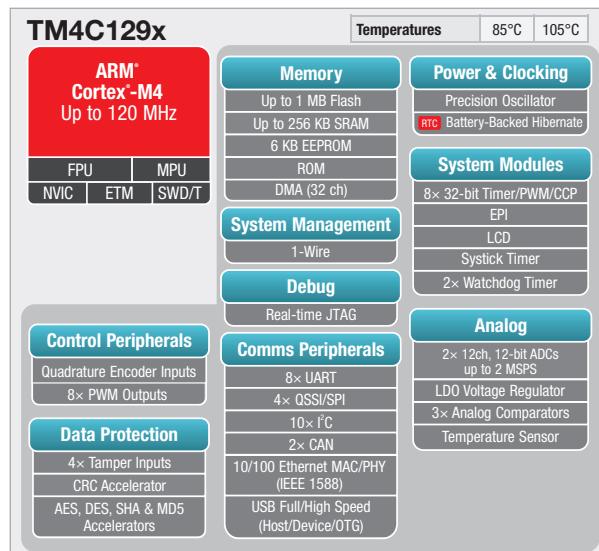
- Connect to the Internet of Things through the integrated 10/100 Ethernet MAC+PHY with IEEE 1588 PTP hardware support allowing the creation of seamless gateway solutions.

- Expand system connectivity with integrated Full-speed Universal Serial Bus (USB) 2.0 with OTG/Host/Device modes to communicate with various products. Expandable to high-speed USB 2.0 by using the ULPI interface to add an external USB PHY.

- Control outputs and manage multiple events with 8 UART ports, 10 I2C ports, 8 PWM outputs, dual 12-bit ADCs, and dual CAN 2.0 A/B controllers.

- Address varying application memory needs with scalable 512 KB to 1 MB Flash memory options that are pin-for-pin compatible across the TM4C129x portfolio. External memory expansion options are possible with four Quad-SSI modules and the External Peripheral Interface that can

support the seamless addition of SPI Flash and/or SDRAM to any system.

- Add an LCD display with the integrated and configurable LCD controller that offers support for both passive and active matrix LCD panels.

- Include data protection to applications and reduce processing overhead with the hardware acceleration of key encryption/decryption.
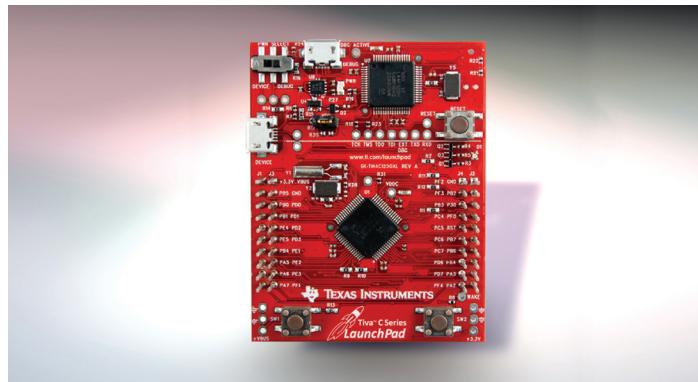
Applications

- IoT Gateway

- Solar inverters

- Industrial sensors

- Industrial automation

- Security access systems

- Industrial motor control

- Communications adapters/concentrators

- Networked industrial meters/controllers

- Industrial HMI control panels/displays

- Networked residential/SoHo systems

- Vending machines
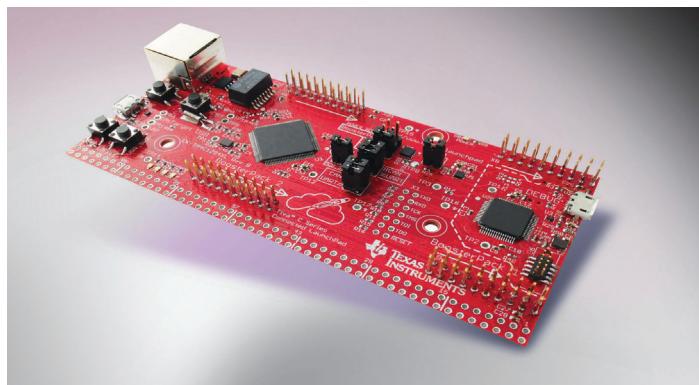
TM4C Evaluation kits

EK-TM4C123GXL LaunchPad™ Evaluation Kit is a low-cost evaluation platform for ARM® Cortex-M4F based micro-controllers. Featuring a 80-MHz ARM® Cortex-M4F CPU, 256kB of flash, and 32kB of SRAM, the TM4C123GH6PM MCU provides integrated USB 2.0 support for USB Host/Device/OTG and two 12-bit ADC modules. The TM4C123GH6PM also includes a multitude of serial communication channels such as UART, SPI, I2C, and CAN. The design of the TM4C123G LaunchPad highlights the TM4C123GH6PM USB 2.0 device interface and additional device features such as the hibernation and PWM modules. The 40-pin stackable headers provide the interface to expand the functionality of the TM4C123G LaunchPad through the Texas Instruments BoosterPack™ plug-in module ecosystem.

EK-TM4C123GXL LaunchPad Evaluation Kit

EK-TM4C1294XL Connected LaunchPad™ Evaluation Kit is a low-cost development platform for ARM Cortex-M4F-based microcontrollers. Featuring a 120-MHz Arm Cortex-M4F CPU, 1MB of flash, 256kB of SRAM, the TM4C1294NCPDT MCU provides an integrated 10/100 Ethernet MAC and PHY and USB 2.0 support for full-speed host and device modes. The TM4C1294NCPDT also includes a hibernation module with calendar mode, two 12-bit ADC modules, PWM and QEI modules, and a multitude of serial connectivity channels for UART, SPI, I2C, and CAN. Two sets of 40-pin stackable headers provide the interface to connect BoosterPack™ plug-in modules to expand functionality and interface with the Texas Instruments BoosterPack ecosystem, and the LaunchPad comes with connectors for both Ethernet and USB to quickly evaluate various connectivity capabilities.

EK-TM4C1294XL Connected LaunchPad Evaluation Kit

TM4C129X Connected Development Kit (DK-TM4C129X) is a versatile and feature-rich engineering platform highlighting the 120-MHz TM4C129XNCZAD ARM Cortex-M4-based microcontroller that includes an integrated 10/100 Ethernet MAC+PHY plus many other key features. Beyond the industry-leading Ethernet integration, this kit and its associated MCU, the TM4C129XNCZADI, also showcase integrated functions such as a color LCD interface, USB 2.0 OTG/Host/Device port, TI wireless EM connection, BoosterPack and BoosterPack XL interfaces, a Quad SSI-supported 512-Mbit Flash memory, microSD slot, plus expansion headers providing easy access for interfacing to the MCU's high-speed USB ULPI port, Ethernet RMII/MII ports, and its external peripheral interface, which supports memories, parallel peripherals and other system functions.
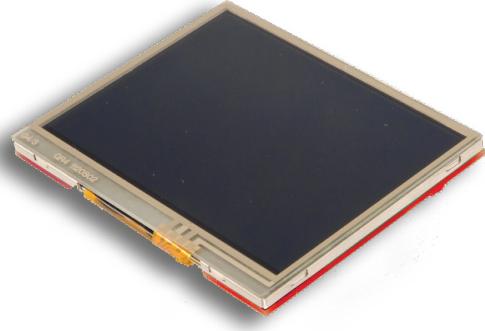
TM4C129X Connected Development Kit

## BoosterPacks

[BOOSTXL-K350QVG-S1 Kentec QVGA Display BoosterPack](#) is an easy-to-use plug-in module for adding a touch screen color display to your design, featuring a 320 x 240 pixel SPI controlled TFT QVGA display with resistive touch screen.

Plug-in BoosterPacks for the Tiva C Series TM4C123x LaunchPad and TM4C129x Connected Development Kit make it simple and fun to explore various applications by expanding the functionality of the Tiva C Series MCUs.

www.ti.com/boosterpack

TM4C Product selector

TM4C123x/TM4C129x Microcontrollers

Part number	Flash (KB)	SRAM (KB)	EEPROM (Bytes)	ARM® Cortex® CPU	Max speed (MHz)	GPIO pins	External peripheral I/F	LCD controller module	10/100 MAC+PHY	10/100 MAC with MII I/F	IEEE 1588	CAN MAC	USB D, H, or O	HS USB PHY I/F (ULPI)	UART	I²C	Units	Quad-capable	General-purpose (Total)	Real-time clock (RTC)	Watchdog	PWM outputs	QEI channels	Resolution (bits)	Channels	Speed (samples/sec)	Analog/digital comparators	Tamper signals	CRC	AES	DES	SHA/MD5	Battery-backed hibernation	Temperature range (°C)	Pin/package
TM4C123x MCUs																																				
TM4C1230C3PM	32	12	2k	M4	80	49	0	0	0	0	0	1	–	0	8	6	4	0	12	1	2	0	0	12	12	1M	2/16	0	0	0	0	0	0	–40 to 85	64 LQFP
TM4C1230D5PM	64	24	2K	M4	80	49	0	0	0	0	0	1	–	0	8	6	4	0	12	1	2	0	0	12	12	1M	2/16	0	0	0	0	0	0	–40 to 85	64 LQFP
TM4C1230E6PM	128	32	2K	M4	80	49	0	0	0	0	0	1	–	0	8	6	4	0	12	1	2	0	0	12	12	1M	2/16	0	0	0	0	0	0	–40 to 85	64 LQFP
TM4C1230H6PM	256	32	2K	M4	80	49	0	0	0	0	0	1	–	0	8	6	4	0	12	1	2	0	0	12	12	1M	2/16	0	0	0	0	0	0	–40 to 85	64 LQFP
TM4C1231C3PM	32	12	2K	M4	80	43	0	0	0	0	0	1	–	0	8	4	4	0	12	1	2	0	0	12	12	1M	2/16	0	0	0	0	0	1	–40 to 85	64 LQFP
TM4C1231D5PM	64	24	2K	M4	80	43	0	0	0	0	0	1	–	0	8	4	4	0	12	1	2	0	0	12	12	1M	2/16	0	0	0	0	0	1	–40 to 85	64 LQFP
TM4C1231D5PZ	64	24	2K	M4	80	69	0	0	0	0	0	1	–	0	8	6	4	0	12	1	2	0	0	12	12	1M	2/16	0	0	0	0	0	1	–40 to 85	100 LQFP
TM4C1231E6PM	128	32	2K	M4	80	43	0	0	0	0	0	1	–	0	8	4	4	0	12	1	2	0	0	12	12	1M	2/16	0	0	0	0	0	1	–40 to 85	64 LQFP
TM4C1231E6PZ	128	32	2K	M4	80	69	0	0	0	0	0	1	–	0	8	6	4	0	12	1	2	0	0	12	22	1M	3/16	0	0	0	0	0	1	–40 to 85	100 LQFP
TM4C1231H6PGE	256	32	2K	M4	80	105	0	0	0	0	0	1	–	0	8	6	4	0	12	1	2	0	0	12	24	1M	3/16	0	0	0	0	0	1	–40 to 85	144 LQFP
TM4C1231H6PM	256	32	2K	M4	80	43	0	0	0	0	0	1	–	0	8	4	4	0	12	1	2	0	0	12	12	1M	2/16	0	0	0	0	0	1	–40 to 85	64 LQFP

TM4C123x/TM4C129x Microcontrollers

Part number	Flash (KB)	SRAM (KB)	EEPROM (Bytes)	ARM Cortex CPU	Max speed (MHz)	GPIO pins	External peripheral I/F	LCD controller module	10/100 MAC+PHY	10/100 MAC with MII I/F	IEEE 1588	CAN MAC	USB D, H, or O	HS USB PHY I/F (ULPI)	UART	I²C	Units	Quad-capable	General-purpose (Total)	Real-time clock (RTC)	Watchdog	PWM outputs	QEI channels	Resolution (bits)	Channels	Speed (samples/sec)	Analog/digital comparators	Tamper signals	CRC	AES	DES	SHA/MD5	Battery-backed hibernation	Temperature range (°C)	Pin/package
TM4C1231H6PZ	256	32	2K	M4	80	69	0	0	0	0	0	1	–	0	8	6	4	0	12	1	2	0	0	12	22	1M	3/16	0	0	0	0	0	1	−40 to 85	100 LQFP
TM4C1232C3PM	32	12	2K	M4	80	49	0	0	0	0	0	1	D	0	8	6	4	0	12	1	2	0	0	12	12	1M	2/16	0	0	0	0	0	0	−40 to 85	64 LQFP
TM4C1232D5PM	64	24	2K	M4	80	49	0	0	0	0	0	1	D	0	8	6	4	0	12	1	2	0	0	12	12	1M	2/16	0	0	0	0	0	0	−40 to 85	64 LQFP
TM4C1232E6PM	128	32	2K	M4	80	49	0	0	0	0	0	1	D	0	8	6	4	0	12	1	2	0	0	12	12	1M	2/16	0	0	0	0	0	0	−40 to 85	64 LQFP
TM4C1232H6PM	256	32	2K	M4	80	49	0	0	0	0	0	1	D	0	8	6	4	0	12	1	2	0	0	12	12	1M	2/16	0	0	0	0	0	0	−40 to 85	64 LQFP
TM4C1233C3PM	32	12	2K	M4	80	43	0	0	0	0	0	1	D	0	8	4	4	0	12	1	2	0	0	12	12	1M	2/16	0	0	0	0	0	1	−40 to 85	64 LQFP
TM4C1233D5PM	64	24	2K	M4	80	43	0	0	0	0	0	1	D	0	8	4	4	0	12	1	2	0	0	12	12	1M	2/16	0	0	0	0	0	1	−40 to 85	64 LQFP
TM4C1233D5PZ	64	24	2K	M4	80	69	0	0	0	0	0	1	D	0	8	6	4	0	12	1	2	0	0	12	22	1M	2/16	0	0	0	0	0	1	−40 to 85	100 LQFP
TM4C1233E6PM	128	32	2K	M4	80	43	0	0	0	0	0	1	D	0	8	4	4	0	12	1	2	0	0	12	12	1M	2/16	0	0	0	0	0	1	−40 to 85	64 LQFP
TM4C1233E6PZ	128	32	2K	M4	80	69	0	0	0	0	0	1	D	0	8	6	4	0	12	1	2	0	0	12	22	1M	3/16	0	0	0	0	0	1	−40 to 85	100 LQFP
TM4C1233H6PGE	256	32	2K	M4	80	105	0	0	0	0	0	1	D	0	8	6	4	0	12	1	2	0	0	12	24	1M	3/16	0	0	0	0	0	1	−40 to 85	144 LQFP
TM4C1233H6PM	256	32	2K	M4	80	43	0	0	0	0	0	1	D	0	8	6	4	0	12	1	2	0	0	12	12	1M	2/16	0	0	0	0	0	1	−40 to 85	64 LQFP
TM4C1233H6PZ	256	32	2K	M4	80	69	0	0	0	0	0	1	D	0	8	6	4	0	12	1	2	0	0	12	22	1M	3/16	0	0	0	0	0	1	−40 to 85	100 LQFP
TM4C1236D5PM	64	24	2K	M4	80	49	0	0	0	0	0	1	0	0	8	6	4	0	12	1	2	0	0	12	12	1M	2/16	0	0	0	0	0	0	−40 to 85	64 LQFP
TM4C1236E6PM	128	32	2K	M4	80	49	0	0	0	0	0	1	0	0	8	6	4	0	12	1	2	0	0	12	12	1M	2/16	0	0	0	0	0	0	−40 to 85	64 LQFP
TM4C1236H6PM	256	32	2K	M4	80	49	0	0	0	0	0	1	0	0	8	6	4	0	12	1	2	0	0	12	12	1M	2/16	0	0	0	0	0	0	−40 to 85	64 LQFP
TM4C1237D5PM	64	24	2K	M4	80	43	0	0	0	0	0	1	0	0	8	4	4	0	12	1	2	0	0	12	12	1M	2/16	0	0	0	0	0	1	−40 to 85	64 LQFP
TM4C1237D5PZ	64	24	2K	M4	80	69	0	0	0	0	0	1	0	0	8	6	4	0	12	1	2	0	0	12	22	1M	2/16	0	0	0	0	0	1	−40 to 85	100 LQFP
TM4C1237E6PM	128	32	2K	M4	80	43	0	0	0	0	0	1	0	0	8	4	4	0	12	1	2	0	0	12	12	1M	2/16	0	0	0	0	0	1	−40 to 85	64 LQFP
TM4C1237E6PZ	128	32	2K	M4	80	69	0	0	0	0	0	1	0	0	8	6	4	0	12	1	2	0	0	12	22	1M	3/16	0	0	0	0	0	1	−40 to 85	100 LQFP
TM4C1237H6PGE	256	32	2K	M4	80	105	0	0	0	0	0	1	0	0	8	6	4	0	12	1	2	0	0	12	24	1M	3/16	0	0	0	0	0	1	−40 to 85	144 LQFP
TM4C1237H6PM	256	32	2K	M4	80	43	0	0	0	0	0	1	0	0	8	4	4	0	12	1	2	0	0	12	12	1M	2/16	0	0	0	0	0	1	−40 to 85	64 LQFP
TM4C1237H6PZ	256	32	2K	M4	80	69	0	0	0	0	0	1	0	0	8	6	4	0	12	1	2	0	0	12	22	1M	3/16	0	0	0	0	0	1	−40 to 85	100 LQFP
TM4C123AE6PM	128	32	2K	M4	80	49	0	0	0	0	0	2	–	0	8	6	4	0	12	1	2	16	2	12	12	1M	2/16	0	0	0	0	0	0	−40 to 85	64 LQFP
TM4C123AH6PM	256	32	2K	M4	80	49	0	0	0	0	0	2	–	0	8	6	4	0	12	1	2	16	2	12	12	1M	2/16	0	0	0	0	0	0	−40 to 85	64 LQFP
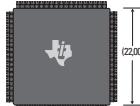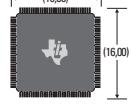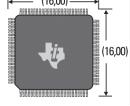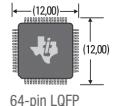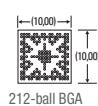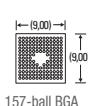
TM4C123x/TM4C129x Microcontrollers

Part number	Flash (KB)	SRAM (KB)	EEPROM (Bytes)	ARM® Cortex® CPU	Max speed (MHz)	GPIO pins	External peripheral I/F	LCD controller module	10/100 MAC+PHY	10/100 MAC with MII I/F	IEEE 1588	CAN MAC	USB D, H, or O	HS USB PHY I/F (ULPI)	UART	I²C	SSI/SPI Units	SSI/SPI Quad-capable	General-purpose (Total)	Real-time clock (RTC)	Watchdog	PWM outputs	QEI channels	Resolution (bits)	Channels	Speed (samples/sec)	Analog/digital comparators	Tamper signals	CRC	AES	DES	SHA/MD5	Battery-backed hibernation	Temperature range (°C)	Pin/package
TM4C123BE6PM	128	32	2K	M4	80	43	0	0	0	0	0	2	–	0	8	4	4	0	12	1	2	16	2	12	12	1M	2/16	0	0	0	0	0	1	−40 to 85	64 LQFP
TM4C123BE6PZ	128	32	2K	M4	80	69	0	0	0	0	0	2	–	0	8	6	4	0	12	1	2	16	2	12	22	1M	3/16	0	0	0	0	0	1	−40 to 85	100 LQFP
TM4C123BH6PGE	256	32	2K	M4	80	105	0	0	0	0	0	2	–	0	8	6	4	0	12	1	2	16	2	12	24	1M	3/16	0	0	0	0	0	1	−40 to 85	144 LQFP
TM4C123BH6PM	256	32	2K	M4	80	43	0	0	0	0	0	2	–	0	8	4	4	0	12	1	2	16	2	12	12	1M	2/16	0	0	0	0	0	1	−40 to 85	64 LQFP
TM4C123BH6PZ	256	32	2K	M4	80	69	0	0	0	0	0	2	–	0	8	6	4	0	12	1	2	16	2	12	22	1M	3/16	0	0	0	0	0	1	−40 to 85	100 LQFP
TM4C123BH6ZRB	256	32	2K	M4	80	120	0	0	0	0	0	2	–	0	8	6	4	0	12	1	2	16	2	12	24	1M	3/16	0	0	0	0	0	1	−40 to 85	157 BGA
TM4C123FE6PM	128	32	2K	M4	80	49	0	0	0	0	0	2	0	0	8	6	4	0	12	1	2	16	2	12	12	1M	2/16	0	0	0	0	0	0	−40 to 85	64 LQFP
TM4C123FH6PM	256	32	2K	M4	80	49	0	0	0	0	0	2	0	0	8	6	4	0	12	1	2	16	2	12	12	1M	2/16	0	0	0	0	0	0	−40 to 105	64 LQFP
TM4C123GE6PM	128	32	2K	M4	80	43	0	0	0	0	0	2	0	0	8	4	4	0	12	1	2	16	2	12	12	1M	2/16	0	0	0	0	0	1	−40 to 85	64 LQFP
TM4C123GE6PZ	128	32	2K	M4	80	69	0	0	0	0	0	2	0	0	8	6	4	0	12	1	2	16	2	12	22	1M	3/16	0	0	0	0	0	1	−40 to 105	100 LQFP
TM4C123GH6PGE	256	32	2K	M4	80	105	0	0	0	0	0	2	0	0	8	6	4	0	12	1	2	16	2	12	24	1M	3/16	0	0	0	0	0	1	−40 to 105	144 LQFP
TM4C123GH6PM	256	32	2K	M4	80	43	0	0	0	0	0	2	0	0	8	4	4	0	12	1	2	16	2	12	12	1M	2/16	0	0	0	0	0	1	−40 to 105	64 LQFP
TM4C123GH6PZ	256	32	2K	M4	80	69	0	0	0	0	0	2	0	0	8	6	4	0	12	1	2	16	2	12	22	1M	3/16	0	0	0	0	0	1	−40 to 105	100 LQFP
TM4C123GH6ZRB	256	32	2K	M4	80	120	0	0	0	0	0	2	0	0	8	6	4	0	12	1	2	16	2	12	24	1M	3/16	0	0	0	0	0	1	−40 to 105	157 BGA
TM4C123GH6ZXR	256	32	2K	M4	80	120	0	0	0	0	0	2	0	0	8	6	4	0	12	1	2	16	2	12	24	1M	3/16	0	0	0	0	0	1	−40 to 105	168 NFBGA
TM4C129x MCUs																																			
TM4C1290NCPDT	1024	256	6K	M4	120	90	1	0	0	0	0	2	0	1	8	10	4	4	8	1	2	8	1	12	20	2M	3/16	4	1	0	0	0	1	−40 to 105	128 TQFP
TM4C1290NCZAD	1024	256	6K	M4	120	140	1	0	0	0	0	2	0	1	8	10	4	4	8	1	2	8	1	12	24	2M	3/16	4	1	0	0	0	1	−40 to 105	212 BGA
TM4C1292NCPDT	1024	256	6K	M4	120	90	1	0	0	1	1	2	0	1	8	10	4	4	8	1	2	8	1	12	20	2M	3/16	4	1	0	0	0	1	−40 to 105	128 TQFP
TM4C1292NCZAD	1024	256	6K	M4	120	140	1	0	0	1	1	2	0	1	8	10	4	4	8	1	2	8	1	12	24	2M	3/16	4	1	0	0	0	1	−40 to 105	212 BGA
TM4C1294KCPDT	512	256	6K	M4	120	90	1	0	1	0	1	2	0	1	8	10	4	4	8	1	2	8	1	12	20	2M	3/16	4	1	0	0	0	1	−40 to 105	128 TQFP
TM4C1294NCPDT	1024	256	6K	M4	120	90	1	0	1	0	1	2	0	1	8	10	4	4	8	1	2	8	1	12	20	2M	3/16	4	1	0	0	0	1	−40 to 105	128 TQFP
TM4C1294NCZAD	1024	256	6K	M4	120	140	1	0	1	0	1	2	0	1	8	10	4	4	8	1	2	8	1	12	24	2M	3/16	4	1	0	0	0	1	−40 to 105	212 BGA
TM4C1297NCZAD	1024	256	6K	M4	120	140	1	1	0	0	0	2	0	1	8	10	4	4	8	1	2	8	1	12	24	2M	3/16	4	1	0	0	0	1	−40 to 105	212 BGA
TM4C1299KCZAD	512	256	6K	M4	120	140	1	1	1	0	1	2	0	1	8	10	4	4	8	1	2	8	1	12	24	2M	3/16	4	1	0	0	0	1	−40 to 105	212 BGA
TM4C1299NCZAD	1024	256	6K	M4	120	140	1	1	1	0	1	2	0	1	8	10	4	4	8	1	2	8	1	12	24	2M	3/16	4	1	0	0	0	1	−40 to 105	212 BGA

TM4C123x/TM4C129x Microcontrollers

Part number	Flash (KB)	SRAM (KB)	EEPROM (Bytes)	ARM® Cortex® CPU	Max speed (MHz)	GPIO pins	External peripheral I/F	LCD controller module	10/100 MAC+PHY	10/100 MAC with MII I/F	IEEE 1588	CAN MAC	USB D, H, or O	HS USB PHY I/F (ULPI)	UART	I²C	SSI/SPI Units	Quad-capable	General-purpose (Total)	Real-time clock (RTC)	Watchdog	PWM outputs	QEI channels	Resolution (bits)	Channels	Speed (samples/sec)	Analog/digital comparators	Tamper signals	CRC	AES	DES	SHA/MD5	Battery-backed hibernation	Temperature range (°C)	Pin/package
TM4C129CNCPDT	1024	256	6K	M4	120	90	1	0	0	0	0	2	0	1	8	10	4	4	8	1	2	8	1	12	20	2M	3/16	4	1	1	1	1	1	−40 to 105	128 TQFP
TM4C129CNCZAD	1024	256	6K	M4	120	140	1	0	0	0	0	2	0	1	8	10	4	4	8	1	2	8	1	12	24	2M	3/16	4	1	1	1	1	1	−40 to 105	212 BGA
TM4C129DNCPDT	1024	256	6K	M4	120	90	1	0	0	1	1	2	0	1	8	10	4	4	8	1	2	8	1	12	20	2M	3/16	4	1	1	1	1	1	−40 to 105	128 TQFP
TM4C129DNCZAD	1024	256	6K	M4	120	140	1	0	0	1	1	2	0	1	8	10	4	4	8	1	2	8	1	12	24	2M	3/16	4	1	1	1	1	1	−40 to 105	212 BGA
TM4C129EKCPDT	512	256	6K	M4	120	90	1	0	1	0	1	2	0	1	8	10	4	4	8	1	2	8	1	12	20	2M	3/16	4	1	1	1	1	1	−40 to 105	128 TQFP
TM4C129ENCPDT	1024	256	6K	M4	120	90	1	0	1	0	1	2	0	1	8	10	4	4	8	1	2	8	1	12	20	2M	3/16	4	1	1	1	1	1	−40 to 105	128 TQFP
TM4C129ENCZAD	1024	256	6K	M4	120	140	1	0	1	0	1	2	0	1	8	10	4	4	8	1	2	8	1	12	24	2M	3/16	4	1	1	1	1	1	−40 to 105	212 BGA
TM4C129LNCZAD	1024	256	6K	M4	120	140	1	1	1	0	1	2	0	1	8	10	4	4	8	1	2	8	1	12	24	2M	3/16	4	1	1	1	1	1	−40 to 105	212 BGA
TM4C129XKCZAD	512	256	6K	M4	120	140	1	1	1	1	1	2	0	1	8	10	4	4	8	1	2	8	1	12	24	2M	3/16	4	1	1	1	1	1	−40 to 105	212 BGA
TM4C129XNCZAD	1024	256	6K	M4	120	140	1	1	1	1	1	2	0	1	8	10	4	4	8	1	2	8	1	12	24	2M	3/16	4	1	1	1	1	1	−40 to 105	212 BGA

Package options

157-ball BGA — (9,00) × (9,00)

212-ball BGA — (10,00) × (10,00)

64-pin LQFP — (12,00) × (12,00)

100-pin LQFP — (16,00) × (16,00)

128-pin TQFP — (16,00) × (16,00)

144-pin LQFP — (22,00) × (22,00)
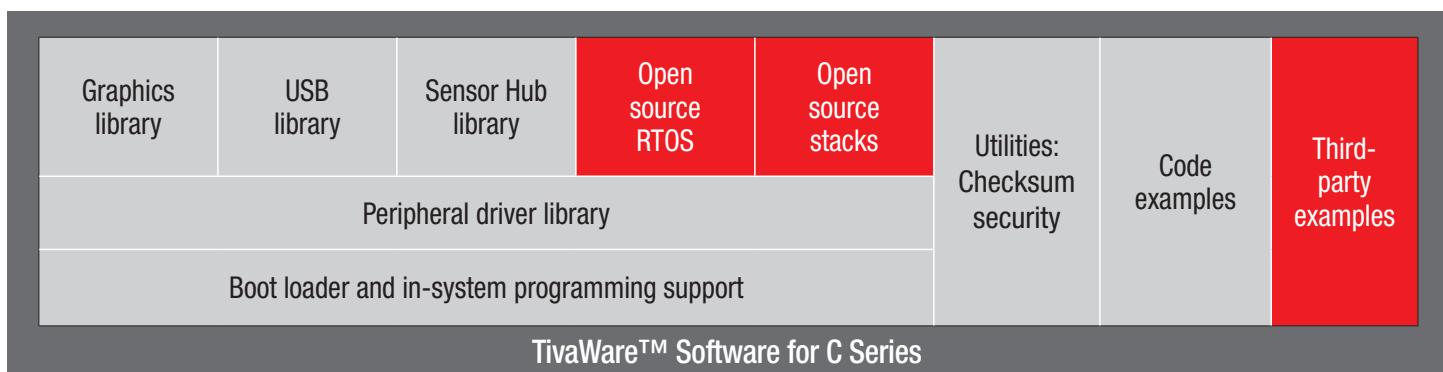
TivaWare™ software for C series

All TM4C MCUs are supported by the TivaWare™ for C Series software development kit (SDK) which allows customers to get accelerate their time to market and minimize their overall cost of software ownership. TivaWare offers free license and royalty-free source code and libraries to help customers write production-ready code easily. The SDK provides a library of drivers for each device peripheral with TI-developed, tested, and maintained API's. Also included are libraries for the TI-developed USB stack and to support LCD graphic interfaces. Over 100 software application examples are offered leveraging TI hardware development kits to offer a starting point for project development and an introduction on how to leverage TivaWare API's for device peripherals.

Graphics library	USB library	Sensor Hub library	Open source RTOS	Open source stacks	Utilities: Checksum security	Code examples	Third-party examples
Peripheral driver library							
Boot loader and in-system programming support							
TivaWare™ Software for C Series							

Libraries and code examples

Use the TivaWare for C Series software libraries and start spending your time differentiating your solution!
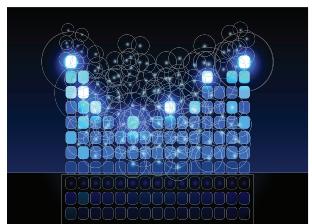
Peripheral driver library

Set of BSD licensed functions for controlling Tiva C Series peripherals.

Graphics library

Royalty-free set of graphics primitives and widgets to create GUIs.

USB library

TivaWare royalty-free USB stack is provided to enable efficient USB host, device, and on-the-go operations.

Sensor Hub library

Tiva C Series Sensor Hub library offers an advanced sensor fusion algorithm and a broad range of sensor support.

Interactive Development Environment (IDE)
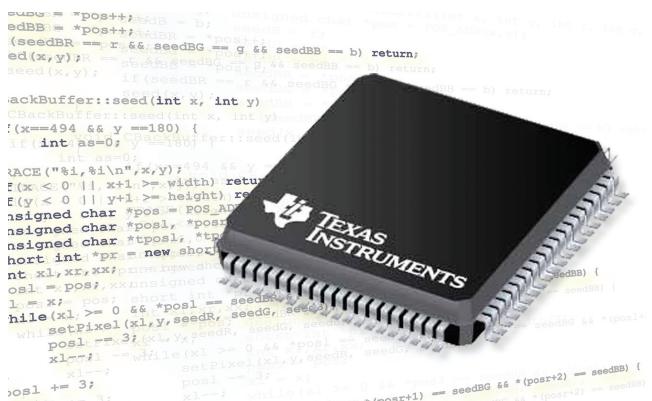
TivaWare Software for C Series is pre-built using four different compilers.

Code Composer Studio™ (CCStudio) is an integrated development environment (IDE) for all of Texas Instruments embedded processor families.
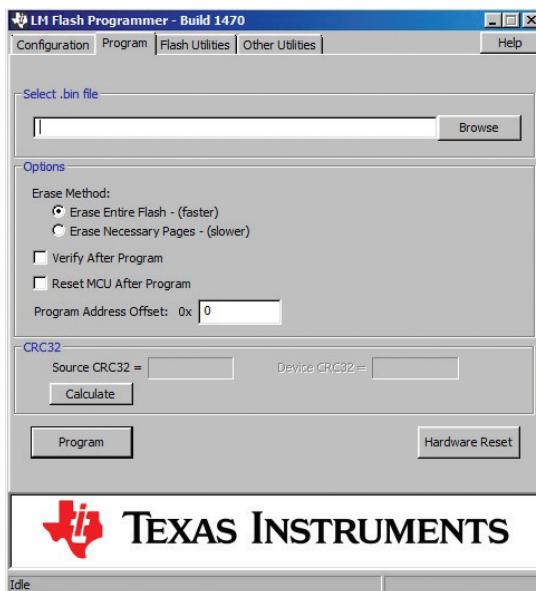
TM4C Software ecosystem

SysConfig Utility

- Easy-to-use tool for configuring the GPIOs
- Generates source code in C
- Automatically checks and solves pin conflicts
- Intuitive user interface
- Provided free of charge

In-System Programming Support

- Boot loaders available in on-chip ROM
- Boot loader customized in Flash memory
- Serial Flash loader

Download: **www.ti.com/tool/lmflashprogrammer**

Real-Time Operating System (RTOS)

TI Worldwide Technical Support

TI Support

Thank you for your business. Find the answer to your support need or get in touch with our support center at

www.ti.com/support

China: http://www.ti.com.cn/guidedsupport/cn/docs/supporthome.tsp

Japan: http://www.tij.co.jp/guidedsupport/jp/docs/supporthome.tsp

Technical support forums

Search through millions of technical questions and answers at TI's E2E™ Community (engineer-to-engineer) at

e2e.ti.com

China: http://www.deyisupport.com/

Japan: http://e2e.ti.com/group/jp/

TI Training

From technology fundamentals to advanced implementation, we offer on-demand and live training to help bring your next-generation designs to life. Get started now at

training.ti.com

China: http://www.ti.com.cn/general/cn/docs/gencontent.tsp?contentId=71968

Japan: https://training.ti.com/jp

TEXAS INSTRUMENTS

SPMT285E

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