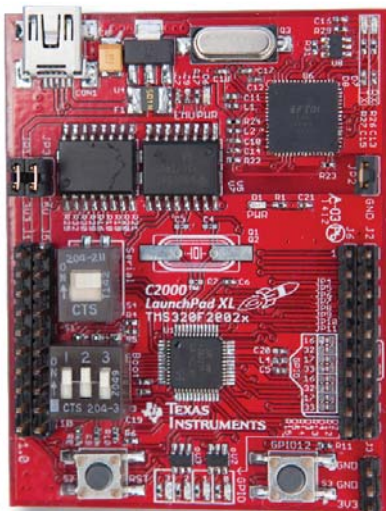# C2000™ Piccolo™ LaunchPad Evalution Kit

The C2000 Piccolo LaunchPad evaluation kit, based on the F28027 microcontroller (MCU), is a modular, quick-launch evaluation kit that contains everything needed – device, emulation and software – to explore the latest digital control techniques in areas such as power, lighting and motor control.

▲ *C2000 LaunchPad (shown at actual size of 2.0" × 2.6")*
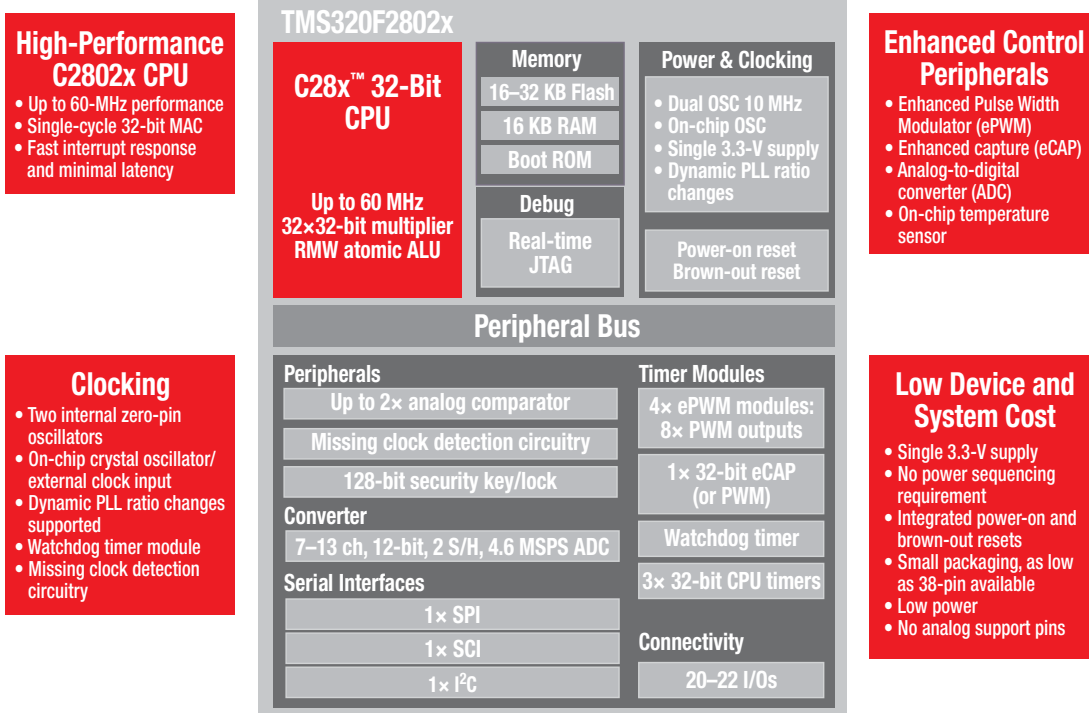
Jump start software development

- Use TI's Code Composer Studio™ v5 IDE for free with the C2000 LaunchPad
- Download controlSUITE™ software for exhaustive examples, libraries and other resources, all free and open for use and modification
- Explore advanced application libraries, such as digital motor control and digital power
- Design your own BoosterPacks! C2000 LaunchPad and LED BoosterPack design files are open source and included in the controlSUITE software package

Evaluation kit	Orderable part number	Price ($ U.S.)
C2000 Piccolo LaunchPad	LAUNCHXL-F28027	17
LED BoosterPack (requires C2000 LaunchPad)	BOOSTXL-C2KLED	30

Rapidly prototype and speed time to market

- On-board JTAG emulator eliminates need for external emulator
- Double-sided header pins for easy access to peripheral pins and C2000 BoosterPack expansions
- Features new Piccolo F2802x MCU to bring powerful control capabilities of Piccolo MCUs to even more low-end applications
- No external hardware required to get started on C2000 LaunchPad
- Basic applications can make use of onboard hardware (such as LEDs and push buttons) and require no external components

▲ *Expand your C2000 Piccolo LaunchPad with application-focused C2000 BoosterPacks, which plug right into the headers.*
Pictured: C2000 Piccolo LaunchPad plus C2000 LED BoosterPack plus MSP430™ Capacitive Touch BoosterPack

C2000™ Piccolo™ LaunchPad Evaluation Kit

The F2802x microcontrollers bring even more value to cost-sensitive applications requiring control-tuned processing, such as digital lighting control, digital power and digital motor control.

High-Performance C2802x CPU
- Up to 60-MHz performance
- Single-cycle 32-bit MAC
- Fast interrupt response and minimal latency

TMS320F2802x

C28x™ 32-Bit CPU
Up to 60 MHz
32×32-bit multiplier
RMW atomic ALU

Memory
16–32 KB Flash
16 KB RAM
Boot ROM

Power & Clocking
- Dual OSC 10 MHz
- On-chip OSC
- Single 3.3-V supply
- Dynamic PLL ratio changes

Power-on reset
Brown-out reset

Debug
Real-time JTAG

Enhanced Control Peripherals
- Enhanced Pulse Width Modulator (ePWM)
- Enhanced capture (eCAP)
- Analog-to-digital converter (ADC)
- On-chip temperature sensor

Peripheral Bus

Clocking
- Two internal zero-pin oscillators
- On-chip crystal oscillator/external clock input
- Dynamic PLL ratio changes supported
- Watchdog timer module
- Missing clock detection circuitry

Peripherals
Up to 2× analog comparator
Missing clock detection circuitry
128-bit security key/lock

Converter
7–13 ch, 12-bit, 2 S/H, 4.6 MSPS ADC

Serial Interfaces
1× SPI
1× SCI
1× I²C

Timer Modules
4× ePWM modules: 8× PWM outputs
1× 32-bit eCAP (or PWM)
Watchdog timer
3× 32-bit CPU timers

Connectivity
20–22 I/Os

Low Device and System Cost
- Single 3.3-V supply
- No power sequencing requirement
- Integrated power-on and brown-out resets
- Small packaging, as low as 38-pin available
- Low power
- No analog support pins

▲ *Piccolo block diagram*

F2802x series

Part number	CPU speed (MHz)	RAM (KB)	Flash (KB)	PWM channels	HRPWM	Timers	Captures	ADC	ADC speed (kSPS)	Comparators	SPI	SCI/UART	I²C	I/Os	Package	Temperature range	Pricing ($ U.S.)
F28027	60	12	64	8	4	9	1	1× 12 bit	4600	1–2	1	1	1	20–22	38 TSSOP, 48 QFP	−40 to 125°C	2.92–3.55
F28026	60	12	32	8	4	9	1	1× 12 bit	4600	1–2	1	1	1	20–22	38 TSSOP, 48 QFP	−40 to 125°C	2.77–3.33
F28023	50	12	64	8	4	9	1	1× 12 bit	3800	1–2	1	1	1	20–22	38 TSSOP, 48 QFP	−40 to 125°C	2.53–3.09
F28022	50	12	32	8	4	9	1	1× 12 bit	3800	1–2	1	1	1	20–22	38 TSSOP, 48 QFP	−40 to 125°C	2.39–2.88
F28021	40	10	64	8	0	9	1	1× 12 bit	2000	1–2	1	1	1	20–22	38 TSSOP, 48 QFN	−40 to 125°C	2.29–2.54
F28020	40	6	32	8	0	9	1	1× 12 bit	2000	1–2	1	1	1	20–22	38 TSSOP, 48 QFN	−40 to 125°C	2.11–2.35
F280200	40	6	16	7	0	8	0	1× 12 bit	2000	1–2	1	1	1	20–22	38 TSSOP, 48 QFN	−40 to 125°C	1.91–2.09

IMPORTANT NOTICE

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