

Piccolo™ MCUs: TMS320F2806x

New C2000™ Piccolo MCUs enhanced with USB connectivity, floating-point precision, and performance-boosting accelerators



3 key new attributes for F2806x MCUs

- Floating-point ease of use and performance in a Piccolo MCU package
- New features like USB, VCU (Viterbi Complex Math Unit), CLA, High-Res Capture
- 256KB Flash, 100KB RAM **starting at under U.S. \$5**

What do these Piccolo devices bring?

These new devices add more memory and peripherals to the Piccolo family. But most importantly, they bring in new technologies and floating-point processing to the Piccolo MCU family.

What is Piccolo again?

First introduced in 2008, Piccolo MCUs represent a real-time control solution for cost-sensitive applications. Piccolo is named for its:

- Small size – starting at 7×7 mm
- Low cost
- High analog integration – oscillators, comparators, BOR/POR, voltage regulator, ADC

So what are these new technologies you speak of?

These F2806x devices bring a few new peripherals to the game:

- **New technology: VCU** for complex math processing, such as FFTs, Viterbi decoding and CRC
- **New technology: CLA** provides a second processing core with independent peripheral access for support of multiple, independent control loops, as well as additional processing performance
- **New technology: High-Resolution Capture (HRCAP)**

- **USB 2.0 host:** for the first time on C2000 MCUs
- **DMA, McBSP, FPU:** for the first time on Piccolo MCUs

What tools are there?

A low-cost controlSTICK is available today for instant plug-and-play evaluation with your computer. The F28069 controlSTICK includes on-board emulation, so it's a complete development kit, along with TI's Code Composer Studio™ IDE and graphical programming for a phenomenal U.S. \$39. Additionally, an Experimenter's Kit, including the F28069 controlCARD, is available today. The controlCARD is also sold individually and can be plugged into all compatible evaluation and application kits.

What software is available?

Piccolo F2806x software is available today in controlSUITE™ software. This includes the Device Support Package, math and application libraries, example projects and development tool software and hardware packages. Download controlSUITE software at www.ti.com/controlsuite

Can you tell me more about the VCU?

The Viterbi Complex Math Unit (VCU) significantly reduces processing time (up to 7.5×) of common complex math operations via new instructions optimized for Viterbi, complex math and CRC calculations. The VCU can be used in many applications, but it is particularly useful for protocols in power line communication (PLC), where noisy environments require robust encoding and filtering.

What applications does it go in?

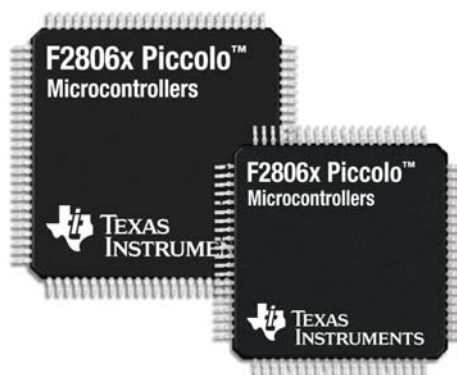
F2806x MCUs are a great fit for control-heavy applications or applications looking to add communication via PLC or USB

- **Industrial:** AC servos, inverters, CNC, drives and motor control, lighting, process and valve controls
- **Power conversion:** HEV/EV, solar / renewable energy, line monitoring, protection
- **Power line communication integration:** Solar + PLC, Lighting + PLC, HEV + PLC
- **Precision control and sensing applications**

When can customers get silicon and tools?

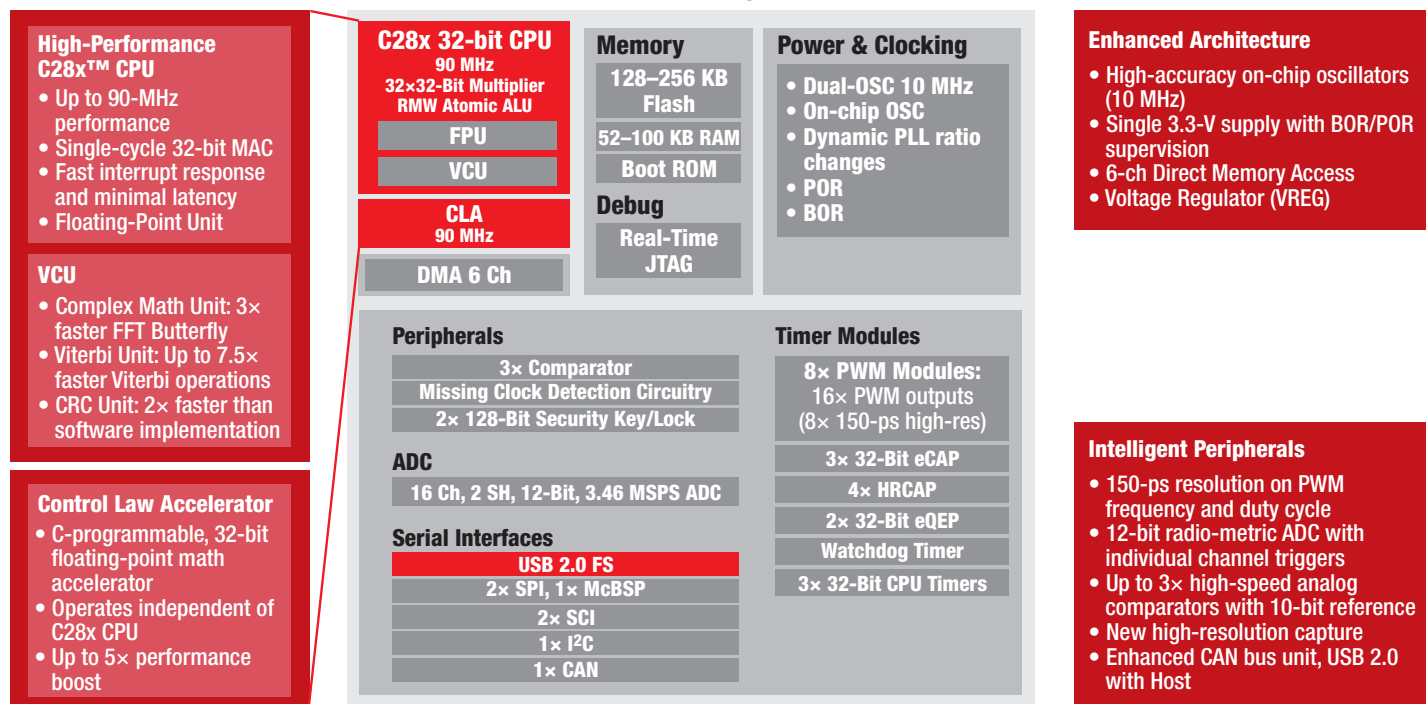
Samples and tools are available today. To order device samples, visit the F2806x MCU product page at www.ti.com/product/tms320f28069.

To order an F2806x-based EVM, visit www.ti.com/c2000tools.



Development Tools	Price (U.S. \$)
Piccolo F2806x controlSTICK [TMDSC28069USB]	\$39
Piccolo F2806x Experimenter's Kit [TMDSDOCK28069]	\$99
Piccolo F2806x controlCARD [TMDSCNCD28069]	\$59
Piccolo F2806x Isolated controlCARD [TMDSCNCD28069ISO]	\$85
Power Line Modem Developer's Kit [TMDSPCLKIT-V3]	\$599

Piccolo™ F2806x MCUs: Low-cost floating point meets real-time control



Piccolo F2806x floating-point MCU configuration chart

Device	Speed (MHz)	Processor			Memory			Control Interfaces							Communication Ports							Core Supply (Volts)	GPIO Pins	On-Chip OSC/ Regulator	Pin/ Package	
		VCU	DMA	CLA	RAM (KB)	Flash (KB)	ROM (KB)	PWM Ch	HiRes PWM	Quadrature Encoder	Event Captures	Timers*	12-Bit ADC Channels/ Conversion Time (ns)	Comparators	USB (Host)	McBSP	I²C	UART/ SCI	SPI	Lin	CAN					External Memory Bus
TMS320F28069	90	Yes	Yes	Yes	100	256	Boot	15	6	1	3	12	12/289	3	0–1	1	1	1	2	–	1	–	3.3	40	Yes/Yes	80 LQFP, 80 HTQFP
TMS320F28069	90	Yes	Yes	Yes	100	256	Boot	19	8	2	7	16	16/289	3	0–1	1	1	2	2	–	1	–	3.3	54	Yes/Yes	100 LQFP, 100 HTQFP
TMS320F28068	90	Yes	Yes	–	100	256	Boot	15	6	1	3	12	12/289	3	0–1	1	1	1	2	–	1	–	3.3	40	Yes/Yes	80 LQFP, 80 HTQFP
TMS320F28068	90	Yes	Yes	–	100	256	Boot	19	8	2	7	16	16/289	3	0–1	1	1	2	2	–	1	–	3.3	54	Yes/Yes	100 LQFP, 100 HTQFP
TMS320F28067	90	–	Yes	–	100	256	Boot	15	6	1	3	12	12/289	3	0–1	1	1	1	2	–	1	–	3.3	40	Yes/Yes	80 LQFP, 80 HTQFP
TMS320F28067	90	–	Yes	–	100	256	Boot	19	8	2	7	16	16/289	3	0–1	1	1	2	2	–	1	–	3.3	54	Yes/Yes	100 LQFP, 100 HTQFP
TMS320F28066	90	–	Yes	–	68	256	Boot	15	6	1	3	12	12/289	3	0–1	1	1	1	2	–	1	–	3.3	40	Yes/Yes	80 LQFP, 80 HTQFP
TMS320F28066	90	–	Yes	–	68	256	Boot	19	8	2	7	16	16/289	3	0–1	1	1	2	2	–	1	–	3.3	54	Yes/Yes	100 LQFP, 100 HTQFP
TMS320F28065	90	Yes	Yes	Yes	100	128	Boot	15	6	1	3	12	12/289	3	0–1	1	1	1	2	–	1	–	3.3	40	Yes/Yes	80 LQFP, 80 HTQFP
TMS320F28065	90	Yes	Yes	Yes	100	128	Boot	19	8	2	7	16	16/289	3	0–1	1	1	2	2	–	1	–	3.3	54	Yes/Yes	100 LQFP, 100 HTQFP
TMS320F28064	90	Yes	Yes	–	100	128	Boot	15	6	1	3	12	12/289	3	0–1	1	1	1	2	–	1	–	3.3	40	Yes/Yes	80 LQFP, 80 HTQFP
TMS320F28064	90	Yes	Yes	–	100	128	Boot	19	8	2	7	16	16/289	3	0–1	1	1	2	2	–	1	–	3.3	54	Yes/Yes	100 LQFP, 100 HTQFP
TMS320F28063	90	–	Yes	–	68	128	Boot	15	6	1	3	12	12/289	3	0–1	1	1	1	2	–	1	–	3.3	40	Yes/Yes	80 LQFP, 80 HTQFP
TMS320F28063	90	–	Yes	–	68	128	Boot	19	8	2	7	16	16/289	3	0–1	1	1	2	2	–	1	–	3.3	54	Yes/Yes	100 LQFP, 100 HTQFP
TMS320F28062	90	–	Yes	–	52	128	Boot	15	6	1	3	12	12/289	3	0–1	1	1	1	2	–	1	–	3.3	40	Yes/Yes	80 LQFP, 80 HTQFP
TMS320F28062	90	–	Yes	–	52	128	Boot	19	8	2	7	16	16/289	3	0–1	1	1	2	2	–	1	–	3.3	54	Yes/Yes	100 LQFP, 100 HTQFP

All devices available with AEC-Q100 (125°C) maximum temperature range.

*Timers include CPU timers, PWM timers, eCAP timers and Watchdog timers.

New devices are listed in bold red.

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