PRODUCT BRIEF

PSOC™ Control C3 Main Line PSC3M/P6

Real-time control for motor and power systems with advanced security

The Next Generation of Industrial Microcontrollers

PSOC™ Control family of MCUs is specifically developed for motor control and power conversion applications. This family of high-performance Arm® Cortex®-M33 MCUs enables designers to innovate, solve complex design problems and get their products to market faster than ever before. Typical applications include up to quad-motor control, aircon drives and compressors, PFC, SMPS, solar inverters, robotics, and industrial drives.

Real-time control

PSOC™ Control Main Line enables **real-time control** with its high-performance 12-bit 9-MSPS SAR ADC, with built-in 16-channel sample-and-hold functions and feature-rich timer/counter/PWM (TCPWM) blocks. The CORDIC math coprocessor is an optional feature.

Wide bandgap ready for higher system efficiency

PSOC™ Control's **unique ADCs** allow idle sampling to boost system performance by minimizing time delay between sampling and conversion. With less than 100 ps of resolution, the TCPWM provides clean signal generation and allows system in-cycle control of up to 200 kHz switching frequency. Being wide bandgap ready, enables **high system efficiency** with lower conduction and switching losses. Industrial-ready peripherals reduce the total system costs.

Advanced security and safety

PSOC™ Control Main Line PSC3M/P6 is **PSA Level 3/EPC3 and DICE ready with Post Quantum Cryptography (PQC) support.** With crypto accelerator, TrustZone, and secure key storage, it enables secure on-site and cloud-based designs. For critical applications, robust safety is ensured with Class B/SIL 2-capable safety libraries.

Ease-of-use for developers

PSOC™ Control is supported by ModusToolbox™, a unified ecosystem platform with tools and software solutions. ModusToolbox™ Motor Suite, and Power Suite are available to deliver a seamless graphical user interface that streamlines evaluation, training and provides real-time parameter monitoring for valuable insights into performance, efficiency, and reliability. Specialized application environments enable engineers to quickly identify issues, optimize designs, and enhance overall functionality.

Find out more about PSOC™ Control C3 Main Line.



Key features

- Up to 180 MHz Arm® Cortex®-M33 with DSP and FPU
- Up to 512kB Read-While-Write (RWW) flash with ECC
- Up to 128kB SRAM with ECC
- 16kB I-Cache
- 6 power modes
- Up to 1x USB-FS, 1x I3C

High-performance analog

- 12-bit, 9-MSPS SAR ADC
- Up to 24 analog channels
- 9 comparators with built-in 10-bit DAC and slope generator
- 2x 12-bit DAC, 4x OpAmps

Real-time control peripherals

- 16-channel x 16-bit TCPWM
- 8-channel x 32-bit (HRPWM)
- CORDIC math coprocessor

Up to PSA L3 device security

- PQC support, and DICE ready
- NIST P-521 and TRNG
- Cryptography
- Secure boot
- Secure firmware update
- Processing isolation

Packages

- E-LQFP-64, E-LQFP -80, E-LQFP -100

Operating temperature

- Ta: -40°C to 115°C

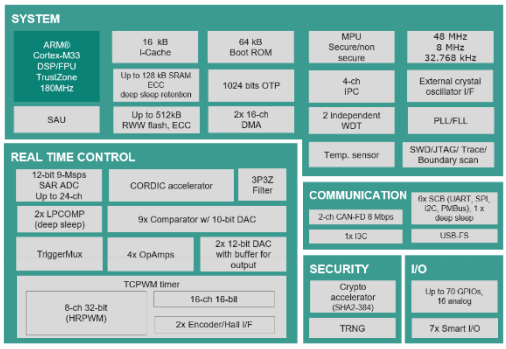
Key benefits

- Fast analog and digital peripherals ready for wide-bandgap systems
- HW accelerators (CORDIC, 3P3Z filters) for boosted task execution
- Motor and Power Suite with multi-functional GUI, dedicated tools, advanced libraries, etc.



PRODUCT BRIEF

Block diagram



Orderable Part Numbers and Kits

Kit	Description
KIT_PSC3M6_EVAL	PSOC™ Control C3 Main Line PSC3M/P6 device functional evaluation
KIT_PSC3M6_MC1	PSOC™ Control C3M6 Complete System Motor Control Kit. Evaluate 4-motor control capabilities
KIT_PSC3M6_CC1	PSOC™ Control C3M6 Digital Power Control Card. Enables power conversion evaluation with customer's own power board
KIT_PSC3M6_CC2	PSOC™ Control C3M6 Motor Drive Control Card. Enables to connect to customer's own power board and motor

Part Number	Package	Flash	SRAM	TCPWM [16/32 bit]	ADC [ch]	GPIO	USB FS	I3C	PSA Capable	Temp (Ta)
PSC3M6GES3AHQ1	E-LQFP-100	512 KB	128 KB	16/8	24	68	1	1	L3	-40 to 115°C
PSC3P6GES3AHQ1	E-LQFP-100	512 KB	128 KB	16/8	24	70	0	1	L3	-40 to 115°C
PSC3M6FDS2AHQ1	E-LQFP-100	256 KB	64 KB	16/8	24	68	1	1	L2	-40 to 115°C
PSC3P6FDS2AHQ1	E-LQFP-100	256 KB	64 KB	16/8	24	70	0	1	L2	-40 to 115°C
PSC3M6GES3AFQ1	E-LQFP-80	512 KB	128 KB	16/8	24	54	0	1	L3	-40 to 115°C
PSC3P6GES3AFQ1	E-LQFP-80	512 KB	128 KB	16/8	24	54	0	1	L3	-40 to 115°C
PSC3M6FDS2AFQ1	E-LQFP-80	256 KB	64 KB	16/8	24	54	0	1	L2	-40 to 115°C
PSC3P6FDS2AFQ1	E-LQFP-80	256 KB	64 KB	16/8	24	54	0	1	L2	-40 to 115°C
PSC3M6GES3ACQ1	E-LQFP-64	512 KB	128 KB	16/8	19	39	0	1	L3	-40 to 115°C
PSC3P6GES3ACQ1	E-LQFP-64	512 KB	128 KB	16/8	19	39	0	1	L3	-40 to 115°C
PSC3M6FDS2ACQ1	E-LQFP-64	256 KB	64 KB	16/8	19	39	0	1	L2	-40 to 115°C
PSC3P6FDS2ACQ1	E-LQFP-64	256 KB	64 KB	16/8	19	39	0	1	L2	-40 to 115°C

Key Applications

Motor Control	HVAC and home appliances, industrial drives, robots, humanoids, drones and LEVs
Power Conversion	SMPS, EV Charging, solar
Other markets	Datacenter UBM, PCIe, e-cigarette, smart inhaler, healthcare tools, drills, etc.

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