

PSOC™ 4000T Microcontrollers

Featuring Multi-Sense with capacitive, inductive, and liquid level sensing

PSOC™ 4000T family of Arm® Cortex®-M0+ microcontrollers feature Infineon's 5th generation high-performance Multi-Sense technology, including CAPSENSE™, inductive and liquid level sensing technology. PSOC™ 4000T provides a 10x higher signal-to-noise ratio (SNR) performance and a 10x lower power consumption than the previous generation. It also features "Always-On" touch sensing technology with improved performance, that enables HMI operation with low active and standby power consumption supporting longer battery life for battery powered products.

PSOC™ 4000T family includes standard communication, timing peripherals, 5th generation CAPSENSE™ and Multi-Sense HMI technology, whether it's a smartwatch, fitness tracker, or a cutting-edge home appliance, PSOC™ 4000T is engineered to provide a substantial performance enhancement with its improved SNR. Multi-Sense expands capacitive sensing with best-in class inductive sensing for new use cases like touch over metal, force touch and proximity sensing. The combined sensing technologies in PSOC™ 4000T enable modern sleek user interfaces with superior liquid tolerance and reliable touch HMI solutions for harsh environments.

In addition, the PSOC™ 4000T provides an easy-to-implement upgrade path for PSOC™ 4000 and PSOC™ 4000S based designs to take advantage of the 5th generation CAPSENSE™ and Multi-Sense with software and package compatibility.

Low-power 1.71 V to 5.5 V operation

- Deep sleep mode with 6 µA always-on touch sensing
- Autonomous sensing for low power optimization with active touch and tracking with 200 µA (average)

5th generation CAPSENSE™ and Multi-Sense technology

- Best-in-class signal-to-noise ratio and liquid tolerance for capacitive sensing
- "Always-on" sensing in deep sleep mode with hardware-based wake on touch detection for ultra-low power operation
- Inductive sensing for HMI over metallic surfaces, force touch and proximity sensing
- Reliable contactless liquid presence and level sensing
- Advanced proximity sensing with directivity, gesture control and CAPSENSE™ hover touch
- Infineon-supplied ModusToolbox™ middleware simplifies capacitive sensing design

ModusToolbox™ software

- Comprehensive collection of multi-platform tools and software libraries
- Includes board support packages (BSPs), peripheral driver library (PDL), and middleware such as CAPSENSE™

Industry-standard development tool compatibility

Key features

32-bit MCU Subsystem

- 48-MHz Arm® Cortex®-M0+
- 64KB Flash and 8KB SRAM

5th Generation CAPSENSE™ and Multi-Sense

- Supports self-capacitive and mutual-capacitive sensing
- Inductive sensing, Liquid sensing and CAPSENSE™ hover touch
- Ultra-Low Power Consumption

Programmable Digital Blocks

- Two 16-bit timer/counter/pulse-width modulator (TCPWM) blocks
- Two serial communication blocks (SCBs), that are configurable as I2C, SPI, or UART

I/O Subsystem

- Up to 21 GPIOs, including 16 sensor inputs

Packages

- 25-WLCSP, 24-QFN, 16-QFN

Key benefits

- Multi-Sense capabilities with wide range of HMI options
- 10x higher SNR
- 10x lower power consumption
- CAPSENSE™ hover touch for long range proximity gestures
- Inductive sensing for metallic surfaces and force touch
- Contactless liquid sensing with high-resolution and foam rejection



Key Applications

Wearables Hearable	Wear Detection, Touchscreen, Slider, TP-Gestures
Smart Home Appliance	Proximity Wakeup (Backlight), Capacitive Keypad, hover touch, inductive touch, Slider, Trackpad
Other consumer Industrial	Proximity Wakeup (Backlight), Touchscreen, Capacitive Keypad, Slider, Trackpad, Liquid Level Sense

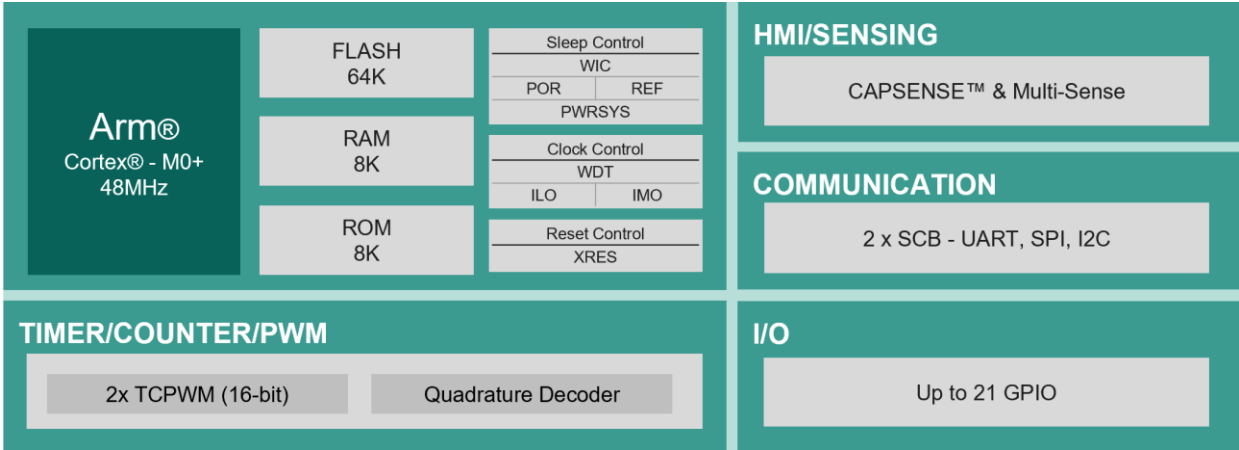
PRODUCT BRIEF

Product Summary

Part Number	Max CPU Speed	Flash [KB]	SRAM [KB]	Multi-Sense			TCPWM Blocks	SCB Blocks	GPIO	Package	Temp [C]
				CAPSENSE	Inductive Sensing	Liquid Sensing					
CY8C4046LQI-T412	48	64	8	1			2	2	19	24-QFN	-40 to 85
CY8C4046LQI-T411	48	64	8	1			2	2	11	16-QFN	-40 to 85
CY8C4046FNI-T412T	48	64	8	1			2	2	21	25-WLCSP	-40 to 85
CY8C4046LQI-T442	48	64	8		1		2	2	19	24-QFN	-40 to 85
CY8C4046LQI-T441	48	64	8		1		2	2	11	16-QFN	-40 to 85
CY8C4046FNI-T442T	48	64	8		1		2	2	21	25-WLCSP	-40 to 85
CY8C4046LQI-T452	48	64	8	1	1	1	2	2	19	24-QFN	-40 to 85
CY8C4046LQI-T451	48	64	8	1	1	1	2	2	11	16-QFN	-40 to 85
CY8C4046FNI-T452T	48	64	8	1	1	1	2	2	21	25-WLCSP	-40 to 85

Additional parts can be found on [infineon.com/PSOC4000T](https://www.infineon.com/PSOC4000T)

PSOC™ 4000T Block Diagram



www.infineon.com

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