

# PSOC™ 4000T Microcontrollers

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

PSOC™ 4000T family of Arm® Cortex®-M0+ microcontrollers feature Infineon's 5<sup>th</sup> 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, 5<sup>th</sup> 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 5<sup>th</sup> 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)

5<sup>th</sup> 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

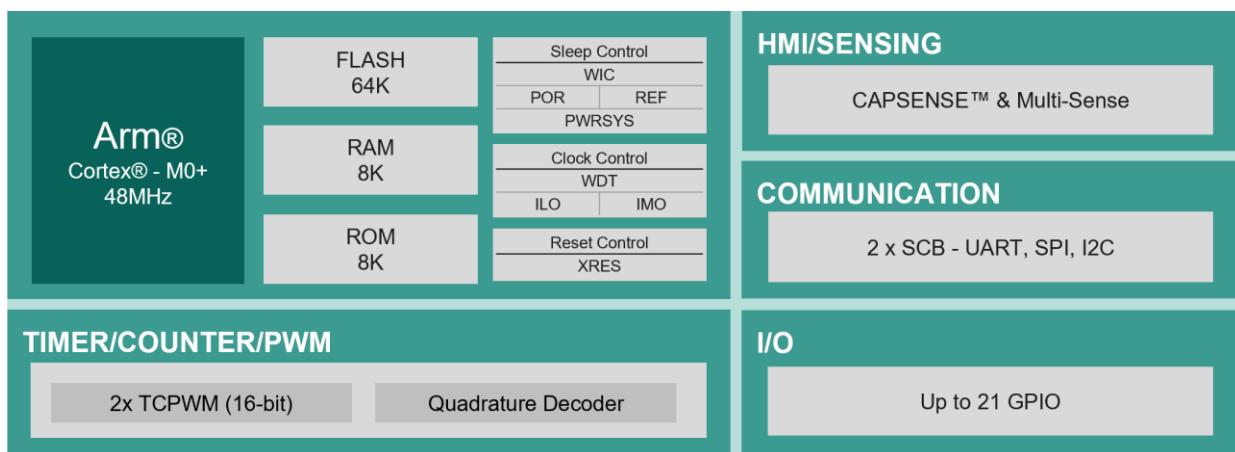
## PRODUCT BRIEF

### Product Summary

Part Number	Max CPU Speed	Flash [KB]	SRAM [KB]	CAPSENSE	Multi-Sense CAPSENSE	Inductive Sensing	Liquid Sensing	TCPWM Blocks	SCB Blocks	GPIO	Package	Temp [C]
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](http://infineon.com/PSOC4000T)

### PSOC™ 4000T Block Diagram



[www.infineon.com](http://www.infineon.com)

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