

NXP capacitive
proximity switches
PCF8883 & PCA8886

World's lowest-power capacitive sensors with auto-calibration

These highly efficient sensors use a patented auto-calibration technology to detect changes in capacitance and continually adjust to the environment. Designed for durability, they are unaffected by dirt, humidity, freezing temperatures, or damage to the electrode.

KEY FEATURES

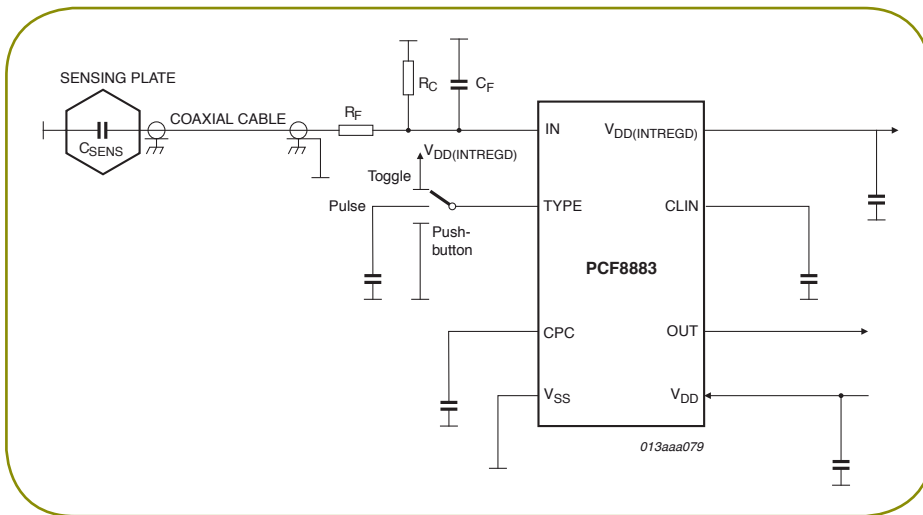
- ▶ Dynamic proximity switch
- ▶ One (PCF8883) or two (PCA8886) channels
- ▶ Digital processing method
- ▶ Adjustable sensitivity can be optimized for touch switch or proximity detection
- ▶ Adjustable response time
- ▶ Wide input capacity range: dynamic up to 60pF, static up to 300 pF
- ▶ Automatic calibration
- ▶ Supports remote sensing plate (50 cm)
- ▶ Designed for battery-powered applications ($I_{DD} = 2.2 \mu\text{A}/\text{channel}$)
- ▶ Output behavior is configurable to react as push-button, toggle or output a predefined pulse and achieving industry's lowest power consumption
- ▶ Wide voltage operating range ($V_{DD} = 3$ to 9 V)
- ▶ Wide temperature operating range ($T_{amb} = -40$ to $+85$ °C)

APPLICATIONS

- ▶ Proximity detection
- ▶ Sanitary applications: electric hand dryers and towel dispensers
- ▶ Switches for medical applications
- ▶ Vandal-proof switches
- ▶ Transportation: switches in or under upholstery, leather, handles, mats, or glass
- ▶ Buildings: switches in or under carpeting, glass, or tile
- ▶ Mobile and handheld devices
- ▶ Switches for home automation
- ▶ Medical self-care equipment
- ▶ Battery wake-up in battery-powered devices

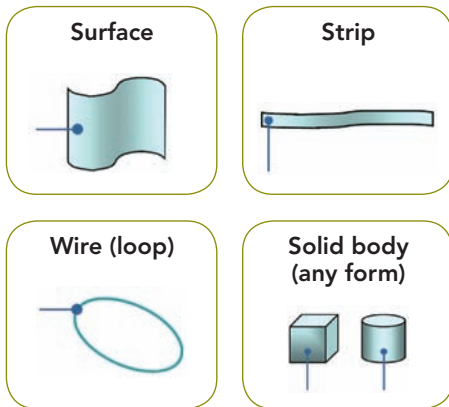
The NXP PCF8883 and PCA8886 are proximity/touch switches that use a patented digital method (EDISEN) to detect a change in capacitance on a remote sensing plate. The PCF8883 has one channel while the PCA8886, designed for industrial and automotive applications, combines two single-channel devices in one package.





PCF8883 application diagram (each channel)

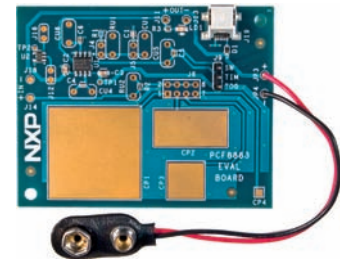
Possible sensing plates



The sensor plate can be made of various materials, including copper foil, conductive plating, wire, or solid blocks, and can be formed into various shapes.

Changes in the static capacitance (as opposed to the dynamic capacitance) are automatically compensated. Sensing plates can be connected remotely by using a coaxial or twisted-pair cable. In a typical application, two capacitors define the sensitivity and reaction speed. Output behavior can be configured to react as push-button, toggle or output a predefined pulse. The internal voltage regulator, which suppresses the supply voltage variations, can also be used for direct battery supply. Self-calibration increases design flexibility. Multiple switches will work the same way, regardless of location. The device continuously compensates for any contamination, such as debris, grease, or moisture. The device detects the capacitive change and the speed of the touching "body".

PCF8883 demo board (OM11055)



PCA8886, demo board (OM11052)



Key parameters

Characteristics	PCF8883	PCA8886
Sensor channels	1 channel	2 independent channels
Supply voltage	2.8 to 9 V	2.8 to 9 V
Operating current	2.2 μ A typical	4.4 μ A typical
Sensing method	Differential capacity with auto-calibration	Differential capacity with auto-calibration
Application(s)	Touch or proximity detection	Channel 1: touch or proximity detection Channel 2: touch or proximity detection

Ordering Information

Characteristics	Package tape and reel	Grade	Version
PCF8883T/1	SOIC8, plastic small outline package, body width 3.9 mm	Industrial	1
PCF8883US/7EA/1	Chip scale package with solder bumps, 1.2 x 0.9 mm, height 0.6 mm	Industrial	1
PCA8886TS/Q900/1	TSSOP16, plastic thin shrink small outline package, body width 4.4 mm	Industrial, automotive	1

For applications that require more channels, consider the PCF8885TS or PCA8885TS.