NXP capacitive proximity switches PCx8885

Dynamic touch and proximity switches with eight sensor channels

Designed for use in a wide range of popular applications, these advanced proximity switches use a patented method for detection to deliver enhanced performance.

KEY FEATURES

▶ Support for matrix arrangement of up to 28 sensors with a single IC
▶ Adjustable response time and sensitivity
▶ Continuous autocalibration
▶ AEC-Q100 qualified (PCA8885TS)
▶ Digital processing method
▶ Copes with up to 6 mm of acrylic glass or 10 mm of glass
▶ I^{2}C Fast-mode plus (Fm+) compatible interface (up to 1 MHz)
▶ Can be configured as two cascaded ICs for 8 x 8 matrix
▶ Interrupt via output or signaling over I^{2}C bus
▶ Large supply voltage range (V_{DD} = 2.5 to 5.5 V)
▶ Ideal of battery-powered operation (I_{DD} ~ 10 μA)
▶ Sleep mode (I_{DD} < 100 nA)

APPLICATIONS

▶ White goods, washing machines, water heaters
▶ Multimedia units, TVs, audio equipment
▶ Self-care medical devices
▶ Gaming, toys
▶ Industrial equipment
▶ Home automation
▶ Automotive: climate control, HVAC, center stack, car entertainment unit, mirror control

The NXP PCF8885TS and PCA8885TS are capacitive 8-channel proximity switches that use a patented method (EDISEN) to detect a change in capacitance on remote sensing plates. Changes in the static capacitances (as opposed to changes in the dynamic capacitances) are automatically compensated by using continuous autocalibration.
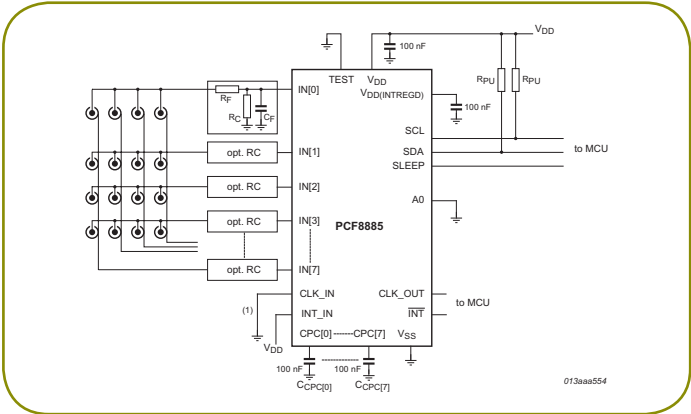
Both switches are well suited to a wide range of applications, including man-to-machine interfaces and hermetically sealed units. They deliver reliable performance in harsh environments and can be used for system wake-up and activation. They also support use with single buttons, slider wheels, and key matrixes. The PCA8885TS is an AEC-Q100 qualified touch switch optimized for use in automotive applications.

Both versions interface to the system controller via an I^{2}C-bus operating at up to 1 MHz (Fm+), and generate an interrupt whenever a touch has occurred. Onboard sensor pads or remote sensing plates, connected via coaxial cables, can be used for touch or proximity sensing.

The eight input channels operate independently of each other. There is also a built-in option for a matrix arrangement. With this arrangement, an interrupt is only generated when two channels are activated simultaneously. The configuration suppresses additional channel outputs when two channels are already active.

Both capacitive sensor circuits make it straightforward to implement a touch display and to add significant improvements to the user interface. A passive display can be integrated with touch capabilities in three ways:
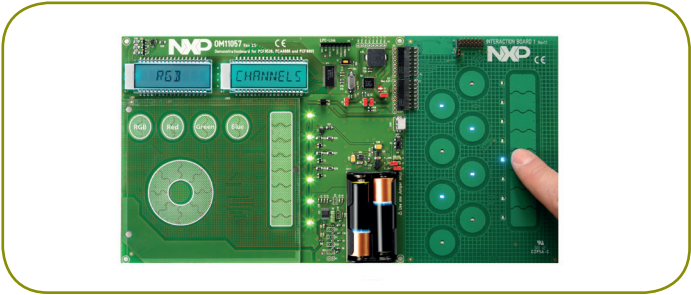
(1) add-on integration, where touch pads reside on an extra touch foil or glass, (2) on-cell integration, where touch pads are deposited in a separate layer between the front glass and the top polarizer, and (3) in-cell integration, where touch pads are placed on the same layer as the display segments, surrounding the segment electrodes.

Demo boards OM11057 and OM11057A for multiplexed and direct-touch applications

PCF8885TS application with 16 touch keys
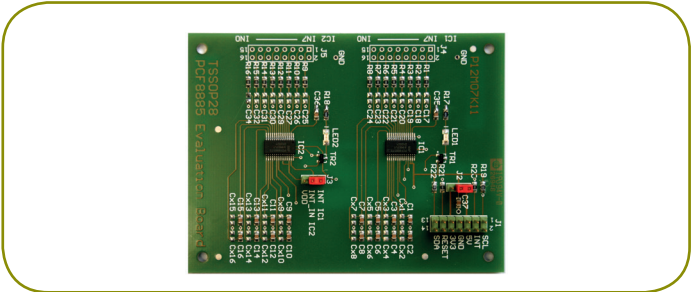
Evaluation board OM11056 with two PCF8885TS switches enabling 64 touch sensors

Demo board OM11058 for climate-control application with touch foil on TFT display
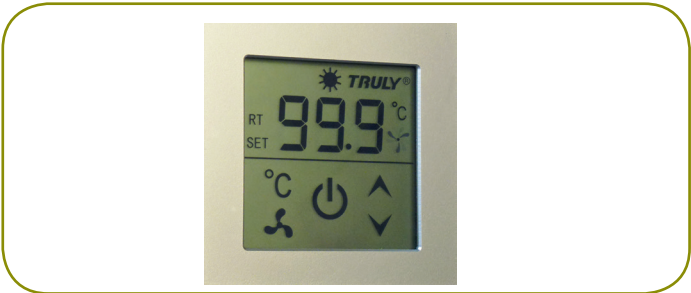
Touch control on a passive LCD, with touch sensors integrated into LCD cells

Selection guide

Type number	Channels	Touch /proximity pads	Package(s)	Grade	Evaluation and demo board(s)
PCF8885TS	8	28 with one circuit 64 with two cascaded circuits	TSSOP28	Industrial	Evaluation boards OM11056/7/7A Touch-on-display demo board OM11058
PCA8885TS	8	28 with one circuit 64 with two cascaded circuits	TSSOP28	Automotive AEC-Q100	Evaluation boards OM11057/57A Touch-on-display demo board OM11058
PCA8886TS	2	2 touch or poximity pads	TSSOP16	Automotive AEC-Q100	Evaluation and demo board OM11052
PCF8883T, PCF8883CX8	1	1 touch or poximity pad	SO8, WLCSP	Industrial	Evaluation and demo board OM11055