NXP in-cell touch display demo with PCF8576E & PCF8885

Segmented 4 x 40 display with in-cell touch technology

This demoboard, developed through a partnership with Truly Semiconductors Ltd, showcases touch-sensitive display technology that enhances user experiences and lowers overall cost in industrial, medical, and consumer applications.

KEY FEATURES

- Twisted Nematic (TN) display with 56 display elements and 5 touch buttons, designed and manufactured by Truly
- In-cell ITO touch layer
- LCD driver PCF8576E
  - Bare die with bumps for COG applications
  - Resolution: 4 x 40
- Capacitive sensor PCF8885
  - TSSOP28 package
  - Eight sensor channels

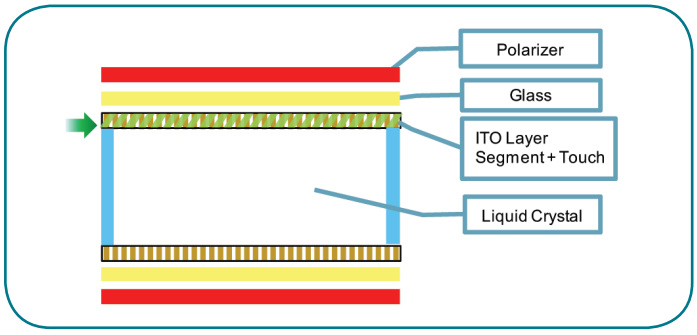
APPLICATIONS

- Industrial
  - Small appliances
  - White goods
  - Measuring equipment
  - General-purpose displays
- Medical
  - Blood pressure meters
  - Blood glucose meters
  - Digital thermometers
- Consumer
  - Entertainment devices
  - Healthcare devices

The in-cell touch display demo makes it easy for engineers to experiment with the latest technologies for touch-sensitive passive LCD.

The demo highlights the features of the NXP Chip-on-Glass (COG) LCD driver PCF8576E and the capacitive sensor PCF8885. The PCF8576E requires no external components to generate the drive signals for the LCD, and supports up to four backplanes and 40 segment drivers. The PCF8885, which offers adjustable response times and continuous auto-calibration, provides dynamic touch sensing with eight sensor channels. Both devices use the I^2C bus for serial communications. The NXP technology allows avoiding any interference between the LCD driving signals and the cap sensor signals, thus enabling the in-cell touch technology with no need for expensive and complicated solutions.

IN-CELL TECHNOLOGY



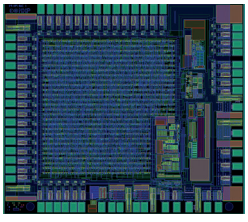
Benefits of in-touch technology

- Simpler structure
- Lower build height
- Easier assembly
- Lower cost

Unlike on-cell technology, which adds an ITO touch layer on top of the display glass, in-cell technology integrates touch-sensing circuitry into the LCD array. The result is a simpler structure (two ITO layers instead of three), a slimmer touch-sensitive screen, and therefore a low-cost solution.

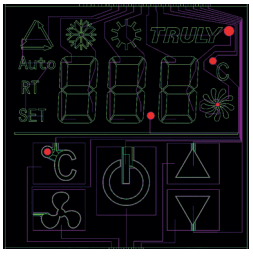
PCF8576E KEY FEATURES

- 40 segments and four backplane outputs
  - Graphics with up to 160 display elements
  - Up to 20 seven-segment numeric characters
  - Up to 10 fourteen-segment alphanumeric characters
- Multiplex rates selectable for static, 1:2, 1:3, and 1:4
- LCD bias configuration selectable for static, 1/2 and 1/3
- Independent supplies for LCD and logic voltages
- Wide power supply range: 1.8 to 5.5 V
- Wide LCD supply range: 2.5 to 6.5 V
- Selectable internal or external oscillator
- Frame frequency: 77 Hz (typ.)
- Blinking function
- Cascadable with up to 16 ICs to drive displays up to 16 x 160 elements
- I^2C-bus interface up to 400 kHz
- Operating temperature range: -40 to 85 °C
- Enhanced ESD/EMC performance
- Bare die with bumps for cost-saving COG applications
- AEC-Q100 compliant for automotive applications (PCA8576D and PCA8576F versions only)



PCF8885TS KEY FEATURES

- 8-channel touch and proximity sensor with auto-calibration
- Adjustable sensitivity and response time
- Three sensing modes: one-key, two-keys, N-keys
  - Up to eight sensors in one-key mode
  - Up to 28 sensors in two-keys mode
- Two event handling modes: push-button and toggle
- I^2C Fast-mode plus interface, up to 1 MHz
- One sub-address for cascading two ICs (up to 64 sensors)
- Power supply range: 2.5 to 5.5 V
- Low power consumption
  - 10 µA in operating mode
  - 100 nA in sleep mode (activated via I^2C or external input)
- Operating temperature range: -40 to +85 °C
- TSSOP28 package: 9.7 x 4.4 x 0.9 mm
- AEC-Q100 compliant for automotive applications (PCA8885TS version only)



ORDERING INFORMATION

Type	Package and description	Delivery format	IC version
PCF8576EUG/2DA/1	Bare die; 59 bumps; 2.2 x 2.0 x 0.4 mm	Chip in tray	1
PCF8885TS/1	TSSOP28: plastic small outline package; 28 leads; body size: 9.7 x 4.4 x 0.9 mm	Tape and reel, 13 inch	1

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