

NXP display demo with COG LCD driver PCA8538 & capacitive sensor PCA8885

Touch-sensitive segmented 9 x 102 display

Developed through a partnership with Unicorn, this advanced display showcases the Chip-On-Glass (COG) LCD driver PCA8538 and the capacitive sensor PCA8885. It can be used to drive a segmented Vertical Alignment (VA) display with integrated touch buttons, and supports a wide range of automotive, industrial, and consumer applications.

DEMO BOARD KEY FEATURES

- VA display with 1:8 multiplex drive mode and 8 touch buttons
- On-cell ITO touch layer
- LCD driver PCA8538
  - Maximum resolution: 9 x 102
  - Bare die with bumps for Chip-On-Glass (COG) applications
- Capacitive sensor PCA8885
  - TSSOP28 package
  - 8 sensor channels
  - Each channel drives one touch button
- Display supplied by Unicorn

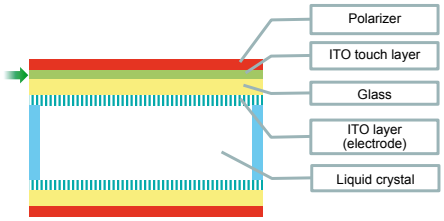
APPLICATIONS

- Automotive
  - Climate control
  - Car entertainment
  - Car radios
- Industrial and consumer
  - Entertainment devices
  - Small appliances
  - White goods
  - Medical and healthcare
  - Measuring equipment
  - Information boards
  - General-purpose display modules



Touch-sensitive display for climate control with fan, air-conditioning, clock, and ventilation controls. Each touch-sensitive icon is implemented as an outline icon and a solid icon. Outline icons indicate where to touch; solid icons display after the outline icon is touched.

Sample displays



Compared to the normal structure, where the ITO touch glass is implemented outside the LCD structure, the on-cell technology offers the following advantages:
- Simpler structure: two glass layers instead of three
- Thinner thickness
- Easier assembly
- Lower cost

On-cell ITO touch layer

PCA8538U KEY FEATURES

- 102 segments and 9 backplane outputs
  - Graphics with up to 918 display elements
  - Up to 114 seven-segment alphanumeric characters
  - Up to 57 fourteen-segment numeric characters
- Multiplex rates selectable from static up to 1:9
- On-chip generation of V_{LCD} up to 12 V
- Software-programmable temperature compensation of V_{LCD} for high, stable contrast over full temperature range: 6 programmable temperature ranges and 8 programmable slopes
- Software-programmable and factory-calibrated frame frequency from 45 to 300 Hz
- Integrated temperature sensor with temperature readout
- Up to four ICs can be cascaded to drive displays up to 4 x 918 elements
- Wide power supply range: 2.5 to 5.5 V
- Selectable I^2C (400 kHz) or SPI (3 MHz) interface
- Extended operating temperature range: -40 to +105 °C
- AEC-Q100 compliant for automotive applications
- Bare die with bumps for cost-saving Chip-On-Glass (COG) applications

PCA8885TS KEY FEATURES

- Capacitive 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 8 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

Ordering information

Type	Package and description	Delivery format	IC version
PCA8538UG/2DA/Q1	Bare die; 247 bumps; 5.88 x 1.20 x 0.4 mm	Chip in tray	1
PCA8885TS/Q900/1	TSSOP28: plastic small outline package; 28 leads; body size: 9.7 mm x 4.4 mm x 0.9 mm	Tape and reel, 13 inch	1

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