NXP automotive-grade cased LCD segment drivers PCA854x

Next-gen AEC-Q100 LCD drivers for quality & performance

These highly cost-effective solutions bring NXP's industry-standard PCA85176 and PCA85134 to the next level by integrating additional features like programmable frame frequency, a charge pump, V_{LCD} temperature compensation, and enhanced ESD performance.

KEY FEATURES

▸ PCA8543: 4 x 60 resolution in LQFP60
▸ PCA8546: 4 x 44 resolution in TSSOP56
▸ PCA8547: 4 x 44 resolution in TSSOP64
▸ V_{DD} range: 1.8 to 5.5 V
▸ V_{LCD} range: 2.5 to 9.0 V
▸ Optional charge pump for on-chip generation of V_{LCD}
▸ Optional V_{LCD} temperature compensation
▸ Optional temperature readout
▸ Multiplex drive mode selectable for static, 1:2, 1:3, and 1:4
▸ Internal or external oscillator
▸ Frame frequency: 60 Hz ÷ 300 Hz
▸ Reset functions: reset pin and/or software reset
▸ 2-line I²C (400 kHz) or 3-line SPI (5 MHz) interface
▸ ESD Human Body Model (HBM) up to ±3.5 or ±4.5 kV
▸ Automotive grade up to 95 or 105 °C

KEY BENEFITS

▸ Supports VA displays with the high programmable frame frequency and V_{LCD}
▸ Rugged performance in automotive environments
▸ High and stable contrast over temperature range due to temperature compensation of V_{LCD}
▸ High reliability: ESD HBM up to ±4.5 kV
▸ Ability to drive large displays

APPLICATIONS

▸ Automotive displays for climate control, instrument clusters, rear seat control, multimedia, etc.
▸ Healthcare devices
▸ White goods
▸ Industrial

Selection guide

Key features	PCA8543	PCA8546	PCA8547
Maximum resolution	4 x 60 = 240	4 x 44 = 176	4 x 44 = 176
Package	LQFP80	TSSOP56	TQFP64
Multiplex drive mode	Static, 1:2, 1:3, 1:4	1:4	Static, 1:2, 1:3, 1:4
VDD range	1.8 to 5.5 V	1.8 to 5.5 V	1.8 to 5.5 V
VLCD range	2.5 to 9.0 V	2.5 to 9.0 V	2.5 to 9.0 V
VLCD generation	Internal charge pump or externally supplied	Externally supplied	Internal charge pump or externally supplied
VLCD temp compensation	Yes	No	Yes
Temperature readout	Yes	No	Yes
Oscillator	Internal or external	Internal or external	Internal or external
Frame frequency	60 Hz ÷ 300 Hz	60 Hz ÷ 300 Hz	60 Hz ÷ 300 Hz
Reset functions	Software reset	Reset pin, software reset	Reset pin, software reset
Interface	2-line I²C (400 kHz)	2-line I²C (400 kHz) 3-line SPI (5 MHz)	2-line I²C (400 kHz) 3-line SPI (5 MHz)
ESD HBM	±4000 V	±3500 V	±4500 V
Operating temperature	-40 to +105 °C	-40 to +95 °C	-40 to +95 °C
Qualification	AEC-Q100 grade 2	AEC-Q100 grade 3	AEC-Q100 grade 3

Continuous evolution for high performance and quality

Parameters	Resolution	Interface	V_{LCDmax}	Frame Frequency	Reset	ESD HBM	V_{LCD} generation	Temp. sensor	V_{LCD} compensation	Qualification
Top Line **PCA8547** TQFP64	4 x 44	I²C & SPI	9 V	60 Hz… 300 Hz	POR SW rst RST pin	±4.5 kV	Internal (charge pump) or external	Yes + temp. read	Yes	AEC-Q100 grade 3
Advanced Line **PCA8546** TSSOP56	4 x 44	I²C & SPI	9 V	60 Hz… 300 Hz	POR SW rst RST pin	±3.5 kV	External supply	No	No	AEC-Q100 grade 3
Base Line **PCA85176** TSSOP56, TQFP64	4 x 40	I²C	8 V	110 Hz	POR	±2 kV	External supply	No	No	AEC-Q100 grade 3

Parameters	Resolution	Interface	V_{LCDmax}	Frame Frequency	Reset	ESD HBM	V_{LCD} generation	Temp. sensor	V_{LCD} compensation	Qualification
Top Line **PCA8543** LQFP80	4 x 60	I²C	9 V	60 Hz… 300 Hz	POR SW rst	± 4 kV	Internal or external	Yes + temp. read	Yes	AEC-Q100 grade 2 (up to 105°C)
Base Line **PCA85134** LQFP80	4 x 60	I²C	8 V	82 Hz	POR	± 2 kV	External supply	No	No	AEC-Q100 grade 3 (up to 95°C)

Ordering information

Type	Package and size	Marking	Interface	Delivery format
PCA8546ATT/A	TSSOP56: 6.1 x 14.0 x 0.95 mm, 0.5 mm pitch	PCA8546ATT	I²C (400 kHz)	Tape & Reel, 13 inch
PCA8546BTT/A	TSSOP56: 6.1 x 14.0 x 0.95 mm, 0.5 mm pitch	PCA8546BTT	SPI (5 MHz)	Tape & Reel, 13 inch
PCA8547AHT/A	TQFP64: 10 x 10 x 1 mm, 0.5 mm pitch	PCA8547AHT	I²C (400 kHz)	Tape & Reel, 13 inch
PCA8547BHT/A	TQFP64: 10 x 10 x 1 mm, 0.5 mm pitch	PCA8547BHT	SPI (5 MHz)	Tape & Reel, 13 inch
PCA8543AHL/A	LQFP80: 12 x 12 x 1.4 mm, 0.5 mm pitch	PCA8543AHL	I²C (400 kHz)	Tape & Reel, 13 inch