

NXP LCD segment drivers PCF8551 & PCF8553

Low-power, low-cost LCD segment drivers for compact, efficient applications

These highly integrated drivers, optimized for low voltage and low power at a low cost, have a minimum V_{DD} and V_{LCD} of only 1.8 V, and typically consume just 4.6 μA at mux 1:4, a frame frequency of 64 Hz, and all segments driven ON. Housed in small TSSOP packages, they are ideally suited for use in metering, consumer healthcare, small appliances, battery-operated systems, wearable devices, and more.

KEY FEATURES

- ▶ PCF8551: 4 x 36 LCD segment driver in TSSOP48 package
- ▶ PCF8553: 4 x 40 LCD segment driver in TSSOP56 package
- ▶ V_{DD} and V_{LCD} with independent supplies (range: 1.8 to 5.5 V)
- ▶ Multiplex drive mode selectable for static, 1:2, 1:3 and 1:4
- ▶ Display bias configuration selectable for static, 1/2 and 1/3
- ▶ Display inversion mode selectable for line (driving scheme A) and frame inversion (driving scheme B)
- ▶ Selectable internal or external clock via input pin CLK
- ▶ Programmable frame frequency from 32 to 128 Hz
- ▶ Selectable power-on-reset (POR) functionality via input pin PORE
- ▶ Blinking functionality and selectable blinking frequencies
- ▶ Programmable power drive boost mode to increase driving capability of LCD outputs and support large displays with higher effective capacitance
- ▶ Ultra-low power ($I_{DD} + I_{LCD}$):
 - 50 nA (typ) in power-down mode
 - 1.6 μA (typ) in static mode and all segments ON
 - 4.6 μA (typ) in mux 1:4 and all segments ON
- ▶ Operating temperature range -40 to $+85$ °C

KEY BENEFITS

- ▶ Low voltage
- ▶ Low power
- ▶ Low cost
- ▶ High reliability
- ▶ Design versatility
- ▶ Suitable for a wide selection of LCDs

APPLICATIONS

- ▶ Utility meters
- ▶ Consumer healthcare devices, such as meters for blood glucose or blood pressure
- ▶ Small appliances, including coffee makers, weight scales, thermostats, etc.
- ▶ Wearable devices

The NXP PCF8551 and PCF8553 are single-chip LCD controllers and drivers that integrate an oscillator, bias generation, and instruction decoding. The PCF8551 is a 4 x 36 driver in a TSSOP48 package, while the PCF8553 is a 4 x 40 driver in a TSSOP56 package.

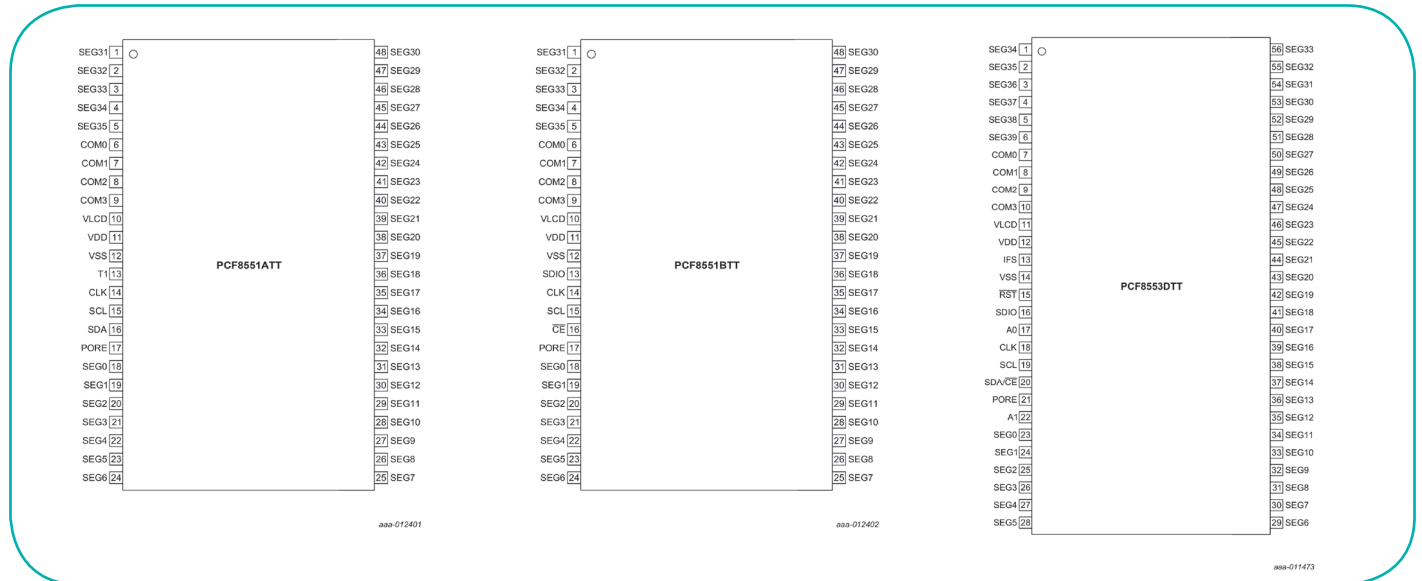


When designers replace a microcontroller that integrates an LCD driver with a two-chip combination that uses a lower-cost microcontroller and an external LCD driver like the PCF8551 or PCF8553, the result is greater design flexibility, better performance, and higher reliability – all at a comparable cost. For example, to create a very cost-effective solution without compromising quality or performance, designers can use the PCF8551 or PCF8553 with one of NXP’s low-cost microcontrollers, such as the LPC812 in a TSSOP20 package.

The PCF8551 is available with a 2-line I²C interface that operates at up to 400 kHz, or a 3-line SPI interface that operates at up to 3 MHz. The PCF8553 has a selectable I²C or SPI interface.

Both devices offer very low current consumption. To reduce consumption even further, the designer can select a low-capacitance display and program it for a low multiplex rate (depending on the display resolution), and a low frame frequency. Selecting a low V_{LCD} voltage can help, too.

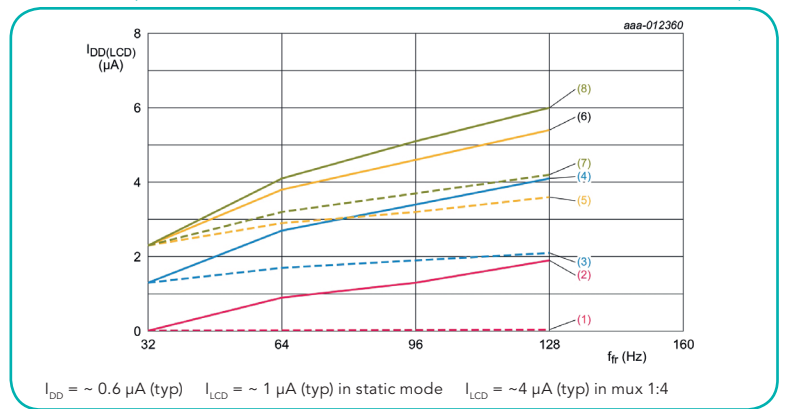
PCF8551 and PCF8553 pin configurations



Integrated versus standalone LCD driver

Features	Microcontroller	
	LCD driver	LCD driver
Design flexibility	Limited	High
Resolution	Limited	High
Optical performance	Limited	High
Reliability	Limited	High
Cost	Low	Comparable

Ultra-low (Please see the datasheet for additional information)



Ordering information

Type	Package and size	Marking	Interface	Delivery
PCF8551ATT/A	TSSOP48: 6.1 x 12.5 x 0.95 mm; pitch = 0.5 mm	PCF8551A	I ² C (400 kHz)	Tape and Reel
PCF8551BTT/A	TSSOP48: 6.1 x 12.5 x 0.95 mm; pitch = 0.5 mm	PCF8551B	SPI (3 MHz)	Tape and Reel
PCF8553DTT/A	TSSOP56: 6.1 x 14.0 x 0.95 mm; pitch = 0.5 mm	PCF8553D	Selectable I ² C or SPI	Tape and Reel

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