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.

**NXP LCD segment drivers PCF8551 & PCF8553**

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

**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 POR
- 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 \( V_{\text{LCD}} \) voltage can help, too.

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

\[
\begin{align*}
I_{\text{LO}} &= -0.6 \mu\text{A (typ)} \\
I_{\text{LO}} &= -1 \mu\text{A (typ)} \text{ in static mode} \\
I_{\text{LO}} &= -4 \mu\text{A (typ)} \text{ in mux 1:4}
\end{align*}
\]

### Ordering information

<table>
<thead>
<tr>
<th>Type</th>
<th>Package and size</th>
<th>Marking</th>
<th>Interface</th>
<th>Delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCF8551ATT/A</td>
<td>TSSOP48: 6.1 x 12.5 x 0.95 mm; pitch = 0.5 mm</td>
<td>PCF8551A</td>
<td>I²C (400 kHz)</td>
<td>Tape and Reel</td>
</tr>
<tr>
<td>PCF8551BTT/A</td>
<td>TSSOP48: 6.1 x 12.5 x 0.95 mm; pitch = 0.5 mm</td>
<td>PCF8551B</td>
<td>SPI (3 MHz)</td>
<td>Tape and Reel</td>
</tr>
<tr>
<td>PCF8553DTT/A</td>
<td>TSSOP56: 6.1 x 14.0 x 0.95 mm; pitch = 0.5 mm</td>
<td>PCF8553D</td>
<td>Selectable I²C or SPI</td>
<td>Tape and Reel</td>
</tr>
</tbody>
</table>

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