TPS65178 — Fully programmable LCD Bias IC for TV with 6-Ch Gamma Buffers, Vcom Reference and Dynamic Gain

Features
- 6-Ch Gamma Buffer
- 48-Pin 6x6 mm QFN Package
- Integrated isolation FET
- I2C Programmable sequencing delays (3 x 3 bits)
- 9-bit VCOM reference
- 2-bit VCOM gain
- 8.6 to 14.7V Input voltage range
- Boost converter VDD
- Integrated input-to-output isolation switch
- Buck converter HVDD
- Buck converter VCC
- Buck converter VCORE
- Buck converter VEPI
- Positive charge pump controller VGH
- Temperature compensation for VGH
- Negative charge pump controller VGL
- Selectable dynamic gain feature
- Reset signal with programmable delay time
- Thermal Shutdown

Benefits
- 1st TI device integrating the LCD bias and the gamma buffer, combining TPS65168 & BUF08630, saving the 5x5mm² package of BUF08630 + routing
- Very small device that use 3 high frequency converters which can be used with chip inductors (cheaper & smaller than wire wounded inductors)
- Better control of startup of the boost and short circuit & reduces the BOM
- I2C Programmability allows for:
  - Easy PCB layout (no resistor divider to set output voltages)
  - Flexible solution (1 BOM for all panels)
- Can be used in conjunction with the TPS65198 level shifter

Applications
- LCD TVs
- LCD monitor
# TPS65178 — Highly Integrated Display Bias

<table>
<thead>
<tr>
<th>Device</th>
<th>Description</th>
<th>Vin (min) (V)</th>
<th>Vin (max) (V)</th>
<th>AVDD lim (min) (A)</th>
<th>Analog Voltage AV/DP (max) (V)</th>
<th>Over-Voltage Protection (max) (V)</th>
<th>Isolation Switch</th>
<th>Vlogic1 lim (min) (A)</th>
<th>Vlogic1 (min) (V)</th>
<th>Vlogic2 lim (min) (A)</th>
<th>Vlogic2 (min) (V)</th>
<th>VOL / Vpos (lg)</th>
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<td>TPS65162</td>
<td>4-CH LCD Bias w/ Integrated 8 Channel Level Shifter</td>
<td>2.5</td>
<td>6</td>
<td>4.4</td>
<td>18</td>
<td>21</td>
<td>—</td>
<td>—</td>
<td>—</td>
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<td>50mA</td>
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<td>40VQFN</td>
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<tr>
<td>TPS65163</td>
<td>4-CH LCD Bias w/ Fully Int. Pos. Charge Pump, 3.3V LDO Conv., 0.96A Min. Boost In &amp; Fault Detect</td>
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<td>16.8</td>
<td>2.8</td>
<td>20</td>
<td>21</td>
<td>External</td>
<td>Buck, 2.5</td>
<td>Fixed 3.3</td>
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<td>3.7</td>
<td>19</td>
<td>20</td>
<td>External</td>
<td>Buck, 2.4</td>
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<td>14</td>
<td>3.5</td>
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<td>External</td>
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<td>LDO Controller</td>
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<td>Integrated 30V max., 50mA</td>
<td>150mA</td>
<td>Controller, Temp Sensor</td>
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<td>TPS65168</td>
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<td>Buck, 1.1</td>
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