LED Drivers
Power Solutions

GENERAL FEATURES

- Wide $V_{IN}$ range: 4.5V to 45V
  - Guarantees flicker free operation
- $V_{OUT}$ up to 65V
  - Higher voltage minimizes number of LED strings
- Up to 240mA per Channel +/- 2% matching
  - Provides uniform brightness across all LEDs
- Advanced dimming control
  - Phase shifted operation lowers output voltage ripple
  - Reduces output capacitor size
  - PWM dimming up to 50kHz
- Enable ultra-thin displays
  - Up to 10x smaller inductor size
- AEC-Q100 qualified solutions

APPLICATIONS

- Displays in:
  - Automotive
  - Industrial
  - Computing
  - Consumer
- High brightness displays up to 12.4”

LED Driver ICs
POWER MANAGEMENT SOLUTIONS

Semtech designs and manufactures an extensive line of LED driver ICs for LCD display backlight and LED camera flash applications. They include inductor-based boost LED drivers for series-connected LEDs and charge pump LED drivers and low-dropout current sinks for parallel-connected LEDs. Each LED Driver topology is designed for optimal high efficiency in the smallest footprint with accurate current regulation, low noise, and a wide dimming range.

![LED Driver Typical Application Schematic](image-url)
SC5012Q HIGH BRIGHTNESS 4-CHANNEL 150MA/CH. LED DRIVER WITH PHASE-SHIFTING

**FEATURES**

- $V_{IN}$ 4.5V to 45V
- $V_{OUT}$ up to 65V
- 2.2µH inductor
- Up to 150mA/Channel
- Adj Switch frequency 200kHz-2.2MHz
- Channel matching: ± 1%
- PWM dimming (100Hz–30kHz)
- 9 or 10 Bit dimming resolution
- Phase shifted operation
- Optional VSYNC / HSYNC / FSYNC
- I²C Control / Configuration
- 6µA Shutdown current
- Extensive protection (Adj OVP, OCP, UVLO, Open/Short LED)
- 4x4mm, QFN-24
- “Q” is AEC-Q100, Grade-2, qualified version

**BENEFITS**

- Prevents false registering of short circuit fault
- Enables ultra-thin display panels
- Eliminates audible noise and waterfall effect, reduces EMI
- Dimming profile is smooth with no visible steps
- I²C interface
- Low quiescent current

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**High Brightness Backlighting Product Summary & Ordering Info**

<table>
<thead>
<tr>
<th>Part #</th>
<th># CHs</th>
<th>I/Ch (mA)</th>
<th>Vin (V)</th>
<th>Auto Grade</th>
<th>Features</th>
<th>Package (mm)</th>
<th>Std Reel Qty</th>
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<tbody>
<tr>
<td>SC441ATETRT</td>
<td>4</td>
<td>150</td>
<td>4.5</td>
<td>21</td>
<td>500:1, PWM dimming, low power dissipation</td>
<td>TSSOP-20</td>
<td>2,500</td>
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<td>SC442ULTRT</td>
<td>10</td>
<td>30</td>
<td>4.5</td>
<td>21</td>
<td>External Sync, PWM dimming, extensive protection</td>
<td>MLPQ-28 (4x4)</td>
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<tr>
<td>SC443ULTRT</td>
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<td>30</td>
<td>4.5</td>
<td>27</td>
<td>+/- 1% string to string current matching, programmable switching frequency</td>
<td>MLP-UT-16</td>
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<td>SC444STETRT / SC445QTERT</td>
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<td>150</td>
<td>4.5</td>
<td>27</td>
<td>Feed forward compensation =&gt; smaller input caps, PWM dimming</td>
<td>TSSOP-20</td>
<td>2,500</td>
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<tr>
<td>SC446ETRT</td>
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<td>100</td>
<td>4.5</td>
<td>27</td>
<td>500:1 PWM dimming, greater than 90% efficiency</td>
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<td>SC4541SKTRT</td>
<td>1</td>
<td>100</td>
<td>2.9</td>
<td>22</td>
<td>Buck or Boost operation, integrated Schottky, high side sense</td>
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<td>SC5010HULTRT</td>
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<tr>
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