Power Management for LEDs
High Performance Analog ICs
LEDs and LED Driver Technology

A light-emitting diode (LED) is a semiconductor device that emits incoherent narrow-spectrum light when electrically forward biased, resulting in a form of electroluminescence. The color of the emitted light depends on the chemical composition of the semiconductor material used, and can be near-ultraviolet, visible or infrared. LEDs are more prevalent today than ever before, replacing traditional incandescent bulbs and fluorescent lights in many applications. Unlike ordinary incandescent bulbs, LEDs do not have a filament that will burn out, and they tend to run cooler. Incandescent bulbs waste 95 percent of the energy they consume as heat. Fluorescent bulbs are more efficient, but their harsh color has prevented them from fully penetrating the lighting market.

Key Advantages of LEDs vs. Alternative Lighting Sources

- High energy efficiency – LEDs use only 10% of the electricity required to power traditional incandescent bulbs and give off less heat with similar light output; efficiencies approach that of fluorescent bulbs
- Extremely long life – typically ten years, twice as long as the best fluorescent bulbs and twenty times longer than the best incandescent bulbs
- Solid state reliability
- Nearly indestructible, solid epoxy lens cases – insensitive to vibration and shock
- Added safety – lamps typically remain cool to the touch and operate at a relatively low voltage
- Fast turn-on time – light up very quickly
- Compact size
- Capable of emitting light of an intended color without the use of color filters
- The shape of the LED package allows light to be focused. Incandescent and fluorescent sources often require an external reflector to collect light and direct it in a usable manner
- Fail by dimming over time, rather than the sudden burn-out of incandescent bulbs

The main advantage of LEDs is high efficiency. In conventional incandescent bulbs, the light production process involves the generation of a lot of heat (to warm the filament). This is completely wasted energy since the majority of the available energy is not converted into visible light. On the other hand, LEDs generate relatively little heat. A much higher percentage of the electrical power into the LED goes directly toward generating light, significantly reducing power demands.

Key advances in LED reliability have enabled lifetimes in excess of 100,000 hours. These advances include alternative semiconductor doping techniques, new optical lens technologies and advanced heat sink and packaging techniques. Many developments are underway that may increase efficiency and lifetimes even further, including new case/housing designs, further improvements in light conversion efficiency, production of larger semiconductors and more thermally efficient packages for higher current operation.

LED Driver Technology

LED driver circuits are available in a variety of topologies, including series (switchmode) drivers and parallel (non-inductor based) drivers. Selecting the appropriate IC and topology depends on the following:

- The relation of LED voltage to battery voltage range
- Efficiency – crucial for driving high brightness (HB) LEDs such as in automotive electronics
- Current consumption required during off-time
- Ability to accurately regulate LED current – eliminates the need for ballast resistors
- Dimming characteristics required
- Total solution size and cost
LED driver circuits tend to be smaller in size compared to alternative solutions, increasing their appeal in space-constrained portable power applications. Popular switchmode LED driver configurations include buck, boost, buck-boost, and SEPIC, with the ability to drive currents from 25mA/LED to 1.5A/LED or more.

Boost-converter-based series LED drivers offer the best possible brightness matching and high efficiency due to inductor-based boosting. PCB traces are also minimized by the series-driver topology, enabling flexibility in space-constrained portable electronic devices.

Higher LED currents result in higher LED forward voltages, and vice-versa. Forward voltage also varies inversely with temperature. Buck-boost topology circuits are advantageous, as the forward voltage of the LED may be above or below the battery (e.g., Lithium-Ion/Polymer) depending on the operating conditions.

Charge pump (inductorless)-based LED drivers are an excellent choice where low to moderate current levels are required and board space is limited. These types of drivers generate a boosted supply to power multiple LEDs connected in parallel. Charge pumps offer a small, low profile solution and are capable of high-efficiency conversion via operation in multiple conversion modes, and are cost-effective to implement. Because charge pumps power LEDs in parallel, they are well-suited for multiple display applications. Charge pumps also have the benefit of low conducted and radiated noise performance.

LEDs are driven with constant current, and DC current level is proportional to LED brightness. To vary the LED brightness, there are two methods of dimming the light by controlling the LED current. The first method is analog dimming, in which the LED DC current level is reduced proportionally to a maximum 10:1 ratio by reducing the constant LED current level. Reducing the LED current further can result in a change in LED color or inaccurate control of the LED current. The second method is digital or PWM dimming. PWM dimming switches the LED on and off at a frequency at or above 100Hz (not perceivable by the human eye). The PWM dimming duty cycle is proportional to LED brightness, while the on-time LED current remains at the same level set by the LED driver IC, maintaining constant LED color during high dimming ratios, i.e., True Color PWM™ Dimming. This method of PWM dimming may be used with ratios as high as 3000:1 in some applications.

Choosing the best LED driver or display bias power IC depends on many factors. As a result, Linear Technology provides a broad range of LED solutions.

Key LED Applications for Semiconductor ICs:

- Automotive Lighting – Interior and Exterior
- Commercial Lighting
- LCD and CCD Panel Backlights
- Photo Sensors
- Portable Electronic Devices
- Residential Lighting
- Signaling
- Signs and Illumination

LED Driver Solutions

Linear Technology has a broad line of LED drivers including inductor based (for LEDs in series) and inductorless (for LEDs in parallel) converters. These are offered in various topologies, providing the highest efficiency, lowest noise and smallest footprints. Other key features include integrated Schottky diodes, accurate LED current matching, a variety of dimming options and multiple output capability.

This selection guide features recommended Linear Technology solutions for a wide variety of LED driver applications. For information on our latest products, visit our website at www.linear.com.
High Power LED Driver ICs (>350mA)

Switching Regulator-Based (Inductor), LEDs in Series
- Buck
- Boost
- Buck-Boost
- Multi-Topology
- Photoflash/Camera Torch
- OLED

Charge Pump-Based (Inductorless), LEDs in Parallel
- Flash/Camera Torch

Low Power (20-100mA) to Medium Power (100-350mA) LED Driver ICs

Charge Pump-Based (Inductorless), LEDs in Parallel
- Multi-Display
- Single-Display

Switching Regulator-Based (Inductor), LEDs in Series
- LCD & CCD Bias
- Multi-Display
- Low Power

Series LED Driver ICs

Parallel LED Driver ICs
High Power (350mA to 10A) LED Drivers - Buck

High-current inductor-based step-down switching LED drivers provide tiny, efficient high power LED lighting solutions for automotive, architectural and display backlighting. Key features include wide-ranging True Color PWM dimming, wide input voltage range, high side sensing and high switching frequency.

**Applications:**
- Automotive and Avionic Lighting
- Architectural Detail Lighting
- Display Backlighting
- Constant Current Sources

### LT3475: Dual Step Down 1.5A LED Driver

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Topology</th>
<th>Dimming Type</th>
<th>Max # of LEDs x I_{LED} from 24V_{IN}</th>
<th>LED Configuration</th>
<th>Input Voltage Range (V)</th>
<th>Max. Output Voltage (V)</th>
<th>I_{SW}(A)</th>
<th>Operating Efficiency (%)</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>LT3474</td>
<td>Buck LED Driver</td>
<td>400:1 PWM</td>
<td>3 x 500mA</td>
<td>Series (3 max)</td>
<td>4 to 36</td>
<td>15</td>
<td>1</td>
<td>87</td>
<td>TSSOP-16E</td>
</tr>
<tr>
<td>LT1618</td>
<td>Buck LED Driver</td>
<td>DC/PWM</td>
<td>2 x 350mA</td>
<td>Series (2 max)</td>
<td>1.6 to 18</td>
<td>30</td>
<td>1.5</td>
<td>87</td>
<td>3x3 DFN, MSOP-10</td>
</tr>
<tr>
<td>LT3477</td>
<td>SEPIC, Buck, Boost, Buck/Boost, Flyback, Inverter</td>
<td>DC/PWM</td>
<td>5 x 1A</td>
<td>Parallel or Series</td>
<td>2.5 to 25</td>
<td>Depends upon Configuration</td>
<td>3</td>
<td>91</td>
<td>4x4 QFN-20, TSSOP-20E</td>
</tr>
<tr>
<td>LT3478 /-1</td>
<td>Buck, Boost, Buck/Boost</td>
<td>3000:1 PWM</td>
<td>8 x 1.5A</td>
<td>1 Series String (8 max)</td>
<td>2.7 to 36</td>
<td>40</td>
<td>4.5</td>
<td>92</td>
<td>TSSOP-16E</td>
</tr>
<tr>
<td>LT3475</td>
<td>Dual Buck LED Driver</td>
<td>3000:1 PWM</td>
<td>6 x 1.5A</td>
<td>2 x Multiple Series String (3 max)</td>
<td>4 to 36</td>
<td>15</td>
<td>2 x 1.5</td>
<td>88</td>
<td>TSSOP-20E</td>
</tr>
<tr>
<td>LT3476</td>
<td>Quad Buck, Boost, Buck/Boost LED Driver</td>
<td>1000:1 PWM</td>
<td>4 x 5 x 1A</td>
<td>4 x Multiple Series String (8 max)</td>
<td>2.8 to 16</td>
<td>Depends upon Configuration</td>
<td>4 x 1.5</td>
<td>96</td>
<td>5x7 QFN-38</td>
</tr>
<tr>
<td>LTC3783</td>
<td>SEPIC, Buck, Boost, Buck/Boost, Flyback, Inverter</td>
<td>3000:1 PWM, 10:1 Analog</td>
<td>4 x 12 x 1A</td>
<td>Series/Parallel</td>
<td>3 to 36+</td>
<td>Limited by ext. FET</td>
<td>&lt;10</td>
<td>97</td>
<td>4x5 DFN-16, TSSOP-16E</td>
</tr>
</tbody>
</table>
LT3003: 3-Channel LED Ballaster with PWM for up to 24 LEDs

- Can Drive up to 3 Strings with 8 LEDs per String
- 3% LED Current Matching
- Up to 350mA Continuous Current per LED String
- Up to 3000:1 PWM Dimming Range
- PWM Input Disconnects LED Strings
- Can Operate in Buck, Boost and Buck-Boost Modes
- Wide Input Range: 3V to 40V
- Over temperature Outputs
- Works with LT1618, LT3477, LT3474, LT3475, LT3476, LTC3783
- Thermally Enhanced 10-Pin MSOP Package

Buck Mode LT3003 with the LT3476
High Power (350mA to 10A) LED Drivers - Boost

High-current inductor-based step-up switching LED drivers provide compact, efficient, LED lighting solutions for notebook computer displays, cell phone camera lighting, automotive dashboard lighting, and avionics displays. Key features include high-current, high voltage switches, wide-ranging True Color PWM dimming, wide input voltage range, and high switching frequency.

**Applications:**
- High Power LED Driver
- DSL Modems
- Distributed Power
- CVCC Source
- Input/Output Current Limited Boost, SEPIC, Inverting, Flyback Converters

**LT3477: 6 x 330mA LED Driver with Open LED Protection**

![LT3477 Circuit Diagram](image)

### High Power (350mA to 10A) LED Drivers - Boost

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Topology</th>
<th>Dimming Type</th>
<th>Max # of LEDs x ILED from 12VIN</th>
<th>LED Configuration</th>
<th>Input Voltage Range (V)</th>
<th>Max. Output Voltage (V)</th>
<th>Isw(A)*</th>
<th>Operating Efficiency (%)</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>LTC3490 **</td>
<td>Sync Boost LED Driver</td>
<td>DC/PWM</td>
<td>1 x 350mA</td>
<td>Single LED</td>
<td>1 to 3.2</td>
<td>4</td>
<td>ILED = 350mA</td>
<td>90</td>
<td>3x3 DFN-8, MSOP-8</td>
</tr>
<tr>
<td>LT3486</td>
<td>Dual LED Driver</td>
<td>1000:1 PWM</td>
<td>2 x 7 x 350mA</td>
<td>Dual Parallel Strings</td>
<td>2.7 to 24</td>
<td>35</td>
<td>2 x 1.3</td>
<td>85</td>
<td>3x5 DFN-16</td>
</tr>
<tr>
<td>LT1618</td>
<td>Boost LED Driver</td>
<td>DC/PWM</td>
<td>7 x 350mA</td>
<td>Parallel or Series Strings</td>
<td>1.6 to 18</td>
<td>36</td>
<td>1.5</td>
<td>80</td>
<td>3x3 DFN-10 MSOP-10</td>
</tr>
<tr>
<td>LT3479</td>
<td>Boost LED Driver</td>
<td>DC/PWM</td>
<td>6 x 1A</td>
<td>Series Strings</td>
<td>2.5 to 24</td>
<td>40</td>
<td>3</td>
<td>89</td>
<td>3x4 DFN-14, TSSOP-16E</td>
</tr>
<tr>
<td>LT3477</td>
<td>SEPIC, Buck, Boost, Buck/Boost, Flyback, Inverter</td>
<td>DC/PWM</td>
<td>6 x 1A</td>
<td>Series</td>
<td>2.5 to 25</td>
<td>40</td>
<td>3</td>
<td>92</td>
<td>4x4 QFN-20, TSSOP-20E</td>
</tr>
<tr>
<td>LT3478/-1</td>
<td>Boost LED Driver</td>
<td>3000:1 PWM</td>
<td>6 x 700mA</td>
<td>Series Strings</td>
<td>2.7 to 36</td>
<td>40</td>
<td>4.5</td>
<td>91</td>
<td>TSSOP-16E</td>
</tr>
<tr>
<td>LT3476</td>
<td>Quad Buck, Boost, Buck/Boost LED Driver</td>
<td>1000:1 PWM</td>
<td>4 x 8 x 350mA</td>
<td>4 x Multiple Series String</td>
<td>2.8 to 16</td>
<td>36</td>
<td>4 x 1.5</td>
<td>83</td>
<td>5x7 QFN-38</td>
</tr>
<tr>
<td>LTC3783</td>
<td>SEPIC, Buck, Boost, Buck/Boost, Flyback, Inverter</td>
<td>3000:1 PWM 10:1 Analog</td>
<td>12 x 3 x 1A</td>
<td>Series/Parallel</td>
<td>3 to 36+</td>
<td>Limited by ext. FET</td>
<td>Ext FET</td>
<td>95</td>
<td>4x5 DFN-16, TSSOP-16E</td>
</tr>
</tbody>
</table>

*Isw = 0.65 ILED x VIN / VOUT. Estimate: may vary depending on external component selection.

**Max VIN = 3.2V**

---

**Applications:**
- High Power LED Driver
- DSL Modems
- Distributed Power
- CVCC Source
- Input/Output Current Limited Boost, SEPIC, Inverting, Flyback Converters

**LT3477: 6 x 330mA LED Driver with Open LED Protection**

![LT3477 Circuit Diagram](image)

### High Power (350mA to 10A) LED Drivers - Boost

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Topology</th>
<th>Dimming Type</th>
<th>Max # of LEDs x ILED from 12VIN</th>
<th>LED Configuration</th>
<th>Input Voltage Range (V)</th>
<th>Max. Output Voltage (V)</th>
<th>Isw(A)*</th>
<th>Operating Efficiency (%)</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>LTC3490 **</td>
<td>Sync Boost LED Driver</td>
<td>DC/PWM</td>
<td>1 x 350mA</td>
<td>Single LED</td>
<td>1 to 3.2</td>
<td>4</td>
<td>ILED = 350mA</td>
<td>90</td>
<td>3x3 DFN-8, MSOP-8</td>
</tr>
<tr>
<td>LT3486</td>
<td>Dual LED Driver</td>
<td>1000:1 PWM</td>
<td>2 x 7 x 350mA</td>
<td>Dual Parallel Strings</td>
<td>2.7 to 24</td>
<td>35</td>
<td>2 x 1.3</td>
<td>85</td>
<td>3x5 DFN-16</td>
</tr>
<tr>
<td>LT1618</td>
<td>Boost LED Driver</td>
<td>DC/PWM</td>
<td>7 x 350mA</td>
<td>Parallel or Series Strings</td>
<td>1.6 to 18</td>
<td>36</td>
<td>1.5</td>
<td>80</td>
<td>3x3 DFN-10 MSOP-10</td>
</tr>
<tr>
<td>LT3479</td>
<td>Boost LED Driver</td>
<td>DC/PWM</td>
<td>6 x 1A</td>
<td>Series Strings</td>
<td>2.5 to 24</td>
<td>40</td>
<td>3</td>
<td>89</td>
<td>3x4 DFN-14, TSSOP-16E</td>
</tr>
<tr>
<td>LT3477</td>
<td>SEPIC, Buck, Boost, Buck/Boost, Flyback, Inverter</td>
<td>DC/PWM</td>
<td>6 x 1A</td>
<td>Series</td>
<td>2.5 to 25</td>
<td>40</td>
<td>3</td>
<td>92</td>
<td>4x4 QFN-20, TSSOP-20E</td>
</tr>
<tr>
<td>LT3478/-1</td>
<td>Boost LED Driver</td>
<td>3000:1 PWM</td>
<td>6 x 700mA</td>
<td>Series Strings</td>
<td>2.7 to 36</td>
<td>40</td>
<td>4.5</td>
<td>91</td>
<td>TSSOP-16E</td>
</tr>
<tr>
<td>LT3476</td>
<td>Quad Buck, Boost, Buck/Boost LED Driver</td>
<td>1000:1 PWM</td>
<td>4 x 8 x 350mA</td>
<td>4 x Multiple Series String</td>
<td>2.8 to 16</td>
<td>36</td>
<td>4 x 1.5</td>
<td>83</td>
<td>5x7 QFN-38</td>
</tr>
<tr>
<td>LTC3783</td>
<td>SEPIC, Buck, Boost, Buck/Boost, Flyback, Inverter</td>
<td>3000:1 PWM 10:1 Analog</td>
<td>12 x 3 x 1A</td>
<td>Series/Parallel</td>
<td>3 to 36+</td>
<td>Limited by ext. FET</td>
<td>Ext FET</td>
<td>95</td>
<td>4x5 DFN-16, TSSOP-16E</td>
</tr>
</tbody>
</table>

*Isw = 0.65 ILED x VIN / VOUT. Estimate: may vary depending on external component selection.

**Max VIN = 3.2V**

---

**Applications:**
- High Power LED Driver
- DSL Modems
- Distributed Power
- CVCC Source
- Input/Output Current Limited Boost, SEPIC, Inverting, Flyback Converters
High Power (350mA to 10A) LED Drivers - Buck-Boost

High-current inductor-based buck-boost switching LED drivers provide flexible, tiny, efficient solutions for DSL modem, CVCC and distributed power applications. Key features include high-current, high-voltage switches, adjustable LED currents, wide input voltage range, and high-switching frequency.

Applications:
- RGGB Lighting
- Automotive and Avionic Lighting
- TFT LCD Backlighting
- Constant-Current Sources

LT3476: High-CURRENT Quad Output LED Driver

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Topology</th>
<th>Dimming Type</th>
<th>Max # of LEDs x ILED from 12 VIN</th>
<th>LED Configuration</th>
<th>Input Voltage Range (V)</th>
<th>Max. Output Voltage (V)</th>
<th>ISW (A)</th>
<th>Operating Efficiency (%)</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>LT1618</td>
<td>Buck/Boost</td>
<td>DC/PWM</td>
<td>1 x 350mA</td>
<td>Series</td>
<td>1.6 to 18</td>
<td>35</td>
<td>1.5</td>
<td>78</td>
<td>3x3 DFN-10, MSOP-10</td>
</tr>
<tr>
<td>LTC3453</td>
<td>Synchronous Buck-Boost LED Driver</td>
<td>DC/PWM</td>
<td>1 x 500mA</td>
<td>1 LED</td>
<td>2.7 to 5.5</td>
<td>4.5</td>
<td>1.1</td>
<td>90</td>
<td>4x4 QFN-16</td>
</tr>
<tr>
<td>LTC3454</td>
<td>Synchronous Buck-Boost LED Driver</td>
<td>DC/PWM</td>
<td>1 x 1A</td>
<td>1 LED</td>
<td>2.7 to 5.5</td>
<td>5.15</td>
<td>2.5</td>
<td>93</td>
<td>3x3 DFN-10</td>
</tr>
<tr>
<td>LT3477</td>
<td>SEPIC, Buck, Boost, Buck/Boost, Flyback, Inverter</td>
<td>DC/PWM</td>
<td>5 x 350mA</td>
<td>Series</td>
<td>2.5 to 25</td>
<td>40</td>
<td>3</td>
<td>78</td>
<td>4x4 QFN-20, TSSOP-20</td>
</tr>
<tr>
<td>LT3478/-1</td>
<td>Buck, Boost, Buck/Boost</td>
<td>3000:1 PWM</td>
<td>4 x 1A</td>
<td>Series</td>
<td>2.7 to 36</td>
<td>40</td>
<td>4.5</td>
<td>92</td>
<td>TSSOP-16E</td>
</tr>
<tr>
<td>LT3476</td>
<td>Quad Buck, Boost, Buck/Boost LED Driver</td>
<td>1000:1 PWM</td>
<td>4 x 4 x 350mA</td>
<td>4 x Multiple Series String</td>
<td>2.8 to 16</td>
<td>36</td>
<td>4 x 1.5</td>
<td>78</td>
<td>5x7 QFN-38</td>
</tr>
<tr>
<td>LTC3783</td>
<td>SEPIC, Buck, Boost, Buck/Boost, Flyback, Inverter</td>
<td>3000:1 PWM, 10:1 Analog</td>
<td>12 X 3 x 1A</td>
<td>Series/Parallel</td>
<td>3 to 36</td>
<td>Limited by ext. FET</td>
<td>Ext FET</td>
<td>93</td>
<td>4x5 DFN-16, TSSOP-16</td>
</tr>
</tbody>
</table>
High Power (350mA to 10A) LED Drivers - Multi-Topology

High-current inductor-based multi-topology switching LED drivers provide flexible solutions for high-voltage LED arrays. Key features include high current, wide input voltage range, scalable output voltage, and wide-ranging True Color dimming.

Applications:
- RGGB Lighting
- Automotive and Avionic Lighting
- TFT LCD Backlighting
- Constant-Current Sources

### LTC3783: PWM LED Driver in Boost Mode

#### LTC3783: Actual Size, Complete Solution

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Topology</th>
<th>Dimming Type</th>
<th>Max # of LEDs x I_{LED}</th>
<th>LED Configuration</th>
<th>Input Voltage Range (V)</th>
<th>Max. Output Voltage (V)</th>
<th>I_{SW} (A)</th>
<th>Operating Efficiency (%)</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>LT1618</td>
<td>SEPIC, Buck, Boost, Buck/Boost, Flyback, Inverter</td>
<td>DC/PWM</td>
<td>2 x 350mA (In Buck-Mode)</td>
<td>Series</td>
<td>1.5 to 18</td>
<td>Depends on Configuration</td>
<td>1.5</td>
<td>85</td>
<td>3x3 DFN-10, MSOP-10</td>
</tr>
<tr>
<td>LT3477</td>
<td>SEPIC, Buck, Boost, Buck/Boost, Flyback, Inverter</td>
<td>DC/PWM</td>
<td>4 x 1A (In Buck-Mode)</td>
<td>Series</td>
<td>2.5 to 25</td>
<td>Depends on Configuration</td>
<td>3</td>
<td>91</td>
<td>4x4 QFN-20, TSSOP-20E</td>
</tr>
<tr>
<td>LT3478/-1</td>
<td>Buck, Boost, Buck/Boost</td>
<td>PWM</td>
<td>8 x 1.5A (In Buck-Mode)</td>
<td>Series</td>
<td>2.7 to 36</td>
<td>Depends on Configuration</td>
<td>4.5</td>
<td>92</td>
<td>TSSOP-16E</td>
</tr>
<tr>
<td>LT3476</td>
<td>Quad Buck, Boost, Buck/Boost LED Driver</td>
<td>PWM</td>
<td>4 x 8 x 1A (In Buck-Mode)</td>
<td>4 x Multiple Series String</td>
<td>2.8 to 16</td>
<td>Depends on Configuration</td>
<td>4 x 1.5</td>
<td>96</td>
<td>5x7 QFN-38</td>
</tr>
<tr>
<td>LTC3783</td>
<td>SEPIC, Buck, Boost, Buck/Boost, Flyback, Inverter</td>
<td>PWM, 10:1 Analog</td>
<td>4 x 12 x 1A (In Buck-Mode)</td>
<td>Series/Parallel</td>
<td>3 to 36</td>
<td>Limited by ext. FET</td>
<td>Ext FET</td>
<td>90+</td>
<td>4x5 DFN-16, TSSOP-16</td>
</tr>
</tbody>
</table>
Medium to High Power (100mA to 2A) LED Drivers for PhotoFlash/Torch Lighting

High-current inductor-based switching LED drivers for camera photoflash, torch and video lighting feature various topologies including buck-boost and boost and provide tiny, efficient high power solutions for camera phone applications.

Applications:
- Cell Phone Camera Flash
- Cell Phone Torch Lighting
- Digital Cameras
- PDAs
- Misc. Li-Ion/Polymer-Based Systems

**LTC3454: 1A Synchronous Buck-Boost High Current LED Driver**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Topology</th>
<th>$V_{IN}$ (V)</th>
<th>$V_{OUT}$ (V)*</th>
<th>Max. Total LED Current (mA)*</th>
<th>Max. No. of White LEDs</th>
<th>Dimming Control</th>
<th>Frequency (MHz)</th>
<th>$I_o$ (mA)</th>
<th>$I_{SD}$ (µA)</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>LTC3452</td>
<td>Buck-Boost</td>
<td>2.7 to 5.5</td>
<td>4.5</td>
<td>200</td>
<td>4</td>
<td>DC/PWM</td>
<td>1</td>
<td>0.6</td>
<td>&lt;1</td>
<td>4x4 QFN-20</td>
</tr>
<tr>
<td>LTC3490</td>
<td>Boost</td>
<td>1.0 to 3.2</td>
<td>4</td>
<td>350</td>
<td>1</td>
<td>DC/PWM</td>
<td>1.3</td>
<td>1</td>
<td>&lt;50</td>
<td>3x3 DFN-8, SO-8</td>
</tr>
<tr>
<td>LTC3453</td>
<td>Buck-Boost</td>
<td>2.7 to 5.5</td>
<td>4.5</td>
<td>500</td>
<td>1</td>
<td>DC/PWM</td>
<td>2.5</td>
<td>&lt;6</td>
<td>4x4 QFN-16</td>
<td></td>
</tr>
<tr>
<td>LT1618</td>
<td>Buck-Boost</td>
<td>1.6 to 18</td>
<td>34</td>
<td>500</td>
<td>1</td>
<td>DC/PWM</td>
<td>1.4</td>
<td>1.8</td>
<td>&lt;1</td>
<td>MSOP-10</td>
</tr>
<tr>
<td>LTC3454</td>
<td>Buck-Boost</td>
<td>2.7 to 5.5</td>
<td>5.15</td>
<td>1A</td>
<td>1</td>
<td>DC/PWM</td>
<td>0.8</td>
<td>&lt;1</td>
<td>3x3 DFN-10</td>
<td></td>
</tr>
<tr>
<td>LT3477</td>
<td>Buck-Boost,</td>
<td>2.5 to 25</td>
<td>42</td>
<td>2A</td>
<td>1</td>
<td>DC/PWM</td>
<td>200kHz to 3.5MHz</td>
<td>5</td>
<td>&lt;1</td>
<td>TSSOP-20E, 4x4 QFN-20</td>
</tr>
<tr>
<td>LT3479</td>
<td>Boost</td>
<td>2.5 to 24</td>
<td>40</td>
<td>2A</td>
<td>1</td>
<td>DC/PWM</td>
<td>6.5</td>
<td>&lt;1</td>
<td>TSSOP-16, 3x4 DFN-14</td>
<td></td>
</tr>
</tbody>
</table>

* Output voltage and current depend on the choice of external components
High Power (350mA to 1A) LED Drivers for Camera Flash - Inductorless

Our family of inductorless charge pump-based LED driver products features a range of performance options, the smallest footprint and highest efficiency. The ICs efficiently drive low, medium and high current white LEDs for a wide range of camera flash applications.

Applications:
- Multi-LED Camera Light Supply for Cellphones/DSCs/PDAs

LTC3217: 600mA Low Noise Multi-LED Camera Charge Pump

<table>
<thead>
<tr>
<th>Part Number</th>
<th>V_IN (V)</th>
<th>Conversion Ratio</th>
<th>Max. Total LED Current (mA)</th>
<th>Max. # of White LEDs</th>
<th>Dimming Control</th>
<th>Operating Efficiency (%)</th>
<th>Frequency (MHz)</th>
<th>I_Q (mA)</th>
<th>I_SD (µA)</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>LTC3218</td>
<td>2.9 to 4.5</td>
<td>1x/2x</td>
<td>400</td>
<td>1*</td>
<td>Resistor/PWM</td>
<td>92</td>
<td>1</td>
<td>0.98</td>
<td>&lt;1</td>
<td>2x3 DFN-10</td>
</tr>
<tr>
<td>LTC3214</td>
<td>2.9 to 4.4</td>
<td>1x/1.5x/2x</td>
<td>500</td>
<td>1*</td>
<td>Resistor/PWM</td>
<td>85</td>
<td>0.9</td>
<td>0.98</td>
<td>&lt;2.5</td>
<td>3x3 DFN-10</td>
</tr>
<tr>
<td>LTC3217</td>
<td>2.9 to 4.5</td>
<td>1x/1.5x/2x</td>
<td>600</td>
<td>4</td>
<td>Resistor/PWM</td>
<td>86</td>
<td>0.9</td>
<td>0.3</td>
<td>&lt;2.5</td>
<td>3x3 QFN-16</td>
</tr>
<tr>
<td>LTC3215</td>
<td>2.9 to 4.4</td>
<td>1x/1.5x/2x</td>
<td>700</td>
<td>1*</td>
<td>Resistor/PWM</td>
<td>90</td>
<td>0.9</td>
<td>0.3</td>
<td>&lt;2.5</td>
<td>3x3 DFN-10</td>
</tr>
<tr>
<td>LTC3216</td>
<td>2.9 to 4.4</td>
<td>1x/1.5x/2x</td>
<td>1000</td>
<td>1*</td>
<td>Resistor/PWM</td>
<td>90</td>
<td>0.9</td>
<td>0.3</td>
<td>&lt;2.5</td>
<td>3x4 DFN-12</td>
</tr>
</tbody>
</table>

* High Current LED
Drivers for Organic LED (OLED) Bias

Linear Technology delivers highly integrated solutions for OLED bias applications. Key features include output disconnect, soft start and integrated Schottky diodes. Their small circuit size and high efficiency make them ideal solutions for space-conscious portable device applications such as cellular phones and media players.

**Applications:**
- Organic LED Power Supply
- Low Noise Power
- MP3 Players

**LT3494: Micropower Low Noise Boost Converter with Output Disconnect**

![LT3494 Diagram](image)

**Output Voltage Ripple vs Load Current**

![Output Ripple Graph](image)

**Part Number | Configuration | Topology | Input Voltage Range (V) | Max. Output Voltage (V) | $I_{SW}$ (mA) | Operating Efficiency (%) | Package**
--- | --- | --- | --- | --- | --- | --- | ---
LTC3459 | Single | Synchronous Boost | 1.5 to 5.5 | 10 | 60 | 89 | ThinSOT
LTC3464 | Single | Boost | 2.3 to 10 | 34 | 85 | 84 | ThinSOT
LTC3464/A | Single | Boost | 2.3 to 16 | 40 | 150/350 | 85 | 2x3 DFN-8
LTC3463 | Dual | Boost and Inverter | 2.4 to 15 | ±40 | 180/320 | 77 | 3x3 DFN-10
LTC3472 | Dual | Boost and Inverter | 2.2 to 16 | ±40 | 250/300 | 83 | 3x3 DFN-10
LT1613 | Single | Boost | 0.9 to 10 | 34 | 550 | 89 | ThinSOT
LT3487 | Dual | Boost and Inverter | 2.3 to 16 | ±28 | 750/900 | 77 | 3x3 DFN-10
LTC3473/A | Single | Boost | 2.2 to 16 | 36 | 1.2A | 77 | 3x3 DFN-8
LTC3467/A | Single | Boost | 2.4 to 16 | 40 | 1.4A | 90 | ThinSOT
LTC3471 | Dual | Boost or Inverter | 2.4 to 16 | ±40 | 2 x 1.5A | 86 | 3x3 DFN-10
LTC3458/L | Single | Synchronous Boost | 1.5 to 6 | 7.5/6 | 1.4A/1.7A | 96 | 3x4 DFN-12
**Low to Medium Power Multi-Display LED Drivers - Inductorless**

Our family of inductorless, multi-display charge-pump-based LED drivers feature the highest level of integration, smallest footprint and highest efficiency. Individual display driver outputs eliminate the need for ballast resistors. These ICs optimize flexibility for designers of portable products, ranging from fully featured, multi-display cellular phones to high-current/high-resolution camera flash electronic devices.

**Applications:**
- Multi-Display Cellular Phones
- Video/Camera Phones with QVGA+ Displays
- General Purpose LED Lighting

**LTC3208: 1A High Efficiency 5-Display LED Driver (see opposite page)**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>V_in (V)</th>
<th>Conversion Ratio</th>
<th>Number of Displays</th>
<th>Display Types</th>
<th>Max. # of White LEDs</th>
<th>Dimming Control</th>
<th>Operating Efficiency (%)</th>
<th>Frequency</th>
<th>I_o (µA)</th>
<th>I_SO (µA)</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>LTC3212</td>
<td>2.7 to 5.5</td>
<td>1x/2x</td>
<td>75</td>
<td>RGB</td>
<td>3***</td>
<td>1-wire</td>
<td>92</td>
<td>900kHz</td>
<td>400</td>
<td>&lt;3</td>
<td>2x3 DFN-12</td>
</tr>
<tr>
<td>LTC3219</td>
<td>2.9 to 5.5</td>
<td>1x/1.5x/2x</td>
<td>250</td>
<td>Main, SUB, RGB</td>
<td>9***</td>
<td>I2C</td>
<td>93</td>
<td>850kHz</td>
<td>400</td>
<td>&lt;2</td>
<td>3x3 QFN-20</td>
</tr>
<tr>
<td>LTC3206</td>
<td>2.8 to 4.5</td>
<td>1x/1.5x</td>
<td>400</td>
<td>Main, SUB, RGB</td>
<td>4 + 2 + 3</td>
<td>SPI*</td>
<td>90</td>
<td>1MHz</td>
<td>180</td>
<td>&lt;1</td>
<td>4x4 QFN-24</td>
</tr>
<tr>
<td>LTC3210/-1</td>
<td>2.9 to 4.5</td>
<td>1x/1.5x/2x</td>
<td>500</td>
<td>Main, CAM</td>
<td>4 + 1**</td>
<td>1-wire</td>
<td>93</td>
<td>800kHz</td>
<td>400</td>
<td>&lt;3</td>
<td>3x3 QFN-16</td>
</tr>
<tr>
<td>LTC3209-1</td>
<td>2.9 to 4.5</td>
<td>1x/1.5x/2x</td>
<td>600</td>
<td>Main, CAM, Aux</td>
<td>6 + 1** + 1</td>
<td>I2C</td>
<td>94</td>
<td>850kHz</td>
<td>400</td>
<td>&lt;3</td>
<td>4x4 QFN-20</td>
</tr>
<tr>
<td>LTC3209-2</td>
<td>2.9 to 4.5</td>
<td>1x/1.5x/2x</td>
<td>600</td>
<td>Main, CAM, Aux</td>
<td>5 + 2** + 1</td>
<td>I2C</td>
<td>94</td>
<td>850kHz</td>
<td>400</td>
<td>&lt;3</td>
<td>4x4 QFN-20</td>
</tr>
<tr>
<td>LTC3207</td>
<td>2.9 to 4.5</td>
<td>1x/1.5x/2x</td>
<td>600</td>
<td>Main, Sub, CAM, RGB</td>
<td>12*** + 1**</td>
<td>I2C</td>
<td>90</td>
<td>850kHz</td>
<td>400</td>
<td>&lt;2</td>
<td>4x4 QFN-24</td>
</tr>
<tr>
<td>LTC3208</td>
<td>2.9 to 4.5</td>
<td>1x/1.5x/2x</td>
<td>1000</td>
<td>Main, SUB, CAM, RGB, Aux</td>
<td>4 + 2 + 4 + 3 + 4</td>
<td>I2C</td>
<td>90</td>
<td>850kHz</td>
<td>250</td>
<td>&lt;1</td>
<td>5x5 QFN-32</td>
</tr>
</tbody>
</table>

* Serial Peripheral Interface  ** High Current LED  *** Universally Configurable  **** R, G, B LEDs
Low to Medium Power Single Output LED Drivers - Inductorless

Our family of charge pumps includes the widest selection of simple and compact inductorless DC/DC converter designs. These step-up converters offer low ripple and can be used to boost an input voltage to drive parallel LEDs. By eliminating the inductor, these switched capacitor converters provide small solution footprint and a simple design.

Applications:
- 2 AA Cell to 3.3V Conversion
- Li-Ion to 5V Conversion
- USB On-the-Go Devices
- LED Drivers
- Handheld Devices

LTC3204/B: Low Noise, Miniature 2x2 DFN Regulated Charge Pump Doubler

Applications:
- 2 AA Cell to 3.3V Conversion
- Li-Ion to 5V Conversion
- USB On-the-Go Devices
- LED Drivers
- Handheld Devices

Output Ripple vs Load Current

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Dimming Type</th>
<th># of LEDs</th>
<th>LED Configuration</th>
<th>Input Voltage Range (V)</th>
<th>Output Voltage (V)</th>
<th>Output Current (mA)</th>
<th>Operating Efficiency (%)</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>LTC3200</td>
<td>PWM</td>
<td>5+</td>
<td>Parallel</td>
<td>2.7 to 4.5</td>
<td>Adj (1.268 to 5.4)</td>
<td>100</td>
<td>87</td>
<td>MSOP-8</td>
</tr>
<tr>
<td>LTC3200-5</td>
<td>PWM</td>
<td>5+</td>
<td>Parallel</td>
<td>2.7 to 4.5</td>
<td>5</td>
<td>100</td>
<td>87</td>
<td>ThinSOT</td>
</tr>
<tr>
<td>LTC3201</td>
<td>DAC</td>
<td>5+</td>
<td>Parallel</td>
<td>2.7 to 4.5</td>
<td>Adj (3.19 to 4.6)</td>
<td>100</td>
<td>87</td>
<td>MSOP-10</td>
</tr>
<tr>
<td>LTC3202</td>
<td>DAC</td>
<td>6+</td>
<td>Parallel</td>
<td>2.7 to 4.5</td>
<td>Adj (3.3 to 4.0)</td>
<td>125</td>
<td>87</td>
<td>3x3 DFN-10</td>
</tr>
<tr>
<td>LTC3204-5*</td>
<td>PWM</td>
<td>6+</td>
<td>Parallel</td>
<td>2.7 to 5.5</td>
<td>5</td>
<td>150</td>
<td>93</td>
<td>2x2 DFN-6</td>
</tr>
<tr>
<td>LTC3204B-5</td>
<td>PWM</td>
<td>6+</td>
<td>Parallel</td>
<td>2.7 to 5.5</td>
<td>5</td>
<td>150</td>
<td>93</td>
<td>2x2 DFN-6</td>
</tr>
<tr>
<td>LTC3203B</td>
<td>PWM</td>
<td>6+</td>
<td>Parallel</td>
<td>2.7 to 5.5</td>
<td>Adj (0.9 to 5.4)</td>
<td>500</td>
<td>90</td>
<td>3x3 DFN-10</td>
</tr>
<tr>
<td>LTC3203-1*</td>
<td>PWM</td>
<td>6+</td>
<td>Parallel</td>
<td>2.7 to 5.5</td>
<td>4.5, 5</td>
<td>500</td>
<td>90</td>
<td>3x3 DFN-10</td>
</tr>
<tr>
<td>LTC3203B-1</td>
<td>PWM</td>
<td>6+</td>
<td>Parallel</td>
<td>2.7 to 5.5</td>
<td>4.5, 5</td>
<td>500</td>
<td>90</td>
<td>3x3 DFN-10</td>
</tr>
</tbody>
</table>

* Burst Mode Operation
LCD and CCD Bias Power

LCD and CCD Bias ICs deliver highly compact and efficient power supply solutions for small LCD displays. Key features include wide input voltage range, built-in inrush current limiting, output disconnect and power saving controls to simplify the task of implementing power friendly LCD displays.

Applications:
- Cellular Handsets with Color Display
- Handheld Instruments
- PDAs

**LTC3450: Triple Output Power Supply for Small TFT-LCD Displays**

Part Number | Number of Outputs | $V_{IN}$ (V) | $V_{OUT}$ (V) | $I_{SW}$ (A)* | Frequency | $I_{Q}$ (µA) | Output Disconnect | Package
--- | --- | --- | --- | --- | --- | --- | --- | ---
LT1611 | 1 | 1.1 to 10 | -34 | 0.55 | 1.4MHz | 3mA | - | ThinSOT
LT1945 | 1 | 1.2 to 15 | ±34 | 0.25 | Constant Off-Time | 20 | - | MSOP-10
LT1618 | 1 | 1.6 to 18 | 36 | 1.50 | 1.4MHz | 1.8mA | - | MSOP-10
LT3472 | 1 | 2.2 to 16 | ±34 | 0.35 | 1.2MHz | 2.8mA | Yes | 3x3 DFN-10
LT3473/A | 1 | 2.2 to 16 | 34 | 1.20 | 1.2MHz | 150 | Yes | 3x3 DFN-8
LT3464 | 1 | 2.3 to 10 | 34 | 0.085 | Constant Off-Time | 25 | - | ThinSOT
LT3467 | 1 | 2.4 to 16 | 40 | 1.10 | 1.3MHz | 1mA | - | ThinSOT
LT3479 | 1 | 2.5 to 24 | 40 | 3.00 | 3.5MHz | 5mA | - | DFN/TSSOP
LT3461/A | 1 | 2.5 to 16 | 38 | 0.30 | 1.3MHz/3MHz | 2.8mA | - | ThinSOT
LT1930/A | 1 | 2.6 to 16 | 34 | 1.00 | 1.2MHz/2.2MHz | 4.2mA/5.5mA | - | ThinSOT
LT1931/A | 1 | 2.6 to 16 | -34 | 1.00 | 1.2MHz/2.2MHz | 5.8mA | - | ThinSOT
LT1697 | 1 | 2.8 to 5.5 | 6 | 0.9 | 300kHz | 0.9mA | - | MSOP-10
LT1617/-1 | 2 | 1.2 to 15 | -34 | 0.35/0.10 | Constant Off-Time | 20 | - | ThinSOT
LT3463/A | 2 | 2.4 to 15 | ±40 | 0.25 x 2 | Constant Off-Time | 40 | Yes | 3x3 DFN-10
LT3471 | 2 | 2.4 to 16 | ±40 | 2 x 1.30 | 1.2MHz | 2.5mA | - | 3x3 DFN-10
LT3466-1 | 2 | 2.7 to 24 | 40 | 0.32 x 2 | 1.0MHz | 5mA | - | 3x3 DFN-10, TSSOP-16E
LTC3450 | 3 | 1.5 to 4.6 | ±15 | 0.09 | 550kHz | 75 | - | 3x3 QFN-16
LT1942 | 4 | 2.6 to 16 | 44 | 0.55/0.15/0.5/0.5 | 1MHz | 7mA | Yes | 4x4 QFN-24

* $I_{SW} \approx 0.65 \times I_{Q} \times (V_{IN} / V_{OUT})$. Estimate: may vary depending on external component selection.
Low Power Multi-Display LED Drivers - Inductor Based

Multi-display inductor-based white LED drivers are capable of driving up to 20 white LEDs from a single cell Li-Ion/Polymer input. Key features include high-voltage internal power switches, internal Schottky diodes, adjustable switching frequency, DC dimming control, open LED protection and optimized internal compensation. They are ideal solutions for multipanel LCD backlight applications or space constrained portable applications such as cellular phones, PDAs and digital cameras.

Applications:
- Notebook PC Displays
- LED Camera Light for Cell Phones
- Car Dashboard Lighting
- Avionics Displays

LT3486: Dual 1.3A White LED Step-Up Converter with 1000:1 Dimming Range

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Type</th>
<th>Dimming Type</th>
<th>Max # of LEDs x I_{OUT}*</th>
<th>LED Configuration</th>
<th>Input Voltage Range (V)</th>
<th>Max. Output Voltage (V)</th>
<th>I_{SW} (mA)</th>
<th>Operating Efficiency (%)</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>LT3497</td>
<td>Dual LED Driver</td>
<td>250:1 PWM</td>
<td>2 x 6 x 20mA</td>
<td>Dual Series Strings</td>
<td>2.5 to 10</td>
<td>32</td>
<td>2 x 300</td>
<td>78</td>
<td>2x3 DFN-10</td>
</tr>
<tr>
<td>LT3466-1</td>
<td>LED Driver and Boost Converter</td>
<td>DC/PWM</td>
<td>10 x 25mA</td>
<td>Series</td>
<td>2.7 to 24</td>
<td>39.4</td>
<td>2 x 320</td>
<td>84</td>
<td>3x3 DFN-10, TSSOP-16E</td>
</tr>
<tr>
<td>LT3466</td>
<td>Dual LED Driver</td>
<td>DC/PWM</td>
<td>2 x 10 x 25mA</td>
<td>Dual Series Strings</td>
<td>2.7 to 24</td>
<td>39.4</td>
<td>2 x 320</td>
<td>84</td>
<td>3x3 DFN-10, TSSOP-16E</td>
</tr>
<tr>
<td>LTC3452</td>
<td>Synchronous Buck-Boost LED Driver</td>
<td>DC/PWM</td>
<td>5 x 20mA + 1 x 200mA</td>
<td>Parallel</td>
<td>2.7 to 5.5</td>
<td>4.5</td>
<td>1A</td>
<td>88</td>
<td>4x4 QFN-20</td>
</tr>
</tbody>
</table>

* Dependent on Input Voltage, number of LEDs from a 12V Input
Low Power LED Drivers (up to 25mA/LED) - Inductor Based

Low-current inductor-based switching LED drivers ensure light intensity matching across LEDs. Key features include the purest white LED color dimming control, low standby mode quiescent current, selectable current level, guaranteed LED brightness matching and extremely small circuit size, making them well suited for cellular phone and other portable backlight applications.

Applications:
- Cellular Phones
- PDAs, Handheld Computers
- Digital Cameras
- MP3 Players
- GPS Receivers

LT3491: White LED Driver in SC70 with Integrated Schottky

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Type</th>
<th>Dimming Type</th>
<th>Max # of LED x Iout*</th>
<th>LED Configuration</th>
<th>Input Voltage Range (V)</th>
<th>Max. Output Voltage (V)</th>
<th>Isw (mA)</th>
<th>Operating Efficiency (%)</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>LT3465/A</td>
<td>LED Driver</td>
<td>DC/PWM</td>
<td>6 x 25mA</td>
<td>Series</td>
<td>2.7 to 16</td>
<td>30</td>
<td>225</td>
<td>81</td>
<td>ThinSOT</td>
</tr>
<tr>
<td>LT3591</td>
<td>LED Driver</td>
<td>90:1 PWM</td>
<td>10 x 20mA</td>
<td>Series</td>
<td>2.5 to 12</td>
<td>42</td>
<td>450</td>
<td>77</td>
<td>2x3 DFN-8</td>
</tr>
<tr>
<td>LT3491</td>
<td>LED Driver</td>
<td>300:1 PWM</td>
<td>6 x 25mA</td>
<td>Series</td>
<td>2.5 to 12</td>
<td>27</td>
<td>260</td>
<td>76</td>
<td>SC70</td>
</tr>
<tr>
<td>LTC3452</td>
<td>Synchronous Buck-Boost Converter</td>
<td>DC/PWM</td>
<td>5 x 20mA +200mA</td>
<td>Parallel</td>
<td>2.7 to 5.5</td>
<td>4.5</td>
<td>300</td>
<td>88</td>
<td>4x4 QFN-20</td>
</tr>
<tr>
<td>LT1937</td>
<td>LED Driver</td>
<td>DC/PWM</td>
<td>4 x 25mA</td>
<td>Series</td>
<td>2.5 to 10</td>
<td>34</td>
<td>320</td>
<td>84</td>
<td>ThinSOT, SC70</td>
</tr>
<tr>
<td>LT3497</td>
<td>Dual LED Driver</td>
<td>250:1 PWM</td>
<td>2x6x20mA</td>
<td>2 Parallel Series Strings of 6</td>
<td>2.5 to 10</td>
<td>32</td>
<td>2 x 300</td>
<td>77</td>
<td>2x3 DFN-10</td>
</tr>
<tr>
<td>LT3466</td>
<td>Dual LED Driver</td>
<td>DC/PWM</td>
<td>2 x 10 x 25mA</td>
<td>2 Parallel Series Strings of 10</td>
<td>2.7 to 24</td>
<td>40</td>
<td>2 x 320</td>
<td>84</td>
<td>3x3 DFN-10</td>
</tr>
<tr>
<td>LT3466-1</td>
<td>LED Driver/Boost Converter</td>
<td>DC/PWM</td>
<td>10 x 25mA</td>
<td>Series</td>
<td>2.7 to 24</td>
<td>40</td>
<td>2 x 320</td>
<td>84</td>
<td>3x3 DFN-10</td>
</tr>
<tr>
<td>LT1932</td>
<td>LED Driver</td>
<td>DC/PWM</td>
<td>10 x 25mA</td>
<td>Series</td>
<td>1.0 to 10</td>
<td>34</td>
<td>400</td>
<td>80</td>
<td>ThinSOT</td>
</tr>
<tr>
<td>LT1942</td>
<td>Quad DC/DC Converter and LED Driver</td>
<td>DC/PWM</td>
<td>12 x 25mA</td>
<td>2 Parallel Series Strings of 6</td>
<td>2.6 to 16</td>
<td>44</td>
<td>550</td>
<td>77</td>
<td>4x4 QFN-24</td>
</tr>
<tr>
<td>LT1618</td>
<td>LED Driver</td>
<td>DC/PWM</td>
<td>8 x 25mA</td>
<td>Series</td>
<td>1.6 to 18</td>
<td>36</td>
<td>1.5A</td>
<td>86</td>
<td>MSOP-10</td>
</tr>
</tbody>
</table>

* from Single Cell Li-Ion / Polymer Input
## NORTH AMERICA

### GREATER BAY AREA
- **Bay Area**
  - 720 Sycamore Dr., Milpitas, CA 95035
  - Tel: (408) 428-2050
  - Fax: (408) 432-6331
- **Sacramento**
  - 2260 Douglas Blvd., Ste. 280, Roseville, CA 95661
  - Tel: (916) 787-0210
  - Fax: (916) 787-0110

### PACIFIC NORTHWEST
- **Denver**
  - 7027 Winchester Cir., Ste. 130, Boulder, CO 80301
  - Tel: (303) 926-0002
  - Fax: (303) 500-1477
- **Portland**
  - 5005 SW Meadows Rd., Ste. 410, Lake Oswego, OR 97035
  - Tel: (503) 520-9930
  - Fax: (503) 520-9929
- **Salt Lake City**
  - Tel: (801) 731-8008

### SOUTHWEST AREA
- **Los Angeles**
  - 21243 Ventura Blvd., Ste. 238, Woodland Hills, CA 91364
  - Tel: (818) 703-0835
  - Fax: (818) 703-0517
- **Orange County**
  - 13375 Barranca Pkwy., Ste. A-213, Irvine, CA 92618
  - Tel: (949) 453-4650
  - Fax: (949) 453-4765
- **San Diego**
  - 5090 Shoreham Place, Ste. 110, San Diego, CA 92122
  - Tel: (858) 638-7131
  - Fax: (858) 638-7231

### CENTRAL AREA
- **Chicago**
  - 2040 E. Algonquin Rd., Ste. 512, Schaumberg, IL 60173
  - Tel: (847) 925-0860
  - Fax: (847) 925-0878
- **Cleveland**
  - 7550 Lucerne Dr., Ste. 106, Middleburg Heights, OH 44130
  - Tel: (440) 239-0817
  - Fax: (440) 239-1466
- **Columbus**
  - Tel: (614) 488-4466

### SOUTH AMERICA
- **Miami**
  - 1535 Brickell Ave., Ste. 4600, Miami, FL 33129
  - Tel: (305) 414-2710

### EUROPE
- **Finland**
  - Linear Technology AB, Teknobulevardi 3-5
  - P.O. Box 35
  - FIN-01311 Vantaa
  - Finland
  - Tel: +358 (0)9 2517 8200
  - Fax: +358 (0)9 2517 8201

### FRANCE
- **Linear Technology S.A.R.L.**
  - Parc Tertiaire Silic
  - 2 Rue de la Couture, BP10217
  - 94518 Rungis Cedex
  - France
  - Tel: +33 (1) 56 70 19 90
  - Fax: +33 (1) 56 70 19 94

### GERMANY
- **Linear Technology GmbH**
  - Osterfeldstrasse 84, Haus C
  - D-85737 Ismaning
  - Germany
  - Tel: +49 (99) 962545-0
  - Fax: +49 (99) 963147

### ITALY
- **Linear Technology Italy Srl**
  - Orione 3, C.D. Colleoni
  - Via Colleoni, 17
  - I-20041 Agrate Brianza (MI)
  - Italy
  - Tel: +39 039 596 5090
  - Fax: +39 039 596 5090

### SWEDEN
- **Linear Technology AB**
  - Electrum 204
  - IASFjordsgatan 22
  - SE-164 40 Kista
  - Sweden
  - Tel: +46 (8) 623 16 00
  - Fax: +46 (8) 623 16 50

### UNITED KINGDOM
- **Linear Technology (UK) Ltd.**
  - 3 The Listons, Liston Road
  - Marlow, Buckinghamshire SL7 1FD
  - United Kingdom
  - Tel: +44 (1628) 477066
  - Fax: +44 (1628) 478153