80V TO 150V NON-ISOLATED DC/DC Controllers, Monolithics & MOSFET Drivers

These new DC/DC switching regulator controllers, monolithics, and MOSFET gate drivers are designed to operate from a high input voltage or from an input that has high voltage transient excursions, eliminating the need for bulky and costly surge suppression devices. Many of them feature low quiescent currents and adjustable gate drive to enable the use of standard threshold or logic-level power MOSFETs to optimize performance in industrial control, transportation, robotic and datacom applications.

**LTC7810 Features**
- $V_{IN}$ Range: 4.5V to 140V (150V Abs Max)
- $V_{OUT}$ Range: 1V ≤ $V_{OUT}$ ≤ 60V
- Easily Configured for 2-Phase Single Output
- Low IQ: 16µA
- Drives Logic-Level or STD Threshold MOSFETs
- Optional Spread Spectrum Operation
- Very Low Dropout: 100% Duty Cycle Operation
- Phase-Lockable Frequency (75kHz to 720kHz)
- Onboard LDO or External NMOS LDO for $V_{CC}$
- 48-Lead 7mm × 7mm LQFP Package

**Efficiency Curves at Different $V_{IN}$**

**Buck & Buck-Boost Controllers**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Topology</th>
<th>$V_{IN}$ Range (V)</th>
<th>$V_{OUT}$ Range (V)</th>
<th>Max $I_{OUT}$ (A)</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>LTC3885</td>
<td>Buck</td>
<td>4 to 140, 150 Abs Max</td>
<td>0.8 to 60</td>
<td>20</td>
<td>TSSOP-38 (31)</td>
</tr>
<tr>
<td>LTC7801</td>
<td>Buck</td>
<td>4 to 140, 150 Abs Max</td>
<td>0.8 to 60</td>
<td>20</td>
<td>TSSOP-24/QFN-24</td>
</tr>
<tr>
<td>LTC7810</td>
<td>Dual Buck</td>
<td>4 to 140, 150 Abs Max</td>
<td>1 to 60</td>
<td>20/Phase</td>
<td>eLQFP-48</td>
</tr>
<tr>
<td>LTC3810</td>
<td>Buck</td>
<td>6 to 100</td>
<td>0.8 to 0.93 $V_{IN}$</td>
<td>20</td>
<td>SSOP-28</td>
</tr>
<tr>
<td>LTC3703</td>
<td>Buck (Voltage Mode)</td>
<td>9 to 100</td>
<td>0.8 to 0.93 $V_{IN}$</td>
<td>20</td>
<td>SSOP-16, TSSOP-28</td>
</tr>
<tr>
<td>LTC3777</td>
<td>Buck-Boost w/Bias Generator</td>
<td>4.5 to 150</td>
<td>1.2 to 150</td>
<td>20</td>
<td>TSSOP-38 (31)</td>
</tr>
<tr>
<td>LTC3779</td>
<td>Buck-Boost</td>
<td>4.5 to 150</td>
<td>1.2 to 150</td>
<td>20</td>
<td>TSSOP-38 (31)</td>
</tr>
<tr>
<td>LT8705A</td>
<td>Buck-Boost</td>
<td>2.8 to 80</td>
<td>1.3 to 80</td>
<td>20</td>
<td>TSSOP-38 (31)</td>
</tr>
<tr>
<td>LTC3871</td>
<td>Bidirectional Buck/Boost</td>
<td>1.2 to 30/5 to 100</td>
<td>1.2 to 30/5 to 100</td>
<td>20/Phase</td>
<td>7mm × 7mm LQFP-48</td>
</tr>
<tr>
<td>LT8706/LT8708-1</td>
<td>Bidirectional Buck/Boost</td>
<td>2.8 to 80</td>
<td>1.3 to 80</td>
<td>20</td>
<td>5mm × 8mm QFN-40</td>
</tr>
</tbody>
</table>

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Monolithic Bucks

LTC7103: 5V to 105V Input to 5V/2.3A Output Step-Down Regulator

LTC7103 Features
- VIN Range: 4.4V to 105V (110V Abs Max)
- EMI/EMC Emissions: CISPR 25 Compliant
- 2µA IQ When Regulating 48 VIN to 3.3 VOUT
- Brick Wall Current Limit
- Low Minimum On-Time: 40ns
- Wide VOUT Range: 1V to VIN
- 100% Duty Cycle Operation
- Selectable Fixed Frequency: 200kHz to 2MHz
- 5mm × 6mm QFN-36 Package

Efficiency Curves at Different VIN

Monolithic Buck Converters

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Quiescent/Current (µA)</th>
<th>VIN Range (V)</th>
<th>VOUT Range (V)</th>
<th>Max IOUT (A)</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>LTC3639</td>
<td>12</td>
<td>4 to 150</td>
<td>0.8 to VIN</td>
<td>100mA</td>
<td>MSOP-16(12)</td>
</tr>
<tr>
<td>LTC3638</td>
<td>12</td>
<td>4 to 150</td>
<td>0.8 to VIN</td>
<td>250mA</td>
<td>MSOP-16(12)</td>
</tr>
<tr>
<td>LTC7138</td>
<td>12</td>
<td>4 to 140</td>
<td>0.8 to VIN</td>
<td>400mA</td>
<td>MSOP-16(12)</td>
</tr>
<tr>
<td>LTC7103</td>
<td>2</td>
<td>4.4 to 105</td>
<td>1 to VIN</td>
<td>2.3</td>
<td>5mm × 6mm QFN-36</td>
</tr>
<tr>
<td>LT8630</td>
<td>7</td>
<td>3 to 100</td>
<td>0.8 to 60</td>
<td>600mA</td>
<td>TSSOP-20</td>
</tr>
<tr>
<td>LT8631</td>
<td>7</td>
<td>3 to 100</td>
<td>0.8 to 60</td>
<td>1</td>
<td>TSSOP-20</td>
</tr>
</tbody>
</table>
Multitopology Devices

**LT8710: Synchronous Inverter Generates –5V/7A from a 4.5V to 25V Input**

**LT8710 Features**
- Synchronous SEPIC/Inverting/Boost Controller
- Wide Input Range: 4.5V to 80V
- Rail-to-Rail Output Current Monitor and Control
- Input Voltage Regulation for High Impedance Inputs
- C/10 or Power Good Indication Pin
- MODE Pin for Forced CCM or Pulse-Skipping Operation
- Switching Frequency Up to 750kHz
- Can Be Synchronized to an External Clock
- High Gain EN/FBIN Pin Accepts Slowly Varying Input Signals
- Thermally Enhanced 20-Lead TSSOP Package

**Efficiency/Power Loss Curves**

<table>
<thead>
<tr>
<th>Multitopology Devices</th>
<th>Part Number</th>
<th>Topology</th>
<th>VIN Range (V)</th>
<th>VOUT Range (V)</th>
<th>Max IOUT (A)</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>LT3758</td>
<td>Boost, Flyback, SEPIC and Inverting</td>
<td>5.5 to 100</td>
<td>Depends on External Components</td>
<td>3</td>
<td>3mm × 3mm DFN-10, MSOP-10</td>
<td></td>
</tr>
<tr>
<td>LT8710</td>
<td>Synchronous SEPIC/Inverting/Boost</td>
<td>4.5 to 80</td>
<td>Depends on External Components</td>
<td>10</td>
<td>TSSOP-20</td>
<td></td>
</tr>
<tr>
<td>LTC3896</td>
<td>Synchronous Inverter</td>
<td>4 to 140, 150 Abs Max</td>
<td>–0.8 to –60V</td>
<td>20</td>
<td>TSSOP-38</td>
<td></td>
</tr>
<tr>
<td>LT8714</td>
<td>Synchronous 4-Quadrant</td>
<td>4.5 to 80</td>
<td>Depends on External Components</td>
<td>10</td>
<td>TSSOP-20</td>
<td></td>
</tr>
<tr>
<td>LT3796</td>
<td>Buck, Boost, SEPIC LED Driver</td>
<td>6 to 100</td>
<td>Depends on External Components</td>
<td>3</td>
<td>TSSOP-28</td>
<td></td>
</tr>
</tbody>
</table>
MOSFET Gate Drivers

LTC7000/LTC7000-1

The LTC7000/-1 are fast high-side N-channel MOSFET gate drivers that operate from input voltages up to 135V. They contain an internal charge pump that fully enhances an external N-channel MOSFET switch, allowing them to remain on indefinitely. Their powerful driver can easily drive large gate capacitances with very short transition times, making them also well suited for high frequency switching applications that require a fast turn-on and/or turn-off time.

LTC700 Features

- VIN Range: 3.5V to 135V (150V Abs Max)
- Internal Charge Pump for 100% Duty Cycle
- 1Ω Pull-Down, 2.2Ω Pull-Up
- Fast Turn-On and Turn-Off Times
- Short-Circuit Protected
- Adjustable Current Trip Threshold
- Current Monitor Output
- Automatic Restart Timer
- Open-Drain Fault Flag
- Adjustable Turn-On Slew Rate
- Gate Driver Supply from 3.5V to 15V
- CMOS Compatible Input
- MSOP-16 Packages with High Voltage Spacing

Turn-On Waveform

<table>
<thead>
<tr>
<th>LTC7000/LTC7000-1</th>
<th>Package 16-Lead MSOP MSE16</th>
<th>16-Lead MSOP MSE16(12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Voltage Pin Spacing</td>
<td>0.157mm</td>
<td>0.657mm</td>
</tr>
<tr>
<td>RUN/OVLO/ISET/IMON Pins</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

MOSFET Gate Drivers

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Topology</th>
<th>VIN Range (V)</th>
<th>VOUT Range (V)</th>
<th>Max IOUT (A)</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>LTC7000/LTC7000-1</td>
<td>Protected High-Side NMOS Gate Driver</td>
<td>3.5 to 150</td>
<td>3.5 to 150</td>
<td>Up to 50+</td>
<td>MSOP-16/MSOP-16(12)</td>
</tr>
<tr>
<td>LTC7001</td>
<td>High-Side NMOS Gate Driver</td>
<td>3.5 to 150</td>
<td>3.5 to 150</td>
<td>Up to 50+</td>
<td>MSOP-10</td>
</tr>
<tr>
<td>LTC4444</td>
<td>Synchronous N-Channel MOSFET Driver</td>
<td>Up to 114</td>
<td>Up to 100</td>
<td>Up to 50+</td>
<td>MSOP-8</td>
</tr>
<tr>
<td>LTC4440A-5</td>
<td>High-Side NMOS Gate Driver</td>
<td>Up to 80, 100 Abs Max</td>
<td>Up to 80, 100 Abs Max</td>
<td>Up to 50+</td>
<td>MSOP-8/SOT-23</td>
</tr>
</tbody>
</table>

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