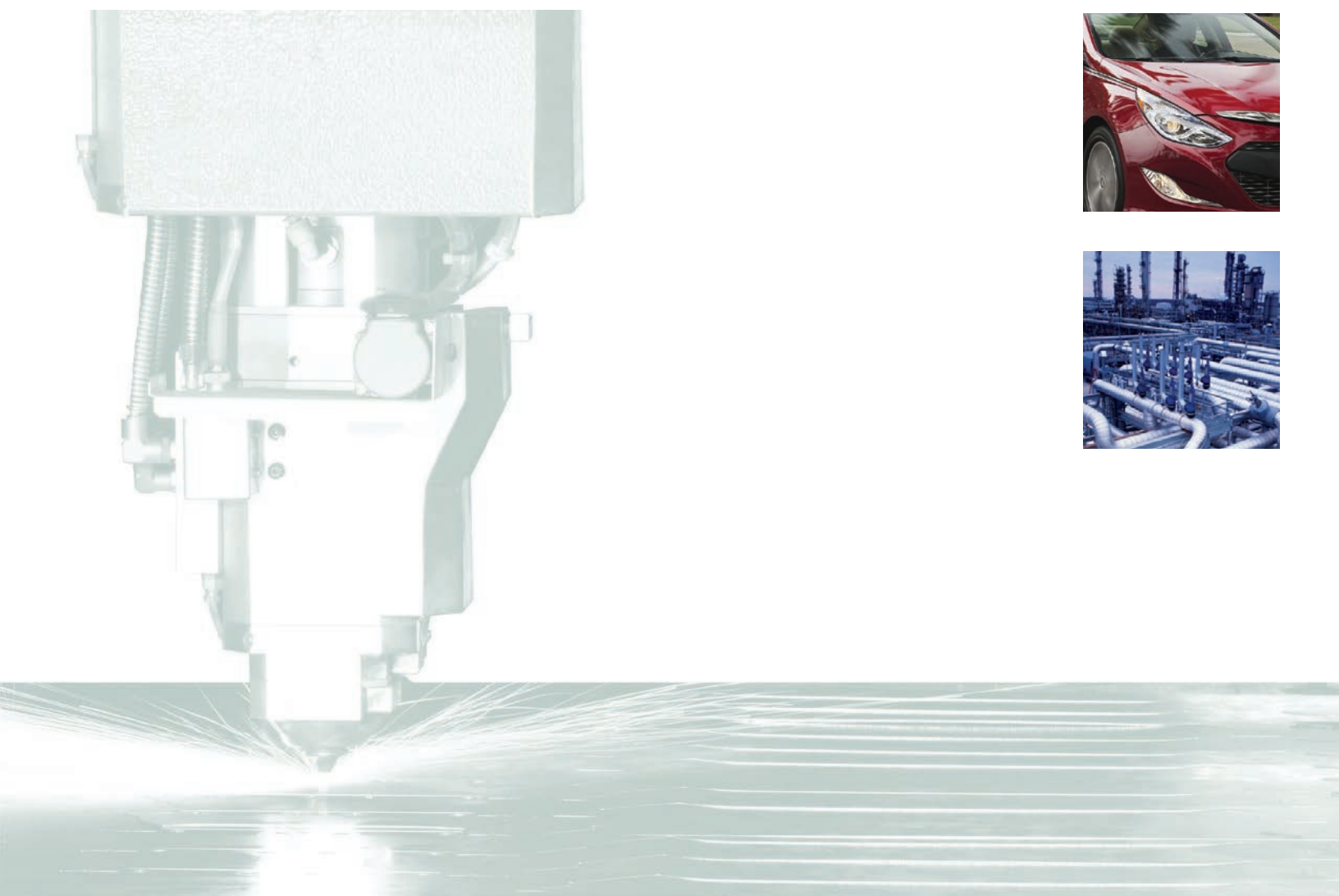
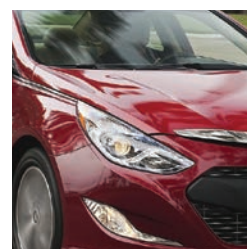


# High Performance DC/DC Controllers



We provide complete power solutions with a full lineup of power management products. This brochure provides an overview of our high performance DC/DC switching regulator controllers for applications including datacom, telecom, industrial, automotive, medical, avionics and control systems. We make power design easier with our industry-leading field application engineering support; a broad selection of demonstration boards with schematics, layout files and parts lists; SwitcherCAD® software for simulation, application notes and comprehensive technical documentation.

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### Step-Up (Boost), Buck-Boost, Sepic, Inverter and Flyback Controllers

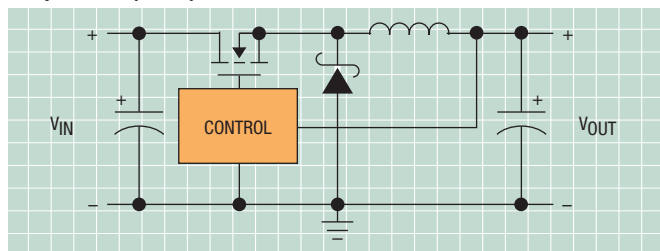
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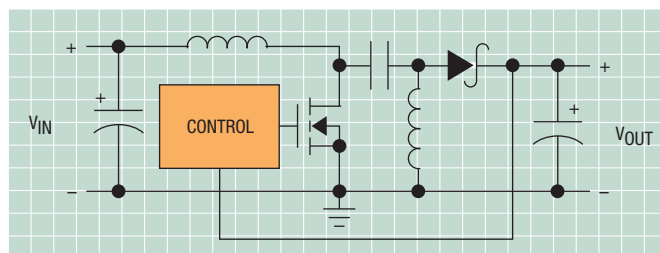
## DC/DC Converter Topologies

### Step-Down (Buck) Converter



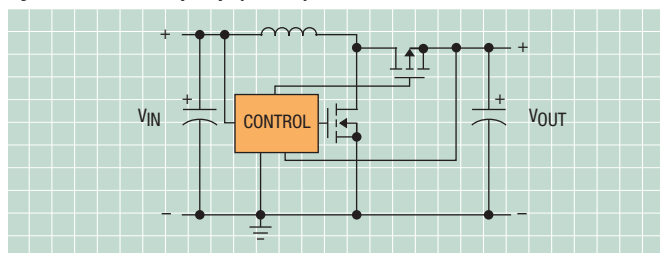
$$V_{OUT} < V_{IN}$$

### SEPIC Converter



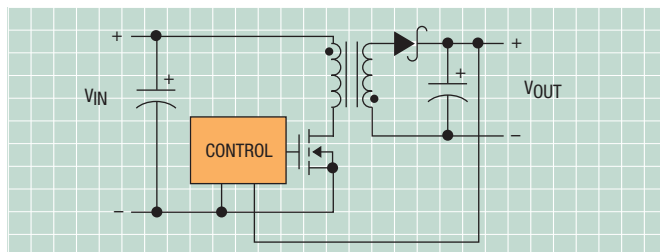
$$V_{IN} \text{ Above, Below or Equal to } V_{OUT}$$

### Synchronous Step-Up (Boost) Converter



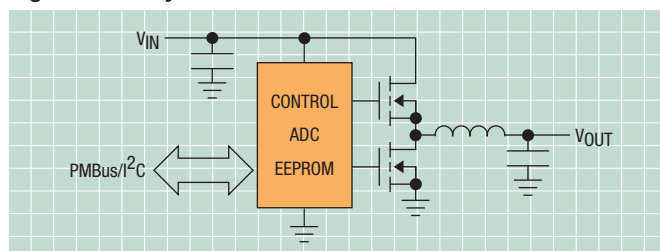
More Efficient than a Standard Boost

### Flyback Converter



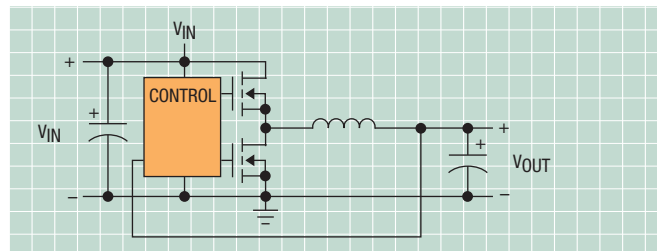
Isolated and Non-Isolated; High  $V_{OUT}/V_{IN}$  Ratios; Simple

### Digital Power Synchronous Buck Converter



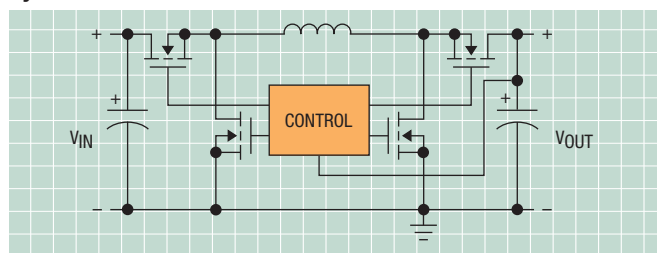
Digital Control, Telemetry and Fault Logging

### Synchronous Step-Down (Buck) Converter



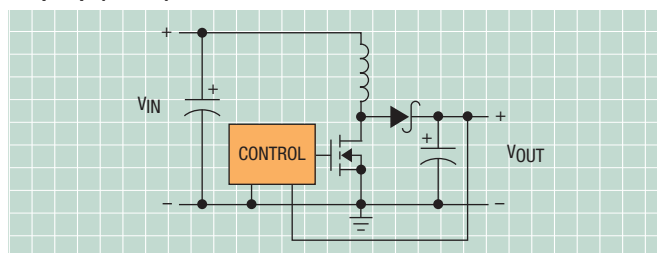
More Efficient than a Standard Buck

### Synchronous Buck-Boost Converter



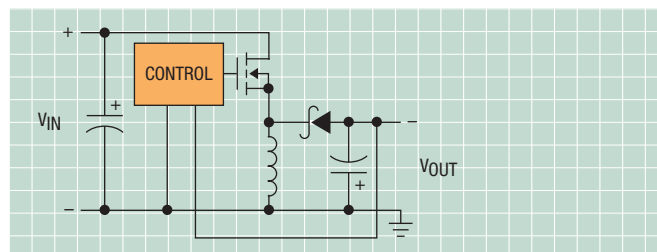
$V_{IN}$  Above, Below or Equal to  $V_{OUT}$ ; More Efficient than a SEPIC

### Step-Up (Boost) Converter



$$V_{OUT} > V_{IN}$$

### Inverter



Converts Positive Input Voltage to Negative Output Voltage

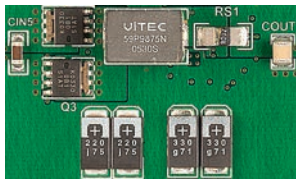
## Single Output Buck DC/DC Controllers

Linear Technology's single output buck step-down DC/DC controllers provide up to 96 percent efficient step-down conversion. Output voltages are as low as 0.6V with currents up to 60 amps. Features include synchronous or nonsynchronous operation, onboard MOSFET drivers, low quiescent current, tracking, tight reference voltage accuracy, optional sense resistor, current mode or voltage mode control, and selectable and/or synchronizable operating frequency. Linear offers several hundred buck controllers. Only a select few are listed below. For a complete list visit [www.linear.com/LTC3852](http://www.linear.com/LTC3852) or contact your local sales office.

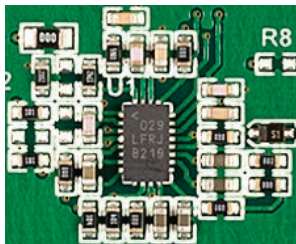
### $V_{IN}$ up to 24V

#### LTC3852 Features

- Charge Pump Input Range: 2.7V to 5.5V
- Integrated Charge Pump Provides 5V Gate Drive to Logic Level MOSFETs
- $R_{SENSE}$  or DCR Current Sensing
- $\pm 1.25\%$  Output Voltage Accuracy Over Temperature
- Phase-Lockable Fixed Frequency: 250kHz to 750kHz

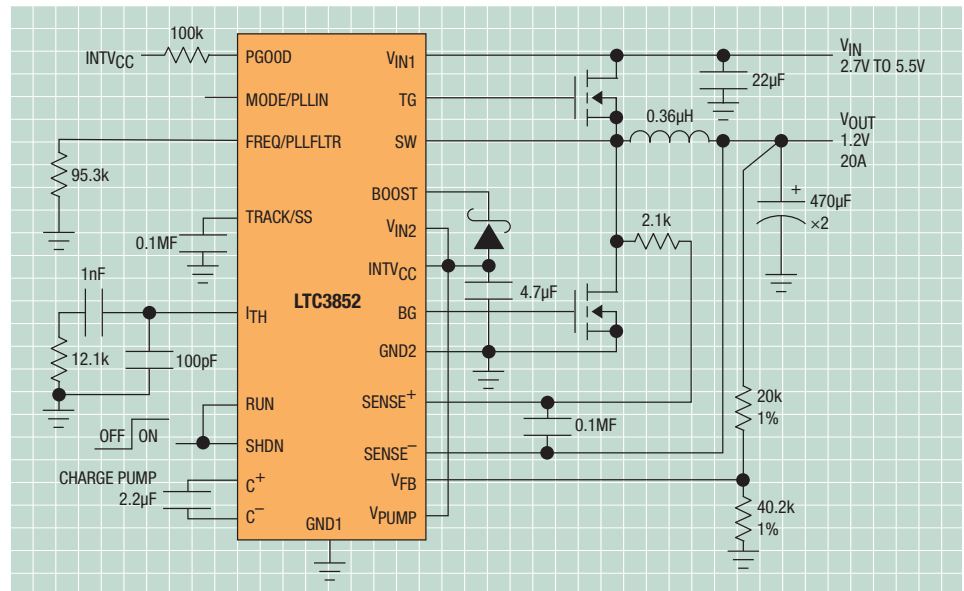


**LTC3852**  
Actual Size  
Demo Board  
(DC1270A)



Actual Size  
Back

**LTC®3852 Low Voltage Synchronous Step-Down Schematic**



Part Number	$V_{IN}$ Range (V)	$V_{OUT}$ Range (V)	$I_{OUT}^{(1)}$ Max (A)	Operating Frequency <sup>(2)</sup>	$I_Q$ (SUPPLY)	Package	DR/MOS Power Block Compatible	Synchronous Rectification	No $R_{SENSE}$	Tracking	Synchronizable	Logic Level MOSFETs	Power Good Signal	Programmable Soft-Start	Current (I) or Voltage (V) Mode Control
LTC3852	2.7 to 5.5	0.8 to $0.9V_{IN}$	25	250kHz to 750kHz	7mA	3x5 QFN-20		✓	✓	✓	✓	✓	✓	✓	I
LT3740	2.2 to 22	0.8 to $0.77V_{IN}$	20	300kHz	2.5mA	DFN-16						✓			I
LTC3830/-1	3 to 8	1.26 to $0.91V_{IN}$	20	100kHz to 500kHz	700uA	S8, S0-16, SSOP-16		✓	✓		✓			✓	V
LTC3832/-1	3 to 8	0.6 to $0.91V_{IN}$	20	100kHz to 500kHz	700uA	S0-8, SSOP-16		✓	✓		✓			✓	V
LTC3861	3 to 24	0.6 to 5	30 x 2	250kHz to 2.25 MHz	30mA	5x6 QFN-36	✓	✓	✓	✓	✓	✓			I
<b>Low Quiescent Current</b>															
LTC3772/B	2.75 to 9.8	0.8 to $0.9V_{IN}$	5	550kHz	40uA	DFN-8, ThinSOT™			✓						I
LTC3801/B	2.4 to 9.8	0.8 to $V_{IN}$	5	550kHz	16uA	ThinSOT									I
LTC3808	2.75 to 9.8	0.6 to $V_{IN}$	5	250kHz to 750kHz	105uA	DFN-14, SSOP-16		✓	✓	✓	✓				I
LTC3809/-1	2.75 to 9.8	0.6 to $V_{IN}$	5	250kHz to 750kHz	105uA	DFN-10, MSOP-10E		✓	✓	✓	✓				I
LTC3822	2.75 to 4.5	0.6 to $0.99V_{IN}$	20	300kHz/550kHz/750kHz	360uA	DFN-10, MSOP-10		✓	✓						I
LTC3822-1	2.75 to 4.5	0.6 to $0.99V_{IN}$	20	300kHz/550kHz/750kHz	105uA	DFN-12, SSOP-16		✓	✓	✓	✓			✓	I

Notes

(1) The maximum output current depends on the choice of external components

(2) The operating frequency can be selected within the range indicated

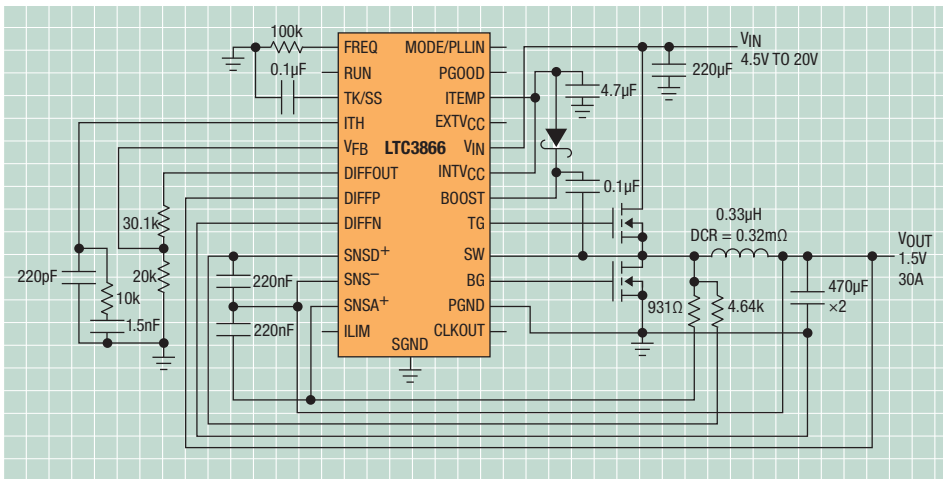
## Single Output Buck DC/DC Controllers

$V_{IN}$  up to 38V

### LTC3866 Features

- Sub Milliohm DCR Current Sensing
- Advanced Current Mode Control For Ultralow Jitter
- High Efficiency: Up to 95%
- Selectable Current Sensing Limit
- Programmable DCR Temperature Compensation
- $\pm 0.5\%$  0.6V Output Voltage Accuracy
- Programmable Fixed Frequency 250kHz to 770kHz
- High Speed Differential Remote Sense Amplifier

### LTC3866 Sub-Milliohm Synchronous Step-Down Schematic

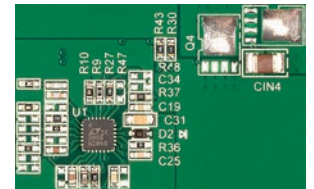


### LTC3866

Actual Size Demo Board  
(DC1829A)



Actual Size Back



Part Number	$V_{IN}$ Range (V)	$V_{OUT}$ Range (V)	$I_{OUT}^{(1)}$ Max (A)	Operating Frequency <sup>(2)</sup>	$I_O$ (SUPPLY)	Package	Synchronous Rectification	Remote $V_O$ Sensing	Sub Millie OHM DCR	Tracking	Synchronizable	Power Good Signal	Number of Phases	DR MOS/Power Block Compatible
LTC3866	4.5 to 38	0.6 to 3.5	40	250kHz to 770kHz	3.2mA	4x4 QFN-20/TSSOP-24	✓	✓	✓	✓	✓	✓	1	✓
LTC3854	4.5 to 38	0.8 to 5.5	25	400kHz	2mA	3x3 DFN/MSOP-12	✓			✓	✓		1	
LTC3851A/-1	4 to 38	0.8 to 5.5	25	250kHz to 750kHz	1mA	QFN-16/SSOP-16	✓			✓	✓		1	
LTC3775	4.5 to 38	0.6 to 0.8 $V_{IN}$	25	250kHz to 1MHz	3.5mA	3x3 QFN-12/MSOP-16E	✓			✓	✓		1	
LTC3878	4 to 38	0.8 to 0.9 $V_{IN}$	25	Constant On-Time	1.5mA	SSOP-16	✓						1	
LTC3879	4 to 38	0.6 to 0.9 $V_{IN}$	25	Constant On-Time	1.5mA	3x3 QFN-12/MSOP-16E	✓			✓		✓	1	
LTC3833	4.5 to 38	0.6 to 5.5	25	200kHz to 2MHz	2mA	3x4 QFN-20/TSSOP-20	✓	✓		✓	✓	✓	1	
LTC3867	4 to 38	0.6 to 14	25	200kHz to 1.2MHz	3.5mA	4x4 QFN-24	✓	✓		✓	✓	✓	1	
<b>Low Quiescent Current</b>														
LTC3835/-1	4 to 36	0.8 to 10	25	140kHz to 650kHz	80µA	GN16/3x5 DFN, FE20/4x5QFN	✓			✓	✓	✓	1	
LTC3834/-1	4 to 36	0.8 to 10	25	140kHz to 650kHz	30µA	GN16/3x5 DFN, FE20/4x5QFN	✓			✓	✓	✓	1	

#### Additional Features

All parts have peak or valley current mode control and a shutdown (run) pin

#### Notes

(1) The maximum output current depends on the choice of external components

(2) The operating frequency can be selected within the range indicated

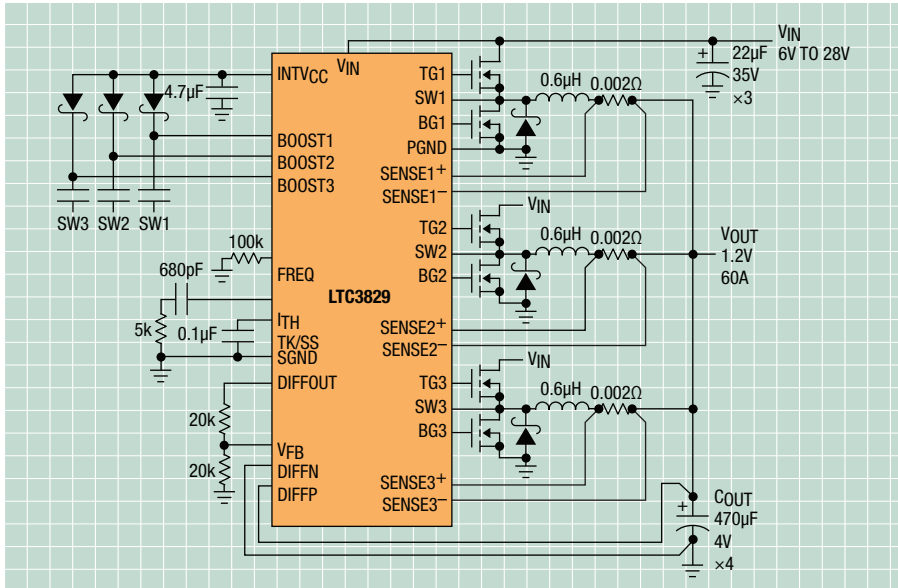




## PolyPhase Single Output DC/DC Controllers

PolyPhase operation clocks multiple DC/DC converter channels out-of-phase. This significantly reduces the input and output ripple currents, resulting in higher efficiency and lower EMI, as well as enabling smaller input and output filtering components.

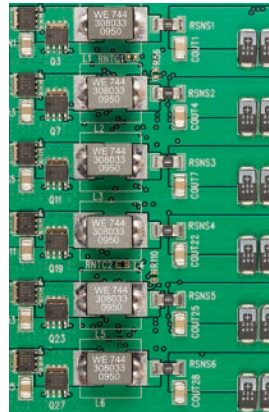
### LTC3829 3-Phase Synchronous Step-Down Schematic



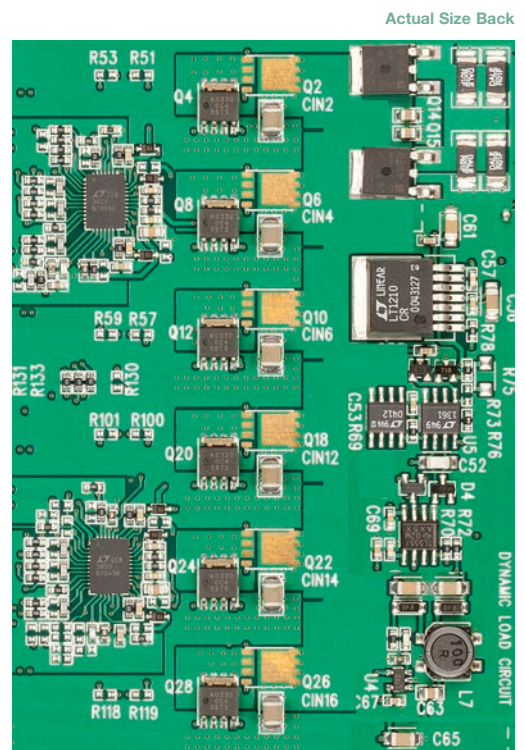
#### LTC3829 Features

- Nonlinear Control for Fast Transient Response
- $\pm 0.75\%$ , 0.6V Reference Accuracy
- PWM, Stage Shedding™ or Burst Mode® Operation
- High Efficiency: Up to 95%
- $R_{SENSE}$  or DCR Current Sensing
- Programmable DCR Temperature Compensation
- Phase-Lockable Fixed Frequency: 250kHz to 770kHz
- True Remote Sense Differential Amplifier

**LTC3829**  
Actual Size  
Demo Board  
(DC1675A)



$V_{IN} = 7V$  to  $14V$   
 $V_{OUT} = 1.5V@120A$   
6-Phase Design with 2 LTC3829 ICs



Part Number	$V_{IN}$ Range (V)	$V_{OUT}$ Range (V)	$I_{OUT}^{(1)}$ MAX (A)	$I_O$ (SUPPLY)	Operating Frequency	Package	Number of Channels	Maximum # of Phases	Remote Sense	Tracking	Synchronizable	EXTV <sub>CC</sub>	DCR Temp Compensation
LTC3856	4.5 to 38	0.6 to 5.5	50 to 300	4mA	250kHz to 770kHz	5x5 QFN-32, TSSOP-38	2	12	✓	✓	✓	✓	✓
LTC3839	4.5 to 38	0.6 to 5.5	40 to 240	3mA	250kHz to 2MHz	5x5 QFN-32	2	12	✓	✓	✓	✓	✓
LTC3829	4.5 to 38	0.6 to 5	75 to 150	4mA	250kHz to 770kHz	5x6 QFN-36	3	6	✓	✓	✓	✓	✓

#### Additional features

- (A) All parts have differential  $V_O$  sensing, shut-down (run) pin, clock input, programmable soft-start and a power good signal  
(B) All parts are peak current mode controllers  
(C) Multiple parts can be paralleled for higher current applications

#### Notes

- (1) The maximum output current depends on the choice of external components and number of phases  
(2) The operating frequency can be selected within the range indicated  
(3) The maximum 240A can only be developed by paralleling multiple phases

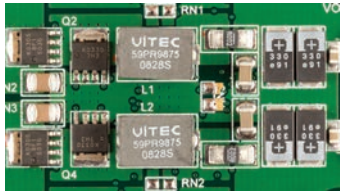
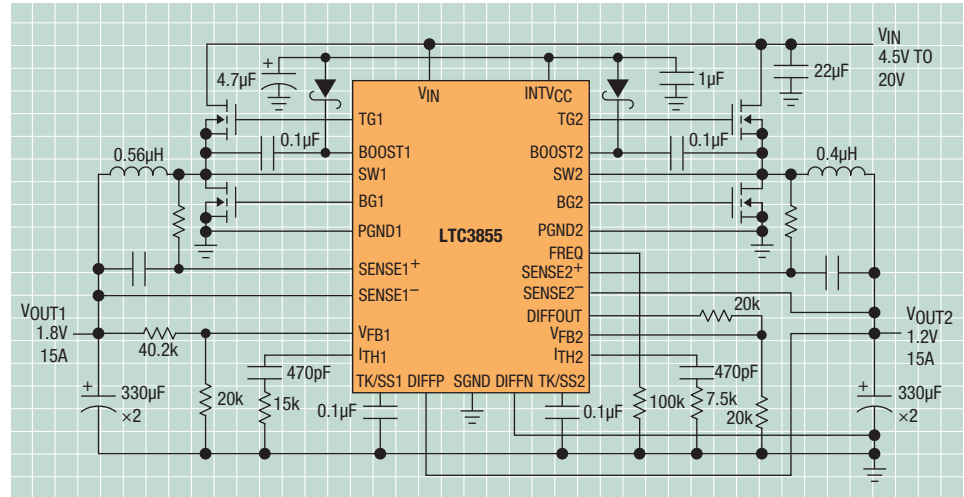
## PolyPhase Multiple Output DC/DC Controllers

Linear's PolyPhase multiple output DC/DC controllers provide up to three high current outputs with up to 95 percent efficiency. Features include multiphase operation, onboard MOSFET drivers, synchronous or nonsynchronous rectification, low quiescent current, tracking, tight  $V_{REF}$  accuracy and choice of current sense element. Other options include selectable, synchronizable switching frequency or constant on-time, tracking, along with DrMOS and power block compatibility.

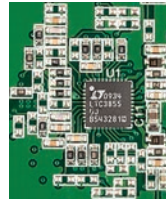
### LTC3855 Features

- Dual, 180° Phased Controllers Reduce Required Input Capacitance and Power Supply Induced Noise
- High Efficiency: Up to 95%
- $R_{SENSE}$  or DCR Current Sensing
- Programmable DCR Temperature Compensation
- $\pm 0.75\%$  0.6V Output Voltage Accuracy
- Phase-Lockable Fixed Frequency 250kHz to 770kHz
- True Remote Sensing Differential Amplifier

### LTC3855 Dual Output 2-Phase Synchronous Step-Down Schematic



**LTC3855**  
Actual Size  
Demo Board  
(DC1441A)



Actual Size  
Back

Part Number	$V_{IN}$ Range (V)	$V_{OUT}$ Range (V)	$I_{OUT}^{(1)}$ MAX (A)	$I_Q$ (SUPPLY)	Operating Frequency <sup>(2)</sup>	Package	Number of Outputs	Maximum # of Phases	Remote Sense	Tracking	Synchronizable	EXTV <sub>CC</sub>	DrMOS/Power Block Compatible	DCR Temp Compensation
LTC3855	4.5 to 38	0.6 to 3.3 (12.5)	25/25	3.5mA	250kHz to 770kHz	6x6 QFN-40, TSSOP-38	2	12	✓	✓	✓	✓		✓
LTC3838	4.5 to 38	0.6 to 5.5	25/25	3mA	250kHz to 2MHz	5x7 QFN-38, TSSOP-38	2	12	✓	✓	✓	✓		
LTC3861	3 to 24	0.6 to 5	40/40	30mA	250kHz to 2.25MHz	5x6 QFN-36	2	12	✓	✓	✓		✓	
LTC3869	4 to 38	0.6 to 12.5	25/25	3mA	250kHz to 780kHz	4x5 QFN-28, SSOP-28	2	2		✓	✓	✓		
LTC3853	4.5 to 24	0.8 to 13.5	25/25/25	4.1mA	250kHz to 750kHz	6x6 QFN-40	3	12		✓	PLL	✓		
LTC3850	4.5 to 28	0.8 to 5.5	25/25	850µA	250kHz to 780kHz	QFN-28, SSOP-28	2	2		✓	PLL	✓		
LTC3736/-1	2.75 to 9.8	0.6 to $V_{IN}$	5/5	475µA	300kHz to 750kHz	QFN-24, SSOP-24	2	2		✓	PLL			
LT3742	3.5 to 30	0.8 to 30	5/5	5mA	500kHz	QFN-24	2	2		✓				
LTC3736-2	2.75 to 9.8	0.6 to $V_{IN}$	8/8	300µA	300kHz to 750kHz	QFN-24, SSOP-24	2	2		✓	PLL			
LTC3836	2.75 to 4.5	0.6 to 0.97 $V_{IN}$	10/10	450µA	250kHz to 850kHz	SSOP-28, QFN-28	2	2		✓	PLL			
LTC3859A	4.5 to 38	0.8 to 24 (Bucks), Up to 60 (Boost)	20/20/10	55µA	50kHz to 900kHz	5x7 QFN-38/TSSOP-38	3	3		✓	PLL	✓		
LTC3890/-1/-2	4 to 60	0.8 to 24	20/20	50µA	50kHz to 900kHz	5x5 QFN-32	2	12		✓	PLL	✓		

Additional features

(A) All parts have a shut-down (run) pin and a power good signal

(B) All parts are synchronous controllers, except the LT3742

(C) All parts have programmable soft-start except the LTC3736

Notes

(1) The maximum output current depends on the choice of external components

(2) The operating frequency can be selected within the range indicated



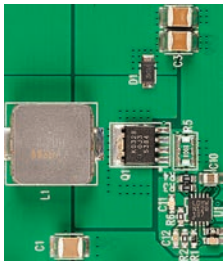
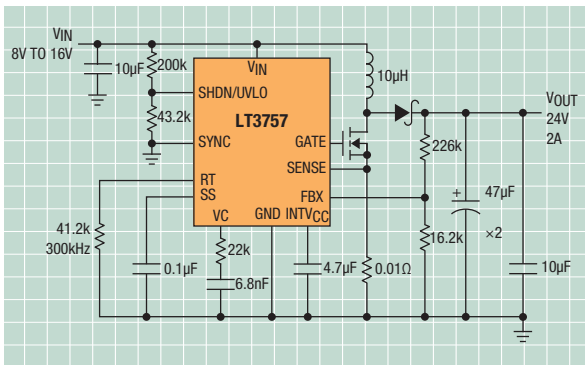
## Boost DC/DC Controllers

Linear Technology offers both synchronous and nonsynchronous boost controllers. Features include optional sense resistor, onboard LDO, 2-phase operation, high power gate drivers, programmable fixed switching frequency and low quiescent current. Efficiencies up to 97 percent can be achieved with synchronous operation.

### LT3757 Features

- Wide Input Voltage Range: 2.9V to 40V
- Positive or Negative Output Voltage Programming with a Single Feedback Pin

### LT3757 Boost Schematic

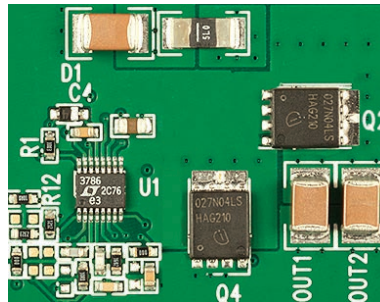
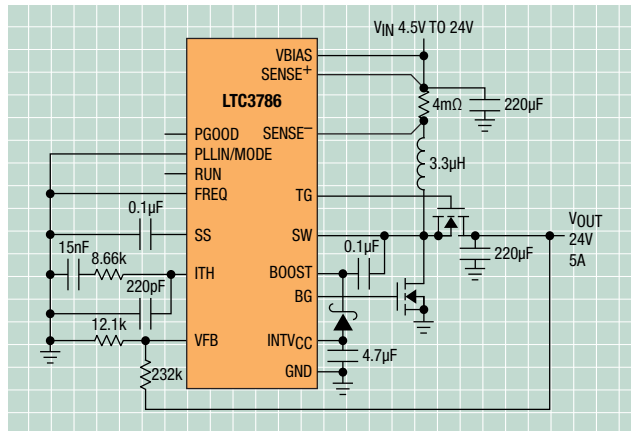


**LT3757**  
Actual Size Demo Board  
(DC1547A)

### LTC3786 Features

- Synchronous Operation For Highest Efficiency and Reduced Heat Dissipation
- Wide  $V_{IN}$  Range: 4.5V to 38V (40V Abs Max) and Operates Down to 2.5V After Start-Up
- Output Voltages Up to 60V
- Low Quiescent Current: 55µA

### LTC3786 High Power Synchronous Boost Schematic



**LTC3786**  
Actual Size Demo Board  
(DC1641A)

Part Number	$V_{IN}$ Range (V)	$V_{OUT}^{(1)}$ Range (V)	$I_{OUT}^{(1)}$ MAX (A)	Operating Frequency <sup>(2)</sup>	Package	Description
LTC3786	4.5 to 38	Up to 60	10	50kHz to 900kHz	3x3 QFN-16, MSOP-16E	Synchronous Rectification
LT3757	2.9 to 40	3.3 and Higher	5	100kHz to 1MHz	3x3 DFN-10, MSOP-10	Simple Design
LT3758	5.5 to 100	6 and Higher	5	100kHz to 1MHz	3x3 DFN-10, MSOP-10	Simple Design
LT3759	1.6 to 42	2.2 and Higher	5	100kHz to 1MHz	3x3 DFN-10, MSOP-10	Simple Design
LTC1871/-1	2.5 to 36	3.3 and Higher	5	50kHz to 1MHz	MSOP-10	No $R_{SENSE}$ : Burst Mode Operation
LTC1871-7	6 to 36	7 and Higher	5	50kHz to 1MHz	MSOP-10	No $R_{SENSE}$ : Burst Mode Operation
LTC3872	2.75 to 9.8	Up to 60V w/o $R_{SENSE}$ & Higher w/ $R_{SENSE}$	5	550kHz	SOT-23, 2x3 DFN-8	No $R_{SENSE}$ : Pulse-Skipping at Light Load
LTC1872	2.5 to 9.8	3.3 and Higher	5	550kHz	ThinSOT	Burst Mode Operation
LTC1700	0.9 to 5	1.5 to 6	5	400kHz to 750kHz	MSOP-10	Synchronous Rectification
LTC3813	7 to $0.9V_{OUT}$	8 to 100	10	100kHz to 1MHz	SSOP-28	No $R_{SENSE}$ : Synchronous Rectification

### Dual Channel (Multiphase)

LTC3862/-1/-2	4 to 36	5 and Higher	5(60)	75kHz to 500kHz	5x5 QFN-24, SSOP-24	Single Output, up to 12 Phases, Selectable Gate Drive Voltage
LTC3787	4.5 to 38	Up to 60	10(120)	50kHz to 900kHz	4x5 QFN-28, T/SSOP-28	Single Output, up to 12 Phases, Synchronous Rectification
LTC3788	4.5 to 38	Up to 60	10/10	50kHz to 900kHz	5x5 QFN-32, SSOP-28	Dual Output, up to 12 Phases, Synchronous Rectification
LT3782A	6 to 40	7 and Higher	10/10	150kHz to 500kHz	SSOP-28	2-Phase Operation

Notes (1) The maximum voltage and current depend on the choice of external components (2) The frequency can be selected within the range indicated

## Synchronous Buck-Boost DC/DC Controllers

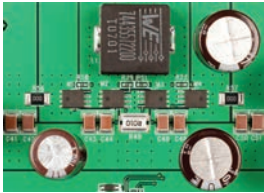
High performance 4-switch synchronous buck-boost controllers operate from an input voltage that is above, below or equal to the output voltage. These controllers utilize a single inductor and can deliver efficiencies up to 98 percent.

### LT8705 Features

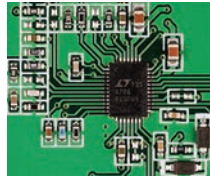
- Single Inductor Allows  $V_{IN}$  Above, Below or Equal
- $V_{IN}$  Range 2.8V (Need  $EXTV_{CC} > 6.4V$ ) to 80V
- $V_{OUT}$  Range: 1.3V to 80V
- Quad N-Channel MOSFET Gate Drivers
- Synchronous Rectification: Up to 98% Efficiency

### LT8705

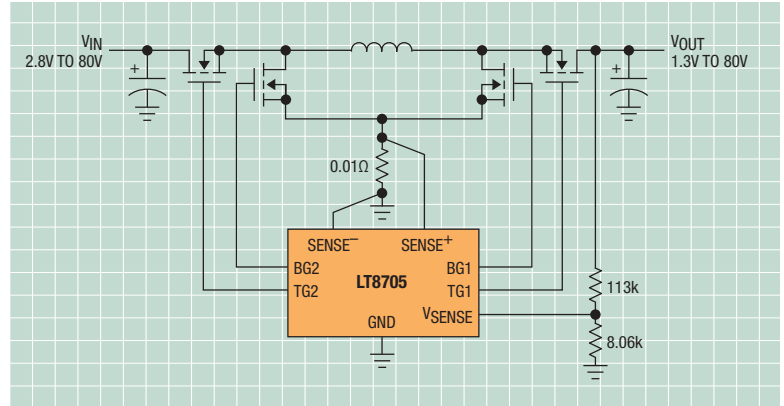
50% Size Demo Board  
(DC1761A)



Actual Size Back



### Simplified Wide Voltage Range Synchronous Buck-Boost Schematic

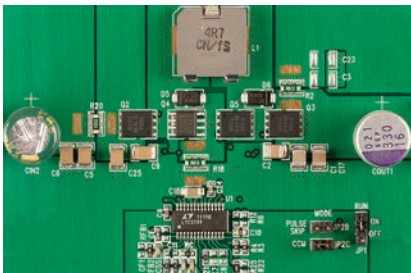


### LTC3789 Features

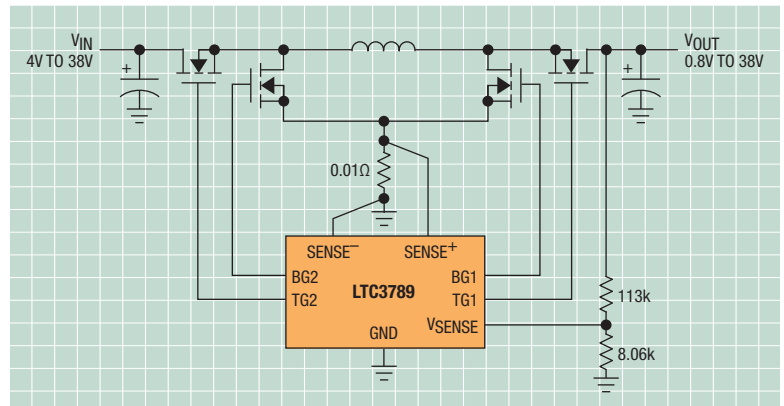
- Single Inductor Architecture Allows  $V_{IN}$  Above, Below or Equal to the Regulated  $V_{OUT}$
- Programmable Input or Output Current
- Wide  $V_{IN}$  Range: 4V to 38V
- 1% Output Voltage Accuracy:  $0.8V < V_{OUT} < 38V$
- Synchronous Rectification: Up to 98% Efficiency
- Current Mode Control

### LTC3789

Actual Size Demo Board  
(DC1523A)



### Simplified Synchronous Buck-Boost Schematic



Part Number	$V_{IN}$ Range (V)	$V_{OUT}$ Range (V)	$I_{OUT}^{(1)}$ MAX (A)	Operating Frequency <sup>(2)</sup>	Package	No RSENSE	Synchronizable	Current (I) or Voltage (V) Mode Control	Input/Output Current Monitor	Battery Changing Capability
LTC3785	2.7 to 10	2.7 to 10	10	100kHz to 1MHz	QFN-24	✓		V		
LTC3780	4 to 36	0.8 to 30	10	200kHz to 400kHz	5X5 QFN-32, SSOP-24		PLL	I		
LTC3789	4 to 38	0.8 to 38	10	200kHz to 600kHz	4X5 QFN-28, SSOP-28			I		
LT3791-1	4.7 to 60	0 to 60	10	200kHz to 700 kHz	TSSOP-38		✓		✓	✓
LT8705	2.8 to 80	1.3 to 80	10	100kHz to 400kHz	5X7 QFN-38, TSSOP-38			I	✓	✓

#### Notes

(1) The maximum voltage and current depend on the choice of external components

(2) The frequency can be selected within the range indicated

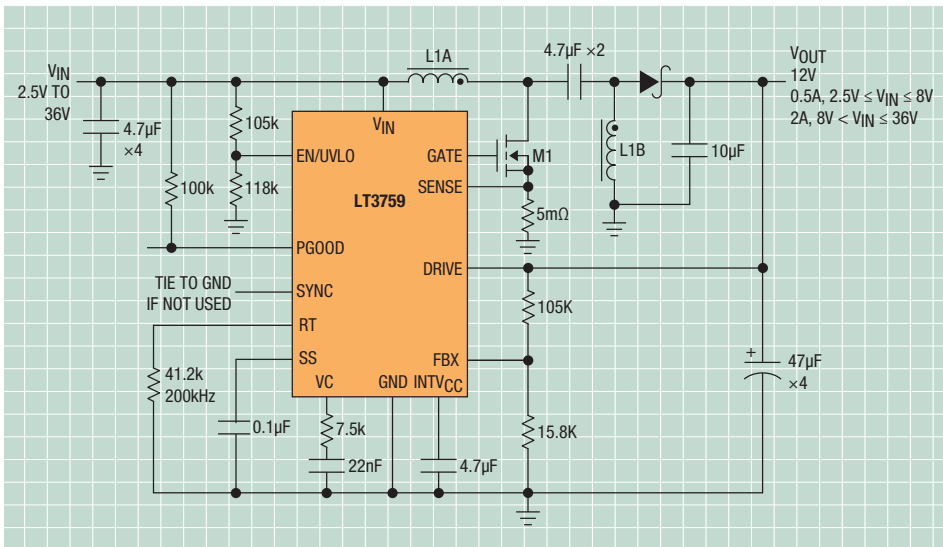
## SEPIC DC/DC Controllers

SEPIC converters operate from an input voltage that is above, below or equal to the output voltage and provides output short-circuit protection. The SEPIC provides a simpler solution as compared to synchronous buck-boost controllers, but has a lower efficiency, power density and maximum output current. All of Linear's boost controllers can be designed into a SEPIC converter. Only a select list of parts is shown below. For a complete list visit [www.linear.com/LT3759](http://www.linear.com/LT3759) or contact your local sales office.

### LT3759 Features

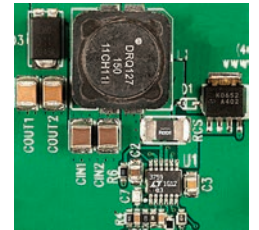
- Wide  $V_{IN}$  Range: 1.6V to 42V
- Positive or Negative Output Voltage Programming with a Single Feedback Pin
- PGOOD Output Voltage Status Report

### LT3759 SEPIC Schematic



### LT3759

Actual Size SEPIC Demo Board (DC1787A)



Part Number	$V_{IN}$ Range (V)	$V_{OUT}^{(1)}$ MAX (V)	Output Current <sup>(1)</sup> (A)	Operating Frequency <sup>(2)</sup>	NO $R_{SENSE}$	$I_O$ (SUPPLY)	Shut-Down Current	Package
LT3757	2.9 to 40	36	3	100kHz to 1MHz		1.6mA	<1µA	3x3 DFN-10/MSOP-10
LT3758	5.5 to 100	75	3	100kHz to 1MHz		1.75mA	<1µA	3x3 DFN-10/MSOP-10
LT3759	1.6 to 42	36	3	100kHz to 1MHz		350µA	<1µA	3x3 DFN-10/MSOP-10
LTC1871/-1	2.5 to 36	30	3	50kHz to 1MHz	✓	250µA	<20µA	MSOP-10
LTC1871-7	6 to 36	30	3	50kHz to 1MHz	✓	250µA	<20µA	MSOP-10
LTC3805/-5	4.7 to 75 <sup>(1)</sup>	52	3	70kHz to 700kHz		360µA	<20µA	3x3 DFN-10/MSOP-10
LT3844	4 to 60	36	3	100kHz to 600kHz		120µA	<15µA	TSSOP-16E
LT3724	7.4 to 60	36	3	200kHz		80µA	<15µA	TSSOP-16
LT1950	3 to 75 <sup>(1)</sup>	52	3	100kHz to 500kHz		2.3mA	<20µA	SSOP-16

#### Notes

(1) The maximum voltage and current depend on the choice of external components

(2) The frequency can be selected within the range indicated

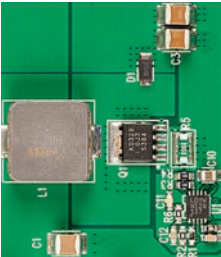
Inverter DC/DC Controllers

Inverting DC/DC controllers convert a positive input voltage to a negative output. Features include optional sense resistor, current mode control, integrated MOSFET driver, undervoltage lockout, selectable operating frequency, low quiescent current and wide input voltage range.

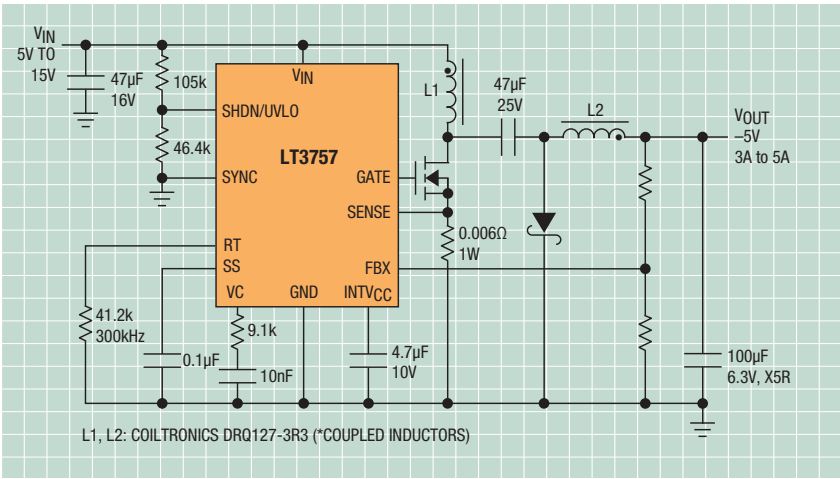
LT3757 Features

- Wide Input Voltage Range: 2.9V to 40V
- Positive or Negative Output Voltage Programming with a Single Feedback Pin

LT3757  
Actual Size Demo Board  
(DC1548A)



LT3757 Inverter Schematic



Part Number	V <sub>IN</sub> Range (V)	V <sub>OUT</sub> <sup>(1)</sup> MAX (V)	I <sub>OUT</sub> <sup>(1)</sup> MAX (A)	Operating Frequency <sup>(2)</sup>	I <sub>Q</sub> (SUPPLY)	Package
LT3757	2.9 to 40	-1.23 and Lower	5	100kHz to 1MHz	1.6mA	3x3 DFN-10, MSOP-10
LT3758	5.5 to 100	-1.23 and Lower	5	100kHz to 1MHz	1.75mA	3x3 DFN-10, MSOP-10
LT3759	1.6 to 42	-1.23 and Lower	5	100kHz to 1MHz	350µA	3x3 DFN-10, MSOP-10
LTC3704	2.5 to 36	-1.23 and Lower	5	50kHz to 1MHz	550µA	MSOP-10
LT3724	4 to 60	-1.23 and Lower	10	200kHz	100µA	TSSOP-16E
LT3800	4 to 60	-1.23 and Lower	10	200kHz	80µA	TSSOP-16E
LT3844	4 to 60	-1.23 and Lower	10	100kHz to 600kHz	120µA	TSSOP-16E
LT1952/-1	8 to 75 <sup>(1)</sup>	-2.5V and Lower	10	100kHz to 500kHz	5.2mA	SSOP-16

Notes  
(1) The maximum voltage and current depend on the choice of external components  
(2) The frequency can be selected within the range indicated

## Flyback Controllers

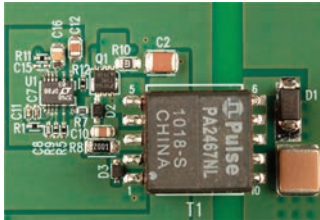
A flyback converter stores energy in a transformer during the on-time of the power switch and then delivers that energy to the output during the off-time. It is most commonly used when isolation is required from input to output, but can also be used in nonisolated applications. The output power of a flyback may vary from one watt to about 100 watts. A flyback design can operate over wide input voltage, typically up to a 4:1 input range. Its simple design makes it popular for lower power applications.

### LT3748 Features

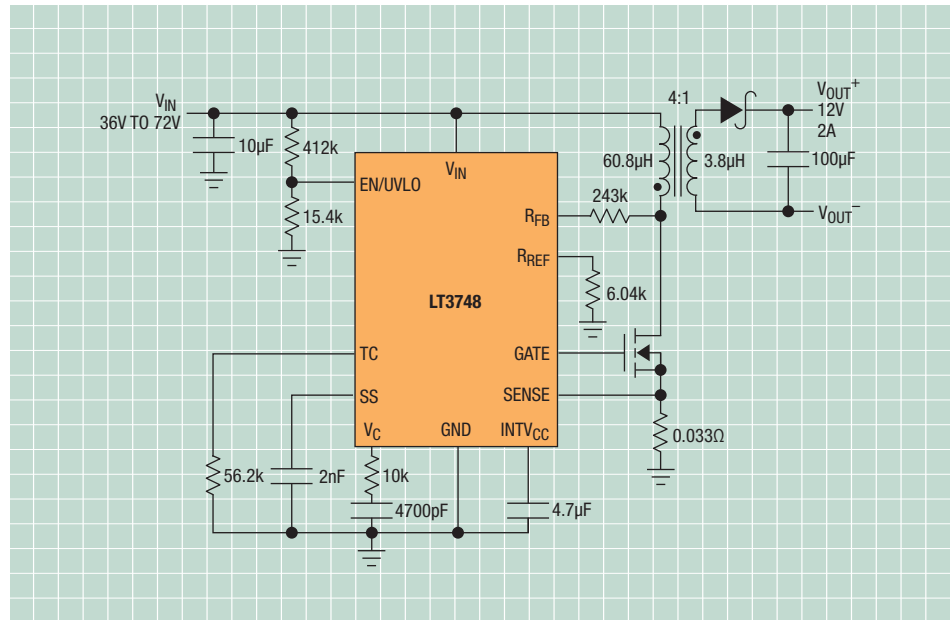
- 5V to 100V Input Voltage Range
- 1.9A Average Gate Drive Source and Sink Current
- Boundary Mode Operation
- No Transformer Third Winding or Opto-Isolator Required for Regulation
- Primary-Side Winding Feedback Load Regulation

### LT3748

Actual Size Demo Board  
(DC1557A)



### LT3748 Flyback Schematic



Part Number	V <sub>IN</sub> Range (V)	V <sub>OUT</sub> <sup>(1)</sup> Min (V)	Output Current <sup>(1)</sup> (A)	Synchronous Operation	Operating Frequency <sup>(2)</sup>	I <sub>O</sub> (SUPPLY)	Package	Comments
LT3748	5 to 100	1.23	5		Variable	1.3mA	MSOP-16 (12)	No Opto
LT3798	90 to 305VAC <sup>(1)</sup>	1.23	5		Variable	70µA	MSOP-16E	Off-Line, Active PFC/No Opto
LT3799	90 to 305VAC <sup>(1)</sup>	1.23	5		Variable	70µA	MSOP-16E	Off-Line, LED Driver w/ Active PFC
LTC3803/-3	9.2 to 75 <sup>(1)</sup>	0.8	5		200kHz or 300kHz	240µA	SOT-23	Small Footprint
LTC3803-5	5.7 to 75 <sup>(1)</sup>	0.8	5		200kHz	240µA	SOT-23	Small Footprint
LTC3805	8.8 to 75 <sup>(1)</sup>	0.8	5		70kHz to 700kHz	360µA	DFN-10, MSOP-10	Synchronizable, Adj Current Limit
LTC3805-5	4.5 to 75 <sup>(1)</sup>	0.8	5		70kHz to 700kHz	360µA	DFN-10, MSOP-10	Synchronizable, Adj Current Limit
LTC3873	8.8 to 75 <sup>(1)</sup>	1.2	5		200kHz	360µA	8-Lead SOT, 2x3 DFN-8	Adjustable Current Limit
LTC3873-5	4 to 75 <sup>(1)</sup>	1.2	5		200kHz	360µA	8-Lead SOT, 2x3 DFN-8	Adjustable Current Limit
LT1725	16 to 75 <sup>(1)</sup>	1.25	5		50kHz to 250kHz	250µA	SO-16, SSOP-16	No Opto
LT1737	4.5 to 75 <sup>(1)</sup>	1.23	5		50kHz to 250kHz	10mA	SO-16, SSOP-16	No Opto
LT3837	4.5 to 75 <sup>(1)</sup>	1.23	12	✓	50kHz to 250kHz	6.4mA	TSSOP-16	Higher Output Current
LT3825	16 to 75 <sup>(1)</sup>	1.23	12	✓	50kHz to 250kHz	400µA	TSSOP-16	Higher Output Current

#### Notes

(1) The maximum voltage and current depend on the choice of external components

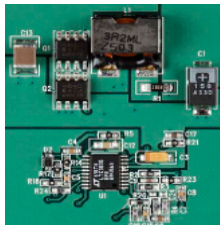
(2) The frequency can be selected within the range indicated

## Micropower DC/DC Controllers

Micropower controllers have a very low quiescent current that creates an extremely low power consuming DC/DC converter during no-load or light-load conditions. The parts listed below utilize Burst Mode operation and/or pulse-skipping to reduce light-load power consumption, preserving battery life during standby or idle mode.

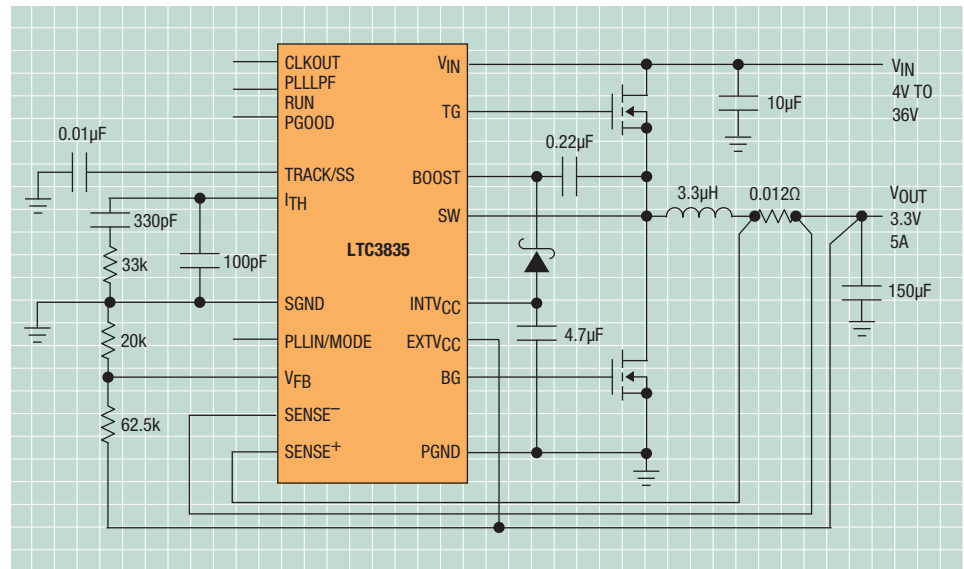
### LTC3835 Features

- Wide Output Voltage Range:  
 $0.8V \leq V_{OUT} \leq 10V$
- Low Operating Quiescent Current: 80µA
- OPTI-LOOP® Compensation  
Minimizes  $C_{OUT}$
- 1% Output Voltage Accuracy
- Wide VIN Range: 4V to 36V Operation
- Phase-Lockable Fixed Frequency  
140kHz to 650kHz



**LTC3835**  
Actual Size Demo Board  
(DC96713)

### LTC3835 Low Quiescent Current Synchronous Step-Down Schematic



Part Number	V <sub>IN</sub> Range (V)	V <sub>OUT</sub> Range (V)	I <sub>OUT</sub> MAX <sup>(1)</sup> (A)	Synchronous Operation	Operating Frequency <sup>(2)</sup>	No R <sub>SENSE</sub>	I <sub>Q</sub> (µA) (SUPPLY)	Package	Topology
<b>Single Outputs</b>									
LTC3864	3.5 to 60	0.8 to V <sub>IN</sub>	5		50kHz to 850kHz		40	3x4 DFN-12, MSOP-12E	Buck
LTC3891	4 to 60	0.8 to 24	20	✓	50 kHz to 900 kHz	✓	50	3 x 4 QFN-20, TSSOP 20	Buck
LTC3834/-1	4 to 36	0.8 to 10V	20	✓	140kHz to 650kHz		30	FE20, 4x5 QFN GN16/3x5 QFN	Buck
LTC3835/-1	4 to 36	0.8 to 10V	20	✓	140kHz to 650kHz		80	FE20, 4x5 QFN GN16/3x5 QFN	Buck
LT3845A	4 to 60	1.23 to 36	20	✓	100kHz to 600kHz		120	TSSOP-16	Buck
LTC3801	2.5 to 9.8	0.8 to V <sub>IN</sub>	5		550kHz		16	ThinSOT	Buck
LTC3772	2.75 to 9.8	0.8 to V <sub>IN</sub>	5		550kHz	✓	40	DFN-8, ThinSOT	Buck
LT3724	4 to 60	1.23 to 36	5		200kHz		80	TSSOP-16	Buck, Boost, SEPIC, Inverter
LT3800	4 to 60	1.23 to 36	20	✓	200kHz		80	TSSOP-16	Buck, Inverter
LT3844	4 to 60	1.23 to 36	5		100kHz to 600kHz		120	TSSOP-16	Buck, Boost, SEPIC, Inverter
LTC3872	2.75 to 9.8	Up to 60V w/o R <sub>SENSE</sub> & Higher w/ R <sub>SENSE</sub>	5		550kHz	✓	250	ThinSOT, DFN-8	Boost
LTC1871-7	6 to 36	1.23 and Higher	5		50kHz to 1MHz	✓	250	MSOP-10	Boost, Flyback & SEPIC
LTC1871/-1	2.5 to 36	1.23 and Higher	5		50kHz to 1MHz	✓	250	MSOP-10	Boost, Flyback & SEPIC
LT3739	1.6 to 42	1.23 and Higher	5		50kHz to 1MHz		350	3x3 DFN-10, MSOP-10	Boost, SEPIC, Inverter
<b>Dual/Triple Outputs</b>									
LTC3890/-1/-2	4 to 60	0.8 to 24	20/20	✓	50 kHz to 900 kHz	✓	50	5x5 QFN-32	Dual Buck
LTC3857	4 to 38	0.8 to 24	25/25	✓	50kHz to 900kHz	✓	50	5x5 QFN-32, SSOP-28	Dual Buck
LTC3858	4 to 38	0.8 to 24	25/25	✓	50kHz to 900kHz	✓	170	5x5 QFN-32, 4x5 QFN-28, SSOP-28	Dual Buck
LTC3859AL	4.5 to 38	0.8 to 24/60	25/25/10	✓	50kHz to 900kHz	✓	27	5x7 QFN-38, TSSOP-38	Buck/Buck/Boost
LTC3826/-1	4 to 36	0.8 to 10	20/20	✓	140kHz to 650kHz	✓	30	5x5 QFN-32/SSOP-28	Dual Buck

#### Notes

(1) The maximum output current depends on the choice of external components

(2) The frequency can be selected within the range indicated

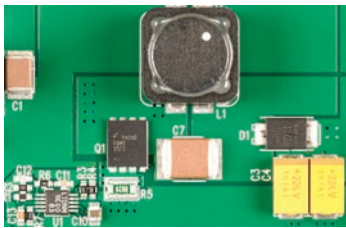


## Multiple Topology DC/DC Controllers

Linear offers DC/DC controllers that can be used in multiple converter topologies including buck, boost, flyback, forward, inverter and SEPIC. Features include a wide input voltage range, low quiescent current, single and dual outputs, selectable operating frequency, optional sense resistor and onboard MOSFET gate driver.

### LT3758 Features

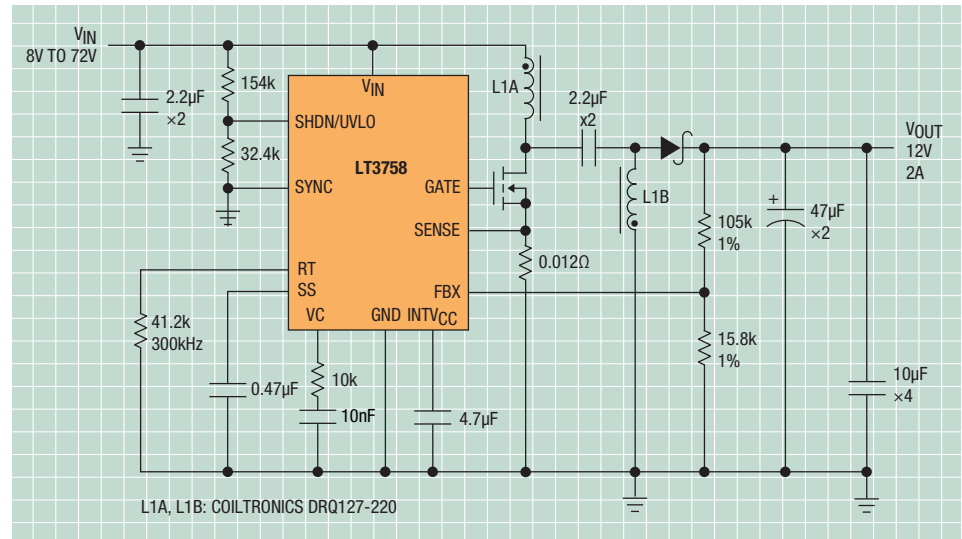
- Wide Input Voltage Range:  
5.5V to 100V
- Positive or Negative Output  
Voltage Programming with a  
Single Feedback Pin



### LT3758

Actual Size Demo Board  
(DC1342A)

### LT3758 High Voltage SEPIC Schematic



Part Number	V <sub>IN</sub> Range (V)	V <sub>REF</sub> (V)	I <sub>Q</sub> (µA) (SUPPLY)	Operating Frequency <sup>(2)</sup>	Package	No R <sub>SENSE</sub>	Buck	Boost	Flyback	Forward	Inverter	SEPIC
LT3757	2.9 to 40	1.6/-0.8	1.6mA	100kHz to 1MHz	3x3 DFN-10, MSOP-10			✓	✓		✓	✓
LT3758	5.5 to 100	1.6/-0.8	1.75mA	100kHz to 1MHz	3x3 DFN-10, MSOP-10			✓	✓		✓	✓
LT3759	1.6 to 42	1.6/-0.8	350	100kHz to 1MHz	3x3 DFN-10, MSOP-10			✓	✓		✓	✓
LT1950	3 to 25	1.23	2.3mA	100kHz to 500kHz	SSOP-16			✓	✓	✓		✓
LTC1871-7	6 to 36	1.23	250	50kHz to 1MHz	MSOP-10	✓		✓	✓			✓
LTC1871/-1	2.5 to 36	1.23	250	50kHz to 1MHz	MSOP-10	✓		✓	✓			✓
LT3724	7.5 to 60	1.23	80	200kHz	TSSOP-16		✓	✓			✓	✓
LTC3703-5	4.1 to 60	0.8	1.7mA	100kHz to 600kHz	SSOP-16, SSOP-28		✓	✓				
LT3844	4 to 60	1.23	120	100kHz to 600kHz	TSSOP-16E		✓	✓			✓	✓
LTC3803/-3	9 to 75 <sup>(1)</sup>	0.8	240	200kHz	ThinSOT			✓	✓		✓	✓
LTC3803-5	5 to 75 <sup>(1)</sup>	0.8	240	200kHz	ThinSOT			✓	✓		✓	✓
LTC3805	8.8 to 75 <sup>(1)</sup>	0.8	360	70kHz to 700kHz	DFN-10, MSOP-10			✓	✓		✓	✓
LTC3805-5	4.5 to 75 <sup>(1)</sup>	0.8	360	70kHz to 700kHz	DFN-10, MSOP-10			✓	✓		✓	✓
LTC3873	8.8 to 75 <sup>(1)</sup>	1.2	360	200kHz	ThinSOT, DFN-8			✓	✓		✓	✓
LTC3873-5	4 to 75 <sup>(1)</sup>	1.2	360	200kHz	ThinSOT, DFN-8			✓	✓		✓	✓
LT1952/-1	8 to 75 <sup>(1)</sup>	1.23	5.2mA	100k to 500kHz	SSOP-16			✓		✓	✓	✓
LTC3703	9.3 to 100	0.8	1.7mA	100kHz to 600kHz	SSOP-16, SSOP-28		✓	✓				

#### Notes

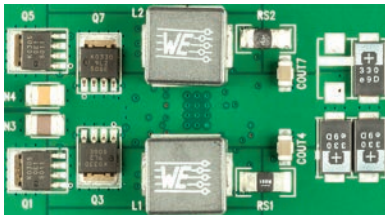
(1) The maximum voltage depends on the choice of external components

(2) The frequency can be selected within the range indicated

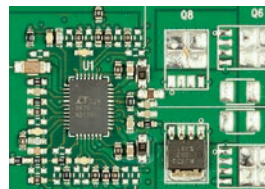
DDR (Double Data Rate)/QDR (Quad Data Rate) termination applications require that  $V_{OUT2}$  ( $V_{TT}$ ) is always 1/2 of  $V_{REF}$  (which is usually  $V_{OUT1}$  or  $V_{DDQ}$ ). Features include dual and single outputs, onboard MOSFET drivers, synchronous rectification, low quiescent current, tracking, tight  $V_{REF}$  accuracy, current mode or voltage mode control, spread spectrum, and no need for a current sense resistor.

## LTC3876 Features

- Complete DDR Power Solution with VTT Reference
- Wide  $V_{IN}$  Range: 4.5V to 38V, VDDQ: 1V to 2.5V
- $\pm 0.67\%$  VDDQ Output Voltage Accuracy
- VDDQ and VTT Termination Controllers
- $\pm 1.2\%$   $\pm 50\text{mA}$  Linear VTTR Reference Output
- Controlled On-Time, Valley Current Mode Control
- Frequency Programmable from 200kHz to 2MHz
- Synchronizable to External Clock
- $t_{ON(MIN)} = 30\text{ns}$ ,  $t_{OFF(MIN)} = 90\text{ns}$

[illegible]

**LTC3876**  
Actual Size Demo Board  
(DC1631A)



Actual Size Back

Part Number	V <sub>IN</sub> Range (V)	VDDQ Range (V)	VTT Range (V)	VTTR Range (V)	I <sub>OUT</sub> <sup>(1)</sup> MAX (A)	Operating Frequency <sup>(2)</sup>	Package	Spread Spectrum	No R <sub>sense</sub>	Tracking	Synchronizable	Current (I) or Voltage (V) Mode
LTC3876	4.5 to 38	1.25 to 2.5	0.5 to 1.25	0.5 to 1.25	25/±25/±0.50	200kHz to 2MHz	5x7 QFN-38, TSSOP-38		✓	✓	✓	I
LTC3776	2.75 to 9.8	0.6 to V <sub>IN</sub>	VDDQ/2	NA	6/±6	300kHz to 750kHz	QFN-24, SSOP-24	✓	✓	✓	PLL	I
LTC3831	3 to 8	NA	1.25 to 0.91V <sub>IN</sub>	NA	±15	100kHz to 500kHz	SSOP-16		✓		✓	V
LTC3831-1	3 to 8	NA	0.40 to 0.91V <sub>IN</sub>	NA	±15	100kHz to 500kHz	SSOP-16		✓		✓	V
LTC3718	1.5 to 36	NA	0.75 to V <sub>REF</sub> /2	NA	±20	200kHz to 1.5MHz	SSOP-24		✓			I
LTC3717/-1	4 to 36	NA	0.75 to V <sub>REF</sub> /2	NA	±20	200kHz to 1.5MHz	SSOP-16		✓			I

### Additional features

(1) All parts have synchronous rectification and use the MOSFET  $R_{DS(ON)}$  for current sense

## Notes

(1) The maximum output current depends on the choice of external components

(2) The operating frequency can be selected within the range indicated

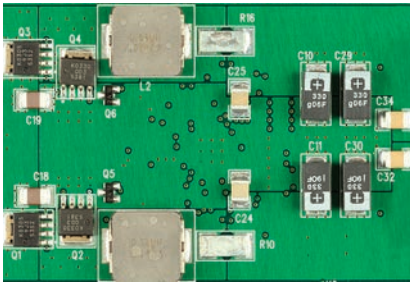
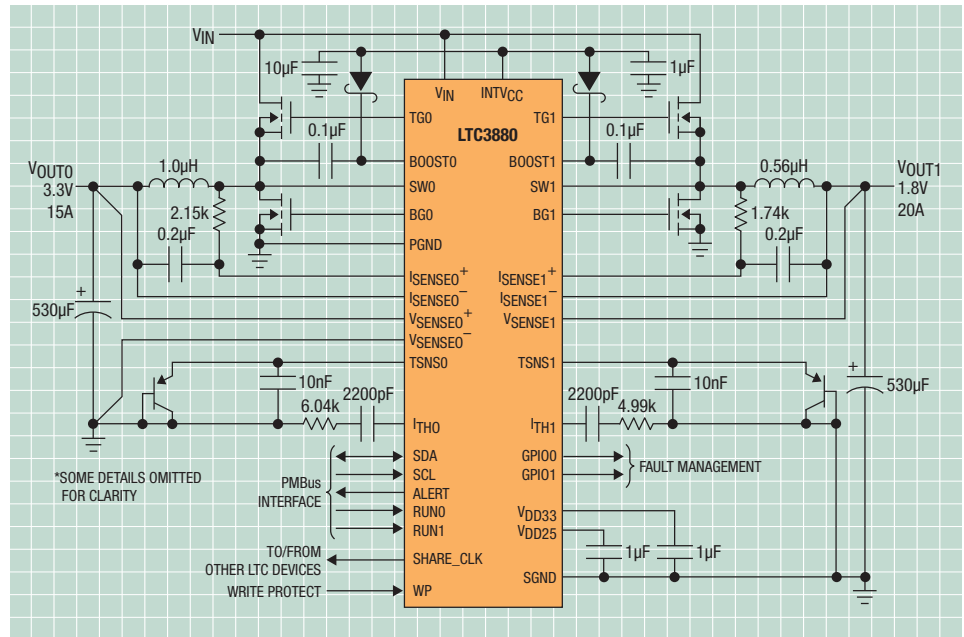
## Digital Power System Management

Digital power system management provides the capability to autonomously control and supervise dozens of voltages, as well as to provide accurate information about the power system using LTpowerPlay™ software. These controllers have onboard data acquisition system, nonvolatile memory and a PMBus interface for real-time reporting and control of point-of-load (POL) applications. Power management monitoring and control parameters include current, voltage, operating frequency and temperature. Power supply sequencing, margining and supervisory levels are easily programmed via the PMBus interface and provide POL fault detection reporting.

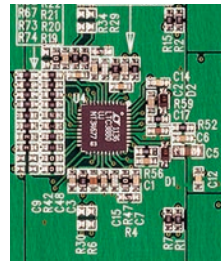
### LTC3880 Features

- PMBus/I<sup>2</sup>C Compliant Serial Interface
  - Telemetry Read Back Includes  $V_{IN}$ ,  $I_{IN}$ ,  $V_{OUT}$ ,  $I_{OUT}$ , Temperature and Faults
  - Programmable Voltage, Current Limit, Digital Soft-Start/Stop, Sequencing, Margining, OV/UV and Frequency Synchronization (250kHz to 1MHz)
- $\pm 0.5\%$  Output Voltage Accuracy over Temperature
- Integrated 16-Bit ADC
- Internal EEPROM and Fault Logging
- Integrated Powerful N-Channel MOSFET Gate Drivers
- LTpowerPlay Configuration and Development Tool

### LTC3880 Digital Control/Telemetry Synchronous Step-Down Schematic



**LTC3880**  
Actual Size Demo Board  
(DC1590B-B)



Actual Size Back

Part Number	Function	Number of Outputs	$V_{IN}$ Range (V)	I/O	ADC	DAC	Control/Monitoring Functions	Package
LTC3883	Step-Down Regulator with I <sup>2</sup> C-based PMBus Compliant Serial Interf	1	4.5 to 24	PMBus/SMBus/I <sup>2</sup> C	16-bit	12-bit	$V_{IN}$ , $I_{IN}$ , $V_{OUT}$ , $I_{OUT}$ , Temperatures and Faults	QFN-32
LTC3880	Step-Down Regulator with I <sup>2</sup> C-based PMBus Compliant Serial Interf	2	4.5 to 24	PMBus/SMBus/I <sup>2</sup> C	16-bit	12-bit	$V_{IN}$ , $V_{OUT}$ , $I_{OUT}$ , Temperatures and Faults	QFN-40
LTC2978	Octal, Digital Power-Supply Monitor, Supervisor, Sequencer, and Margin Controller	8	3.3 to 15	PMBus/SMBus/I <sup>2</sup> C	16-bit	10-bit	$V_{IN}$ , $V_{OUT}$ , $I_{OUT}$ , Temperatures and Faults	QFN-64
LTC2974	Quad, Digital Power-Supply Monitor, Supervisor, Sequencer, and Margin Controller	4	3.3 to 15	PMBus/SMBus/I <sup>2</sup> C	16-bit	10-bit	$V_{IN}$ , $V_{OUT}$ , $I_{OUT}$ , Temperatures and Faults	QFN-64
LTC2970 <sup>(1)</sup>	Dual Power Supply Monitor and Margining Controller with SMBus Compatible I <sup>2</sup> C Interface	1	5 to 15	SMBus/I <sup>2</sup> C	14-bit	8-bit	$V_{IN}$ , $V_{OUT}$ , $I_{OUT}$ , Temperatures and Faults	QFN-24

Note

(1) All parts have onboard nonvolatile memory except LTC2970

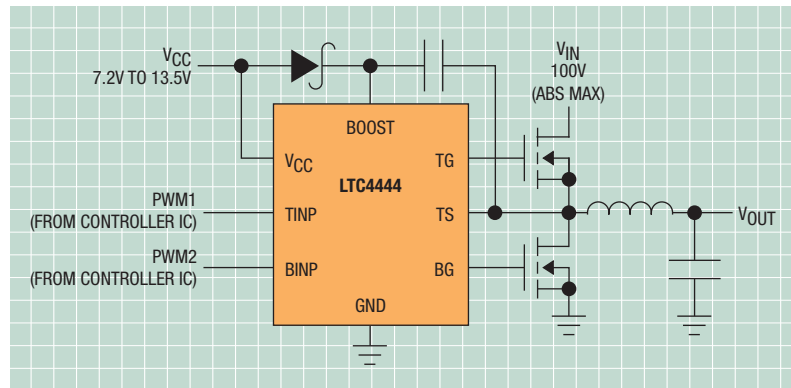
## High Speed MOSFET Drivers

Linear Technology offers several types of high speed MOSFET drivers with features that include low and high side driving, single or dual outputs, inverting or noninverting, and a wide range of voltage applications.

### LTC4444 Features

- Bootstrap Supply Voltage to 114V
- Wide  $V_{CC}$  Voltage: 7.2V to 13.5V
- Adaptive Shoot-Through Protection
- 2.5A Peak TG Pull-Up Current
- 3A Peak BG Pull-Up Current
- 1.2 $\Omega$  TG Driver Pull-Down
- 0.55 $\Omega$  BG Driver Pull-Down
- 5ns TG Fall Time Driving 1nF Load
- 8ns TG Rise Time Driving 1nF Load
- 3ns BG Fall Time Driving 1nF Load
- 6ns BG Rise Time Driving 1nF Load

### LTC4444 Low Quiescent Current Synchronous Step-Down Regulator



Part Number	$V_{CC}$ Input Range (V)	Maximum $V_{IN}$ Voltage (V)	Maximum Output Current/Ohms Source/Sink	Rise/Fall Time (ns)	Prop Delay (ns)	$I_o$ ( $\mu$ A) (SUPPLY)	Package	Description
LTC4442/-1	6 to 9.5	38	2.4A/5A	12/8/12/8 <sup>(2)</sup>	20/12/20/12	730	MSOP-8E	Synchronous
LTC4444/-5	7.2/4.5 to 15	100	2.5A/2.5A	10/7/10/5 <sup>(1)</sup>	30/30/18/15	350	MSOP-8E	Synchronous
LTC4446	7.2 to 13.5	100	2.5A/2.5A	8/5/6/3 <sup>(1)</sup>	30/30/18/15	350	MSOP-8E	Synchronous
LTC4449	4 to 6.5	38	3.2A/2.4A	8/7/7/4 <sup>(1)</sup>	14/13/13/11	300	2x3 DFN-8	Synchronous
LTC4441	5 to 24	28	6A/6A	13/8 <sup>(3)</sup>	30/36	250	MSOP-10, SO-8	Low-Side
LTC4440	7.3 to 15	80, 100pk	2.4A/1.5 $\Omega$	10/7 <sup>(1)</sup>	30/28	250	MSOP-10, SO-8	High Side, High Voltage
LTC4440-5	3.65 to 15	60, 80pk	1.1A/1.85 $\Omega$	10/7 <sup>(1)</sup>	35/33	200	MSOP-8E, SOT-23	High Side, High Voltage
LTC1693-1	4.5 to 13.2	14V	1.4A/1.7A	17.5/16.5 <sup>(1)</sup>	38/32	730	SO-8	Dual N-Chnl both Noninverting
LTC1693-2	4.5 to 13.2	14V	1.4A/1.7A	17.5/16.5 <sup>(1)</sup>	38/32	730	SO-8	Dual N-Chnl 1 Noninverting, 1 Inverting
LTC1693-3	4.5 to 13.2	14V	1.4A/1.7A	17.5/16.5 <sup>(1)</sup>	38/32	730	MSOP-8	Single with Output pPolarity Select
LTC1693-5	4.5 to 13.2	14V	1.4A/1.7A	17.5/16.5 <sup>(1)</sup>	38/32	360	MSOP-8	Single P-Chnl

#### Notes

- (1) 1nF capacitive load  
 (2) 3nF capacitive load  
 (3) 4.7nF capacitive load

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