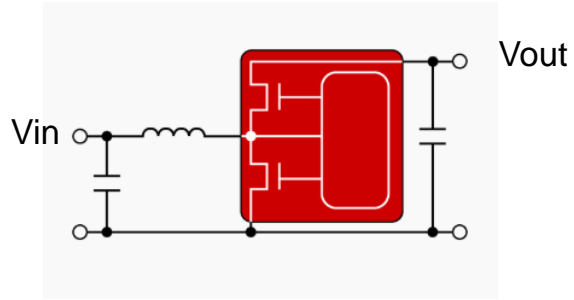


LM5155/1 Product Overview

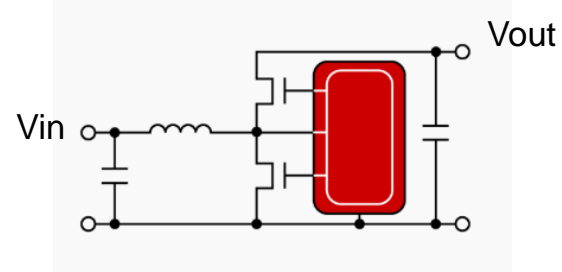
Boost Converter and Controller Solutions

December 20, 2019

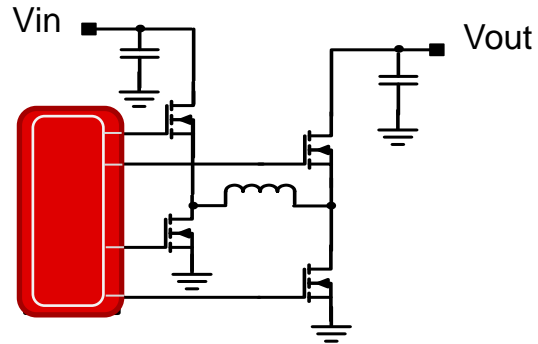
BCS Terminology Definition



Boost Converter

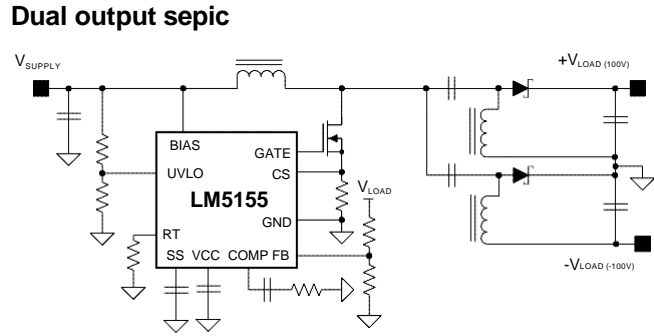
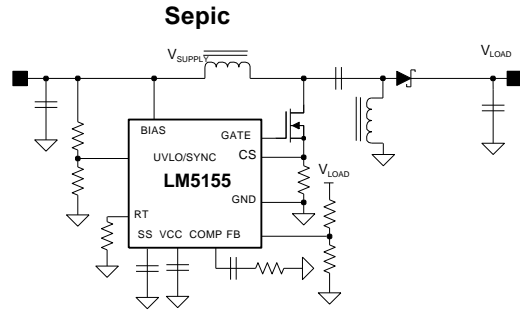
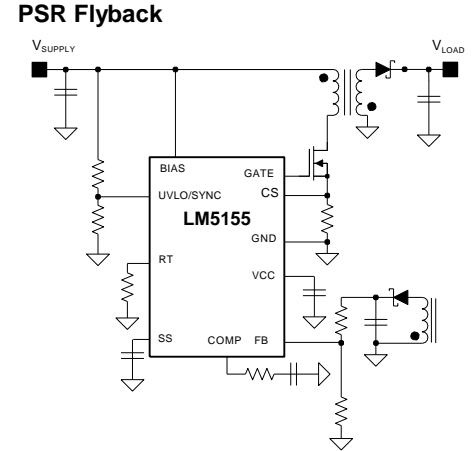
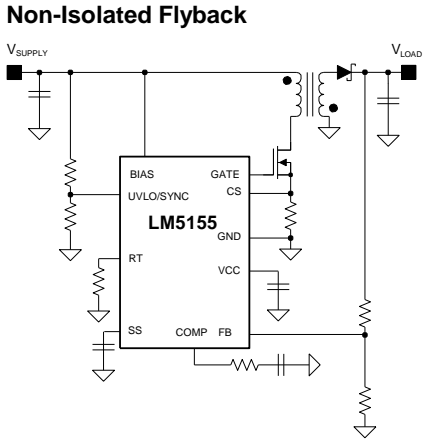
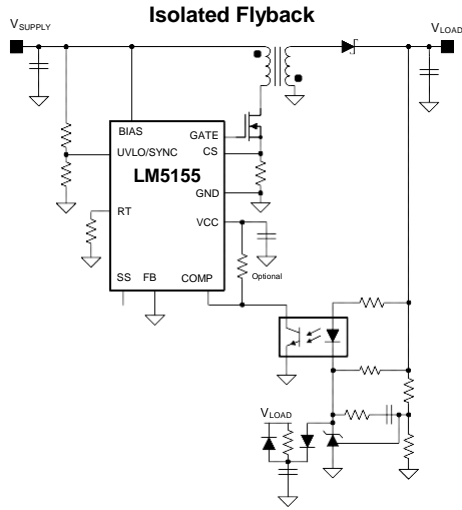


Boost Controller



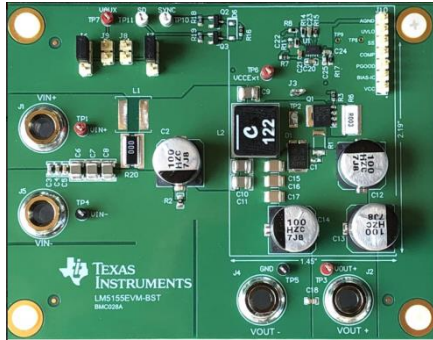
Buck-Boost Converter/Controller

LM5155/551(Q1) as a Flyback or SEPIC Converter



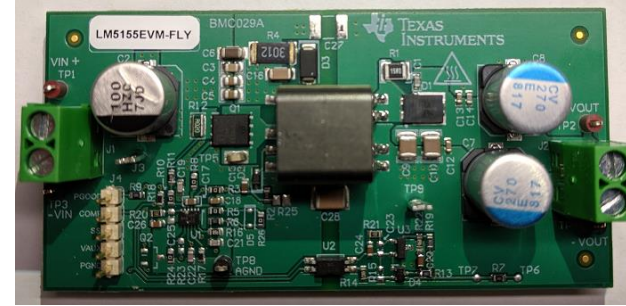
LM5155(Q1) – Various EVMs and Design Supports

Boost EVM



- Vin: 6-18V
- Vout: 24V
- P: 50W
- 440KHz Switching

Flyback EVM



- Vin: 18-36V
- Vout: 5V
- P: 20W
- Isolation
- 250KHz Switching

SEPIC EVM

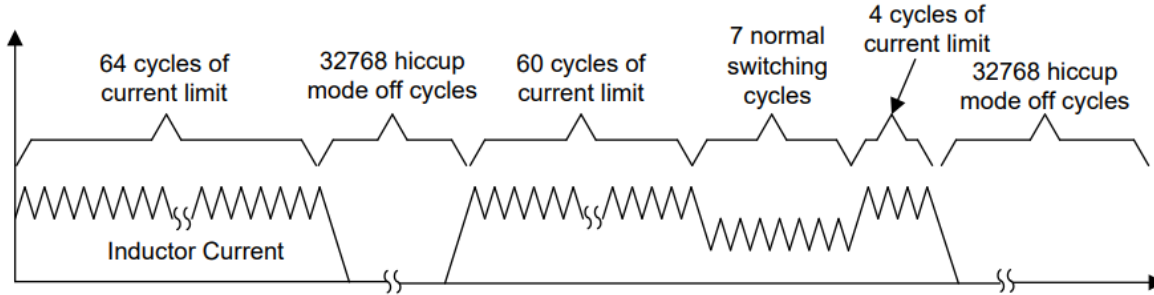


- Vin: 5-42V
- Vout: 12V
- P: 24W
- 2.2MHz Switching

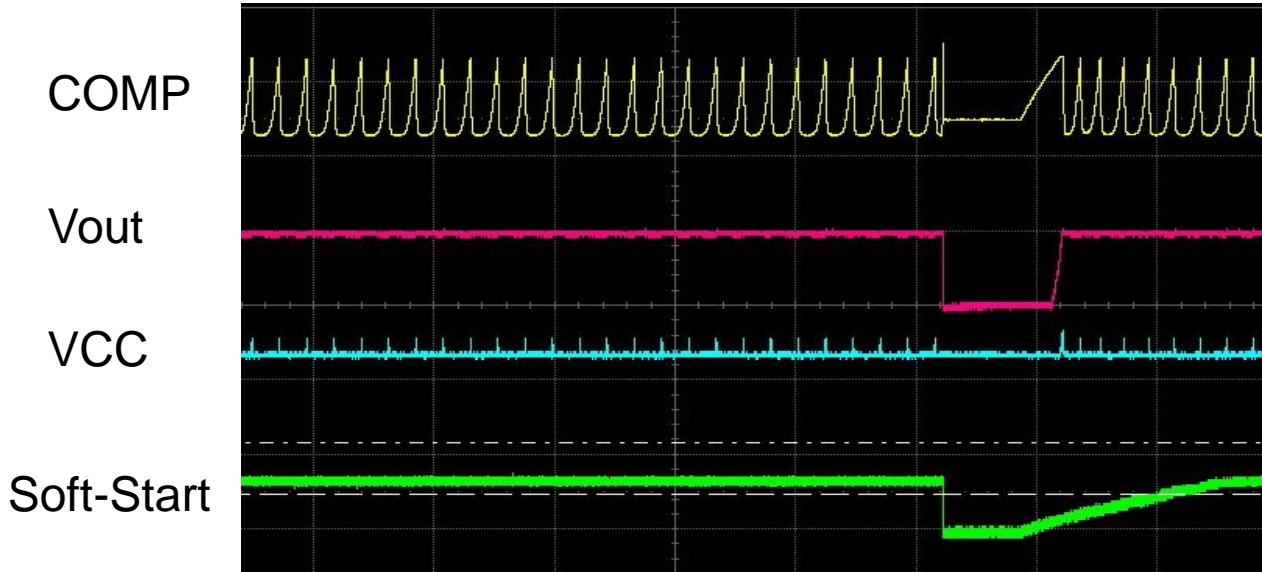
Tools & Resources

- [LM5155 tool folder](#)
- Quick Start Excel Calculator
- PSpice and TINA models
- WeBench Designer
- App Note: How to Design a Boost Converter using LM5155

LM51551(Q1) – Hiccup Protections



Hiccup mode protection	
Disabled	Enabled
LM5155(Q1)	LM51551(Q1)



LM5155x

Reference designs

Design	Name	Sector	Vin(min)	Vin(max)	Topology	Vout1(V)	Iout1(A)	Vout2(V)	Iout2(A)	Vout3(V)	Iout3(A)	Vout4(V)	Iout4(A)
PMP30722	Automotive non-synchronous boost converter with dynamic output voltage scaling	Automotive	6	18	Boost	24	2						
PMP21781	30-V to 150-V Adjustable output voltage boost reference design for LiDAR applications	Automotive	18	18	Boost	35-150	0.085						
TIDA-020013	Automotive SPD-SmartGlass driver reference design	Automotive	9	18	Boost	66.7	0.21						
PMP22170	Two output flyback power supply reference design for EV motor/generator inverter applications	Automotive	5	40	Isolated Flyback	10	1.5	5	0.25				
PMP40555	9-60-Vdc input, 12-V/2-A output flyback reference design	Industrial	9	60	Isolated Flyback	12	2						
TIDA-050023	Type-3 IEEE802.3bt-ready flyback converter PoE powered device reference design	Industrial, Communications equipment	42	57	Isolated Flyback	12	4.25						
PMP30523	Wide input range 3-W power reference design with four outputs	Industrial, Automotive	6	60	Isolated Flyback	11	0.05	11	0.05	11	0.1	3.3	0.3
PMP22151	70-W flyback and 37-W Boost power tree reference design	Industrial	18	29	Isolated Flyback/Boost	37	1	28	2.5				
PMP40569	36-57-Vdc input, 5-V/4-A output isolated flyback with synchronous rectification	Industrial, Communications equipment	36	57	Isolated Synchronous Flyback	5	4						
PMP21883	Four-output SEPIC converter-bias power supply for solar panel applications	Industrial	7	45	SEPIC	3.3	0.25	12	0.025	12	0.025	12	0.05
PMP30676	24-W nonsynchronous SEPIC pre-regulator reference design for automotive telematics control units	Automotive	6	36	SEPIC	12	2						
PMP40488	6-W dual output SEPIC converter	Industrial	9	12	SEPIC	60	0.05	-60	-0.05				
TIDA-020009	Automotive dual stage(SEPIC + Linear) static LED driver module reference design for rear-lights	Automotive	6	18	SEPIC	12.5	0.5						

PMP30722

Automotive non-synchronous boost converter with dynamic output voltage scaling reference design

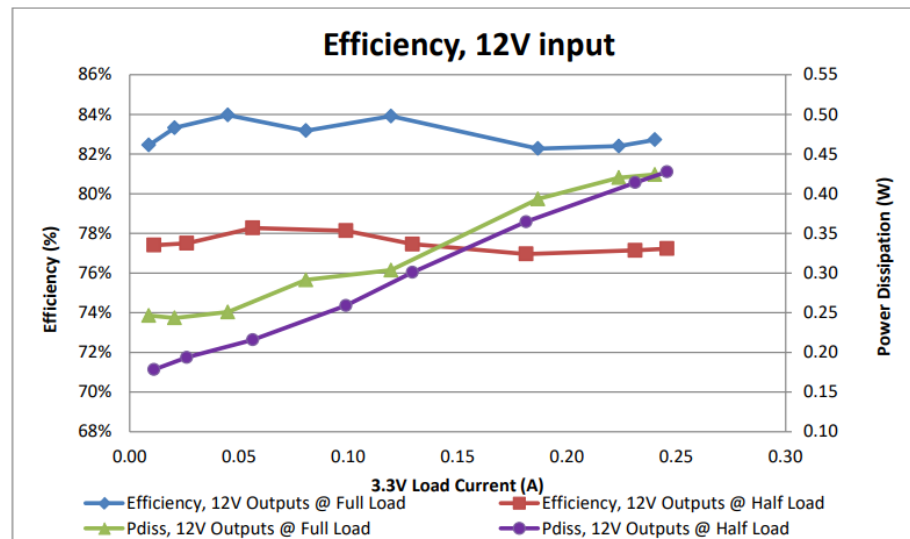
Features

- Vin: 6~18V(36V Transient)
- Output: 20-36V at 2.0A
- Output voltage is programmable using a 0-3.3V PWM signal generated by a signal generator or MCU
- Fsw: 400kHz

Applications



Performance



PMP21781

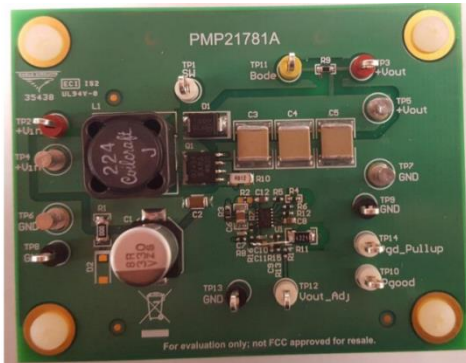
30-V to 150-V Adjustable Output Voltage Boost Reference Design for LiDAR Applications

Features

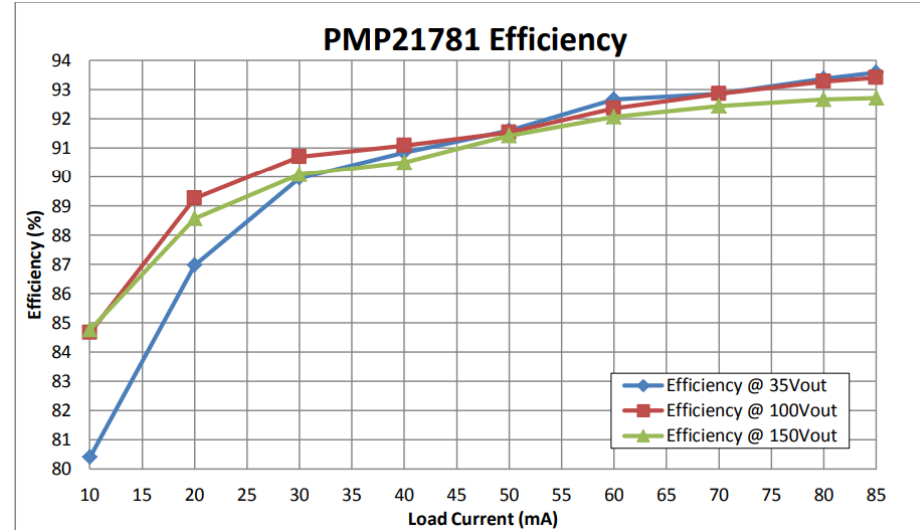
- Vin: 18V
- Output : 35~150V adjustable at up to 85mA
- Fsw: 100kHz nominal

Applications

- Automotive LiDAR supply



Performance



TIDA-020013

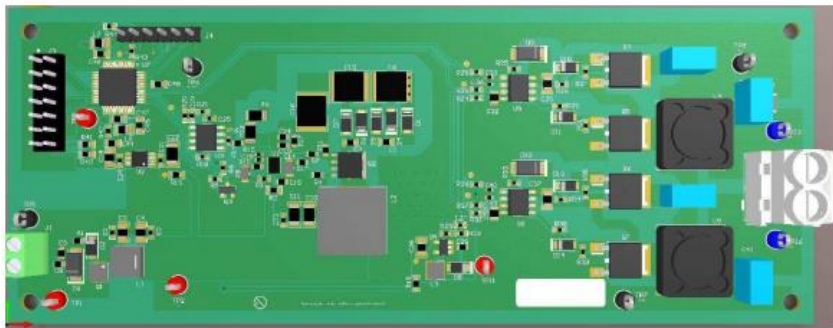
Automotive SPD-SmartGlass™ driver reference design

Features

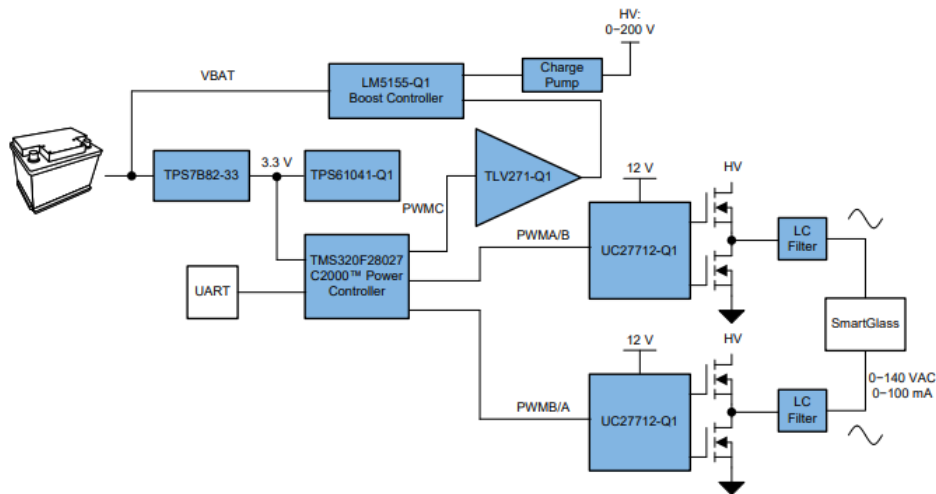
- Vin: 9~18V
- LM5155 Output: 66.7V
- Output from LM5155 boost circuit feeds into switching capacitor voltage tripler for 200V output
- Fsw: 2.2MHz

Applications

- SPD-SmartGlass driver



Block Diagram



PMP22170

Two output flyback power supply reference design for EV motor/generator inverter applications

Features

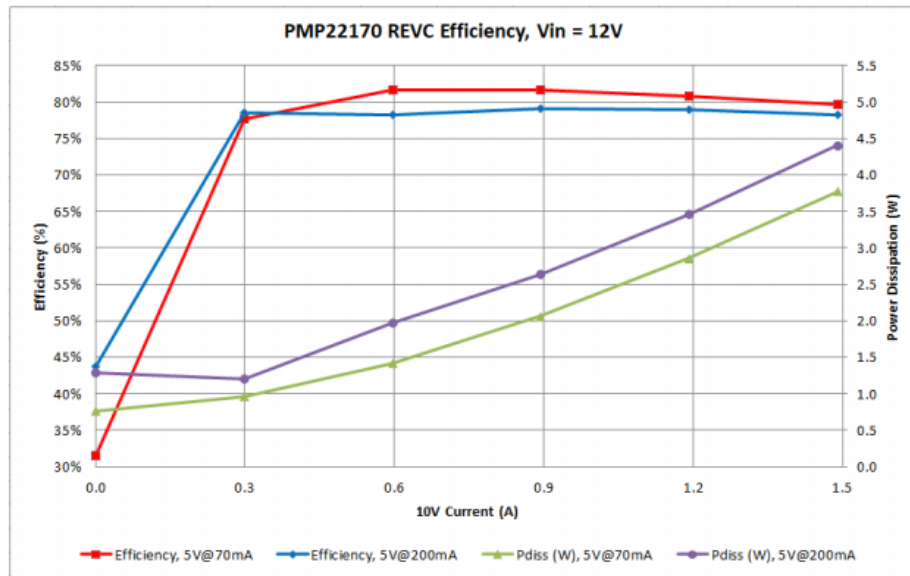
- Vin: 6-18V typical, 5-40V transient
- Output 1: Flyback 5V 0.25A(current regulated)
- Output 2: Isolated Flyback 10V/0.8A(1.5A peak)
- Fsw: 300kHz

Applications

- EV Motor
- Generator Inverter



Performance



PMP40555

9~60-Vdc Input, 12-V/2-A Output Flyback Reference Design

Features

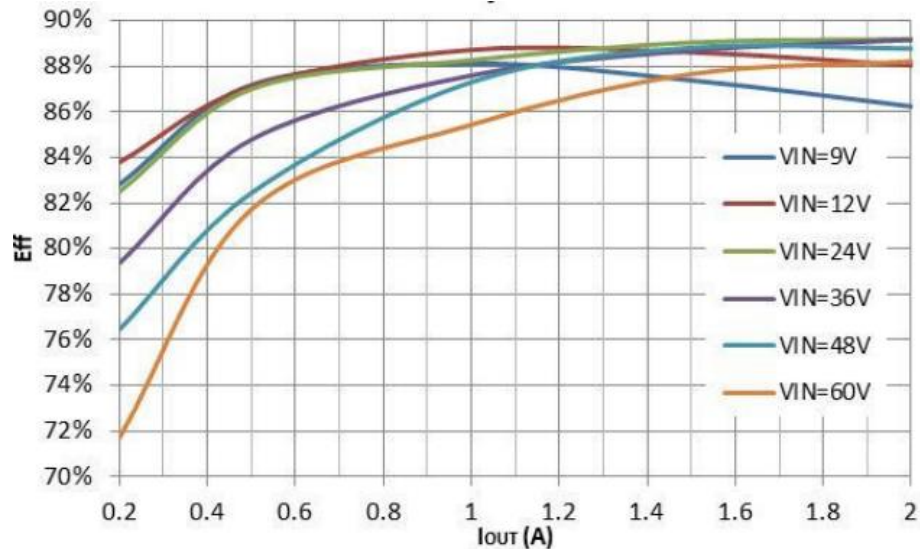
- Vin: 9~60V
- Output: 12V at 2A
- Fsw: 250kHz

Applications

- Automotive Preboost
- Generator Inverter



Performance



Type-3 IEEE802.3bt-ready flyback converter PoE powered device reference design

TI Designs Number: TIDA-050023

Solution Features

- Supports Power Levels for IEEE802.3bt Type 3
- Isolated Diode Rectified Flyback Design
- Hiccup Mode Protection
- ORing Circuit for Auxiliary Power through AC/DC
- Automate Maintain Power Signature

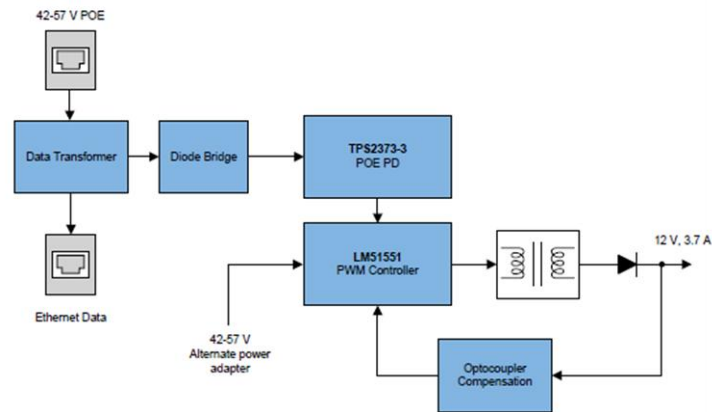
Tools & Resources



- [TIDA-050023 Tools Folder](#)
- [User Guide](#)
- [Device Datasheets:](#)
 - LM51551
 - TPS2373

Applications

- IP Network Cameras
- Wireless Access Points
- Other >25-W PoE PD Design



PMP30523

Wide Input Range 3 W Power Reference Design with four Outputs

Features

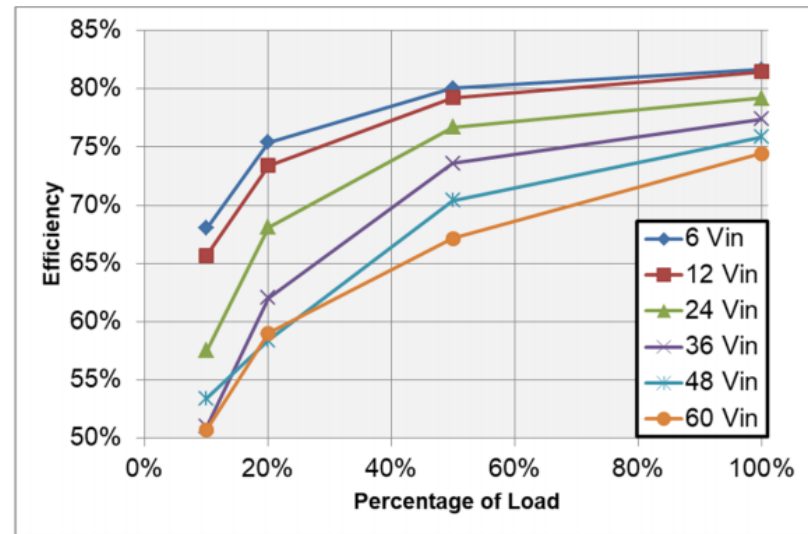
- Vin: 6~60V(7.5 for startup)
- Output 1: 3.3V at 300mA
- Output 2: 11V at 100mA
- Outputs 3 and 4: Isolated 11V at 50mA
- Fsw: 200kHz nominal

Applications

- Multi-rail automotive



Performance



PMP22151 70-W flyback and 37-W boost power tree reference design

Key Specs: 24V Rail input, 37V boost and 28V isolated output

Device: LM5155

Features

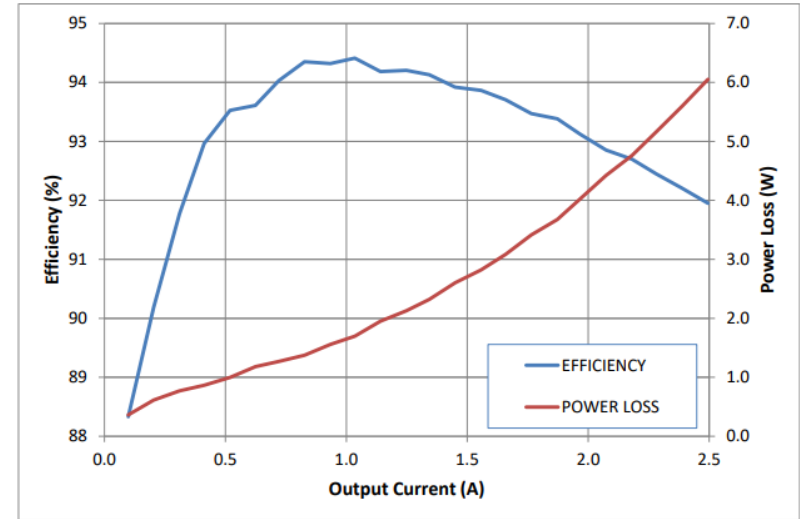
- Vin: 21.4V to 26.4V,
- Output 1: Isolated Flyback 28V 2.5A
- Output 2: Boost 37V 1A
- Flyback efficiency up to 94.2%

Applications

- Fire alarm control panel



Performance



PMP40569

36~57-Vdc Input, 5-V/4-A Output Isolated Flyback With Synchronous Rectification Reference Design

Features

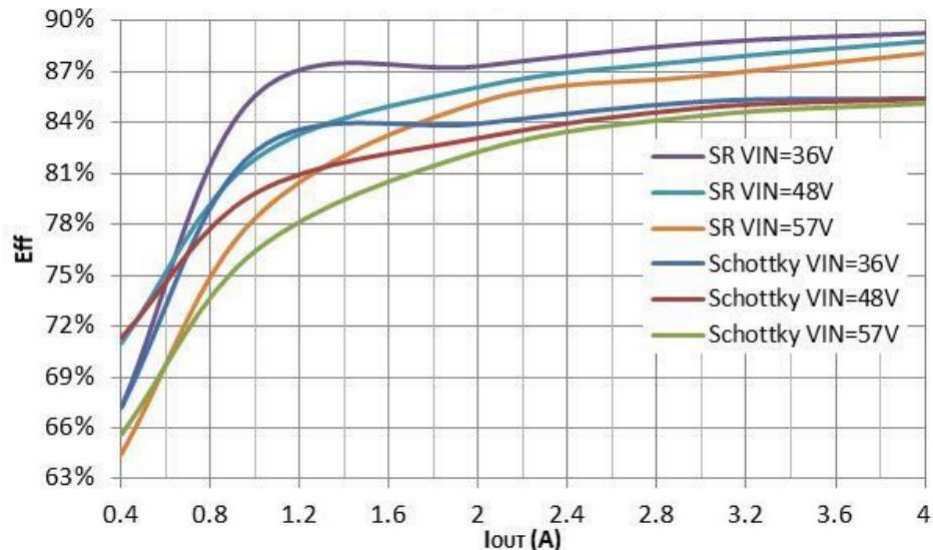
- Vin: 36~57V
- Output: 5V at 4A
- Fsw: 250kHz

Applications

- Synchronous flyback
- Power Module



Performance



PMP40569

36~57-Vdc Input, 5-V/4-A Output Isolated Flyback With Synchronous Rectification Reference Design

Features

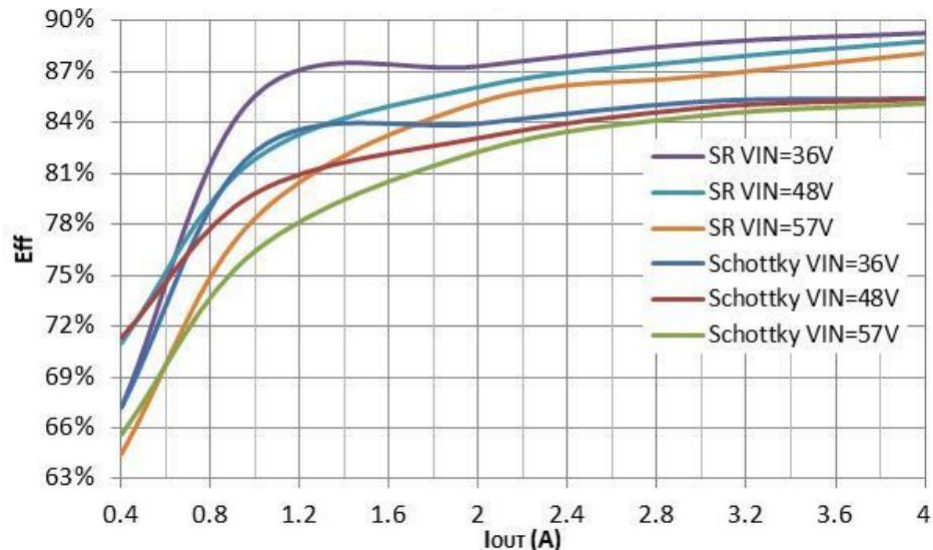
- Vin: 36~57V
- Output: 5V at 4A
- Fsw: 250kHz

Applications

- Synchronous flyback
- Power Module



Performance



PMP21883

Four-Output, SEPIC-Converter-Bias Power Supply Reference Design for Solar Panel Applications

Features

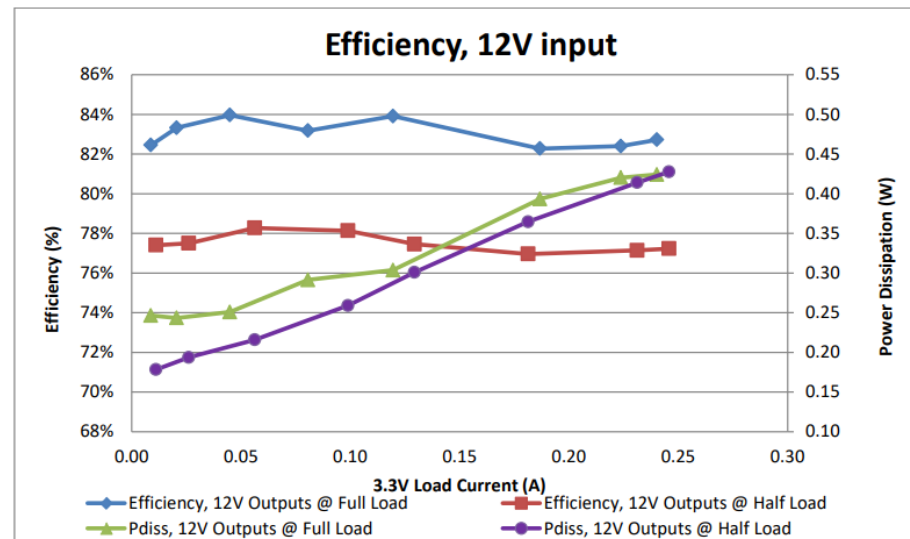
- Vin: 7~45V
- Output 1: 3.3V at 0.25A(Regulated)
- Output 2: 12V at 0.05A
- Outputs 3 and 4: Isolated 12V at 0.025 each

Applications

- Solar Panel



Performance



PMP30676

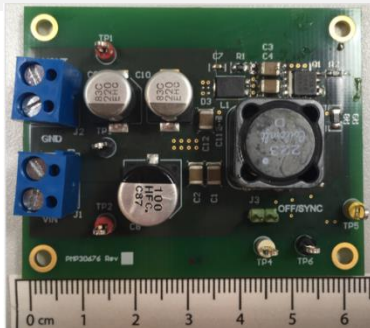
24-W nonsynchronous SEPIC pre-regulator reference design for automotive telematics control units

Features

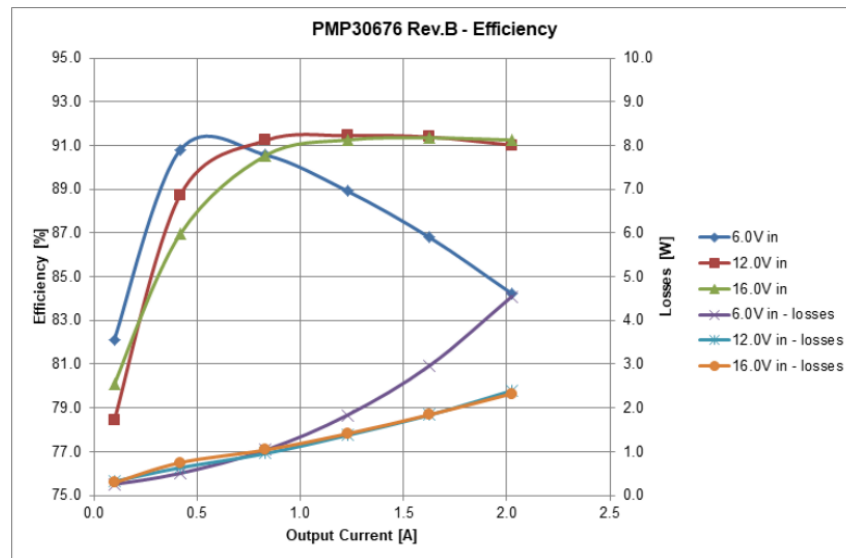
- Vin: 6V to 16, 36V peak, down to 4.5V during cranking
- Vout: 12V, 2A
- Fsw: 300kHz
- 91.5% Efficiency at

Applications

- Telematics Control Unit



Performance



PMP40488

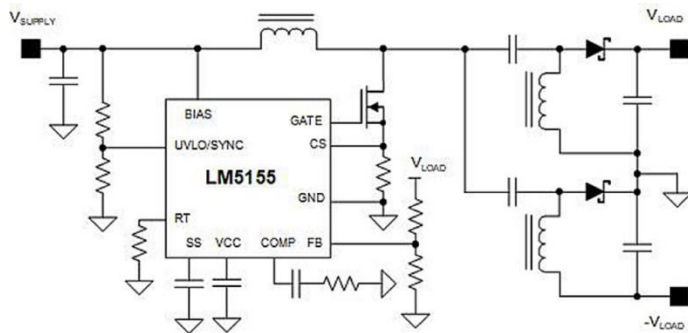
6-W dual-output SEPIC converter reference design

Features

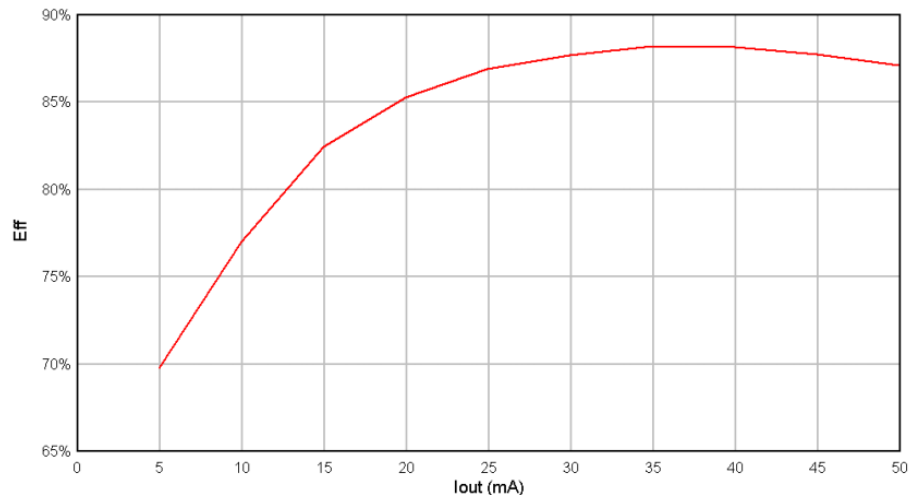
- V_{in} : 9~12V
- Output 1: 60V, 50mA
- Output 2: -60V, -50mA
- F_{sw} : 500kHz

Applications

- Ultrasound power supply
- Bias supply



Performance



TIDA-020009

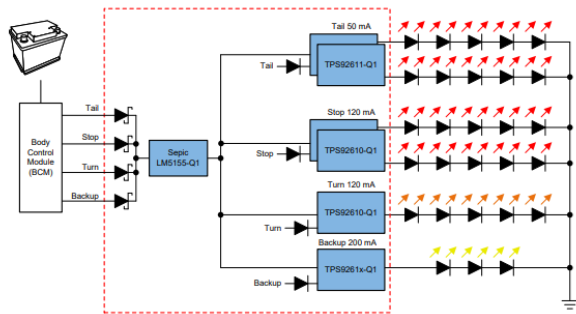
Automotive Dual Stage (SEPIC + Linear) Static LED Driver Module Reference Design for Rear Lights

Features

- Vin: 6~18V
- LM5155 Output: 8~16V
- Fsw: 460kHz

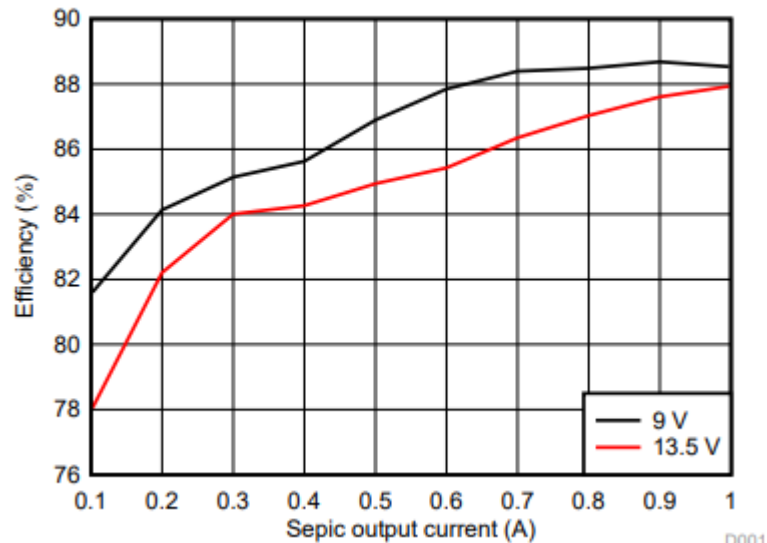
Applications

- Automotive Rear Lights



Performance

Figure 29. Efficiency of SEPIC Voltage Regulator



D001