

Boost Converter 24V Output from 4.5V to 20V Input

The project presented here is a boost converter with 24V output from 4.5V to 20V DC Input. The project is built using an LT8357 chip and configured as a boost converter. Under voltage lockout, and soft-start are a few key features of the project. LED D1 indicates the output, and screw terminals are provided for easy output and input connections.

The LT8357 is a wide input range, current mode, DC/DC controller which can be configured as a boost, SEPIC or flyback converter. The LT8357 drives a low side N-channel power MOSFET with 5V split gate drive. The current mode architecture allows adjustable and synchronizable 100kHz to 2MHz fixed frequency operation, or internal 19% triangle spread spectrum operation for low EMI. At light load, either pulse-skipping mode or low-ripple Burst Mode operation can be selected. Additional features include output power good and output short circuit protection in SEPIC and flyback configurations with a wide 3V to 60V input voltage range and 8 μ A low quiescent current, the LT8357 provides a simple, compact and efficient solution for automotive, industrial, and battery-powered systems.

Connections

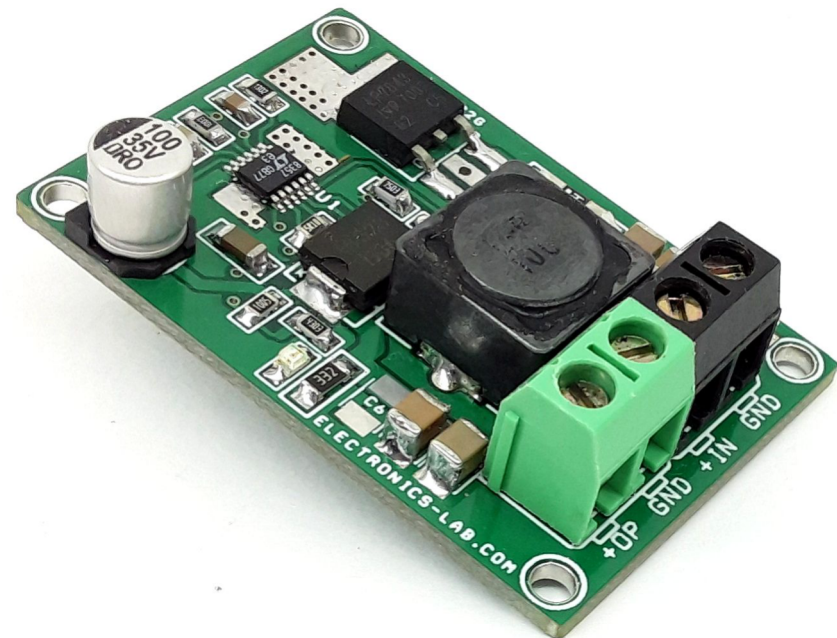
CN1: Pin 1 = DC Supply Input 4.5V to 20V DC, Pin 2 = GND

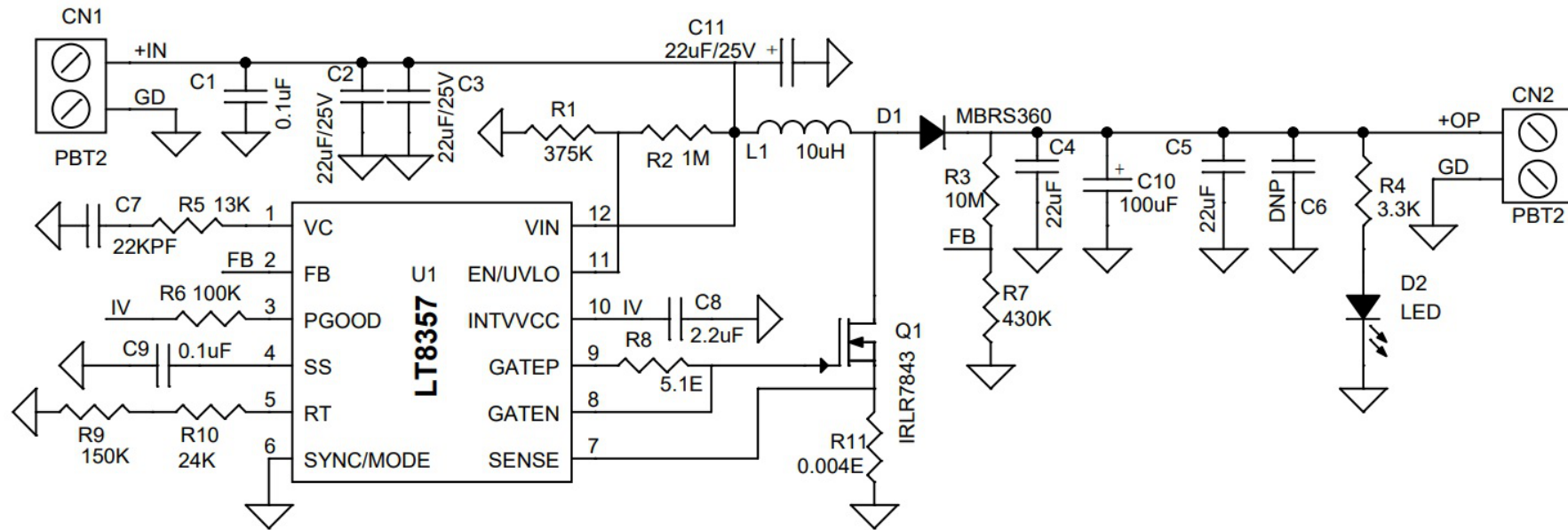
CN2: Pin 1 = +24V DC Output, Pin 2 = GND

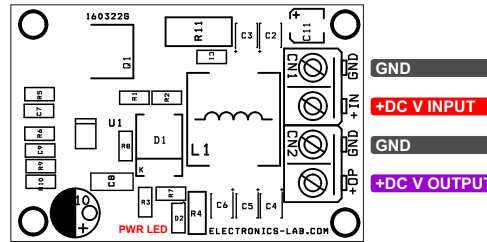
D2: Power LED

Features

- Input Supply Range 4.5V to 20V
- Output 24V DC (Up to 2Amps)
- Operating Frequency 200Khz
- Under Voltage Lockout 4.3V
- Efficiency Up to 90-95%
- Soft Start Feature
- PCB Dimensions 46.04 x 30.80mm
- Power LED On Output
- 4 X 2.5mm Mounting Holes

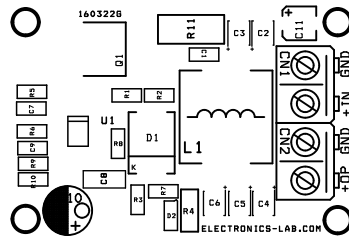




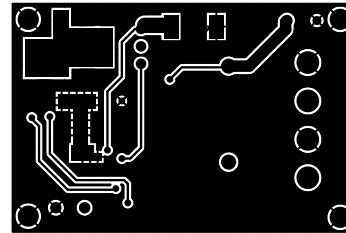


BOM						
NO.	QNTY.	REF.	DESC.	MANUFACTURER	SUPPLIER	SUPPLIER PART NO
1	2	CN1,CN2	2 PIN SCREW TERMINAL PITCH 5.08MM	PHOENIX	DIGIKEY	277-1247-ND
2	2	C1,C9	0.1uF CERAMIC SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
3	3	C2,C3,C11	22uF/25V CERAMIC SMD SIZE 1210	MURATA/YAGEO	DIGIKEY	
4	2	C4,C5	22uF/35V CERAMIC SIZE 1210	MURATA/YAGEO	DIGIKEY	
5	1	C6	DNP		DIGIKEY	
6	1	C7	22KPF/50V CERAMIC SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
7	1	C8	2.2uF/25V CERAMIC SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
8	1	C10	100uF/35V LOW ESR ELECTROLYTIC	WURTH	DIGIKEY	732-8942-1-ND
9	1	D1	MBRS360	ON SEMI	DIGIKEY	MBRS360BT3GOSTR-ND
10	1	D2	LED RED SMD SIZE 0805	OSRAM	DIGIKEY	475-1278-1-ND
11	1	L1	10uH/7AMP 12X12MM	PULSE	DIGIKEY	553-3679-1-ND
12	1	Q1	IRLR7843 DPK	INFINEON	DIGIKEY	448-IRLR7843TRLPBFTR-ND
13	1	R1	375K 1% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
14	1	R2	1M 1% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
15	1	R3	10M 1% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
16	1	R4	3.3K 5% SMD SIZE 1206	MURATA/YAGEO	DIGIKEY	
17	1	R5	13K 1% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
18	1	R6	100K 5% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
19	1	R7	430K 1% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
20	1	R8	5.1E 1% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
21	1	R9	150K 1% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
22	1	R10	24K 1% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
23	1	R11	0.004E 1% SMD SIZE 2512	YAGEO	DIGIKEY	YAG2139CT-ND
24	1	U1	LT8357	ANALOG DEVICES	DIGIKEY	505-LT8357HMSE#PBF-ND

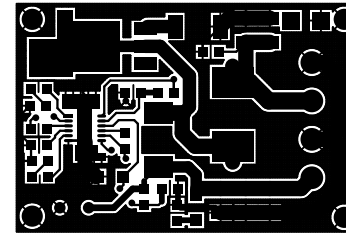
C11 Can be replace with 47uF/25V THT for better performance



SILK SCREEN TOP



BOTTOM LAYER



TOP LAYER

PCB DIMENSIONS 46.04 X 30.80MM