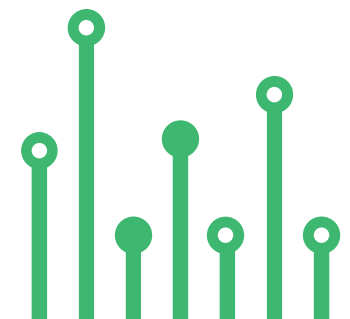


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POWER SUPPLY



3.3V - 5A Output DC-DC Converter with 10 to 24V Input



SKU: EL134682

3.3V-5A OUTPUT DC-DC CONVERTER WITH 10 TO 24V INPUT



The project published here is a synchronous step-down DC/DC converter based on the RT7258 chip. The chip has integrated high-side internal power MOSFET and gate driver for a low-side external power MOSFET. The board delivers 3.3V DC – 5A output current from 10V to 24V input supply. The RT7258's current mode architecture allows the transient response to be optimized over a wide input voltage and load range. Cycle-by-cycle current limit provides protection against shorted outputs and softy-start eliminates input current surge during start-up.

FEATURES

- Supply 10V to 24V DC
- Output 3.3V DC
- Load Current 5Amps
- Current Mode Control
- Switching Frequency 600Khz
- Up to 90% Efficiency
- Cycle-by-cycle Current Limit
- Input Under Voltage Lockout
- Output Under Voltage Protection
- Thermal Shutdown Protection, Threshold 150°C
- Output Power LED
- 4 x 2.5MM Mounting Holes
- PCB Dimensions 51.44 x 24.13 mm



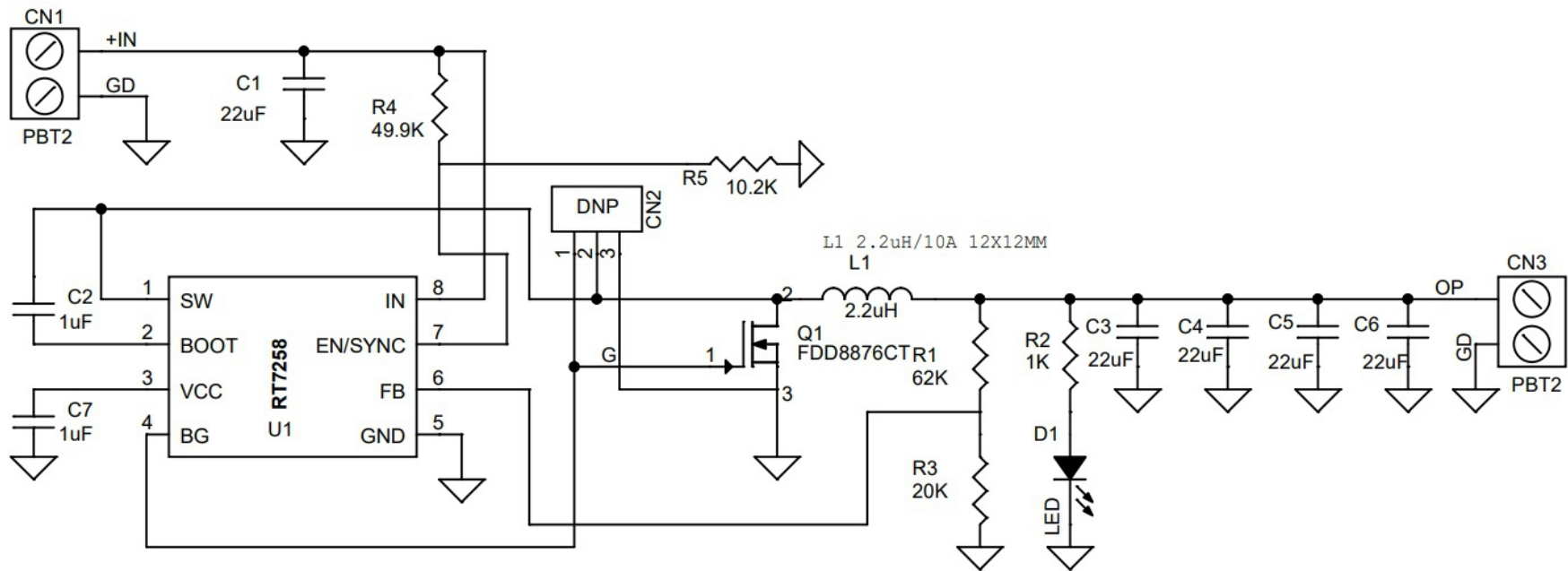
Soft-Start (SS) :

An internal current source charges an internal capacitor to build the soft-start ramp voltage (V_{SS}). The VFB voltage will track the internal ramp voltage during the soft-start interval. The typical soft-start time is 2ms.

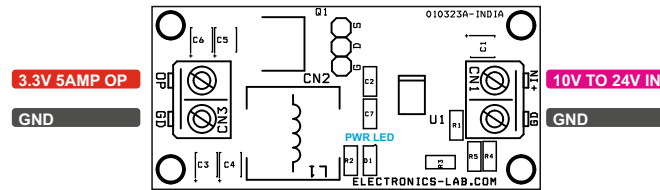
Over Temperature Protection

The RT7258 features Over Temperature Protection (OTP) circuitry to prevent overheating due to excessive power dissipation. The OTP will shut down the switching operation when the junction temperature exceeds 150°C. Once the junction temperature cools down by approximately 20°C, the converter will resume operation. To maintain continuous operation, the maximum junction temperature should be lower than 125°C.

Schematic



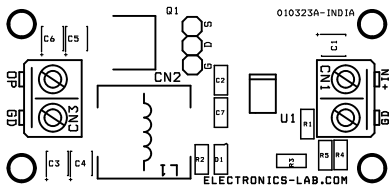
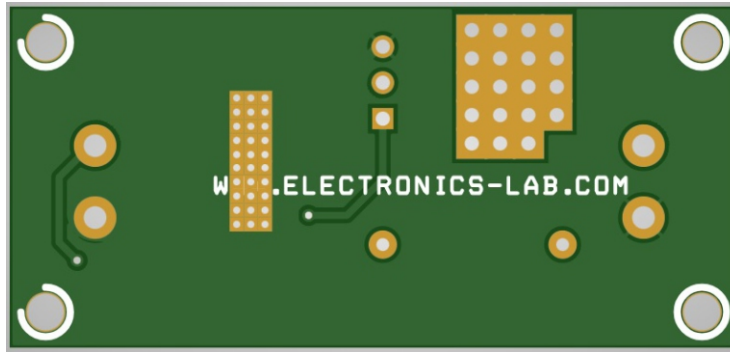
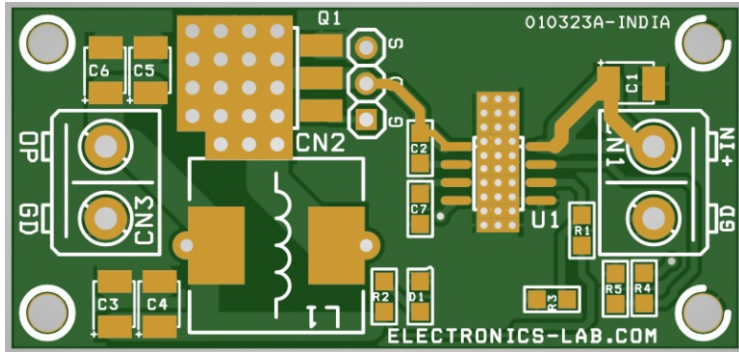
Connections



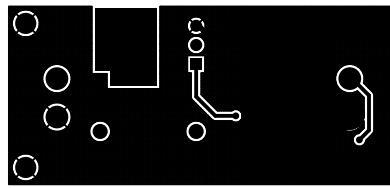
Connections

- CN1: Pin 1 = 10V to 24V DC Input, Pin 2 = GND
- CN2: Optional Connector for TO220 MOSFET
- CN3: Pin 1 = 3.3V / 5Amps Output, Pin 2 = GND
- D1: Output Power LED

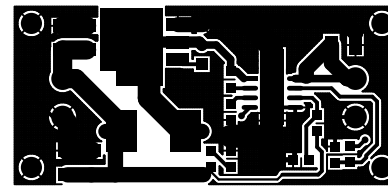
PCB



SILK SCREEN TOP



BOTTOM LAYER



TOP LAYER

PCB DIMENSIONS 51.44 X 24.13 MM

Parts List

BOM						
NO.	QNTY.	REF.	DESC.	MANUFACTURER	SUPPLIER	SUPPLIER'S PART NO
1	2	CN1,CN3	2 PIN SCREW TERMINAL PITCH 5.08MM	PHOENIX	DIGIKEY	277-1247-ND
2	1	CN2	DNP			
3	5	C1,C3,C4,C5,C6	22uF/25V CERAMIC SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
4	2	C2,C7	1uF/25V CERAMIC SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
5	1	D1	LED RED SMD SIZE 0805	OSRAM	DIGIKEY	475-1278-1-ND
6	1	L1	2.2uH/10A SMD OR THT 12X12MM	CHILISIN ELECTR	DIGIKEY	553-BPRR001010512R2TA0TR-ND
7	1	Q1	FDD8876CT	ON SEMI	DIGIKEY	FDD8876CT-ND
8	1	R1	62K 1% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
9	1	R2	1K 5% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
10	1	R3	20K 1% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
11	1	R4	49.9K 1% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
12	1	R5	10.2K 1% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
13	1	U1	RT7258 SOIC8	RICHTEK USA INC	DIGIKEY	1028-1214-1-ND



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