

## 65V Input -12Vdc Output 1A synchronous buck DC/DC converter using LM5164

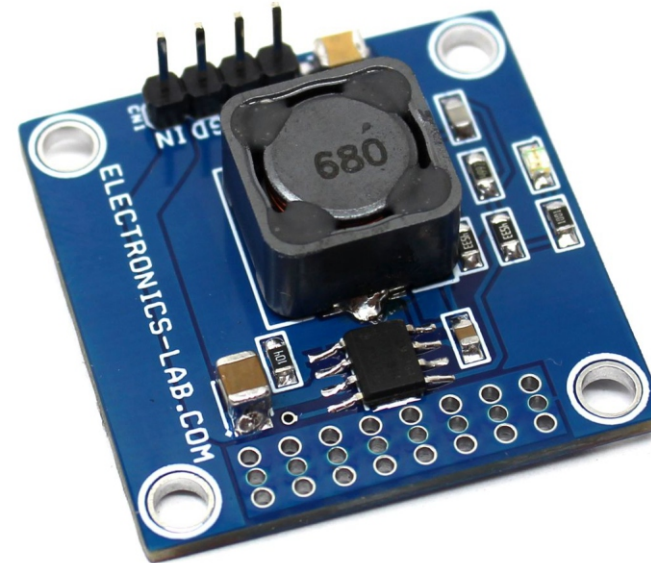


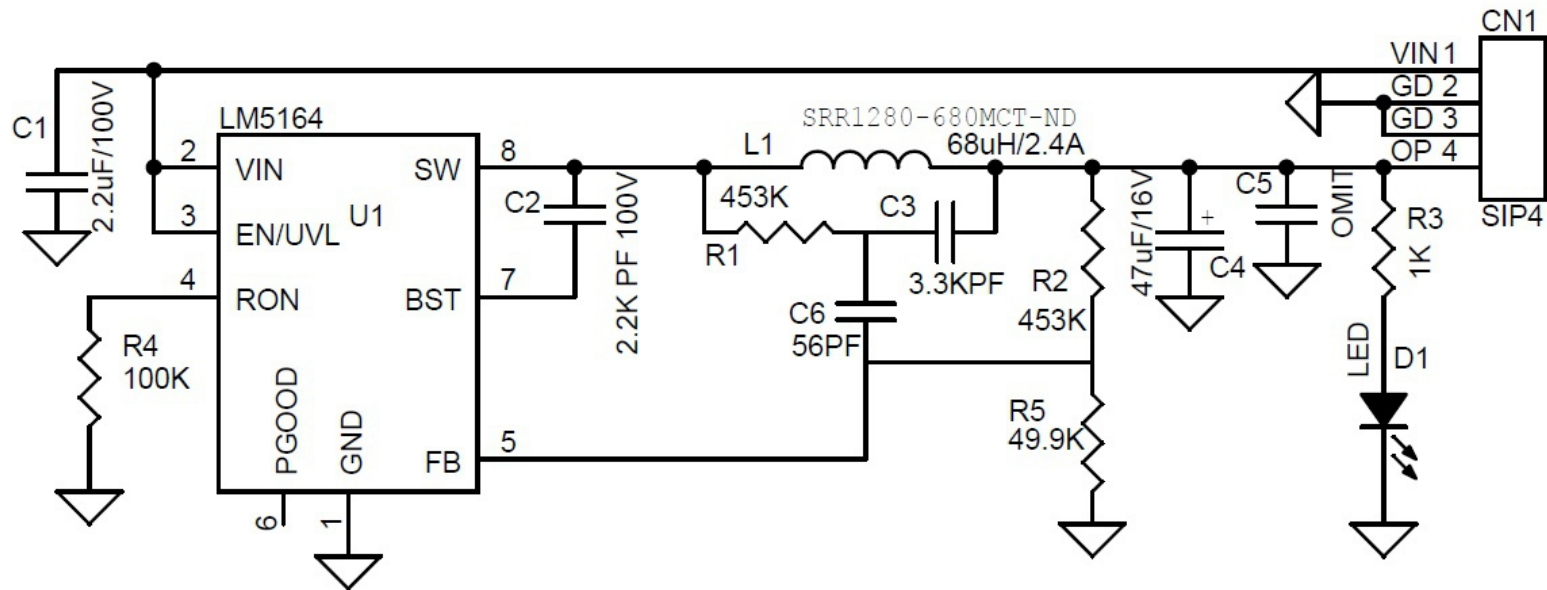
This is a step-down DC-DC converter mainly designed for application such as high-cell-count battery packs, power tools, garden tools and electric scooters, drones. Some of the features of the project is precision enable, input voltage UVLO, internal soft start etc. The project operates over wide input voltage range of 15V to 65V to provide a regulated 12V-1A output at 300Khz working frequency. D1 is the power LED, and 4 Pin male header connectors provided for input and output. The full-load efficiency of the project is 90% @ nominal input voltage of 48 V and an output voltage of 12 V. The switching frequency is set by resistor R4 at 300 kHz. The output voltage soft-start time is 3 msec.

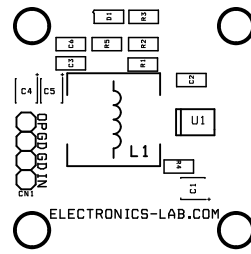
**The LM5164** synchronous buck converter is designed to regulate over a wide input voltage range, minimizing the need for external surge suppression components. A minimum controllable on-time of 50 ns facilitates large step-down conversion ratios, enabling the direct step-down from a 48-V nominal input to low-voltage rails for reduced system complexity and solution cost. The LM5164 operates during input voltage dips as low as 6 V, at nearly 100% duty cycle if needed, making it an excellent choice for wide input supply range industrial and high cell count battery pack applications. With integrated high-side and low-side power MOSFETs, the LM5164 delivers up to 1-A of output current. A constant on-time (COT) control architecture provides nearly constant switching frequency with excellent load and line transient response. Additional features of the LM5164 include ultra-low IQ and diode emulation mode operation for high light-load efficiency, innovative peak and valley overcurrent protection, integrated VCC bias supply and bootstrap diode, precision enable and input UVLO, and thermal shutdown protection with automatic recovery. An open-drain PGOOD indicator provides sequencing, fault reporting, and output voltage monitoring.

### Features

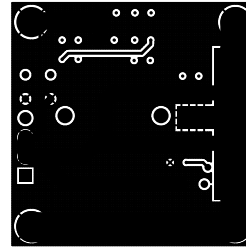
- Wide input voltage range of 15 V to 65V
- Output 12V DC 1Amp
- Output has 1.5% Accuracy
- Junction temperature range:  $-40^{\circ}\text{C}$  to  $+150^{\circ}\text{C}$
- Fixed 3-ms internal soft-start timer
- Peak and valley current-limit protection
- Input UVLO and thermal shutdown protection
- PCB Dimensions 32.70 x 32.70 mm



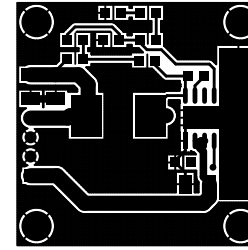




SILK SCREEN TOP

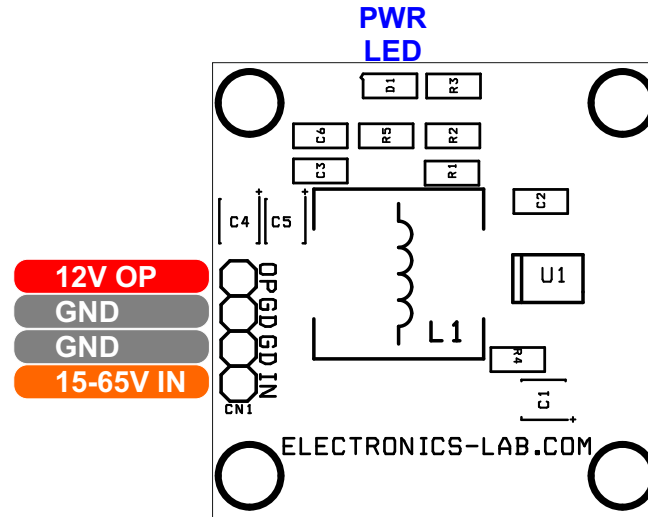


BOTTOM LAYER



TOP LAYER

PCB DIMENSION 32.70MM X 32.70MM



BOM				
SR.	QNTY.	REF.	DESC	VENDOR/DIGIKEY/MOUSER
1	1	CN1	4 PIN MALE HEADER 2.54MM PITCH	DIGIKEY 732-5317-ND
2	1	C1	2.2uF/100V SMD SIZE 1210	DIGIKEY 399-13375-1-ND
3	1	C2	2.2K PF 100V SMD SIZE 0805	DIGIKEY 478-1354-1-ND
4	1	C3	3.3KPF 100V SMD SIZE 0805	DIGIKEY 478-1355-1-ND
5	1	C4	47uF/16V SMD SIZE 1210	DIGIKEY 587-5436-1-ND
6	1	C5	10uF/16V OPTIONAL	OMIT
7	1	C6	56PF/50V SMD SIZE 0805	YAGEO
8	1	D1	LED RED SMD SIZE 0805	DIGIKEY 475-1415-1-ND
9	1	L1	68uH/2.4A 12MM	DIGIKEY SRR1280-680MCT-ND
10	2	R1,R2	453K 1% SMD SIZE 0805	YAGEO
11	1	R3	1K 5% SMD SIZE 0805	YAGEO
12	1	R4	100K 5% SMD SIZE 0805	YAGEO
13	1	R5	49.9K 1% SMD SIZE 0805	YAGEO
14	1	U1	LM5164 SOIC8	DIGIKEY 296-LM5164DDARCT-ND