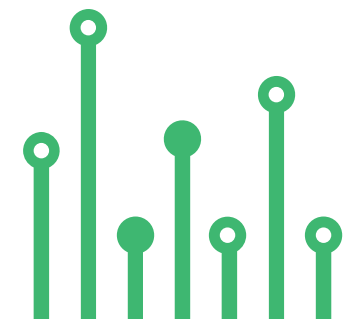


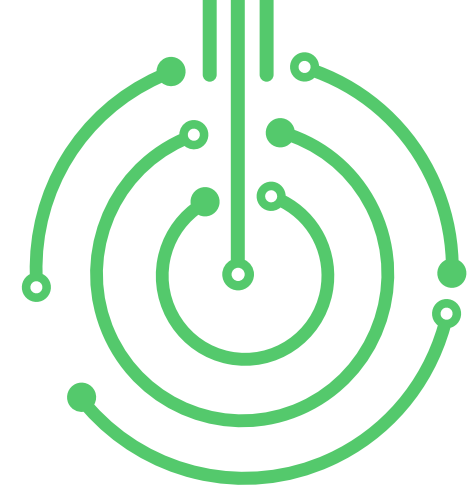
THE
electronics-lab
.com
from ideas to
boards

[electronics-lab - Projects](#) | [Embedded News](#) | [Online Community](#) | [e-Shop](#)

Open Source Hardware Electronics Projects

[electronics-lab.com /projects](https://electronics-lab.com/projects)





” Variable Over- Current Detection Load Switch



SKU: EL135010

Variable Over-Current Detection Load Switch



This over-current latch load switch provides over-current protection, thermal shutdown protection, soft-start function, and low power OFF function. The Overcurrent protection function is activated when the load is shorted. This protection function is effective in preventing damage due to sudden and unexpected incidents. It is also equipped with an error flag notification pin which indicates thermal shutdown and over-current condition. The project can help to protect the connected device from overcurrent, monitoring of various power lines, and power management. The board operates from 12V DC to 24V DC. The power LED indicates the output. Screw terminals provided for an easy connection of input and output supply. For the Fault function, additional 5V VCC DC input is required, otherwise, the VCC is not required. The circuit is normally enabled, and you can connect enable pin to GND to disable the output. Output is latching type; power is OFF when a fault condition occurs and sequence can be reversed with power OFF or Disable/Enable Pin.



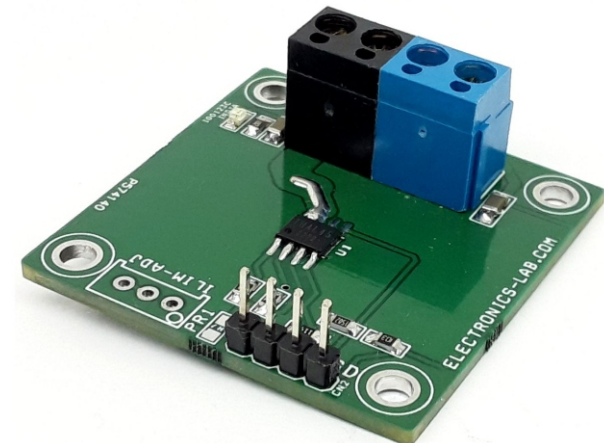
Note 1: Default over current threshold = 3.35A, this can be increased by changing the value of resistor R2 (Between 3.35A to 10A/ R2=200K Ohms to 50K Ohms), Optional Onboard multiturn potentiometer is provided for easy adjustment of the current range, Use R7=50K, PR1=200K Ohms- Bourns Inc Type 3296, and do not install R2 in this case.



Note 2: PCB has a small thermal area for power dissipation for current loads up to 3.35A, it is important to use Fan when a higher current threshold is selected.

Features

- Operating Supply 12V DC to 24V
- Operating Current 3mA + 5mA LED = 8mA Approx
- Load Current 3Amps
- Output Load Voltage 12V-24V DC
- Output On Resistance 45mOhms
- Over Current Threshold 3.35A (Adjustable 3.35A to 10Amps, Read Note)

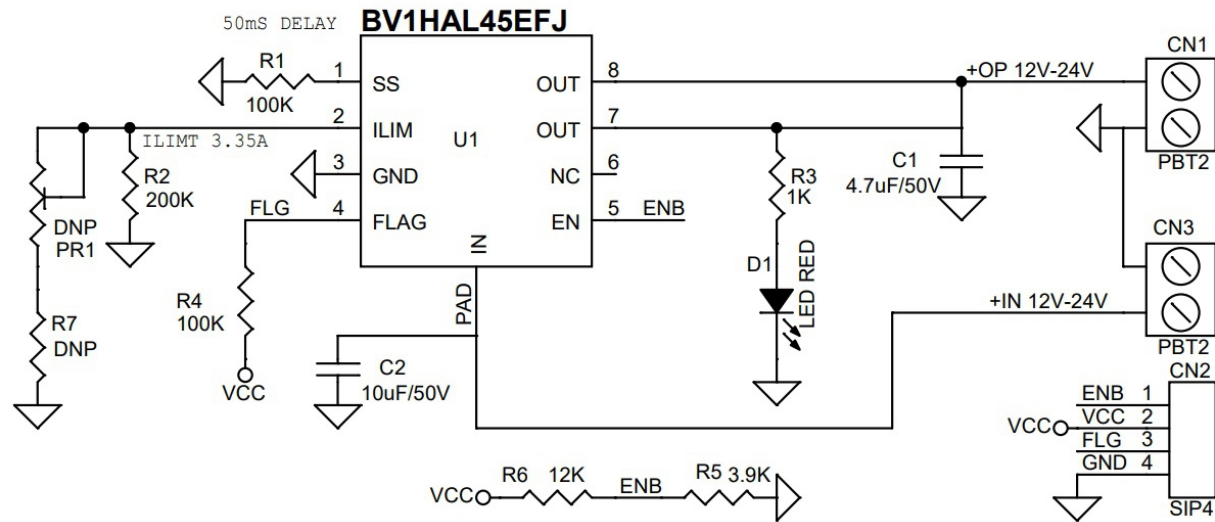


- Over Current Protection Function (Latch OFF)
- Thermal Shutdown Protection Function (TSD)
- Low Voltage Output OFF Function (UVLO) Threshold 6V
- Standby Current 5uA + LED Current
- Operating Temperature -40C to +85C
- Error Flag Notification Output, Normally High (VCC=5V)
- PCB Dimensions 40.64 x 39.69mm
- 4 X 3MM Mounting Holes

THERMAL SHUTDOWN FUNCTION

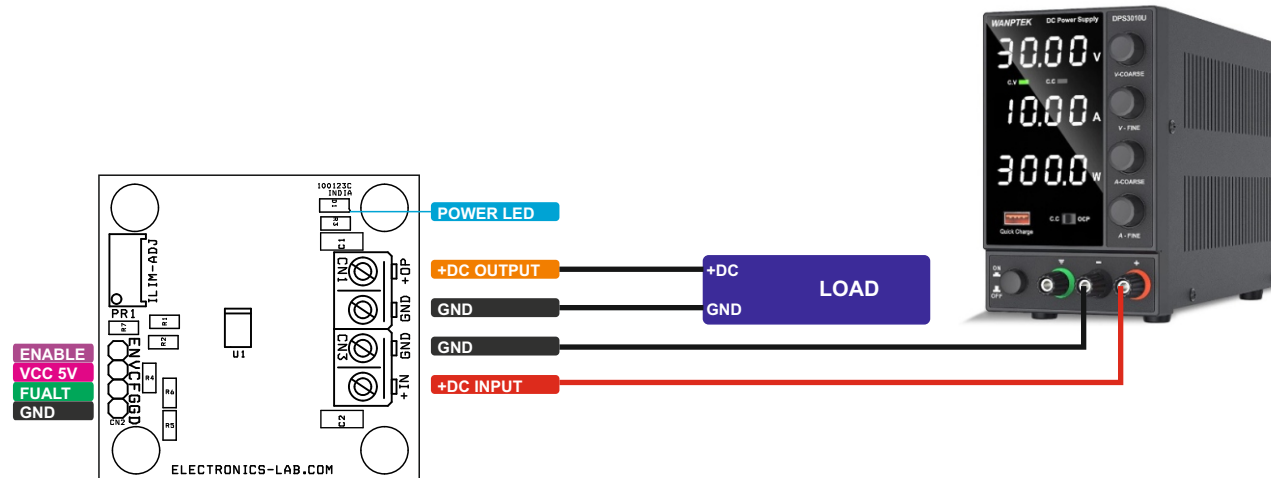
(Thermal Shutdown Detection TTSD, Thermal Shutdown Hysteresis TTSDHYS) This IC has a built-in TSD function. When the temperature of the IC reaches Thermal Shutdown Detection (TTSD) = 175 °C (Typ) or more, the output is turned off, and the FLAG outputs Low. Hysteresis (TTSDHYS) is installed for thermal shutdown function, and output automatically returns to normal when chip temperature becomes 160 °C (Typ) or less. The condition for Latch-Off is when Variable Overcurrent Detection (IOCD2) is reached and the temperature of IC reaches Thermal Shutdown Detection (TTSD) = 175 °C (Typ) or more. The condition for Latch-off Release is the switching of EN voltage (VEN) or IN voltage (VIN).

Schematic



VCC=5V DC Input for fault function Pull-Up, Output is Default Enabled

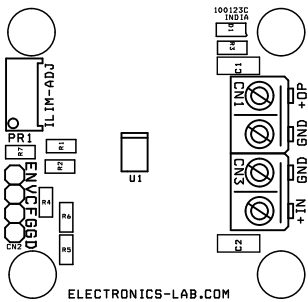
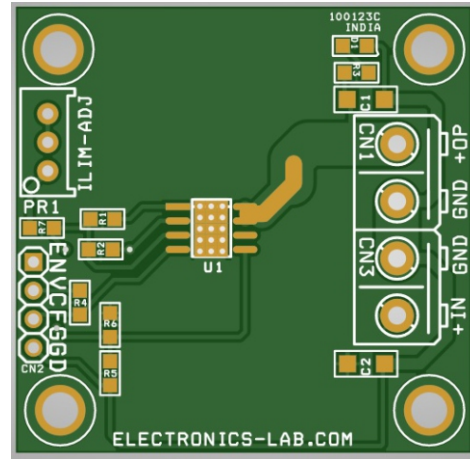
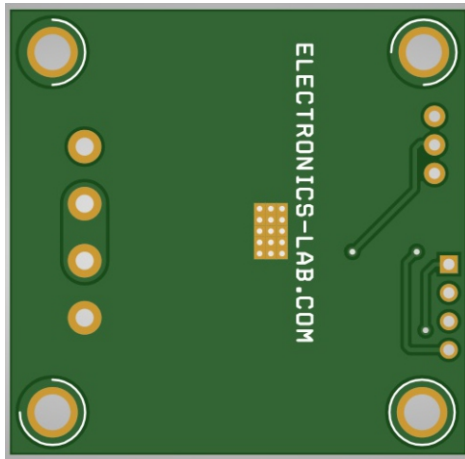
Connections



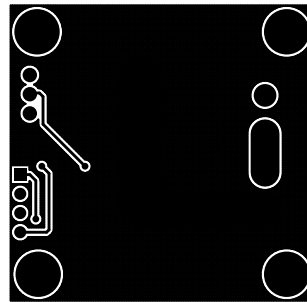
Connections and Other Details

- CN1: Pin 1 = +12V to +24V DC Output, Pin 2 = GND
- CN2: Pin 1 = Enable (Default Enabled, Connect to GND = Disable), Pin 2 = VCC 5V DC Flag Pull-Up Supply, Pin 3 = Flag Output (Default High, Low= When Fault Condition Occurs), Pin 4 = GND
- CN3: Pin 1 = +12V to +24V DC Input, Pin 2 = GND
- D1: Output Power LED
- R2: Current Limit Adjust, Refer Figure
- PR1 + R7: Optional for Adjustable Current Limit
- R1: Soft Start Delay 50mS (Refer Figure to change Delay)

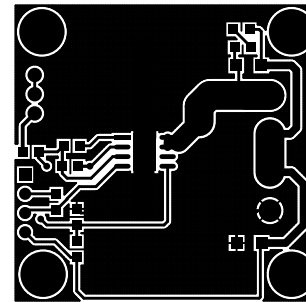
PCB



SILK SCREEN TOP



BOTTOM LAYER

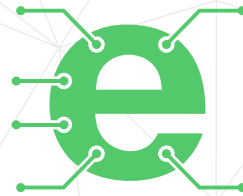


TOP LAYER

PCB DIMENSIONS 40.64 X 39.69MM

Parts List

BOM						
NO.	QNTY.	REF.	DESC.	MANUFACTURER	SUPPLIER	SUPPLIER PART NO
1	2	CN1,CN3	2 PIN SCREW TERMINAL PITCH 5.08MM	PHOENIX	DIGIKEY	277-1247-ND
2	1	CN2	4 PIN MALE HEADER PITCH 2.54MM	WURTH	DIGIKEY	732-5317-ND
3	1	C1	4.7uF/50V CERAMIC SMD SIZE 1206	YAGEO/MURATA	DIGIKEY	
4	1	C2	10uF/50V CERAMIC SMD SIZE 1206	YAGEO/MURATA	DIGIKEY	
5	1	D1	LED RED SMD SIZE 0805	OSRAM	DIGIKEY	475-1278-1-ND
6	2	PR1,R7	OPTIONAL READ NOTE		DIGIKEY	
7	2	R1,R4	100K 5% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
8	1	R2	200K 5% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
9	1	R3	1K 5% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
10	1	R5	3.9K 1% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
11	1	R6	12K 1% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
12	1	U1	BV1HAL45EFJ SOIC8	ROHM	DIGIKEY	846-BV1HAL45EFJ-E2TR-ND



Keep
In touch..

electronics-lab
.com

info@electronics-lab.com
www.electronics-lab.com

from ideas to **boards**

