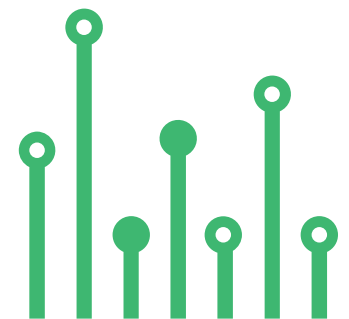


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POWER SUPPLY



**±340V DC**

**Output, 15V DC**

**Input, Isolated**

**Flyback**

**Converter**



SKU: EL153468

## POWER SUPPLY

# ±340V DC Output, 15V DC Input, Isolated Flyback Converter



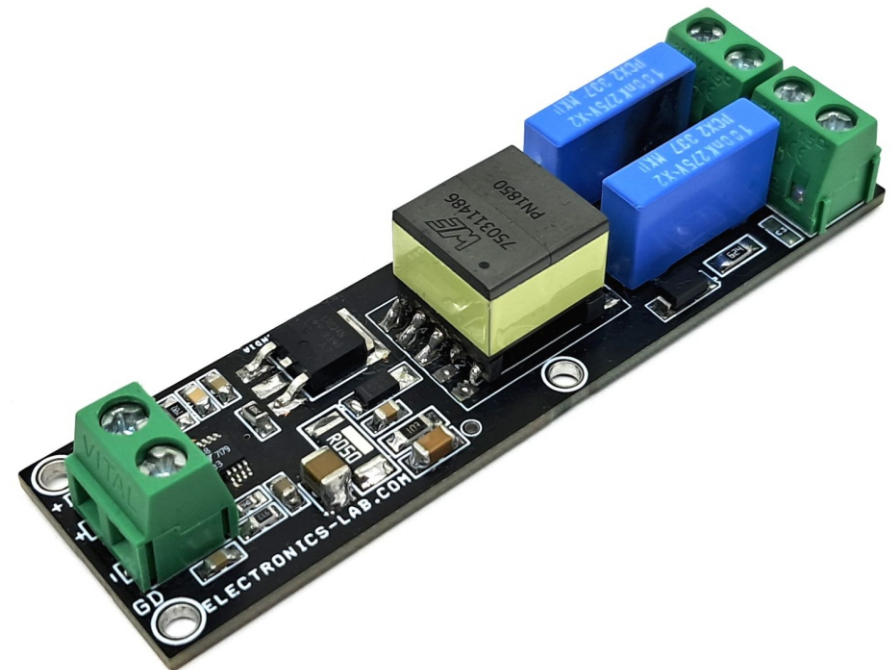
The project presented here is an isolated flyback converter featuring the LT3748 chip from Analog Devices. The circuit is designed for a +/-340V DC (2 x 340V) output from a 7V to 15VDC input. The output current is up to 2 x 8mA. The board senses the isolated output voltage directly from the primary side flyback waveform during the off time of the power switch. No third winding, optocoupler, or signal transformers are required for regulation. A minimum load of approximately 2% of the maximum load is required on the output to maintain regulation.



**Info:** If current regulation is not required, the ISEN pin should be directly connected to the PCB ground plane, thus shunt resistor R4 should be 0 Ohms. Refer data sheet of the chip for change the load current regulation.

## FEATURES

- - Power Supply 7V to 15V DC @ 500mA
- - Output ±340V DC
- - Output Load Current 8mA + 8mA
- - Soft start
- - Under Voltage Lockout
- - 2.5MM X 4 Mounting Holes
- - Screw Terminals for Easy Connections
- - PCB Dimensions 78.90 X 22.23MM



## Output Short Circuits and SENSE Pin Over Current

The LT3748 has an internal threshold to detect when the primary inductor current exceeds the programmed range. This can result from an inductive output short-circuit and an output voltage below zero, reflecting a voltage back to the primary side of the transformer which, in turn, causes the LT3748 to turn the external MOSFET on before the secondary current has discharged. When the voltage at the SENSE pin exceeds approximately 130mV—equivalent to 30% higher than the programmed  $I_{LIM(MAX)}$  in the RSENSE resistor—the SS pin will be reset, stopping switching. Once the soft-start capacitor is recharged and the soft-start threshold is reached, switching will resume at the minimum current limit.

### Soft-Start (Capacitor C8)

The LT3748 contains an optional soft-start function that is enabled by connecting an explicit external capacitor between the SS pin and ground. Internal circuitry prevents the control voltage at the VC pin from exceeding that on the SS pin. Capacitor C8 provides soft-start.

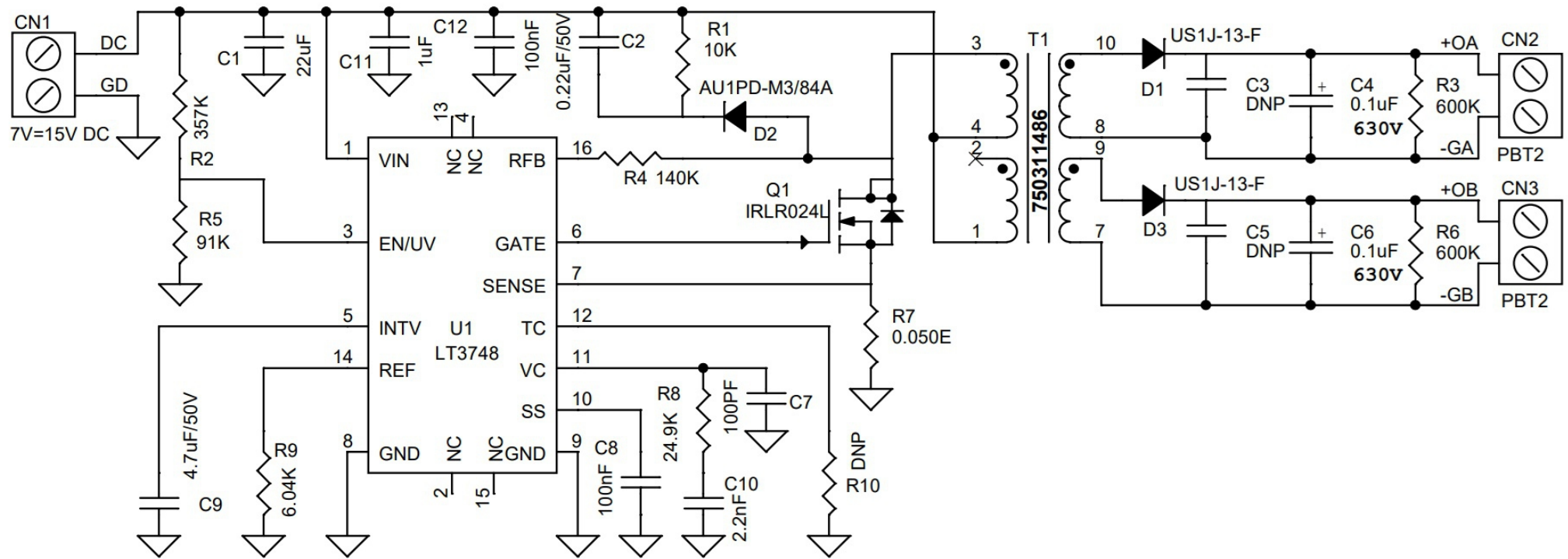
### ENABLE and Undervoltage Lockout (UVLO)

A resistive divider from VIN to the EN/UVLO pin implements undervoltage lockout (UVLO). The EN/UVLO pin threshold is set at 1.223V. In addition, the EN/UVLO pin draws 2.4 $\mu$ A when the voltage at the pin is below 1.223V. Resistor R2 and R5 used to set the UVLO.

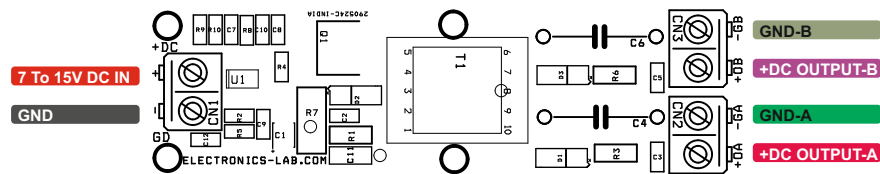
The LT3748 is a switching regulator controller specifically designed for the isolated flyback topology and capable of high power. It drives a low side external N-channel power MOSFET from an internally regulated 7V supply. No third winding or opto-isolator is required for regulation as the part senses the isolated output voltage directly from the primary-side flyback waveform.

The LT3748 utilizes boundary mode to provide a small magnetic solution without compromising load regulation. Operating frequency is set by load current and transformer magnetizing inductance. The gate drive of the LT3748 combined with a suitable external MOSFET allow it to deliver load power up to several tens of watts from input voltages as high as 100V.

# Schematic



# Connections

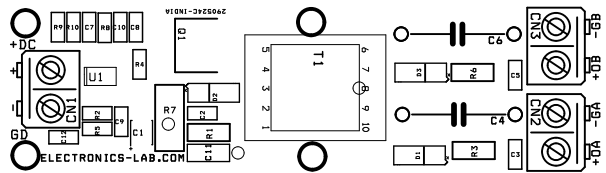
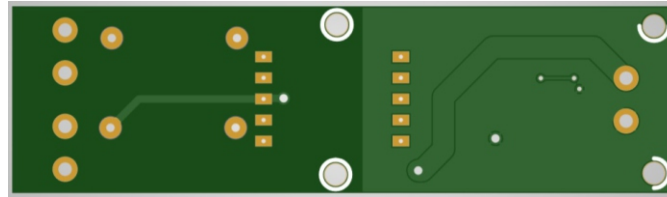
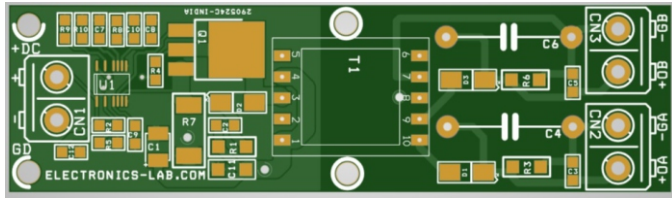


HIGH VOLTAGE

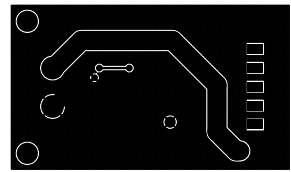


HIGH VOLTAGE

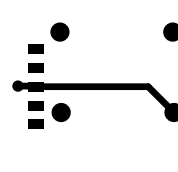
# PCB



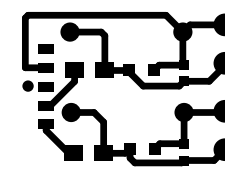
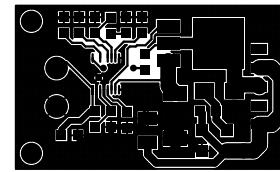
SILK SCREEN TOP



BOTTOM LAYER



TOP LAYER



PCB DIMENSIONS 78.90MM X 22.23MM

# Parts List

BOM						
BOM	QNTY.	REF	DESC	MAUFACTURER	SUPPLIER	SUPPLIER PART NO
1	3	CN1,CN2,CN3	2 PIN SCREW TERMINAL PITCH 5.08MM	PHOENIX	DIGIKEY	277-1247-ND
2	1	C1	22uF/25V CERAMIC SMD SIZE 1210	YAGEO/MURATA	DIGIKEY	
3	1	C2	0.22uF/50V	YAGEO/MURATA	DIGIKEY	
4	3	C3,C5,R10	DNP			
5	2	C4,C6	0.1uF/630V DC OR 250VX2 THT	KEMET	DIGIKEY	399-9651-ND
6	1	C7	100PF/50V CERAMIC SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
7	2	C8,C12	100nF/50V CERMAIC SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
8	1	C9	4.7uF/50V CERAMIC SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
9	1	C10	2.2nF/50V CERAMIC SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
10	1	C11	1uF/25V CERAMIC SMD SIZE 1206	YAGEO/MURATA	DIGIKEY	
11	2	D1,D3	US1J-13-F SDM 600V/1 FAST DIODE	DIODE INC	DIGIKEY	US1J-FDICT-ND
12	1	D2	AU1PD-M3/84A 200V/1A FAST DIODE	VISHAY	DIGIKEY	AU1PD-M3/84AGICT-ND
13	1	Q1	IRLR024NPBFCT-ND	INFINEON	DIGIKEY	IRLR024NPBFCT-ND
14	1	R1	10K 5% SMD SIZE 1206	YAGEO/MURATA	DIGIKEY	
15	1	R2	357K 1% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
16	2	R3,R6	600K 5% SMD SIZE 1206	YAGEO/MURATA	DIGIKEY	
17	1	R4	140K 1% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
18	1	R5	91K 1% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
19	1	R7	0.050E/2W 1% SMD SIZE 2512	YAGEO/MURATA	DIGIKEY	YAG6100CT-ND
20	1	R8	24.9K 1% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
21	1	R9	6.04K 1% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
22	1	T1	750311486 TRANSFORMER	WURTH	DIGIKEY	732-2622-1-ND
23	1	U1	LT3748	ANALOG DEVICE	DIGIKEY	505-LT3748HMS#TRPBFCT-ND



# Notes

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## APP

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### Android App

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