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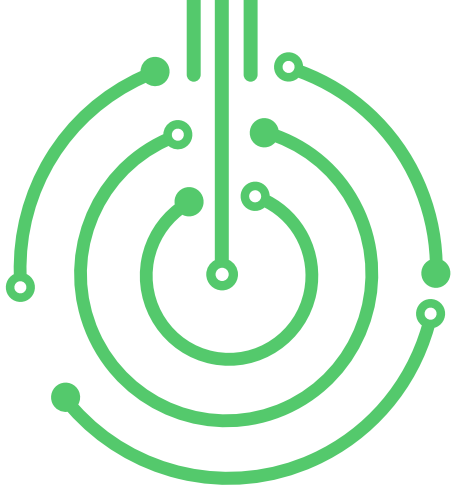


Isolated Power Supply with 24V Input and Dual 15V Output

SKU: EL154972

Isolated Power Supply with 24V Input and Dual 15V Output

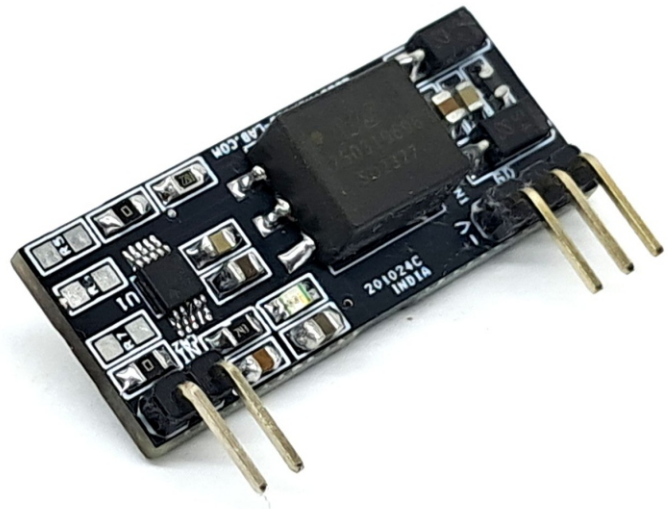
This isolated power supply features the SN6507 chip, a push-pull isolation transformer driver, which provides a reliable and efficient power conversion solution. The power supply comprises a transformer, rectifier circuit, and isolation transformer T1, which separates the input and isolated output, ensuring electrical isolation and preventing high voltages and noise from interfering with or damaging sensitive circuitry.

The SN6507 chip generates complementary output signals (SW1 and Sw2), which are ground-referenced, N-channel power switches that drive the primary side of the center-tapped transformer. The secondary side of the transformer has its center tap referenced to an isolated ground plane, and the complementary outputs are rectified through a four-diode bridge. The break-before-make feature of the two driver outputs from the SN6507 ensures that only one of the primary-side transformer windings is driven at a time, preventing simultaneous conduction and minimizing electromagnetic interference (EMI).

Output: Power Supply provides unregulated Dual outputs, without load +/-18V, With Load +/-15V DC, 250mA+250mA=500mA with 24V DC Input, Output varies with input power supply.

FEATURES

- Output +/-18V (Dual 18V) without Load, Unregulated (+/-15V With Full Load)
- Output Load Current 500mA (250mA+250mA)
- Operating Frequency 1Mhz
- On Board Power LED Input Side
- 2 Pin Header Connector for Power Input
- 3 Pin Header Connector for Dual Power Output
- Compact SIP Type PCB fits in Small Area
- PCB Dimensions 34.93x13.65MM



After rectification, the DC voltage is smoothed and routed to an unregulated dual output, capable of powering external loads up to 500 mA. This isolated power supply is designed to provide a stable and reliable power source for sensitive electronic circuits, ensuring optimal performance and minimizing the risk of electrical noise and interference damage. Ferrite beads L1 and L2 are provided to reduce emissions when power supply outputs are connected to long cables or have high ringing. Optional secondary-side snubber circuit built using R8, R9, C9, C10 helps minimize electromagnetic emissions. These components are optional so they may be replaced with other components or removed.

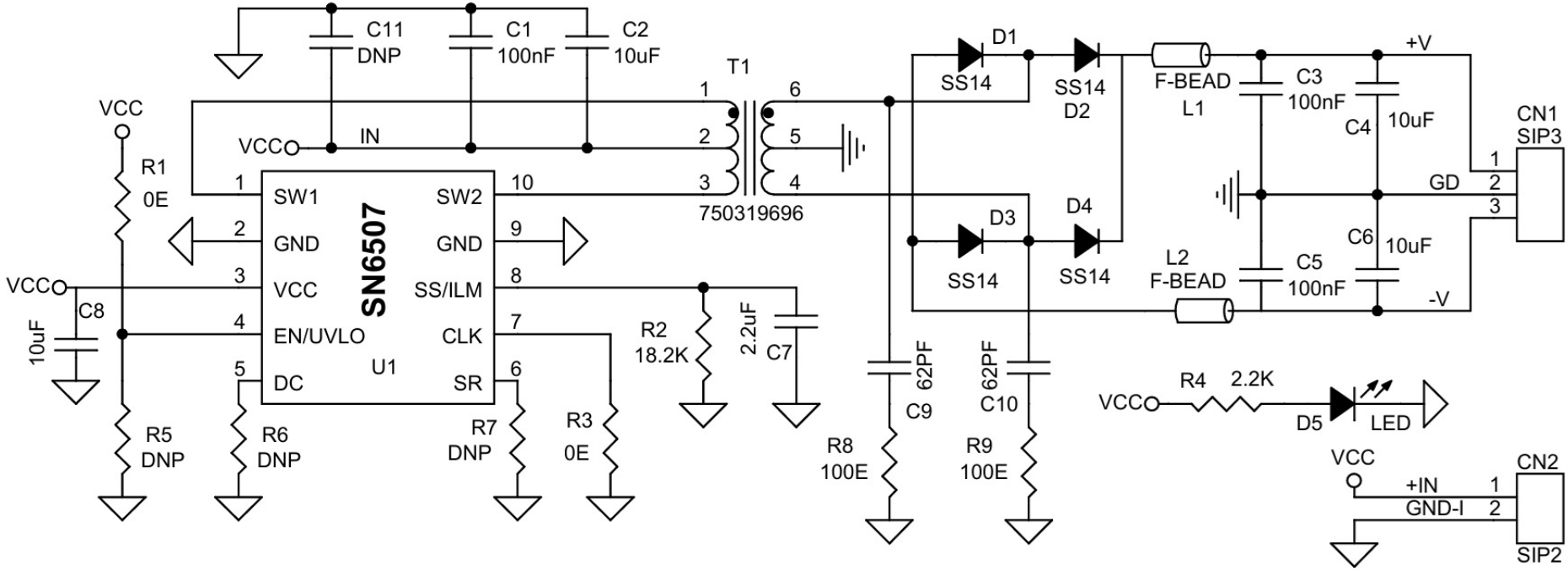
An RC snubber circuit of 100 Ω, 62pF is populated on R12, C15, and R13, C16 by default to help minimize electromagnetic emissions. These components are optional so that they may be replaced with other components or removed from the PCB and excluded from designs using the Sn6507

Soft Start and Over Current Limit

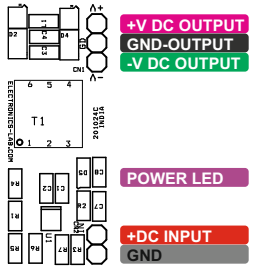
- Resistor R2: Rilim is used to adjust the over-current protection limit of Sn6507
- Capacitor C7: CSS is used to adjust the soft start time of SN6507 during power-up Chip features soft start and current limit.

The SN6507 is a high voltage, high-frequency push-pull transformer driver providing isolated power in a small solution size. The device comes with the push-pull topology's benefits of simplicity, low EMI, and flux cancellation to prevent transformer saturation. Further space savings are achieved through duty cycle control, which reduces component count for wide-input ranges, and by selecting a high switching frequency, reducing the size of the transformer. The device integrates a controller and two 0.5-A NMOS power switches that switch out of phase. Its input operating range is programmed with precision undervoltage lockouts. The device is protected from fault conditions by over-current protection (OCP), adjustable under-voltage lockout (UVLO), over-voltage lockout (OVLO), thermal shutdown (TSD), and break-before-make circuitry. The programmable Soft Start (SS) minimizes inrush currents and provides power supply sequencing for critical power-up requirements. Spread Spectrum Clocking (SSC) and pin-configurable Slew Rate Control (SRC) further reduce radiated and conducted emissions for ultra-low EMI requirements.

Schematic


C11
DNP
C1
100nF
C2
10uF
T1
750319696
VCC
VCC
IN
R1
0E
SW1
GND
VCC
EN/UVLO
DC
SW2
GND
SS/ILM
CLK
SR
SN6507
U1
C8
10uF
R5
DNP
R6
DNP
R7
DNP
R3
0E
R2
18.2K
2.2uF
C7
D1
SS14
SS14
D2
F-BEAD
L1
C3
100nF
C4
10uF
+V
CN1
SIP3
GD
D3
SS14
D4
SS14
L2
F-BEAD
C5
100nF
C6
10uF
-V
62PF
C9
62PF
C10
R8
100E
R9
100E
R4
2.2K
D5
LED
VCC
+IN
GND-I
CN2
SIP2

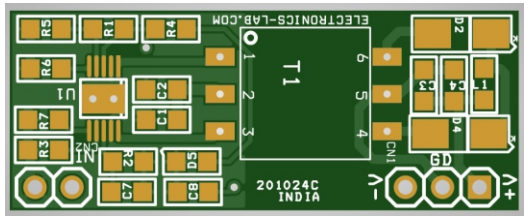
Connections

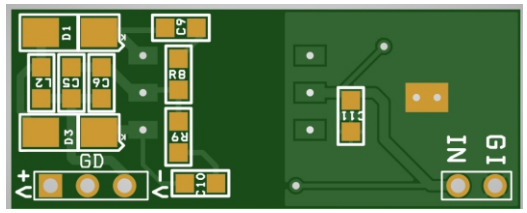


Connections

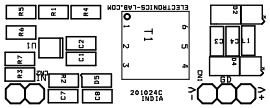
- CN1 Power Output: Pin 1 = +V DC Output, Pin 2 = GND, Pin 3 = -V DC Output
- CN2 Power Input: Pin 1 = +Input 24V DC, Pin 2 = GND
- D5: Power LED

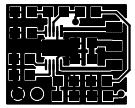
PCB

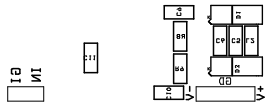




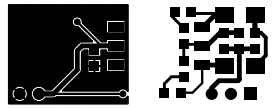
PCB GERBER FILES AVAILABLE


SILK SCREEN TOP


TOP LAYER



SILK SCREEN BOTTOM


BOTTOM LAYER

PCB DIMENSIONS **34.93x13.65MM**

Parts List

BOM						
NO	QNTY	REF.	DESC.	MANUFACTURER	SUPPLIER	SUPPLIER PART NO
1	1	CN1	3 PIN MALE HEADER PITCH 2.54MM	WURTH	DIGIKEY	732-5316-ND
2	1	CN2	2 PIN MALE HEADER PITCH 2.54MM	WURTH	DIGIKEY	732-5315-ND
3	3	C1,C3,C5	100nF/50V CERAMIC SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
4	4	C2,C4,C6,C8	10uF/35V CERAMIC SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
5	1	C7	2.2uF/35V CERAMIC SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
6	2	C9,C10	62PF/50V CERAMIC SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
7	4	R5,R6,R7,C11	DNP			
8	4	D1,D2,D3,D4	SS14 SMD DIODE SOD214	LAIRD	DIGIKEY	SS14CT-ND
9	1	D5	LED SMD SIZE 0805	LITE ON INC	DIGIKEY	160-1427-1-ND
10	2	L1,L2	LI0805G301R-10 FERRITE BEAD	LAIRD	DIGIKEY	240-2382-1-ND
11	2	R1,R3	0E SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
12	1	R2	18.2K 1% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
13	1	R4	2.2K 5% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
14	2	R8,R9	100E 5% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
15	1	T1	750319696 WURTH	WURTH	DIGIKEY	1297-750319696CT-ND
16	1	U1	SN6507	TI	DIGIKEY	296-SN6507DGQRCT-ND

Notes

APP

Android App

DOWNLOAD

Android App launched in 2017 and has 100k+ downloads - rated with 4.5 stars.

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