

Reverse Voltage Protection 50A Kit - Assembly Manual

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INTRODUCTION

The reverse voltage protection (RVP) circuit is designed to prevent damage to an electronic device when connected to DC power in the opposite polarity for which the electronic device was designed to operate normally. The RVP incorporates a relay and some associated circuitry that only allows the relay contacts to close in one polarity direction (that being the direction the electronic device was designed for). Visual indications in the form of LEDs are provided to indicate normal (forward) connection and improper (reverse) connection. Four holes are for source and load wire connections have a current capability of 50 amps continuous.



SPECIFICATIONS

Input voltage:	10-14 VDC
Operating Current:	50A continuous
Mounting:	Four M4 floating mounting holes
Indications:	RED LED on = Indication of reverse power connection, GREEN LED on = Indication of proper power connection.
Size:	1.00" x 1.58"

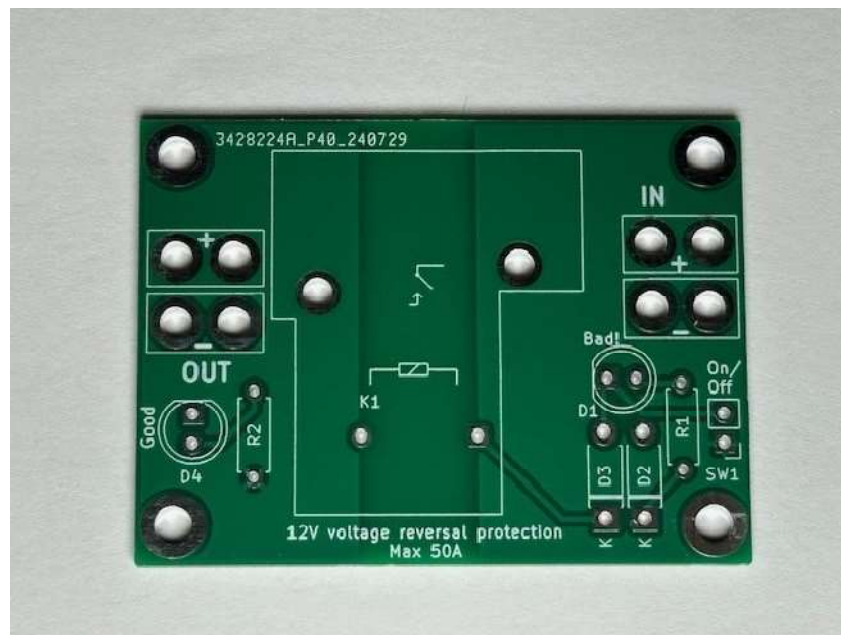
INVENTORY AND PREWORK

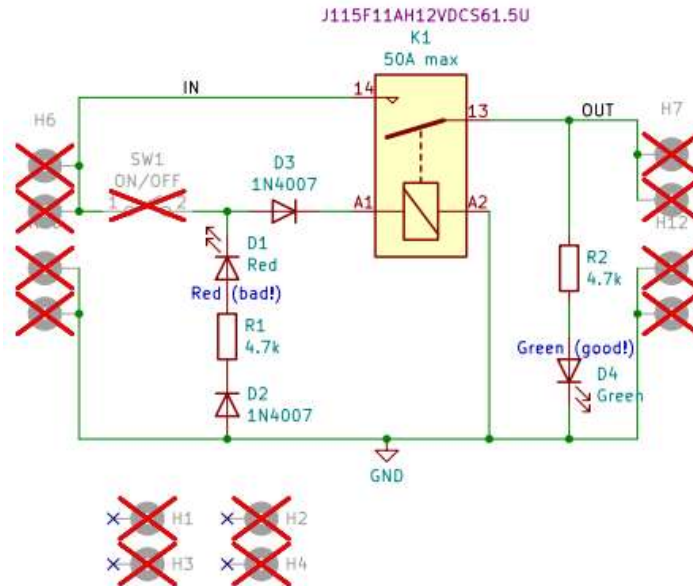
Before you begin, inventory your parts against BOM to make sure you have everything you need to complete the RVP board. The BOM is given below:

Quantity	Ref	Description
1	D1	Red LED 5.0mm
2	D2,D3	1N4007 1000V 1A Leaded Diode
1	D4	Green LED 5.0mm
1	K1	RELAY GEN PURPOSE SPST 50A 12V
2	R1, R2	4.7k 1/4W 5% Leaded Carbon Film Resistor
1	SW1	1x2 IDC Male Pins - 2.53mm pitch
1	SW1-S	1x2 Shorting bar
1	PCB	PCB

BOARD AND CIRCUIT

Refer to the unpopulated circuit board and the schematic for building the RVP kit:



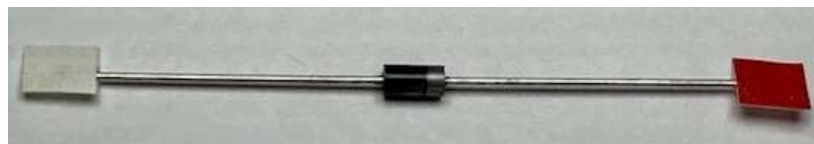


BUILDING THE BOARD

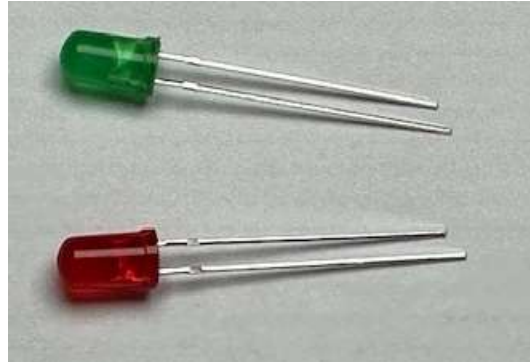
1. Find a place where you can spread out your work, including a printouts of the schematic and BOM. Your workstation should be such that you can leave it overnight without having to "clean up". The workspace should also be kid- and cat-proof. If you get tired, stop. Come back to it tomorrow. Rushing the assembly rarely works out saving time.
2. Start by cleaning the RVP board with IPA (Iso-propyl or "rubbing" alcohol) to make sure it's clean.
3. Next, bend the leads and solder the three 4.7K ohm resistors at positions R1 and R2 on the board. Clip the leads on the bottom side of the board:



4. Solder D2 and D3, the "all black" looking 1N4007 diodes with the white stripe on one end. Make sure the end with the white stripe aligns with the white stripe on the board at the D2 and D3 positions (square pad on the circuit board):



5. Solder the two LEDs D1 (RED or “BAD”), and D4 (GREEN or “GOOD”) onto the board. Note the orientation is such that the SHORT LEAD of the LEDs goes through the hole in the SQUARE PAD on the circuit board.



6. Solder the RELAY into its position at K1.



7. Solder the two IDC pins into position at SW1. Place the Shorting Jumper over the pins.
8. Finally, solder 12 gauge WIRES into the WIRE HOLES on the “IN” and “OUT” sides of the board minding the polarity. Note that there are two holes for each connection such that two 12 gauge wires can be used to carry up to 50A of current.
9. The board is now complete. Use IPA again to clean the flux off the board. If done right, It should look like this:



USING THE BOARD

Connect incoming power to the “IN” side of the RVP board. Mind the connection polarity. Apply power to test the RVP. The GREEN LED should light. Remove power and connect the load (radio or other piece of electronic gear) to the “OUT” side minding the connection polarity to the load. Now apply power to the PRV and the load should be active. Note that this board is small enough to fit inside most projects and will protect the project from voltage reversals. A quick check of the LEDs will tell you if there is a connection problem.

You can remove the jumper at SW1 and replace it with a small/ remote SPST (NO=OFF) switch to make the EVP board into a power switch capable of switching 50A at 12VDC.