

**CUSTOMER WARNING – This circuit is designed for use with a current limited source such as a photo-voltaic (PV) solar panel of about 100W maximum or a 16.5V/ 5A current limited power supply (based on the likes of a LM317/ LM338 regulator).**

**We hope to be able to offer a suitable power supply in the near future.**

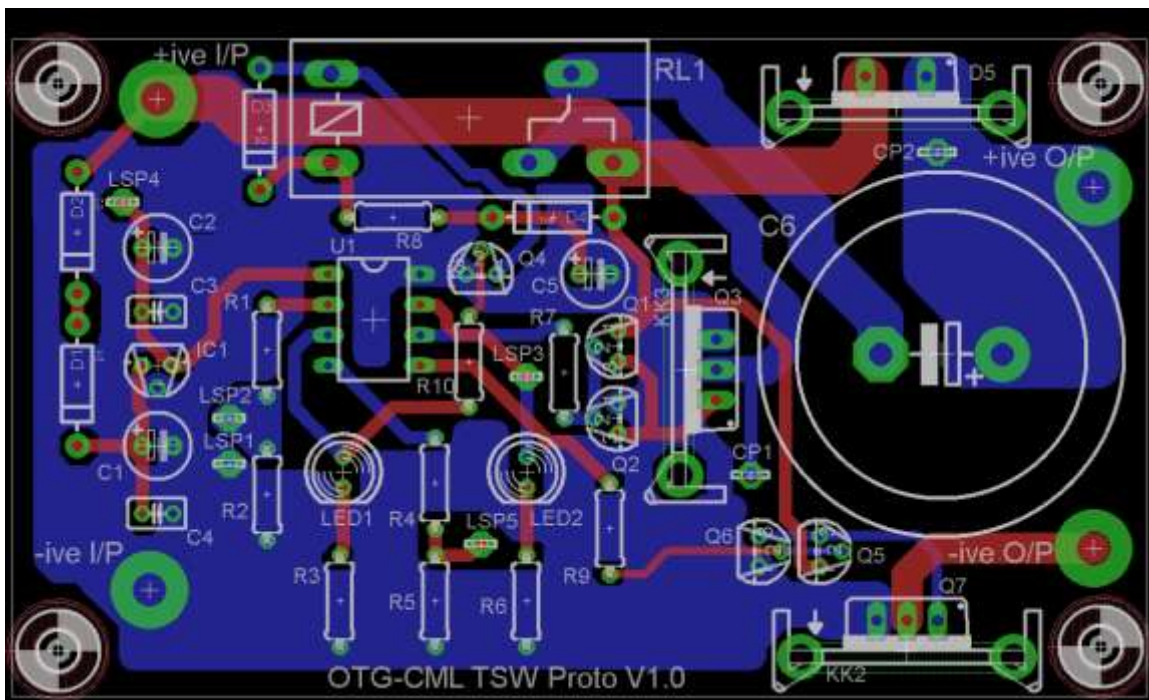
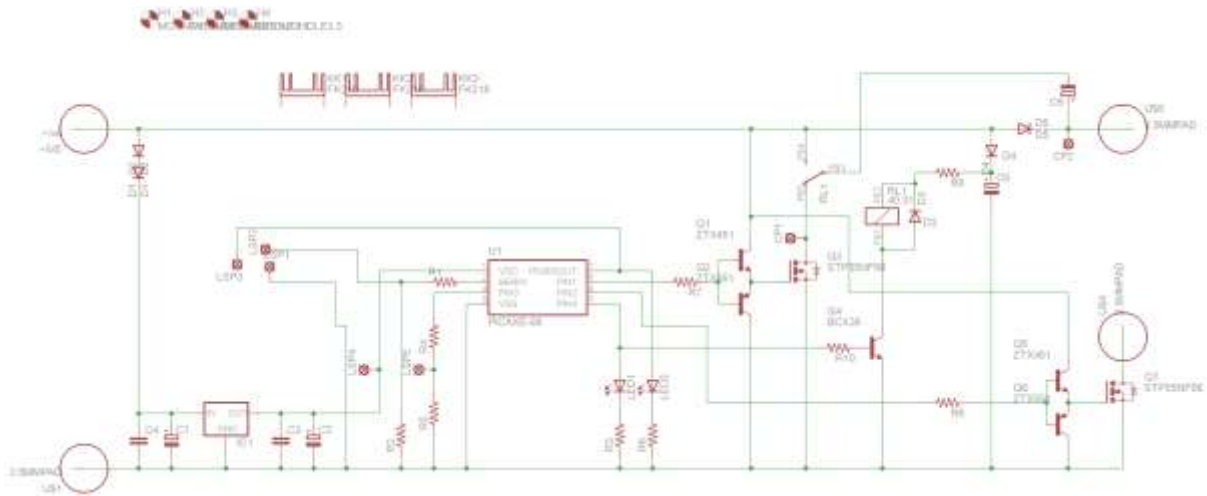
### **OTG-CML TSW CHARGER**

#### **Parts List**

R1	22k	1off
R2, R5 & R10	10k	3off
R3 & R6	330R	2off
R4	1k	1off
R7 & R9	270R	2off
R8	56R	1off
C1 & C2	100uF/ 35V	2off
C3 & C4	100nF	2off
C5	220uF/ 35V	1off
C6	6800uF/ 50V	1off
D1 - D4	1N4001	4off
D5	STPS1045D	1off
LED1	Green LED	1off
LED2	Red LED	1off
Q1 & Q5	ZTX451	2off
Q2 & Q6	ZTX551	2off
Q3 & Q7	STP55NF06	1off
Q4	BCX38	1off
IC1	78L05	1off
U1	PICAXE-08M	1off
	8 pin DIL socket	1off
RL1	Finder 40.31S	1off
	Relay base	1off
SW1	Push to make switch	1off
	FK218 heat sinks	3off
	M3 x 6mm bolt	3off
	M3 nut	3off

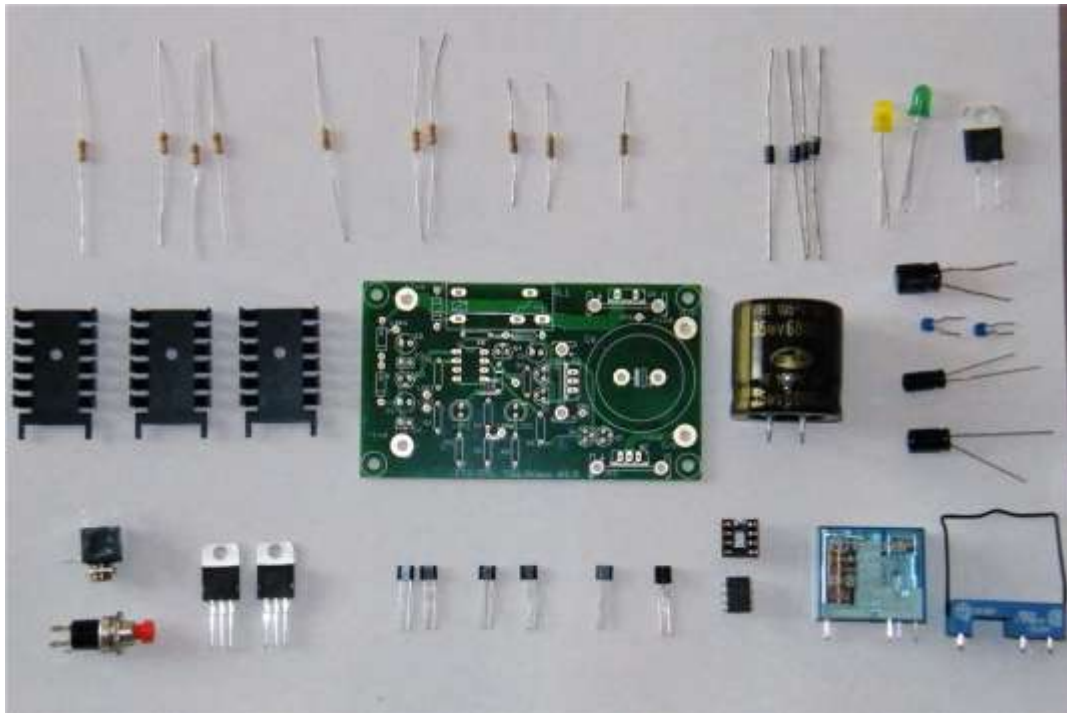
PCB

1off

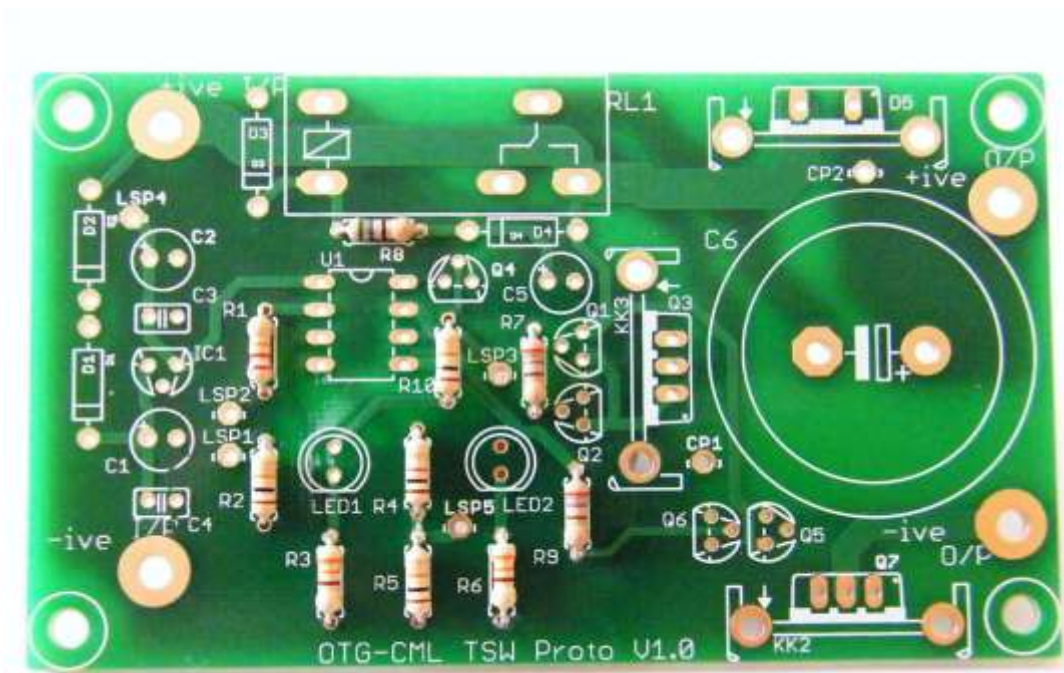


### Assembly Instructions

1. Firstly check all components are present and that you can identify them.



2. Fit the resistors first.



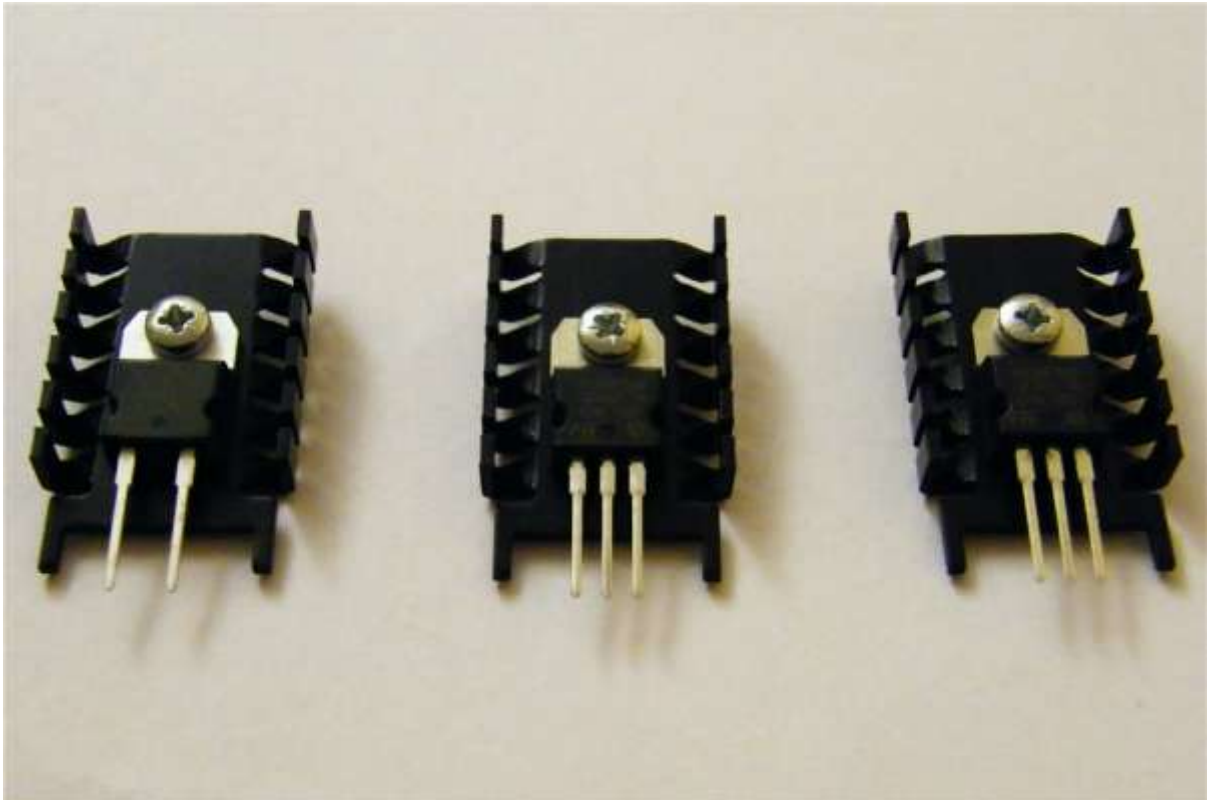
3. Fit the capacitors and diodes next.



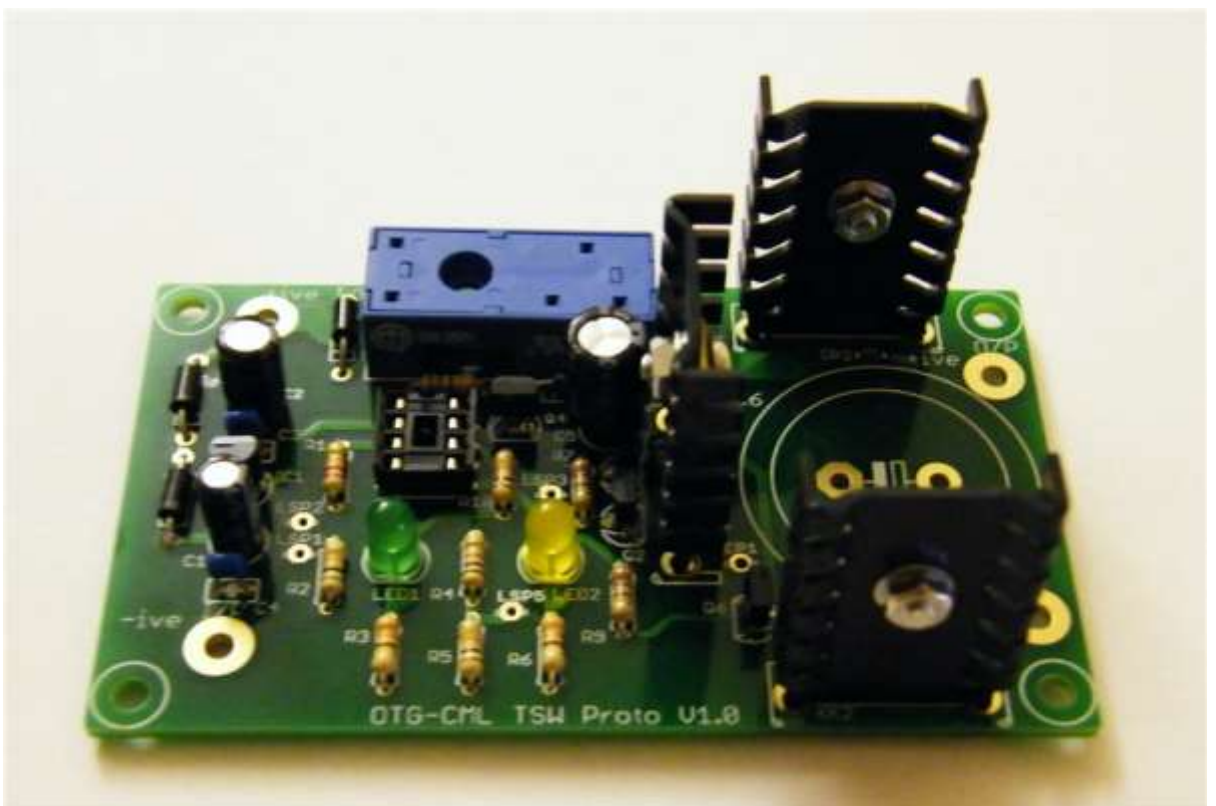
4. Fit the electrolytics and relay base next



5. Attach the diode/ MOSFET's to the heatsinks.



6. The above components soldered to the PCB.



7. Fit the relay and large electrolytic capacitor. It is most important you understand that only a current limited power source should be used

with this device. Thus it is meant to be used with the likes of a 100W PV solar panel or such as a LM338 based current limited power supply (we intend supplying such a device as a kit shortly but there are ready built units available on eBay from Hong Kong – we are using one and it seems suitably durable).



8. The input/ output leads can be attached next.



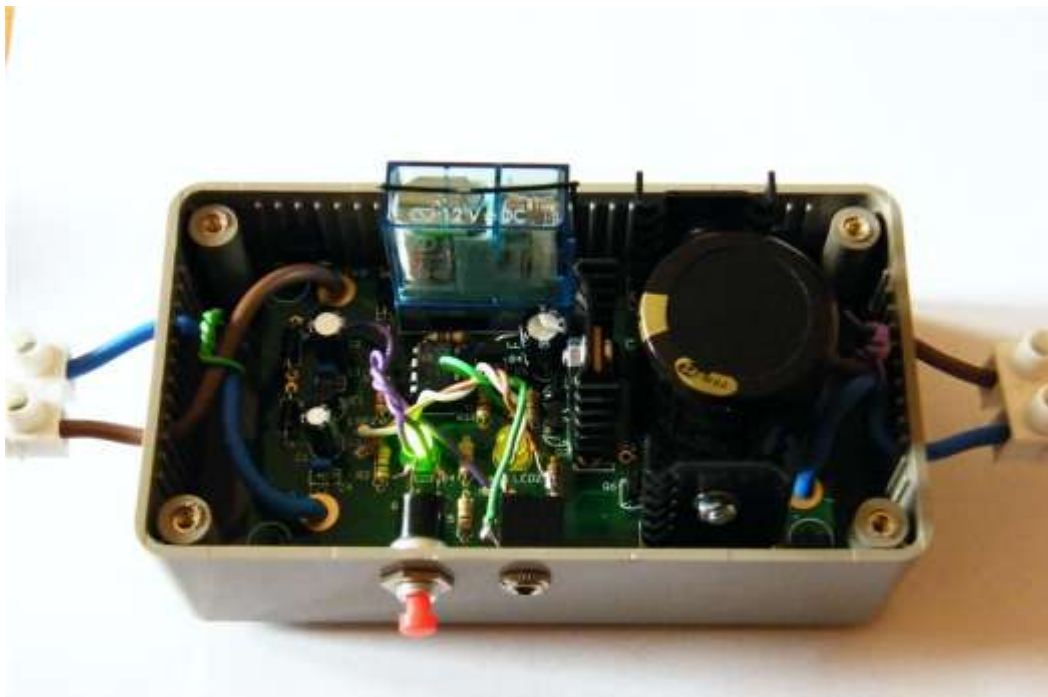
9. The push button can be used as follows;



- a) Pressing the push to make switch will cause the program to stop and the red LED will light
  - b) Further pushing will step the programme through each of the five steps of the program i.e. capacitor charge, relay on (doubling the voltage after the diode), discharging the cap across the battery, switching off the relay with constant voltage/current to the battery and starting the cycle again.
10. The life of the relay is currently unknown. The manufacturer gives a mean time between failure of some 20 million operations. This would give some 230 days of continuous operation. We view the relay as a consumable item and the programme has been written such that the relay opens and closes with minimal current across it. We will supply replacement relays on demand (at minimal cost) and may well supply a spare with kits in future.

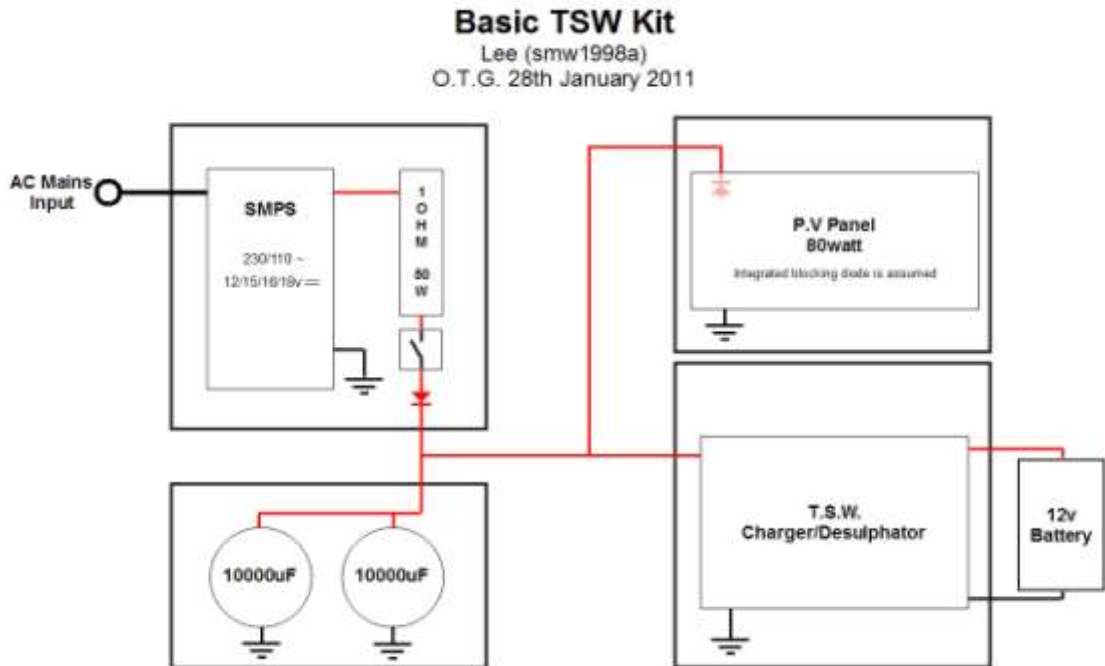


11. As ever we will provide support to our customers but please bear in mind that this circuit is still to be viewed as 'experimental' and we will be very interested to hear back from customers with their experience 'in the field' so to speak.





12. Finally we suggest the device could be used as represented by the following diagram:-



In order to maximise the efficiency of the charger when used with PV panels as the input and with its current timing you would need to utilise some 375,000uF of capacitor bank to store the charge. This figure has yet to be confirmed as it is a theoretical currently.