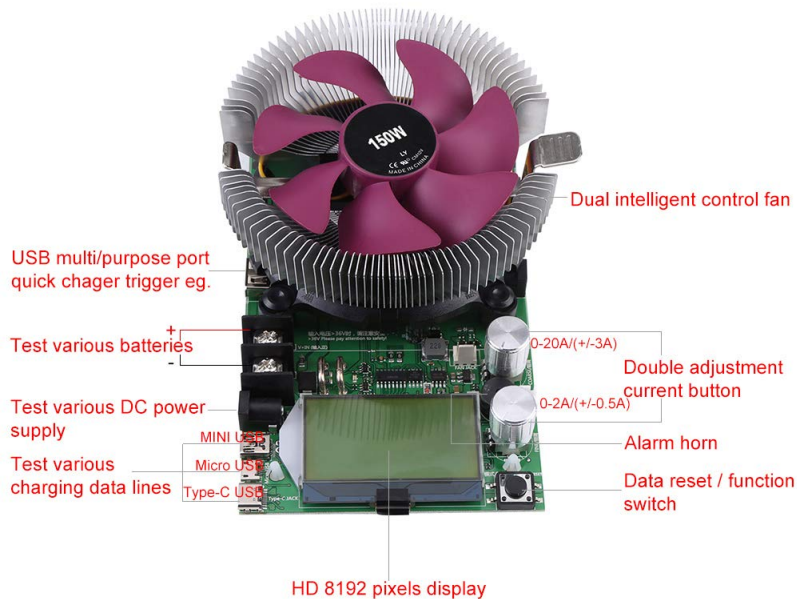


# Load Battery Tester

## Overview

### USB Adjustable Constant Current Electronic Load 200V / 20A 150W



## Specification

Input Interface / Output Interface: 100A High Current Bite Screw Stud  
Voltage measurement range: 0.00V ~ 200V, Resolution accuracy: 0.01V  
Current measurement range: 0.00A ~ 20A, Resolution accuracy: 0.01A  
Capacity accumulation range: 0 ~ 999.999Ah, Resolution accuracy: 0.01Ah  
Power accumulation range: 0 ~ 9999.9Wh, Resolution accuracy: 0.01Wh  
Power measurement range: 0000.00 ~ 150W, Resolution accuracy: 0.01W  
Impedance measurement range: 1 ~ 999.9, Resolution accuracy: 0.01  
Temperature measurement range: 0 ~ 99, Resolution accuracy: 1  
Timing maximum time: 999 hours 59 minutes 59 seconds, Resolution accuracy: 1 second  
Timing measurement reminder settings: countdown 24 hours, any value can be set  
Small current standby to remind the threshold parameters and timing: <2W / 0.5 hours; > 0.5W begin timing  
Power supply: 4 ~ 30V range of DC voltage

#### Note:

1. Please turn down the knob to the end counterclockwise before using, and **then turn up slowly**.
2. Please pay attention to your safety when the voltage is more than 36V.
3. Several tested power supply can not be connected simultaneously.
4. The current adjustment knob should be regulated slowly.

#### Package Include:

- 1 x Adjustable Constant Current Electronic Load
  - 1 x Charger
  - 2 x Crocodile Clip
  - 1 x USB Crocodile Clip
- (Other items in the picture are NOT included)

## Instructions

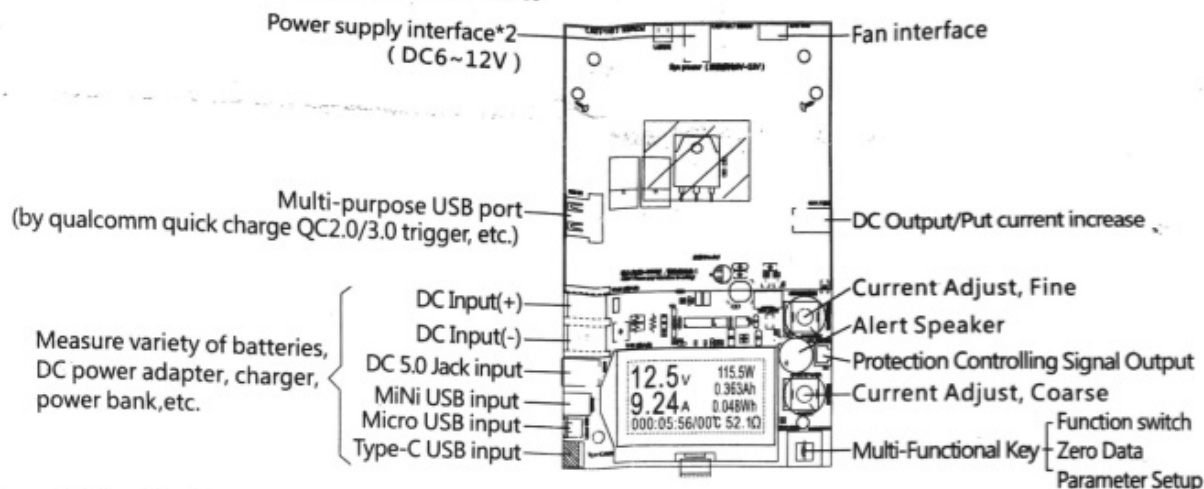
- Turn knobs counter clockwise to reset things to 0
- Calculate the max current using  $I=P/V$ ,  $I=150/V$
- Slowly increase current using the knobs ensuring that you are well under your max current.

# Battery Capacity/Dc Power Multi-function Tester

## — Usage introduction —

**Prevent burning warning:** when the input voltage battery and large power test, access must be before using two current adjustment knob counterclockwise to the minimum to zero, then the access, according to the priority according to current power to slowly adjust current knob, must not instantly transferred in full, so there are excessive instantaneous power load discharge tube burnt huge risk! Please use the special attention to this point, thank you!

### Interface function instruction:



### Description for Function Key :

- 1) Keep Press long time the key: Zero all data(mAh,Wh,00:00:00)
- 2) Double-click the key: for the Capacity data reset to zero
- 3) Three-click the key:for the electric quantity data reset to zero
- 4) Four-click the key: for the time data reset to zero
- 5) Five-click the key: Auto-Standby Mode & Timer for discharge alert
- 6) Single-click to change the window, entering the setup window for high&Low Voltage background light, adjust the parameters by double-clicking or three-clicking, click-holding for continuous and quick adjust.
- 7) Without load,quickly click the key for 7 times, for current data reset to zero(0.00A).It is for Precise calibration in local circumstance, so that the small current could be precisely measured.
- 8) Keep pressing the key when power-off, then power-on, entering the Background setup window for High&Low Voltage over-load, single-click or double-click to adjust the parameters, keep press the key long time to reset to the default setup  
(Note: Please don't calibrate the voltage or current if without standard instruments)

### Instruction for Connection and Operation :

- 1) Open the package, insert the power adapter into the end of the product and supply the power.
- 2) Anti-clockwise rotate the two current knobs to the lower limit.
- 3) Connecting the Power Supply under test to the product according to the diagram above, and the current Input Voltage value will be read out. Keep pressing the key to reset all data to zero;
- 4) Slowly clockwise rotate the two current knobs (coarse&fine) to adjust the current to the rating value of the Power Supply(The current should be slowly adjusted, using the fine knob priority, the coarse knob could be only used under large current condition.)
- 5) When testing the battery, Low voltage discharge limit should be set up, to avoid the possible damage caused by over discharging while discharge capacity test of the battery.

### SPECIFICATIONS:

Supply Voltage/ Interface : DC6~12V / DC 5.0 or Micro USB  
 Voltage measure Range : 0.00V~200V Accuracy : 0.05V  
 Current Adjustable Range : 0.00A~20A Accuracy : 0.05A  
 Capacity measure Range : 0~999.999Ah Accuracy : 0.01Ah  
 Power cumulative range : 0~99999.9Wh Accuracy : 0.01Wh  
 Power measure Range : 0~2999.99 W Accuracy : 0.01W  
 Impedance measure Range : 1~999.9 ohm Accuracy : 0.01  
 Temperature Range : 0~99°C Accuracy : 1°C  
 Max Timing : 999H59M59S Accuracy : 1S  
 Cooling Fan Power : <150W/<180W (Fan could be changed for different cooling power)  
 Fan controlling gate: The cooling fan auto-started while the current>0.5A or the Temperature >45°C  
 Input/Output : 20A biting screw + USB  
 Refresh time : >500ms/time  
 measure rate : about 2s/time  
 Over voltage and over current alert method : Display warning window and voice warning  
 Protecting Voltage setting Range : 1~300V  
 Low Voltage setting Range : 0~149V  
 Protecting Current setting Range : 0.2~100A  
 Protecting Power setting Range : 185W  
 Display Type : Micro power consumption, LCM module, black font, green backlit, Chinese&English  
 Size : 160x95x60mm  
 Consumption Current : <1.5A  
 Operating Temp. : -10~+60°C  
 Operating Humidity : : 10~80°C Condensation )  
 Operating Pressure : 80~106kPa

### Warning:

- 1) The two current knobs should be set at the lower limit before using(Counterclockwise Adjust to the end Double current knobs to 0.00A)! Then increase the current slowly.
- 2) When the voltage > 36V, please attention to safety! Avoid electric shock
- 3) Several Powers should not be connected at the same time, avoid the over voltage or current to damage your power supply.
- 4) Slowly adjust the current while observing the displayed value, avoid the instant large current overloaded.
- 5) Be sure to obey the law of conservation of energy, the

3) Be sure to check the limit of current rating of energy, the product of the voltage and the current should less than 150W.

## Problem

- something has shorted

## Solution

Tested the MOSFET (See reference below) and replaced MOSFET and everything seems to be working now.

## Why did it Break?

Probably because I hadn't reset the knobs controlling the current to zero resistance before connecting to battery.

This unit has a 150W limit! So, if you are using 40V, the max current you should draw would be:

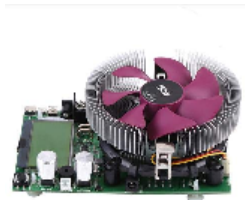
$$P=IV$$

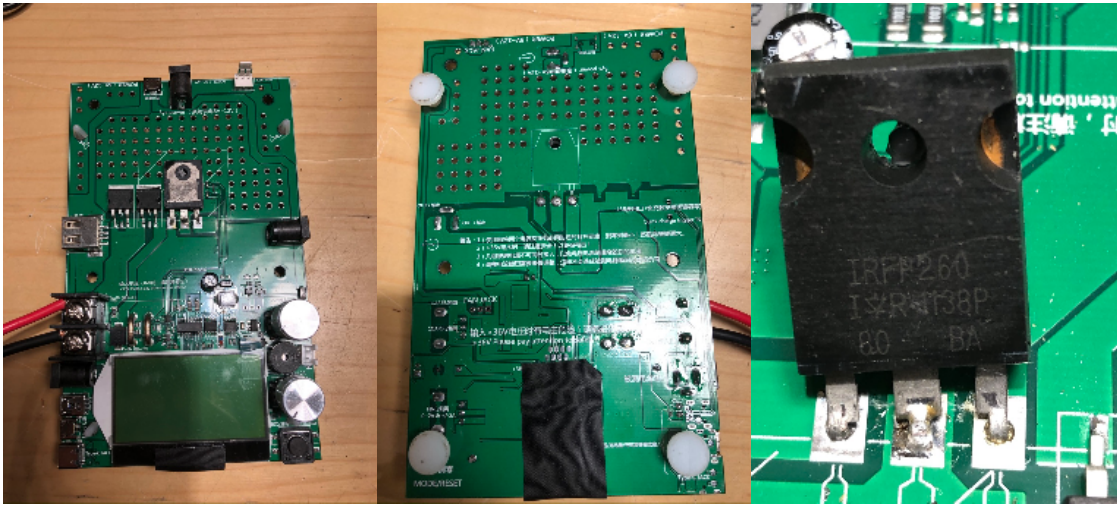
$$I=P/V$$

$$I=150/40$$

$$I = 3.75A$$

## Pictures





IRFP260

| PRODUCT SUMMARY           |                        |       |
|---------------------------|------------------------|-------|
| $V_{DS}$ (V)              | 200                    |       |
| $R_{DS(on)}$ ( $\Omega$ ) | $V_{GS} = 10\text{ V}$ | 0.055 |
| $Q_g$ (Max.) (nC)         | 230                    |       |
| $Q_{gs}$ (nC)             | 42                     |       |
| $Q_{gd}$ (nC)             | 110                    |       |
| Configuration             | Single                 |       |

| ABSOLUTE MAXIMUM RATINGS (T <sub>C</sub> = 25 °C, unless otherwise noted) |                         |                         |                                   |                  |          |
|---|-------------------------|-------------------------|-----------------------------------|------------------|----------|
| PARAMETER   |                         |                         | SYMBOL                            | LIMIT            | UNIT     |
| Drain-Source Voltage  |                         |                         | V <sub>DS</sub>                   | 200              | V        |
| Gate-Source Voltage   |                         |                         | V <sub>GS</sub>                   | ± 20             |          |
| Continuous Drain Current  | V <sub>GS</sub> at 10 V | T <sub>C</sub> = 25 °C  | I <sub>D</sub>                    | 46               | A        |
|   |                         | T <sub>C</sub> = 100 °C |                                   | 29               |          |
| Pulsed Drain Current <sup>a</sup>   |                         |                         | I <sub>DM</sub>                   | 180              |          |
| Linear Derating Factor  |                         |                         |                                   | 2.2              | W/°C     |
| Single Pulse Avalanche Energy <sup>b</sup>                                |                         |                         | E <sub>AS</sub>                   | 1000             | mJ       |
| Repetitive Avalanche Current <sup>a</sup>                                 |                         |                         | I <sub>AR</sub>                   | 46               | A        |
| Repetitive Avalanche Energy <sup>a</sup>                                  |                         |                         | E <sub>AR</sub>                   | 28               | mJ       |
| Maximum Power Dissipation   |                         | T <sub>C</sub> = 25 °C  | P <sub>D</sub>                    | 280              | W        |
| Peak Diode Recovery dV/dt <sup>c</sup>                                    |                         |                         | dV/dt                             | 5.0              | V/ns     |
| Operating Junction and Storage Temperature Range                          |                         |                         | T <sub>J</sub> , T <sub>stg</sub> | - 55 to + 150    | °C       |
| Soldering Recommendations (Peak Temperature)                              |                         | for 10 s                |                                   | 300 <sup>d</sup> |          |
| Mounting Torque   | 6-32 or M3 screw        |                         |                                   | 10               | lbf · in |
|   |                         |                         |                                   | 1.1              | N · m    |

IRDF264

| PRODUCT SUMMARY           |                        |       |
|---------------------------|------------------------|-------|
| $V_{DS}$ (V)              | 250                    |       |
| $R_{DS(on)}$ ( $\Omega$ ) | $V_{GS} = 10\text{ V}$ | 0.075 |
| $Q_g$ (Max.) (nC)         | 210                    |       |
| $Q_{gs}$ (nC)             | 35                     |       |
| $Q_{gd}$ (nC)             | 98                     |       |
| Configuration             | Single                 |       |

| ABSOLUTE MAXIMUM RATINGS (T <sub>C</sub> = 25 °C, unless otherwise noted) |                         |                         |                                   |                  |          |
|---|-------------------------|-------------------------|-----------------------------------|------------------|----------|
| PARAMETER   |                         |                         | SYMBOL                            | LIMIT            | UNIT     |
| Drain-Source Voltage  |                         |                         | V <sub>DS</sub>                   | 250              | V        |
| Gate-Source Voltage   |                         |                         | V <sub>GS</sub>                   | ± 20             |          |
| Continuous Drain Current  | V <sub>GS</sub> at 10 V | T <sub>C</sub> = 25 °C  | I <sub>D</sub>                    | 38               | A        |
|   |                         | T <sub>C</sub> = 100 °C |                                   | 24               |          |
| Pulsed Drain Current <sup>a</sup>   |                         |                         | I <sub>DM</sub>                   | 150              |          |
| Linear Derating Factor  |                         |                         |                                   | 2.2              | W/°C     |
| Single Pulse Avalanche Energy <sup>b</sup>                                |                         |                         | E <sub>AS</sub>                   | 1000             | mJ       |
| Repetitive Avalanche Current <sup>a</sup>                                 |                         |                         | I <sub>AR</sub>                   | 38               | A        |
| Repetitive Avalanche Energy <sup>a</sup>                                  |                         |                         | E <sub>AR</sub>                   | 28               | mJ       |
| Maximum Power Dissipation   | T <sub>C</sub> = 25 °C  |                         | P <sub>D</sub>                    | 280              | W        |
| Peak Diode Recovery dV/dt <sup>c</sup>                                    |                         |                         | dV/dt                             | 4.8              | V/ns     |
| Operating Junction and Storage Temperature Range                          |                         |                         | T <sub>J</sub> , T <sub>stg</sub> | - 55 to + 150    | °C       |
| Soldering Recommendations (Peak Temperature)                              |                         | for 10 s                |                                   | 300 <sup>d</sup> |          |
| Mounting Torque   | 6-32 or M3 screw        |                         |                                   | 10               | lbf · in |
|   |                         |                         |                                   | 1.1              | N · m    |

## Fix

I replaced the broken IRFP260 with a IRFP264. Works but not reported proper results.

Ordered some IRFP260N chips. Will try those.

## References

| Reference            | URL   |
|----------------------|---|
| IRFP260 Datasheet    | <a href="https://www.vishay.com/docs/91215/91215.pdf">https://www.vishay.com/docs/91215/91215.pdf</a> |
| IRFP264 Datasheet    | <a href="https://www.vishay.com/docs/91217/91217.pdf">https://www.vishay.com/docs/91217/91217.pdf</a> |
| How to test a MOSFET | <a href="https://www.youtube.com/watch?v=IF740E5bm84">https://www.youtube.com/watch?v=IF740E5bm84</a> |