

# USB meter: USB OLED display tester J7-4T



Official specifications:

- Input Voltage: 3V - 30V
- Input current : 0 - 5.1A
- Cumulative capacity range: 0-99999 mAh
- Cumulative power range: 0-99999 mWh
- Timing the maximum range: 0-999 hours 59 minute 59 seconds precision: 1 second
- Parameters that you can test: Voltage of battery, Current of battery, discharge capacity of battery,Quantity of electric charge,power of battery,timing.
- Parameters adjusting function: Yes.

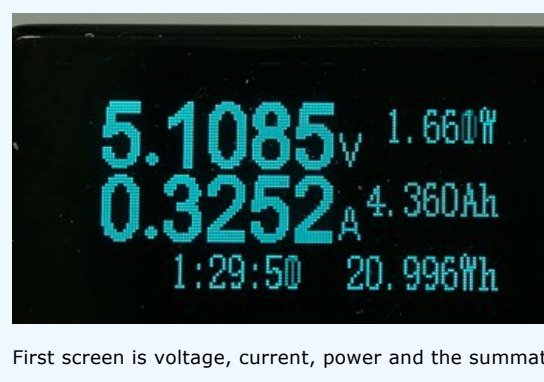
I found this unit on Aliexpress at a dealer called ETORCH Design Manufactory Co.,Ltd store

## How does it look

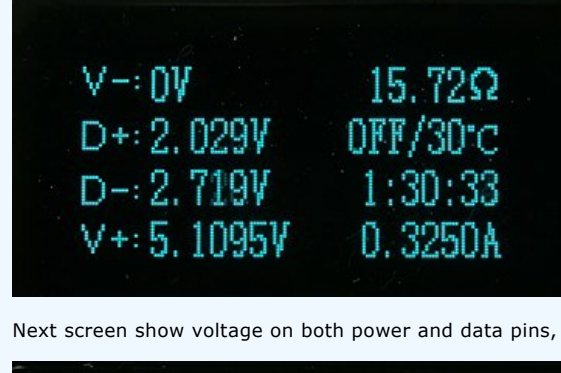


The button has many functions:  
 1 click will move to next screen  
 2 clicks will only reset the Ah counter.  
 3 clicks will only reset the Wh counter.  
 4 clicks will only reset the time.  
 5 clicks will adjust when to turn off power: Never, auto or hours.  
 6 clicks will change between English and Chinese language.  
 Holding it down will reset time, Ah and Wh counters.  
 Single and double clicks are used to step up/down in some selections.  
 Note: Not all click combinations works on all screens.

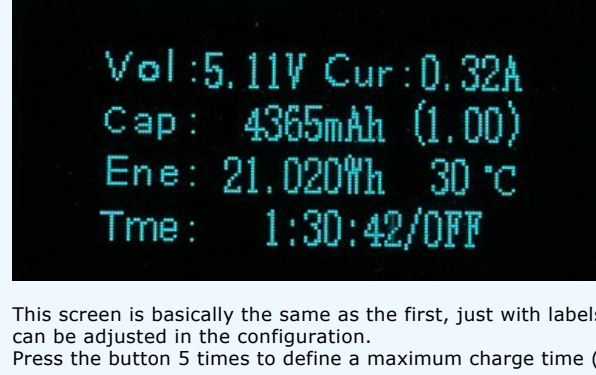
Holding the button down when connecting power will enter the configuration and calibration menu.



First screen is voltage, current, power and the summations Ah, Wh and time.



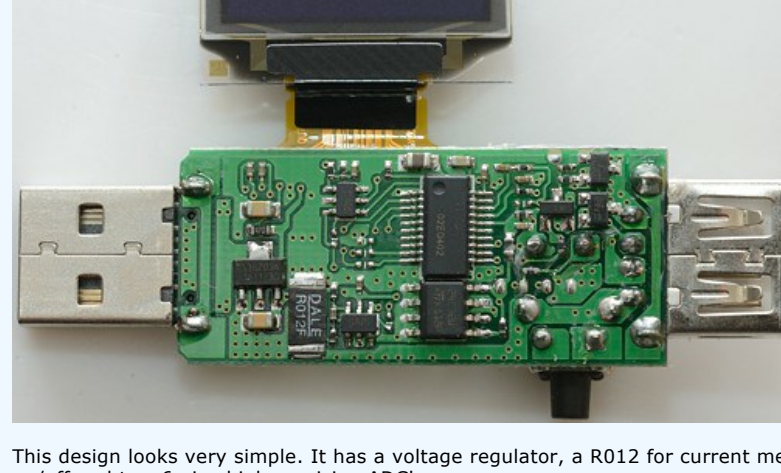
Next screen show voltage on both power and data pins, a calculated resistance of the load, internal temperature, time and current.



This screen is basically the same as the first, just with labels for the sums and less resolution on voltage and current. The (1.00) shown is a scale factor that can be adjusted in the configuration.  
 Press the button 5 times to define a maximum charge time (AO is auto off), wait to save.



I could break it open without any damage.



This design looks very simple. It has a voltage regulator, a R012 for current measurement, a processor, a EEPROM and some transistors for turning the output on/off and two 6 pins high precision ADC's.



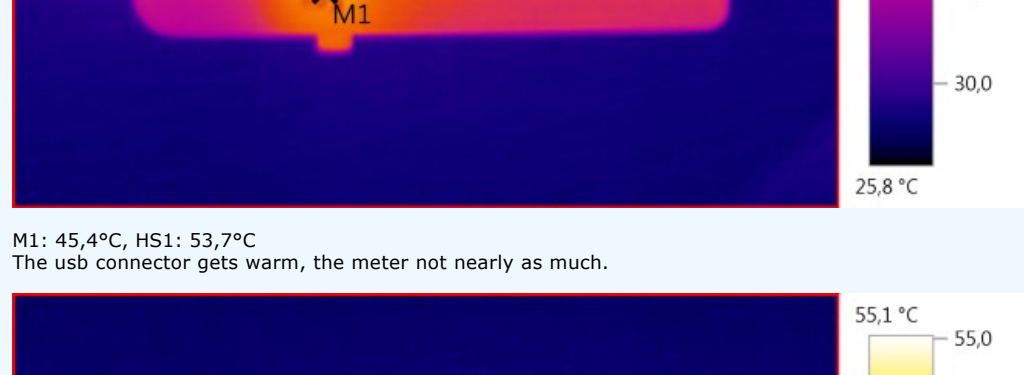
## Measurements

Current	Vin	Vout	Display U	Display A
0,00	2,0000	0,0000		
0,00	2,4986	0,0000	<3	
0,00	2,9997	0,0000	<3	
0,00	3,4995	3,4995	3,4774	0,0000
0,00	4,0000	3,9993	3,9748	0,0000
0,00	4,4995	4,4988	4,4714	0,0000
0,00	4,9997	4,9989	4,9687	0,0000
0,00	5,4997	5,4989	5,4656	0,0000
0,00	5,9997	5,9989	5,9625	0,0000
0,00	7,9998	7,9990	7,9507	0,0000
0,00	9,9997	9,9989	9,9389	0,0000
0,00	12,0000	11,9992	11,927	0,0000
0,00	20,0000	19,9990	19,882	0,0000
0,00	30,0009	29,9997	29,830	0,0000
0,50	4,9992	4,9142	4,9070	0,4992
1,00	4,9982	4,8362	4,9134	0,9994
1,50	4,9973	4,7673	4,8877	1,4994
2,00	4,9964	4,7004	4,8627	2,0000
2,50	4,9955	4,6265	4,8356	2,4995
3,00	4,9946	4,5506	4,8001	2,9999
3,00	3,4944	3,0364	3,3054	3,0000
3,00	3,9944	3,5504	3,8038	3,0002
3,00	5,9946	5,5616	5,7945	3,0004

- The usb connector is reversibel, it is always possible to mount with display up.
- Own current consumption is 13mA
- Internal resistance is about 0.15ohm including connection resistance.
- Remembers Wh and Ah when power is off
- Voltage display is within 0.04 volt in the 4.0 to 6.0 volt range.
- Current display is better than 0.001 ampere in the 0 to 3.0 ampere range.
- Over current turn off is at 5A (Can be configured)
- Over voltage turn off at 30 volt (Can be configured)
- Under voltage turn off is at 3 volt (Can be configured)
- USB data works fine.
- Meter has a buzzer than sound when voltage is disconnected.
- Reading drift a small bit when meter gets hot, during the 1 hour test current reading increased to 3.0018A



M1: 45,4°C, HS1: 53,7°C  
 The usb connector gets warm, the meter not nearly as much.



M1: 46,7°C, M2: 42,0°C, HS1: 55,1°C

## Conclusion

This is a usb meter with a few extra function. For technical people the D+/D- voltage can be very interesting (Together with the table at the [bottom of this page](#)).  
 The voltage precision is not very good compared to number of digits, but that can be calibrated (if you have a precise 5V source, I did that after the test and the precision was very good after that). The current was much better calibrated.  
 I do not see much idea in the disconnect function, scaled capacity or the timed charge.

The other function is a good usb meter with Ah and Wh counters, but I could have wished for lower internal resistance.

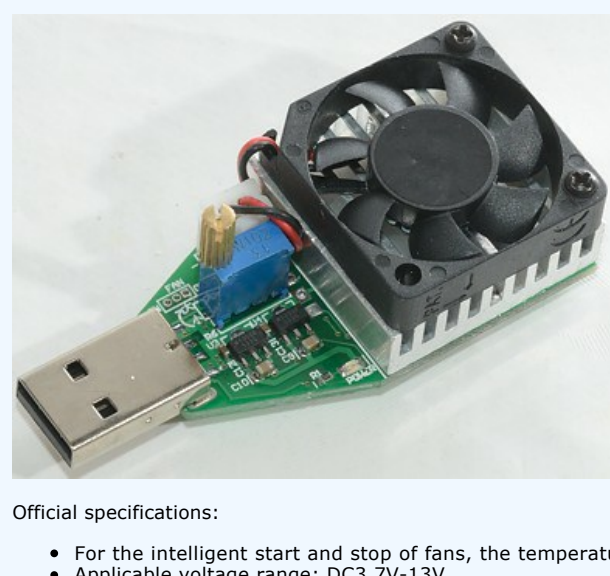
## Notes

The other usb meters in the same serie: [Safety tester J7-t \(Also called Security tester\)](#) and [QC2-3-MTK-PF Trigger J7-t](#). They uses nearly the same circuit board and parts.

[How do I make the test](#)



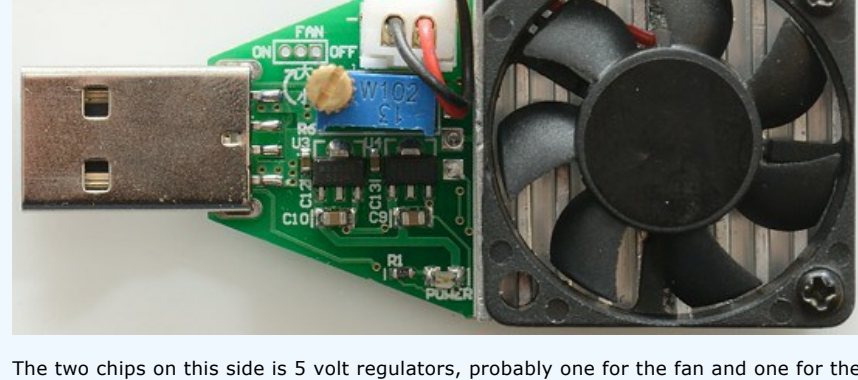
# USB Load 4-13V 3A



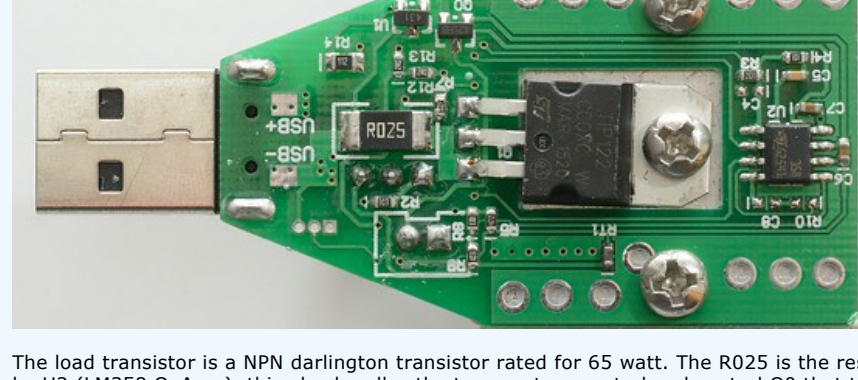
Official specifications:

- For the intelligent start and stop of fans, the temperature control is around 40 Celsius degrees.
- Applicable voltage range: DC3.7V-13V
- Current regulation range: 0.15A-3.00A
- Continuous discharging with 15W

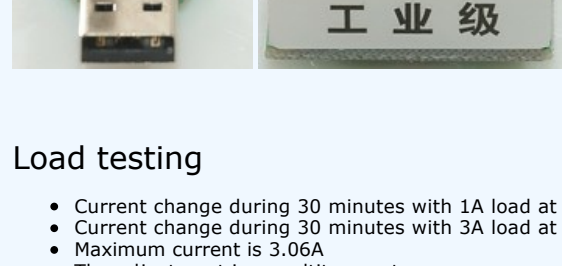
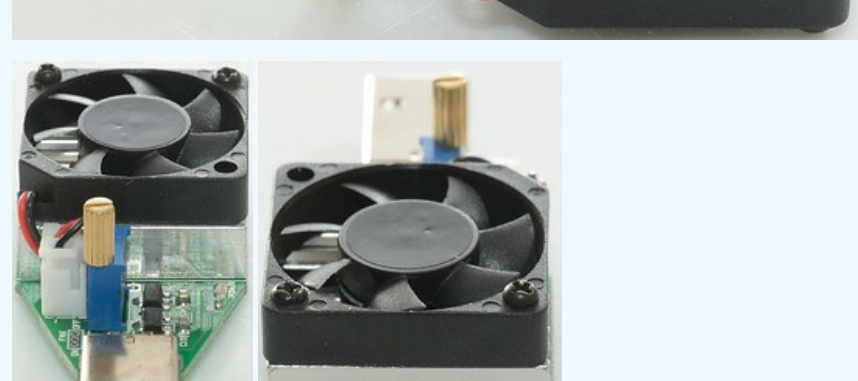
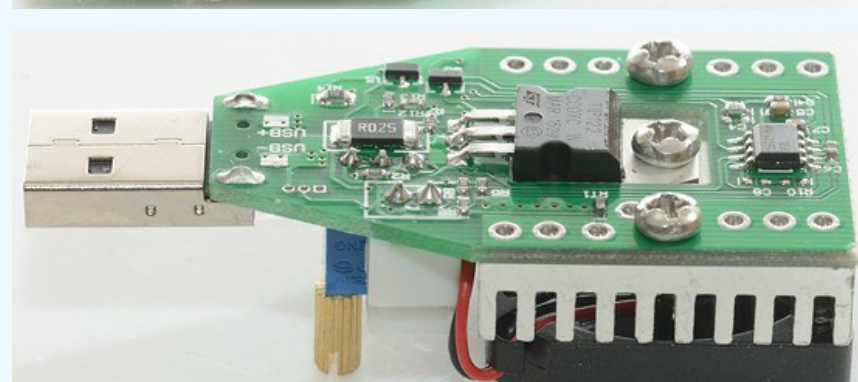
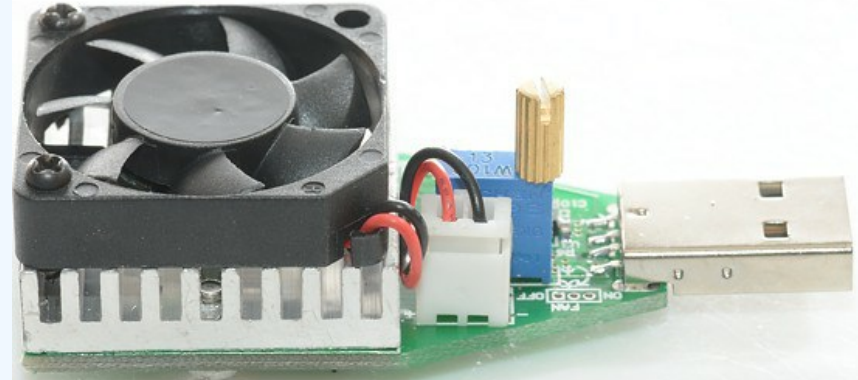
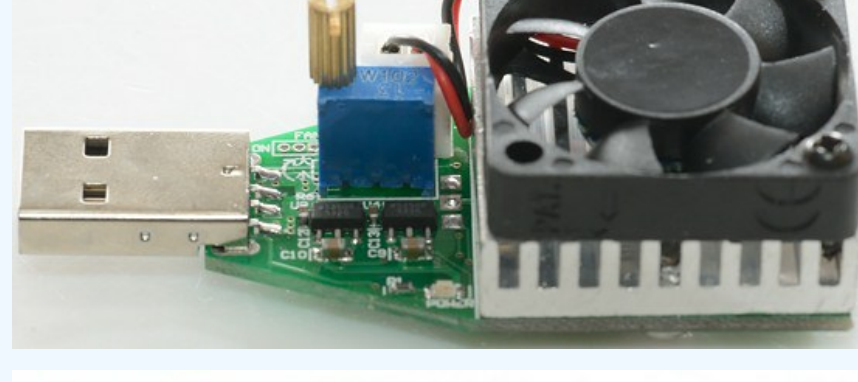
I bought from ebay dealer: wishyou-happy



The two chips on this side is 5 volt regulators, probably one for the fan and one for the electronic. The adjustment is a multiturn trimpot with a handle on it. Above the text "POWER" is a red led.



The load transistor is a NPN darlington transistor rated for 65 watt. The R025 is the resistor used to measure the current across. The actual regulation is done by U2 (LM358 OpAmp), this also handles the temperature control and control Q0 that turns the fan on/off. U1 is a reference used for the current measurement.

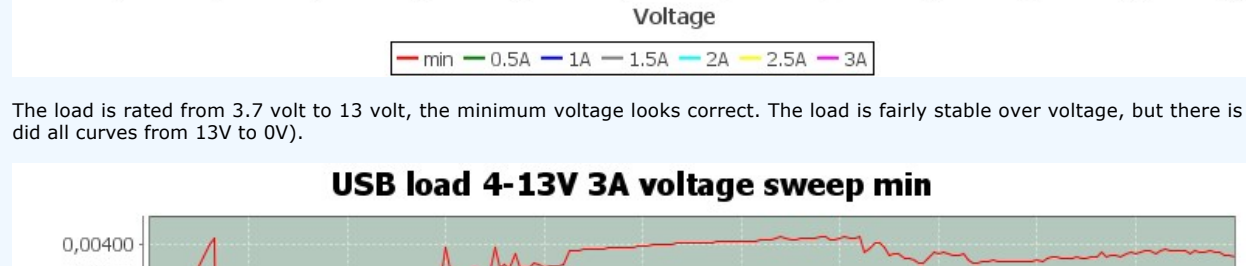


## Load testing

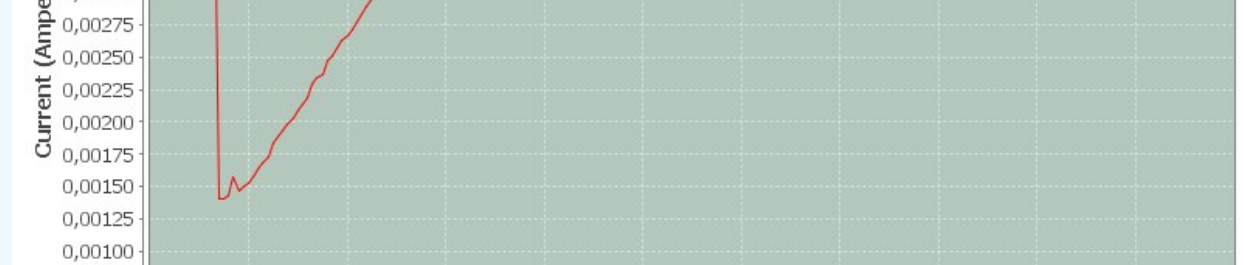
- Current change during 30 minutes with 1A load at 5V is 0.015A, i.e. 1.5%
- Current change during 30 minutes with 3A load at 5V is 0.029A, i.e. 0.9%
- Maximum current is 3.06A
- The adjustment is a multiturn pot.
- The fan is audible, but not loud.
- I did check for oscillations, but there was none.



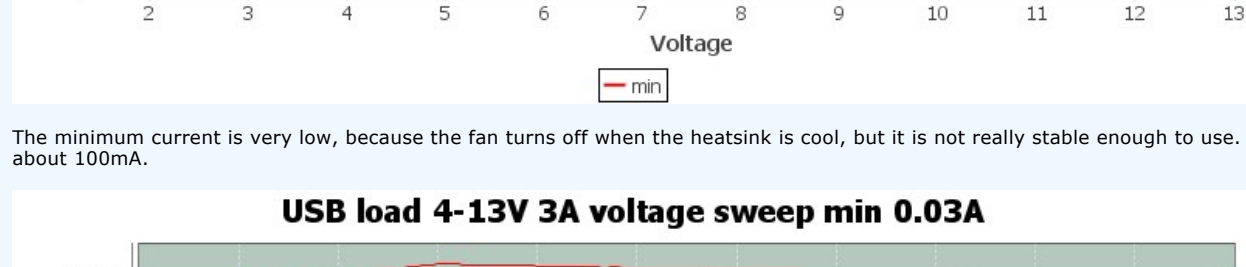
The load is rated from 3.7 volt to 13 volt, the minimum voltage looks correct. The load is fairly stable over voltage, but there is a small change during startup (I did all curves from 13V to 0V).



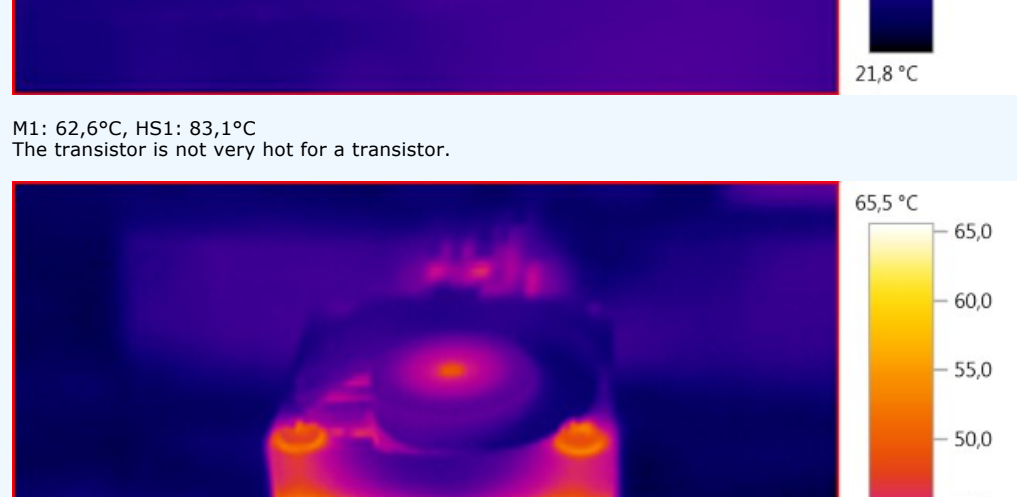
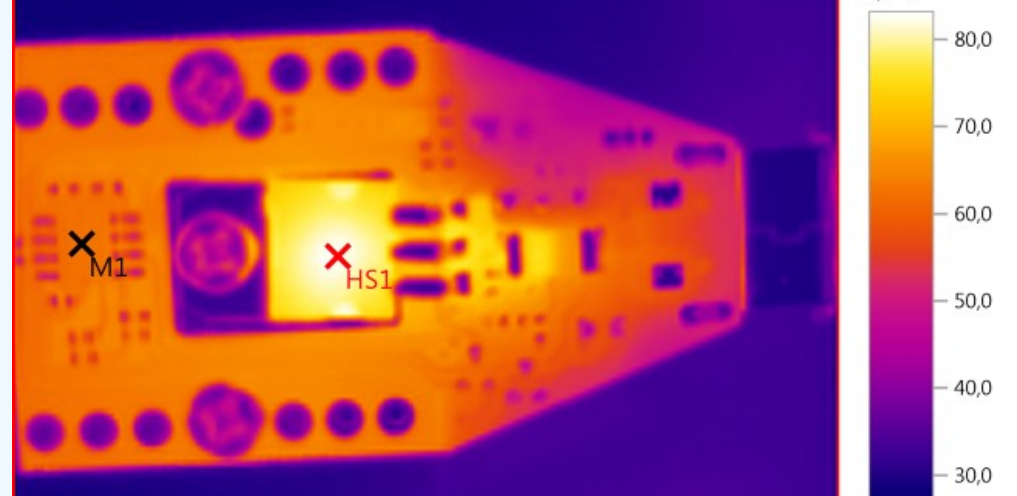
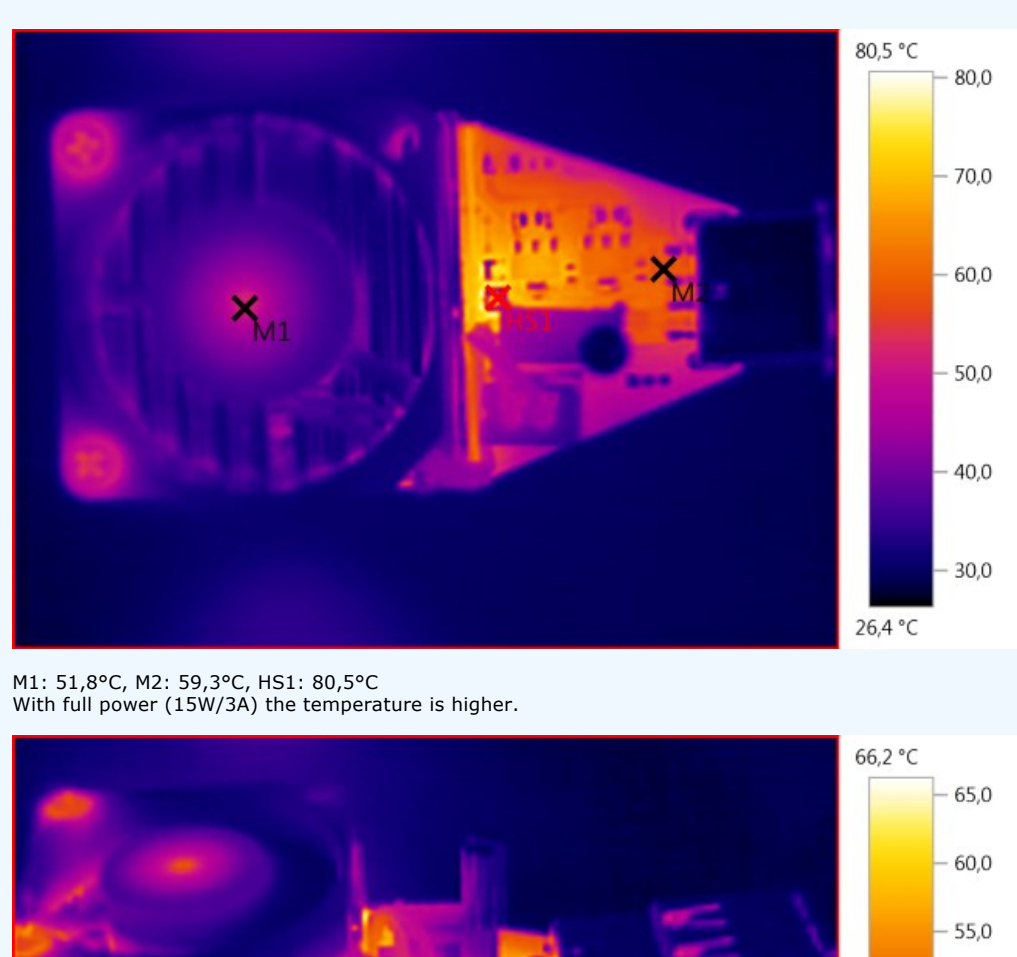
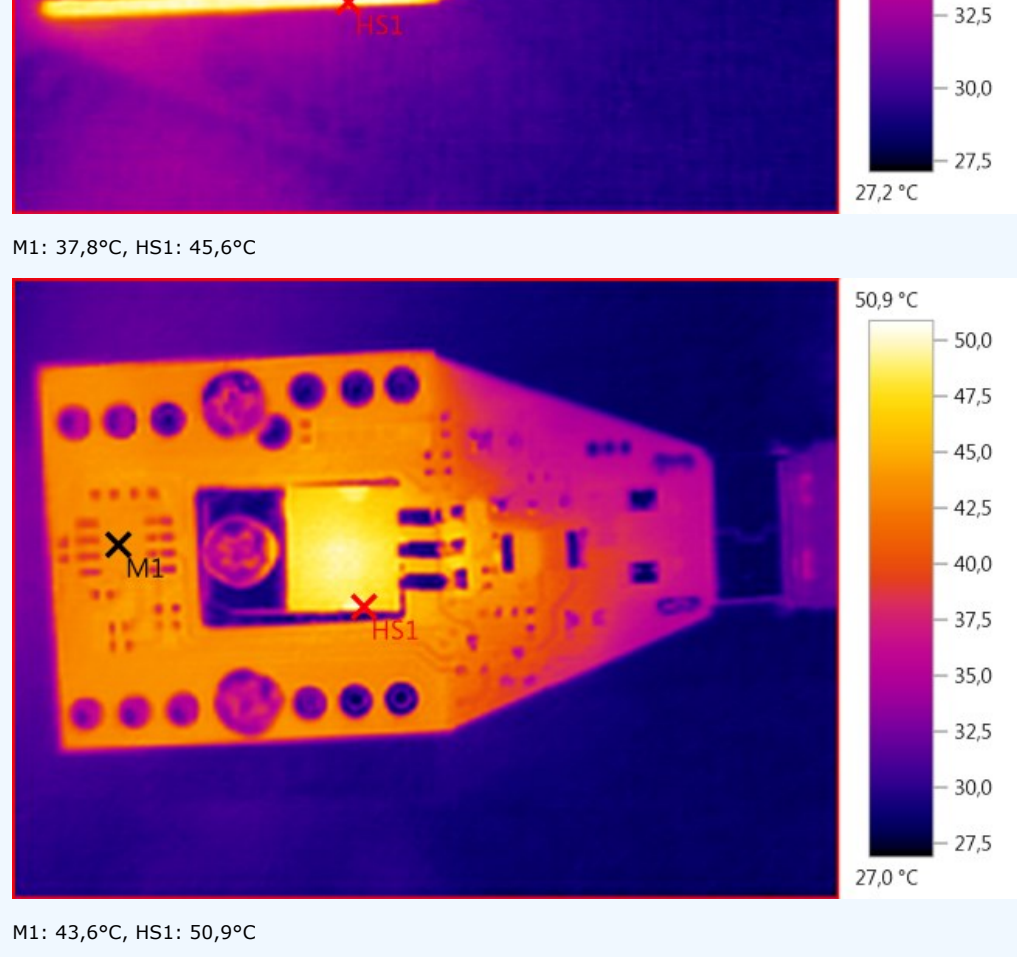
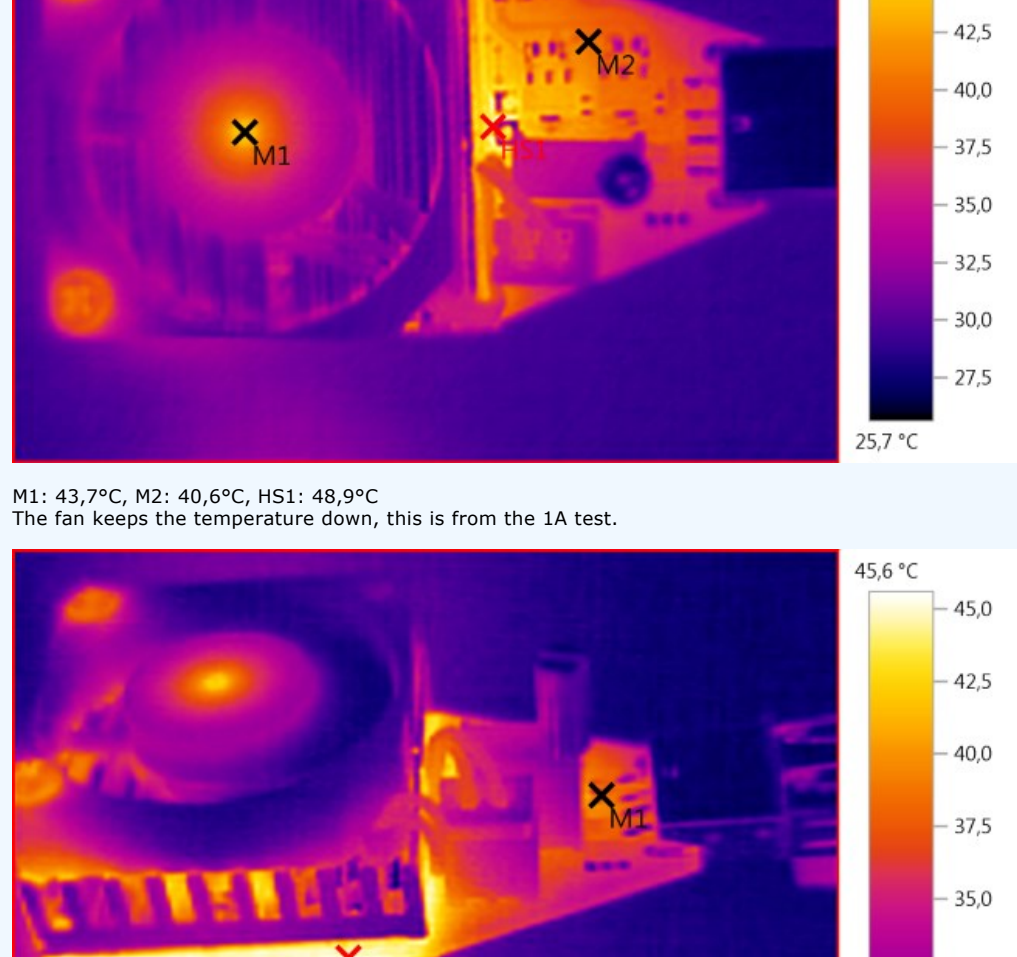
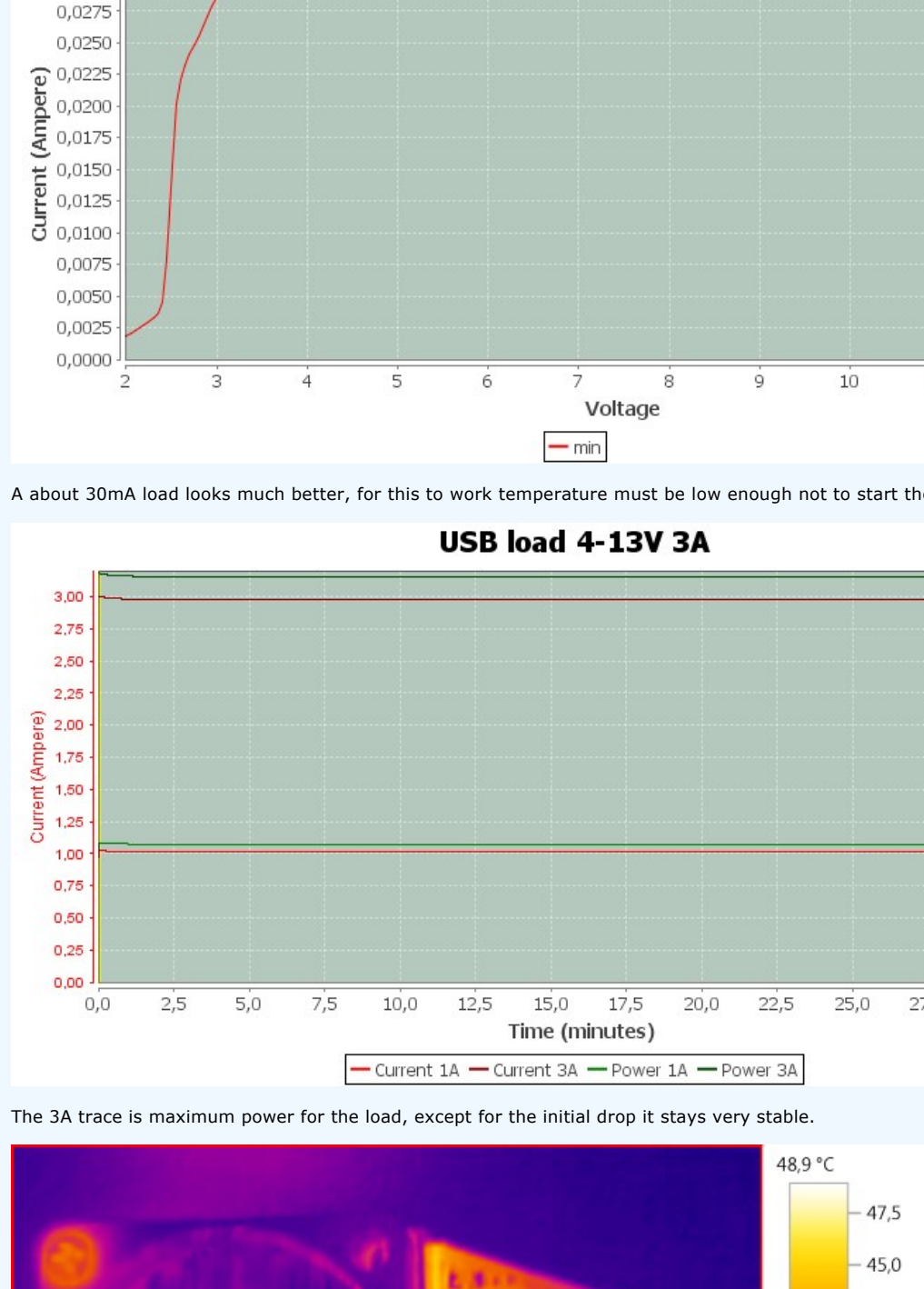
The minimum current is very low, because the fan turns off when the heatsink is cool, but it is not really stable enough to use. With the fan on minimum load is about 100mA.



A about 30mA load looks much better, for this to work temperature must be low enough not to start the fan.



The 3A trace is maximum power for the load, except for the initial drop it stays very stable.



## Conclusion

This load works fine for testing normal usb outputs, but it cannot activate quick charge. I like the current adjustment, it is easy to fine tune and it works without tools.