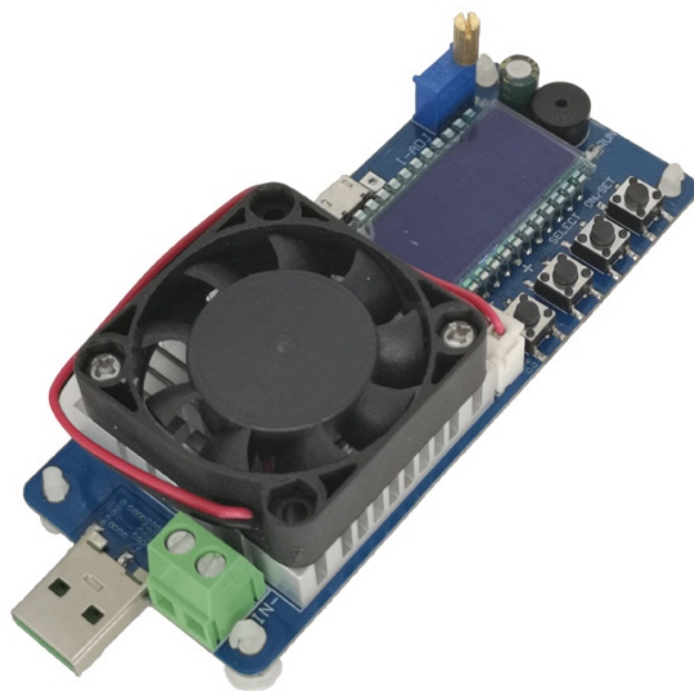


ZK-FX25/35 USB电子负载测试仪

用户手册

版本: V1.0



青岛无治智能科技有限公司

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1. 产品简介

本产品为USB电子负载测试仪。本产品既有USB测试端口，也拥有接线端子接口，可以满足客户的多种需求。本产品拥有液晶显示界面，可以实时显示电压电流等信息，界面友好，简单易懂。

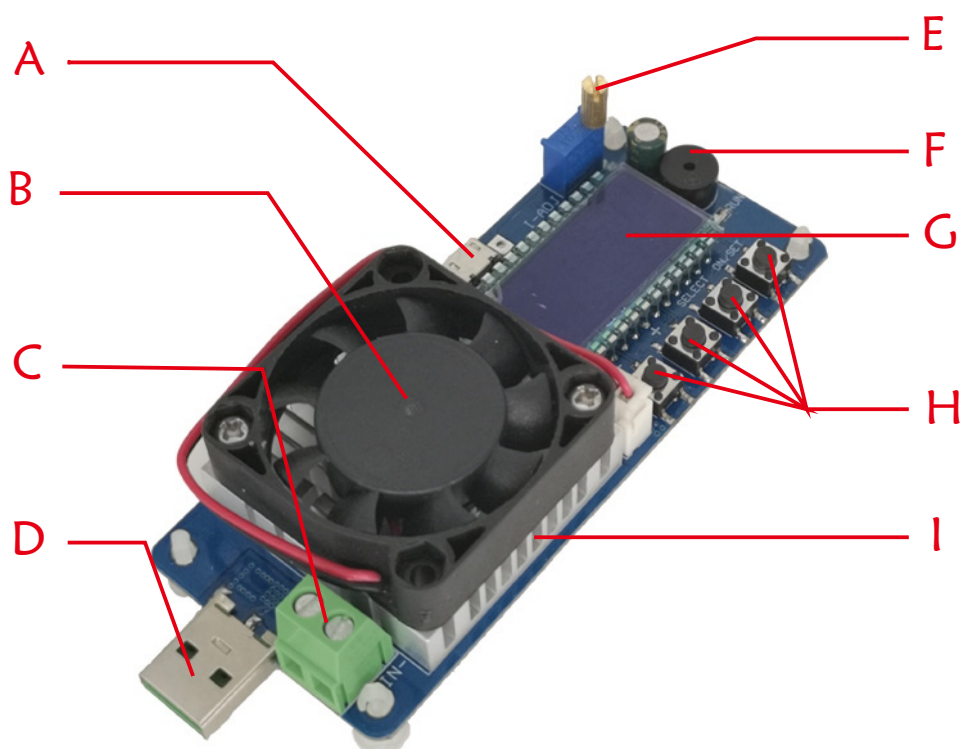
产品特点：

- 采用单独供电的设计，产品本身测量电路和显示电路不消耗测试端的能量，测量更精准可靠。
- 采用液晶屏显示，可以显示负载输入电压、输入电流、输入功率、放电_{maH}、放电时间、产品温度等信息。
- 保护机制齐全，拥有欠压保护、过压保护、过流保护、过功率保护、过温保护等多种保护。
- 电流调节采用长柄电位器，用手就可旋转调节，不需要一字刀等额外工具。
- 带电压电流校正功能，满足客户高精度的需求。

2. 产品技术参数

	Fx25	Fx35
负载电源电压	DC5.0V（带防反接）	
负载电源电流	<=200mA	
负载输入电压	DC1.5V-25V（带防反接）	
负载输入电流	0.00A-4.00A	0.00A-5.00A
电压精度	（±1%+1个字） 可以校准	
电流精度	（±1%+1个字） 可以校准	
散热方式	智能温控风扇+全铝散热片	
风扇转速	6000rpm	8000rpm
工作环境温度	-15℃-50℃	
欠压保护LVP阈值	默认 1.5V(可在1.5V-24.5V之间调节)	
过压保护OVP阈值	默认25.0V(可在1.5V-25.0V之间调节)	
过流保护OCP阈值	默认4.1A（可在1.0A-4.1A之间调节）	默认5.1A(可在1.0A-5.1A之间调节)
过功率保护OPP阈值	默认25.5W(可在1.0W-25.5W之间调节)	默认35.5W(可在1.0W-35.5W之间调节)
过温保护OTP阈值	默认80℃(可在40℃-80℃之间调节)	
产品尺寸	114mm*43mm*30mm	
产品重量	65g	

3. 产品图解



A--产品电源供电端口(DC5V)

B--散热风扇

C--负载普通端子输入端口 (DC1.5V-25V)

D--负载USB输入端口 (DC1.5V-25V)

E--负载电流调节电位器

F--报警蜂鸣器

G--液晶显示屏

H--按键

I--全铝散热片

4. 产品详解

4.1 产品功能详解

1、液晶屏显示

正常模式下，液晶屏上行显示负载输入电压和负载温度；下行显示负载电流、功率、容量和放电时间。

保护模式下，液晶屏显示保护代码。

设置模式下，液晶屏显示各个设置参数代码以及参数阈值。

2、负载电流调节

可以通过电位器调节放电电流的大小。

3、声光报警

负载开启工作时，RUN指示灯常亮，蜂鸣器不响；负载关闭时，RUN指示灯不亮，蜂鸣器不响。进入保护模式后，蜂鸣器滴滴报警，RUN指示灯闪烁。

4、智能风扇降温

负载放电功率大于10W或者负载温度大于40℃时自动启动。

5、**放电容量和放电时间自动统计**，只要打开负载(RUN指示灯常亮)就开始统计，关闭负载(RUN指示灯不亮)，停止统计，**统计数据支持掉电存储**，清零统计数据只有一个办法，就是在液晶屏显示放电容量或者放电时间时，长按按键一。开始统计前，请先将统计数据清零。最大放电容量(OAH)和最大放电时间(OHP)可以在设置模式中设置开启或者关闭(默认关闭)，在开启后可以设置阈值大小，**超过阈值，负载自动关闭，从而实现无人值守的放电实验。**

6、完善的软硬件保护机制，并且软件保护阈值都可调节。软件保护后，输出关断。

硬件保护：

模块供电端口和负载输入端口都有防反接保护。

软件保护：

OVP 过压保护（默认 25.5V,可自行设置，过压保护后，RUN指示灯闪烁，液晶界面显示 OVP）；

OCP 过流保护（默认 4.10A/5.10A，可自行设

置，过流保护后，RUN指示灯闪烁，液晶显示 OCP）；

OPP 过功率保护（默认 25.5W/35.5W，可自行设置，过功率保护后，RUN指示灯闪烁，液晶显示OPP）；

OTP 过温保护（默认80℃，可自行设置，过温保护后，RUN指示灯闪烁，液晶显示 OTP）；

LVP 欠压保护（默认 1.5V，可自行设置，欠压保护后，RUN指示灯闪烁，液晶显示 LVP，在电池放电测试等应用中，设置合适的 LVP，可以有效防止电池过度放电，以免损坏电池）

7、负载默认关闭，上电后按ON/SET键启动或者关闭。

8、所有可设参数都可掉电存储。

4.2 产品操作详解

1、电位器的操作详解

电位器是用来调节负载放电电流的，顺时针旋转，电流值增大，逆时针旋转电流值减小。

2、按键操作详解

	正常模式	保护模式	设置模式
ON/SET	短按：切换负载开关状态 长按：进入参数设置模式	短按：退出保护模式 长按：无	短按：切换某些参数的启用状态 长按：退出参数设置模式
SELECT	短按：切换显示屏下行电流、功率、容量和放电时间的显示 长按：切换显示屏上行电压和温度的显示	无	短按：切换需要设置的参数 长按：无
+	无	无	短按：设置参数值增加一个单位 长按：设置参数值连续增加
-	短按：无 长按：在显示放电容量或放电时间时，清零放电容量或时间	无	短按：设置参数值减少一个单位 长按：设置参数值连续减小

4.3 产品界面详解

1、开机界面

注:开机显示产品型号, 然后进入正常模式界面。

ZK-FX25



ZK-FX35



2、正常模式界面

注: 短按按键SELECT, 可以切换显示屏下行的电流 (负载开启时显示实时电流, 负载关闭或者操作恒流电位器时, 显示设置电流)、功率、放电容量和放电时间的显示; 长按按键SELECT, 可以切换显示屏上行的电压和模块温度的显示。

电压-设置电流



电压-实时电流



电压-实时功率



电压-放电容量



电压-时间分秒



电压-时间时分



温度



3、保护模式界面

注：当负载的工作参数超过允许值时，进入保护模式，显示故障代码，负载关断，LED灯闪烁，蜂鸣器报警。在保护模式下，短按按键ON/SET，退出保护模式。

欠压保护



过压保护



过流保护



过功率保护



过温保护



超容量保护



超时保护



负载故障



4、设置模式界面

注：在正常模式下，长按按键ON/SET，进入设置模式。在设置模式下，长按按键ON/SET，进入正常模式。

在设置界面下，短按按键SELECT，切换需要设置的参数。短按按键+或者-，调节参数大小。在显示超时或者超容量界面，短按按键ON/SET，选择开启或者关断超时保护或超容量保护。他们默认是关闭状态。

欠压阈值



过压阈值



过流阈值



过功率阈值



过温阈值



超时关闭



超时开启



超容量关闭



超容量开启



电压校准



电流校准

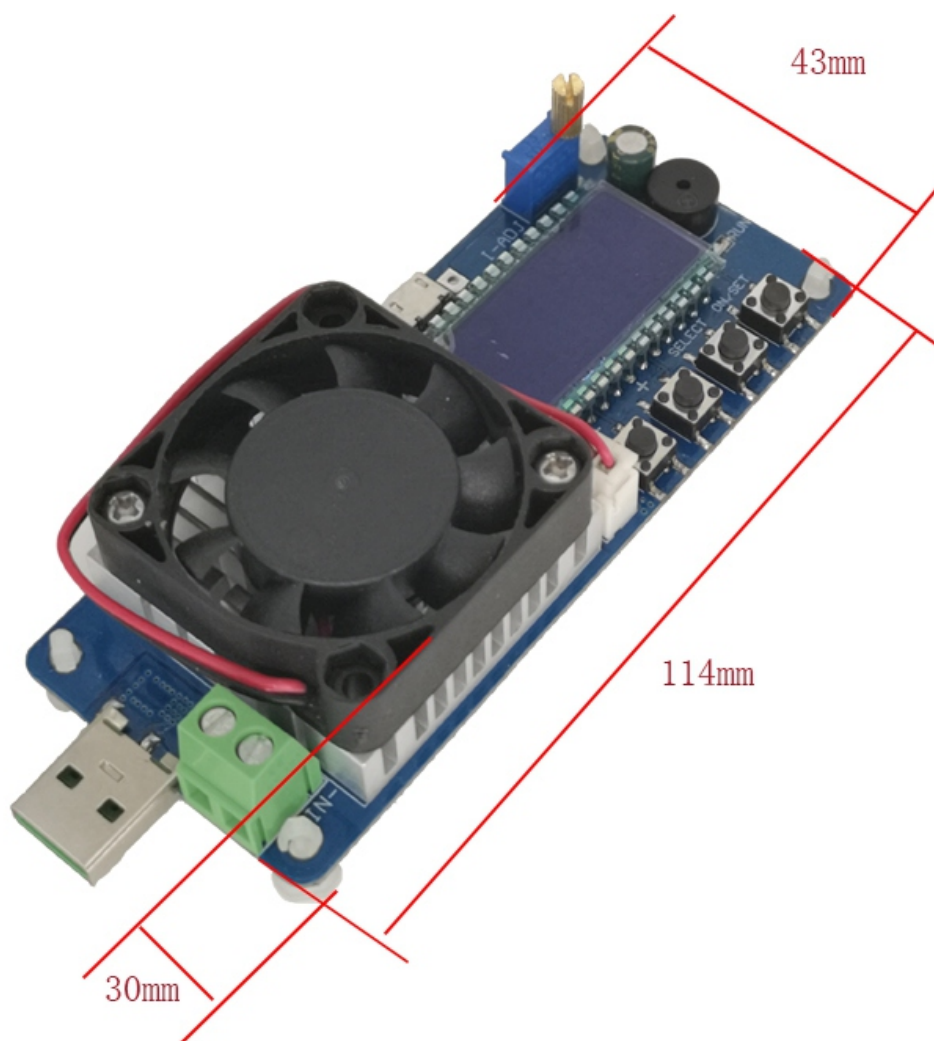


4.4 产品应用示意图



5. 产品外观

5.1 电路板尺寸图



6. 使用注意事项

6.1 请认真阅读使用手册后,再使用本产品!如因错误使用导致模块损坏,或者擅自拆换器件,不退不换。

6.2 电源电压应使用 DC5V,直流供电,切勿使用交流电!若电压超压,上电后可能烧毁模块;

6.3 负载输入端的电压应在DC1.5V-25V之间,电流应在4A(ZK-FX25)或者5A(ZK-FX35)以下。

6.4 负载输入端口不能短路,否则会烧毁产品。

6.5 注意模块不要受潮,不要让电路板上的元件短路,不要用手触摸板上元件的引脚和焊盘。

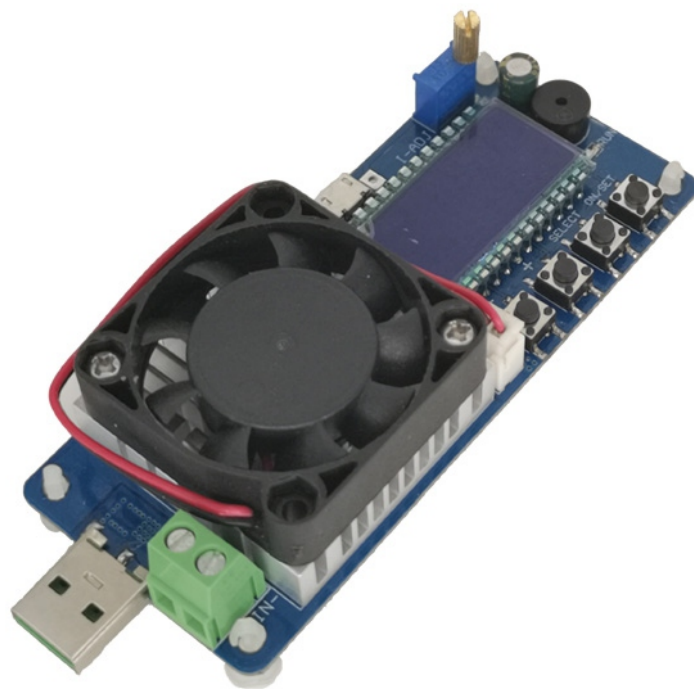
6.6 免责声明:本产品不可用于医疗、救生、易燃易爆等领域和场合,对此造成的后果,我厂不承担任何责任。

ZK-FX25/35

Electronic Load Tester

User's Manual

versions: V1.0



Qingdao wuzhi intelligent co. LTD

2019-03-26

Catalogue

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1.General Description

This product is USB electronic load tester. This product has both USB test port and terminal interface, which can meet various needs of customers. This product has liquid crystal display interface, can real-time display information such as voltage and current, friendly interface, simple and easy to understand.

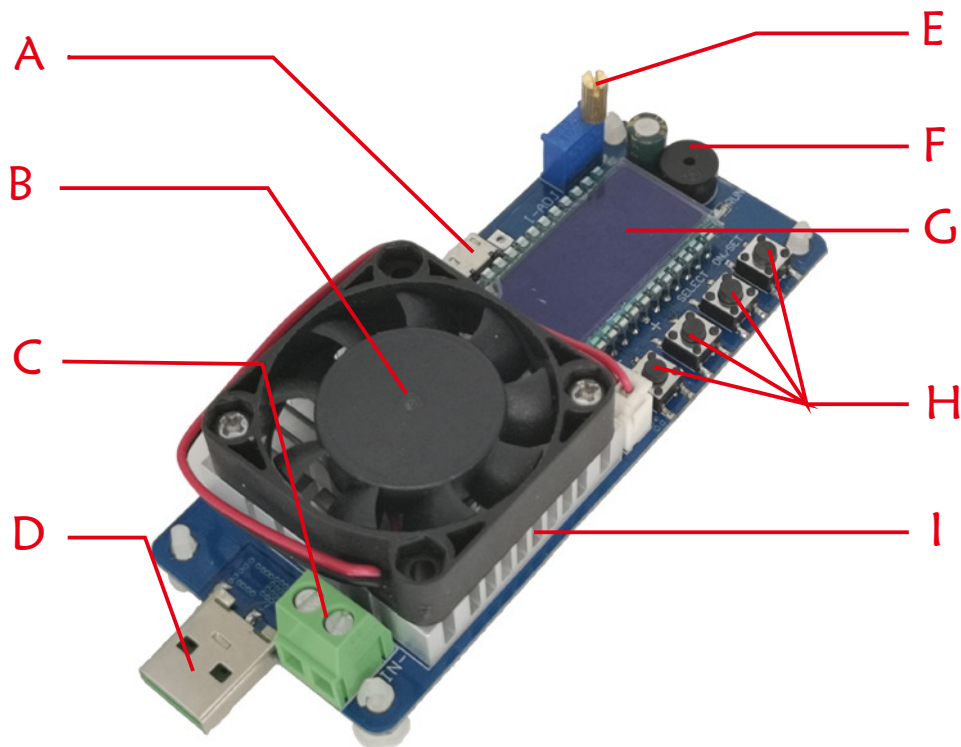
Product features:

- the design of separate power supply is adopted. The measuring circuit and display circuit of the product do not consume the energy of the test port, so the measurement is more accurate and reliable.
- LCD display can display load input voltage, input current, input power, discharge maH, discharge time, product temperature and other information.
- complete protection mechanism, including under-voltage protection, over-voltage protection, over-current protection, over-power protection, over-temperature protection and other protection.
- the current is regulated by a potentiometer with a long handle, which can be rotated by hand without the need for extra tools such as a word knife.
- with voltage and current correction function, to meet the needs of customers with high precision.

2. Technical Parameters

	Fx25	Fx35
Voltage Supply	DC5.0V (anti-reverse connection)	
Voltage Supply	<=200mA	
Input Voltage	DC1. 5V–25V (anti-reverse connection)	
Input Current	0. 00A–4. 00A	0. 00A–5. 00A
Voltage Accuracy	$(\pm 1\%+1 \text{ unit})$ Can be calibrated	
Current Accuracy	$(\pm 1\%+1 \text{ unit})$ Can be calibrated	
TheCooling Way	Fan with temperature control and Heat sinks	
Fan Speed	6000rpm	8000rpm
Operating Temp	-15℃–50℃	
Under-Voltage	default 1. 5V (Adjustable between 1.5v and 24.5v)	
Over-Voltage	default 25.0V (Adjustable between 1.5v and 25v)	
Over-Current	default 4. 1A (Adjustable between 1.0A and 4.1A)	default 5. 1A (Adjustable between 1.0A and 4.1A)
Over-Power	default 25. 5W (Adjustable between 1.0W and 25.5W)	default 35. 5W (Adjustable between 1.0W and 25.5W)
Over-Temperature	default 80℃ (Adjustable between 40℃ and 80℃)	
Size	114mm*43mm*30mm	
Weight	65g	

3. Product Picture



- A— micro-usb for voltage supply (DC5V)
- B— fan
- C— the load input terminal (DC1.5V-25V)
- D— the load USB input port (DC1.5V-25V)
- E— potentiometer that regulates current
- F— buzzer
- G— Liquid crystal display
- H— keys
- I— aluminum heat sink

4. Product Overview

4.1 Function Overview

1. LCD display

In the normal mode, The top line of LCD screen displays the load input voltage and load temperature. Load current, power, capacity and discharge time are displayed downline.

In the protection mode, LCD display protection code.

In the setting mode, LCD displays the setting parameter codes and parameter thresholds.

2. Load current adjustment

The discharge current can be adjusted by potentiometer.

3. Sound-light alarm

When the load starts working, the RUN indicator light is always on and the buzzer does not ring; When the load is off, the RUN indicator does not light and the buzzer does not sound. After entering the protection mode, the buzzer will beep and the RUN indicator will flash.

4. intelligent fan cooling

The fan starts automatically when load discharge power is greater than 10 w or load temperature greater than 40 °C .

5. Automatic statistics of discharge capacity and discharge time

as long as open the load (the RUN light is normally on), it began to statistics. When close the load (the RUN light is not bright), it stop the statistics. statistical data to support electricity storage, only a way to reset the statistics in the LCD panel display discharge capacity, or discharge time, long press the button "-". Before starting the statistics, please clear the statistical data first. The maximum discharge capacity (OAH) and maximum discharge time (OHP) can be set on or off in the setting mode (default off). When the threshold value is on, it is set. the load will automatically close if the threshold value is exceeded, so as to realize the unattended discharge experiment.

6. Perfect software and hardware protection mechanism

Software protection threshold are adjustable .After the software is protected, the output is turned off.

Hardware protection:

Module power supply port and load input port are protected against reverse connection.

Software protection:

OVP overvoltage protection (default 25.5V, which can be set by yourself. After overvoltage protection, the RUN indicator flashes and the LCD interface displays OVP);

OCP overcurrent protection (default 4.10A / 5.10A, can be set by

yourself. After overcurrent protection, the RUN indicator flashes and the LCD shows OCP;

OPP overpower protection (default: 25.5w / 35.5w, which can be set by itself. After overpower protection, the RUN indicator will flash and the LCD will display OPP);

OTP over temperature protection (default is 80℃, can set, ask protection after the RUN light is flashing, liquid crystal display OTP);

LVP undervoltage protection (default: 1.5v, you can set it by yourself. After the undervoltage protection, the RUN indicator will flash and the LCD will display LVP. In battery discharge test and other applications, setting an appropriate LVP can effectively prevent the battery from excessive discharge and damage the battery);

7. The load is turned off by default. After power ON, press ON/SET key to start or shut down.

8. All parameters can be set off power storage.

4.2 Operation Overview

1. Detailed operation of potentiometer

Potentiometer is used to adjust the load discharge current, clockwise rotation current increases, counterclockwise rotation current decreases.

2. Detailed explanation of key operation

MODE KEYS	Normal Mode	Protect Mode	Setting Mode
ON/SET	Short press: switch the load on/off state Long press: enter parameter setting mode	Short press: exit protection mode Long press: null	Short press: switch the on-off state of over capacity and timeout Long press: exit the setting mode
SELECT	Short press: switch the display of current, power, capacity and discharge time Long press: switch the display of voltage and temperature	NULL	Short press: switch the parameters to be set Long press: null
+	NULL	NULL	Short press: set parameter value to increase by one unit Long press: set the parameter value to increase continuous
-	Short press: null Long press: reset when display discharge capacity or discharge time	NULL	Short press: set parameter value to decrease by one unit Long press: set the parameter value to decrease continuously

4.3 Interface Overview

1、boot screen

Note: start the machine and display the product model, then enter the normal mode interface.

ZK-FX25



ZK-FX35



2、normal mode interface

Note: short press the button SELECT to switch the display of current, power, discharge capacity and discharge time in the line below the display screen (display the real-time current when the load is on, display the setting current when the load is off or the potentiometer is operated). Long press the button SELECT, you can switch the display of voltage and module temperature on the top of the display screen.

Vin--Iset



Vin--Iin



Vin--Pin



Vin--C



Vin--TIME-S



Vin--TIME-h



Temperature--Iin



3、Protection mode interface

Note: when the working parameters of the load exceed the allowable value, enter the protection mode, display the fault code, load off, LED light flashing, buzzer alarm. In the protection mode, press the button ON/SET to exit the protection mode.

under-voltage over-voltage over-current



over-power over-temperature over-capacity



timeout

load-failure



4、Setting mode interface

Note: in normal mode, long press the button ON/SET to enter the setting mode. In the setting mode, long press the button ON/SET to enter the normal mode.

Under the setting interface, press the SELECT button to switch the parameters to be set. Press the button + or - to adjust the parameter size. Under the timeout protection interface or overcapacity protection interface, press the button ON/SET to turn ON or off the timeout protection and overcapacity protection. Timeout protection and overcapacity protection are off by default.

under-voltage over-voltage over-current
threshold threshold threshold



over-power
threshold



over-temperature
threshold



timeout
ON



timeout
ON



over-capacity
OFF



over-capacity
ON



voltage
calibration



current
calibration

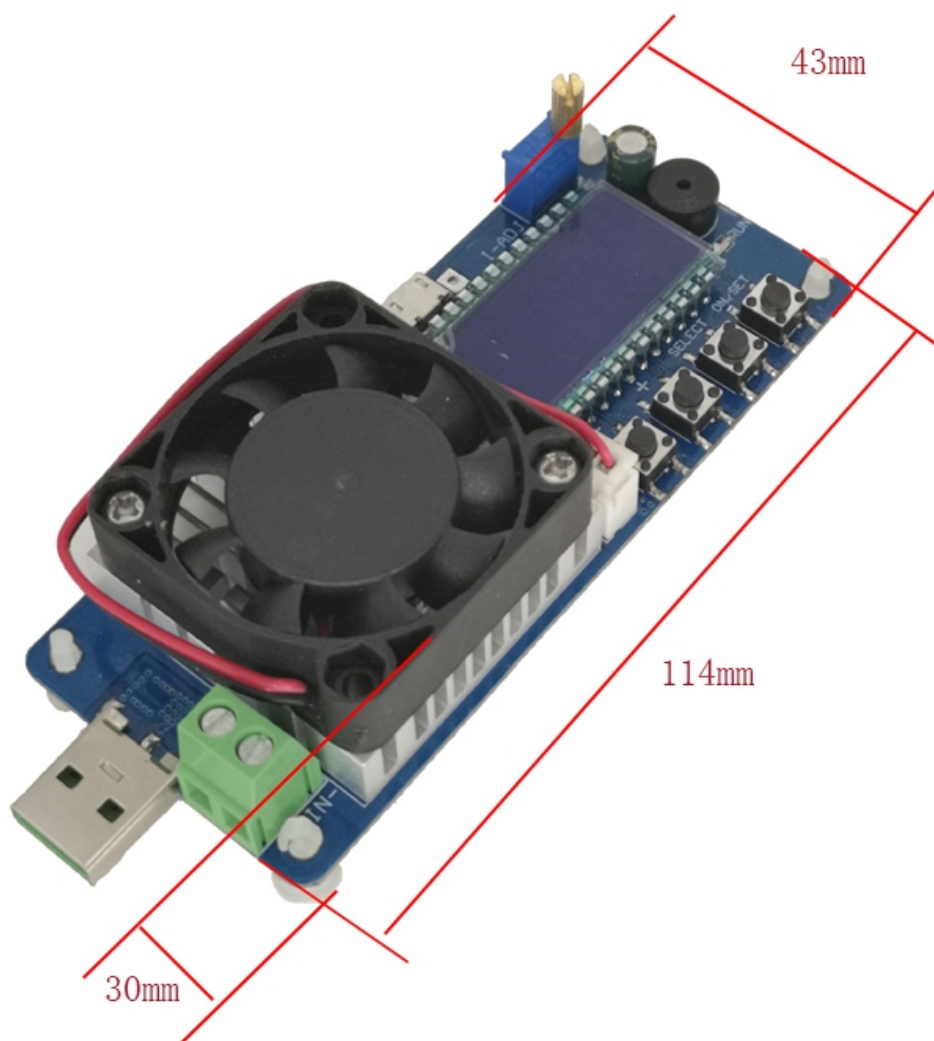


4.4 Application Example



5. Product Appearance

5.1 Board Dimension Figure



6. Matters Need Attention

6.1 Please read the manual carefully before using the product ! If the module is damaged due to wrong use, or the device is removed without permission, it shall not be returned or replaced.

6.2 Power supply voltage shall use 5V DC power supply, do not use AC power !!! If the voltage is over voltage, the module will be burnt after power on.

6.3 The voltage of the load input shall be between DC1.5V-25V, and the current shall be below 4A(ZK-FX25) or 5A (ZK-FX35).

6.4 The load input port cannot be shorted, otherwise the product will be burnt.

6.5 Pay attention to the module shall not be affected by moisture, shall not make the components on the circuit board short-circuit, shall not touch the pins and pads of the components on the board by hand.

6.6 Disclaimer: this product is not allowed to be used in medical, life-saving, flammable, explosive and other fields and occasions. Our factory will not assume any responsibility for the consequences caused thereby.