

IT8912E

IT8912E LED Electronic Load

IT8912E programmable electronic load hardware circuit can realize simulation of LED current for PWM dimming test and current ripple and surge current tests. The voltage current measurement speed can be as high as 50KHZ and the programmable panel can realize OCP/OPP test. Multiple operating modes and powerful programming functions.

Features

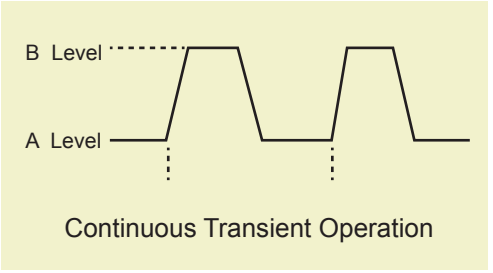
- VFD Display
- Multiple operating modes: CC/CV/CR/CP/CC+CV/CR-LED
- CC Dynamic mode up to 20KHz
- Voltage and current measurement speed: 50KHz
- Unique CR-LED mode with perfect PWM-LED driver test solution
- Adjustable frequency, duty ratio PWM dimming output (frequency: 20Hz-2KHz)
- Easy programmable parameter setting, applicable for simulating LED lights with different characteristics
- Adjustable current rising and falling slope
- OCP and OPP test functions
- Battery discharge mode, auto test, short circuit and measure test functions
- Support VISA/USBTMC/SCPI communication protocols
- Built-in GPIB/RS232/USB communication interfaces

CR-LED Mode

The unique CR-LED mode developed by IT8912E is especially applicable for LED driver test. The user only needs to set the operating voltage、current and coefficient, the real output parameters of the LED driver can be measured.
Different from universal electronic load, IT8912E adopts pure hardware circuit design without software operation by MCU module, thus increasing the speed and stability of CR mode control circuit, solving voltage and current jitter during LED driver test, increasing frequency width and helping to realize PWM dimming test.

Dynamic Test Function(Tran)

The operation of dynamic load is periodic switch between two levels and the power supply regulation and transient response are in high and low current levels. With the change of lasting time and ascending and descending rate, the output voltage waveform can be monitored.
Dynamic mode of electronic load tests the transient response time of power, reflecting the ability of the power for keeping itself stable during the step change of load current.



Continuous Transient Operation

CC+CV Model

The fixed current output function refers to the " CV+CC" LED "CV" mode, which is suitable for the use of IC or series connected current limiting resistors for collocation LED, and when the output current exceeds the rated value to set current (CC) mode, it can be used for the design of direct drive LED.

Model	Voltage	Current	Power
IT8912E	500V	15A	300W

IT8912E Specifications

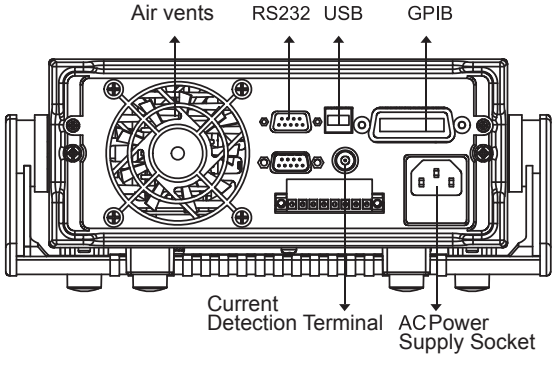
		IT8912E	
Input rating	Voltage	0 ~ 500 V	
(0~40 ℃)	Current	0 ~ 3 A	0 ~ 15 A
	Power	300 W	
	Minimum operating voltage	0.72 V / 3 A	3.6 V / 15 A
	Temperature coefficient	≤ 100 ppm / ℃	
CV	Range	0 ~ 500 V	
	Resolution	10 mV	
	Precision	± (0.05 % + 0.05 % FS)	
	Range	0 ~ 3 A	0 ~ 15 A
CC	Resolution	0.1 mA	1 mA
	Precision	± (0.05 % + 0.1 % FS)	± (0.05 % + 0.05 % FS)
	Range	Uo-L	Uo-H
CR-LED	Option	Uo Io coef Rd	Uo Io coef Rd
	Range	0 ~ 100 V 0 ~ 15 A 0.01 ~ 1 0.08 ~ 30 Ω	0 ~ 500 V 0 ~ 15 A 0.01 ~ 1 1.8 ~ 1600 Ω
	Range	0.3 Ω ~ 300 Ω【0 ~ 100 V / 0 ~ 15 A】	8 Ω ~ 7.5 KΩ【0 ~ 500 V / 0 ~ 3 A】
CR *1	Resolution	16 bit	
	Precision	0.2 % + 0.01 S *2	0.2 % + 0.001 S *3
	Range	300 W	
CP *4	Resolution	100 mW	
	Precision	0.2 % + 0.2 % FS	
		Dynamic model	
	T1＆T2	20 μS ~ 3600 S / Res: 1 μS	
	Precision	5 μS ± 100 ppm	
Dynamic mode	Rise / fall *5	0.0001 ~ 0.3 A / μS	0.001 ~ 1.5 A / μS
	Minimum rise time *6	≈10 μS	≈10 μS
		PWM Dimming output	
Output voltage		10 V	
Frequency range		20 Hz ~ 2 KHz	
Duty cycle		10 % ~ 100 %	
		Measurement range	
Voltage value	Range	0 ~ 500 V	
	Resolution	10 mV	
	Precision	± (0.025 % + 0.025 % FS)	
Current value	Range	0 ~ 3 A	0 ~ 15 A
	Resolution	0.01 mA	0.1 mA
	Precision	± (0.05 % + 0.05 % FS)	
Power	Range	300 W	
Back read value	Resolution	10 mW	
	Precision	± (0.2 % + 0.2 % FS)	
		Protection range	
OPP		≈310 W	
OCP		≈3.3 A	≈16.5 A
OVP		≈530 V	
OTP		≈85 ℃	
		Specifications	
Short circuit	CC	≈3.3 A	≈16.5 A
	CV	0 V	0 V
	CR	≈240 mΩ	
Input terminal impedance		≈500 KΩ	
Dimension（W*H*D）		214.5 mm * 88.2 mm * 354.6 mm	

*1 Voltage / current input value is not less than 10%FS (FS full range)
*2 Range of resistance to read value:（1/(1/R+(1/R)*0.2%+0.01),1/(1/R-(1/R)*0.2%-0.01)
a) Voltage input value is less than 10%FS: 0.02%+0.1/Vin（s）;
b) Current input value is less than 10%FS load current accuracy: ±（0.2%xVin/Rsetting+3mA）;
*3 Range of resistance to read value:（1/(1/R+(1/R)*0.2%+0.001),1/(1/R-(1/R)*0.2%-0.001)
a) Voltage input value is less than 10%FS: 0.02%+0.05/Vin（s）;
b) Current input value is less than 10%FS load current accuracy:±（0.2%xVin/Rsetting+10mA）;
*4 Voltage / current input value is not less than 10%FS
*5 Rise / fall：The rising slope of 10%-90% current for 0 to maximum current
*6 Minimum rise time: Rise time for 10%-90% current

Standard Fittings

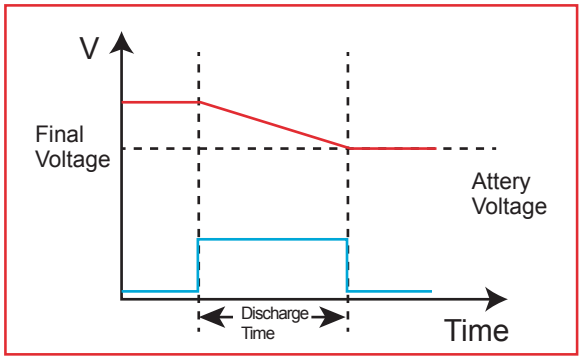
- One Power Cord
- User Manal
- Test Report
- USB Communication Cable

IT8912E Rear Panel



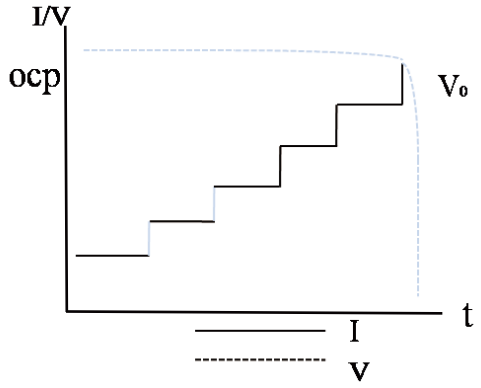
Battery Discharge Test Function

IT8912E series electronic load panel can be programmed to realize battery discharge test and programmable settings include turn-off voltage, turn-off capacity and discharge time. During the test, the voltage, time and discharged capacity of the battery can be observed.



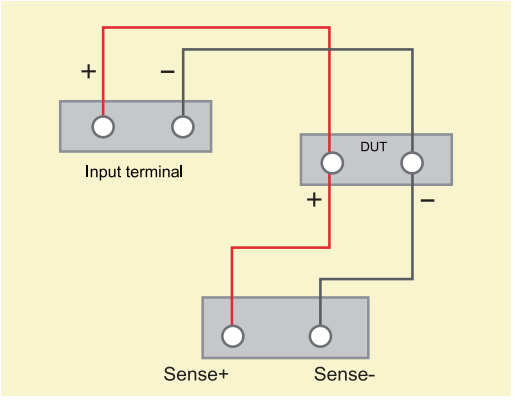
OCP/OPP Test

OCP and OPP test functions are particularly suitable for over-circuit and over-power point tests of products such as lithium battery protection module and power module. Through built-in OCP and OPP functions, the user can set such parameters as the initial current, cutoff current, step current, lasting time of each step current and the voltage drop value for judgement of protection of built-in OCP program for test. This will finally help users to automatically obtain over-current or over-power protection point and to judge if it is within the scope. The user can use it for design validation and production line system to save test time and improve test efficiency.



Remote Compensation Function

Under CC, CV or CP mode, when the load consumes a large amount of current or the connection conductor is too long, pressure drop will occur on the connection line between the instrument in the north and the load terminal. To ensure measurement precision, there is a remote measurement terminal at the back of the load which can be used by the user to measure the output terminal voltage of the instrument in the north.SENSE(+) and SENSE(-) are remote measurement terminals. Before using the remote measurement function, the user must set the load in remote measurement mode.



CR-LED Mode For Pure Hardware Circuit Design

CR or LED mode for main load products on the market generally uses AD sampling voltage and current and the value of R is obtained by software operation through MCU processing unit with slow response speed. Most universal load CR modes are not supported by actual hardware circuit and the constant resistance is obtained by operation through detection of voltage and current.

Theoretically, there is a certain delay characteristic and the CR mode is only suitable for products which feature slow input change and response speed.The IT8912E (500V/15A/300W) electronic load newly launched by ITECH adopts pure hardware circuit design and is compatible with LED constant flow source test of varied specifications, providing perfect PWM-LED driver solution.

Unique CV+CC Mode

CR or CVmode can only test stable operating points and cannot actually stimulate LED of different characteristics.
For CV+CC operating mode, if it is CV mode at startup, LED driver IC or concatenated current-limiting resistor should be used. When the output current exceeds the rated value and reaches constant current interval, CC mode will be triggered for directly driving LED. This CV+CC can be used for various LED configuration modes, contributing to the flexibility of system design as well as protection for LED driver source.

PWM Dimming Test

LED lights are widely used in different occasions such as street lighting, LED searchlight, stage lighting and tunnel lighting. Illumination regulation is required in many applications according to the actual situations. General electronic load has a response speed so slow that LED driver PWM dimming test cannot be carried out.PWM (Pulse Width Modulation) is the most common digital dimming method and can regulate the illumination by changing the set cycle and duty ratio. When PWM is high, the LED is on, otherwise, the LED is off. The frequency change is so fast that we cannot feel intermittent ons/offs. Therefore, illumination regulation is realized by regulating the duty ratio of PWM.

Actual Simulation Of LED Light Characteristics

The operating current of LED light is generally tens of milliampere to hundred of milliampere. Over-large startup current will shorten the service life of LED light or even burn it down. Therefore, at the beginning of design of LED constant flow source, there are strict indicators for startup transient surge current. IT8912E electronic load voltage current measurement speed is 50KHz. It can automatically collect and compare the maximum current for a certain period. The user only need to read the maximum current value to the PC through instructions in order to obtain startup transient surge current value and complete the analysis of LED constant flow source design indexes.

It can test current ripple and startup surge current of LED constant flow source.
The user can read the MAX current through communication instruction measure:current:max to obtain startup transient surge current. The current ripple can be tested by the reading of Min value.

To sump up, the new LED special electronic load developed by ITECH with innovative design concept and rigorous LED market research analysis can be applied in the research and development, production and quality analysis stages of LED constant flow source manufacturers for completing the analysis of LED constant flow output parameter (voltage, current) and startup characteristic index. For LED driver with dimming characteristics, the user does not need to prepare a digital signal source as 8912E can output PWM pulse wave, thus significantly reducing the cost and simplifying test procedures. 8912E is a product which can truly satisfy various tests in LED field.

