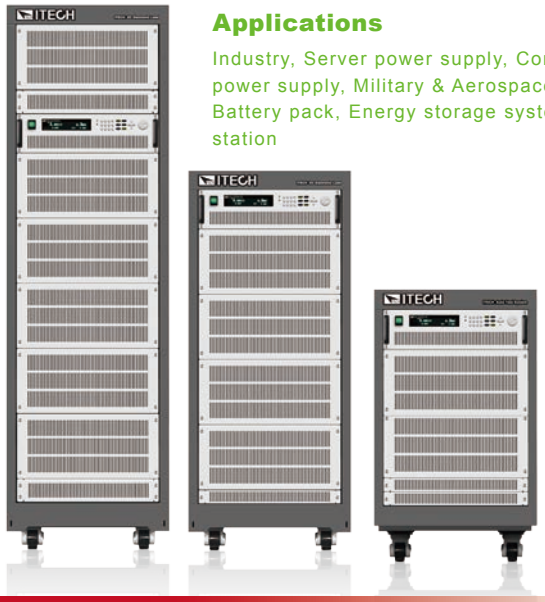
IT8900 High Performance High Power Programmable DC Electronic Load



Applications

Industry, Server power supply, Communication power supply, Military & Aerospace, Car Charger, Battery pack, Energy storage system, Charging station

IT8900 series of high performance high power dc electronic loads provide three voltage ranges 150V/600V/1200V. The power expands to 600kW by master-slave paralleling, and maintains stand-alone functions. 50kHz high speed measurement, six working modes, transient over-power loading capability, CV loop speed adjustment, Measurement function, 25kHz dynamic test and other multiple accurate testing functions make IT8900 series well-suited for types of high power applications.
Built-in LAN/USB/RS232/GPIB interfaces are designed for many fields such as power supply, power battery, DC charging station, generators, military and aerospace etc.

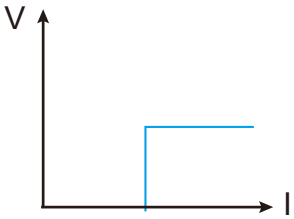
Feature

- High resolution for voltage / current: 1mV/1mA
- Supports master-slave paralleling, maintains stand-alone functions
- Provides six working modes: CC/CV/CR/CW/CC+CV/CR-LED
- Adjustable CV loop speed, well-suited for multiple power supplies
- Transient over-power loading capability
- Ultrafast loop response, available for 18Bits high speed test with up to 50kHz voltage/current measuring speed
- Unique Measure function, designed for rise/fall time measurement of voltage or current
- Overall modular design, convenient for maintenance and service
- Full protection: OVP/OCP/OPP/overheat protection/anti-reverse protection/current limit protection/power limit protection
- Built-in LAN/USB/RS232/GPIB interfaces
- Supports VISA/USBTMC/SCPI
- 25kHz dynamic mode
- Short circuit function
- Battery test function
  OCP/OPP test function
- Remote sense
- I-monitor
- External analog control
- Up to 100 groups memories, with power off memory function
- Control via software by computer

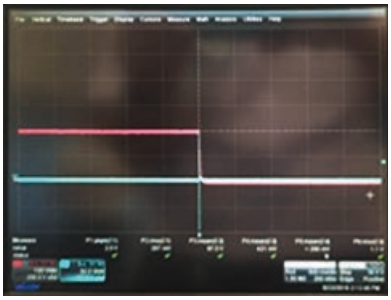
Model	Voltage	Current	Power	Size
IT8912-600-480	600V	480A	12kW	15U
IT8912-1200-240	1200V	240A	12kW	15U
IT8915-150-960	150V	960A	15kW	15U
IT8918-600-720	600V	720A	18kW	24U
IT8918-1200-360	1200V	360A	18kW	24U
IT8922-150-1440	150V	1440A	22.5kW	24U
IT8924-600-960	600V	960A	24kW	24U
IT8924-1200-480	1200V	480A	24kW	24U
IT8930-150-1920	150V	1920A	30kW	24U
IT8930-600-1200	600V	1200A	30kW	37U
IT8930-1200-600	1200V	600A	30kW	37U
IT8936-600-1440	600V	1440A	36kW	37U
IT8936-1200-720	1200V	720A	36kW	37U
IT8945-150-2500	150V	2500A	45kW	37U
IT8948-600-1920	600V	1920A	48KW	24U*2
IT8948-1200-960	1200V	960A	48KW	24U*2
IT8960-150-2500	150V	2500A	60KW	24U*2
IT8960-600-2400	600V	2400A	60KW	37U*2
IT8960-1200-1200	1200V	1200A	60KW	37U*2
IT8972-600-2500	600V	2500A	72KW	37U*2
IT8972-1200-1440	1200V	1440A	72KW	37U*2
IT8990-150-2500	150V	2500A	90KW	37U*2
IT89108-600-2500	600V	2500A	108KW	37U*3
IT89108-1200-2160	1200V	2160A	108KW	37U*3

CV+CC compound operation mode

CV+CC mode is a new increased mode for operation, it can help engineer to solve the transient surge current problem and avoid DUT trigger or DUT burned problem in application testing. For example, in charging station testing, under CV working mode, electronic load need to rise up to 700V in a fast speed, current value will suddenly rise up quickly, the result is that charging station will OCP so that no output from charging station. In order to avoid the similar problem, we can use CV+CC mode to set CC(I-Limit) value, setting interior current value will no more than OCP value in charging station, it can effectively avoid the current surge and solve the OCP problem.

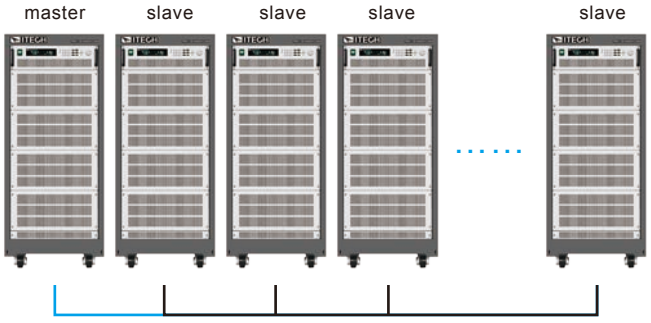


CV+CC mode


Oscilloscope testing example

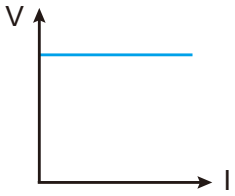
Master-slave paralleling, maintains stand-alone functions

IT8900 series support master-slave paralleling for same models, to expand power up to 600kW. The user operates on master panel and the slave unit will be distributed automatically, simple to use. Master-slave paralleling can achieve stand-alone functions, traditional paralleling is not workable under CV mode. However IT8900 series can parallel under CC/CV modes innovatively. IT8900 series are mainly applicable in the fields of DC charging station, power battery, high voltage UPS and military high power DC motor tests.

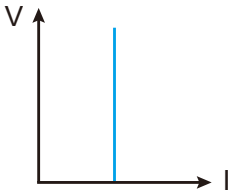


4 basic load operation modes

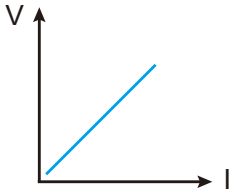
IT8900 series provide constant voltage, constant current, constant resistance and constant power modes, to meet the test needs from customers.



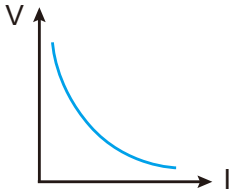
CV mode



CC mode



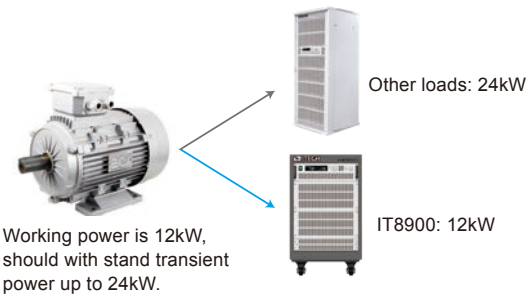
CR mode



CP mode

Transient over power loading capability

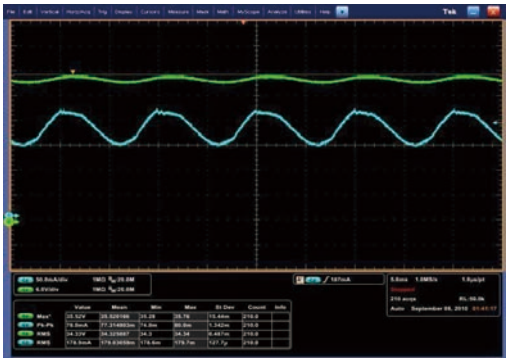
Transient over power loading capability, it will make load to take over power loading capability in short time, users no need to select types as maximum power value, it can extremely save cost. This function can be widely used in the DUT transient peak power
supply ability test. Such as DC motor start-up simulation, start transient power will be several times of common working power, or else, it can simulate power supply's
transient over load features, application in discharging for high power battery in transient time.



Working power is 12kW, should with stand transient power up to 24kW.

CR-LED (CC+CR) operation mode

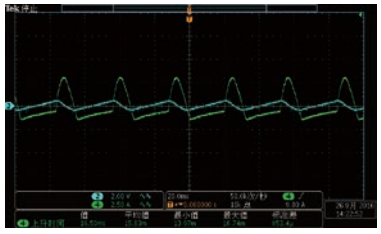
IT8900 series CR-LED (CC+CR) mode can supply LED power drive testing and be applied in led current simulation, to simulate the ripple in real testing, CR-LED can improve speed and stability for control loop, it can solve the voltage and current jitter problem in LED driver testing, furthermore, IT8900 can increase frequency width, it can help users to achieve PWM dimmer testing.



CV loop speed is adjustable

We believe that many engineers will meet the below similar situation, load loop speed is too fast or too slow to match some slow or high speed power supply features, result is testing value will vibrated. This problem can be well solved with IT8900 series, when appear mismatch situation, users can adjust interior CV loop speed with “High-rate” or “Low-rate” to achieve the best matching point.

This function can conveniently help customers to solve the different matching problems. Even it can save the cost and improve testing efficiency, after a simply setting up, one electronic load will meet the multiple complex DUT testing,
CV high-low rate testing: power supply: IT6015 setting up: 60V/1A
Blue is voltage waveform, green is current waveform



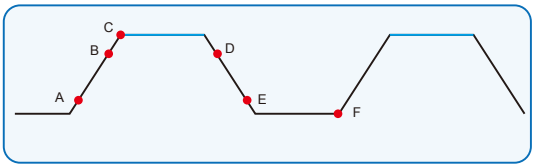
CV 50V low speed mode: it’s obvious to find vibration phenomenon

CV 50V high speed mode: CV stability, no vibration phenomenon

Measure function

IT8900 series provide measure function, mainly used for measuring the rising and falling time of voltage or current within a specified range.

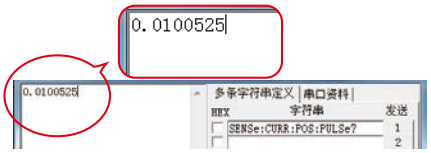
Measurable period of time as follows:
(1) The rising time period from A point to B point.
(2) The falling time period from D point to E point.
(3) The falling time period from C point to E point. (Positive pulse width time)
(4) The rising time period from D point to F point (Negative pulse width time)



Remarks: from above graph, A and B are arbitrary points of the rising stage, C is one point on the green stage, D and E are arbitrary points of the falling stage.

Application

■ Power module rising and falling time measurement
The Rising time test and Falling time test are one of the necessary power supply test item. The users can directly read the voltage rising/falling time from on the IT8900 display screen by sending instructions, easy operation and high testing accuracy, which is comparable with oscilloscope.



IT8900 testing data

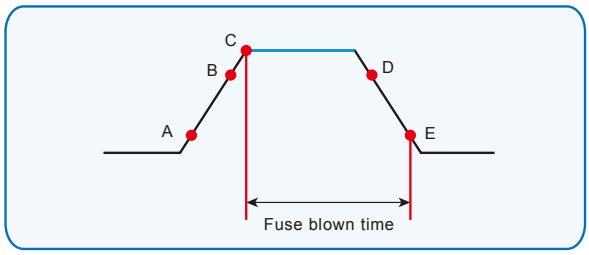
Oscilloscope testing data

Current positive pulse width test

■ Fuse blown time

Combine the CC function and Measure function together, the users can measure the fuse blown time, time measurement accuracy can reach 10μs.

The automotive industry requires to test the fuse blown time in the different magnification conditions. For example, 500A fuse with 6 times magnification, the fusing current will reach 3000A. IT8900 can meet the testing requirements.

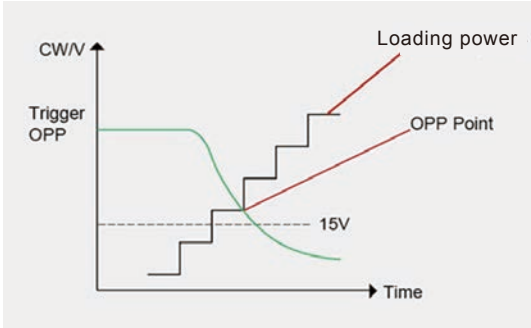


Measurement speed up to 50kHz

IT8900 with high performance characteristics, 1mv/1mA high resolution, 50kHz measurement speed, which increase the testing speed and accuracy. Such as solar battery testing. Because solar battery's IV feature will change with the different environment temperature, illumination radiation, luminous intensity etc. Thus, the solar battery IV feature must be multiple-points tested within short period of time, which request the loads to be able to high speed measure. IT8900 can measure 250 points of the solar battery IV curve within 5ms, using together with IT9380 solar battery test software, the users can set the measurement voltage, and the software will acquire the data within the specified range automatically.

OCP, OPP Tests

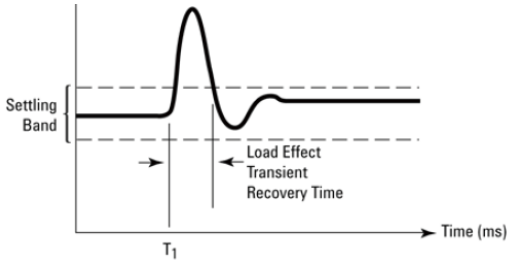
OCP and OPP are mainly applied in over-current and over-power point tests of the lithium-battery protection board and power modules. For power supplies, OCP and OPP are designed to guarantee the user's safety and to reduce damage rate. IT8900 loads can automatically judge the test result according to the set specifications, so the users can save much time in verification of design and production system.



OPP Protection Test

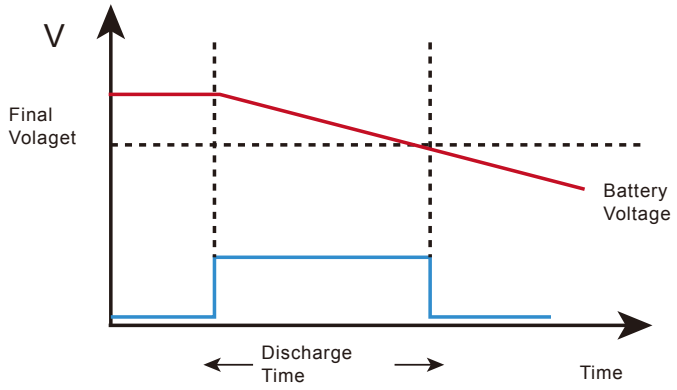
Dynamic mode reach 25kHz

Dynamic mode operation enable the electronic load to switch between the two set parameters according to set regulations, making use of the electronic load dynamic mode to test the power supplies, which can reflect the stability when power supply loading current in step changes. Meanwhile, IT8900 series digital loop circuit design and CV loop speed adjustment increase the loop response speed. For different power supply characteristics, IT8900 series has high and low bandwidth for choice, which is suitable for different power supply test.



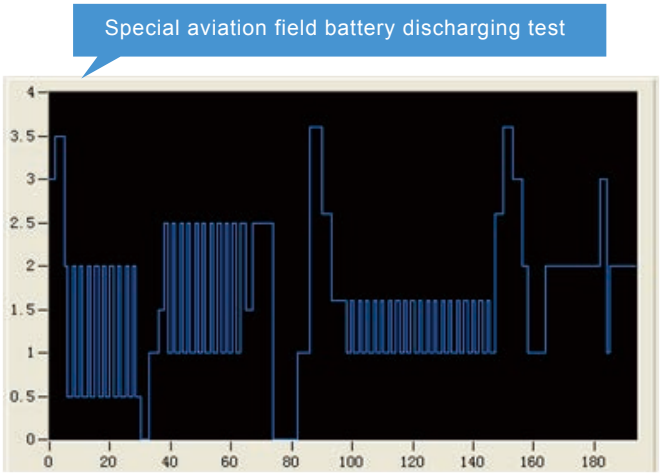
Battery Discharge Test

Through operation panel or software, IT8900 can set 3 battery stop conditions: voltage, capacity and time. Whenever met any condition, it will automatically stop test. During the test, users can observe battery's voltage, time and already-discharged-capacity. The discharging curves can be checked through the software. The discharge test can reflect battery's reliability and residual service life.



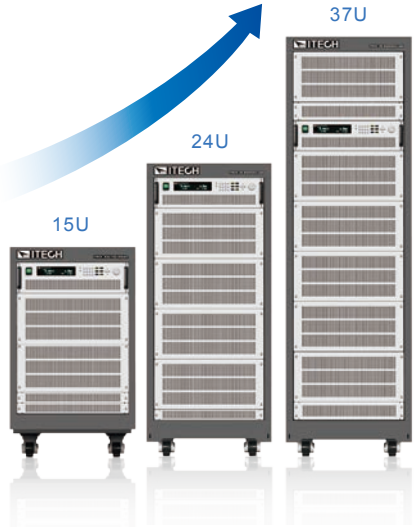
External Analog Test

Analog control interface is to meet industrial control requirements, when there's no need to use PC controlling, user can control through PLC. IT8900 loads can control load voltage or current through the analog interface at the rear panel, to analog 0-full scale input range by connecting to 0-10V adjustable voltages, so as to adjust load's input voltage and current values.



Automatic Test

IT8900 has a very strong automatic test function. The automatic test function is useful for simulating various tests and allows the user to edit up to 10 groups of testing files. It helps engineers to test out all kinds of data of the tested power supply at different loading status. Automatic test function can edit multiple product tests, such as CC, no-load, short-circuit, CV, so it can finish all test by one time. It makes tests convenient and fast, and to ensure high efficiency and testing accuracy.



Power off memory

IT8900 can save 100 groups of frequently testing data in nonvolatile memory device, which makes it convenient for users to recall the data. IT8900 provides power off memory to guarantee that the long-term testing result data can be saved well when there's abnormal power-off or computer crash. Once the system is back to normal, the program can continue staring from the fault point. This function can avoid repeated tests, thus to improve testing efficiency. When it remains under power-off status, IT8900 will automatically stop working, and to make test safe and reliable.

IT8900 Specification

Model		IT8912-600-480		IT8912-1200-240		IT8915-150-960	
Rated input (0~40℃)	Voltage	0~600V		0~1200V		0~150V	
	Current	0~48A	0~480A	0~24A	0~240A	0~96A	0~960A
	Power	12kW		12kW		15kW	
CV mode	Range	0.1~60V	0.1~600V	0.1~120V	0.1~1200V	0.1~18V	0.1~150V
	Resolution	1mV	10mV	10mV	100mV	1mV	
	Accuracy	±(0.05%+0.05%FS)					
CC mode	Range	0~48A	0~480A	0~24A	0~240A	0~96A	
	Resolution	1mA	10mA	1mA	10mA	1mA	10mA
	Accuracy	±(0.05%+0.1%FS)		±(0.05%+0.1%FS)		±(0.1%+0.1%FS)	
CR mode*1	Range	0.01Ω~10Ω	10Ω~7.5kΩ	0.03Ω~10Ω	10Ω~7.5kΩ	0.005Ω~10Ω	10Ω~7.5kΩ
	Resolution	16bit					
	Accuracy	0.01%+0.08S*2	0.01%+0.0008S	0.01%+0.08S*2	0.01%+0.0008S	0.01%+0.08S*2	0.01%+0.0008S
CP mode*3	Range	12kW		12kW		15kW	
	Resolution	1W		1W		1W	
	Accuracy	0.2%+0.3%FS		0.2%+0.3%FS		0.2%+0.3%FS	
Readback Voltage	Range	0~60V	0~600V	0~120V	0~1200V	0~18V	0~150V
	Resolution	1mV	10mV	10mV	100mV	1mV	
	Accuracy	±(0.025%+0.025%FS)		±(0.025%+0.025%FS)		±(0.025%+0.025%FS)	
Readback Current	Range	0~48A	0~480A	0~24A	0~240A	0~96A	
	Resolution	1mA	10mA	1mA	10mV	1mA	10mA
	Accuracy	±(0.05%+0.1%FS)		±(0.05%+0.1%FS)		±(0.1%+0.1%FS)	
Readback Power*2	Range	12kW		12kW		15kW	
	Resolution	1W		1W		1W	
	Accuracy	±(0.2%+0.3%FS)		±(0.2%+0.3%FS)		±(0.2%+0.3%FS)	
Height		15U		15U		15U	

*1 Voltage/Current is not less than 10%FS (FS is full range)
*2 Readback resistance range: (1/(1/R+(1/R)*0.01%+0.08),1/(1/R-(1/R)*0.01%-0.08))
*3 Voltage/Current is not less than 10%FS

* This information is subject to change without notice