

FT6110A/R series

Multi-channel electronic load array



Characteristic

- Compact structure, economical, cost-effective, and occupy small space;
- Channel modular design is small, can achieve 3U/8CH, only 1/3 of the conventional electronic load;
- Electrical isolation between channels, can be controlled separately or arbitrarily parallel;
- Power channel: 150W x 8CH/300W x 4CH;
- Voltage range: 0 ~ 150V/0 ~ 500V;
- Current range: 0 ~ 30A/0 ~ 15A;
- 50kHz dynamic test function, can set up, down slope;
- Up to 500kHz voltage and current sampling rate;
- Supports remote and near-end voltage functions;
- Battery discharge test function;
- Load effect test function;
- Voltage and current ripple test function;
- Dynamic frequency sweep function;
- Sequence function, simulate more complex load with carrier shape;
- Automatic test function, more suitable for production test, automatic judgment output test results;
- Convenient and practical OCP test function;
- Time measurement function;
- Over voltage, over current, over power, over temperature and reverse detection protection;
- Provides LAN, RS485 remote communication interface, convenient multi-computer integration;
- Standard MODBUS communication protocol, provides a perfect dynamic link library, easy to secondary development;
- Standard with complete functions of the upper computer software;
- The 19-inch rack structure is designed for easy system integration and installation.

Automatic test function

Automatic test function A single file can support 100 steps of testing, each step of the test can set the load mode, load value, detection items, detection items upper/lower limits, running time. The running time ranges from 0.1s to 86400s. This function only needs to complete the product insertion and removal, and the load will be tested and judged automatically. After the test is completed, it will be reflected in the form of PASS or FAIL.

Load effect test function

When the output load changes, the power supply products will cause the change of the output stability, which is called the load effect. The load effect test function provides users with multiple sets of on-load parameters and stable time Settings. After the test is completed, the load adjustment rate, voltage change rate and DC internal resistance of the power supply are provided directly.

Summary

The FT6110A/R series multi-channel electronic load is a high-performance, cost-effective product for power ATE test systems. In integrated applications, it can replace small power single electronic loads, saving a lot of space for system construction, and significantly saving costs.

In order to facilitate the development of power ATE test system, FT6110A/R has built-in special functions such as voltage and current ripple test, dynamic frequency sweep, load effect test, LED driver test, OCP test, slope setting, etc., and provides a complete DLL development kit. Support C#, C++, Delphi, Labview development languages, convenient for users to secondary development.

Application field

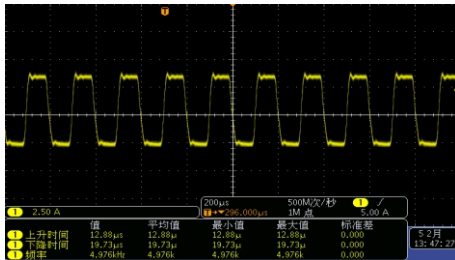
- Production, aging and quality inspection of low-power power supply products such as low-power power supply, DC converter, mobile phone charger, 3C battery, BMS, etc;
- Automotive wiring harness, connectors, fuses, relays, central electrical box and other product testing;
- Battery pack, BMS protection board balanced discharge, power tool production testing, LED power board production testing and other related fields.

Ripple test function

Load support voltage ripple V_{pp} , current ripple (I_{pp}) measurement, bandwidth 10Hz ~ 250kHz. In the range of measurement bandwidth, the ripple measurement accuracy is high and the repeatability is good. Generally speaking, the ripple includes two different frequency segments, power ripple and switch ripple. The load ripple measurement results are the comprehensive results of superposition of the two kinds of ripple.

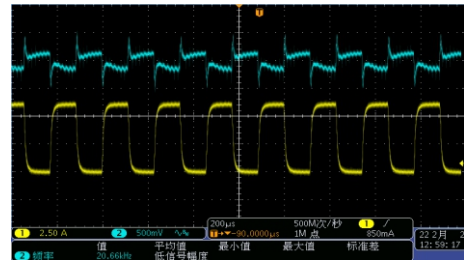
Dynamic function

The FT6110A/R series of electronic loads provides programmable dynamic testing capabilities. The dynamic mode is used to simulate all kinds of on-load sudden changes and anomalies, and is suitable for testing the dynamic characteristics of power supplies. The maximum frequency can reach 50kHz, support continuous, pulse, flip, rise slope, fall slope, range switching parameter settings.



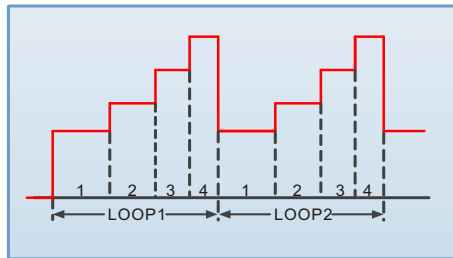
Dynamic frequency sweep function

The dynamic sweep function can manually or automatically adjust the on-load frequency continuously, up to 50kHz. This test function captures the maximum (Vp+) and minimum (Vp-) voltage peaks of the power class test object under the worst conditions.



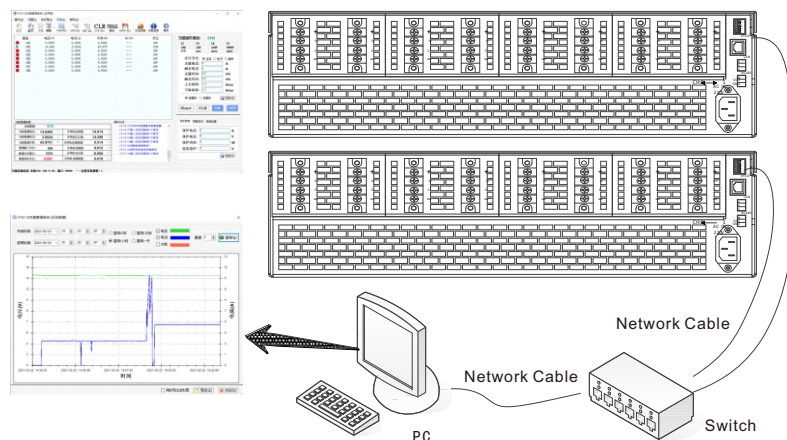
Sequence function

The FT6110A/R series electronic load provides serial test functionality, allowing users to edit 10 serial test files, which can be linked and run repeatedly. Each test file supports 20 test steps. In each test step, the user can set the load mode, load master value, and single step time. The single step time ranges from 0.001s to 86400s.



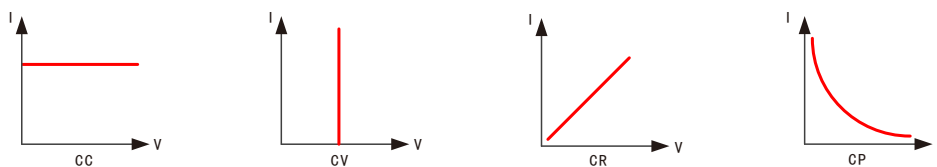
Application programming

The FT6110A/R provides a LAN or RS485 interface for multi-machine integration and can be easily integrated into the test system. Communication adopts standard Modbus protocol and provides detailed programming manual and DLL development kit, supports C#, C++, Delphi, Labview development languages, convenient secondary development. To facilitate debugging, the product comes with a Demo software, which can perform all functions of the load system, waveform display, and data saving functions. The software system is easy to operate and powerful, and users can easily use it.



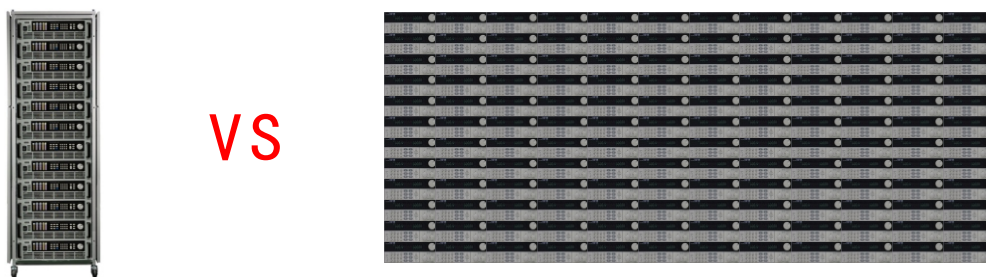
Constant state function

FT6110A/R series electronic load has four test modes of constant current, constant voltage, constant resistance and constant power, which can meet a wide range of test requirements. Constant current and constant resistance modes can be used to test whether the output voltage of the voltage source maintains a stable output under different load conditions. For battery chargers and adapters, constant voltage mode can change the output voltage of the charger and adapter to verify that the output current is correct.

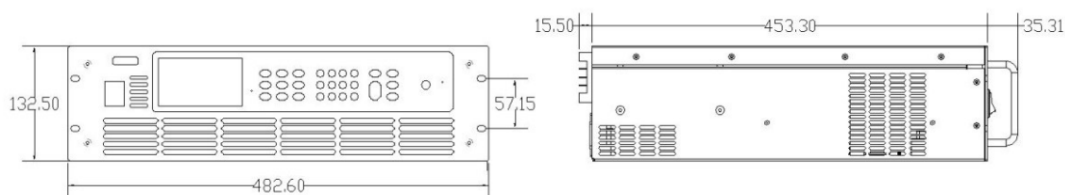


3U/8CH High integration

The FT6110A/R series adopts a highly integrated design, and a single 3U can integrate 8 electronic load channels, which is two-thirds smaller than the traditional electronic load volume and greatly compresses the space of the integrated system. Each channel is electrically isolated, independent of each other, and can be controlled separately.



Dimension drawing



FT6110A/R Chassis Dimension Drawing

Ordering information

Model	Specification	Note
FT6110	FT6110 Series dedicated chassis	The maximum power of a unit is 1200 W. Within the same mainframe, A/R series models cannot be mixed and matched.
FT6111A	Electronic load module 150V/30A/150W, 2 Channels	A series
FT6112A	Electronic load module 150V/30A/300W, 1 Channel	A series
FT6113A	Electronic load module 500V/15A/300W, 1 Channel	A series
FT6114A	Electronic load module 600V/15A/300W, 1 Channel	A series
FT6111R	Electronic load module 150V/30A/150W, 2 Channels	R series
FT6112R	Electronic load module 150V/30A/300W, 1 Channel	R series
FT6113R	Electronic load module 500V/15A/300W, 1 Channel	R series
FT6114R	Electronic load module 600V/15A/300W, 1 Channel	R series

Specification parameters

Channel model	FT6111A		FT6112A		FT6113A		FT6111R		FT6112R		FT6113R	
Number of channels per unit	4, 6, 8		2, 3, 4		2, 3, 4		4, 6, 8		2, 3, 4		2, 3, 4	
Voltage	150V		150V		500V		150V		150V		500V	
Current	30A		30A		15A		30A		30A		15A	
Power	150W		300W		300W		150W		300W		300W	
Full current minimum operating voltage	1. 6V@30A		1V@30A		5V@15A		1. 6V@30A		1V@30A		5V@15A	
Constant current												
Range	3A	30A	3A	30A	3A	15A	3A	30A	3A	30A	3A	15A
Resolution	0.75mA	7.5mA	0.75mA	7.5mA	0.75mA	7.5mA	0.05mA	0.5mA	0.05mA	0.5mA	0.025mA	0.25mA
Precision	0.1%+0.25%F.S.						0. 05%+0. 05%F. S.					
Constant voltage												
Range	30V	150V	30V	150V	100V	500V	30V	150V	30V	150V	100V	500V
Resolution	7. 5mV	37. 5mV	7. 5mV	37.5mV	25mV	125mV	0. 5mV	2. 5mV	0. 5mV	2. 5mV	2mV	8. 5mV
Precision	0.1%+0.1%F.S.						0. 025%+0. 025%F. S					
Constant resistance												
Range	0. 05Ω～5kΩ		0. 05Ω～5kΩ		0. 35Ω～15kΩ		0. 05Ω～5kΩ		0. 05Ω～5kΩ		0. 35Ω～15kΩ	
Precision	0. 5%+0. 002R		0. 5%+0. 002R		0. 5%+0. 02R		0. 5%+0. 002R		0. 5%+0. 002R		0. 5%+0. 02R	
Constant power												
Range	150W		300W		300W		150W		300W		300W	
Precision	0.1%+0.15%		0.1%+0.15%		0.1%+0.15%		0.1%+0.15%		0.1%+0.15%		0.1%+0.15%	
Dynamic function												
T1&T2	10us～60s		10us～60s		10us～60s		10us～60s		10us～60s		10us～60s	
Resolution	2us		2us		2us		2us		2us		2us	
Precision	1us+20ppm		1us+20ppm		1us+20ppm		1us+20ppm		1us+20ppm		1us+20ppm	
Slope	0.6A/ms～1A/us		0.6A/ms～2A/us		0.6A/ms～0.8A/us		0.6A/ms～1A/us		0.6A/ms～2A/us		0.6A/ms～0.8A/us	
Current measurement												
Range	3A	30A	3A	30A	3A	15A	3A	30A	3A	30A	3A	15A
Resolution	0. 75mA	7. 5mA	0. 75mA	7. 5mA	0. 75mA	7. 5mA	0. 05mA	0. 5mA	0.05mA	0. 5mA	0.025mA	0.25mA
Precision	0.1%+0.25%F.S.						0.05%+0.05%F.S.					
Voltage measurement												
Range	30V	150V	30V	150V	100V	500V	30V	150V	30V	150V	100V	500V
Resolution	7. 5mV	37. 5mV	7. 5mV	37. 5mV	25mV	125mV	0. 5mV	2. 5mV	0. 5mV	2. 5mV	2mV	8. 5mV
Precision	0.1%+0.1%F.S.						0.025%+0.025%F.S					
Ripple measurement												
Range	*	*	*	*	*	*	30V	150V	30V	150V	100V	500V
Bandwidth	*	*	*	*	*	*	10Hz～250kHz		10Hz～250kHz		10Hz～250kHz	
Precision	*	*	*	*	*	*	0.03%+2mV 0.03%+10mV		0.03%+2mV 0.03%+10mV		0.03%+6mV 0.03%+30mV	

A-series vs. R-series load function comparison table

Functions and characteristics	FT6110A	FT6110R
Maximum number of channels	8	8
Working mode	CC, CV, CR, CP	CC, CV, CR, CP
Sampling rate	250kHz	500kHz
Sampling resolution	12Bits	16Bits
Sampling precision	Voltage: 0.1%+0.1%F. S.	Voltage: 0.025%+0.025%F. S.
	Current: 0.1%+0.25%F. S.	Current: 0.05%+0.05%F. S.
Programmed resolution	12Bits	16Bits
Programmed accuracy	Voltage: 0.1%+0.1%F. S.	Voltage: 0.025%+0.025%F. S.
	Current: 0.1%+0.25%F. S.	Current: 0.05%+0.05%F. S.
CC transient function	50kHz	50kHz
Slope control	Can set	Can set
Analog short circuit test function	P	P
Von function	P	P
Voltage compensation function	P	P
Battery discharge test function	P	P
Load effect test function	O	P
Ripple test function	O	P
Dynamic frequency sweep function	O	P
OCF test function	P	P
Time measuring function	O	P
Automatic test function	P	P
Sequence function	P	P
Protection function	OCF, OVP, OPP, OTP, RV, LVP	OCF, OVP, OTP, OPP, RV, LVP
Communication interface	LAN, RS485	LAN, RS485
Communication protocol	MODBUS	MODBUS
External IO input/output	P	P
DLL development kit	P	P
Application system software	P	P