



### **IT-M3300** Regenerative DC Electronic Load

#### **APPLICATIONS**

Battery discharge test

Multi-channel power supply test

Semiconductor aging test

Your Power Testing Solution

# ITECH

High efficient power regeneration

Battery discharge test

8 operation modes

Independent control of multiple channels

IT-M3300 regenerative DC electronic load can not only simulate various load characteristics, but also can feed back electrical energy to the grid without pollution. With high power density design, it can provide up to 800W power absorption with tiny body of only 1U half-rack. Its flexible modular architecture design can meet the test requirement of customers with different current and power. At the same time, it has high-precision output and measurement, and has made a number of safety designs for the test. It is suitable for various test fields such as various types of battery discharge, multi-channel power supply, and semiconductor aging.

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#### Feature

- 1U half rack, high power density
- Battery discharge test
- High efficient power regeneration
- Battery simulation
- 8 operating modes : CC/CV/CP/CR/CV+CC/CC+CR/CV+CR/ CV+CC+CP+CR
- Independent control of multi-channels, implement synchronization or proportional tracking
- Parallel connection, up to 16 units
- High-speed measurement, keep 10 times / s update rate even connecting 16 stand-alone units
- Adjustable current rise/fall time
- List

- Various protection such as ±OCP,±OVP,OPP, over heat protection, grid fault protection and fault storage, fold-back,Power-off protection, sense abnormal protection
- Temperature measurement function, over temperature protection
- Automatic detection of power grid state to realize reliable grid connection
- Precharge function to prevent overshoot of DC loading current
- Anti-reverse protection function through optional accessories
- Five optional cards, supporting RS232, CAN, LAN, GPIB, USB\_TMC, USB\_VCP 

  RS485, analog and IO communication

Model	Voltage	Current	Power	Model	Voltage	Current	Power
IT-M3312	60V	30A	200W	IT-M3314	300V	6A	200W
IT-M3322	60V	30A	400W	IT-M3324	300V	6A	400W
IT-M3332	60V	30A	800W	IT-M3334	300V	6A	800W
IT-M3313	150V	12A	200W	IT-M3315	600V	ЗA	200W
IT-M3323	150V	12A	400W	IT-M3325	600V	ЗA	400W
IT-M3333	150V	12A	800W	IT-M3335	600V	ЗA	800W

#### Applications

Burning testing solution for multi-channel power supply module

Burning test of LED driver, DC-DC or AC-DC modules' burning test.

Semi-conductor power IC, relay, and wire harness, etc.

Power regulator, smart electronic switch IPS, and burning test of automotive central control box

Working condition simulation, verification of electrical performance of products.

Electrical performance test of mobile phone mother board, adapter performance test, small DC generator test

Discharging test of various types of batteries

Battery capacity test, screening of disqualified batteries

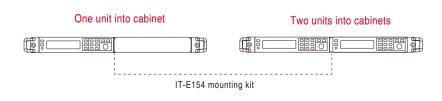


#### 1U half rack, mini size

IT-M3300 has mini size of 1U half rack and is able to output 800W. It has not only the high density but also the high resolution, accuracy, stability and etc. The output voltage can reach 600V and the output current can reach 30A. There're 12 models for IT-M3300 series, with design of wide range output, with one unit, it can cover a wide range of application requirements.

#### Module design, flexible combination

IT-M3300, with module design, without additional spare parts, it can be stacked as easy as the toy bricks. With IT-E154 rack installation kit, users can easily install one or multiple instruments into a standard 19-inch cabinet.







### Your Power Testing Solution

IT-M3300 Regenerative DC Electronic Load

#### High energy recovery efficiency

IT-M3300 has an energy recovery function, which can recover electrical energy. The conversion efficiency can be up to 90%, which greatly reduces the user's electricity cost. It also avoids the using of air conditioning or expensive refrigeration systems and reduces noise.



### Electricity accumulation, high energy saving effect

IT-M3300 uses power electronic conversion technology to recycle the output energy of the power supply under test under the premise of completing the test power experiment. Through the internal high-speed voltage and current sampling, the user can directly view the current total amount of feedback in the instrument panel.

The IT-M3300 is equipped with a temperature measurement function as standard. With an optional temperature sensor, you can also directly view the external measurement temperature.



#### Parallel function

IT-M3300 supports parallel connection of multiple products of the same model to create a system with greater current and power. The user takes the master-slave operation according to the current value of different requirements; maximum up to 16 instruments can be connected in parallel.

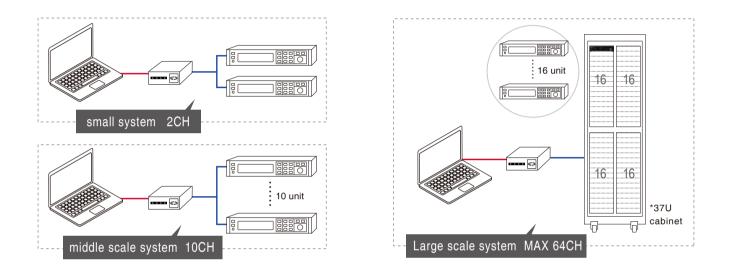
The IT-M3300 can still have high-speed measurement capability after parallel connection and this speed is almost the same as the single unit.



#### Multi-channel independent control, maximum 256 channels

IT-M3300 series is provided with independent multi-channel design. The channel suquence will be displayed when it combines to be a multi-channel power and electronic load system. The user can control each unit independently by PC software when connecting the communication interface of one unit with PC. Each channel can be operated separately.

IT-M3300 series supports maximum 16\*16 channels. One 37U rack case contains 64 channels. The user may test DUT with different power ranges by parallel connection, making tests more flexible and device usage more efficient.



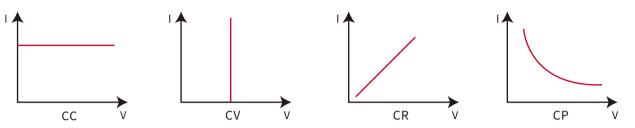
#### **Battery simulation**

Battery charger will monitor the voltage of battery after battery is connected to battery, if the connection is correctly, the battery charger comes into charge state. In Battery Sim mode, users can set analog voltage of battery, and can output low current, to simulate battery state. It can satify working demand of battery charge, which can be applied to discharging test of battery charger.

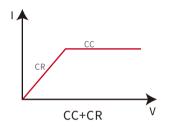


#### Multiple operation mode

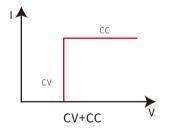
IT-M3300 provides CC/CV/CP/CR four basic operation mode.



IT-M3300 also provides CC+CR/CV+CR/CV+CC/CC+CV+CP+CR four combined operation mode, which can be applied to the test requirements of various occasions.



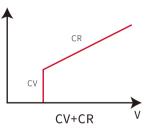
CC+CR mode can be applied to OBC feature test of voltage limit, feature test of current limit, constant voltage accuracy test, constant current accuracy test, to prevent over current protection.



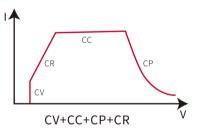
CV+CC mode can be applied to load simulate battery, test charging station or car charger, the maximum loading current is limited,when the CV is working.

#### List function

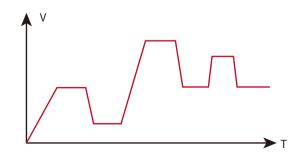
IT-M3300 does not need any software, according to users test demand, it can be edited output waveform which be generated by voltage and current, and can control voltage rising slope and falling slope. When receiving the triggle signal, it can switch loading waveform automatically.



CV+CR mode can be applied to simulate LED light, test LED power, LED current ripple parameters.

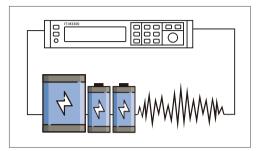


CV+CC+CP+CR mode can be applied to test lithium-ion battery charger, to gain complete V-I charging curve.In addition, when protection circuit of DUT is damaged, it can auto switch to aviod damage.



#### Battery discharge test

The battery discharge function of IT-M3300 allows you to proceed the discharge test of battery under CC mode.3 cut off conditions can be set, including voltage, capacity and discharge time. When any of the three conditions are met, it will automatically stop the test. The battery voltage, discharge time and discharged capacity can be monitored during the test.



#### **Full protection**

IT-M3300 has  $\pm$ OCP /  $\pm$ OVP / overheat / OPP / protection, power grid fault protection and fault storage function, power off protection function and Sense function. The power grid state automatic detection function helps to shut down the instrument when the power is suddenly cut off, so as to realize reliable grid connection function and island protection function. The precharge function prevents current overshoot. Equipped with the optional anti-reverse connection module, the anti-reverse connection protection function can be realized to effectively suppress the inrush current.

#### **Optional accessories**

IT-M3300 series provides below optional multiple interfaces on rear panel to realize different functions, like communication interface, external analog interface.

Pictures	Model	Interface
	IT-E1205	GPIB
	IT-E1206	USB/LAN
	IT-E1207	RS-232/CAN
	IT-E1208	Analog
	IT-E1209	USB
	IT-E118	Anti-reverse module
	IT-E1203	Temperature Sensor
	IT-E154A/B/C	Rack mount kit



Rear panel with optional interface

Specification

		IT-M3312	IT-M3313
			arameters
	Input Voltage	0~60V	0~150V
Rated Input Value	Input Current	0~30A	0~12A
(0°C-40°C)	Input Power	0~200W	0~200W
	MOV	1V at 30A	2V at 12A
	Current Range	0~30A	0~12A
CC Mode	Resolution	10mA	1mA
operation	Accuracy	<0.1% Imax+0.1%Icurrent	<0.1% Imax+0.1% Icurrent
	Voltage Range	0~60V	0~150V
CV Mode operation	Resolution	1mV	10mV
operation	Accuracy	<0.1% Umax	<0.1% Umax
	Resistance Range	0.04~600Ω	0.25~1500Ω
CR Mode	Resolution	min 0.001Ω	min 0.01Ω
operation	Accuracy	(1/Rmin)*2%:(0.04~60Ω);(1/Rmin)*5%:(60~600Ω)	(1/Rmin) *2% : (0.25~100Ω); (1/Rmin) *5% : (100~1500Ω)
	Power Range	0~200W	0~200W
CP Mode	Resolution	0.1W	0.1W
operation	Accuracy	<1.0% Pmax	<1.0% Pmax
	Rising speed	30A/ms	12A/ms
			tal conditions
Operating temp		0~40°C	0~40°C
Storage temp		-20~70°C	-20~70°C
Acoustic noise		60dB	60dB
1000310 110130			ure measurement
Temperature Ra	ange	-20120°C	-20120°C
Measurement A	-	±1°C	±1°C
	·····,		ection Range
OCP		31A	12.5A
OVP		61V	155V
OPP		210W	210W
	Voltage Resolution	0.001V	0.01V
D 1 1	Current Resolution	0.01A	0.001A
Resolution	Power Resolution	0.1W	0.1W
	Resistance Resolution	0.01R	1R
			ircuit Test
Current		33A	13.2A
		Ri	pple
Current ripple (r	ms) battery test	≤30mArms	≤30mArms
Current ripple (p	eak) battery test	≤60mAp-p	≤60mAp-p
			Supply
Voltage		100VAC~240VAC	100VAC~240VAC
OVP		264VAC	264VAC
UVP		90VAC	90VAC
Frequency		50Hz~60Hz	50Hz~60Hz
Max. Current (rms)		1Aac (AC220)	1Aac (AC220)
DC Component		-0.1A~+0.1A	-0.1A~+0.1A
Efficiency (Max.)		86%	88%
	, 		l Parameters
Dimension		450mm*214mm*43.5mm	450mm*214mm*43.5mm
Net Weight		5kg	5kg
Net weight		U C	U C

\*Load mode resistance accuracy range: lower limit 1/(1/R+(1/R)\*0.05+0.004); upper limit 1/(1/R-(1/R)\*0.05-0.004)

#### Specification

		IT-M3314	IT-M3315
			arameters
	Input Voltage	0~300V	0~600V
Rated Input Value	Input Current	0~6A	0~3A
(0°C-40°C)	Input Power	0~200W	0~200W
	MOV	5V at 6A	10V at 3A
	Current Range	0~6A	0~3A
CC Mode	Resolution	1mA	1mA
operation	Accuracy	<0.1% Imax+0.1%Icurrent	<0.1% Imax+0.1% Icurrent
	Voltage Range	0~300V	0~600V
CV Mode operation	Resolution	10mV	10mV
operation	Accuracy	<0.1% Umax	<0.1% Umax
	Resistance Range	1~3000Ω	4~6000Ω
CR Mode operation	Resolution	min 1Ω	min 1Ω
oporation	Accuracy	(1/Rmin)*2%:(1~300Ω);(1/Rmin)*5%:(300~3000Ω)	(1/Rmin)*2%:(4~600Ω);(1/Rmin)*5%:(600~6000Ω)
	Power Range	0~200W	0~200W
CP Mode	Resolution	0.1W	0.1W
operation	Accuracy	<1.0% Pmax	<1.0% Pmax
	Rising speed	6A/ms	1
		Environmen	tal conditions
Operating temp		0~40°C	0~40°C
Storage temp		-20~70°C	-20~70°C
Acoustic noise		60dB	60dB
		DUT Temperatu	ure measurement
Temperature Ra	nge	-20120°C	-20120°C
Measurement Ac	ccuracy	±1°C	±1°C
		Input Prote	ection Range
OCP		6.2A	3.1A
OVP		310V	610V
OPP		210W	210W
	Voltage Resolution	0.01V	0.01V
Resolution	Current Resolution	0.001A	0.001A
	Power Resolution	0.1W	0.1W
	Resistance Resolution	1R	1R
		Short C	ircuit Test
Current		6.6A	3.3A
			pple
Current ripple (rr		≤600mVp-p	≤30mArms
Current ripple (p	eak) battery test	≤60mAp-p	≤60mAp-p
			Supply
Voltage		100VAC~240VAC	100VAC~240VAC
OVP		264VAC	264VAC
UVP		90VAC	90VAC
Frequency		50Hz~60Hz	50Hz~60Hz
Max. Current (rms)		1Aac (AC220)	1Aac (AC220)
DC Component		-0.1A~+0.1A	-0.1A~+0.1A
Efficiency (Max.)		88%	88%
			I Parameters
Dimension		450mm*214mm*43.5mm	450mm*214mm*43.5mm
Net Weight		5kg	5kg

\*Load mode resistance accuracy range: lower limit 1/(1/R+(1/R)\*0.05+0.004); upper limit 1/(1/R-(1/R)\*0.05-0.004)

#### Specification

		IT-M3322	IT-M3323
		Load Par	
	Input Voltage	0~60V	0~150V
Rated Input Value	Input Current	0~30A	0~12A
(0°C-40°C)	Input Power	0~400W	0~400W
	MOV	1V at 30A	2V at 12A
	Current Range	0~30A	0~12A
CC Mode	Resolution	10mA	1mA
operation	Accuracy	<0.1% Imax+0.1% lcurrent	<0.1% Imax+0.1%Icurrent
	Voltage Range	0~60V	0~150V
CV Mode operation	Resolution	1mV	10mV
oporation	Accuracy	<0.1% Umax	<0.1% Umax
	Resistance Range	0.04~600Ω	0.25~1500Ω
CR Mode operation	Resolution	min 0.001Ω	min 0.01Ω
-1 · · · ·	Accuracy	( 1/Rmin ) *2% : ( 0.04~60Ω ) ; ( 1/Rmin ) *5% : ( 60~600Ω )	(1/Rmin)*2%:(0.25~100Ω);(1/Rmin)*5%:(100~1500Ω)
	Power Range	0~400W	0~400W
CP Mode	Resolution	0.1W	0.1W
operation	Accuracy	<1.0% Pmax	<1.0% Pmax
	Rising speed	30A/ms	12A/ms
		Environment	al conditions
Operating temp		0~40°C	0~40°C
Storage temp		-20~70°C	-20~70°C
Acoustic noise		60dB	60dB
		DUT Temperatu	re measurement
Temperature Ra	nge	-20120°C	-20120°C
Measurement A	ccuracy	±1°C	±1°C
		Input Protect	tion Range
OCP		31A	12.5A
OVP		61V	155V
OPP		810W	410W
	Voltage Resolution	0.001V	0.01V
Resolution	Current Resolution	0.01A	0.001A
	Power Resolution	0.1W	0.1W
	Resistance Resolution	0.01R	1R
		Short Cir	
Current		33A	13.2A
		Rip	
Current ripple (ri		≤30mArms	≤30mArms
Current ripple (p	eak) battery test	≤60mAp-p	≤60mAp-p
		AC S	
Voltage		100VAC~240VAC	100VAC~240VAC
OVP		264VAC	264VAC
UVP		90VAC	90VAC
Frequency		50Hz~60Hz	50Hz~60Hz
Max. Current (rms)		2Aac (AC220)	2Aac (AC220)
DC Component		-0.1A~+0.1A	-0.1A~+0.1A
Efficiency (Max.	)	86%	88%
		Mechanical	
Dimension		450mm*214mm*43.5mm	450mm*214mm*43.5mm
Net Weight		5kg	5kg

\*Load mode resistance accuracy range: lower limit 1/(1/R+(1/R)\*0.05+0.004); upper limit 1/(1/R-(1/R)\*0.05-0.004)

#### Specification

		IT-M3324	IT-M3325
			arameters
	Input Voltage	0~300V	0~600V
Rated Input Value	Input Current	0~6A	0~3A
(0°C-40°C)	Input Power	0~400W	0~400W
	MOV	5V at 6A	10V at 3A
	Current Range	0~6A	0~3A
CC Mode	Resolution	1mA	1mA
operation	Accuracy	<0.1% Imax+0.1%Icurrent	<0.1% Imax+0.1% Icurrent
	Voltage Range	0~300V	0~600V
CV Mode operation	Resolution	10mV	10mV
oporation	Accuracy	<0.1% Umax	<0.1% Umax
	Resistance Range	1~3000Ω	4~6000Ω
CR Mode operation	Resolution	min 1Ω	min 1Ω
	Accuracy	( 1/Rmin )*2%: ( 1~300Ω ) ; ( 1/Rmin ) *5%: ( 300~3000Ω )	(1/Rmin)*2%:(4~600Ω);(1/Rmin)*5%:(600~6000Ω)
	Power Range	0~400W	0~400W
CP Mode	Resolution	0.1W	0.1W
operation	Accuracy	<1.0% Pmax	<1.0% Pmax
	Rising speed	6A/ms	1
		Environme	ntal conditions
Operating temp		0~40°C	0~40°C
Storage temp		-20~70°C	-20~70°C
Acoustic noise		60dB	60dB
		DUT Tempera	ture measurement
Temperature Ra	inge	-20120°C	-20120°C
Measurement A	ccuracy	±1°C	±1℃
		Input Prot	ection Range
OCP		6.2A	3.1A
OVP		310V	610V
OPP		410W	410W
	Voltage Resolution	0.01V	0.01V
Resolution	Current Resolution	0.001A	0.001A
	Power Resolution	0.1W	0.1W
	Resistance Resolution	1R	1R
		Short C	Circuit Test
Current		6.6A	3.3A
		R	ipple
Current ripple (ri	ms) battery test	≤30mVp-p	≤30mArms
Current ripple (p	eak) battery test	≤60mAp-p	≤60mAp-p
			Supply
Voltage		100VAC~240VAC	100VAC~240VAC
OVP		264VAC	264VAC
UVP		90VAC	90VAC
Frequency		50Hz~60Hz	50Hz~60Hz
Max. Current (rms)		2Aac (AC220)	2Aac (AC220)
DC Component		-0.1A~+0.1A	-0.1A~+0.1A
Efficiency (Max.)		88%	88%
		Mechanica	al Parameters
Dimension		450mm*214mm*43.5mm	450mm*214mm*43.5mm
Net Weight		5kg	5kg

\*Load mode resistance accuracy range: lower limit 1/(1/R+(1/R)\*0.05+0.004); upper limit 1/(1/R-(1/R)\*0.05-0.004)

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#### Specification

		IT-M3332	IT-M3333	
		Load Pa		
	Input Voltage	0~60V	0~150V	
Rated Input Value	Input Current	0~30A	0~12A	
(0°C-40°C)	Input Power	0~800W	0~800W	
	MOV	1V at 30A	2V at 12A	
	Current Range	0~30A	0~12A	
CC Mode	Resolution	10mA	1mA	
operation	Accuracy	<0.1% Imax+0.1%Icurrent	<0.1% Imax+0.1% Icurrent	
	Voltage Range	0~60V	0~150V	
CV Mode operation	Resolution	1mV	10mV	
oporation	Accuracy	<0.1% Umax	<0.1% Umax	
	Resistance Range	0.04~600Ω	0.25~1500Ω	
CR Mode operation	Resolution	min 0.001Ω	min 0.01Ω	
	Accuracy	(1/Rmin)*2%:(0.04~60Ω);(1/Rmin)*5%:(60~600Ω)	(1/Rmin)*2%:(0.25~100Ω);(1/Rmin)*5%:(100~1500Ω)	
	Power Range	0~800W	0~800W	
CP Mode	Resolution	0.1W	0.1W	
operation	Accuracy	<1.0% Pmax	<1.0% Pmax	
	Rising speed	30A/ms	12A/ms	
		Environment	al conditions	
Operating temp		0~40°C	0~40°C	
Storage temp		-20~70°C	-20~70°C	
Acoustic noise		60dB	60dB	
		DUT Temperatu	re measurement	
Temperature Ra	inge	-20120°C	-20120°C	
Measurement A	ccuracy	±1°C	±1°C	
		Input Protein	ction Range	
OCP		31A	12.5A	
OVP		61V	155V	
OPP		810W	810W	
	Voltage Resolution	0.001V	0.01V	
Resolution	Current Resolution	0.01A	0.001A	
	Power Resolution	0.1W	0.1W	
	Resistance Resolution	0.01R	1R	
			cuit Test	
Current		33A	13.2A	
		Rip	ple	
Current ripple (r		≤30mArms	≤30mArms	
Current ripple (p	eak) battery test	≤60mAp-p	≤60mAp-p	
			upply	
Voltage		100VAC~240VAC	100VAC~240VAC	
OVP		264VAC	264VAC	
UVP		90VAC	90VAC	
Frequency		50Hz~60Hz	50Hz~60Hz	
Max. Current (rms)		4Aac (AC220)	4Aac (AC220)	
DC Component		-0.1A~+0.1A	-0.1A~+0.1A	
Efficiency (Max.	)	86%	88%	
			Parameters	
Dimension		450mm*214mm*43.5mm	450mm*214mm*43.5mm	
Net Weight		5kg	5kg	

\*Load mode resistance accuracy range: lower limit 1/(1/R+(1/R)\*0.05+0.004); upper limit 1/(1/R-(1/R)\*0.05-0.004)

#### Specification

		IT-M3334	IT-M3335
			Parameters
	Input Voltage	0~300V	0~600V
Rated Input Value	Input Current	0~6A	0~3A
(0°C-40°C)	Input Power	0~800W	0~800W
	MOV	5V at 6A	10V at 3A
	Current Range	0~6A	0~3A
CC Mode	Resolution	1mA	1mA
operation	Accuracy	<0.1% Imax+0.1% Icurrent	<0.1% Imax+0.1% Icurrent
	Voltage Range	0~300V	0~600V
CV Mode operation	Resolution	10mV	10mV
operation	Accuracy	<0.1% Umax	<0.1% Umax
	Resistance Range	1~3000Ω	4~6000Ω
CR Mode operation	Resolution	min 1Ω	min 1Ω
oporation	Accuracy	(1/Rmin)*2%:(1~300Ω);(1/Rmin)*5%:(300~3000Ω)	( 1/Rmin ) *2% : ( 4~600Ω ) ; ( 1/Rmin ) *5% : ( 600~6000Ω )
	Power Range	0~800W	0~800W
CP Mode	Resolution	0.1W	0.1W
operation	Accuracy	<1.0% Pmax	<1.0% Pmax
	Rising speed	6A/ms	1
		Environn	nental conditions
Operating temp		0~40°C	0~40°C
Storage temp		-20~70°C	-20~70°C
Acoustic noise		60dB	60dB
		DUT Tempe	rature measurement
Temperature Ra	inge	-20120°C	-20120°C
Measurement A	ccuracy	±1°C	±1°C
		Input Pr	otection Range
OCP		6.2A	3.1A
OVP		310V	610V
OPP		810W	810W
	Voltage Resolution	0.01V	0.01V
Resolution	Current Resolution	0.001A	0.001A
	Power Resolution	0.1W	0.1W
	Resistance Resolution	1R	1R
		Shor	t Circuit Test
Current		6.6A	3.3A
			Ripple
Current ripple (ri	ms) battery test	≤30mVp-p	≤30mArms
Current ripple (p	eak) battery test	≤60mAp-p	≤60mAp-p
		Α	C Supply
Voltage		100VAC~240VAC	100VAC~240VAC
OVP		264VAC	264VAC
UVP		90VAC	90VAC
Frequency		50Hz~60Hz	50Hz~60Hz
Max. Current (rms)		4Aac (AC220)	4Aac (AC220)
DC Component		-0.1A~+0.1A	-0.1A~+0.1A
Efficiency (Max.	)	88%	88%
		Mechan	ical Parameters
Dimension		450mm*214mm*43.5mm	450mm*214mm*43.5mm
Net Weight		5kg	5kg

\*Load mode resistance accuracy range: lower limit 1/(1/R+(1/R)\*0.05+0.004); upper limit 1/(1/R-(1/R)\*0.05-0.004)



This information is subject to change without notice.For more information, please contact ITECH.

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