

IT8500G+ series Programmable DC Electronic Load

APPLICATIONS

- Battery test
- Lithium battery protection board test
- Power supply test

- Charger test
- Component test

ATE

Your Power Testing Solution



IT8500G+ series Programmable **DC Electronic Load**



IT8500G+ series programmable electronic load is not only a desktop power supply, but also suitable for system integration. It is specially designed for fast charging adapters, power banks, industrial power modules, power electronic device R&D and burn-in testing. It not only has the traditional CC/CV/CR/CP load mode, but also provide compound modes such as CR+CC/CV+CC/CR-LED, which are widely applicable to DUTs with different characteristics. So it performs well in limiting current overshoot and dynamic loading. Not only that, the multi-channel mode and ripple measurement mode of IT8500G+ help to reduce test cost and improve test efficiency. Without additional oscilloscope and communication interface, you can easily realize the program control of hundreds of channels.

FEATURE

- 7 operating modes:: CC/CV/CR/CW/CR+CC/CV+CC/CR-LED
- Built-in voltage and current ripple measurement functions
- Built in 8 fast charging communication protocol, including QC2.0, QC3.0, PE+, PE2.0+, USB PD2.0, USB, PD3.0, FCP, SCP *1
- Dynamic mode up to 20kHz
- Voltage measurement resolution up to 0.1mV / 0.1mA
 - *1 Only available with IT8511G+
 - *2 150W model with built-in USB interface

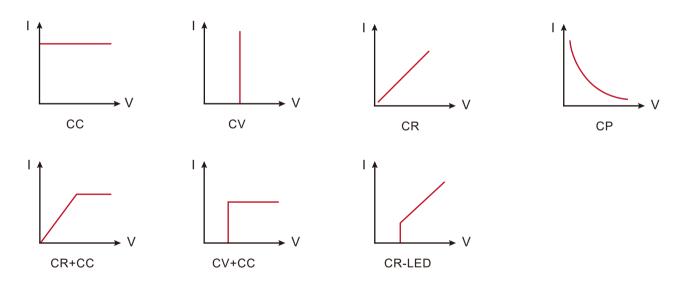
- Multi-channel, up to 16 units can be connected
- OCP/OPP, battery discharge mode
- Auto test, LIST mode, short circuit mode
- Measure function, can measure the voltage rise/fall time
- Monitor 0-100% current at 0-10V (I-monitor)
- Built-in USB/LAN communication interface *2

Model	Parameter			Accessories			
	Voltage	Current	Power	Fast charge card IT-E164	USB	LAN	
IT8511G+	150V	30A	150W	Optional	Standard	/	
IT8512G+	150V	30A	300W	/	Standard	Standard	
IT8512BG+	600V	15A	300W	/	Standard	Standard	
IT8513G+	150V	120A	600W	/	Standard	Standard	
IT8513BG+	600V	20A	600W	/	Standard	Standard	
IT8513CG+	40V	200A	600W	/	Standard	Standard	

IT8500G+ series Programmable DC Electronic Load



7 working mode



Voltage/current ripple measurement

Ripple is one of the parameters that must be tested for switching power supplies. Excessive ripple may cause interference to the DUT or shorten the life of the DUT. IT8500G+ has a ripple measurement function, and its measurement bandwidth is up to 300kHz, which meets the ripple measurement requirements of switching power supplies or chargers. At the same time, its remote sense function can help to eliminate the impact caused by the voltage drop on the line. No oscilloscope needed, users can just press the 'down' button on the front panel to read the voltage ripple value (Vpp/Vp+/Vp-) and current ripple value (lpp/lp+/lp-) of the DUT directly. This greatly simplifies the wiring and operation process.

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Built-in multiple fast charge protocol

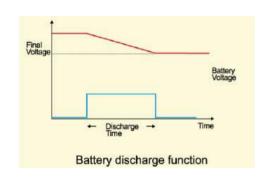
The consumption of battery power is getting faster and faster due to more and more functions generated in mobile phone. Fast charging technology can help to improve user experience under the situation. IT8500G+ has built-in multiple fast charging protocols (QC2.0, QC3.0, PE+, PE2.0+, USB PD2.0, USB PD3.0, F CP, SCP) which can complete the test for adapters with different protocols. Users can quickly choose the charging protocol on the menu. And in automatic test mode, it can realize the performance verification of the fast charging adapter under different charging process, like no-load voltage, short-circuit current, constant voltage and constant current.



* Only available with IT8511G+

Battery discharge test

IT8500G+ can perform battery discharge test in CC mode. After selecting the discharge test mode, set the turn off conditions "off voltage", "off capacity" and "discharge time". When any one of the above conditions is met during the test, the discharge stops and the electronic load automatically switches to the OFF state. During the test, the battery voltage, time and battery discharged capacity can be acquired.

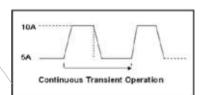


Dynamic mode

Dynamic testing means that the electronic load can be switched between two set parameters according to the set rules. This function is used to test the dynamic characteristics of power supplies.

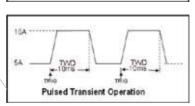
Continuous transient operation

In the continuous mode, when the dynamic test operation is enabled, it will continuously switch between value A and value B.



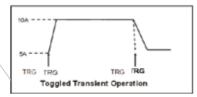
Pulsed transient operation

In the pulse mode, when the dynamic test operation is enabled, each time a trigger signal is received, it will switch to value B. After maintaining pulse width time B, it will switch back to value A.



Toggled transient operation

In the toggled transient mode, when the dynamic test operation is enabled, it will switch between value A and value B every time a trigger signal is received.



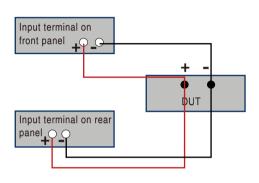
IT8500G+ series Programmable DC Electronic Load

OCP/OPP

The IT8500G+ has over-power protection (OPP) and over-current protection (OCP) test function. Take the OPP test mode for example, when the input voltage reaches Von value, it will delay for a period of time, and then start to work. It will increase by a step value at regular intervals. At the same time, detect and evaluate whether the input voltage of the electronic load is higher than the OPP voltage. If it is, go down and continue to delay increment according to the cut-off power value until it reaches the cut-off power. Judge by voltage value first, and then power value according to the set power value range.

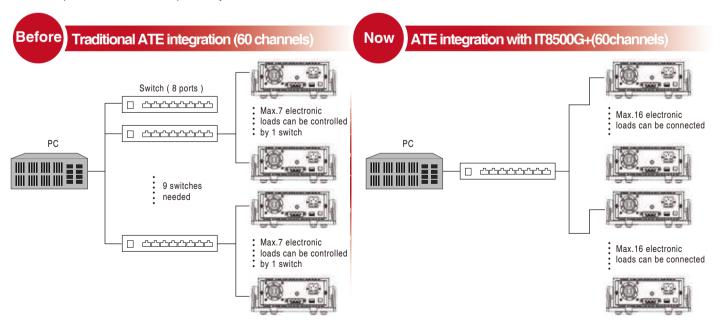
Remote measurement

In the CC/CV/CR/CP mode, when the electronic load consumes a large current, a large voltage drop will be generated on the connection line between the DUT and the load terminal. In order to keep the measurement accuracy, the electronic load provides a remote measurement terminal on the rear panel, and the user can use this terminal to measure the output terminal voltage of the DUT.



Multi-channel

The multi-channel mode of IT8500G+ is specially designed for optimizing system integration. Through this mode, it can easily build hardware platforms with dozens or even hundreds of channels. It simplifies communication connections. There is no need to purchase expensive communication modules or communication interface expansion cards (such as USB hub, multi-serial card or switch), which greatly saves test costs. The multi-channel mode of IT8500G+ allows up to 16 units connections. This means that only one communication line is required to connect to the PC for every 16 electronic loads. Let us take the 60-channel burn-in test as an example, if you use the multi-channel mode of IT8500G+, it can save the cost of 8 expansion switches, which presents you an more efficient ATE solution.



Traditional solution:To control 60 channels electronic loads, you need extra 9 switches.

Solution with IT8500G+: only 1 switch needed to control 60 channels electronic loads. With multi-channel commands, it can shorten communication time and improve system efficiency.

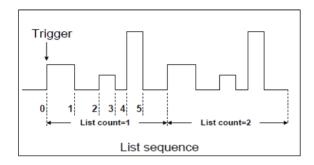


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LIST

List mode allows users to generate a complex current sequence. Moreover, the mode change can be synchronized with an internal or external signal, to accomplish dynamic and precise test which can save cost for users. Users can edit step value, pulse width and slope sequence and meet a complex test request. A list file includes following parameters: file name step counts (range 2-84), time width of single step (0.00005s-3600s), step value and slope. The edited list file

can be recalled easily. The DC load provides 7 nonvolatile registers to save list files setting for recall later. In the list mode, the load starts to run the list file once receiving a trigger signal, continue to run until end of the operation or receiving another trigger.

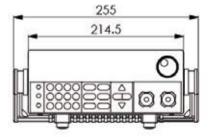


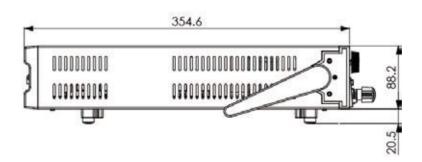
I Monitor and Measure

To make it easy to monitor the actual current waveform during the test, there is an I-monitor monitoring terminal on the rear panel of IT8500G+. With just an oscilloscope, no need to use expensive current probes, you can monitor the current waveforms. Through the I-Monitor terminal, the electronic load converts the 0-100% full-range current into an analog signal of 0-10V, which can be connected to the oscilloscope to display the real-time current waveform.

In addition, IT8500G+ also provides Measure function. It can guickly measure the voltage rise/fall time of the DUT's power modules. You only need to pre-program the start and end voltages. The measurement time of IT8500G+ is almost as good as that of an oscilloscope.

Dimension





IT8500G+ series Programmable DC Electronic Load

Specification

	Parameter	IT8511G+			
	Input Voltage	0~15	50V		
Rated	Input Current	0~3A	0~30A		
(0 ℃-40 ℃)	Input Power	150\	N		
	Mov	0.12V/3A	1.2V/30A		
	Range	0.1~18V	0.1~150V		
CV mode	Resolution	1mV	10mV		
	Accuracy	±(0.05%+0.02%FS)	±(0.05%+0.025%FS)		
	Range	0~3A	0~30A		
CC mode	Resolution	0.1mA	1mA		
	Accuracy	±(0.05%+0.05%FS)	±(0.05%+0.05%FS)		
	Range	0.05Ω ~ 10Ω	10Ω~7.5ΚΩ		
CR mode*1	Resolution	16b	oit .		
	Accuracy	0.01%+0.08S *2	0.01%+0.0008S		
	Range	150	W		
CP mode*3	Resolution	10mW			
	Accuracy	0.1%+0.2%FS			
		Dynamic mode			
		CC m			
	T1 &T2	20uS~3600S			
Dynamic mode	Accuracy	2uS±10	0ppm		
	Up/down slope*4	0.0001~0.2A/uS	0.001~1.5A/uS		
	Up/down slope*5	10uS	10uS		
		Measurin	g range		
	Range	0~18V	0~150V		
Voltage Readback	Resolution	0.1 mV	1 mV		
	Accuracy	±(0.025%+0.025%FS)	±(0.025%+0.025%FS)		
	Range	0~3A	0~30A		
Current Readback	Resolution	0.1mA	1mA		
	Accuracy	±(0.05%+0.05%FS)			
	Range	150	W		
Power Readback	Resolution	10mW			
	Accuracy	±(0.1%+0.2%FS)			
		Protected range			
OPP		≒16	0W		
OCP		≒3.3 A	≒33A		
OVP		≒15			
OTP		≒.85	i°C		
	·	Specific	eations		
	Current (CC)	≒3.3/3A	≒33/30A		
Short circuit	Voltage (CV)	≒0V	=:0V		
	Power (CR)	≔40mΩ	≔40mΩ		
nput terminal impedance	ionia (cit) ionia ioni				
Dimension	214.5mmW*88.2mmH*354.6mmD				
		214.5MMMV 88.2MMMT 354.0MMD			

*This information is subject to change without notice

^{*1} Voltage/current input value is not less than 10% FS (FS is full range)

^{*2} Range of resistance readback value: (1/(1/R+(1/R)*0.01%+0.08),1/(1/R-(1/R)*0.01%-0.08))

^{*3} Voltage/current input value is not less than 10%FS

^{*4} Rise/fall slope: 10%~90% current rise slope from 0 to maximum current

^{*5} Minimum rise time: 10%~90% current rise time

IT8500G+ series Programmable DC Electronic Load

Specification

	Parameter	IT8512G+				
	Input Voltage	0~15	50V			
Rated	Input Current	0~3A	0~30A			
0 ℃-40 ℃)	Input Power	300'	W			
	Mov	0.12V/3A	1.2V/30A			
CV mode	Range	0~18V	0~150V			
	Resolution	1mV	10mV			
	Accuracy	±(0.05%+0.02%FS)	±(0.05%+0.025%FS)			
	Range	0~3A	0~30A			
CC mode	Resolution	0.1mA	1mA			
	Accuracy	±(0.05%+0.05%FS)	±(0.05%+0.05%FS)			
	Range	$0.05\Omega\sim10\Omega$	10Ω~7.5ΚΩ			
R mode*1	Resolution	160	oit .			
	Accuracy	0.01%+0.08S *2	0.01%+0.0008S			
	Range	300				
P mode*3	Resolution	0.01W				
	Accuracy	0.1%+0.2%FS				
		Dynamic mode				
		CCm				
	T1 & T2					
Dynamic mode*4	T1 & T2 20uS~3600S /Res:1us Accuracy 2uS±100ppm					
yriamio mode 4	Up/down slope	0.0001~0.2A/uS	0.001~1.5A/uS			
	Up/down slope	10uS	10uS			
	Op/down slope	Measuring				
	Dongo	0∼18V	0~150V			
/alliana Danadharal	Range					
/oltage Readback	Resolution	0.1mV	1mV			
	Accuracy	±(0.025%+0.025%FS)	±(0.025%+0.025%FS)			
	Range	0~3A	0~30A			
Current Readback	Resolution	0.1mA	1mA			
	Accuracy	±(0.05%+0.05%FS)	±(0.05%+0.05%FS)			
	Range	300				
ower Readback*2	Resolution		0.01W			
	Accuracy ±(0.1%+0.2%FS)					
		Protecte	•			
OPP		≒32	0W			
OCP		≒3.3A	≒33 A			
OVP		≒16				
TP		≒85	SC			
		Specific	cations			
	Current (CC)	≒3.3A	≒33 A			
Short circuit	Voltage (CV)	≒0V	≔ 0V			
	Power (CR)	≔40mΩ	≒:40mΩ			
nput terminal impedance	= 250ΚΩ					
	214.5mmW*88.2mmH*354.6mmD					

*This information is subject to change without notice

Rise/fall slope: 10%~90% current rise slope from 0 to maximum current Minimum rise time: 10%~90% current rise time

^{*1} Voltage/current input value is not less than 10% FS (FS is full range)

^{*2} Range of resistance readback value: (1/(1/R+(1/R)*0.01%+0.08),1/(1/R-(1/R)*0.01%-0.08))

^{*3} Voltage/current input value is not less than 10%FS

^{*4} Loading current is not less than 4%FS_CCH

Your Power Testing Solution IT8500G+ series Programmable DC Electronic Load

Specification

	Parameter	IT85	i12BG+		
	Input Voltage	0~	600V		
Rated	Input Current	0~3A	0~15A		
0 ℃-40 ℃)	Input Power	30	00W		
	Mov	0.6V/3A	3V/15A		
	Range	0~60V	0~600V		
CV mode	Resolution	1mV	10mV		
	Accuracy	±(0.05%+0.02%FS)	±(0.05%+0.025%FS)		
	Range	0~3A	0~15A		
CC mode	Resolution	0.1mA	1mA		
	Accuracy	±(0.05%+0.05%FS)	±(0.05%+0.05%FS)		
	Range	$0.05\Omega\sim10\Omega$	10Ω~7.5ΚΩ		
R mode*1	Resolution	1	6bit		
	Accuracy	0.01%+0.08\$ *2	0.01%+0.0008S		
	Range	30	00W		
CP mode*3	Resolution	0.01W			
	Accuracy	0.1%+	-0.2%FS		
		Dynamic mode			
		CC	mode		
	T1 & T2		00S /Res:1us		
ynamic mode*4	Accuracy	2uS±	100ppm		
•	Up/down slope	0.0001~0.2A/uS	0.001~0.8A/uS		
	Up/down slope	10uS	10uS		
	op. actim. crops		ing range		
	Range	0~60V	0~600V		
oltage Readback	Resolution	1mV	10mV		
g	Accuracy	±(0.025%+0.025%FS)	±(0.025%+0.025%FS)		
	Range	0~3A	0~15A		
Current Readback	Resolution	0.1mA	1mA		
Juli et it i teauback	Accuracy	±(0.05%+0.05%FS)	±(0.05%+0.05%FS)		
	Range	,	00W		
ower Readback*2	Resolution		01W		
	Accuracy		±(0.1%+0.2%FS)		
	Protected range				
)PP			320W		
DCP					
OVP		≒3.3A ≒16A			
OTP	=630V =-85 ℃				
711					
	O		ifications — 16A		
Maria at at an its	Current (CC)	≒3.3A 	≒16A : 0V		
Short circuit	Voltage (CV)	≒0V	≒0V : 400mΩ		
	Power (CR)	≒188mΩ	≒188mΩ		
nput terminal impedance	$= 800$ K Ω				
Dimension	214.5mmW*88.2mmH*354.6mmD				

*This information is subject to change without notice

Rise/fall slope: 10%~90% current rise slope from 0 to maximum current Minimum rise time: 10%~90% current rise time

^{*1} Voltage/current input value is not less than 10% FS (FS is full range)

^{*2} Range of resistance readback value: (1/(1/R+(1/R)*0.01%+0.08),1/(1/R-(1/R)*0.01%-0.08))

^{*3} Voltage/current input value is not less than 10%FS

^{*4} Loading current is not less than 4%FS_CCH

IT8500G+ series Programmable DC Electronic Load

Specification

	Parameter	IT8	513G+			
	Input Voltage	0~	150V			
Rated	Input Current	0~12A	0~120A			
(0 ℃-40 ℃)	Input Power	60	noW			
	Mov	0.2V/12A	2V/120A			
	Range	0~18V	0~150V			
CV mode	Resolution	1mV	10mV			
	Accuracy	±(0.05%+0.02%FS)	±(0.05%+0.025%FS)			
	Range	0~12A	0~120A			
CC mode	Resolution	1mA	10mA			
	Accuracy	±(0.05%+0.05%FS)	±(0.05%+0.05%FS)			
	Range	0.05Ω~10Ω	10Ω~7.5ΚΩ			
CR mode*1	Resolution	1	6bit			
	Accuracy	0.01%+0.08\$ *2	0.01%+0.0008\$			
	Range	60	00W			
CP mode*3	Resolution	0.01W				
	Accuracy	0.2%+0.2%FS				
	,	Dynam	nic mode			
			mode			
	T1 & T2		20uS~3600S /Res:1us			
Dynamic mode*4	Accuracy	2uS±100ppm				
•	Up/down slope	0.001~0.2A/uS	0.01~1.6A/uS			
	Up/down slope	10uS	10uS			
	органия виде		ing range			
	Range	0~18V	0~150V			
Voltage Readback	Resolution	0.1mV	1mV			
	Accuracy	±(0.025%+0.025%FS)	±(0.025%+0.025%FS)			
	Range	0~12A	0~120A			
Current Readback	Resolution	1mA	10mA			
Julient Headback	Accuracy	±(0.05%+0.05%FS)	±(0.05%+0.05%FS)			
	Range	· ,	00W			
Power Readback*2	Resolution 0.01W					
	Accuracy ±(0.2%+0.2%FS)					
	Protected range					
OPP			620W			
OCP		≒13A	≒130A			
OVP						
OTP	≒160V ≒85°C					
~··	Specifications					
	Current (CC)					
Ole and refined the	Current (CC)	≒13A ≒0V	≒130A ≒0V			
Short circuit	Voltage (CV)					
	Power (CR)	\rightleftharpoons 15m Ω	≒15mΩ			
nput terminal impedance	⇒ 250KΩ					
Dimension	214.5mmW*88.2mmH*354.6mmD					

*This information is subject to change without notice

Rise/fall slope: 10%~90% current rise slope from 0 to maximum current Minimum rise time: 10%~90% current rise time

^{*1} Voltage/current input value is not less than 10% FS (FS is full range)

^{*2} Range of resistance readback value: (1/(1/R+(1/R)*0.01%+0.08),1/(1/R-(1/R)*0.01%-0.08))

^{*3} Voltage/current input value is not less than 10%FS

^{*4} Loading current is not less than 4%FS_CCH

Your Power Testing Solution IT8500G+ series Programmable DC Electronic Load

Specification

	Parameter	IT851	3BG+	IT8513CG+		
	Input Voltage	0~60	00V	0~40V		
Rated	Input Current	0~3A			0~200A	
0 ℃-40 ℃)	Input Power	600	W	600	W	
	Mov	0.4V/3A	2.4V/20A	0.06V/20A	0.6V/200A	
	Range	0~60V	0~600V	0~4V	0~40V	
CV mode	Resolution	1mV	10mV	0.1mV	1mV	
	Accuracy	±(0.05%+0.02%FS)	±(0.05%+0.025%FS)	±(0.05%+0.1%FS)	±(0.05%+0.15%FS)	
	Range	0~3A	0~20A	0~20A	0~200A	
CC mode	Resolution	0.1mA	1mA	1mA	10mA	
	Accuracy	±(0.05%+0.05%FS)	±(0.05%+0.05%FS)	±(0.1%+0.1%FS)	±(0.1%+0.15%FS)	
	Range	0.05Ω~10Ω	10Ω~7.5KΩ	0.01Ω~10Ω	10Ω~200Ω	
CR mode*1	Resolution	16	bit	16	3bit	
	Accuracy	0.01%+0.08S *2	0.01%+0.0008\$	0.01%+0.08S *2	0.01%+0.0008\$	
	Range	600	DW .	60	0W	
CP mode*3	Resolution	0.0	1W	0.01W		
	Accuracy	0.2%+0).2%FS	0.2%+0.5%FS		
			Dynam	ic mode		
		CC ħ		CC 模式		
	T1 & T2	20uS~3600	S /Res:1us	20uS~3600S /Res:1us		
ynamic mode*4	Accuracy	2uS±1	00ppm	2uS±100ppm		
	Up/down slope	0.0001~0.2A/uS	0.001~0.8A/uS	0.001~0.2A/us	0.01~1A/us	
	Up/down slope	10uS	10uS	10uS	10uS	
			Measuri	ng range		
	Range	0~60V	0~600V	0~4V	0~40V	
oltage Readback	Resolution	1mV	10mV	0.1mV	1mV	
	Accuracy	±(0.025%+0.025%FS)	±(0.025%+0.025%FS)	±(0.025%+0.1%FS)	±(0.025%+0.1%FS)	
	Range	0~3A	0~20A	0~20A	0~200A	
Current Readback	Resolution	0.1mA	1mA	1mA	10mA	
	Accuracy	±(0.05%+0.05%FS)	±(0.05%+0.05%FS)	±(0.1%+0.1%FS)	±(0.1%+0.1%FS)	
	Range	600)W	600W		
ower Readback*2	Resolution	0.0	1W	0.01W		
	Accuracy	±(0.2%+	0.2%FS)	±(0.2%+0.5%FS)		
			Protect	ed range		
)PP		≒62	0W	≒620W		
DCP		≒3.3A	=21A	≒21A	≑210A	
OVP		÷630V			4V	
OTP		≒85		≒8		
			Speci	fications		
	Current (CC)	≒ 3.3A	≑21A	≒ 21A	≒ 210A	
Short circuit	Voltage (CV)	⇒0V	⇒0V	⇒0V	÷0V	
J. J. Collocate	Power (CR)	≒120mΩ	≒120mΩ	≒3mΩ	≒3mΩ	
nput terminal impedance	÷ 800KΩ			÷ 90KΩ		
ipat torrilliai irripodalio	214.5mmW*88.2mmH*354.6mmD			214.5mmW*88.2mmH*354.6mmD		

*This information is subject to change without notice

Rise/fall slope: 10%~90% current rise slope from 0 to maximum current

Minimum rise time: 10%~90% current rise time

^{*1} Voltage/current input value is not less than 10% FS (FS is full range)

^{*2} Range of resistance readback value: (1/(1/R+(1/R)*0.01%+0.08),1/(1/R-(1/R)*0.01%-0.08))

^{*3} Voltage/current input value is not less than 10%FS

^{*4} Loading current is not less than 4%FS_CCH



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

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