

PROGRAMMABLE DC ELECTRONIC LOAD MODEL 6310A SERIES

The Chroma 6310A series Programmable DC Electronic Load is ideal for the test and evaluation of multi-output AC/DC power supplies, DC/ DC converters, chargers and power electronic components. It is designed for applications in research and development, production, and incoming inspection. The system is configured by plugging the user selectable load modules into the system mainframe. The user interfaces include an ergonomically designed user friendly keypad on the front panel and the following computer interfaces: RS-232C, USB or GPIB.

The 6310A series offers 12 different modules with power ratings from 20 watts to 1,200 watts, current ratings from 0.5mA to 240A, and voltage ratings from 0.5mV to 600V. The loads can be operated in constant current, constant voltage, constant power and constant resistance and may be placed in parallel for increased current and power.

The 6310A series can simulate a wide range of dynamic loading applications. The waveforms

programmable parameters include: slew rate, load level, duration and conducting voltage. In addition, up to 100 sets of system operating status can be stored in EEPROM and recalled instantly for automated testing applications.

Real time measurement of voltage and current are integrated into each 6310A load module using a 16-bit precision measurement circuit. The user can perform on line voltage measurements and adjustments or simulate short circuit test using the user friendly keypad on the front panel. Additionally, the 6310A series offers an optional remote controller for automated production lines.

The 6310A series has a self-diagnosis routines to maintain instrument performance. It also provides OC, OP, OT protection, and alarm indicating OV, reverse polarity to guarantee quality and reliability for even in the most demanding engineering testing and ATE applications.



Programmable DC Electronic Load

MODEL 6310A SERIES

Key Features:

- Max Power: 200W, 100W × 2(Dual),
 30W & 250W, 300W, 350W, 600W, 1200W
- Wide range 0~600V operating voltage
- Compatibility between 6310 and 6310A
- Up to eight channels in one mainframe, for testing multiple output SMPS
- Parallel load modules up to 1400W for high current and power applications
- Synchronization with multiple loads
- Flexible CC, CR, CP and CV operation modes
- Dynamic loading with speeds up to 20kHz
- Fast response of 0.32mA/µs ~ 10A/µs slew rate
- Minimum input resistance allows load to sink high current at low voltage (63123A : 0.6V@70A)
- Real time power supply load transient response simulation and output measurements
- User programmable 100 sequences. Front panel input status for user-friendly operation
- High/Low limits of testing parameters to test GO/NG
- Digital I/O control
- Over current protection (OCP) testing function
- 16-bit precision voltage and current measurement with dual-range
- Remote sensing capability
- Short circuit test
- Self-test at power-on
- Full Protection: OC, OP, OT protection and OV, reverse alarm
- USB, GPIB & RS-232C interfaces

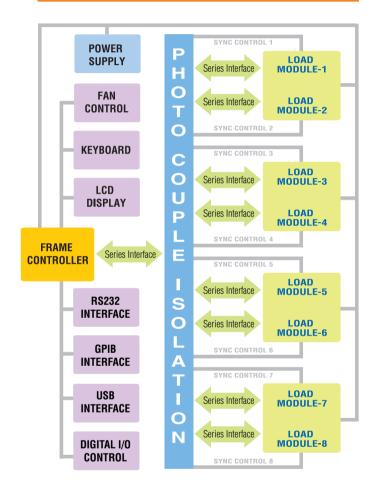


Chroma

VERSATILE SYSTEM CONFIGURATION

Chroma 6310A Programmable Electronic Load integrates microprocessor capabilities into each load module and mainframe to provide simple and accurate parallel operation to optimize the speed and control among multiple load modules. All load modules may be configured to work synchronously, to test multiple outputs simultaneously, thus simulating real life applications.

6310A System Block Diagram



COMPATIBILITY WITH 6310 SERIES

The 6310A series load modules will be compatible with the 6310 series mainframes (6312/6314). In addition, the remote control commands will be compatible between the 6310 and the 6310A series without needing to re-writing any remote control programs.

MODULE LOAD DESIGN

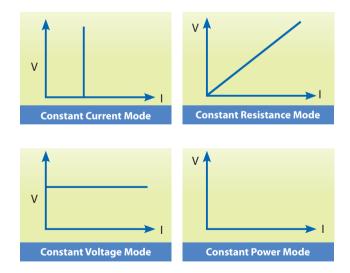
The Chroma 6314A 1400W and 6312A 700W electronic load mainframes accept the user-installable 6310A series load modules for easy system configuration and will mount in a 19" instrument rack. The 6314A holds up to four 63102A load modules, which will result in an

8-channel 100W/channel load with standard front-panel inputs. This makes it ideal for testing multiple output switching power supplies and multiple DC-DC converters. There are also higher wattage modules that may be mixed and matched for an even more versatile system. Additionally, the GO/NG output port is useful for UUT's pass/fail testing on an automated production line. All modules on the 6314A/6312A mainframe share a common GPIB address to synchronize and speed up the control of the load modules and the read-back of data.



APPLICATION OF SPECIFIC LOAD SIMULATION

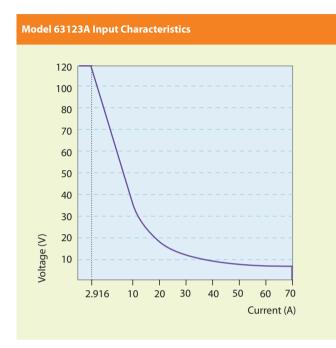
The 6310A load modules operate in constant current, constant voltage, constant power or constant resistance to satisfy a wide range of test requirements. For example, the test of a battery charger can be simulated easily by setting the load to operate in constant voltage.



Each load module is designed with state-of-the-art technology and connects all the power MOSFET devices in parallel to insure high accuracy load control with a minimum drift of less than 0.1%+0.1%F.S. of the current setting. Chroma's use of FET technology provides minimum input resistance and enables the load to sink high current even at very low voltages. For example, the model 63123A is capable

of sinking 70A at 0.6V, and well-suited for testing the new 3.3V low voltage power supplies. Low voltage operation, down to zero volts, is possible at reduced current levels.

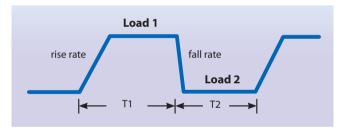
The 6310A load module uses a photo coupler for isolation between the output and control sections, thus each load is isolated and floating. The user can use multiple load modules independently to test multi-output power supplies, or parallel them for high power testing applications.



DYNAMIC LOADING AND CONTROL

Modern electronic devices operate at very high speeds and require fast dynamic operation of their power providing components. To satisfy these testing applications, the 6310A loads offer high speed, programmable dynamic load simulation and control capability. The figure aside shows the programmable parameters of the 6310A modules: Low Voltage Characteristics (Typical) Model 63101A/63102A/63103A/63106A/63112A/63123A

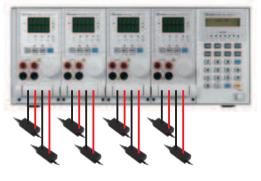




The programmable slew rate makes the simulation of transient load change demanded by real life applications possible. The 6310A internal waveform generator is capable of producing a maximum slew rate at 10A/µs, and dynamic cycling up to 20kHz. It's dedicated remote load sense and control circuit guarantee minimum waveform distortion during continuous load changes.

MULTI-CHANNEL CONTROL

The 6310A comes with RS-232C as standard for remote control and automated testing applications. The USB and GPIB interfaces are available as options. In addition, the 6310A provides an efficient solution for testing single output AC to DC or DC to DC converters by controlling multiple loads. The 6310A provides the capability to test up to 8 UUTs at a time.



UUT : Adaptor

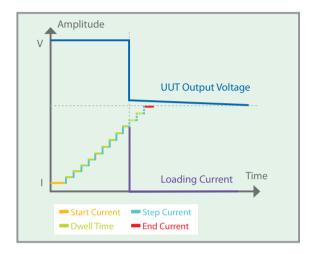
POWERFUL MEASUREMENTS

Each 6310A load module has an integrated 16-bit precision A/D converter for voltage measurement with an accuracy of 0.025%+0.015%^{*} of full scale. The built-in resistive load current sensing circuit is capable of measuring current with an accuracy of 0.04%+0.04%^{*} of full scale. Apart from voltage and current measurement, 6310A also provides power measurement function and there is no need for users to spend time for power calculation. Also, short circuit can be simulated. All measurements are done using remote sensing to eliminate any error due to voltage drops along the measurement path. The user can also select from a complete set of voltage and current measurements. Note *: Only for Model 63123A

OCP TEST

Modern switching power supplies are designed with over current protection (OCP) circuitry; therefore, it is important to test the OCP circuitry to make sure it is functioning within its designed specifications. The 6310A series provides an easy and fast solution for this testing.

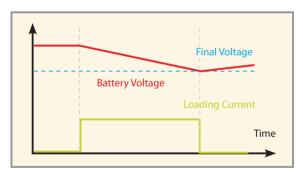
By simply choosing the channel and setting the OCP parameters (start current, end current, step current and dwell time) from the front panel, the 6310A series provides a fast and easy OCP testing solution. The 6310A series will automatically detect the OCP point, making it an ideal solution for design verification as well as production line testing.



TIMING FUNCTION

The 6310A series of loads include a unique timing & measurement function, which allows precise time measurements in the range of 1ms to 86,400s. This feature allows the user to set the final voltage & timeout values for battery discharge testing, super capacitor discharge, and other similar applications.

For example, the figure on the right shows the 6310A internal timer starting at Load ON, and ending when the battery voltage reaches the final voltage.



Battery Discharge Testing

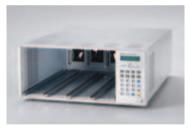
DIGITAL I/O

The digital I/O interface makes the 6310A DC Load the ideal choice for automated testing requirements. Through the digital I/O, the 6310A can accept digital signals to trigger its functions (Load On/Off, OCP test, etc.) as well as current output status signals.

Pin	Definition		
Pin 1	Reserved	Pin 9	Short Signal (O/P)
Pin 2	DGND	Pin 10	Protection Signal (O/P)
Pin 3	DGND	Pin 11	External Load ON/OFF (I/P)
Pin 4	DGND	Pin 12	Reserved
Pin 5	DGND	Pin 13	Reserved
Pin 6	Load ON/OFF (O/P)	Pin 14	DGND
Pin 7	Total Pass (O/P)	Dim 15	External Trig.
Pin 8	Total Fail (O/P)	Pin 15	For Sequences Run (I/P)

6310A SERIES PROGRAMMABLE DC ELECTRONIC LOAD FAMILY





6314A: 4 in 1 Mainframe



6312A: 2 in 1 Mainframe

A631001:

Remote Controller



A631003 : USB Interface

Mainframe Model	6312A	6314A		
Number of slots	2	4		
Operating Temperature	0~40°C	0~40°C		
Input Rating	1Ø 100/200Vac ± 10% V _{LN} , 47~63Hz ; 1Ø 115/230Vac ± 10% V _{LN} , 47~63Hz	1Ø 100/200Vac \pm 10% V $_{\tiny LN}$ 47~63Hz ; 1Ø 115/230Vac \pm 10% V $_{\tiny LL}$ 47~63Hz		
Dimensions (HxWxD)	194x275x550mm / 7.6x10.8x21.7inch	194x439x550mm / 7.6x17.3x21.7inch		
Weight	15 kg / 33.1 lbs	21.5 kg / 47.4 lbs		

LED LOAD SIMULATOR

As a constant current source, the LED power driver has an output voltage range with a constant output current. LED power drivers are usually tested in one of the following ways : 1. With LEDs

2. Using resistors for loading

3. Using Electronic Loads in Constant Resistance (CR) mode, or Constant Voltage (CV) mode However, all these testing methods, each of them has their own disadvantages.



As shown on the V-I curve in Figure 1, the LED has a forward voltage VF and a operating resistance (Rd). When using a resistor as loading, the V-I curve of the resistor is not able

to simulate the V-I curve of the LED as shown in blue on Figure 1. This may cause the LED power driver to not start up due to the difference in V-I characteristic between the resistors and the LEDs. When using Electronic Loads, the CR and CV mode settings are set for when the LED is under stable operation and therefore, is unable to simulate turn on or PWM brightness control characteristics. This may cause the LED power driver to function improperly or trigger it's protection circuits. These testing requirements can be achieved when using a LEDs as a load; however, issues regarding the LED aging as well as different LED power drivers may require different types of LEDs or a number of LEDs. This makes it inconvenient for mass production testing.

Chroma has created the industries first LED Load Simulator for simulating LED loading with our 63110A load model from our 6310A series Electronic Loads. By setting the LED power driver's output voltage, and current, the Electronic Load can simulate the LED's loading characteristics. The LED's forward voltage and operating resistance can also be set to further adjust the loading current and ripple current to better simulate LED characteristics. The 63110A design also has increased bandwidth to allow for PWM dimming testing.

Figure 4 shows the dimming current waveform of the LED.

Figure 5 shows the dimming current waveform when using 63110A as a load.

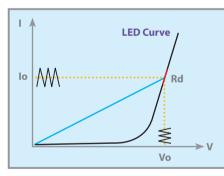


Figure 1 - LED V-I characteristics

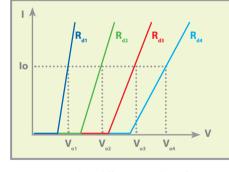


Figure 2 - Simulate different number of LEDs

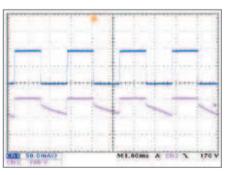


Figure 4 - LED dimming test

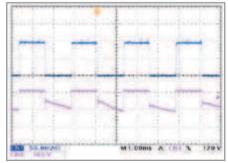


Figure 5 - 63110A dimming test

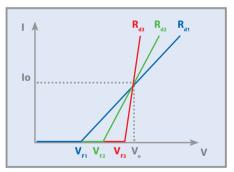


Figure 3 - Simulate different characteristic of LEDs

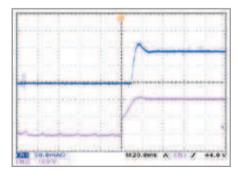
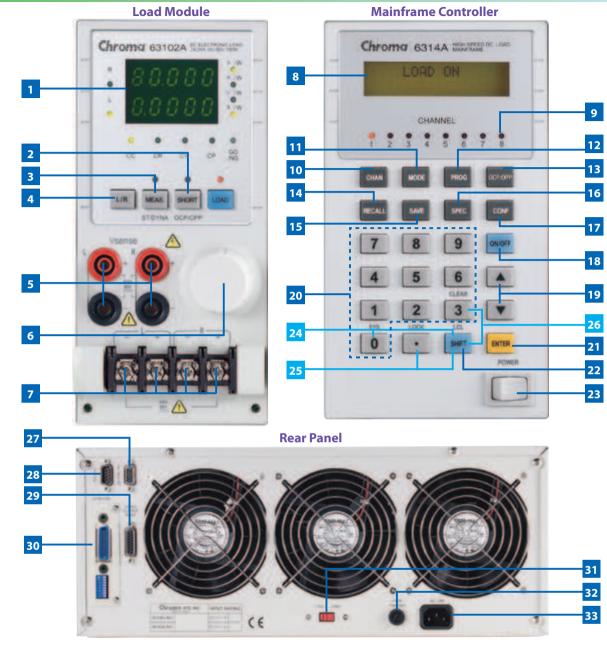


Figure 6 - LED driver turn-on waveform

PANEL DESCRIPTION



1 LED indicator

- 2 SHORT key: To apply a short circuit across the input
- 3 STATIC/DYNA key: To select static or dynamic test mode
- 4 L/R key : To select left or right channel of input load(63102A, 63107A)
 A/B key : To select static A or B load (other models)
- 5 V terminal : To measure the UUT's output voltage using remote sense
- 6 Rotary knob : To adjust load setting continuously
- 7 Load terminal
- 8 LCD display
- 9 LED indicator : To display the channel at which load is set
- 10 CHAN key: To select input load channel
- **11 MODE key :** To select the operation mode of CC, CR, CV or CP
- 12 PROG key : For program data setting
- **13 OCP/OPP key :** Over current protection/Over power protection testing
- **14 RECALL key :** To recall the front panel input status from memory
- **15 SAVE key :** To save the front panel input status into memory
- 16 SPEC key : To set up High/Low limits for GO/NG test
- 17 CONF key: To set the configuration

- 18 ON/OFF key: To enable or disable the load input
- 19 Up/Down key : To select the next or previous display in edit mode
- 20 Numeric key : For data setting
- 21 ENTER key : To confirm editing data on the instrument
- 22 SHIFT key : As LOCAL key when in remote mode
- 23 Power switch
- 24 SHIFT + 0 key: System function
- 25 SHIFT + . key : Lock function
- 26 SHIFT + 3 key : Clear the currently edited data
- 27 Digital I/O : Used for system input/output control signals
- 28 RS-232C connector
- 29 GO/NG output port
- **30** GPIB or USB slot
- 31 AC input voltage switch
- 32 AC input fuse
- 33 AC input connector

SPECIFICATIONS-LED LOAD SIMULATOR

Model	63110A (100Wx2)		631	13A	63115A *3			
Power		ow		oW	300W			
Current	0~0.6A 0~2A		0~5A	0~20A	0~5A	0~20A		
Voltage *1		00V		00V		600V		
Min. Operating Voltage 6V@2A			20A	1	20A			
Constant Current Mode		^y 2R	476	207	476	208		
Range	- 0~0.6A	0~2A	0~5A	0~20A	0~5A	0~20A		
Resolution	12µA	40μA	100µA	400µA	100µA	400µA		
	· · · · · · · · · · · · · · · · · · ·	40μΑ).1% F.S.	0.1%+0.1% F.S.	0.1%+0.2% F.S.	0.1%+0.1% F.S.	0.1%+0.2% F.S.		
Accuracy Constant Resistance M		Л. 1 % Г.З.	0.1%+0.1% F.S.	0.1%+0.2% F.S.	0.1%+0.1% F.S.	0.1%+0.2% F.S.		
Constant Resistance M	ode			$200 \cap (200) M/(60) M$		$200 \cap (200 W/60 V)$		
Danga	CRL:3Ω~1kΩ	2 (100W/100V)	CRL @ CH : 0.2 Ω ~200 Ω (300W/60V) CRL @ CL : 0.8 Ω ~800 Ω (300W/60V)		CRL @ CH : $0.2 \Omega \sim 200 \Omega$ (300W/60V) CRL @ CL : $0.8 \Omega \sim 800 \Omega$ (300W/60V)			
Range	CRH:10Ω~10k	Ω (100W/500V)		kΩ (300W/300V)				
					CRH @ CL : 8 Ω ~8k Ω (300W/600V) CRL @ CH :100μS			
	CRL : 6	52.5µS		Η:100μS	-			
Resolution*2		6.25µS		CL:25μS		CL:25μS		
		-	CRH @	CL : 5µS	CRH @ C	CL : 2.5μS		
Accuracy		nS+0.2%	0.2% (setti	ng + range)	0.2% (setti	ng + range)		
		mS+0.1%	012 /0 (5000	.9	01270 (5000	0.2% (setting + range)		
Constant Voltage Mod			I					
Range		V00V		00V		500V		
Resolution	20mV		бr	nV	12	mV		
Accuracy	0.05% + 0.1%F.S.		0.05% +	0.1%F.S.	0.05% +	0.1%F.S.		
LED Mode								
			Operating Voltag	e:0~60V/0~300V	Operating Voltage : 0~60V/0~600V			
	Operating Voltage: 0~100V/0~500V		R _d Coefficie	nt:0.001~1	R₄ Coefficient : 0.001~1			
Damas	R_d Coefficient : 0.001~1		V _F : 0~60'	V/0~300V	V _F :0~60V/0~600V			
Range	V _F : 0~100V/0~500V Current : 0~2A		LEDL @ CH : 0~60V- 0-	~20A (R _d : 0.05 Ω ~50 Ω)	LEDL @ CH : 0~60V- 0~20A (R _d : 0.05 Ω ~50 Ω			
				~5A (R _d : 0.8 Ω ~800 Ω)	LEDL @ CL : 0~60V- 0	~5A (R _d : 0.8Ω~800Ω)		
	$R_d: 1 \Omega \sim 1 K \Omega$	/10Ω~10kΩ		$-0\sim5A(R_d:4\Omega\sim4k\Omega)$		$-0 \sim 5A(R_d: 8\Omega \sim 8k\Omega)$		
	Vo : 4mV/20mV			mV/6mV		nV/12mV		
		.1mA		A/400µA	lo : 100u	A/400µA		
Resolution *2	R _d Coefficient : 0.001		· ·	ent : 0.001	· ·	ent: 0.001		
	R₄: 62.5µS/6.25µS		R _d : 400μS / 25μS / 5μS		R _d : 400µS/25mS/2.5mS			
	V _F :4mV/20mV		$V_{\rm F}$: 1.2mV/ 6mV			// 60mV		
Dynamic Mode	ve	720111	VF. 1.21		VF. OIII			
Dynamic Mode				Node		Node		
			0.025ms ~ 50ms / Res: 5µs		0.025ms ~ 50ms / Res: 5µs			
T1 & T2			0.1ms ~ 500ms / Res: 25µs		0.1ms ~ 500ms / Res: 25µs			
11012			10ms ~ 50s / Res: 2.5ms		10ms ~ 50s / Res: 25µs			
Accuracy			1µs/1ms+100ppm		10ms ~ 50s / Kes: 2.5ms 1μs/1ms+100ppm			
Accuracy Slew Rate				-100ppm 3.2~800mA/µs				
			0.8~200mA/µs		0.8~200mA/µs	3.2~800mA/µs		
Resolution			0.8mA/µs 3.2mA/µs		0.8mA/µs 3.2mA/µs			
Accuracy			10% ±20µs		<u>10% ±20μs</u>			
Min. Rise Time		-	25µs (Typical)		25µs (Typical)			
Current			0~5A	0~20A	0~5A	0~20A		
Resolution			100µA 400µA		100μΑ 400μΑ			
Accuracy	-	-	0.4%F.S.		0.4%F.S.			
Measurement Section								
Voltage Read Back								
Range	0~100V	0~500V	0~60V	0~300V	0~60V	0~600V		
Resolution	2mV	10mV	1.2mV	6mV	1.2mV	12mV		
Accuracy	0.025%+0	.025% F.S.	0.025%+0	0.025% F.S.	0.025%+0	0.025% F.S.		
Current Read Back								
Range	0~0.6A	0~2A	0~5A	0~20A	0~5A	0~20A		
Resolution	12µA	40µA	100µA	400µA	100µA	400µA		
Accuracy		0.05% F.S.		0.05% F.S.	· · ·	0.05% F.S.		
Accuracy	0.05%+0	.05701.5.	0.05%+0	.0.5 /0 1.5.	0.05%+0	.0.5701.5.		

NOTE*1: If the operating voltage exceeds 1.1 times of the rated voltage, it would cause permanent damage to the device.

NOTE*2: S (siemens) is the SI unit of conductance, equal to one reciprocal ohm.

NOTE*3 : Call for availability

SPECIFICATIONS-1

Model	63101A		63102A (100Wx2)	63103A		
Power	20W 200W		20W 100W		30W 300W		
Current	0~4A	0~40A	0~2A	0~20A	0~6A	0~60A	
Voltage *3		30V		80V	0~80V		
Typical Min. Operation Voltage	0.4V@2A	0.4V@20A	0.4V@1A	0.4V@10A	0.4V@3A	0.4V@30A	
(DC)*1	0.8V@4A	0.8V@40A	0.8V@2A	0.8V@20A	0.8V@6A	0.8V@60A	
Constant Current Mode	0.07@477	0.01@10/1	0.07@277	0.01@2011	0.07@077	0.07@0077	
Range	0~4A	0~40A	0~2A	0~20A	0~6A	0~60A	
Resolution	1mA 10mA		0.5mA	5mA	1.5mA	15mA	
Accuracy	0.1%+0.1%F.S.	0.1%+0.2%F.S.	0.1%+0.1%F.S.	0.1%+0.2%F.S.	0.1%+0.1%F.S.	0.1%+0.2%F.S.	
Constant Resistance Mode	0.170+0.1701.3.	0.170+0.2701.3.	0.170+0.1701.3.	0.170+0.2701.3.	0.170+0.1701.3.	0.170+0.2701.3.	
constant resistance mode	0.0375Ω~150Ω (200W/16V)		0.075Ω~300Ω (100W/16V)		0.025Ω~100Ω (300W/16V)		
Range	1.875Ω~7.5k	· · · ·		2 (100W/80V)		· /	
		2 (200W/80V) 200W/16V)		(1.25Ω~5kΩ (300W/80V) 10mS (300W/16V)		
Resolution*5		00W/80V)	3.333mS (100W/16V) 66.667µS (100W/80V)		200µS (300W/80V)		
	150Ω: 0.		300Ω: 0.1S + 0.2%		<u>200μ3 (50</u> 100Ω: 0.7		
Accuracy	7.5kΩ: 0.0		300Ω : 0.15 + 0.2% 15k Ω : 0.015 + 0.1%		5kΩ: 0.0		
Constant Valtara Mada	7.5K52: 0.0	115 + 0.1%	ISK\$2: 0.0	/15 + 0.1%	5K32: 0.0	15+ 0.1%	
Constant Voltage Mode	0.0		0.1	201/	0.0		
Range		30V		80V	0~8		
Resolution	20		-	mV	201		
Accuracy	0.05% +	0.1%F.S.	0.05% +	0.1%F.S.	0.05% +	0.1%F.S.	
Constant Power Mode	0.0011	0.00011	0.0011	0.40014	0.2011	0.00011	
Range	0~20W	0~200W	0~20W	0~100W	0~30W	0~300W	
Resolution	5mW	50mW	5mW	25mW	7.5mW	75mW	
Accuracy	0.5% + 0	0.5%F.S.	0.5% +	0.5%F.S.	0.5% + 0).5%F.S.	
Dynamic Mode							
Dynamic Mode	C.C. I			Node	C.C. Mode		
	0.025ms ~ 50	ms / Res: 5µs	0.025ms ~ 50)ms / Res: 5µs	0.025ms ~ 50ms / Res: 5µs		
T1 & T2	0.1ms ~ 500ms / Res: 25µs		0.1ms ~ 500r	ns / Res: 25µs	0.1ms ~ 500ms / Res: 25µs		
	10ms ~ 50s / Res: 2.5ms		10ms ~ 50s	/ Res: 2.5ms	10ms ~ 50s / Res: 2.5ms		
Accuracy	1µs/1ms-	-100ppm	1µs/1ms-	+100ppm	1µs/1ms+100ppm		
Slew Rate	0.64~160mA/µs	6.4~1600mA/µs	0.32~80mA/µs 3.2~800mA/µs		0.001~0.25A/µs	0.01~2.5A/µs	
Resolution	0.64mA/µs	6.4mA/µs	0.32mA/µs	3.2mA/µs	0.001A/µs	0.01A/µs	
Accuracy	10% =	±20μs	10% :	10% ±20μs		10% ±20µs	
Min. Rise Time	10µs (1	ypical)	10μs (Typical)		10µs (T		
Current	0~4A	0~40A	0~2A 0~20A		0~6A	0~60A	
Resolution	1mA	10mA	0.5mA	5mA	1.5mA	15mA	
Accuracy	0.4%	6F.S.	0.49	6F.S.	0.4%	bF.S.	
Measurement Section					·		
Voltage Read Back							
Range	0~16V	0~80V	0~16V	0~80V	0~16V	0~80V	
Resolution	0.25mV	1.25mV	0.25mV	1.25mV	0.25mV	1.25mV	
Accuracy	0.025% + 0	0.025%F.S.	0.025% + 0.025%F.S.		0.025% + 0).025%F.S.	
Current Read Back	0.02570 + 0.025701.5.						
Range	0~4A	0~40A	0~2A	0~20A	0~6A	0~60A	
Resolution	0.0625mA	0.625mA	0.03125mA	0.3125mA	0.09375mA	0.9375mA	
Accuracy		0.05%F.S.	0.05% + 0.05%F.S.		0.05% + 0.05% F.S.		
Power Read Back*2	0.03 /01 0.05 /01.5.						
Range	0~20W	0~200W	0~20W	0~100W	0~30W	0~300W	
Accuracy	0.1% + 0		0.1% + 0.1%F.S.		0.1% + 0.1%F.S.		
Protective Section	0.170 1 0.1701.5.						
Over Power Protection	Y	20	Y	۵۵	Ve Ve	20	
Over Current Protection	Yes Yes		Yes Yes		Yes Yes		
Over Temperature Protection	Yes		Yes Yes		Yes		
Over Voltage Alarm*3	Yes		Yes Yes		Yes		
General	10	25	I	25	T t	25	
Short Circuit							
		- 404		- 204			
Current (CC)	-	=40A	-	≒20A	-	÷60A	
Voltage (CV)	-	0V	-	0V	-	0V	
Resistance (CR)	- = 0.0375		-	≒0.075Ω	-	≒0.025Ω	
Power (CP)	- ≒200W		- ≒100W		- ≒300W		
put Resistance 100kΩ (Typical)		100kΩ (Typical)		$100 \mathrm{k}\Omega$ (Typical)			
(Load Off)							
Temperature Coefficient		100PPM/°C (Typical)		100PPM/°C (Typical)		100PPM/°C (Typical)	
Power	Supply from 6314A Mainframe			Supply from 6314A Mainframe		Supply from 6314A Mainframe	
Dimensions (HxWxD)	172x82x489.5mm / 6.8x3.2x19.3inch		172x82x489.5mm / 6.8x3.2x19.3inch		172x82x489.5mm / 6.8x3.2x19.3inch		
Weight	4.2 kg /			9.3 lbs	4.2 kg / 9.3 lbs		
Operating Temperature Range	0~4			10°C	0~40°C		
EMC & Safety	C	E	0	E	CE		

Continued on next page —

SPECIFICATIONS-2

Prover 30W 30W 60W 60W 60W 30W 30W 250 Current 0-1A 0-100V 0-80V 0-80V 0-80V 0-80V 0-80V Spraid-Min. Operation 10/990.25A 10.9290.25A 0.4792.40 0.4792.5A 0.4792.40 <t< th=""><th>Model</th><th colspan="5">63105A 63106A 63107A</th><th>21074 (2</th><th>011 8. 250</th><th>14/)</th></t<>	Model	63105A 63106A 63107A					21074 (2	011 8. 250	14/)
Current 0~1A 0~0.1A 0~0.2A 0~3A 0~4A 0~4A Viblag*13 0.0×50V 0.4Vg66A 0.4Vg66A 0.4Vg67A 0.4Vg67A 0.4Vg7A 0.4Vg7A <th></th> <th colspan="2"></th> <th colspan="2"></th> <th colspan="3">63107A (30W & 250W)</th> <th>250W</th>						63107A (30W & 250W)			250W
Vallage*3 0 -500V 0-80V 0-80V 0-80V TypicxIMin. Openation 1.0% e0.2 A 0.4% e0.0 0.50 - 1.50 (1.0 0.0% e0.0 0.51 - 1.50 (1.0 0.0% e0.0 0.50 - 1.50 (1.0 0.0% e0.0 0.50 - 1.50 (1.0 0.0% e0.0 0.0 0.50 - 1.50 (1.0 0.0% e0.0 0.50 - 1.50 (1.0 0.0% e0.0 0.0 0.5									0~40A
Typical Mino Openation Towlep SA Towlep SA Towlep SA OdVige SA <thodvige sa<="" t<="" td=""><td></td><td>-</td><td></td><td></td><td></td><td>0~5A</td><td>1</td><td></td><td>0~40A</td></thodvige>		-				0~5A	1		0~40A
Valuegic DC1 ⁻¹ 2.0Ve1A 2.0Ve1A 0.8Ve1A 0.8Ve1A 0.8Ve3A	<u> </u>					0.41/02.54	1		0.41/0204
Constant Current Mode 0				-	-		1	-	0.4V@20A
Bange 0-1A 0-10A 0-12A 0-12MA 12mA 12mA 12mA 10mA 00mA Accuracy 0.1%+0.1%F.S. 0.1%+0.1%F.S. 0.1%+0.1%F.S. 0.1%+0.1%F.S. 0.1%+0.1%F.S. 0.1%+0.1%F.S. 0.1%+0.1%F.S. 0.1%+0.1%F.S. 0.1%+0.1%F.S. 0.1%F.S. 0.1%F.S. 0.1%F.S. 0.1%F.S. 0.1%F.S. 0.1%F.S. 0.1%F.S. 0.1%F.S. 0.1%F.S. 0.50.7-1.2K.C 300M/SV 1.6.5.7.5.K.C 0.50.7-1.2K.C 300KV 1.5.5.7.5.K.C 1.5.5.7.5.K.C 0.5.5.K.C 1.5.5.0.1%F.S. 0.5.5%F.S.			2.0V@10A	0.8V@12A	0.8V@120A	0.8V@5A	0.8	/@4A	0.8V@40A
Resolution 0.25mA 2.5mA 3mA 30mA 1.25mA 1mA 1mA 1mA Constant Resistance Mode 0.1%+0.1%FS. 0.032-1.2KG (30W/16V) 10.327-1.5GG (XOW/16V) 13.325 (30W/16V)							1	-	
Accuracy 0.1%+0.1%F.S. 0.1%F.C. 0.1%	3								0~40A
Constant Resistance Mode Constant Section 2000 Constant Volume	Resolution			-			1		10mA
Range 1.25D-36.0 (300W/125V) 1.25m D-90.0 (300W/16V) 9.3 D-1.26 (21 30W/16V) 0.3 D-1.26 (21 30W/16V) 0.3 D-2.36 (12 30W/16V) 1.3 D-0.5 (12 30W/16V) 1.5 D-0.5 (12 30W/16V)		· · · · · · · · · · · · · · · · · · ·		0.1%+0.1%F.S.	0.1%+0.2%F.S.	0.1%+0.1%F.S.	0.1%+	0.1%F.S.	0.1%+0.2%F.S.
	Constant Resistance M	lode							
Resolution*5 200/pS (300W/12SV) 20mS (G00W/16V) 833/pS (300W/16V) 667/pS (230W) Accuracy 256/pS (200% PA) 50/pS (200% PA) 12.67/pS (300% PA) 13.67/pS (200% PA) Resolution 0~500V 0~800V 0.258/pS (200% PA)	Range					. , , , ,		1	~150Ω (250W/16V) -7.5kΩ (250W/80V)
Accuracy SUC : OMS + 0.2% SUC : OMS + 0.0%	Resolution*5	200µS (300W/125V)							7μS (250W/16V)
CACUARCY 2.00k2:smS+ 0.1% 2.5k2:0.04S + 0.2% 60k0:0.01S + 0.1% 7.5k Ω:0.01S + 0.1% Range 0 - 500V 0 -80V 0 -20W 0 -20W <td></td> <td colspan="2"></td> <td colspan="2"></td> <td colspan="2">1 2k () + 0.15 + 0.20k 150 (250W)</td> <td></td>						1 2k () + 0.15 + 0.20k 150 (250W)			
Constant Voltage Mode 0=50/V 0=80/V 0=20/V	Accuracy								
Range 0 -80V 0 -80V 0 -80V 0 -80V 0 -80V 0 -30V 0.05% + 0.1%E. 0.05% + 0.5%E. 0.05% + 0.5%E. 0.05% + 0.5%E. 0.5%E + 0.5%E. 0.5%E + 0.5%E. 0.05% + 0.5%E. 0.025m - 50ms / Res: 5µS 0.045m / 5MS 0.045m	·		mS+0.1%	2.5K \2:0.0	045 + 0.2%	60k \2: 0.015 +	0.1%	7.5K	2:0.015 + 0.1%
Resolution 12 mV 20mV									
Accuracy 0.05% + 0.1%F.S. 0.05% + 0.1%F.S. 0.05% + 0.1%F.S. 0.05% + 0.5%F.S. 030W 040W 030W 040W	3								
Constain Power Mode O=30W O=30W O=30W O=60W O=60W O=30W O=30W<	Resolution	125	mV	20	mV		2	0mV	
Range 0~30W 0~60W 0~60W 0~30W 0~30W 0~30W 0~30W 0~30W 0<30W 0<20 Resolution 7.5mW 0.5% + 0.5% F.S. 0.05% + 0.5% F.S. 0.05% + 0.5% F.S. 0.05% + 0.5% F.S. 0.05% + 0.5% F.S. 0.025ms - 50ms / Res: 5µs 0.05% + 0.5% F.S. 0.025ms - 50ms / Res: 5µs 0.025% F.S. 0.025% F.S. 0.025% F.S. 0.025% F.S. 0.025% F.S. 0.025% F.S. 0.64 - F0m A/µs 6.4 - F0m A/µs <			0.1%F.S.	0.05% +	0.1%F.S.		0.05%	+ 0.1%F.S.	
Resolution 7.5mW 7.5mW 7.5mW 7.5mW 7.5mW 6.25 Accuracy 0.5% + 0.5% + 0.5% F.S. 5.5% F.S. <	Constant Power Mode								
Accuracy 0.5% + 0.5%F.S. 0.5% + 0.5%F.S. 0.5% + 0.5%F.S. Dynamic Mode C.C. Mode C.C. Mode C.C. Mode 0.025ms ~ 50ms / Res: 5µs 1 8 T2 0.1ms ~ 50mr / Res: 5µs Accuracy 1µs/1ms+100ppm 1µs/1ms+100ppm 1µs/1ms+100ppm 1µs/1ms+100ppm Slew Rate 0.16~40mA/µs 1.6~400mA/µs 0.002~0.5A/µs 0.02~5A/µs 0.8~200mA/µs 0.64mA/µs 6.4 Accuracy 10ms + 50µs 10ms + 50µs 0.024/µs 0.8mA/µs 0.64mA/µs 6.4 Accuracy 0.16~40mA/µs 1.6m4/µs 0.002~0.5A/µs 0.02m/µs 0.8mA/µs 0.64mA/µs 6.4 Accuracy 0.10ms / 50ms 0.8ma / 10ms 10ms / 50ms Res 10ms / 50ms Res 0.5 0.6 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 <	Range	0~30W	0~300W	0~60W	0~600W	0~30W	0~3	30W	0~250W
Accuracy 0.5% + 0.5%F.S. 0.5% + 0.5%F.S. 0.5% + 0.5%F.S. 0.5% + 0.5%F.S. Dynamic Mode C.C. Mode C.C. Mode C.C. Mode C.C. Mode 0.025ms ~ SOms / Res: 5µs 0.025ms ~ SOms / Res: 5µs 0.025ms ~ SOms / Res: 5µs 0.01ms ~ SOms / Res: 5µs 0.04ms ~ SOms / Res: 5µs 0.04m ~ Lomm ~ SOms / Res: 5µs 0.04m ~ Lomm ~ SOms / Res: 5µs 0.64 ~ 160m ~ Aµs 6.4 ~ 160 Recuracy 10ms / SOms / Res: 5µs 0.02 ~ SA/µs 0.02 ~ Aµs 0.64 ~ 160 m ~ Aµs 6.4 ~ 160 Recuracy 10ms / SUpical 10ys ± 20µs 10ys t(Ypical) 10ys t(Ypical) 10ys ± 20µs 10ys ± 20µs <t< td=""><td>Resolution</td><td>7.5mW</td><td>75mW</td><td>15mW</td><td>150mW</td><td>7.5mW</td><td>7.5</td><td>mW</td><td>62.5mW</td></t<>	Resolution	7.5mW	75mW	15mW	150mW	7.5mW	7.5	mW	62.5mW
Dynamic Mode C.C. Mode C.C. Mode C.C. Mode Dynamic Mode 0.025ms - 50ms / Res: 5µs 0.025ms - 50ms / Res: 5µs 0.025ms - 50ms / Res: 5µs 11 & T2 0.1ms - 500 ms / Res: 25µs 0.1ms - 500 ms / Res: 25µs 0.1ms - 500 ms / Res: 25ms 10ms - 500 ms / Res: 25ms Stew Rate 0.16 - 40mA/µs 1.6 - 400mA/µs 0.025Ms - 50/ms / Res: 25ms 0.1ms - 500 ms / Res: 25ms Stew Rate 0.16 - 40mA/µs 1.6 - 400mA/µs 0.002 - 5A/µs 0.02 - 5A/µs 0.8 - 100mA/µs 6.4 - 160 mA/µs Min. Rise Time 24µs (Typical) 100µs (Typical) 100µs (Typical) 100µs (Typical) 100µs (Typical) Current 0 -11A 0 -10A 0 -112A 0 -12A 0 -5A 0.44M FS. Measurement Section 0.025mk - 5. 0.44%FS. 0.44%FS. 0.44%FS. Voltage Read Back Current Nead Dack 0.015m A 1.25mV 0.25mV 1 Current Read Back Current Nead Dack 0.016M A 0.18% A 0.075m A 0.075m A 0.025% + 0.025% FS. Range 0 -10A 0 -10A 0 -12A </td <td></td> <td></td> <td>-</td> <td>-</td> <td></td> <td></td> <td>1</td> <td></td> <td></td>			-	-			1		
Dynamic Mode C.C. Mode C.C. Mode C.C. Mode C.C. Mode N 0.025ms ~ S0ms / Res: 5µs 0.025ms ~ S0ms / Res: 5µs 0.025ms ~ S0ms / Res: 2µs 0.1ms ~ 500ms / Res: 2µs 0.1ms ~ 500 / Res: 2.5ms 10ms ~ 500 / Res: 2.5ms 0.1ms ~ 500 / Res: 2.5ms 0.4ms / Sum /									
$\begin{tabular}{ c c c c c } \hline $ 0.025ms - 50ms / Res: $ Jus $ 0.025ms - 50ms / Res: $ Jus $ 0.1ms - 500ms / Res: $ Jus $ 0.1ms - 500 / Res: $ Jus $ 0.025 / Avs $ 0.02 - 50 / Jus $ 0.202 / Jus $ 0.226 / $			Node		Mode		CC	Mode	
11 & T2 0.1ms ~ 500ms / Res: 2.5µs 0.1ms ~ 500ms / Res: 2.5µs 0.1ms ~ 500ms / Res: 2.5µs 10ms ~ 50s / Res: 2.5µs Accuracy 1µs / 1ms + 100pp m 0.64 - 160m A/µs 6.64 - 160 - 100 - 120 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 0 -	Dynamic Mode					0.0			5.1.6
10ms → 50s / Res: 2.5ms 10ms → 50s / Res: 2.5ms 10ms → 50s / Res: 2.5ms Accuracy 1µs/1ms+100ppm 1µs/1ms+100ppm 1µs/1ms+100ppm 1µs/1ms+100ppm Stew Rate 0.16 → 40mA/µs 1.6~×400mA/µs 0.002-0.5A/µs 0.002-5A/µs 0.8~200mA/µs 0.64~160mA/µs 6.4~160 Resolution 0.16mA/µs 1.6~×400mA/µs 0.002A/µs 0.002-5A/µs 0.8~200mA/µs 0.64~160mA/µs 6.4~160 Accuracy 10% ± 20µs 10% ± 20µs 0.64~160 mA/µs 6.4~160 Min. Rise Time 24µs (Typical) 10µs (Typical) 10µs (Typical) 10% ± 20µs Current 0~1A 0~10A 0~12A 0~120A 0~5A 0~44 0~44 Resolution 0.25mA 3mA 30mA 1.25mV 0.25mV 1.25mV 0.44%FS. Measurement Section Veasurement Section Veasurement Section Veasurement Section 0.25mV 1.25mV 0.25mV 1.25mV 0.25mV 1.25mV 0.25mV 1.25mV 0.25mV 1.25mV 0.25mV 1.25mV 0.25mV <	T1 0 TO		•						
Accuracy 1µs/1ms+100ppm 1µs/1ms+100ppm 1µs/1ms+100ppm 1µs/1ms+100ppm 0.02-0.5A/µs 0.02-0.5A/µs 0.08-200mA/µs 0.64-160mA/µs 6.4-160 Resolution 0.16mA/µs 1.6mA/µs 0.002A/µs 0.02A/µs 0.8mA/µs 0.64-160mA/µs 6.4mA Accuracy 10% ± 20µs 10% ± 20µs 0.02A/µs 0.02A/µs 0.8mA/µs 6.4m Accuracy 0.016m 010A 012A 05A 04A 04A Resolution 0.25mA 2.5mA 3mA 30mA 1.25mA 1mA 10 Accuracy 0.4%F.5 0.4%F.5 0.4%F.5 0.4%F.5 0.4%F.5 0.4%F.5 0.025% + 0.05% + 0.05\% + 0.05\% + 0.05\% + 0.05\% + 0.05\% + 0.05\% + 0.05\% + 0.0	11 & 12					· · · · · ·			•
Slew Rate 0.16~40mA/µs 1.6~400mA/µs 0.002~05A/µs 0.08~200mA/µs 0.64~160mA/µs 6.4~160 Resolution 0.16mA/µs 1.0mA/µs 0.002A/µs 0.027 0.8~200mA/µs 0.64mA/µs 6.4~160 Accuracy 10% ± 20µs 110% ± 20µs 10% ± 20µs 0.~4A 0~4A 0.4G						1			
Resolution 0.16mA/μs 1.6mA/μs 0.002A/μs 0.02A/μs 0.8mA/μs 0.64mA/μs 6.4m Accuracy 10% ±20μs 10% ±20μs <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>									
Accuracy 10% ±20µs 10% ±20µs 10µs (∃y i c) 10µs (∃y i c) Min. Rise Time 24µs (∃y i c) 10µs (Jy i c) <t< td=""><td>Slew Rate</td><td></td><td></td><td></td><td></td><td>0.8~200mA/µs</td><td></td><td></td><td>6.4~1600mA/µs</td></t<>	Slew Rate					0.8~200mA/µs			6.4~1600mA/µs
Min. Rise Time24µs (Tyrical)10µs (Tyrical)−10µs (Tyrical)10µs (Tyrical)Current0~1A0~10A0~12A0~5A0~5A0~4A0~4AResolution0.25mA2.5mA3mA30mA1.25mA1mA0~4Accuracy0.4% F.S.0.4% F.S.0.4% F.S.0.4% F.S.0.4% F.S.0.4% F.S.0.4% F.S.0.4% F.S.Wassement Section0~125V0~500V0~16V0~80V0~616V0~80V0~16V0.80V0.6% F.S.0.25mV1.25mV0.25mV1.25mV0.25mV1.25mV0.25mV1.25mV0.25mV1.25mV0.25mV1.25mV0.25mV1.25mV0.25mV1.25mV0.25mV0.25mV1.25mV0.25mV	Resolution	0.16mA/µs	1.6mA/µs	0.002A/µs	0.02A/µs	0.8mA/µs	0.64r	mA/μs	6.4mA/µs
Current 0~1A 0~10A 0~12A 0~12A 0~12A 0~4A 0~4A 0~4A Resolution 0.25mA 3mA 30mA 1.25mA 1mA 10 Accuracy 0.4%F.S. 0.4%F.S. 0.4%F.S. 0.4%F.S. 0.4%F.S. Measurement Section Voltage Read Back Range 0~125V 0~500V 0~16V 0~80V 0~16V 0.25mV 1.25mV 0.25mV 1.25mV 0.25mV 1 Accuracy 0.025% + 0.025%F.S. 0.025% + 0.05%F.S. 0.025% + 0.025%F.S. 0.025% + 0.05%F.S. 0.025% + 0.05%F.S. 0.05% + 0.05%F.S. 0.025% + 0.05%F.S. 0.025% + 0.05%F.S.	Accuracy	10% =	±20μs	10% :	±20μs	10% ±20µs			
Resolution 0.25mA 2.5mA 3mA 30mA 1.25mA 1mA 100 Accuracy 0.4%F.S. 0.25mV 0.76V 0~80V 0~16V 0~80V 0~16V 0.25mV 1.25mV 0.25mV 0.05mV 0.4mA	Min. Rise Time	1		10µs (Typical)					
Resolution 0.25mA 2.5mA 3mA 30mA 1.25mA 1mA 100 Accuracy 0.4%F.S. 0.716V 0~80V 0~16V 0~80V 0~16V 0~80V 0.716V 0.25mV 1.25mV 0.25mV 0.05mV 0.62 More 0.62 More More 0.62 More	Current	0~1A	0~10A	0~12A	0~120A	0~5A	0~	-4A	0~40A
Accuracy 0.4%F.S. 0.4%F.S. 0.4%F.S. 0.4%F.S. Measurement Section Voltage Read Back Normal Section Normal S									10mA
Measurement Section Voltage Read Back Range 0~125V 0~500V 0~16V 0~80V 0~16V 0~80V 0~16V 0 Resolution 2mV 8mV 0.25mV 1.25mV 0.25mV 1.25mV 0.25mV 1 Accuracy 0.025% + 0.025% F.S. 0.05% + 0.05%						· · · · · · · · · · · · · · · · · · ·			
Voltage Read Back Range 0~125V 0~500V 0~16V 0~80V 0~16V 0~80V 0~16V 0~80V 0.125W 0.025W 1 Resolution 2mV 8mV 0.25W 1.25mV 0.25mV 1.25mV 0.25W 1 Accuracy 0.025% + 0.025% F.S. 0.0625mA 0.062 Resolution 0.016mA 0.16mA 0.1875mA 1.875mA 0.078125mA 0.0625mA 0.62 Accuracy 0.05% + 0.05% F.S. 0.0625mA 0.62 Accuracy 0.05% + 0.05% F.S. 0.01% - 10% F.S. 0.01% - 10% F.S. 0.025 M.				0.17			0.1	701.3.	
Range $0 \sim 125V$ $0 \sim 500V$ $0 \sim 16V$ $0 \sim 80V$ $0 \sim 16V$ $0 \sim 16V$ $0 \sim 25mV$ $1 \sim 125mV$ $0 \sim 25mV$ $0 \sim 25mV$ $1 \sim 25mV$ $0 \sim 26mV$ $0 \sim 4M$ $0 \sim 4A$									
Resolution 2mV 8mV 0.25mV 1.25mV 0.25mV 1.25mV 0.25mV 1 Accuracy 0.025% + 0.025% + 0.025% + S. 0.025% + 0.025% + 0.025% + S. 0.062 mA 0~4A 0~4A 0~4A 0.62 Range 0~16mA 0.16mA 0.1875mA 1.875mA 0.078125 mA 0.062 5mA 0.62 0.62 Accuracy 0.05% + 0.05% F.S. 0.062 5mA 0.62 Power Read Back*2 Range 0~30W 0~30W 0~60W 0~60W 0~30W 0~20 Accuracy 0.05% F.S. 0.062 5mA 0.62 More 2mA		0 1251/	0.5001/	0.1()/	0.001/	0.101	0.001/	0.10	0.001/
Accuracy 0.025% + 0.025% F.S. 0.025% + 0.025% F.S. 0.025% + 0.025% F.S. Current Read Back Number of the second	3								
Current Read Back Range $0 ~1A$ $0 ~10A$ $0 ~12A$ $0 ~120A$ $0 ~5A$ $0 ~4A$ $0 ~-2A$ Resolution $0.016mA$ $0.16mA$ $0.1875mA$ $1.875mA$ $0.078125mA$ $0.0625mA$ 0.622 Accuracy $0.05\% + 0.05\% F.S.$ $0.078125mA$ $0.078125mA$ $0.078125mA$ $0.0625mA$ 0.622 Power Read Back*2 $0.05\% + 0.05\% F.S.$ $0.075\% + 0.05\% F.S.$ $0.075\% + 0.05\% F.S.$ $0.075\% + 0.05\% F.S.$ $0.075\% + 0.05\% F.S.$ Power Read Back*2 $0 ~-30W$ $0 ~-30W$ $0 ~-30W$ $0 ~-30W$ $0 ~-22$ Range $0 ~-30W$ $0 ~-30W$ $0 ~-30W$ $0 ~-30W$ $0 ~-30W$ $0 ~-30W$ $0 ~-22$ Range $0 ~-30W$ $0 ~-30W$ $0 ~-30W$ $0 ~-30W$ $0 ~-22$ $0.0\% ~-21$ $0.0\% ~-21$ $0.0\% ~-21$ $0.0\% ~-21$ $0.0\% ~-21$ $0.0\% ~-21$ $0.0\% ~-21$ $0.0\% ~-21$ $0.0\% ~-21$ $0.0\% ~-21$ $0.0\% ~-21$ $0.0\% ~-21$ $0.0\% ~-21$ $0.0\% $									
Range $0 \sim 1A$ $0 \sim 10A$ $0 \sim 12A$ $0 \sim 120A$ $0 \sim 5A$ $0 \sim 4A$ $0 \sim 4A$ Resolution $0.016mA$ $0.16mA$ $0.1875mA$ $1.875mA$ $0.078125mA$ $0.0625mA$ 0.62 Accuracy $0 \sim 30W$ $0 \sim 50\%$ F.S. 0.05% F.S. 0.05% F.S. 0.05% F.S. 0.05% F.S. Power Read Back2 Range $0 \sim 30W$ $0 \sim 22$ Accuracy 0.1% + 0.1% F.S. Potective Section Yes Yes <t< td=""><td></td><td>0.025% + 0</td><td>0.025%F.S.</td><td>0.025% +</td><td>0.025%F.S.</td><td></td><td>0.025% +</td><td>- 0.025%F.</td><td>5.</td></t<>		0.025% + 0	0.025%F.S.	0.025% +	0.025%F.S.		0.025% +	- 0.025%F.	5.
Resolution 0.016mA 0.16mA 0.1875mA 1.875mA 0.078125mA 0.0625mA 0.62 Accuracy 0.05% + 0.05% F.S. 0.05% + 0.05% F.S. 0.05% + 0.05% F.S. 0.0625mA 0.62 Power Read Back*2 <									
Accuracy $0.05\% + 0.05\%$ F.S. $0.05\% + 0.05\%$ F.S. $0.05\% + 0.05\%$ F.S. Power Read Back*2 V									0~40A
Power Read Back*2 Range $0 \sim 30W$ $0 \sim 300W$ $0 \sim 600W$ $0 \sim 30W$ $0 \sim 30W$ $0 \sim 2.2$ Accuracy $0.1\% + 0.1\%F.S.$ $0.1\% + 0.1\%F.S.$ $0.1\% + 0.1\%F.S.$ $0.1\% + 0.1\%F.S.$ Protection Yes Yes $0.1\% + 0.1\%F.S.$ $0.1\% + 0.1\%F.S.$ $0.1\% + 0.1\%F.S.$ Over Power Protection Yes Yes Yes Yes Yes Over Current Protection Yes Yes Yes Yes Yes Over Temperature Yes Yes Yes Yes Yes Yes Over Voltage Alarm*3 Yes Yes Yes Yes Yes Yes General Yes Yes Yes Yes Yes Yes Short Circuit OV O OV O OV O O Current (CC) - $ = 100A$ - $ = 120A$ - $ = 6.00$ $ = 0.02$ $ = 0.02$ $ = 0.02$ $ = 0.02$ $ = 0.02$ $ = 0.02$ $ = 0.$						0.078125mA			0.625mA
Range0~30W0~30W0~60W0~60W0~30W0~30W0~2.Accuracy0.1% + 0.1%F.S.0.1% + 0.1%F.S.0.1% + 0.1%F.S.0.1% + 0.1%F.S.0.1% + 0.1%F.S.ProtectionOver Power ProtectionYesYesYesYesOver Current ProtectionYesYesYesYesOver Current ProtectionYesYesYesYesYesOver Current ProtectionYesYesYesYesYesOver Voltage Alarm*3YesYesYesYesYesGeneralShort CircuitCurrent (CC)- $=10A$ - $=120A$ - $=4$ Voltage (CV)-0V-0V-00Resistance (CR)- $=1.25\Omega$ - $=600W$ - $= 500W$ $= 52$ Power (CP)- $=300W$ - $=600W$ - $= 52$ $100k\Omega$ (Typical) $100k\Omega$ (Typical) $100PPM/°C$ (Typical)	Accuracy	0.05% + 0	0.05%F.S.	0.05% +	0.05%F.S.		0.05% + 0.05%F.S.		
Accuracy $0.1\% + 0.1\%$ F.S. $0.1\% + 0.1\%$ F.S. $0.1\% + 0.1\%$ F.S.Protective SectionOver Power ProtectionYesYesYesOver Current ProtectionYesYesYesOver Temperature ProtectionYesYesYesOver Voltage Alarm*3YesYesYesGeneralShort CircuitCurrent (CC) $ = 10A$ $ = 120A$ $ = 44$ Voltage (CV) $ 0V$ $ 0V$ $ = 600125 \Omega$ $ = 600125 \Omega$ $ = 600125 \Omega$ $ = 60000$ $= 100k \Omega$ (Typical) $100k \Omega$ (Typical) $100PPM/^{*}C$ (Typical) $100PPM/^{*}C$ (Typical) $100PPM/^{*}C$ (Typical) $100PPM/^{*}C$ (Typical) $100PPM/^{*}C$ (Typical) $100PPM/^{*}C$ (Typical)	Power Read Back*2								
Accuracy $0.1\% + 0.1\%$ F.S. $0.1\% + 0.1\%$ F.S. $0.1\% + 0.1\%$ F.S.Protective SectionOver Power ProtectionYesYesYesOver Current ProtectionYesYesYesOver Temperature ProtectionYesYesYesOver Voltage Alarm*3YesYesYesGeneralShort CircuitCurrent (CC) $ =$ 10A $ =$ 120A $ =$ 4Voltage (CV) $ =$ 0V $ =$ 00V $ =$ 000 $ =$ 400125 Ω $ =$	Range	0~30W	0~300W	0~60W 0~600W		0~30W 0~30W 0~250W			0~250W
ProtectionOver Power ProtectionYesYesYesOver Current ProtectionYesYesYesOver Temperature ProtectionYesYesYesOver Voltage Alarm*3YesYesYesGeneralShort CircuitCurrent (CC) $ = 10A$ $ = 120A$ $ = 44$ Voltage (CV) $ = 0V$ $ = 0V$ $ = 600W$ $ = 600W$ Power (CP) $ = 300W$ $ = 600W$ $ = 100k\Omega$ (Typical) $100k\Omega$ (Typical) $100k\Omega$ (Typical) $100k\Omega$ (Typical) $100PPM/°C$ (Typical) $100PPM/°C$ (Typical)						· · · · · · · · · · · · · · · · · · ·			
$\begin{array}{c c c c c } Over Power Protection & Yes & Ye$									
$ \begin{array}{c c c c c } Over \ Current \ Protection & Yes & Y$		Ye	25	Yes		Yes			
ProtectionYesYesYesOver Voltage Alarm*3YesYesYesGeneralShort CircuitCurrent (CC)- $\doteq 10A$ - $\doteq 120A$ - $ = 44$ Voltage (CV)-0V-0V-00Resistance (CR)- $= 1.25\Omega$ - $= 0.0125\Omega$ - $= 0.002000000000000000000000000000000000$		Tes		105					
Over Voltage Alarm*3YesYesYesGeneralShort CircuitCurrent (CC)- $\stackrel{1}{\approx}10A$ - $\stackrel{1}{\approx}120A$ $\stackrel{1}{\approx}4$ Voltage (CV)- $0V$ - $0V$ - $\stackrel{1}{\approx}0.0125\Omega$ - <t< td=""><td>•</td><td colspan="2">Yes</td><td colspan="2">Yes</td><td colspan="3">Yes</td><td></td></t<>	•	Yes		Yes		Yes			
General Short Circuit Current (CC) $ +$ 10A $ +$ 20A Current (CC) $ +$ 10A $ +$ 120A $ +$ 20 Current (CC) $ +$ 100V $ +$ 20 Voltage (CV) $ +$ 00V $ +$ 00 Power (CR) $ +$ 300W $ +$ 600W $ +$ 29 Input Resistance $100k\Omega (Typical)$ $100k\Omega (Typical)$ $100k\Omega (Typical)$ Temperature Coefficient $100PPM/°C (Typical)$ $100PPM/°C (Typical)$		Vec							
Short CircuitCurrent (CC)- $\stackrel{1}{\approx}10A$ - $\stackrel{1}{\approx}120A$ $\stackrel{1}{\approx}4$ Voltage (CV)-0V-0V-0Resistance (CR)- $\stackrel{1}{\approx}1.25\Omega$ - $\stackrel{1}{\approx}0.0125\Omega$ $\stackrel{1}{\approx}0.0125\Omega$ Power (CP)- $\stackrel{1}{\approx}300W$ - $\stackrel{1}{\approx}600W$ $\stackrel{1}{\approx}2.52$ Input Resistance (Load Off) $100k\Omega$ (Typical) $100k\Omega$ (Typical) $100k\Omega$ (Typical) $100k\Omega$ (Typical)Temperature Coefficient $100PPM/°C$ (Typical) $100PPM/°C$ (Typical) $100PPM/°C$ (Typical) $100PPM/°C$ (Typical)		Yes		Yes		Yes			
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $									
Resistance (CR)- $= 1.25 \Omega$ - $= 0.0125 \Omega$ - $= 0.0125 \Omega$ Power (CP)- $= 300W$ - $= 600W$ - $= 22$ Input Resistance (Load Off) $100k \Omega$ (Typical) $100k \Omega$ (Typical) $100k \Omega$ (Typical) $100k \Omega$ (Typical)Temperature Coefficient $100PPM/°C$ (Typical) $100PPM/°C$ (Typical) $100PPM/°C$ (Typical) $100PPM/°C$ (Typical)		-		-		-		-	≒40A
Power (CP) - \doteq 300W - \doteq 600W - \doteq 22 Input Resistance (Load Off) 100k Ω (Typical) Temperature Coefficient 100PPM/°C (Typical) 100PPM/°C (Typical) 100PPM/°C (Typical)		-		-		-		-	0V
Power (CP)- \doteq 300W- \doteq 600W \doteq 29Input Resistance (Load Off) $100k\Omega$ (Typical) $100k\Omega$ (Typical) $100k\Omega$ (Typical) $100k\Omega$ (Typical) $100PPM/°C$ (Typical) $100PPM/°C$ (Typical)Temperature Coefficient $100PPM/°C$ (Typical) $100PPM/°C$ (Typical) $100PPM/°C$ (Typical) $100PPM/°C$ (Typical)	Resistance (CR)	-	≒1.25Ω	-	≒ 0.0125 Ω	-		-	≒0.0375 Ω
Input Resistance (Load Off)100kΩ (Typical)100kΩ (Typical)Temperature Coefficient100PPM/°C (Typical)100PPM/°C (Typical)	Power (CP)	-	≒300W	-	≒600W	-		-	≒250W
IOUK Ω (Typical) IOUK Ω (Typical) IOUK Ω (Typical) Temperature Coefficient 100PPM/°C (Typical) 100PPM/°C (Typical) 100PPM/°C (Typical)								(T · ·	
Temperature Coefficient 100PPM/°C (Typical) 100PPM/°C (Typical) 100PPM/°C (Typical)	•	100k ^Ω (Typical)		100kΩ (Typical)		100k Ω (Typical)			
		t 100PPM/°C (Typical)		100PPM/°C (Typical)		100PPM/°C (Typical)			
Power Supply from 6314A Mainframe Supply from 6314A Mainframe Supply from 6314A Mainframe									
		Supply from 6314A Mainframe				Supply from 6314A Mainframe			
Dimensions (HxWxD) 172x82x489.5mm / 6.8x3.2x19.3inch 172x164x489.5mm / 6.8x6.5x19.3inch 172x82x489.5mm / 6.8x3.2x19.3inch						172x82			x 19.3INCN
		4.2 kg /	9.3 lbs	7.3 kg /	16.1 lbs	4.5 kg / 9.9 lbs			
Operating 0~40°C 0~40°C 0~40°C		0~4	۱0°C	0~4	10°C	∩~40°C			
Temperature Range									
EMC & Safety CE CE CE	EMC & Safety	C	E	0	E			CE	

NOTE*1: Low voltage operation, under 0.8 volt, is possible at correspondingly reduced current level. Operating temperature range is 0° C to 40° C. All specifications apply for 25° C $\pm 5^{\circ}$ C, except as noted

SPECIFICATIONS-3

Model	631	08A	631	12A	631	23A	
Power	60W 6		120W 1200W		350W		
Current	0~2A	0~20A	0~24A			0~7A 0~70A	
/oltage*3	0~500V			BOV	0~120V		
ypical Min. Operation Voltage	1.0V@1A	1.0V@10A	0.4V@12A	0.4V@120A	0.05V@3.5A	0.3V@35A	
DC)*1	2.0V@2A	2.0V@20A	0.8V@24A	0.8V@240A	0.1V@7A	0.6V@70A	
Constant Current Mode	2.01@2/1	2.01@2011	0.07@2477	0.07@24077	0.17@771	0.01@7071	
lange	0~2A	0~20A	0~24A	0~240A	0~7A	0~70A	
Resolution	0.5mA	5mA	6mA	60mA	0.125mA	1.25mA	
Accuracy	0.1%+0.1%F.S. 0.1%+0.2%F.S.		0.1%+0.1%F.S.	0.1%+0.2%F.S.	0.1%+0.1%F.S.	0.1%+0.1%F.S.	
Constant Resistance Mode	0.1%+0.1%0F.3.	0.1%+0.2%+.3.	0.1%+0.1%F.3.	0.1%+0.2%F.3.	0.1%+0.1%0F.3.	0.1%+0.1%F.3.	
Solistant Resistance Mode	0.625 0 2.540) (600)///125)/)	6.25m () .25 ()) (1200)///16)/)	0.015 0 150 0	(250)///24)/)*4	
ange	0.625 Ω ~2.5k Ω (600W/125V) 25 Ω ~100k Ω (600W/500V)			$6.25 \text{m} \Omega \sim 25 \Omega (1200 \text{W}/16 \text{V})$		0.015Ω~150Ω (350W/24V)*4 2Ω~2kΩ (350W/120V)	
	400μS (600W/125V)		0.3125Ω~1.25kΩ (1200W/80V)				
Resolution*5	10μS (600W/123V)		40mS (1200W/16V) 800µS (1200W/80V)		1.33mS (350W/24V)*4		
					10μS (350W/120V)		
Accuracy	2.5kΩ:50			S + 0.8%	$150 \Omega: 67 \text{mS} + 0.1\%$		
	100kΩ:5r	nS + 0.1%	1.25kΩ: 0.08S + 0.2%		2kΩ:5m	15 + 0.2%	
Constant Voltage Mode							
ange	0~5			30V		20V	
esolution	125			mV		nV	
ccuracy	0.05% +	0.1%F.S.	0.05% +	0.1%F.S.	0.05% +	0.1%F.S.	
Constant Power Mode							
lange	0~60W	0~600W	0~120W	0~1200W	0~35W	0~350W	
Resolution	15mW	150mW	30mW	300mW	2.5mW	25mW	
Accuracy	0.5% + 0	0.5%F.S.	0.5% +	0.5%F.S.	0.5% + 0	0.5%F.S.	
Dynamic Mode							
Dynamic Mode	C.C. M	Node	C.C. I	Mode	C.C. MODE		
	0.025ms ~ 50ms / Res: 5µs		0.025ms ~ 50)ms / Res: 5µs	0.025ms~50ms/Res: 5µs		
1 & T2	0.1ms ~ 500ms / Res: 25µs		0.1ms ~ 500ms / Res: 25µs		0.1ms~500ms / Res: 25µs		
	10ms ~ 50s / Res: 2.5ms			10ms ~ 50s / Res: 2.5ms		10ms~50s / Res: 2.5ms	
Accuracy	1µs/1ms-		1µs/1ms+100ppm		1µs /1ms+100ppm		
Slew Rate	0.32~80mA/µs	3.2~800mA/µs	0.004~1A/µs 0.04~10A/µs		0.001~0.25A/μs 0.01~2.5A/		
Resolution	0.32mA/µs	3.2mA/µs	0.004A/µs	0.04A/µs	0.001 0.237 (µs	0.01 2.5/ (µs	
Accuracy			10% ±20µs		10% ±20µs		
Ain. Rise Time	10% ±20µs 24µs (Typical)			Ezops Typical)		pical) *6	
Current	0~2A	0~20A	0~24A	0~240A	0~7A	0~70A	
Resolution	0.5mA	5mA	6mA	60mA	0.125mA	1.25mA	
			-				
Accuracy	0.4%	0F.5.	0.49	0F.S.	0.1%	0 F.S.	
Measurement Section							
/oltage Read Back	0.40514	0.500/	0.101	0.001/	0.000	0.4001/	
Range	0~125V	0~500V	0~16V	0~80V	0~24V	0~120V	
Resolution	2mV 8mV		0.25mV	1.25mV	0.4mV	2mV	
Accuracy	0.025%+0	0.025%F.S.	0.025% +	0.025%F.S.	0.025%+0	.015% F.S.	
Current Read Back							
lange	0~2A	0~20A	0~24A	0~240A	0~7A	0~70A	
Resolution	0.03125mA	0.3125mA	0.375mA 3.75mA		0.125mA 1.25mA		
Accuracy	0.05% + 0	0.05%F.S.	0.075% +	0.075%F.S.	0.04%+0	.04% F.S.	
Power Read Back*2							
lange	0~60W	0~600W	0~120W	0~1200W	0~35W	0~350W	
Accuracy	0.1%+	0.1%F.S.	0.1% +	0.1%F.S.	0.1%+0	.1% F.S.	
Protective Section							
Over Power Protection	Ye	25	Y	es	Ye	es	
Over Current Protection	Yes		Yes		Yes		
Over Temperature Protection	Yes		Yes		Yes		
Over Voltage Alarm*3	Yes		Yes		Yes		
Seneral							
Short Circuit							
Current (CC)	_	≒20A	-	≒240A	_	≒70A	
/oltage (CV)	_	OV	_	0V	_	0V	
desistance (CR)	_	==0.625Ω	_	⇒0.00625Ω	_	= 0.01 Ω	
	- − 0.02512 - ≒600W		- ≒0.00625Ω		-		
Power (CP)					- ≒ 350W		
nput Resistance (Load Off)	$100 \mathrm{k}\Omega$ (Typical)		$100 \text{k}\Omega$ (Typical)		800kΩ(Typical)		
emperature Coefficient	100PPM/°C (Typical)		100PPM/°C (Typical)		100PPM/°C (Typical)		
Power	Supply from 6314A Mainframe			Supply from 6314A Mainframe		Supply from 6314A Mainframe	
Dimensions (HxWxD)	172x164x489.5mm		172x329x495mm / 6.8x12.9x19.5inch		172x82x489.5mm / 6.8x3.2x19.3inc		
Veight	7.3 kg / 16.1 lbs		14 kg / 30.8 lbs		4.2kg / 9.3 lbs		
Operating Temperature Range		0~40°C		0~40°C		0~40°C	
EMC & Safety	CE		CE		CE		

NOTE*3: When the operating voltage exceeds the rated voltage for 1.02 times, a warning will occur and if it exceeds 1.1 times of the rated voltage, it would cause permanent damage to the device.

NOTE*4 : Please refer to user's manual for detail specifications.

NOTE*5 : S (siemens) is the SI unit of conductance, equal to one reciprocal ohm.

NOTE*6 : The loading current should be 0.35A at least.

SOFTPANEL

The 6310A loads can be operated from the front panel controls of mainframe or from available softpanels. This user friendly software includes all functions of 6310A and is easy to understand and operate. The 6310A can be controlled via GPIB and USB interfaces for remote control and automated testing applications.



LED Mode









Battery Test



ORDERING INFORMATION

6312A : Mainframe for 2 Load Modules 6314A : Mainframe for 4 Load Modules 63101A : Load Module 80V/40A/200W 63102A : Load Module 80V/20A/100W x 2 63103A : Load Module 80V/60A/300W 63105A : Load Module 500V/10A/300W 63106A : Load Module 80V/120A/600W 63107A : Load Module 80V/5A & 40A/30W & 250W 63108A : Load Module 500V/20A/600W 63112A : Load Module 80V/240A/1200W 63123A : Load Module 120V/70A/350W

A631000 : GPIB Interface for Model 6314A/6312A Mainframe A631001 : Remote Controller A631003 : USB Interface for Model 6314A/6312A Mainframe A631005 : Softpanel for 6310A/6330A series A631006 : Rack Mounting Kit for Model 6312A Mainframe A631007 : Rack Mounting Kit for Model 6314A Mainframe A800042 : Test Fixture **LED Load Simulator for LED Driver Test** 63110A : Load Module 500V/2A/100W x 2 63113A : Load Module 300V/20A/300W * 63115A : Load Module 600V/20A/300W

* Call for availability

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