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 8 channels in one mainframe, for testing multiple output SMPS
- Parallel load modules up to 1400W for high current and power application
- 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 allowing load to sink high current at low voltage (63123A : 0.6V@70A)
- Real time power supply load transient response simulation and output measurement
- User programmable 100 sequences. Front panel input status for user-friendly operating
- 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 alarm
- USB, GPIB & RS-232 interfaces

The Chroma 6310A series Programmable DC Electronic Load is suitable for the test and evaluation of multi-output AC/DC power supplies, DC/DC converters, chargers and power electronic components. It is ideal 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-232, USB or GPIB.

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

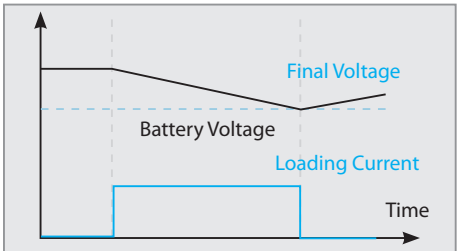
Module Load Design

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.

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 and other similar applications.

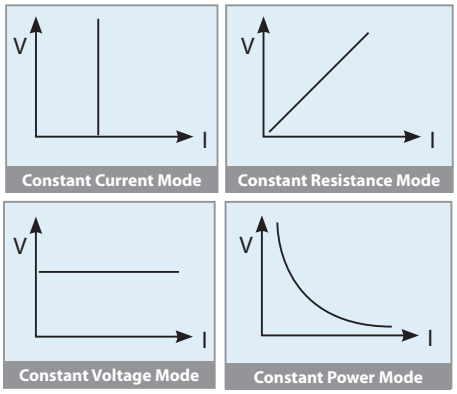
The Timing function can be used in testing battery and super capacitor discharge, or other similar applications.



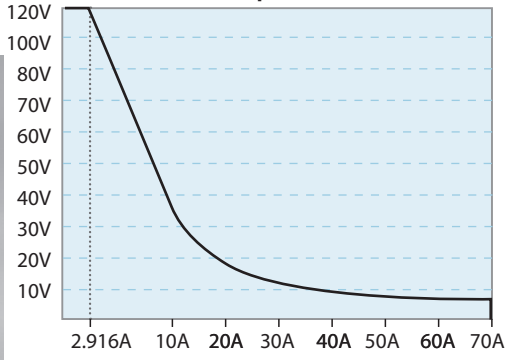
Battery Discharge Testing

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.

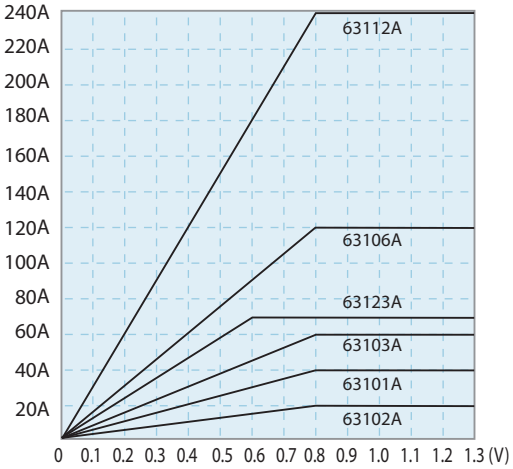


Model 63123A Input Characteristics



Low Voltage Characteristics (Typical)

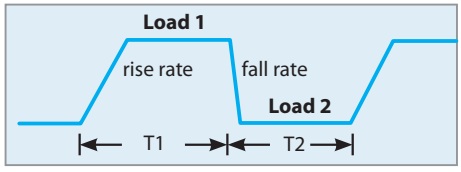
Model 63101A/63102A/63103A/ 63106A/63112A/63123A



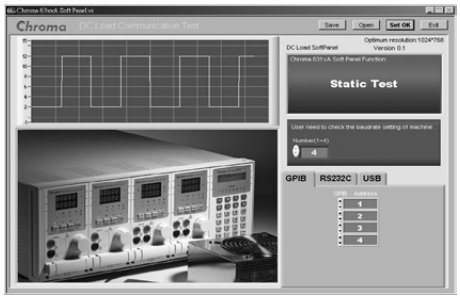
Note: All specifications are measured at load input terminals. (Ambient Temperature of 25˚C)

Dynamic Loading and Control

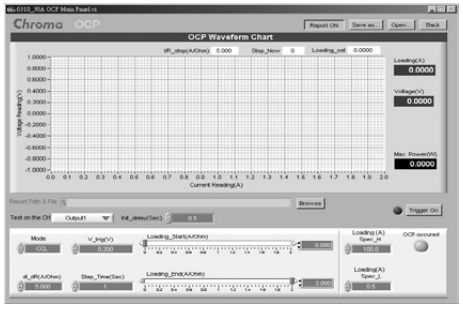
Modern electronic devices operate at very high speeds and require fast dynamic operation of their power providing components. To satisfy these testing applications, the 6310A loads offer high speed, programmable dynamic load simulation and control capability. The figure below shows the programmable parameters of the 6310A modules.



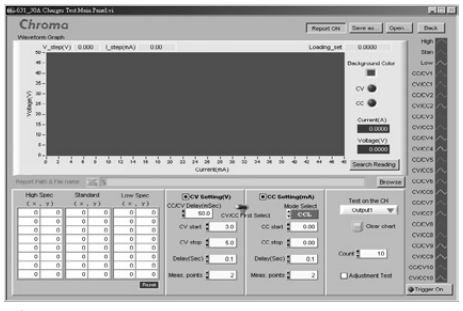
Soft Panel



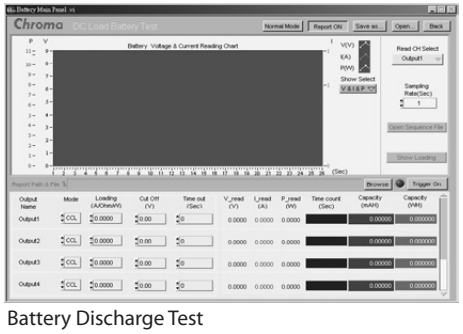
Main Operation Menu



OCP Test

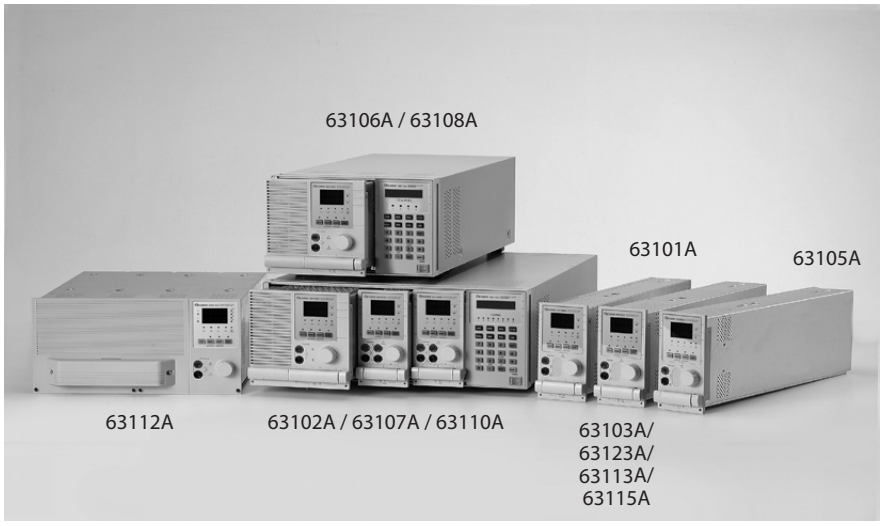


Charger Test



Battery Discharge Test

6310A Series DC Electronic Load Family



6314A : 4 in 1 Mainframe

6312A : 2 in 1 Mainframe

A631001: Remote Controller

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 ± 10% V_{LN}, 47~63Hz ; 1Ø 115/230Vac ± 10% V_{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

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

• Continued on next page ➟

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	0~80V		0~80V		0~80V	
Typical Min. Operation Voltage (DC)*1	0.4V@2A 0.8V@4A	0.4V@20A 0.8V@40A	0.4V@1A 0.8V@2A	0.4V@10A 0.8V@20A	0.4V@3A 0.8V@6A	0.4V@30A 0.8V@60A
Constant Current Mode						
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						
Range	0.0375Ω~150Ω (200W/16V) 1.875Ω~7.5kΩ (200W/80V)		0.075Ω~300Ω (100W/16V) 3.75Ω~15kΩ (100W/80V)		0.025Ω~100Ω (300W/16V) 1.25Ω~5kΩ (300W/80V)	
Resolution*5	6.667mS (200W/16V) 133μS (200W/80V)		3.333mS (100W/16V) 66.667μS (100W/80V)		10mS (300W/16V) 200μS (300W/80V)	
Accuracy	150Ω: 0.1S+ 0.2% 7.5kΩ: 0.01S + 0.1%		300Ω: 0.1S + 0.2% 15kΩ: 0.01S + 0.1%		100Ω: 0.1S+ 0.2% 5kΩ: 0.01S+ 0.1%	
Constant Voltage Mode						
Range	0~80V		0~80V		0~80V	
Resolution	20mV		20mV		20mV	
Accuracy	0.05% + 0.1%F.S.		0.05% + 0.1%F.S.		0.05% + 0.1%F.S.	
Constant Power Mode						
Range	0~20W	0~200W	0~20W	0~100W	0~30W	0~300W
Resolution	5mW	50mW	5mW	25mW	7.5mW	75mW
Accuracy	0.5% + 0.5%F.S.		0.5% + 0.5%F.S.		0.5% + 0.5%F.S.	
Dynamic Mode						
Dynamic Mode	C.C. Mode		C.C. Mode		C.C. Mode	
T1 & T2	0.025ms ~ 50ms / Res: 5μs 0.1ms ~ 500ms / Res: 25μs 10ms ~ 50s / Res: 2.5ms		0.025ms ~ 50ms / Res: 5μs 0.1ms ~ 500ms / Res: 25μs 10ms ~ 50s / Res: 2.5ms		0.025ms ~ 50ms / Res: 5μs 0.1ms ~ 500ms / Res: 25μs 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% ±20μs		10% ±20μs	
Min. Rise Time	10μs (Typical)		10μs (Typical)		10μs (Typical)	
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%F.S.		0.4%F.S.		0.4%F.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% + 0.025%F.S.		0.025% + 0.025%F.S.		0.025% + 0.025%F.S.	
Current Read Back						
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% + 0.05%F.S.		0.05% + 0.05%F.S.		0.05% + 0.05%F.S.	
Power Read Back*2						
Range	0~20W	0~200W	0~20W	0~100W	0~30W	0~300W
Accuracy	0.1% + 0.1%F.S.		0.1% + 0.1%F.S.		0.1% + 0.1%F.S.	
Protective Section						
Over Power Protection	Yes		Yes		Yes	
Over Current Protection	Yes		Yes		Yes	
Over Temperature Protection	Yes		Yes		Yes	
Over Voltage Alarm*3	Yes		Yes		Yes	
General						
Short Circuit						
Current (CC)	-	≒40A	-	≒20A	-	≒60A
Voltage (CV)	-	0V	-	0V	-	0V
Resistance (CR)	-	≒0.0375Ω	-	≒0.075Ω	-	≒0.025Ω
Power (CP)	-	≒200W	-	≒100W	-	≒300W
Input Resistance (Load Off)	100kΩ (Typical)		100kΩ (Typical)		100kΩ (Typical)	
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		4.2 kg / 9.3 lbs	
Operating Range	0~40˚C		0~40˚C		0~40˚C	
EMC & Safety	CE		CE		CE	

SPECIFICATIONS-2								
Model	**63105A**		**63106A**		**63107A (30W & 250W)**			
Power	30W	300W	60W	600W	30W	30W	250W	
Current	0~1A	0~10A	0~12A	0~120A	0~5A	0~4A	0~40A	
Voltage*3	0~500V		0~80V		0~80V			
Typical Min. Operation Voltage (DC)*1	1.0V@0.5A 2.0V@1A	1.0V@5A 2.0V@10A	0.4V@6A 0.8V@12A	0.4V@60A 0.8V@120A	0.4V@2.5A 0.8V@5A	0.4V@2A 0.8V@4A	0.4V@20A 0.8V@40A	
Constant Current Mode								
Range	0~1A	0~10A	0~12A	0~120A	0~5A	0~4A	0~40A	
Resolution	0.25mA	2.5mA	3mA	30mA	1.25mA	1mA	10mA	
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.	0.1%+0.2%F.S.	
Constant Resistance Mode								
Range	1.25Ω~5kΩ (300W/125V) 50Ω~200kΩ (300W/500V)		12.5mΩ~50Ω (600W/16V) 0.625Ω~2.5kΩ (600W/80V)		0.3Ω~1.2kΩ (30W/16V) 15Ω~60kΩ (30W/80V)		0.0375Ω~150Ω (250W/16V) 1.875Ω~7.5kΩ (250W/80V)	
Resolution*5	200μS (300W/125V) 5μS (300W/500V)		20mS (600W/16V) 400μS (600W/80V)		833μS (30W/16V) 16.67μS (30W/80V)		6.667μS (250W/16V) 133μS (250W/80V)	
Accuracy	5kΩ: 20mS+ 0.2% 200kΩ:5mS+ 0.1%		50Ω: 0.4S + 0.5% 2.5kΩ: 0.04S + 0.2%		1.2kΩ: 0.1S + 0.2% 60kΩ: 0.01S + 0.1%		150Ω: 0.1S + 0.2% 7.5kΩ: 0.01S + 0.1%	
Constant Voltage Mode								
Range	0~500V		0~80V		0~80V			
Resolution	125mV		20mV		20mV			
Accuracy	0.05% + 0.1%F.S.		0.05% + 0.1%F.S.		0.05% + 0.1%F.S.			
Constant Power Mode								
Range	0~30W	0~300W	0~60W	0~600W	0~30W	0~30W	0~250W	
Resolution	7.5mW	75mW	15mW	150mW	7.5mW	7.5mW	62.5mW	
Accuracy	0.5% + 0.5%F.S.		0.5% + 0.5%F.S.		0.5% + 0.5%F.S.			
Dynamic Mode								
Dynamic Mode	C.C. Mode		C.C. Mode		C.C. Mode			
T1 & T2	0.025ms ~ 50ms / Res: 5μs 0.1ms ~ 500ms / Res: 25μs 10ms ~ 50s / Res: 2.5ms		0.025ms ~ 50ms / Res: 5μs 0.1ms ~ 500ms / Res: 25μs 10ms ~ 50s / Res: 2.5ms		0.025ms ~ 50ms / Res: 5μs 0.1ms ~ 500ms / Res: 25μs 10ms ~ 50s / Res: 2.5ms			
Accuracy	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	0.64~160mA/μs	6.4~1600mA/μs	
Resolution	0.16mA/μs	1.6mA/μs	0.002A/μs	0.02A/μs	0.8mA/μs	0.64mA/μs	6.4mA/μs	
Accuracy	10% ±20μs		10% ±20μs		10% ±20μs			
Min. Rise Time	24μs (Typical)		10μs (Typical)		10μs (Typical)			
Current	0~1A	0~10A	0~12A	0~120A	0~5A	0~4A	0~40A	
Resolution	0.25mA	2.5mA	3mA	30mA	1.25mA	1mA	10mA	
Accuracy	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	0~80V	0~16V	0~80V
Resolution	2mV	8mV	0.25mV	1.25mV	0.25mV	1.25mV	0.25mV	1.25mV
Accuracy	0.025% + 0.025%F.S.		0.025% + 0.025%F.S.		0.025% + 0.025%F.S.			
Current Read Back								
Range	0~1A	0~10A	0~12A	0~120A	0~5A	0~4A	0~40A	
Resolution	0.016mA	0.16mA	0.1875mA	1.875mA	0.078125mA	0.0625mA	0.625mA	
Accuracy	0.05% + 0.05%F.S.		0.05% + 0.05%F.S.		0.05% + 0.05%F.S.			
Power Read Back*2								
Range	0~30W	0~300W	0~60W	0~600W	0~30W	0~30W	0~250W	
Accuracy	0.1% + 0.1%F.S.		0.1% + 0.1%F.S.		0.1% + 0.1%F.S.			
Protective Section								
Over Power Protection	Yes		Yes		Yes			
Over Current Protection	Yes		Yes		Yes			
Over Temperature Protection	Yes		Yes		Yes			
Over Voltage Alarm*3	Yes		Yes		Yes			
General								
Short Circuit								
Current (CC)	-	≒10A	-	≒120A	-	-	≒40A	
Voltage (CV)	-	0V	-	0V	-	-	0V	
Resistance (CR)	-	≒1.25Ω	-	≒0.0125Ω	-	-	≒0.0375Ω	
Power (CP)	-	≒300W	-	≒600W	-	-	≒250W	
Input Resistance (Load Off)	100kΩ (Typical)		100kΩ (Typical)		100kΩ (Typical)			
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		172x164x489.5mm / 6.8x6.5x19.3inch		172x82x489.5mm / 6.8x3.2x19.3inch			
Weight	4.2 kg / 9.3 lbs		7.3 kg / 16.1 lbs		4.5 kg / 9.9 lbs			
Operating Range	0~40°C		0~40°C		0~40°C			
EMC & Safety	CE		CE		CE			

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SPECIFICATIONS-3						
Model	**63108A**		**63112A**		**63123A**	
Power	60W	600W	120W	1200W	350W	
Current	0~2A	0~20A	0~24A	0~240A	0~7A	0~70A
Voltage*3	0~500V		0~80V		0~120V	
Typical Min. Operation Voltage (DC)*1	1.0V@1A 2.0V@2A	1.0V@10A 2.0V@20A	0.4V@12A 0.8V@24A	0.4V@120A 0.8V@240A	0.05V@3.5A 0.1V@7A	0.3V@35A 0.6V@70A
Constant Current Mode						
Range	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						
Range	0.625Ω~2.5kΩ (600W/125V) 25Ω~100kΩ (600W/500V)		6.25mΩ~25Ω (1200W/16V) 0.3125Ω~1.25kΩ (1200W/80V)		0.015Ω~150Ω (350W/24V)*4 2Ω~2kΩ (350W/120V)	
Resolution*5	400μS (600W/125V) 10μS (600W/500V)		40mS (1200W/16V) 800μS (1200W/80V)		1.33mS (350W/24V)*4 10μS (350W/120V)	
Accuracy	2.5kΩ: 50mS + 0.2% 100kΩ: 5mS + 0.1%		25Ω: 0.8S + 0.8% 1.25kΩ: 0.08S + 0.2%		150Ω: 67mS + 0.1% 2kΩ: 5mS + 0.2%	
Constant Voltage Mode						
Range	0~500V		0~80V		0~120V	
Resolution	125mV		20mV		2mV	
Accuracy	0.05% + 0.1%F.S.		0.05% + 0.1%F.S.		0.05% + 0.1%F.S.	
Constant Power Mode						
Range	0~60W	0~600W	0~120W	0~1200W	0~35W	0~350W
Resolution	15mW	150mW	30mW	300mW	2.5mW	25mW
Accuracy	0.5% + 0.5%F.S.		0.5% + 0.5%F.S.		0.5% + 0.5%F.S.	
Dynamic Mode						
Dynamic Mode	C.C. Mode		C.C. Mode		C.C. MODE	
T1 & T2	0.025ms ~ 50ms / Res: 5μs 0.1ms ~ 500ms / Res: 25μs 10ms ~ 50s / Res: 2.5ms		0.025ms ~ 50ms / Res: 5μs 0.1ms ~ 500ms / Res: 25μs 10ms ~ 50s / Res: 2.5ms		0.025ms~50ms/Res: 5μs 0.1ms~500ms / Res: 25μs 10ms~50s / Res: 2.5ms	
Accuracy	1μs/1ms+100ppm		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/μs
Resolution	0.32mA/μs	3.2mA/μs	0.004A/μs	0.04A/μs	0.001A/μs	0.01A/μs
Accuracy	10% ±20μs		10% ±20μs		10% ±20μs	
Min. Rise Time	24μs (Typical)		10μs (Typical)		25μs (Typical) *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%F.S.		0.4%F.S.		0.1% F.S.	
Measurement Section						
Voltage Read Back						
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% + 0.025%F.S.		0.025% + 0.025%F.S.		0.025%+0.015% F.S.	
Current Read Back						
Range	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% + 0.05%F.S.		0.075% + 0.075%F.S.		0.04%+0.04% F.S.	
Power Read Back*2						
Range	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	Yes		Yes		Yes	
Over Current Protection	Yes		Yes		Yes	
Over Temperature Protection	Yes		Yes		Yes	
Over Voltage Alarm*3	Yes		Yes		Yes	
General						
Short Circuit						
Current (CC)	-	≒20A	-	≒240A	-	≒70A
Voltage (CV)	-	0V	-	0V	-	0V
Resistance (CR)	-	≒0.625Ω	-	≒0.00625Ω	-	≒ 0.01Ω
Power (CP)	-	≒600W	-	≒1200W	-	≒350W
Input Resistance (Load Off)	100kΩ (Typical)		100kΩ (Typical)		800kΩ (Typical)	
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)	172x164x489.5mm / 6.8x6.5x19.3inch		172x329x495mm / 6.8x12.9x19.5inch		172x82x489.5mm / 6.8x3.2x19.3inch	
Weight	7.3 kg / 16.1 lbs		14 kg / 30.8 lbs		4.2kg / 9.3 lbs	
Operating Range	0~40˚C		0~40˚C		0~40˚C	
EMC & Safety	CE		CE		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±5˚C, except as noted
NOTE*2 : Power F.S. = Vrange F.S. x Irange F.S.
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.

KEY FEATURES

- Unique LED mode for LED power driver test
- Programmable LED dynamic resistance (R_d)
- Programmable internal resistance (Rr) for simulating LED ripple current
- Fast response for PWM dimming test
- Up to eight channels in one mainframe
- 16-bit precision voltage and current measurement with dual-range
- Full Protection: OC, OP, OT protection and OV alarm

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 V_F and a dynamic 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 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.

63113A/63115A

Chroma has created the industries first LED Load Simulator for simulating LED loading with our 63110A/63113A/63115A 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 2 shows the dimming current waveform of the LED. Figure 3 shows the dimming current waveform when using 63110A as a load.The 6314A holds up to four 63110A load modules, which will result in an 8-channel 100W/channel load with standard front-panel inputs. This makes it ideal for testing single output and multiple output LED driver. 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.

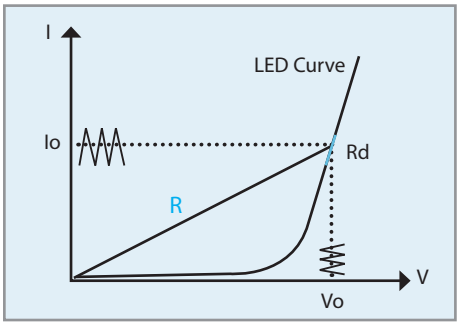

Figure 1 LED V-I Characteristics

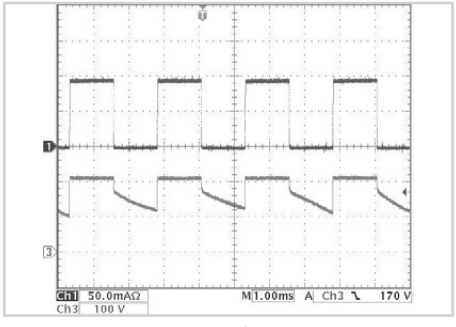

Figure 2 - LED dimming test

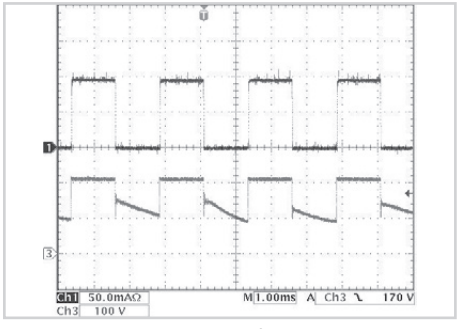

Figure 3 - 63110A dimming test

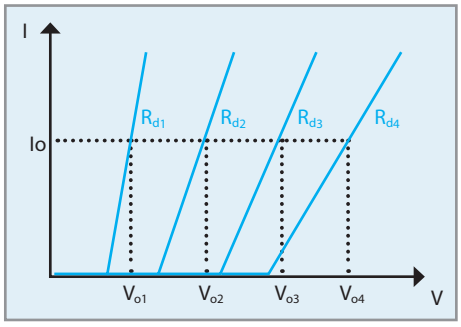

Figure 4 - Simulate different number of LEDs

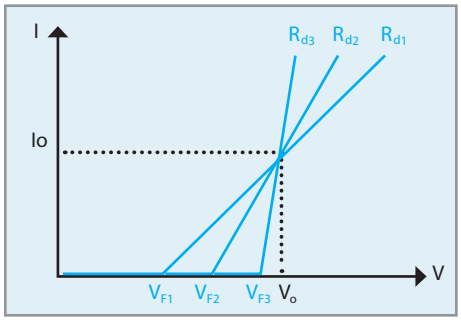

Figure 5 - Simulate different characteristic of LEDs

6312A : 2 in 1 Mainframe

6314A : 4 in 1 Mainframe

SPECIFICATIONS						
Model	**63110A (100Wx2)**		**63113A**		**63115A**	
Power	100W		300W		300W	
Current	0~0.6A	0~2A	0~5A	0~20A	0~5A	0~20A
Voltage *1	0~500V		0~300V		0~600V	
Min. Operating Voltage	6V@2A		4V@20A		4V@20A	
Constant Current Mode						
Range	0~0.6A	0~2A	0~5A	0~20A	0~5A	0~20A
Resolution	12μA	40μA	100μA	400μA	100μA	400μA
Accuracy	0.1%+0.1% 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.
Constant Resistance Mode						
Range	CRL : 3Ω~1kΩ (100W/100V) CRH : 10Ω~10kΩ (100W/500V)		CRL @ CH : 0.2Ω~200Ω (300W/60V) CRL @ CL : 0.8Ω~800Ω (300W/60V) CRH @ CL : 4Ω~4kΩ (300W/300V)		CRL @ CH : 0.2Ω~200Ω (300W/60V) CRL @ CL : 0.8Ω~800Ω (300W/60V) CRH @ CL : 8Ω~8kΩ (300W/600V)	
Resolution*2	CRL : 62.5μS CRH : 6.25μS		CRL @ CH : 100μS CRL @ CL : 25μS CRH @ CL : 5μS		CRL @ CH :100μS CRL @ CL : 25μS CRH @ CL : 2.5μS	
Accuracy	1kΩ : 4mS+0.2% 10kΩ : 1mS+0.1%		0.2% (setting + range)		0.2% (setting + range)	
Constant Voltage Mode						
Range	0~500V		0~300V		0~600V	
Resolution	20mV		6mV		12mV	
Accuracy	0.05% + 0.1%F.S.		0.05% + 0.1%F.S.		0.05% + 0.1%F.S.	
LED Mode						
Range	Operating Voltage: 0~100V/0~500V R_d Coefficient : 0.001~1 V_F: 0~100V/0~500V Current : 0~2A R_d: 1Ω~1kΩ/10Ω~10kΩ		Operating Voltage : 0~60V/0~300V R_d Coefficient : 0.001~1 V_F : 0~60V/0~300V LEDL @ CH : 0~60V- 0~20A (R_d: 0.05Ω~50Ω) LEDL @ CL : 0~60V- 0~5A (R_d: 0.8Ω~800Ω) LEDH @ CL : 0~300V- 0~5A (R_d: 4Ω~4kΩ)		Operating Voltage : 0~60V/0~600V R_d Coefficient : 0.001~1 V_F : 0~60V/0~600V LEDL @ CH : 0~60V- 0~20A (R_d: 0.05Ω~50Ω) LEDL @ CL : 0~60V- 0~5A (R_d: 0.8Ω~800Ω) LEDH @ CL : 0~600V- 0~5A (R_d: 8Ω~8kΩ)	
Resolution *2	Vo : 4mV/20mV Io : 0.1mA R_d Coefficient : 0.001 R_d : 62.5μS/6.25μS V_F : 4mV/20mV		Vo : 1.2mV/6mV Io : 100μA/400μA R_d Coefficient : 0.001 R_d : 400μS / 25μS / 5μS V_F : 1.2mV/ 6mV		Vo : 1.2mV/12mV Io : 100μA/400μA R_d Coefficient : 0.001 R_d : 400μS/25μS/2.5μS V_F : 6mV/ 60mV	
Dynamic Mode						
Dynamic Mode	--		C.C. Mode		C.C. Mode	
T1 & T2	--		0.025ms ~ 50ms / Res: 5μs 0.1ms ~ 500ms / Res: 25μs 10ms ~ 50s / Res: 2.5ms		0.025ms ~ 50ms / Res: 5μs 0.1ms ~ 500ms / Res: 25μs 10ms ~ 50s / Res: 2.5ms	
Accuracy	--		1μs/1ms+100ppm		1μs/1ms+100ppm	
Slew Rate	--		0.8~200mA/μs	3.2~800mA/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		10% ±20μs	
Min. Rise Time	--		25μs (Typical)		25μs (Typical)	
Current	--		0~5A	0~20A	0~5A	0~20A
Resolution	--		100μA	400μA	100μA	400μA
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%+0.025% F.S.		0.025%+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%+0.05% F.S.		0.05%+0.05% F.S.		0.05%+0.05% F.S.	

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.