Programmable
DC Electronic Load

# PROGRAMMABLE DC ELECTRONIC LOAD
# MODEL 6310A SERIES

Chroma Programmable DC Electronic Load 6310A series is suitable for the test and evaluation of multi-output AC/DC power supply, DC/DC converter, charger and power electronic components and good for application in areas such as research and development, production, and incoming inspection. The system is configured by plugging the user selectable load modules into the system mainframe, and operated using the keypad on the front panel of the instrument or the remote controlled instructions via RS-232C, USB or GPIB interface.

The 6310A series offers 8 types of modular loads with power ranging from 100 watts to 1,200 watts, current from 0.5mA to 240A, and voltage measurement from 0.5mV to 500V. Each load is isolated and floating, programmable in dual current range and measuring voltage range, and capable of synchronizing with other modules for control operation. The load can be operated in constant current, constant voltage, constant power and constant resistance.

The 6310A series can simulate a wide range of dynamic loading applications. The loading waveform is programmable in slew rates, load levels, duration and conducting voltage. Furthermore, up to 100 series of system operating status can be stored in EEPROM and recalled instantly for automated testing application.

Real time measurement of voltage and current is integrated into each 6310A load module using a 15-bit precision measurement circuit. The user can perform on line voltage measurement and adjustment, or simulate short circuit test using the simple keypad on the front panel. Additionally, the 6310A series offers an optional remote controller for automated production line.

The 6310A series has self-diagnosis routine to maintain instrumental performance all the time. It is also protected against OP, OC, OV, OT, and reverse polarity to guarantee quality and reliability for even the most demanding engineering testing and ATE application.

USB GPIB RS-232 CE

## MODEL 6310A SERIES

***Key Features:***

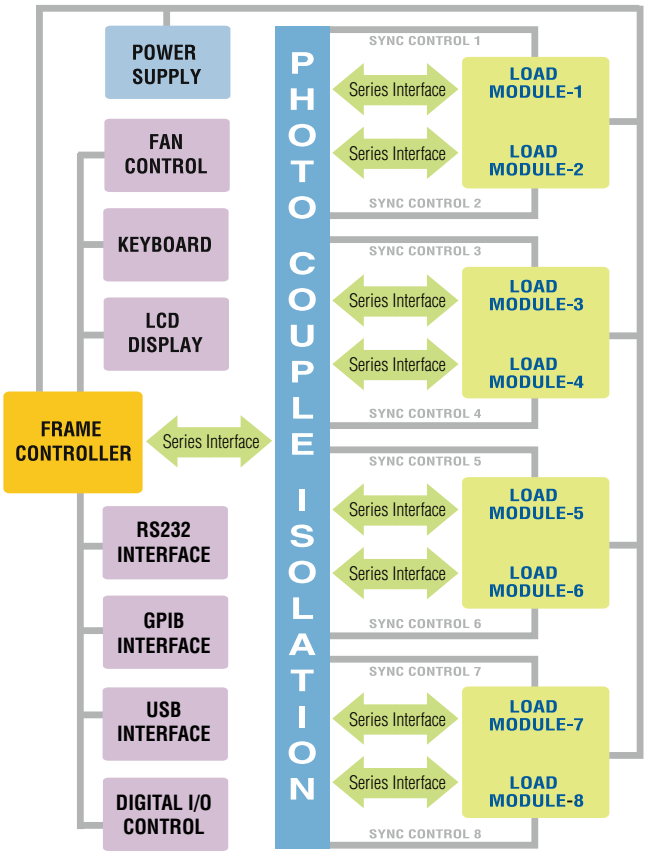
- Max Power: 200W, 100W×2(Dual), 30W & 250W, 300W, 600W, 1200W
- Wide range 0~500V operating voltage
- High compatibility between 6310 and 6310A
- Up to 8 channels in one mainframe, fit for testing multiple output SMPS
- Parallel load modules up to 1200W for high current and power application
- Synchronization with multiple loads
- Flexible CC, CR, CP and CV operation modes
- Dynamic loading with speed up to 20kHz
- Fast response of 0.32mA/us~10A/us slew rate
- Minimum input resistance allowing load to sink high current at low voltage
- Real time power supply load transient response simulation and output measurement
- User programmable 100 sequential 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
- 15-bit precision voltage and current measurement with dual-range selection
- Remote sensing capability
- Short circuit test
- Self-test at power-on
- Full Protection: OV, OC, OP and OT
- USB, GPIB & RS-232C interfaces

Chroma

## VERSATILE SYSTEM CONFIGURATION

Chroma 6310A Programmable Electronic Load integrates microprocessing capability into each load module and mainframe as the system operates in parallel processing mode to optimize the speed and control among multiple load modules. All load modules are configured to work synchronously, and testing can be carried out simultaneously at multiple output to simulate real life application.

### 6310A System Block Diagram




## COMPATIBILITY WITH 6310 SERIES

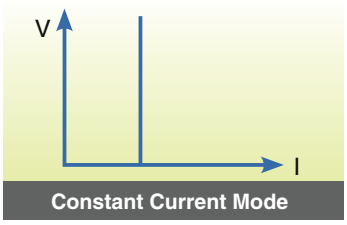
The 6310A series load modules are compatible with the 6310 series mainframes and vice versa. However certain new features and functions will not be available when using the 6310A modules in the 6310 mainframes as well as 6310 modules in the 6310A mainframes. This allows users to save on new equipment cost.

## MODULE LOAD DESIGN

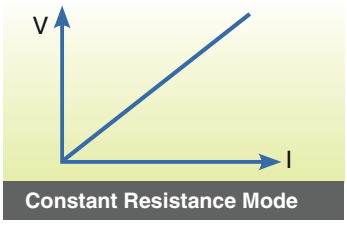
The Chroma 6314A 1200W and 6312A 600W electronic load mainframes accept the user-installable 6310A series load modules for easy system configuration and fit 19" instrument rack. The 6314A holds four 63102A load modules at most to offer 8-channel 100W input load with standard front-panel inputs. It fits for testing multiple output switch power supply. Additionally, GO/NG output port is useful for UUT's pass/fail judgement on automated production line. All modules on the 6314A/6312A mainframe share a common GPIB address to synchronize and speed up the control of load modules and read-back of operating data.

## APPLICATION OF SPECIFIC LOAD SIMULATION

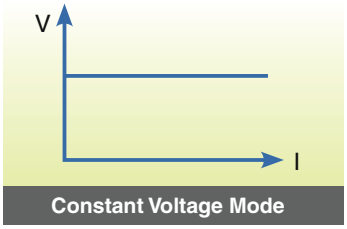
The 6310A load modules operate in constant current, constant voltage, constant power or constant resistance to satisfy a wide range of test requirements. For example, the test of battery charger can be simulated easily by setting the load to operate in constant voltage.



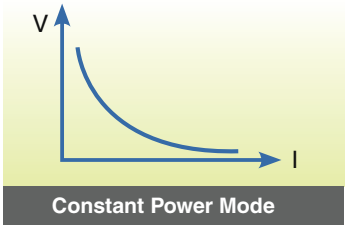
Constant Current Mode



Constant Resistance Mode



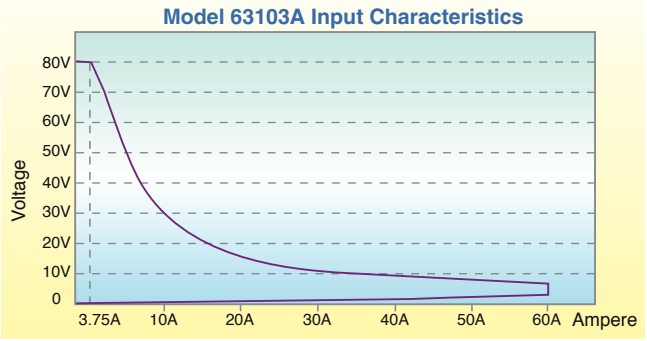
Constant Voltage Mode

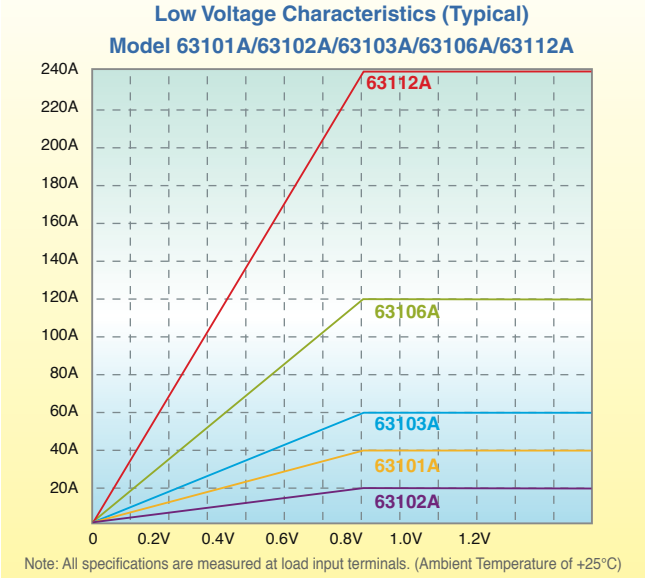


Constant Power Mode

Each load module is designed with state-of-the-art technology and connects all power MOSFET devices parallel to insure high accuracy load control with minimum drift of less than 0.1%+0.1%F.S. of the current setting. The FET technology accomplishes minimum input resistance and enables the load to sink high current even at very low voltage. For example, model 63103A is capable of sinking 60A at 1V output, and well-suited for testing the new 3.3V low voltage power supplies. Low voltage operation, down to zero volt, is possible at correspondingly reduced current level.

The 6310A load module uses 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 in high power testing application.

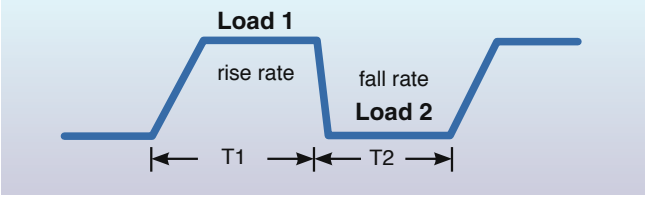



Note: All specifications are measured at load input terminals. (Ambient Temperature of +25°C)

## DYNAMIC LOADING AND CONTROL

Modern electronic devices operate at very high speed, and perform well in the transient and dynamic response of power devices. To satisfy these testing applications, the 6310A loads offer high speed, programmable dynamic load simulation and control capability never achieved before. The figure below shows the programmable parameters of the 6310A modules:




The programmable slew rate makes the simulation of transient load change demanded by the requirement of real life application possible. The 6310A internal waveform generator is capable of producing maximum slew rate at 10A/us, and dynamic cycling up to 20kHz. Its dedicated remote load senses and controls circuit to guarantee minimum waveform distortion during continuous load changes.

## PARALLEL CONTROL

The 6310A provides parallel controls, enabling high power testing when a single module can not meet the requirements for high power applications, two or more load modules can be paralleled together to achieve the desired loading. The 6310A comes with RS-232C as standard for remote control and automated testing applications, with USB and GPIB interfaces as optional items.

In addition, the 6310A through its synchronized controls provides an efficient solution for testing single output AC to DC or DC to DC converters by controlling multiple loads, testing upto 8 UUTs at a time.

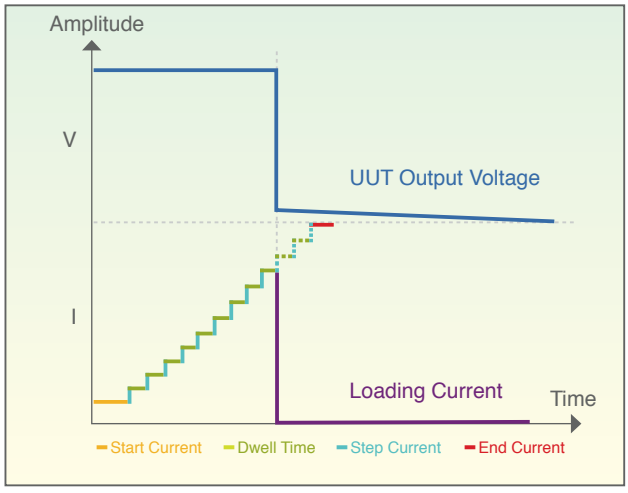
## POWERFUL MEASUREMENTS

Each 6310A load module has integrated a 15-bit precision A/D converter for voltage measurement with an accuracy of 0.05% +0.05% full scale. The built-in resistive load current sensing circuit is capable of measuring current in an accuracy of 0.1%+0.1% full scale. Also, short circuit can be simulated.All measurement is done using remote sensing to eliminate any error due to voltage drop along the measurement path.The user can also select a full setting range of voltage and current measurement according to application requirements.

## 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 OCP testing.

By 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 complete OCP testing solution. The 6310A series will automatically detect the OCP point, making it an ideal solution for design verification as well as in the production line.

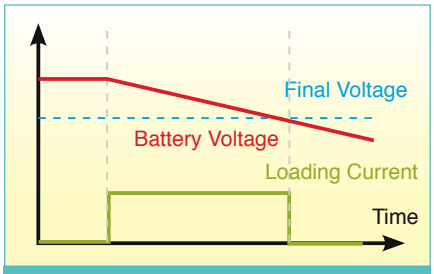


## TIMING FUNCTION

The 6310A series loads include a unique timing & measurement function allowing precise time measurements in the range of 60ms to 100,000s. This feature allows the users to set the final voltage & timeout values for battery discharge testing and other similar applications.

For example, the right figure shows that the 6310A's internal timer can be initiated automatically when the battery voltage falls below a preset value. The timer will continue counting until the second preset value is reached.

The Timing function can be used in testing battery and super capacitor discharge, fuse and breaker protection, rise time for ATX or D/D power supplies, and other similar applications.




Battery Discharge Testing

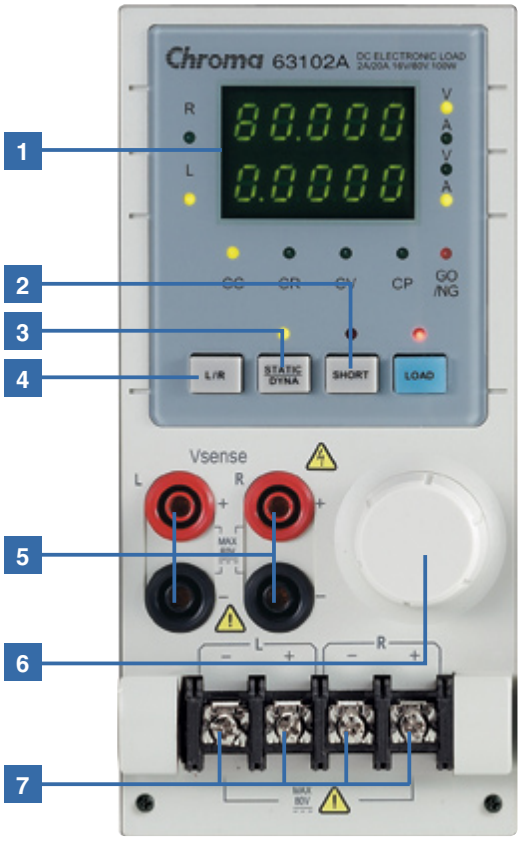
## DIGITAL I/O

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

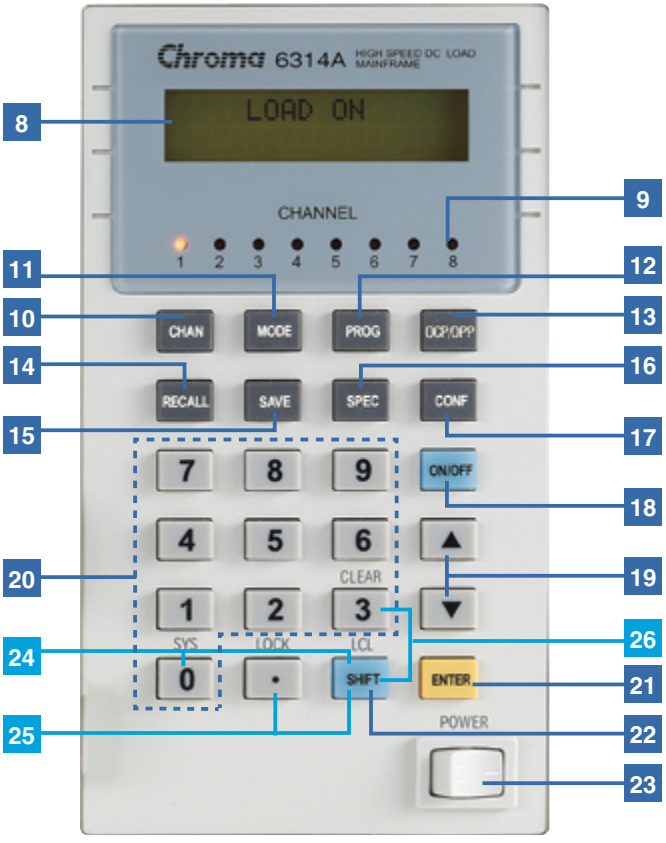
| Pin | Definition | Pin | Definition |
|---|---|---|---|
| Pin 1 | Reserved | Pin 9 | Short Signal (O/P) |
| Pin 2 | DGND | Pin 10 | Protection Signal (O/P) |
| Pin 3 | DGND | Pin 11 | External Load ON/OFF (I/P) |
| Pin 4 | DGND | Pin 12 | Reserved |
| Pin 5 | DGND | Pin 13 | OCP Trig. Run (I/P) |
|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

## PANEL DESCRIPTION

### Load Module




### Mainframe Controller



## Rear Panel


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**

## 6310A SERIES PROGRAMMABLE DC ELECTRONIC LOAD FAMILY



6314A : 4 in 1 Mainframe


6312A : 2 in 1 Mainframe


A631001: Remote Controller


A630002 : GPIB Interface

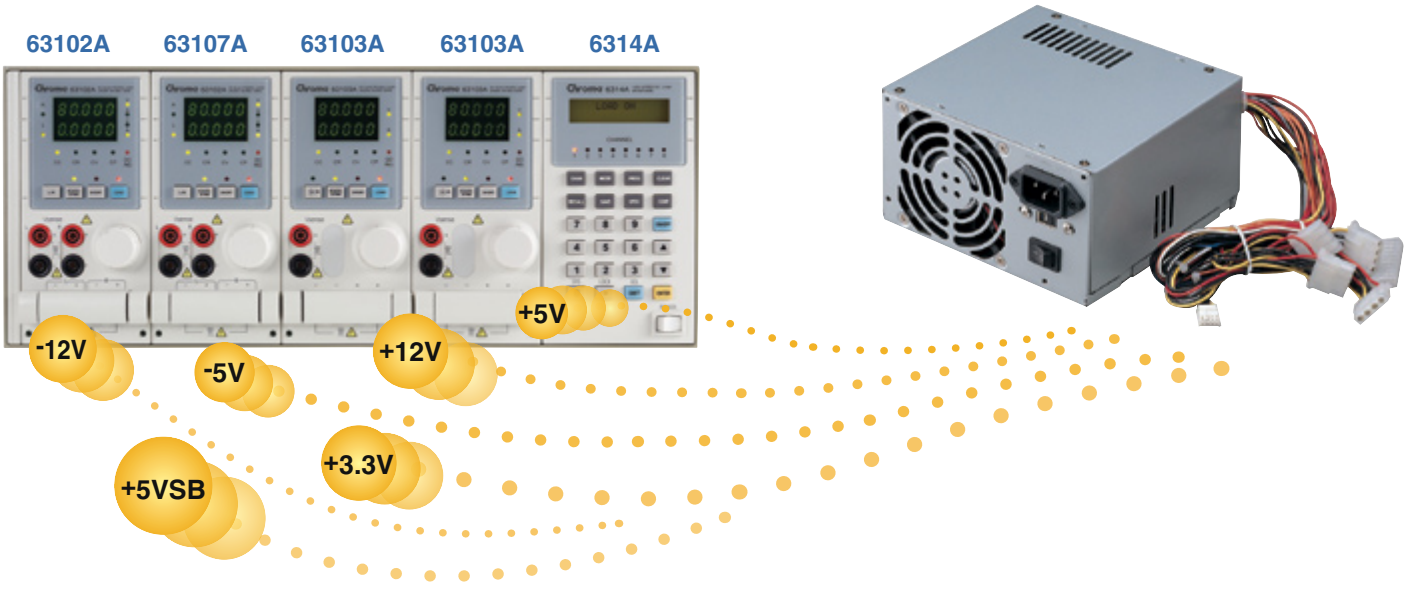

A631003 : USB Interface

## A MULTIPLE SELECTION FOR MULTIPLE OUTPUT SMPS TEST APPLICATION

Modern switching power supplies get more complicated with more outputs and control signals for PC or system requirements. Such as ATX power supply needs more channels in a load to simulate or test the output than the traditional AT power supply. No doubt, you really need a new solution for your test application! Chroma offers a broad selection of load modules and at most an 8-channel load in a standard mainframe. It is fit for any kinds of power supplies that require different Power, Current or Voltage, and also for testing the multiple output switching power supply.

**Product Lineup**

| Model | Power | Operation Voltage | Current |
|---|---|---|---|
| **63101A** | 200W | 0~80V | 40A |
| **63103A** | 300W | 0~80V | 60A |
| **63106A** | 600W | 0~80V | 120A |
| **63112A** | 1200W | 0~80V | 240A |
| **63102A** | 100W x 2 | 0~80V | 20A(Dual Channels) |
| **63107A** | 250W & 30W | 0~80V | 40A & 5A(Dual Channels) |
| **63105A** | 300W | 0~500V | 10A |
| **63108A** | 600W | 0~500V | 20A |





A more efficient solution to testing the single output AC to DC or DC to DC converters by synchronization control with multiple loads for testing 8 UUTs at one time.


*Testing 8 Units at one time*

## SPECIFICATIONS

| Model | 63101A | | 63102A (100Wx2) | | 63103A | | 63105A | |
|---|---|---|---|---|---|---|---|---|
| Power | 20W | 200W | 20W | 100W | 30W | 300W | 30W | 300W |
| Current | 0~4A | 0~40A | 0~2A | 0~20A | 0~6A | 0~60A | 0~1A | 0~10A |
| Voltage | 0~80V | | 0~80V | | 0~80V | | 0~500V | |
| Min. Operation Voltage (DC)*1 (Typical) | 0.4V@2A | 0.4V@20A | 0.4V@1A | 0.4V@10A | 0.4V@3A | 0.4V@30A | 1.0V@0.5A | 1.0V@5A |
| | 0.8V@4A | 0.8V@40A | 0.8V@2A | 0.8V@20A | 0.8V@6A | 0.8V@60A | 2.0V@1A | 2.0V@10A |
| **Constant Current Mode** | | | | | | | | |
| Range | 0~4A | 0~40A | 0~2A | 0~20A | 0~6A | 0~60A | 0~1A | 0~10A |
| Resolution | 1mA | 10mA | 0.5mA | 5mA | 1.5mA | 15mA | 0.25mA | 2.5mA |
| 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. | 0.1%+0.1%F.S. | 0.1%+0.2%F.S. |
| **Constant Resistance Mode** | | | | | | | | |
| Range | 0.0375Ω~150Ω (200W/16V)<br>1.875Ω~7.5kΩ (200W/80V) | | 0.075Ω~300Ω (100W/16V)<br>3.75Ω~15kΩ (100W/80V) | | 0.025Ω~100Ω (300W/16V)<br>1.25Ω~5kΩ (300W/80V) | | 1.25Ω~5Ω (300W/125V)<br>50Ω~200kΩ (300W/500V) | |
| Resolution | 12 bits | | 12 bits | | 12 bits | | 12 bits | |
| Accuracy | 150Ω : 0.1℧ + 0.2%<br>7.5kΩ : 0.01℧ + 0.1% | | 300Ω : 0.1℧ + 0.2%<br>15kΩ : 0.01℧ + 0.1% | | 100Ω : 0.1℧ + 0.2%<br>5kΩ : 0.01℧ + 0.1% | | 5kΩ : 20m℧ + 0.2%<br>200kΩ :5m℧ + 0.1% | |
| **Constant Voltage Mode** | | | | | | | | |
| Range | 1~80V | | 1~80V | | 1~80V | | 2.5~500V | |
| Resolution | 20mV | | 20mV | | 20mV | | 125mV | |
| Accuracy | 0.05% ± 0.1%F.S. | | 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 | 0~30W | 0~300W |
| Resolution | 5mW | 50mW | 5mW | 25mW | 7.5mW | 75mW | 7.5mW | 75mW |
| 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** | | | | | | | | |
| Dynamic Mode | C.C. Mode | | C.C. Mode | | C.C. Mode | | C.C. Mode | |
| T1 & T2 | 0.025ms ~ 50ms / Res: 5us<br>0.1ms ~ 500ms / Res: 25us<br>10ms ~ 50s / Res: 2.5ms | | 0.025ms ~ 50ms / Res: 5us<br>0.1ms ~ 500ms / Res: 25us<br>10ms ~ 50s / Res: 2.5ms | | 0.025ms ~ 50ms / Res: 5us<br>0.1ms ~ 500ms / Res: 25us<br>10ms ~ 50s / Res: 2.5ms | | 0.025ms ~ 50ms / Res: 5us<br>0.1ms ~ 500ms / Res: 25us<br>10ms ~ 50s / Res: 2.5ms | |
| Accuracy | 1μs/1ms+100ppm | | 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 | 0.16~40mA/μs | 1.6~400mA/μs |
| Resolution | 0.64mA/μs | 6.4mA/μs | 0.32mA/μs | 3.2mA/μs | 0.001A/μs | 0.01A/μs | 0.16mA/μs | 1.6mA/μs |
| Min. Rise Time | 10μs (Typical) | | 10μs (Typical) | | 10μs (Typical) | | 24μs (Typical) | |
| Current | 0~4A | 0~40A | 0~2A | 0~20A | 0~6A | 0~60A | 0~1A | 0~10A |
| Resolution | 1mA | 10mA | 0.5mA | 5mA | 1.5mA | 15mA | 0.25mA | 2.5mA |
| Current Accuracy | 0.4%F.S. | | 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 | 0~125V | 0~500V |
| Resolution | 0.5mV | 2.5mV | 0.5mV | 2.5mV | 0.5mV | 2.5mV | 4mV | 16mV |
| Accuracy | 0.05% + 0.05%F.S. | | 0.05% + 0.05%F.S. | | 0.05% + 0.05%F.S. | | 0.05% + 0.05%F.S. | |
| **Current Read Back** | | | | | | | | |
| Range | 0~4A | 0~40A | 0~2A | 0~20A | 0~6A | 0~60A | 0~1A | 0~10A |
| Resolution | 0.125mA | 1.25mA | 0.0625mA | 0.625mA | 0.1875mA | 1.875mA | 0.032mA | 0.320mA |
| Accuracy | 1mA | 10mA | 0.5mA | 5mA | 1.5mA | 15mA | 0.25mA | 2.5mA |
| Current 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. | |
| **Protective Section** | | | | | | | | |
| Over Power Protection | ≒20.8W | ≒208W | ≒20.8W | ≒104W | ≒31.2W | ≒312W | ≒31.2W | ≒312W |
| Over Current Protection | ≒4.08A | ≒40.8A | ≒2.04A | ≒20.4A | ≒6.12A | ≒61.2A | ≒1.02A | ≒10.2A |
| Over Temperature Protection | ≒85°C | | ≒85°C | | ≒85°C | | ≒85°C | |
| Over Voltage Protection | ≒81.6V | | ≒81.6V | | ≒81.6V | | ≒510V | |
| **General** | | | | | | | | |
| **Short Circuit** | | | | | | | | |
| Current (CC) | - | ≒40A | - | ≒20A | - | ≒60A | - | ≒10A |
| Voltage (CV) | - | 0V | - | 0V | - | 0V | - | 0V |
| Resistance (CR) | - | ≒0.0375Ω | - | ≒0.075Ω | - | ≒0.025Ω | - | ≒1.25Ω |
| Power (CP) | - | ≒200W | - | ≒100W | - | ≒300W | - | ≒300W |
| **Input Resistance (Load Off)** | 100kΩ (Typical) | | 100kΩ (Typical) | | 100kΩ (Typical) | | 100kΩ (Typical) | |
| **Temperature Coefficient** | 100PPM/°C (Typical) | | 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 | |
| **Dimensions (WxHxD)** | 81 x 172 x 495 mm | | 81 x 172 x 495 mm | | 81 x 172 x 495 mm | | 81 x 172 x 495 mm | |
| **Weight** | 4.2 kg | | 4.2 kg | | 4.2 kg | | 4.2 kg | |
| **Operating Range** | 0~40°C | | 0~40°C | | 0~40°C | | 0~40°C | |
| **EMC & Safety** | CE | | CE | | CE | | CE | |

| Mainframe Model | 6312A | 6314A |
|---|---|---|
| Dimensions(WxHxD) | 275x177x543mm | 439x177x543mm |
| Weight | 15kg | 22kg |

continued on next page...

| Model | 63106A | | 63107A (30W & 250W) | | | 63108A | | 63112A | |
|---|---|---|---|---|---|---|---|---|---|
| Power | 60W | 600W | 30W | 30W | 250W | 60W | 600W | 120W | 1200W |
| Current | 0~12A | 0~120A | 0~5A | 0~4A | 0~40A | 0~2A | 0~20A | 0~24A | 0~240A |
| Voltage | 0~80V | | 0~80V | | | 0~500V | | 0~80V | |
| Min. Operation Voltage (DC)*1 (Typical) | 0.4V@6A | 0.4V@60A | 0.4V@2.5A | 0.4V@2A | 0.4V@20A | 1.0V@1A | 1.0V@10A | 0.4V@12A | 0.4V@120A |
| | 0.8V@12A | 0.8V@120A | 0.8V@5A | 0.8V@4A | 0.8V@40A | 2V@2A | 2V@20A | 0.8V@24A | 0.8V@240A |
| **Constant Current Mode** | | | | | | | | | |
| Range | 0~12A | 0~120A | 0~5A | 0~4A | 0~40A | 0~2A | 0~20A | 0~24A | 0~240A |
| Resolution | 3mA | 30mA | 1.25mA | 1mA | 10mA | 0.5mA | 5mA | 6mA | 60mA |
| Accuracy | 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. | 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 | 12.5mΩ~ 50Ω (600W/16V)<br>0.625Ω~2.5kΩ (600W/80V) | | 0.3Ω~1.2kΩ (30W/16V)<br>15Ω~60kΩ (30W/80W) | | 0.0375Ω~150Ω (250W/16V)<br>1.875Ω~7.5kΩ (250W/80V) | 0.625Ω~2.5kΩ (600W/125V)<br>25Ω~100kΩ (600W/500V) | | 6.25mΩ~25Ω (1200W/16V)<br>0.3125Ω~1.25kΩ (1200W/80V) | |
| Resolution | 12 bits | | 12 bits | | 12 bits | 12 bits | | 12 bits | |
| Accuracy | 50Ω: 0.4ʊ + 0.5%<br>2.5kΩ: 0.04ʊ + 0.2% | | 1.2kΩ: 0.1ʊ + 0.2%<br>60kΩ: 0.01ʊ + 0.1% | | 150Ω: 0.1ʊ + 0.2%<br>7.5kΩ: 0.01ʊ + 0.1% | 25kΩ: 50mʊ+ 0.2%<br>100kΩ: 5mʊ+ 0.1% | | 25Ω: 0.8ʊ+ 0.8%<br>1.25kΩ: 0.08ʊ+ 0.2% | |
| **Constant Voltage Mode** | | | | | | | | | |
| Range | 1~80V | | 1~80V | | | 2~500V | | 1~80V | |
| Resolution | 20mV | | 20mV | | | 125mV | | 20mV | |
| Accuracy | 0.05% ± 0.1%F.S. | | 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 | 0~30W | 0~30W | 0~250W | 0~60W | 0~600W | 0~120W | 0~1200W |
| Resolution | 15mW | 150mW | 7.5mW | 7.5mW | 62.5mW | 15mW | 150mW | 30mW | 300mW |
| 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** | | | | | | | | | |
| Dynamic Mode | C.C. Mode | | C.C. Mode | | | C.C. Mode | | C.C. Mode | |
| T1 & T2 | 0.025ms~10ms/Res:1μs<br>1ms~30s/Res:1ms | | 0.025ms~10ms/Res:1μs<br>1ms~30s/Res:1ms | | | 0.025ms~10ms/Res:1μs<br>1ms~30s/Res:1ms | | 0.025ms~10ms/Res:1μs<br>1ms~30s/Res:1ms | |
| Accuracy | 1μs/1ms+100ppm | | 1μs/1ms+100ppm | | | 1μs/1ms+100ppm | | 1μs/1ms+100ppm | |
| Slew Rate | 0.002~0.5A/μs | 0.02~5A/μs | 0.8~200mA/μs | 0.64~160mA/μs | 64~1600mA/μs | 0.32~80mA/μs | 3.2~800mA/μs | 0.004~1A/μs | 0.04~10A/μs |
| Resolution | 0.002A/μs | 0.02A/μs | 0.8mA/μs | 0.64mA/μs | 64mA/μs | 0.32mA/μs | 3.2mA/μs | 0.004A/μs | 0.04A/μs |
| Min. Rise Time | 10μs (Typical) | | 10μs (Typical) | | | 24μs (Typical) | | 10μs (Typical) | |
| Current | 0~12A | 0~120A | 0~5A | 0~4A | 0~40A | 0~2A | 0~20A | 0~24A | 0~240A |
| Resolution | 3mA | 30mA | 1.25mA | 1mA | 10mA | 0.5mA | 5mA | 6mA | 60mA |
| Current Accuracy | 0.4%F.S. | | 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 | 0~125V | 0~500V | 0~16V | 0~80V |
| Resolution | 0.5mV | 2.5mV | 0.5mV | 2.5mV | 0.5mV | 2.5mV | 4mV | 16mV | 0.5mV | 2.5mV |
| Accuracy | 0.05% + 0.05%F.S. | | 0.05% + 0.05%F.S. | | | 0.05% + 0.05%F.S. | | 0.05% + 0.05%F.S. | |
| **Current Read Back** | | | | | | | | | |
| Range | 0~12A | 0~120A | 0~5A | 0~4A | 0~40A | 0~2A | 0~20A | 0~24A | 0~240A |
| Resolution | 0.375mA | 3.75mA | 0.15625mA | 0.125mA | 1.25mA | 0.375mA | 0.625mA | 0.75mA | 7.5mA |
| Accuracy | 3mA | 30mA | 1.25mA | 1mA | 10mA | 0.5mA | 5mA | 6mA | 60mA |
| Current Accuracy | 0.1% + 0.1%F.S. | | 0.1% + 0.1%F.S. | | | 0.1% + 0.1%F.S. | | 0.15% + 0.15%F.S. | |
| **Protective Section** | | | | | | | | | |
| Over Power Protection | ≒62.4W | ≒624W | ≒31.2W | ≒31.2W | ≒260W | ≒62.4W | ≒624W | ≒124.8W | ≒1248W |
| Over Current Protection | ≒12.24A | ≒122.4A | ≒5.1A | ≒4.08A | ≒40.8A | ≒2.04A | ≒20.4A | ≒24.48A | ≒244.8A |
| Over Temperature Protection | ≒85°C | | ≒85°C | | | ≒85°C | | ≒85°C | |
| Over Voltage Protection | ≒81.6V | | ≒81.6V | | | ≒510V | | ≒81.6V | |
| **General** | | | | | | | | | |
| **Short Circuit** | | | | | | | | | |
| Current (CC) | - | ≒120A | - | - | ≒40A | - | ≒20A | - | ≒240A |
| Voltage (CV) | - | 0V | - | - | 0V | - | 0V | - | 0V |
| Resistance (CR) | - | ≒0.0125Ω | - | - | ≒0.0375Ω | - | ≒0.625Ω | - | ≒0.00625Ω |
| Power (CP) | - | ≒600W | - | - | ≒250W | - | ≒600W | - | ≒1200W |
| **Input Resistance(Load Off)** | 100kΩ (Typical) | | 100kΩ (Typical) | | | 100kΩ (Typical) | | 100kΩ (Typical) | |
| **Temperature Coefficient** | 100PPM/°C (Typical) | | 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 | |
| **Dimensions (WxHxD)** | 162 x 172 x 495 mm | | 81 x 172 x 495 mm | | | 162 x 172 x 495 mm | | 324 x 172 x 495 mm | |
| **Weight** | 8.4 kg | | 4.5 kg | | | 8.4 kg | | 16.8 kg | |
| **Operating Range** | 0~40°C | | 0~40°C | | | 0~40°C | | 0~40°C | |
| **EMC & Safety** | CE | | CE | | | CE | | CE | |

**NOTE*1** :
Low voltage operation, under 0.8 volt, is possible at correspondingly reduced current level.
Operating temperature range is 0ºC to 40ºC. All specifications apply for 25ºC±5ºC, except as noted.

All specifications are subject to change without notice.

## ORDERING INFORMATION

**6312A** : Mainframe for 2 Load Modules
**6314A** : Mainframe for 4 Load Modules
**63101A** : Load Module 40A/80V/200W
**63102A** : Load Module 20A/80V/100Wx2 channels
**63103A** : Load Module 60A/80V/300W
**63105A** : Load Module 10A/500V/300W
**63106A** : Load Module 120A/80V/600W
**63107A** : Load Module 5A&40A/80V/30W&250W
**63108A** : Load Module 20A/500V/600W
**63112A** : Load Module 240A/80V/1200W
**A630002** : GPIB Interface for Model 6314A, 6312A
**A631003** : USB Interface for Model 6314A, 6312A
**A631001** : Remote Controller
**A631002** : Test Fixture
**A631004** : Softpanel


Developed and Manufactured by :

**CHROMA ATE INC.**
致茂電子股份有限公司
**HEADQUARTERS**
66, Hwa-Ya 1st Rd., Hwa-Ya Technology Park, Kuei-Shan Hsiang, Taoyuan Hsien 33383, Taiwan
Tel: +886-3-327-9999
Fax: +886-3-327-8898
http://www.chromaate.com
E-mail: chroma@chroma.com.tw

**U.S.A.**
**CHROMA ATE INC. (U.S.A.)**
7 Chrysler Irvine, CA 92618
Tel: +1-949-421-0355
Fax: +1-949-421-0353
Toll Free: +1-800-478-2026

**EUROPE**
**CHROMA ATE EUROPE B.V.**
Morsestraat 32
NL-6716 AH Ede
The Netherlands
Tel: +31-318-648282
Fax: +31-318-648288

**CHINA**
**CHROMA ELECTRONICS (SHENZHEN) CO., LTD.**
8F, No.4, Nanyou Tian An Industrial Estate, Shenzhen, China PC: 518054
Tel: +86-755-2664-4598
Fax: +86-755-2641-9620

Distributed by:


Worldwide Distribution and Service Network


6310A-200808-PDF