Low Operating Voltage | High Current Density | High Slew Rate

MODEL 63202A-20-1000
63202A-20-2000

KEY FEATURES

- Rated power: 2kW
- Voltage range: 0 - 20V
- Current range: 1,000A/2,000A
- 0.25V@2,000A Low Voltage operating characteristics
- CC, CR, CV & CP operation modes
- 255 programmable sequences
- User-Defined Waveforms (UDW)
- External signal control for current simulation
- Low-inductance terminal design
- Low-Inductance Load Cable (Optional, under patent examination)
- Standard USB interface
- Optional GPIB, Ethernet, CAN BUS interface

ULTRA LOW VOLTAGE DC ELECTRONIC LOAD MODEL 63202A-20-1000 / 63202A-20-2000

The Chroma 63202A-20 Ultra Low Voltage DC Electronic Load series includes two models: 63202A-20-1000 and 63202A-20-2000. This series is ideal for the design, testing, and validation of point-of-load converters (POLs), embedded DC-DC converters, and voltage regulator modules (VRMs), critical devices that provide the appropriate supply voltage for CPUs and GPUs.

This new generation of low-voltage, high-current DC loads features an innovative low-inductance terminal design that reduces internal inductance and impedance while improving response speed, making these loads particularly well-suited for power supply products below 1.0V. The output copper busbar is equipped with multiple mounting points for added convenience.

The 63202A-20 series boasts outstanding low-voltage characteristics, capable of drawing its rated current at a low voltage of 0.25V. This makes it a perfect fit for testing DC-DC converters and other products requiring low voltage and high current.

This electronic load offers various basic modes of operation, including constant voltage, constant current, constant resistance, and constant power modes. Additionally, the series supports User Defined Waveforms (UDW) and external signal control functions, enabling accurate simulation of real current waveforms to meet more complex testing needs.

The unit can be intuitively configured via the front panel display and control knob, or remotely through USB, Ethernet, GPIB, or CAN.

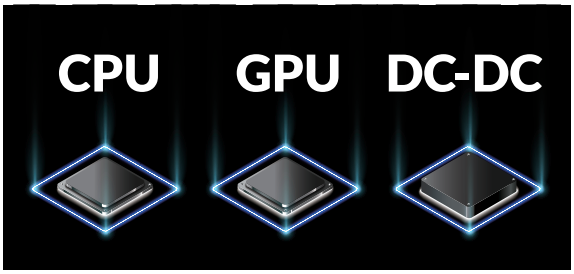
The 63202A-20 features three fan control modes, allowing users to choose between noise reduction or rapid cooling according to the application environment. Quiet Mode operates at just 55dB, making it suitable for R&D laboratory environments. The load is also equipped with over-current, over-power, and over-temperature protection, as well as an overvoltage alarm mechanism, providing a safe and reliable solution for both development and test applications.

USB | Ethernet LXI | GPIB | CAN BUS | CE | RoHS2 Compliant

Chroma
Advancing Excellence

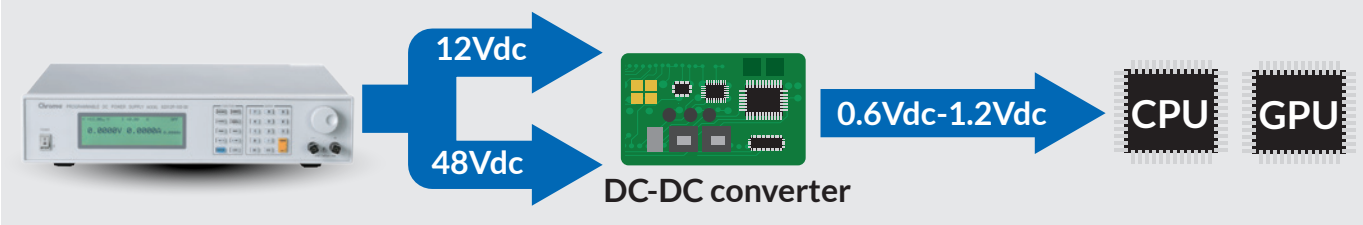
APPLICATIONS

The 63202A-20 series is specifically designed for testing the power supplies of CPUs (VCORE) and GPUs. These electronic loads can accurately simulate the power supplies' load characteristics and conduct reliable tests on Voltage Regulator Modules (VRM), Voltage Regulator Down (VRD), Point of Load (POL) converters, and embedded DC-DC converters. The 63202A-20 incorporates a low-inductance design that effectively reduces internal inductance and impedance while increasing response speed.



In the power supply sequence for CPUs and GPUs, a 12V or 48V input is typically converted by a DC-DC converter to a voltage of 0.6V-1.2V. For the front end of DC-DC converters, Chroma's 62000P series is recommended, as it offers 40V/120A/1,200W and 80V/60A/2,400W output capabilities well-suited for this application. The output voltage range of the DC-DC modules is approximately 0.6V-1.2V. The 63202-20 series provides loading capabilities of 20V/1,000A/2kW and 20V/2,000A/2kW, making it particularly suitable for test applications involving low voltage and high current.

CPU & GPU Power Sequencing



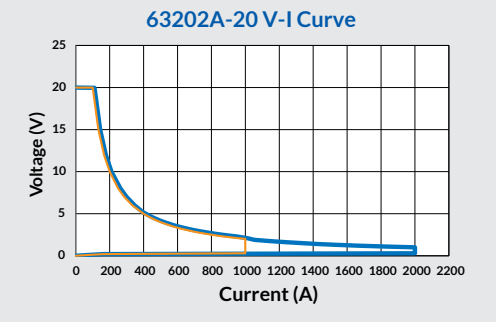
LOW-INDUCTANCE FRONT BUSBAR TERMINALS

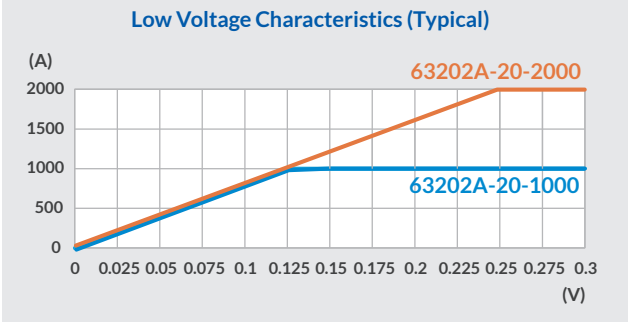
The novel terminal design improves on the last generation's 63200A by moving the output from the rear to the front panel. The positive and negative terminals are placed close together, with an isolating plastic cover placed in between to prevent short circuits. The positive and negative busbars on each side are interconnected, increasing the contact area between them to reduce inductance. In addition, the load terminals are equipped with multiple locking points for extra convenience.

63202A-20 Load terminal

LOW-VOLTAGE OPERATING CHARACTERISTICS

The Ultra Low Voltage DC electronic load features excellent low-voltage characteristics. The 63202A-20-2000 model has a load terminal minimum operating voltage as low as 0.25V and a rated current of up to 2,000A at this voltage. Note that if a wiring-induced voltage drop causes the load terminal to fall below 0.25V, it will not be able to provide a current of 2,000A. The device can draw current all the way down to the 0.25V - 0V range while maintaining stable performance. Refer to the low-voltage operating characteristics V-I curve chart below for more details*.

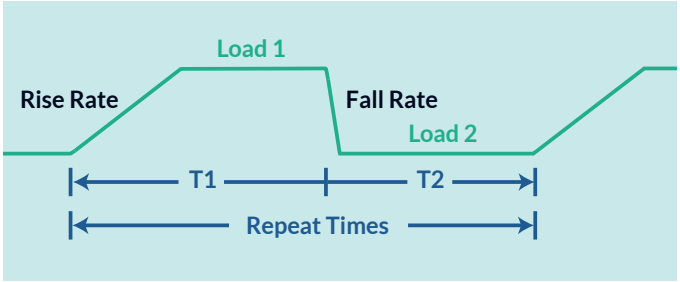




Note: Due to the specification range of the RDS(on) of internal power components, there are variations in the actual loadable current values for each load when the operating voltage is below the minimum operating voltage.

DYNAMIC LOAD

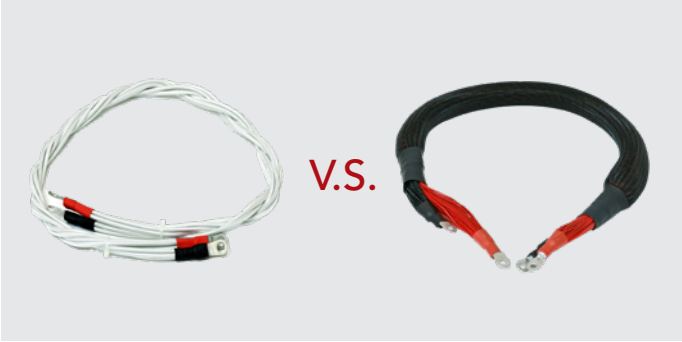
Transient response testing is a basic requirement for power supply testing. Sudden changes in load current can cause the output voltage overshoot or undershoot, resulting in system malfunction or damage to components. The 63202A-20 offers a programmable dynamic current load (CCD) mode with a current slew rate of up to 60A/μs and a minimum operating voltage at the load terminal of 0.5V. The minimum response time for current ramp-up is 20μs. Programmable settings include high/low current levels, T1/T2, rise/fall rates, and execution times. It is also possible to set a repetition frequency ranging from 1 to 65,535 times, and peak load simulation is suitable for testing the transient load capabilities of DC-DC converters.



Programmable parameters

LOW-INDUCTANCE CABLES (OPTIONAL)

Chroma's newly patented low-inductance cables, compared to conventional coolant cables with the same 60cm (23.6") length (inductance 310nH / impedance 8.4mΩ), reduce inductance and impedance down to 105nH and 2.5mΩ respectively. This significant reduction effectively mitigates dynamic response issues caused by inductance and minimizes voltage drops due to impedance. As a result, the electronic load maintains stable operation even in low-voltage applications.



Coolant cable

Low-inductance cable

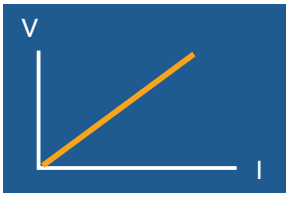
63202A-20 with low-inductance cables

BASIC LOAD APPLICATIONS

The 63202A-20 features four modes of operation: constant voltage (CV), constant current (CC), constant resistance (CR), and constant power (CP). These operating modes offer both the flexibility and precision required to meet a wide range of testing needs. CC mode is particularly important for testing voltage source products, as it can verify whether the device under test (DUT) can maintain stable output voltage under different load conditions. CR mode is often used for voltage source soft-start testing, confirming the voltage behavior of the DUT at power-on. CV mode can adjust its output voltage to ensure current accuracy at the set output voltage. Lastly, CP mode is ideal for simulating the load behavior of electronic devices, allowing for precise analysis of other power consumption applications.

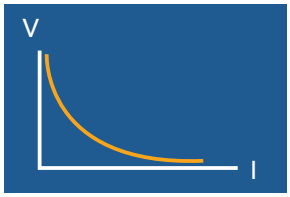
CC Mode

CR Mode



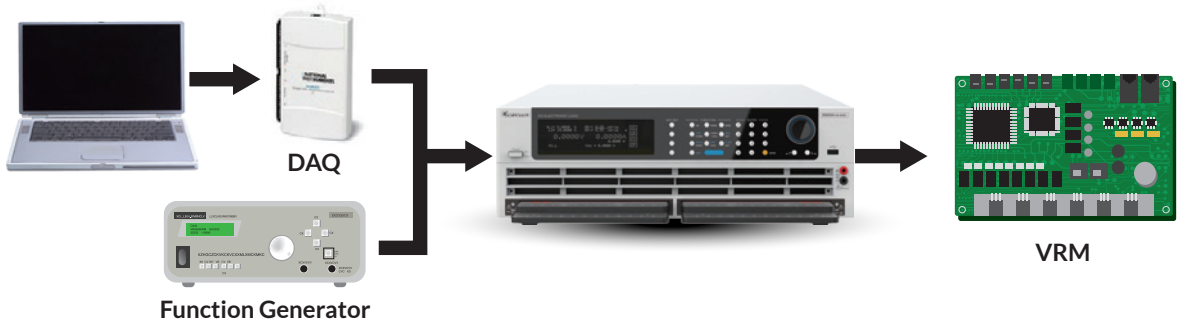
CV Mode

CP Mode



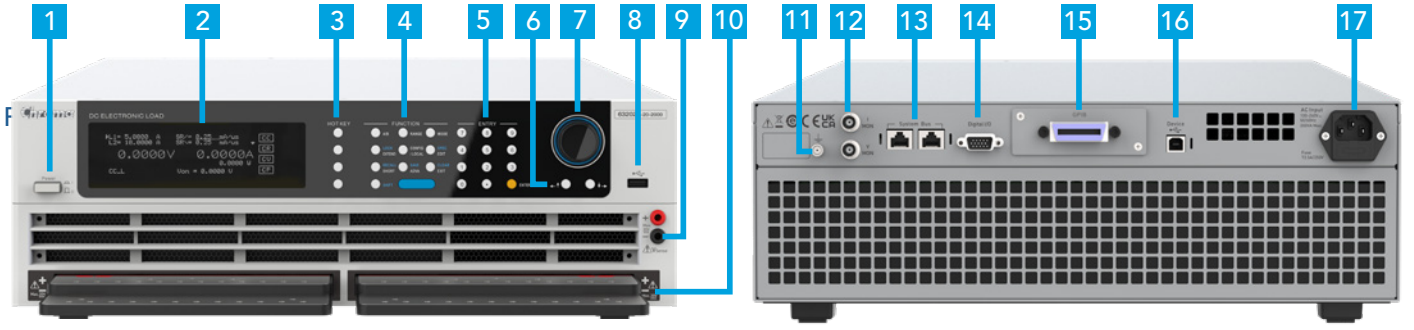
USER-DEFINED WAVEFORM FUNCTION

Besides the basic load modes discussed earlier, loading of specific waveforms traditionally involved using a DAQ card or function generator to send pre-stored waveforms to the electronic load through a PC.



Improving on this legacy solution, the 63202A-20 offers a user-defined waveform (UDW)* function to enable accurate simulation of real load currents. This allows the user to easily store actual current waveform data captured by an oscilloscope or custom-edited waveforms in the unit's internal memory via software, with support for a total of 1.5 million waveform points. This can be a great cost-saver by eliminating the need for DAQ cards and waveform generators. When an application requires simulation of more complex waveforms, users can easily load the desired arbitrary waveforms by accessing the UDW function via the 63200A's intuitive graphical operating software.

* The user-defined waveform (UDW) specifications are the same as those for the dynamic current load (CCD) mode.



1. Power Switch: AC power switch for the electronic load mainframe
2. OLED Display: Displays settings and data
3. Shortcut Keys: Quick access keys for switching load modes
4. Function Keys: A/B, RANGE, MODE, EXTEND, LOCK, CONFIG./ LOCAL, EDIT, SPEC, SHORT, RECALL, ADVA, SAVE, CLEAR
5. ENTRY Keys: Numeric keys and ENTER key
6. Direction Keys: Used to edit screen and navigate lists
7. Multi-function Rotary Knob: Press to enter parameter editing mode; press again to confirm the values entered
8. USB HOST: For import/export of user-defined waveforms and program data settings, and exporting error logs
9. Remote Sense Terminal
10. Positive and Negative Load Terminals:
    Upper busbar = positive, lower busbar = negative
11. Ground Terminal
12. Voltage & Current Monitoring Output:
    Proportional analog output of voltage and current waveforms
13. System Bus*:
    For data transmission in master/slave control systems
14. System I/O: For system input/output control signals
15. Shared Slot for GPIB/Ethernet/CAN BUS Card
16. USB Port
17. AC Input Connector

* Please contact Chroma for details.

SPECIFICATIONS

Models*1	63202A-20-1000			63202A-20-2000		
Voltage*2	0-20V			0-20V		
Current	0-250A	0-500A	0-1,000A	0-500A	0-1,000A	0-2,000A
Power	0-500W	0-1,000W	0-2,000W	0-500W	0-1,000W	0-2,000W
Static Mode						
Min. Operating Voltage (DC)*3	0.125V@1,000A			0.25V@2,000A		
Constant Current Mode						
Range	0-250A	0-500A	0-1,000A	0-500A	0-1,000A	0-2,000A
Resolution	5mA	10mA	20mA	5mA	10mA	20mA
Accuracy	0.05%+0.05%F.S.			0.05%+0.05%F.S.		
Constant Resistance Mode						
Range	0.0002Ω-2Ω (4V/2kW) 0.012Ω-120Ω (10V/2kW) 0.1Ω-1000Ω (20V/2kW)			0.0001Ω-1Ω (4V/2kW) 0.006Ω-60Ω (10V/2kW) 0.05Ω-500Ω (20V/2kW)		
Resolution	0.01mΩ	0.1mΩ	1mΩ	0.01mΩ	0.1mΩ	1mΩ
Accuracy	Vin/Rset*(0.2%)+0.2% IF.S.			Vin/Rset*(0.2%)+0.2% IF.S.		
Constant Voltage Mode						
Range	0-4V	0-10V	0-20V	0-4V	0-10V	0-20V
Resolution	0.1mV	0.2mV	0.35mV	0.1mV	0.2mV	0.35mV
Accuracy	0.025%+0.025%F.S.			0.025%+0.025%F.S.		
Constant Power Mode						
Range	0-500W	0-1,000W	0-2,000W	0-500W	0-1,000W	0-2,000W
Resolution	5mW	20mW	50mW	5mW	20mW	50mW
Accuracy *4	0.2%+0.2%F.S.			0.2%+0.2%F.S.		
Dynamic Mode						
Min. Operating Voltage*5	0.5V			0.5V		
T1 & T2	0.010ms~99.999ms / 100ms~99,999ms					
Resolution	1μs / 1ms					
Accuracy	1μs + 100ppm					
Slew Rate	5mA/μs-12.5A/μs	10mA/μs-25A/μs	20mA/μs-50A/μs	5mA/μs-25A/μs	10mA/μs-50A/μs	20mA/μs-60A/μs
Resolution	5mA/μs	10mA/μs	20mA/μs	5mA/μs	10mA/μs	20mA/μs
Accuracy	5% ± 10μs			5% ± 10μs		
Min. Rise Time	20μs (Typical)*6			20μs (Typical)*7		
Current						
Range	0-250A	0-500A	0-1,000A	0-500A	0-1,000A	0-2,000A
Resolution	5mA	10mA	20mA	5mA	10mA	20mA
Accuracy	0.2%F.S.			0.2%F.S.		
Measurement						
Voltage Read Back						
Range	0-4V	0-10V	0-20V	0-4V	0-10V	0-20V
Resolution	0.1mV	0.2mV	0.35mV	0.1mV	0.2mV	0.35mV
Accuracy	0.015%+0.015%F.S.			0.015%+0.015%F.S.		
Current Read Back						
Range	0-250A	0-500A	0-1,000A	0-500A	0-1,000A	0-2,000A
Resolution	10mA	20mA	35mA	10mA	20mA	35mA
Accuracy	0.05%+0.05%F.S.			0.05%+0.05%F.S.		
Power Read Back						
Range	0-2,000W			0-2,000W		
Resolution *4	0.1%+0.1%F.S.			0.1%+0.1%F.S.		
Program mode						
Sequence No.	255 / Program			255 / Program		
Dwell / SEQ	0.1ms-30s (Resolution: 0.1ms)			0.1ms-30s (Resolution: 0.1ms)		
Load Setting	Refer to Static mode specifications			Refer to Static mode specifications		

• Continued on next page ➟

SPECIFICATIONS

Models*1	63202A-20-1000	63202A-20-2000
Protection		
Over Current	Yes (Settable)	
Over Power	Yes (Settable)	
Over Temperature	Yes	
Over Voltage Alarm	Yes	
Reverse Alarm	Yes	
Interface		
Standard	Front USB (Host), Rear USB (Device)	
Option	Ethernet / LXI, GPIB, CAN BUS	
General		
Input Resistance (Load Off)	530kΩ(Typical)	
Dimension (HxWxD)*8	132.4 x 428 x 600mm / 5.21 x 16.85 x 23.62 inch	
Weight	45kg / 99.2lbs	
Operating Temperature	0-40℃	
Line Voltage	100-240VAC, 50/60Hz	
EMC & Safety	CE	

Note*1: The specifications are guaranteed to meet specified performance at the temperature range of 25±5℃.
Note*2: If the operating voltage exceeds the rated voltage by 1.1 times, it will cause permanent damage to the device.
Note*3: Due to the specification range of the RDS(on) of internal power components, there are variations in the actual loadable current values for each load when the operating voltage is below the minimum operating voltage.
Note*4: Power F.S. = Vrange F.S.×Irange F.S.
Note*5: Overshoot≦10%. Testing conditions: Cable impedance of 18nH/80μΩ, current range of 20-2,000A, and current slew rate of 20A/μs.
Note*6: The minimum load current must be greater than 2% F.S., and the current change must be greater than 280A to meet the specifications.
Note*7: The minimum load current must be greater than 1% F.S., and the current change must be greater than 280A to meet the specifications.
Note*8: The height indicated does not include the footpad height of 17.8mm/0.7 inches and the depth does not include the output copper busbar of 82.25mm/3.2 inches.
* All specifications are subject to change without notice.

ORDERING INFORMATION

63202A-20-1000: Ultra Low Voltage DC Electronic Load 20V / 1,000A / 2kW
63202A-20-2000: Ultra Low Voltage DC Electronic Load 20V / 2,000A / 2kW
62012P-40-120: Programmable DC Power Supply 40V/120A/1,200W
62012P-80-60: Programmable DC Power Supply 80V/60A/1,200W
62024P-40-120: Programmable DC Power Supply 40V / 120A / 2,400W
62024P-80-60: Programmable DC Power Supply 80V / 60A / 2,400W
A632000: SoftPanel for 63200A Series
A636000: GPIB interface
A636010: Ethernet interface
A600009: GPIB Cable (200cm)
A600010: GPIB Cable (60cm)
B632008: Low inductance cable (500A/1m)
B63202009: Low Inductance Cable (100A/0.6m)
B63202010: Low Inductance Cable (100A/1m)

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