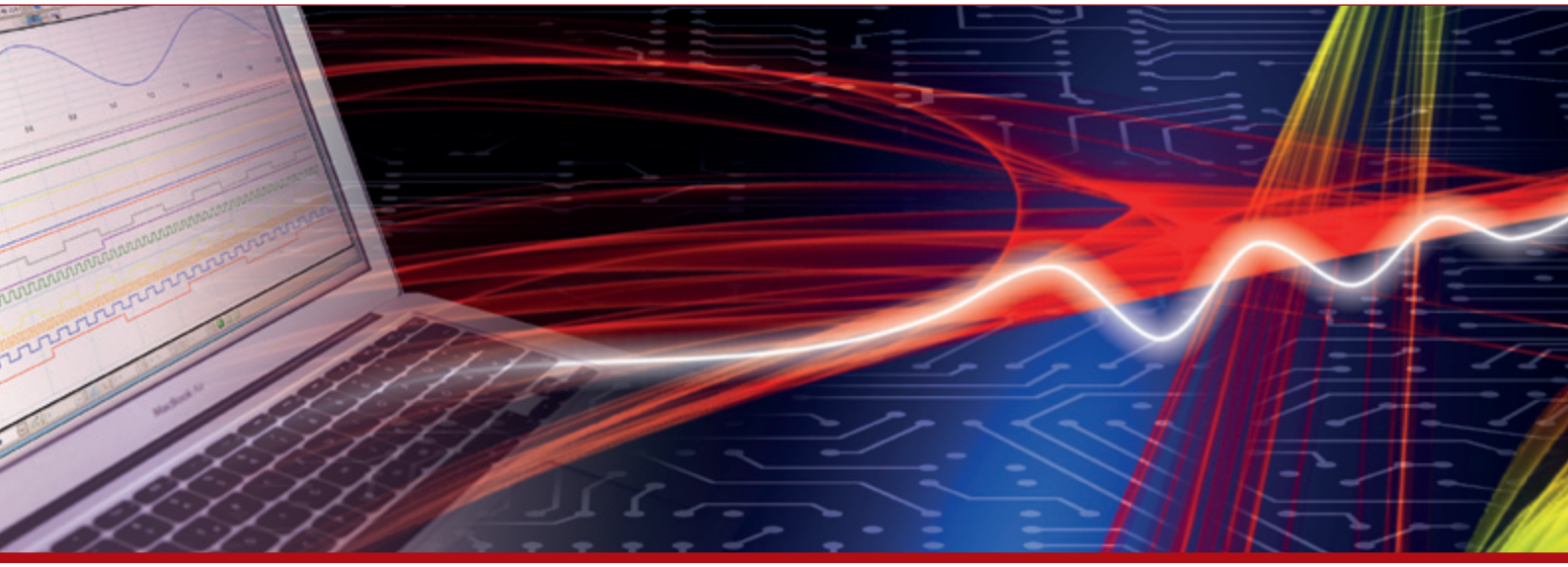
Product Datasheet - Technical Specifications



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Data Sheet

Modular System DC Power Supplies

MPS Series

The MPS Series Modular System DC Power Supplies provide up to four output channels and 1200 W in a compact 1U form factor. Select from eight different modules with various voltage and current ratings to create a 1 to 4 channel DC power supply ideal for ATE system applications.

The modules are capable of outputting 100 W (multi-range) or 300 W (fixed range) to meet different power requirements. Populate mainframes with any combination of modules to deliver a total output power of 600 W or 1200 W depending on the mainframe model.

The MPS Series supports synchronization between installed modules where multiple outputs can be enabled in a sequence, as well as synchronization between mainframes.

Similarly, advanced list mode programming makes it easy to output complex sequences from the front panel. Operating software and battery test software are provided for remote PC control and monitoring. This series includes USB (USBTMC-compliant), LAN (LXI), and GPIB interfaces standard supporting SCPI commands.

Applications

The MPS Series is a comprehensive ATE system solution in R&D, production test, and manufacturing operations requiring multiple outputs. The low-profile, modular design offers increased throughput for repetitive testing and validation applications.

Mainframe

Model	MPS1000	MPS1001
Total Available Power	600 W	1200 W
Number of Slots	4	
Form Factor	1U	

100 W Modules

Model	MPS1101	MPS1102	MPS1103	MPS1104
Rated Voltage	15 V	32 V	60 V	100 V
Rated Current	20 A	9.5 A	5 A	3 A
Ranging	Multi-range (autoranging)			

300 W Modules

Model	MPS1301	MPS1302	MPS1303	MPS1304
Rated Voltage	15 V	32 V	60 V	100 V
Rated Current	20 A	9.5 A	5 A	3 A
Ranging	Fixed range			

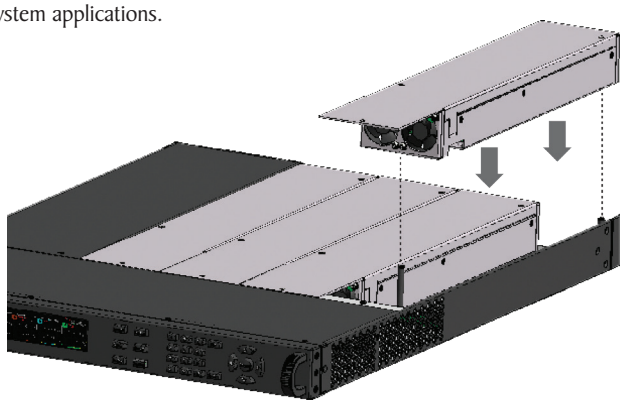
Features and benefits

- Compact size supports up to four outputs in a 1U form factor
- Modular design
- Multi-ranging operation delivers rated power at multiple voltage/current combinations
- Advanced list mode programming
- Series/parallel operation increases maximum voltage/current output to 400 V or 80 A (depending on model)
- Module synchronization and output coupling
- Clean output power
- Overvoltage (OVP), overcurrent (OCP), Overtemperature (OTP) protection, and key-lock function
- Adjustable voltage/current slew rates
- Front panel USB host port to save/recall instrument settings and list mode programs
- Save/recall instrument settings to internal memory
- Fast command processing time (< 10 ms)
- Digital I/O terminal offers external triggering, voltage fault, and remote inhibit capabilities
- Operating software and battery test software provided
- USB (USBTMC-compliant), LAN (LXI-Class C compliant), and GPIB interfaces standard
- NISPOM-compliant sanitization to securely restore factory settings
- Rack-mount kit included
- LabVIEW™, IVI-C, and IVI.NET drivers provided
- cTUVus certification mark fulfills CSA and UL safety standards

Operation highlights

Modular Design

The MPS Series modular design provides test system engineers with a selection of 8 available modules to meet specific DC power requirements. Any combination of up to 4 modules can be installed in the available 600 W or 1200 W mainframes. Modules are interchangeable and the mainframe guideposts combined with engineered mating pins ensure a secure fit into mainframe slots. Featuring an included rack-mount kit, the compact 1U form factor is ideal for ATE system applications.

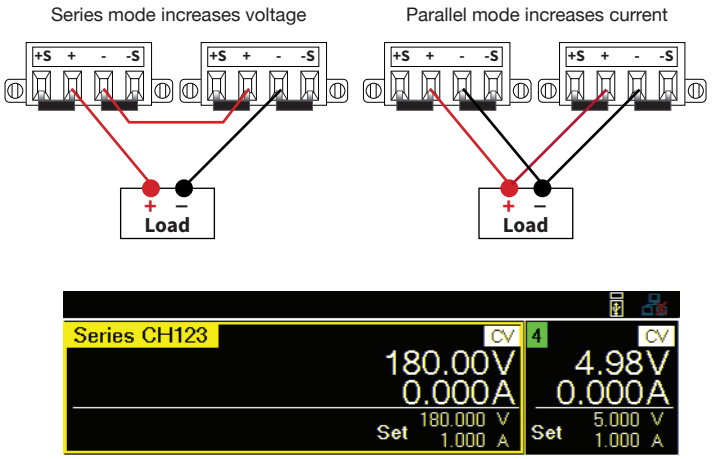


Module installation

Rack-mount kit included

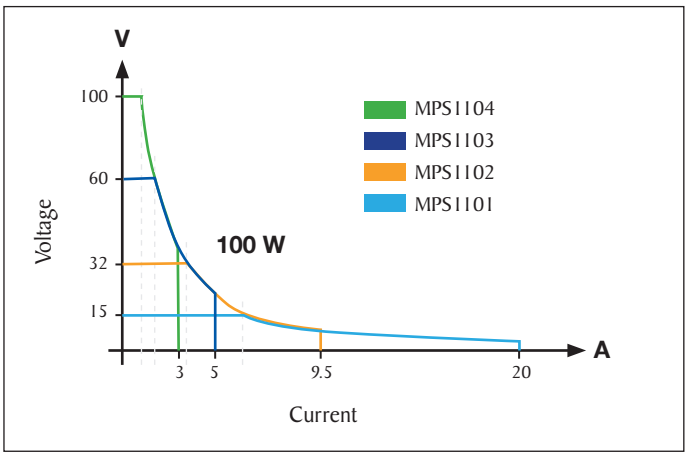
Series/Parallel Operation

Identical modules can be combined in series/parallel to increase the maximum voltage/current output to 400 V or 80 A.
When series/parallel operation is enabled, the display automatically adjusts for increased voltage/current limits.



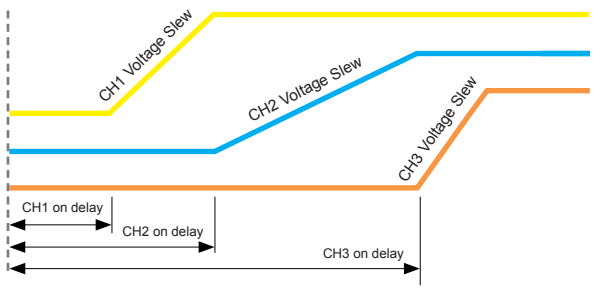
Multi-Range Power

Traditional power supplies only output their rated power at one voltage/current point. The MPS Series 100 W multi-range modules extend the rated power from one point to a curve, delivering the rated power at a wider range of voltage/current combinations.



Channel Coupling and Output Sequencing

The MPS Series' coupling mode, output delays, and slew rate can be configured to execute precise startup power sequences.



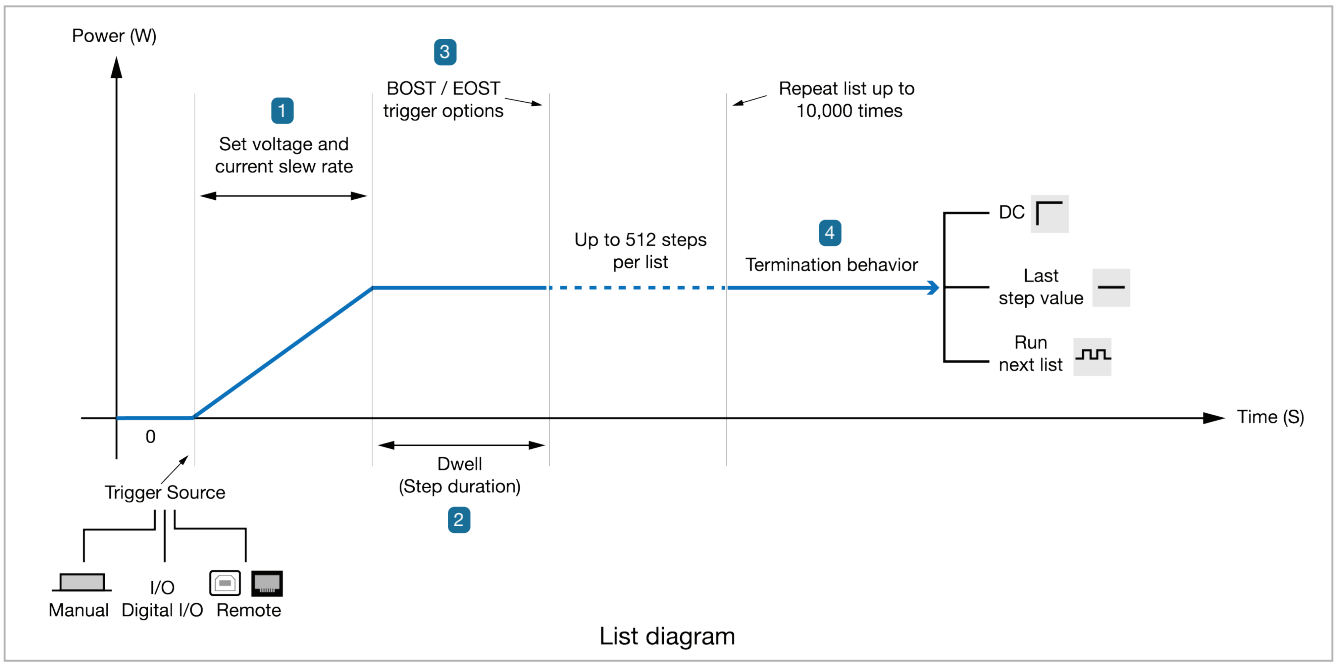
Mainframe Synchronization

The MPS series supports synchronization across multiple mainframes enabling control of output status of all modules in the system from one power supply.

Operation highlights

Advanced List Mode

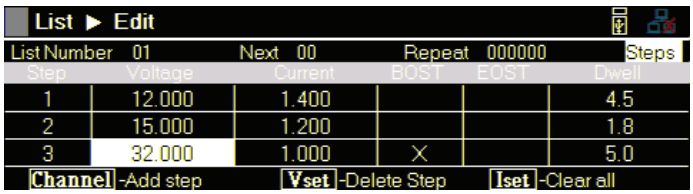
The MPS Series list mode programming features are useful for repetitive testing or other applications requiring a specific sequence of voltage and current settings. The illustration below highlights some of the configurable options for setting up a list mode program.



List diagram

1. To help minimize inrush current, the voltage and current slew rates are adjustable.
2. Dwell (step duration) can be set with 0.1 second resolution.
3. BOST / EOST (Beginning / End of Step Trigger) can be enabled for any step in the list to generate output triggers for synchronizing events with other externally connected instruments.
4. At the end of a list mode program, the termination behavior can be set to a constant DC value, remain at the last programmed list step value, or run another user-configured list program.

Intuitive List Mode Editing



Each list mode program contains up to 512 user programmable steps. Save up to 10 list mode programs directly to internal memory for quick recall. List mode programs can be configured and run from the front panel or remotely using the provided application software.

Operation highlights

Mainframe Power Allocation

Available mainframe models support a maximum output power of 600 W or 1200 W. The ability to allocate mainframe power enables the total output power of installed modules to exceed the rated mainframe power.

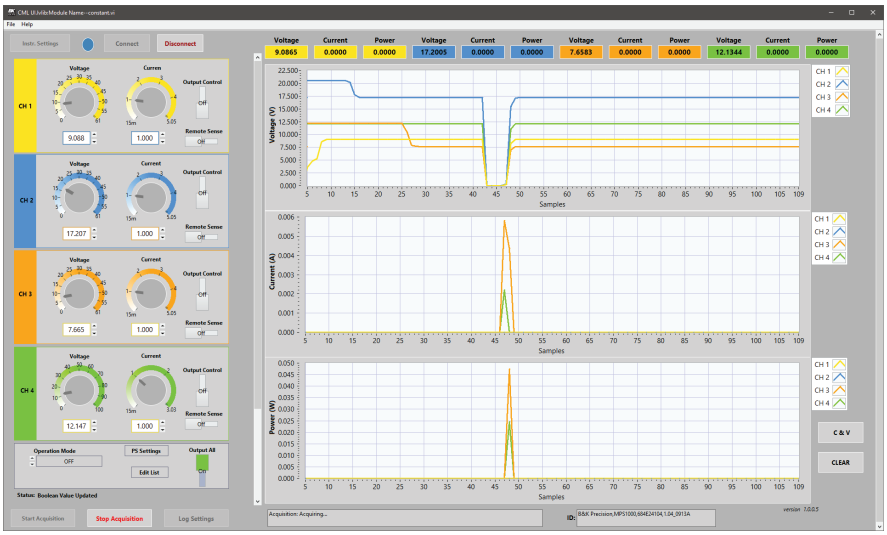
For example, a 600 W mainframe model MPS1000 is populated with two 300 W modules and two 100 W modules providing a combined total output power of 800 W. The mainframe will automatically limit output power to 600 W. The power limits of each installed module can also be adjusted to provide more or less power where needed. This flexibility maximizes investment for changing power demands and requirements.

Application Software

PC software is provided for generating and executing test sequences and measurement data logging without the need to write source code.

- Log voltage, current, power measurements and export data in spreadsheet format for further analysis

- Configure and run transient operation, list mode, and more



Battery Test Software

Supplementary PC software is available to simplify battery testing with the ability to create discharge sequences and log data. Combine the MPS Series with a compatible DC electronic load, to perform battery charge/discharge cycle tests on batteries using the Battery Test Software.

System Integration and Protection

Connectivity

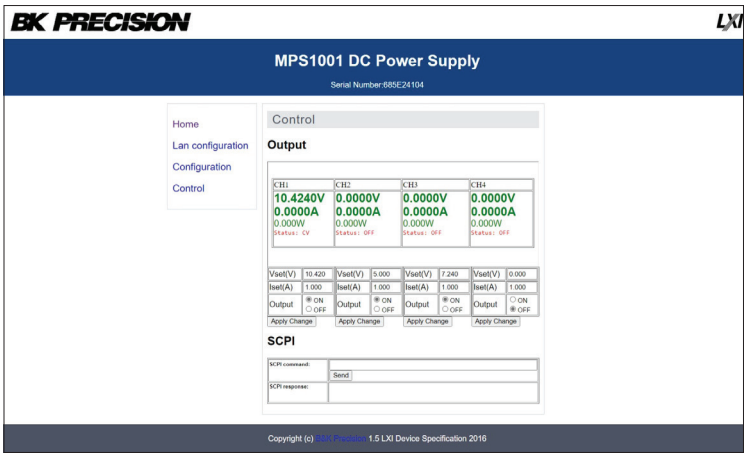
Integrators will benefit from fast command response times combined with the included USB (USBTMC-compliant), GPIB, and LAN (LXI-Class C compliant) interfaces for remote PC connectivity. The MPS Series supports SCPI (Standard Commands for Programmable Instruments) facilitating easy integration into existing test systems. The provided LabVIEW™, IVI-C, and IVI.NET drivers simplify system development and integration.

Heat management

To optimize rack space, the MPS Series' side air vents enable multiple instruments to be installed directly above or below the mainframe.

Web browser control

The MPS Series provides a built-in web server that allows users to configure and control basic power supply settings including voltage, current, and output status from a web browser on a computer.



NISPOM sanitization

The MPS Series supports NISPOM sanitization to perform a full memory wipe removing all stored configuration files, help files, and hex files. Similarly, selecting factory reset in the menu performs a full memory wipe with the exception of removing the help and hex files.

Interface security

In the mainframe security menu, the remote PC interfaces and front panel USB host port can be individually disabled. This capability provides an added layer of security and protection.

Comprehensive protection

Overvoltage (OVP), overcurrent (OCP), overtemperature (OTP) protection features help protect the MPS Series power supply modules and the device under test.

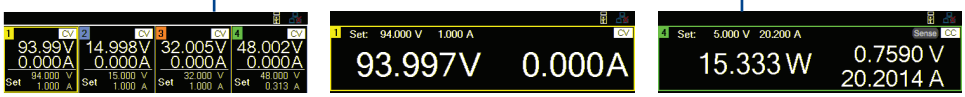
Front panel

USB host
Update firmware, save/recall instrument settings, screenshots, and list mode programs

Wide TFT Color Display
The bright display is easy to read and offers multiple display modes

Output control
Dedicated output on/off button

Standby power button



Multiple display modes

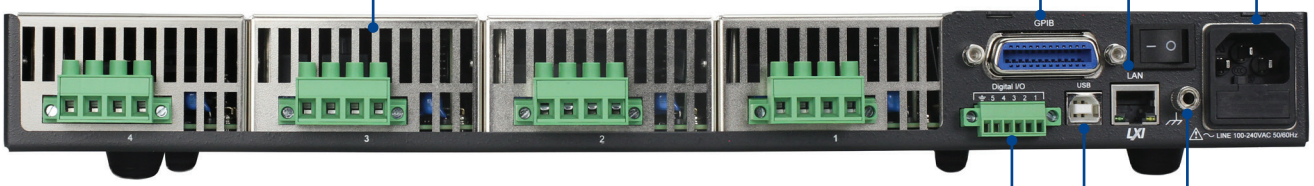
Rear panel - Mainframe

Installed modules*

GPIB interface

LAN interface

Universal AC input



Digital I/O terminal
Assign pins for input/output trigger, remote inhibit, voltage fault conditions, and synchronization with other mainframes

USB interface
USBTMC or USBVCP (Virtual COM Port) selectable

Chassis ground

* Modules purchased separately

Rear panel - Module

Output terminal with remote sense

Convenient quick output terminal disconnect

Specifications

Note: All specifications apply to the unit after a temperature stabilization time of 20 minutes over an ambient temperature range of 23 °C ± 5 °C and a maximum relative humidity of 90%. Specifications are subject to change without notice.

Module Specifications					
Model		**MPS1101**	**MPS1102**	**MPS1103**	**MPS1104**
Output Rating					
Voltage		15 V	32 V	60 V	100 V
Current		20 A	9.5 A	5 A	3 A
Maximum Output Power		100 W			
Load Regulation [1] ± (% output + offset)					
Voltage		0.01% + 5 mV	0.01% + 3 mV	0.01% + 3 mV	
Current		0.1% + 3 mA			
Line Regulation ± (% output + offset)					
Voltage		0.01% + 3 mV			
Current		0.1% + 3 mA			
Ripple and Noise (20 Hz to 20 MHz)					
Normal Mode Voltage p-p		20 mV	5 mV	10 mV	15 mV
Normal Mode Voltage rms		2 mV	1 mV	2 mV	3 mV
Normal Mode Current rms		6 mA	3 mA	3 mA	
Programming / Readback Resolution					
Voltage		1 mV			2 mV
Current		1 mA			
Programming / Readback Accuracy ± (% output + offset)					
Voltage		0.03% + 4 mV	0.03% + 13 mV	0.03% + 16 mV	0.03% + 20 mV
Current		0.1% + 16 mA	0.1% + 5 mA	0.1% + 3 mA	0.1% + 2 mA
Temperature Coefficient per °C					
Voltage		3.2 mV / °C	6.4 mV / °C	12 mV / °C	18 mV / °C
Current		3.2 mA / °C	1.6 mA / °C	0.8 mA / °C	0.4 mA / °C
Output Response Time [2]					
Rise Time	Full Load	20 ms	10 ms	20 ms	20 ms
	No Load	20 ms	10 ms	20 ms	20 ms
Fall Time	Full Load	20 ms	10 ms	20 ms	25 ms
	No Load	200 ms	250 ms	250 ms	250 ms
Transient Response [3]					
Time		0.5 ms			
Protection					
OVP	Range	16.5 V	35.2 V	66 V	110 V
	Accuracy	150 mV	320 mV	600 mV	1000 mV
OCP	Range	22 A	10.45 A	5.5 A	3.3 A
	Accuracy	200 mA	95 mA	50 mA	30 mA

(1) With remote sense terminal connected.
(2) From 10% to 90% or from 90% to 10% of total voltage excursion.
(3) Time for output voltage to recover within 0.5% of its rated output for a load change 50-100% of full load.

Specifications (cont.)

Model		MPS1301	MPS1302	MPS1303	MPS1304
Output Rating					
Voltage		15 V	32 V	60 V	100 V
Current		20 A	9.5 A	5 A	3 A
Max. Output Power		300 W			
Load Regulation [1] ± (% output + offset)					
Voltage		0.01% + 5 mV	0.01% + 3 mV	0.01% + 3 mV	
Current		0.1% + 3 mA			
Line Regulation ± (% output + offset)					
Voltage		0.01% + 3 mV			
Current		0.1% + 3 mA			
Ripple and Noise (20 Hz to 20 MHz)					
Normal Mode Voltage p-p		20 mV	5 mV	10 mV	15 mV
Normal Mode Voltage rms		2 mV	1 mV	2 mV	3 mV
Normal Mode Current rms		6 mA	3 mA	3 mA	
Programming / Readback Resolution					
Voltage		1 mV			2 mV
Current		1 mA			
Programming / Readback Accuracy ± (% output + offset)					
Voltage		0.03% + 4 mV	0.03% + 13 mV	0.03% + 16 mV	0.03% + 20 mV
Current		0.1% + 16 mA	0.1% + 5 mA	0.1% + 3 mA	0.05% + 2 mA
Temperature Coefficient per °C					
Voltage		3.2 mV / °C	6.4 mV / °C	12 mV / °C	18 mV / °C
Current		3.2 mA / °C	1.6 mA / °C	0.8 mA / °C	0.4 mA / °C
Output Response Time [2]					
Rise Time	Full Load	20 ms	10 ms	20 ms	20 ms
	No Load	20 ms	10 ms	20 ms	20 ms
Fall Time	Full Load	20 ms	10 ms	20 ms	20 ms
	No Load	200 ms	250 ms	250 ms	250 ms
Transient Response [3]					
Time		0.5 ms			
Protection					
OVP	Range	16.5 V	35.2 V	66 V	110 V
	Accuracy	150 mV	320 mV	600 mV	1000 mV
OCP	Range	22 A	10.45 A	5.5 A	3.3 A
	Accuracy	200 mA	95 mA	50 mA	30 mA

(1) With remote sense terminal connected.
(2) From 10% to 90% or from 90% to 10% of total voltage excursion.
(3) Time for output voltage to recover within 0.5% of its rated output for a load change 50-100% of full load.

Specifications (cont.)

Model		MPS1101	MPS1102	MPS1103	MPS1104	MPS1301	MPS1302	MPS1303	MPS1304
General									
Temperature Ratings	Operation	32 °F to 104 °F (0 °C to 40 °C)							
	Storage	14 °F to 158 °F (-10 °C to 70 °C)							
Warranty		3 Years							
Safety		Low Voltage Directive (LVD) 2014/35/EU, EN61010-1:2010, cTUVus certification mark [4] fulfills US (UL 61010-1:2012) and Canadian (CAN/CSA-C22.2 NO. 61010-1-12) safety standards							
Electromagnetic Compatibility		EMC Directive 2014/30/EU, EN61326-1:2013							
Dimensions (W x H x D)		3" x 1.7" x 12.4" (75.4 x 42.6 x 316 mm)							
Weight		2.8 lbs (1.25 kg)							
Standard Accessories		Certificate of calibration							

(4) Tested and certified by a Nationally Recognized Testing Laboratory (NRTL), accredited by OSHA.

Mainframe Specifications

Model	MPS1000	MPS1001
Maximum Power Available	600 W	1200 W
Command Response Time [5]	10 ms	
Efficiency	70%	
Power Factor	0.97	
I/O Interfaces	USB (USBTMC-compliant and virtual COM), LAN (LXI-Class C compliant), and GPIB	
AC Line Input [6]	100 VAC to 240 VAC ± 10%, 50/60 Hz	180 VAC to 240 VAC ± 10%, 50/60 Hz
Maximum Rated Input Power	850 VA	1700 VA
Dimensions (W x H x D)	16.73" x 1.73" x 21.65" (425 x 44 x 550 mm)	
Weight	Mainframe: 15 lbs (6.8 kg), with 4 blank covers: 19.8 lbs (9 kg)	
Standard Accessories	Rack-mount kit and power cord	

(5) Typical time required for output to begin to change following receipt of command data.
(6) Mainframe model MPS1001 supports an AC line input of 100 to 240 VAC. When AC input power is less than 180 VAC, the maximum output power will be limited to 600 W.

Ordering Information

Mainframes and modules are sold as separate products. User assembly is required.

1. Select the mainframe that meets your power requirements.
The mainframe houses and controls up to four DC power modules.

Model	Description
MPS1000	600 W Mainframe
MPS1001	1200 W Mainframe

2. Populate the mainframe with any combination of up to four DC power modules.

Model	Description
MPS1101	Multi-Range DC Power Supply Module 15 V / 20 A / 100 W
MPS1102	Multi-Range DC Power Supply Module 32 V / 9.5 A / 100 W
MPS1103	Multi-Range DC Power Supply Module 60 V / 5 A / 100 W
MPS1104	Multi-Range DC Power Supply Module 100 V / 3 A / 100 W
MPS1301	Fixed Range DC Power Supply Module 15 V / 20 A / 300 W
MPS1302	Fixed Range DC Power Supply Module 32 V / 9.5 A / 300 W
MPS1303	Fixed Range DC Power Supply Module 60 V / 5 A / 300 W
MPS1304	Fixed Range DC Power Supply Module 100 V / 3 A / 300 W