DATA SHEET

N6700 Modular Power System Family

Low-Profile MPS Mainframes
N6700C–N6702C, N6710C–N6712C
DC Power Modules N6731B–N6786A
Electronic Load Modules N6791A-N6792A NEW

Small Size and Flexibility for ATE

- Ideal for ATE systems in R&D, design validation, and manufacturing
- Small size: up to four outputs in 1U of rack space
- Flexible, modular system: Lets you mix and match power levels and performance levels to optimize your investment
- Performance modules for critical test requirements
- Value modules for basic DC power requirements
- Electronic load modules for power supply testing
- Fast command processing time and output speed to improve throughput
- Connect via GPIB, LAN, or USB
- Fully compliant to LXI Class C specification



KEYSIGHT TECHNOLOGIES

Power supplies and electronic loads are a fundamental component of every test system in industries including aerospace and defense, consumer electronics, computers and peripherals, communications, semiconductor and automotive electronics. Today's complex automatic test equipment (ATE) systems often require multiple power sources or electronic loads. Test system designers are challenged to keep costs down by reducing rack space occupied by these multiple power supplies or electronic loads and to continually increase test system throughput.

The Keysight Technologies, Inc. N6700 Low-Profile Modular Power System (MPS) is a 1U (rack unit) high, multiple-output programmable DC power supply or electronic load system that enables test system integrators to optimize performance, power and price to match test needs.

N6700 System Features

The Keysight N6700 MPS gives test system designers the flexibility to mix and match from over 30 different DC power modules to create a 1- to 4-channel DC power system or electronic load system optimized to meet specific test requirements. Test system engineers can invest in high-performance outputs where speed and accuracy are needed, or purchase basic performance outputs for simple DC power requirements or an electronic load is required for power supply testing.

Small size

The Keysight N6700 MPS uses an advanced switching power supply design that fits within 1U of rack space (1.75 in./44 mm). It has side air vents (no top or bottom air vents) so other instruments can be mounted directly above or below it. (Requires rack mount kit; see ordering information.)

Built-in measurement of voltage and current

The N6700 modules come standard with built-in measurement of voltage and current to simplify wiring and design of an ATE system.

Protection features

Each N6700 module is protected against over-voltage, over-current, and over-temperature. A fault condition in one module can be detected within 10 microseconds by other modules so that they can be quickly shut down to avoid hazardous conditions on your device under test (DUT).

Connectivity

The N6700 MPS comes standard with GPIB, USB 2.0, and 10/100 Base-T ethernet LAN interfaces. While GPIB is best suited for use with existing systems, Keysight offers USB and LAN to allow you to take advantage of the availability, speed, and ease-of-use of common computer industry standard interfaces. The N6700 is fully compliant with the LXI Class C specification.



Figure 1. Connectivity: GPIB, 10/100 Base-T ethernet, and USB 2.0 all standard

Security

When used in systems running GPIB, the LAN and/or USB interfaces can be disabled for extra security. Also, all non-volatile RAM data and settings can be cleared from the front panel.

Control from any browser

The N6700 can be controlled via a standard web browser. The N6700 contains a web server that provides web pages for monitor, control, and setup of the MPS.

Output Sequencing

Each DC power module or electronic load can be individually set to turn on or to turn off with a delay. By adjusting the delay times and then commanding the N6700 to turn on, you can set the N6700 modules to sequence on in a particular order. The same sequencing capability is available to shut down the modules in a particular order.

For applications that require more than four DC power or electronic load modules to be sequenced, this output sequencing can be extended across multiple N6700 mainframes. When the I/O ports on the rear panel of the main-frames are wired together, a pair of synchronization signals can be sent between mainframes, allowing the output sequences of all mainframes to be synchronized. This capability is supported on N6700C, N6701C and N6702C mainframes.

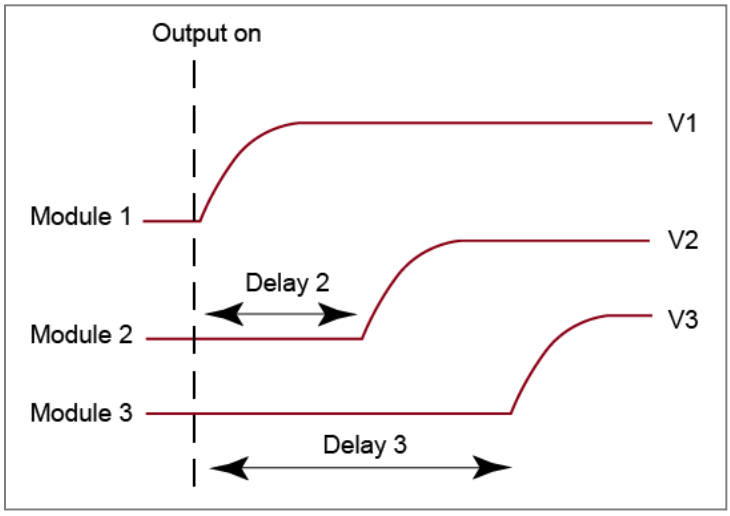

Figure 2. Output sequencing

Programmable Slew

For some applications, like inrush limiting or powering rate-sensitive devices, it is necessary to slow down and control the speed of the power supply to maintain a specific voltage slew rate. The N6700 provides programmable voltage slew rate, so that you can easily control the speed at which the output slews from one voltage to another. You can set the speed of a voltage change anywhere from its maximum up/down programming speed to its slowest change of up to 10 seconds. Programmable voltage slew is available from the front panel when operating the N6700 manually or via computer control. For the electronic load family, slew control is available for voltage or current or resistance or power.

Series Operation

To increase available voltage and power, similarly rated outputs can be operated directly in series on power supply modules.

Easy Parallel Operation With Virtual Channels

To increase available output power and current, identical outputs can be operated in parallel. To simplify parallel operation for applications requiring currents greater than any single output can provide, the N6700 offers virtual channels, a firmware-based feature that allows the N6700 system to treat up to 4 channels as a single, synchronized channel. Once configured, all functions (sourcing, measurements, triggering, protection, and status monitoring) behave as if there is 1 channel of up to 4 times the capacity of a single channel, without writing a single line of code to manage the interaction and synchronization of the paralleled power supplies or electronic loads.

Virtual channel capability is available from the front panel when operating the N6700 manually or via computer control.

Power Management Feature Allows You Allocate Mainframe Power

Often, a DUT requires a single high power DC source and several very low power DC sources. Since the DUT does not require full power to all outputs, you may choose to save money configuring a system where the sum of the power modules installed in a mainframe exceeds the total power available from the mainframe. In this case, the power management features of the N6700 allow you to allocate mainframe power to the outputs where it is needed, achieving maximum asset utilization and flexibility. This feature provides safety from unexpected and dangerous shutdowns that can occur with power systems without power management when operated in a similar way.

For example, if your DUT requires 280 W on its main input, and 10 W each on three auxiliary inputs, you can configure a system consisting of one 300 W DC module and three 100 W DC modules. Even though the sum of the module power is 600 W, you can still use the N6700C 400 W MPS mainframe. Thanks to the power management feature, you can allocate the full 300 W to the 300 W module while you allocate only 33 W to each of the 100 W modules.

Note that if you install one of the new 500 W modules in an N6700C 400 W MPS mainframe, you cannot run this module at its full rated output power.

Plug High Power Mainframes Into Standard AC Sockets Without Dedicated High Current AC Circuits

When you first turn on the N6702C 1200 W MPS mainframe, the mainframe automatically senses the power available from the AC line. If the AC line voltage is such that the resulting current would exceed a standard AC outlet rating, the mainframe automatically scales back the available output power to prevent overloading the AC line. The N6702C will limit the output power to 600 W allowing the high power mainframe to be plugged into any standard outlet. This is very convenient for initial bench checkout of the MPS system. It is also very convenient for test development, which is typically done on the bench when DUT is not yet driven to full power. You can also control this power reduction by manually allocating less than the full available mainframe power among the modules. As a result, the N6702C will draw less power (and less current) from the AC line.

Triggering

The N6700 Low-Profile MPS mainframe has hardware trigger in/trigger out signals which permit the N6700 to be synchronized with external events. For example, a switch closure in the fixture can trigger the N6700 to apply voltage to the DUT or take a measurement.

Drivers

The N6700 comes with both VXIplug&play drivers and IVI-COM drivers. LabView drivers are also available at NI.COM.

Programming Language

The N6700 supports SCPI (Standard Commands for Programmable Instruments).

Firmware Updates

The N6700 firmware is stored in FLASH ROM and can be easily updated when new features become available. Firmware can be downloaded into the N6700 over GPIB, LAN, or USB using the supplied firmware update utility program. Keysight recommends that you keep your N6700 system up to date with the latest firmware available at www.keysight.com/find/N6700firmware.

Output Disconnect And Polarity Reversal Relays

Modules in the N6700 can be individually ordered with optional Output Disconnect Relays (option 761) or Output Disconnect/Polarity Reversal Relays (option 760). See the table on page 19 for option 760 and 761 availability. All relays are built into the module, so no additional wiring or rack space is needed to incorporate the relay function.

Although the plus and minus rail of the output power mesh are physically disconnected from the output terminals with options 760 and 761, a small AC network is still connected across the plus and minus output terminals, This AC network is required for EMI compliance.

With option 761, Output Disconnect Relays, mechanical relays disconnect both the plus and minus side of the power supply, including the sense leads.

With option 760, Output Disconnect/Polarity Reversal Relays, mechanical relays switch the leads on both the plus and the minus side of the power supply, including the sense leads, resulting in a voltage polarity reversal at the DUT. In addition to polarity reversal, option 760 provides the same output disconnect function as option 761.

Note: Output current is limited on some modules when option 760 Output Disconnect/Polarity Reversal Relays is installed. See the “Available options” table on page 19 for more information about maximum current limitations with option 760.

Front Panel

In addition to full control over its three standard interfaces, the N6700 has a full featured front panel to permit easy manual operation for test prototyping, debugging, and troubleshooting when used in an ATE system. You can have confidence that the N6700 is working properly because you can view the settings and actual output values on all four outputs at the same time.



Figure 3. Front panel with up to 4 channels displayed simultaneously (Picture shows 3 channels installed.)

Quieter Fans To Keep Noise Down

To reduce acoustic noise, the N6700 mainframes employ fan speed control. When operating at less than full output power, the cooling fans spin slower and generate less noise.

Universal AC Input

The N6700 has a universal input that operates from 100-240 Vac, 50/60/400 Hz. There are no switches to set or fuses to change when switching from one voltage standard to another. The AC input employs power factor correction.

Quick Disconnects

Each power module has quick disconnects for easy system setup and maintenance.



Figure 5. Quick disconnects for power and sense leads

Rack Mount Kit

The N6700 is easily rack-mounted using the N6709C rack mount kit. This kit provides all the necessary hardware to rack mount one N6700 mainframe in only 1U of rack space. This rack mount kit includes front rack ears and rear supports which take the place of standard rack rails and/or slides. Note that standard rack rails or slides are not compatible with the N6700 because of its 1U size and airflow requirements.

Choosing the right DC Power or Electronic load system to meet your ATE needs

N6790 Electronic Load Series

The new Keysight N6790 Series Modular Electronic Loads offer a 100W module and a 200W module each in a 1U footprint. Four different user operation modes are available: constant voltage, constant current, constant resistance, and constant power. With a high, accurate measurement system and digitizing capabilities, users can easily gain insight into their power supply test. Also, the new series offers a powerful, built-in arbitrary waveform generator which allows users to emulate complex dynamic load waveforms. This is a must have for any serious power system designer and test engineer.

NEW



Figure 6a. The Electronic Load Series

N6750 High-Performance Series

For applications where the power supply plays a critical role – Now with available power up to 500 W

The Keysight N6750 Series of high-performance, autoranging DC power modules provides low noise, high accuracy and programming speeds that are up to 10 to 50 times faster than other programmable power supplies. In addition, Keysight has, for the first time, included high-speed test extensions in general-purpose power supplies. The high-speed test extensions offer an oscilloscope-like digitizer that simplifies system configuration and increases measurement accuracy when viewing high-speed transient or pulse events within the DUT. In addition, autoranging output capabilities enable one power supply to do the job of several traditional power supplies.

N6760 Precision Series

For applications where precision is required – Now with available power up to 500 W

The Keysight N6760 Series of precision DC power modules provides precise control and measurements in the milliampere and microampere region with the ability to simultaneously digitize voltage and current, and capture those measurements in an oscilloscope-like data buffer.

N6730/40/70 Basic Series

For basic DC applications – Now with voltages up to 150 V

The Keysight N6730, N6740 and N6770 Series of DC power modules provide programmable voltage and current, measurement and protection features at a very economical price, making these modules suitable to power the DUT or to provide power for ATE system resources, such as fixture control.



Figure 6b. The basic series

N6780 SMU Series

For applications where multi-quadrant operation and high-precision are required.

For details on these products and how they can be used for applications including battery drain analysis and function test, visit www.keysight.com/find/N6780 and download the *N6780 Series Source/Measure Units (SMUs) for the N6700 Modular Power System Data Sheet,* literature number 5990-5829EN



Figure 6c The N6753A – N6756A High performance and the N6763A – N6766A Precision DC power modules each occupy two module slots within the mainframe. All other modules occupy 1 module slot.

N6783 Application-Specific Series

For details on these products and how they can be used for specific applications visit www.keysight.com/find/N6783A-BAT, www.keysight.com/find/N6783A-MFG and download the *N6783A-BAT Data Sheet,* 5990-8662EN and the *N6783A-MFG Data Sheet*, 5990-8643EN.



Figure 6c. User re-configurable modular system

Additional Features

When your testing requires a power supply to do more than just provide a constant DC level, the N6750 Series of high-performance, autoranging DC power modules and the N6760 Series of precision DC power modules are the perfect fit. These modules combine a fast output with flexible controls and sophisticated measurements. The N6750/60 is more than a power supply; it is a stimulus/response instrument.

To fit in 1U, the N6750/60 use an advanced switch-mode design that offers the low output noise and fast output speed typically found on linear power supplies.

Low Noise Outputs

Careful attention has been paid to this design to ensure low normal mode noise (ripple and peak-peak) as well as low common mode noise. This switching power supply outperforms most linear power supplies on the market.

Fast Voltage Changes

When it comes to speed, the N6750 high-performance autoranging DC power modules, the N6760 precision DC power modules, and the N6780 source measure units achieve performance unlike a typical DC power supply. Thanks to an active down-programming circuit to rapidly pull down the output when lowering the module's output voltage, these power modules can rapidly program both up and down in voltage. Changing voltage from 0 V to 50 V, or 50 V to 0 V for example, can be accomplished in less than 1.5 milliseconds.

Note that for smaller voltage changes, from 0 V to 5 V or 5 V to 0 V for example, the programming speed is less than 200 microseconds. These output speeds allow the N6750/60/80 to give maximum system throughput when your test calls for frequent changes in power supply voltage settings.

Autoranging For Flexibility

The N6750 high-performance auto-ranging DC power modules and the N6760 precision DC power modules give you even more flexibility by providing autoranging outputs. This autoranging capability provides maximum output power at any output voltage up to 60 V. This allows one power supply to do the job of several power supplies because its operating range covers low voltage, high current as well as high voltage, low current operating points.

For example, the N6755A high-performance autoranging DC module, rated at 20 V, 50 A, and 500 W can provide full power at 10 V @ 50 A (= 500 W), 20 V @ 25 A (= 500 W), 15 V @ 33 A (= 500 W), or anywhere in between.

Therefore, this 500 W autoranging power supply, due to its extended voltage and current range, can produce voltage and current combinations in the range of a 1000 W non-autoranging power supply.

The flexibility of autoranging is useful when the DUT operates over a wide range of voltages, when the ATE system needs to test a wide range of DUTs, or when margin is needed because the ATE power supply must be selected before final DUT power requirements are determined.

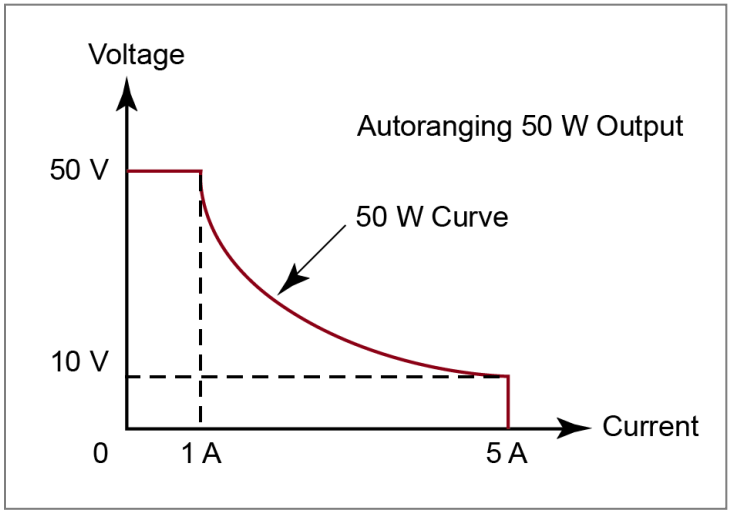

Figure 7. Autoranging characteristic

High-Speed Test Extensions

To make your testing go even faster, the N6700 DC power modules offer High-Speed Test Extensions (HSTE). This enhancement to the DC power modules extends the capabilities to include features similar to a built-in arbitrary waveform generator and a built-in oscilloscope. HSTE is optional on the N6730/40/50/70 DC power modules. HSTE is standard on the N6760 precision DC power modules, the N6780 SMU modules, the N6783 application-specific modules, and the N6790 Electronic Load series modules.

Through the LIST mode of HSTE, you can download up to 512 setpoints of voltage and current. In LIST mode, you can program the output to execute a LIST of voltage and current setpoints. For each setpoint, a dwell time can be specified and the power supply will stay (i.e., dwell) at that setpoint for the programmed dwell time value. For each setpoint in the LIST, you can have a different dwell time from 0 to 262 seconds with 1 microsecond resolution.* Then, you can trigger the module to begin executing the list. The module will step thru the list, staying at each setpoint for the programmed dwell time, and then it will move on to the next point. This speeds up execution by removing the computer I/O from the process.

The result is an output that automatically changes according to the programmed list, just like an arbitrary waveform generator.

HSTE also provides an oscilloscope-like digitizer built into the power module to capture voltage and current measurements of up to 524,288 points at up to 97,656 samples per second. Note that the N6780 SMUs and N6790 Electronic Loads measure at 195,312 samples per second.

For applications such as design validation of battery powered digital devices, the ability to capture dynamic information about the current flowing into the DUT allows designers to better understand the current drain on DUT batteries and optimize DUT power management during normal DUT operation and in DUT standby mode.

The digitizer can also be synchronized with changes in the output. For example, the digitizer can make measurements in response to a trigger generated by a change in output voltage caused by LIST mode. In this configuration, you can ensure that measurements are made at the right moment during each step of an executing LIST. This is particularly useful if you are trying to measure current consumption during a rapidly changing voltage stimulus, such as current drawn during a pulsed output voltage.

* Note that the output response time is less than 5 milliseconds per voltage change, so steps of less than 5 milliseconds will not achieve their final output voltage value before moving on to the next step. This is useful when trying to create a smooth waveform.

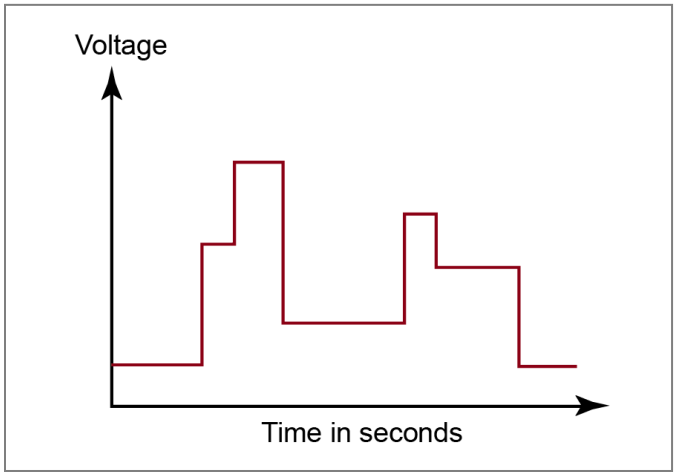

Figure 8. High speed test extensions LIST mode provides “power ARB” capability

Precision Low-Level Performance

The N6760 Series of Precision DC Power Modules additionally provide dual ranges on both programming and measurement. In the low range, these power supplies provide precision in the milliampere and microampere regions. They are ideally suited for semiconductor and passive device testing, or where a precisely controlled output and highly accurate, precise measurements are needed during test.

Source/Measure Unit Modules For The Most Demanding Applications

The N6780 Series of Source/Measure Units offer the highest level of performance in the N6700 Series. These SMUs feature highly accurate measurements down to nanoamperes while providing operation as a DC voltage source, DC current source, and electronic load. For details on these products and how they can be used for applications including battery drain analysis and functional test, visit www.keysight.com/find/N6780 and download the *N6780 Series Source/Measure Units (SMUs) for the N6700 Modular Power System Data Sheet*, literature number 5990-5829EN.

Electronic load modules for advanced loading requirement applications

The New N6790 Series Electronic Load family offers users various loading methods for power supply testing. These methods come in the form of operations modes - from constant voltage, constant current, constant resistance or constant power, which allows users to adapt various load conditions needed for power supply testing.

DC Electronic Load Module Feature Map

For detailed product specifications and characteristics, refer to the Keysight N6700 Modular Power System Family Specifications Guide at http://literature.cdn.keysight.com/litweb/pdf/N6700-90001.pdf.

Feature (● = available)	Load Module	
	N6791A	N6792A
Input rating [1]	100 W	200 W
Input terminal short capability	●	●
Arbitrary waveform generation	●	●
Under voltage inhibit	●	●
Voltage, current, power, and resistance priority	●	●
Number of resistance input ranges	3	3
Number of current input and measurement ranges	2	2
Number of voltage input and measurement ranges	1	1
Number of power measurement ranges	3	3
Simultaneous voltage and current measurements	●	●
SCPI command output list capability [2]	●	●
SCPI command array readback [2]	●	●
SCPI command programmable sample rate [2]	●	●
SCPI command external data logging [2]	●	●
Double-wide (occupies 2 channel locations)		●

1. The load module's input is referred to by the term "Output" throughout this document.
2. Only available when using the remote interfaces; not from the front panel.

DC Power Module Feature Map

Feature (● = available)	DC power N673xB, N674xB, N677xA	High-performance N675xA	Precision N676xA
50 W output rating	N6731B – N6736B	N6751A	N6761A
100 W output rating	N6741B – N6746B	N6752A	N6762A
300 W output rating	N6773A – N6777A	N6753A, N6754A	N6763A, N6764A
500 W output rating		N6755A, N6756A	N6765A, N6766A
Output disconnect relays	Option 761	Option 761	Option 761
Output disconnect/polarity reversal relays	Option 760	Option 760	Option 760
Autoranging output capability		●	●
Voltage or current turn-on priority			N6761A, N6762A
Precision voltage and current measurements			●
Low voltage and current output ranges			N6761A, N6762A
Low voltage and current measurement ranges			●
200 µA measurement range (N6761A/N6762A only)			Option 2UA
Simultaneous voltage and current scope traces			●
Output list capability (High speed test extensions)	Option 054	Option 054	●
Array readback capability (High speed test extensions)	Option 054	Option 054	●
Programmable sample rate (High speed test extensions)	Option 054	Option 054	●
Double-wide (Occupies two channel locations)		N6753A - N6756A	N6763A - N6766A

Feature (● = available)	Source/measure units (SMU)					Application-specific	
	N6781A	N6785A	N6782A	N6786A	N6784A	N6783A-BAT	N6783A-MFG
Output rating	20 W	80 W	20 W	80 W	20 W	24 W	18 W
2-quadrant operation	●	●	●	●	●	●	●
4-quadrant operation					●		
Auxiliary voltage measurement input	●	●					
Output disconnect relays	●	●	●	●	●	Option 761	Option 761
Negative voltage protection	●	●	●	●	●	●	●
Voltage or current priority mode	●	●	●	●	●		
Programmable output resistance	●	●					
600 mV output range	●		●		●		
300 mA output range	●		●				
100 mA, 10 mA output ranges					●		

Feature (● = available)	Source/measure units (SMU)					Application-specific	
	N6781A	N6785A	N6782A	N6786A	N6784A	N6783A-BAT	N6783A-MFG
1 V, 100 mV measurement ranges	●		●		●		
100 mA, 1 mA, 10 µA measurement ranges	●		●		●		
8A, 100 mA, 1 mA measurement range		●		●			
150 mA measurement range						●	●
Simultaneous voltage and current measurements	●	●	●	●	●		
Seamless measurement autoranging	●	●	●	●			
Output list capability	●	●	●	●	●	●	●
Array readback capability	●	●	●	●	●	●	●
Programmable sample rate	●	●	●	●	●	●	●
Double-wide (occupies two channel locations)		●		●			

DC Electronic Load Module Key Performance Specifications

Note: This data sheet does not include a comprehensive list of all power module specifications and characteristics. Complete performance specifications and supplemental characteristics for all power modules can be found at http://literature.cdn.keysight.com/litweb/pdf/N6700-90001.pdf. See the *Keysight N6700 Modular Power System Family Specifications Guide*, part number N6700-90001.

Performance Specifications	N6791A	N6792A
Input Ratings:		
Current	0 - 20 A	0 - 40 A
Voltage	0 - 60 V	0 - 60 V
Maximum Power @ 40 °C	100 W	200 W
Specified Current @ Low Voltage Operation:		
1.6 V	20 A	40 A
1 V	12.5 A	25 A
0.5 V	6.25 A	12.5 A
0.1 V	1.25 A	2.5 A

Performance Specifications		N6791A	N6792A
Programming Accuracy:			
Current high range	20 A/40 A	0.04 % + 2.6 mA	0.04 % + 5.2 mA
Current low range	2 A/4 A	0.04 % + 0.46 mA	0.04 % + 0.92 mA
Voltage	60 V	0.03 % + 7.2 mV	0.03 % + 7.2 mV
Resistance high range	8 kΩ	± (0.1 % + 0.0014) S	± (0.1 % + 0.0028) S
Resistance medium range	100 Ω	± (0.1 % + 0.014) S	± (0.1 % + 0.019) S
Resistance low range	3 Ω	± (0.1 % + 0.38) S	± (0.1 % + 0.55) S
Power high range	100 W/200 W	0.06 % + 180 mW	0.06 % + 360 mW
Power low range	10 W/20 W	0.06 % + 30 mW	0.06 % + 65 mW
Measurement Accuracy:			
Current high range	20 A/40 A	0.04 % + 2.4 mA	0.04 % + 4.6 mA
Current low range	2 A/4 A	0.04 % + 0.40 mA	0.04 % + 0.82 mA
Voltage	60 V	0.03 % + 7.2 mV	0.03 % + 7.2 mV
Power high range	100 W/200 W	0.06 % + 160 mW	0.06 % + 320 mW
Power low range	10 W/20 W	0.06 % + 25 mW	0.06 % + 50 mW

DC Power Module Key Performance Specifications

	DC output ratings (volts/amps/watts)	Ripple & noise (p-p/rms)	Voltage programming accuracy	Current programming accuracy	Voltage measurement accuracy	Current measurement accuracy
N6731B	5 V/10 A/50 W	10 mV/2 mV	0.1% + 19 mV	0.15% + 20 mA	0.1% + 20 mV	0.15% + 20 mA
N6732B	8 V/6.25 A/50 W	12 mV/2 mV	0.1% + 19 mV	0.15% + 20 mA	0.1% + 20 mV	0.15% + 10 mA
N6733B	20 V/2.5 A/50 W	14 mV/3 mV	0.1% + 20 mV	0.15% + 20 mA	0.1% + 20 mV	0.15% + 5 mA
N6734B	35 V/1.5 A/52.5 W	15 mV/5 mV	0.1% + 35 mV	0.15% + 20 mA	0.1% + 35 mV	0.15% + 4 mA
N6735B	60 V/0.8 A/50 W	25 mV/9 mV	0.1% + 60 mV	0.15% + 20 mA	0.1% + 60 mV	0.15% + 4 mA
N6736B	100 V/0.5 A/50 W	30 mV/18 mV	0.1% + 100 mV	0.15% + 10 mA	0.1% + 100 mV	0.15% + 2 mA
N6741B	5 V/20 A/100 W	20 mV/2 mV	0.1% + 19 mV	0.15% + 20 mA	0.1% + 20 mV	0.15% + 20 mA
N6742B	8 V/12.5 A/100 W	12 mV/2 mV	0.1% + 19 mV	0.15% + 20 mA	0.1% + 20 mV	0.15% + 10 mA
N6743B	20 V/5 A/100 W	14 mV/3 mV	0.1% + 20 mV	0.15% + 20 mA	0.1% + 20 mV	0.15% + 5 mA
N6744B	35 V/3 A/105 W	15 mV/5 mV	0.1% + 35 mV	0.15% + 20 mA	0.1% + 35 mV	0.15% + 4 mA
N6745B	60 V/1.6 A/100 W	25 mV/9 mV	0.1% + 60 mV	0.15% + 20 mA	0.1% + 60 mV	0.15% + 4 mA
N6746B	100 V/1 A/100 W	30 mV/18 mV	0.1% + 100 mV	0.15% + 10 mA	0.1% + 100 mV	0.15% + 2 mA

	DC output ratings (volts/amps/watts)	Ripple & noise (p-p/rms)	Voltage programming accuracy	Current programming accuracy	Voltage measurement accuracy	Current measurement accuracy
N6751A	50 V/5 A/50 W	4.5 mV/0.35 mV	0.06% + 19 mV	0.1% + 20 mA	0.05% + 20 mV	0.1% + 4 mA
N6752A	50 V/10 A/100 W	4.5 mV/0.35 mV	0.06% + 19 mV	0.1% + 20 mA	0.05% + 20 mV	0.1% + 4 mA
N6753A	20 V/50 A/300 W	5 mV/1 mV	0.06% + 10 mV	0.1% + 30 mA	0.05% + 10 mV	0.1% + 30 mA
N6754A	60 V/20 A/300 W	6 mV/1 mV	0.06% + 25 mV	0.1% + 12 mA	0.05% + 25 mV	0.1% + 8 mA
N6755A	20 V/50 A/500 W	5 mV/1 mV	0.06% + 10 mV	0.1% + 30 mA	0.05% + 10 mV	0.1% + 30 mA
N6756A	60 V/17 A/500 W	6 mV/1 mV	0.06% + 25 mV	0.1% + 12 mA	0.05% + 25 mV	0.1% + 8 mA
N6761A [1]	50 V/1.5 A/50 W	4.5 mV/0.35 mV	0.016% + 6 mV	0.04% + 0.2 mA	0.016% + 6 mV	0.04% + 0.16 mA
N6762A [1]	50 V/3 A/100 W	4.5 mV/0.35 mV	0.016% + 6 mV	0.04% + 0.2 mA	0.016% + 6 mV	0.04% + 0.16 mA
N6763A [1]	20 V/50 A/300 W	5 mV/1 mV	0.03% + 5 mV	0.1% + 15 mA	0.03% + 10 mV	0.1% + 10 mA
N6764A [1]	60 V/20 A/300 W	6 mV/1 mV	0.03% + 12 mV	0.1% + 15 mA	0.03% + 25 mV	0.1% + 5 mA
N6765A [1]	20 V/50 A/500 W	5 mV/1 mV	0.03% + 5 mV	0.1% + 15 mA	0.03% + 10 mV	0.1% + 10 mA
N6766A [1]	60 V/17 A/500 W	6 mV/1 mV	0.03% + 12 mV	0.1% + 15 mA	0.03% + 25 mV	0.1% + 5 mA
N6773A	20 V/15 A/300 W	20 mV/3 mV	0.1% + 20 mV	0.15% + 60 mA	0.1% + 20 mV	0.15% + 15 mA
N6774A	35 V/8.5 A/300 W	22 mV/5 mV	0.1% + 35 mV	0.15% + 60 mA	0.1% + 35 mV	0.15% + 12 mA
N6775A	60 V/5 A/300 W	35 mV/9 mV	0.1% + 60 mV	0.15% +60 mA	0.1% + 60 mV	0.15% +12 mA
N6776A	100 V/3 A/300 W	45 mV/18 mV	0.1% + 100 mV	0.15% + 30 mA	0.1% + 100 mV	0.15% + 6 mA
N6777A	150 V/2 A/300 W	68 mV/27 mV	0.1% + 150 mV	0.15% + 30 mA	0.1% + 150 mV	0.15% + 6 mA
N6781A [1]	20 V/± 3 A/20 W	12 mV/1.2 mV	0.025% + 1.8 mV	0.04% + 0.3 mA	0.025% + 1.2 mV	0.03% + 0.25 mA
N6782A [1]	20 V/±3 A/20 W	12 mV/1.2 mV	0.025% + 1.8 mV	0.04% + 0.3 mA	0.025% + 1.2 mV	0.03% + 0.25 mA
N6783A-BAT[2]	8 V/−2 A to 3 A/24 W	8 mV/1.5 mV	0.1% + 10 mV	0.1% + 1.8 mA	0.05% + 5 mV	0.1% + 0.6 mA
N6783A-MFG[2]	6 V/−2 A; 3 A/18 W	8 mV/1.5 mV	0.1% + 10 mV	0.1% + 1.8 mA	0.05% + 5 mV	0.1% + 0.6 mA
N6784A [1]	± 20 V/± 3 A/20 W	12 mV/1.2 mV	0.025% + 1.8 mV	0.04% + 0.3 mA	0.025% + 1.2 mV	0.03% + 0.25mA
N6785A [1]	20 V/+/-8A/80 W	15 mV/1.5 mV	0.025%_1.8 mV	0.04%+1.5 mA	0.025%+1.8 mV	0.04%_1.5 mA
N6786A [1]	20 V/+/-8A/80 W	15 mV/1.5 mV	0.025%_1.8 mV	0.04%+1.5 mA	0.025%+1.8 mV	0.04%_1.5 mA

1. These power modules have multiple output and measurement ranges; values shown are for the highest range.
2. These power modules have multiple measurement ranges; values shown are for the highest range.

Low Profile Mainframe Key Characteristics

Interface capabilities	
GPIB	SCPI – 1993, IEEE 488.2 compliant interface
LXI compliance	Class C
USB 2.0	Requires Keysight IO Library version M.01.01 or 14.0 and up
10/100 LAN	Requires Keysight IO Library version L.01.01 or 14.0 and up

Environmental conditions		
Operating environment	Indoor use, installation category II (for AC input), pollution degree 2	
Temperature range	0 °C to 55 °C (output current is derated 1% per °C above 40 °C ambient temperature)	
Relative humidity	Up to 95%	
Altitude	Up to 2000 meters	
AC input		
Input ratings	~ 100 VAC – 240 VAC; 50/60/400 Hz	
Power consumption	1000 VA (N6700C) 1440 VA (N6701C) 1440 VA (N6702C @ < 180 VAC input) 2200 VA (N6702C @ > 180 VAC input)	
Power factor	0.99 @ nominal input and rated power	
Net weight		
N6700C with 4 modules (typical)	12.73 kg/28 lbs.	
N6701C with 4 power modules	11.82 kg/26 lbs.	
N6702C with 4 power modules	14.09 kg/31 lbs.	
Dimensions	**N6700C/N6701C**	**N6702C**
Height/width/depth	44.45 mm/432.5 mm/585.6 mm 1.75 in/17.03 in/23.06 in	44.45 mm/432.5 mm/611.9 mm 1.75 in./17.03 in./24.09 in.

Ordering Information

The Low Profile Mainframe System Is Available Two Ways

- You can order an N6700C, N6701C or N6702C mainframe and various modules as separate products. (See steps below.) Each item will arrive in a separate box so that you can assemble the system yourself.
- You can order an N6710C, N6711C or N6712C system, which is a build-to-order system that is shipped as a fully assembled multiple-output power supply. (See pages 20 - 22 for N6710C, N6711C and N6712C ordering information.

When ordering the N6700 MPS as a mainframe and modules, follow these steps.

Step 1

Select which mainframe you want based on your power requirements.

Step 2

Select the appropriate documentation and line cord options.

Step 3

Order 1 to 4 modules (see next page). If the sum of the power of the modules exceeds the available output power rating on the mainframe, see page 4 for an explanation of Keysight's power management capability. Each module occupies one module slot, except for the N6753A-N6756A, N6763A-N6766A and N6792A which occupy two module slots.

Step 4

For proper operation, you must fill any empty module slots with filler panels. When configuring a mainframe with less than four filled module slots, you MUST order a filler panel kit. Each kit contains three filler panels. Each filler panel fills one empty module slot.

Step 5

If you will be rack mounting your N6700, you MUST order the rack mount kit.

Mainframes	
N6700C	Low-profile modular power system mainframe, 400 W Holds 1 to 4 modules. Total available output power = 400 W
N6701C	Low-profile modular power system mainframe, 600 W Holds 1 to 4 modules. Total available output power = 600 W
N6702C	Low-profile modular power system mainframe, 1200 W Holds 1 to 4 modules. Total available output power = 1200 W
Available options to the N6710C, N6711C, and N6712C systems	
N6709C	Rack mount kit Required for rack mounting. Standard rack mount hardware will not work.N6708A
N6708A	Filler panel kit Required when you have less than 4 modules in a mainframe. Each filler kit contains 3 filler panels.
OL1	Full documentation on CD-ROM and printed users guide
900	Power cord, United Kingdom, P/N 8120-1351
901	Power cord, Australia, New Zealand, P/N 8120-1369

902	Power cord, Europe, Korea, P/N 8120-1689
903	Power cord, USA, Canada, 120 V, P/N 8120-4383
904	Power cord, USA, Canada, 240 V, P/N 8120-0698
906	Power cord, Switzerland, P/N 8120-2104
912	Power cord, Denmark, P/N 8120-2956
917	Power cord, South Africa, India, P/N 8120-4211
918	Power cord, Japan, 100 V, P/N 8120-5342 Note: For model N6712C, the maximum output power is limited to 600 W at 100 VAC. To achieve full output power of 1200 W, you must use option 929 and operate at 200 VAC.
919	Power cord, Israel, P/N 8120-6800
920	Power cord, Argentina, P/N 8120-6869
921	Power cord, Chile, P/N 8120-6980
922	Power cord, China, P/N 8120-8376
927	Power cord, Thailand, Brazil, P/N 8120-8871
929	Power cord, Japan, 200 V, P/N 8121-1392 Note: This option is available only on model N6702C

Modules

Order 1 to 4 modules to be installed in each N6700C, N6701C or N6702C mainframe. (To order modules as part of the N6710C, N6711C or N6712C build-to-order systems, see page 20). If the sum of the power of the modules exceeds the available output power rating on the mainframe, see page 4 for an explanation of Keysight's power management capability.

You can individually specify each option for each module. For example, you can order one module with Option 761 Output Disconnect Relays while the remaining modules have no relay options.

As your needs change and you want to change configuration or add more modules to existing N6700C, N6701C or N6702C mainframes, use this ordering information to order the required modules.

Modules		
N6730 50 W DC power modules	N6731B	5 V, 10 A, 50 W DC power module
	N6732B	8 V, 6.25 A, 50 W DC power module
	N6733B	20 V, 2.5 A, 50 W DC power module
	N6734B	35 V, 1.5 A, 50 W DC power module
	N6735B	60 V, 0.8 A, 50 W DC power module
	N6736B	100 V, 0.5 A, 50 W DC power module

N6740 100 W DC power modules	N6741B	5 V, 20 A, 100 W DC power module
	N6742B	8 V, 12.5 A, 100 W DC power module
	N6743B	20 V, 5 A, 100 W DC power module
	N6744B	35 V, 3 A, 100 W DC power module
	N6745B	60 V, 1.6 A, 100 W DC power module
	N6746B	100 V, 1 A, 100 W DC power module
N6750 high-performance, auto-ranging DC power modules	N6751A	50 V,5 A,50 W high-performance autoranging DC power module
	N6752A	50 V,10 A,100 W high-performance autoranging DC power module
	N6753A	20 V, 50 A, 300 W high-performance autoranging DC power module (occupies 2 of 4 mainframe slots)
	N6754A	60 V, 20 A, 300 W high-performance autoranging DC power module (occupies 2 of 4 mainframe slots)
	N6755A	20 V, 50 A, 500 W high-performance autoranging DC power module (occupies 2 of 4 mainframe slots)
	N6756A	60 V, 17 A, 500 W high-performance autoranging DC power module (occupies 2 of 4 mainframe slots)
N6760 precision DC power modules	N6761A	50 V, 1.5 A, 50 W precision DC power module
	N6762A	50 V, 3 A, 100 W precision DC power module
	N6763A	20 V, 50 A, 300 W precision DC power module (occupies 2 of 4 mainframe slots)
	N6764A	60 V, 20 A, 300 W precision DC power module (occupies 2 of 4 mainframe slots)
	N6765A	20 V, 50 A, 500 W precision DC power module (occupies 2 of 4 mainframe slots)
	N6766A	60 V, 17 A, 500 W precision DC power module (occupies 2 of 4 mainframe slots)
N6770 300 W DC power modules	N6773A	20 V, 15 A, 300 W DC power module
	N6774A	35 V, 8.5 A, 300 W DC power module
	N6775A	60 V, 5 A, 300 W DC power module
	N6776A	100 V, 3 A, 300 W DC power module
	N6777A	150 V, 2 A, 300 W DC power module

N6780 ~80 W application-specific modules	N6781A	20 V, ± 3 A, 20 W source/measure unit
	N6782A	20 V, ± 3 A, 20 W source/measure unit
	N6783A-BAT	8 V, 3 A, 24 W battery charge/discharge module
	N6783A-MFG	6 V, 3 A, 18 W mobile communications module
	N6784A	± 20 V, ± 3 A, 20 W source/measure unit
	N6785A	20 V, +/-8 A, 80 W source/measure unit
	N6786A	20 V, +/-8 A, 80 W source/measure unit
N6790 Electronic load	N6791A	60 V, 20 A, 100 W electronic load
	N6792A	60 V, 40 A, 200 W electronic load

Available Options To N6700 Modules

	N6731B-N6736B 50 W DC power modules	N6741B-N6746B 100 W DC power modules	N6751A-N6756A high-performance autoranging DC power modules	N6761A-N6766A precision DC power modules	N6773A-N6776A 300 W DC power modules	N6781A, N6782A, N6784A, N6785A, N6786A, SMU modules	N6783A-BAT N6783A-MFG application-specific	N6790 Series Electronic Loads
Output disconnect relays	761	761	761	761	761	Standard	761	NA
Output disconnect and polarity reversal relays	760	760 [1, 2]	760 [1]	760 [1]	760 [2]	NA	NA	NA
High speed test extensions (HSTE)	054	054	054	Standard	054	Standard	Standard	Standard
200 microampere measurement range	NA	NA	NA	2UA [3]	NA	NA	NA	NA
Commercial calibration with test results data	UK6	UK6	UK6	UK6	UK6	UK6	UK6	UK6
ISO 17025 calibration certificate	1A7	1A7	1A7	1A7	1A7	NA	1A7	1A7

1. Option 760 is not available on Models N6741B, N6751A, N6752A, N6761A, N6762A.
2. Option 760 limits the output current to 10 A maximum on Models N6742B and N6773A.
3. Option 2UA is only available on Models N6761A and N6762A.

N6700 Build-To-Order System

To purchase an N6700 system, order an N6710C, N6711C, or N6712C. These model numbers are build-to-order systems that are shipped as a fully tested and assembled multiple-output power supplies. Each system consists of one mainframe plus optionally 1 to 4 modules. Each mainframe has four module slots to hold modules. Each module occupies one module slot, except for the N6753A–N6755A and the N6763A–N6766A and the N6792A, which occupy two module slots. To specify which modules you want installed in the system, the modules are ordered as options to the system model number. If you order less than four modules, the empty slots will be automatically filled with blank filler panels. You must order at least one module.

If the sum of the power of the modules exceeds the available output power rating on the mainframe, see page 4 for an explanation of Keysight's power management capability.

If you prefer to purchase a mainframe and modules as separate pieces, see page 19.

Build-to-order system	
N6710C System	Build-to-order modular power system, 400 W Consists of 1 N6700C mainframe with total available power of 400 W
N6711C System	Build-to-order modular power system, 600 W Consists of 1 N6701C mainframe with total available power of 600 W
N6712C System	Build-to-order modular power system, 1200 W Consists of 1 N6702C mainframe with total available power of 1200 W
Available options to the N6715B system	
N6709C	Rack mount kit Required for rack mounting. Standard rack mount hardware will not work Full documentation on CD-ROM and printed users guide
OL1	Full documentation on CD-ROM and printed users guide
900	Power cord, United Kingdom, P/N 8120-1351
901	Power cord, Australia, New Zealand, P/N 8120-1369
902	Power cord, Europe, Korea, P/N 8120-1689
903	Power cord, USA, Canada, 120 V, P/N 8120-4383
904	Power cord, USA, Canada, 240 V, P/N 8120-0698
906	Power cord, Switzerland, P/N 8120-2104
912	Power cord, Denmark, P/N 8120-2956
917	Power cord, South Africa, India, P/N 8120-4211
918	Power cord, Japan, 100 V, P/N 8120-5342 Note: For model N6712C, the maximum output power is limited to 600 W at 100 VAC. To achieve full output power of 1200 W, you must use option 929 and operate at 200 VAC.

919	Power cord, Israel, P/N 8120-6800
920	Power cord, Argentina, P/N 8120-6869
921	Power cord, Chile, P/N 8120-6980
922	Power cord, China, P/N 8120-8376
927	Power cord, Thailand, Brazil, P/N 8120-8871
929	Power cord, Japan, 200 V, P/N 8121-1392 Note: This option is available only on model N6712C

Modules As Options To N6710C, N6711C, or N6712C

Order 1 to 4 modules as options to an N6710C, N6711C or N6712C, specify its model number, followed by "-ATO." For example, to order an N6731B as an option to the N6710C, you would specify "-ATO." For example, to order an N6731B as an option to the N6710C, you would specify "N6731B-ATO"as the option. (To order modules as separate products, see page 19). If the sum of the power of the modules exceeds the available output power rating on the mainframe, see page 4 for an explanation of Keysight's power management capability.

You can individually specify each option for each module. For example, you can order one module with Option 761 Output Disconnect Relays while the remaining modules have no relay options.

Module options for N6710C, N6711C, and N6712C systems

N6730 50 W DC power modules	N6731B-ATO	5 V, 10 A, 50 W DC power module
	N6732B-ATO	8 V, 6.25 A, 50 W DC power module
	N6733B-ATO	20 V, 2.5 A, 50 W DC power module
	N6734B-ATO	35 V, 1.5 A, 50 W DC power module
	N6735B-ATO	60 V, 0.8 A, 50 W DC power module
	N6736B-ATO	100 V, 0.5 A, 50 W DC power module
N6740 100 W DC power modules	N6741B-ATO	5 V, 20 A, 100 W DC power module
	N6742B-ATO	8 V, 12.5 A, 100 W DC power module
	N6743B-ATO	20 V, 5 A, 100 W DC power module
	N6744B-ATO	35 V, 3 A, 100 W DC power module
	N6745B-ATO	60 V, 1.6 A, 100 W DC power module
	N6746B-ATO	100 V, 1 A, 100 W DC power module

N6750 high-performance, auto-ranging DC power modules	N6751A-ATO	50 V, 5 A, 50 W high-performance autoranging DC power module
	N6752A-ATO	50 V, 10 A, 100 W high-performance autoranging DC power module
	N6753A-ATO	20 V, 50 A, 300 W high-performance autoranging DC power module (occupies 2 of 4 mainframe slots)
	N6754A-ATO	60 V, 20 A, 300 W high-performance autoranging DC power module (occupies 2 of 4 mainframe slots)
	N6755A-ATO	20 V, 50 A, 500 W high-performance autoranging DC power module (occupies 2 of 4 mainframe slots)
	N6756A-ATO	60 V, 17 A, 500 W high-performance autoranging DC power module (occupies 2 of 4 mainframe slots)
N6760 precision DC power modules	N6761A-ATO	50 V, 1.5 A, 50 W precision DC power module
	N6762A-ATO	50 V, 3 A, 100 W precision DC power module
	N6763A-ATO	20 V, 50 A, 300 W precision DC power module (occupies 2 of 4 mainframe slots)
	N6764A-ATO	60 V, 20 A, 300 W precision DC power module (occupies 2 of 4 mainframe slots)
	N6765A-ATO	20 V, 50 A, 500 W precision DC power module (occupies 2 of 4 mainframe slots)
	N6766A-ATO	60 V, 17 A, 500 W precision DC power module (occupies 2 of 4 mainframe slots)
N6770 300 W DC power modules	N6773A-ATO	20 V, 15 A, 300 W DC power module
	N6774A-ATO	35 V, 8.5 A, 300 W DC power module
	N6775A-ATO	60 V, 5 A, 300 W DC power module
	N6776A-ATO	100 V, 3 A, 300 W DC power module
	N6777A-ATO	150 V, 2 A, 300 W DC power module
N6780 ~80 W application-specific modules	N6781A-ATO	20 V, ± 3 A, 20 W source/measure unit
	N6782A-ATO	20 V, ± 3 A, 20 W source/measure unit
	N6783A-BAT	8 V, 3 A, 24 W battery charge/discharge module
	N6783A-MFG	6 V, 3 A, 18 W mobile communications module
	N6784A-ATO	± 20 V, ± 3 A, 20 W source/measure unit
	N6785A-ATO	20 V, +/-8 A, 80 W source/measure unit
	N6786A-ATO	20 V, +/-8 A, 80 W source/measure unit
N6790 Electronic load	N6791A	60 V, 20 A, 100 W electronic load
	N6792A	60 V, 40 A, 200 W electronic load

Need a Power Solution For R&D Bench Work?

The Keysight N6705C DC Power Analyzer saves time

- Provides unrivaled productivity gains for sourcing and measuring DC voltage and current into your DUT by integrating up to 4 advanced power supplies or electronic loads with DMM, scope, arb, and data logger features.
- Eliminates the need to gather multiple pieces of equipment, create complex test setups including transducers (such as current probes and shunts) to measure current into your DUT.
- Eliminates the need to develop and debug programs to control a collection of instruments and take useful measurements because all the functions and measurements are available at the front panel.
- Modular system: Uses the same DC power modules at the N6700 low-profile modular power system.

Complete specifications can be found in *the N6705C DC Power Analyzer Data Sheet*, publication 5992-1880EN. For more information go to www.keysight.com/find/dcpoweranalyzer



www.keysight.com/find/n6700

Learn more at: www.keysight.com

For more information on Keysight Technologies' products, applications or services, please contact your local Keysight office. The complete list is available at: www.keysight.com/find/contactus

KEYSIGHT TECHNOLOGIES

This information is subject to change without notice. © Keysight Technologies, 2012-2020, Published in USA, October 7, 2020, 5992-1857EN