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Mobile Communications DC Sources
40-100 W



66319B/D, 66321B/D

- Ideal for testing wireless and battery powered devices
- Several times improvement in measurement throughput over general purpose DC sources
- Superior output transient performance with short or long load leads (up to 6 meters)
- Dynamic measurement system for accurate battery current drain measurement
- New easy-to-use Graphical User Interface and analysis tools for bench top use

Overcome Battery Powered Device Testing Challenges

Digital communications devices and digital battery powered devices present a unique testing challenge: they draw rapid pulses of current. By offering superior transient performance, unmatched in the marketplace, the Agilent Mobile Communications DC Sources dramatically reduce the transient voltage drop due to pulse loading characteristics of digital communications devices. The Agilent Mobile Communications DC Sources enable you to maximize test throughput by minimizing test interruption due to false trigger of device low voltage shutdown.

Dynamic Measurement Capabilities

The Agilent Mobile Communications DC Sources offer a built-in advanced measurement system to accurately measure battery current drains when the device operates in different modes (such as talk mode, active mode, standby mode, and off/sleep mode). Measurements made during these modes are critical for ensuring that your devices are operating properly and that you are getting the most out of the battery.

Simulate both Main Battery and Charger

Single output models are recommended when you need to provide power as a replacement to your

Specifications (at 0° to 55°C unless otherwise specified)		**66309B/D**	**66311B**	**66319B/D**	**66321B/D**	**66332A**	**66332A-J01** Special Order Option
Number of outputs		2	1	2	1	1	1
GPIB		Yes	Yes	Yes	Yes	Yes	Yes
Output ratings							
Voltage		0 to 15 V	0 to 15 V	0 to 15 V	0 to 15 V	0 to 20 V	0 to 30 V
Current		0 to 3 A	0 to 3 A	0 to 3 A	0 to 3 A	0 to 5 A	0 to 3.3 A
Peak current for up to 7 ms		5 A	5 A	5 A	5 A	5 A	3.3 A
Programming accuracy at 25°C ±5°C (% of setting plus fixed)							
Voltage	0.05%+	10 mV	10 mV	10 mV	10 mV	10 mV	15 mV
+Current	0.05%+	1.33 mA	1.33 mA	1.33 mA	1.33 mA	2 mA	2 mA
Ripple and Noise (20 Hz to 20 MHz)							
Voltage	rms	1 mV	1 mV	1 mV	1 mV	0.3 mV	0.5 mV
	peak-to-peak	6 mV	6 mV	6 mV	6 mV	3 mV	5 mV
Current	rms	2 mA	2 mA	2 mA	2 mA	2 mA	2 mA
DC measurement accuracy							
Voltage	0.03%+	5 mV	5 mV	5 mV	5 mV	3 mV	5 mV
+20 mA to + rated current	0.2%+	0.5 mA[2]	0.5 mA[2]	—	—	0.5 mA	0.5 mA
-20 mA to - rated current	0.2%+	1.1 mA	1.1 mA	—	—	1.1 mA	1.1 mA
-3 A to + 5 A	0.2%	—	—	0.5 mA[2]	0.5 mA[2]	—	—
-1 A to + 1 A	0.1%	—	—	0.2 mA	0.2 mA	—	—
-20 mA to + 20 mA range	0.1%+	2.5 µA	2.5 µA	2.5 µA	2.5 µA	2.5 µA	2.5 µA
Dynamic measurement system							
Buffer size		4096 points	4096 points	4096 points	4096 points	4096 points	4096 points
Sampling interval		15 µs - 31,200 s	15 µs - 31,200 s	15 µs - 31,200 s	15 µs - 31,200 s	15 µs - 31,200 s	15 µs - 31,200 s
Transient response time		<35 µs[3]	<35 µs[3]	<20 µs[3]	<20 µs	<100 µs[4]	<100 µs[4]
Transient voltage dip (typical with up to 15 feet 22 AWG wiring)		70 mV	70 mV	40 mV	40 mV	500 mV	650 mV
Programmable output resistance							
Range		—-	—	-40 mΩ to +1 Ω	-40 mΩ to +1 Ω	—	—
Programming accuracy		—	—	0.5% + 2 mΩ	0.5% + 2 mΩ	—	—
Resolution		—	—	1 mΩ	1 mΩ	—	—

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Mobile Communications DC Sources
40-100 W (Continued)

device's main battery during testing. Dual output models are recommended when you need to provide power as a replacement to your device's main battery and when you need to simulate the battery charger power; Use one output to supply current to the battery charger input port and the second output to connect in place of the main battery (which sinks current to simulate the main battery being charged).

Performs Like a Battery

With their battery emulation features, the Agilent 66319B/D and 66321B/D allow you to test your devices under the same power conditions that exist in actual use. Emulating the battery is key when characterizing battery operating life and detecting early product failures. These DC sources simulate the effects of internal resistance of the battery, enabling them to emulate the operation of various battery types or batteries in different charge states. Plus, these DC sources can simulate negative resistance so that you can compensate for voltage drop due to wiring in a fixture.

Feature Summary

Agilent has designed in the capability and flexibility that is required for accurately testing today's communications devices as well as your next generation designs for cell phones (formats include: 3G, cdma2000, WCDMA, CDMA, TDMA, GSM, PCS, DECT, TETRA, PHS, NADC), PDAs, *Bluetooth*™ enabled devices, and Wireless LAN access devices.

Specifications (at 0° to 55°C unless otherwise specified)		66309B/D	66311B	66319B/D	66321B/D	66332A	66332A-J01 Special Order Option
Voltmeter input (66309D, 66319D, and 66321D only)							
Input range		-25 to +25 Vdc	— —	-25 to +25 Vdc	-25 to +25 Vdc	— —	— —
DC readback accuracy (at 25°C ±5°C)		0.04% + 5 mV	— —	0.04% + 5 mV	0.04% + 5 mV	— —	— —
AC + DC readback accuracy (at 25°C ±5°C) with DC plus a sinewave input > 25 mV rms		1% + 5 mV (60 Hz to 10 kHz)	— — — —	1% + 5 mV (60 Hz to 10 kHz)	1% + 5 mV (60 Hz to 10 kHz)	— — — —	— — — —
Auxilary output (66309B/D and 66319B/D)							
Output ratings	Voltage	0 to 12V	—	0 to 12V	—	—	—
	Current	0 to 1.5 A	—	0 to 1.5 A	—	—	—
Programming accuracy	Voltage	0.2% + 40 mV	—	0.2% + 40 mV	—	—	—
	+Current	0.2% + 4.5 mA	—	0.2% + 4.5 mA	—	—	—
DC measurement accuracy	Voltage	0.2% + 15 mV	—	0.2% + 15 mV	—	—	—
	+Current	0.2% + 3 mA	—	0.2% + 3 mA	—	—	—
Ripple and Noise (20 Hz to 20 MHz)							
Voltage	rms	1 mV	—	1 mV	—	—	—
	peak-to-peak	6 mV		6 mV			
Current	rms	2 mA	—	2 mA	—	—	—

Notes:

[1] 66332A also has RS-232 interface.

[2] Applies with current detector set to DC.

[3] Time for the output voltage to recover to within 20 mV of final value after 0.1 to 1.5 A load change in high capacitance compensation range.

[4] Time for the output voltage to recover to within 20 mV or 0.1% of the voltage rating of the unit following a change in load current of up to 50% of the output current rating.

Supplemental Characteristics (Non-warranted characteristics determined by design and useful in applying the product)

DC Floating Voltage
Output terminals can be floated up to +/- 50 Vdc maximum from chassis ground (+/- 240 Vdc for 66332A)

Remote Sensing Voltage Drop
For 66332A: Up to 2 V can be dropped in each load lead. Add 2 mV to the load regulation specification for each 1 V drop in the positive output lead. For 66309B/D, 66311B: Up to 4 V can be dropped in each load lead. Add 2 mV to the load regulation specification for each 1 V drop in the positive output lead. For 66319B/D main output, 66321B/D main output: Up to 3 V total can be dropped in both load leads. For 66319B/D auxiliary output, 66321B/D auxiliary output: Up to 4 V total can be dropped in both load leads.

Command Processing Time
Average time required for the output voltage to begin to change following receipt of GPIB data is 4 ms (with display disabled).

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Mobile Communications DC Sources
40-100 W (Continued)

All models offer:

- Fast output response technology
- Programmable output response compensation
- Advanced DSP-based dynamic measurements
- Current sinking for testing and calibrating charger circuitry
- Extensive protection features (including broken sense lead detection)
- GPIB Interface, SCPI (Standard Commands for Programmable Instruments), VXI*plug&play* drivers

In addition, the 66319B/D and 66321B/D high performance models offer:

- Output resistance programming (positive and negative)
- Superior output stability with up to 6 meters of load leads
- Excellent transient voltage drop (typically < 30 mV)
- Three current measurement ranges
- NEW! Additional advanced battery drain measurements (CCDF, long term battery drain)

The new and improved 66319B/D and 66321B/D high performance models are recommended for new automated test system platforms and for R&D applications. The 66309B/D and the 66311B are available for those customers who need to replicate existing test platforms and who do not want to re-engineer existing automated test system designs.

Supplemental Characteristics (Non-warranted characteristics determined by design and useful in applying the product)

(Continued)

Output Programming Response Time
For 66332A: The rise and fall time (10/90% and 90/10%) of the output voltage is < 2 ms (400 µs in fast mode). The output voltage change settles within 1 LSB (0.025% x full scale voltage) of final value in < 6 ms (2 ms in fast mode). For 66311B, 66321B/D, 66309B/D output 1, 66319B/D output 1: The rise and fall time (10/90% and 90/10%) of the output voltage is < 200 µs.

Measurement Time
Average time to process query, calculate measurement parameter and return data is 50 ms (includes the default time of 30 ms for acquiring data and 20 ms data processing overhead).

GPIB Interface Capabilities
IEEE-488.2, SCPI command set, 6630A series programming capability (not supported in 66309B/D, 66319B/D, 66321B/D)

Software Driver:
- VXI*Plug&Play*
- IntuiLink Connectivity Software

Input power
(at worst case conditions: full load, 100 Vac mains)
For 66311B, 66321B/D: 1.7 A, 125 W.
For 66309B/D, 66319B/D: 2 A, 170 W.
For 66332A: 3.5 A, 250 W.

Regulatory Compliance
Complies with EMC directive 89/336/EEC (ISM 1B).

Warranty Period One year

Size
For 66309B/D, 66311B, 66319B/D, 66321B/D: 212.8 mm W x 88.1 mm H x 435 mm D (8.4 in x 3.5 in x 17.13 in).
For 66332A: 425.5 mm W x 88.1 mm H x 364.4 mm D (16.8 in x 3.5 in x 14.3 in).

Weight
For 66309B/D, 66311B, 66319B/D, 66321B/D: 9.07 kg (20 lb) net, 11.1 kg (24.5 lb) shipping. For 66332A: 12.7 kg (28 lb) net, 15.0 kg (33 lb) shipping.

Application Notes:

Mobile Communications Device Testing
(AN 1310)
5968-2424EN

Evaluating Battery Run-down Performance Using the Agilent 66319D or 66321D with Option #053 14565A Device Characterization Software
(AN 1427)
5988-8157EN

Using Battery Drain Analysis to Improve Mobile-Device Operating Time
5988-7772EN

Current Drain Analysis Enhances WLAN Network Card Design and Test
(AN 1468)
5989-0565EN

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Mobile Communications DC Sources
40-100 W (Continued)

Ordering Information

Opt 100 87 to 106 Vac, 47 to 63 Hz
Opt 120 104 to 127 Vac, 47 to 63 Hz
Opt 220 191 to 233 Vac, 47 to 63 Hz
Opt 230 207 to 253 Vac, 47 to 63 Hz
Opt 004 Make "Hi Compensation Mode" as default setting
Opt 007 Extra 5-pin output connectors (2 x p/n 0360-2604
Opt 020 Front-panel Binding Posts (66332A only)
Opt UJ0 No front panel binding posts (66332A only)
Opt 521 Solid State Relays (66309B/D, 66319B/D)
Opt AYK No Solid State Relays (66309B/D,66319B/D)
Opt 760 Isolation and Reversal Relays (66332A only)
Opt 8ZJ Delete feet
Opt 8ZL Include feet

* **Opt 1CM** Rack-mount kit 66309B/D, 66311B, 66319B/D, 66321B/D: p/n 5062-3972; 66332A: p/n 5062-1912
* **Opt 1CP** Rack-mount Kit with Handles, p/n 5062-3975 (66332A only)
* **Opt AXS** Rack-mount Kit for side-by-side mounting, (N/A for 66332A) Locking Kit p/n 5061-9694; Flange Kit p/n 5062-3974
Opt 0L1 Full documentation on CD-ROM, and printed standard documentation package
Opt 0L2 Extra copy of standard printed documentation package
Opt 0B0 Full documentation on CD-ROM only
Opt 0B3 Service manual

*Support rails required

Accessories

p/n 1494-0060 Rack Slide Kit (66332A only)

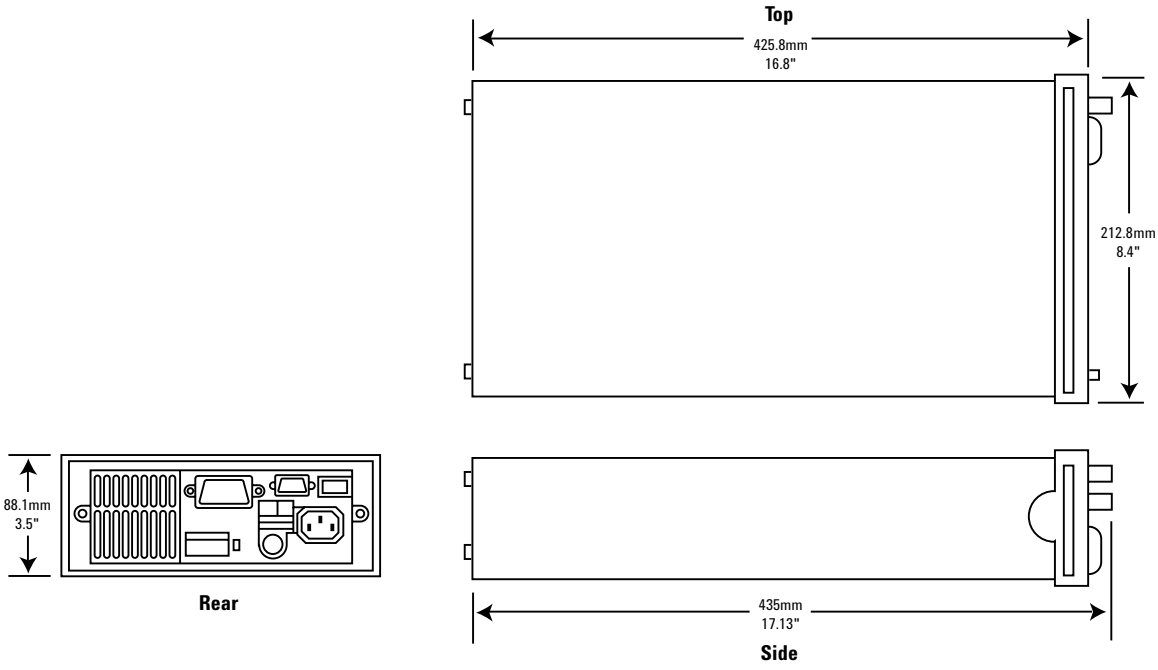
E3663AC Support rails for Agilent rack cabinets

14565B Device Characterization with Battery Drain Analysis & Test Automation

14565U Device Characterization Software Upgrade (provides upgrade from 14565A to 14565B Software)

Note: Battery Drain Analysis means Data Logging and CCDF measurements. These capabilities require models 66319B, 66319D, 66321B or 66321D with version A.03.00 firmware or higher and 14565B or 14565A software version 3.01 or higher.

Agilent Models: 66309B/D, 66311B, 66319B/D, 66321B/D

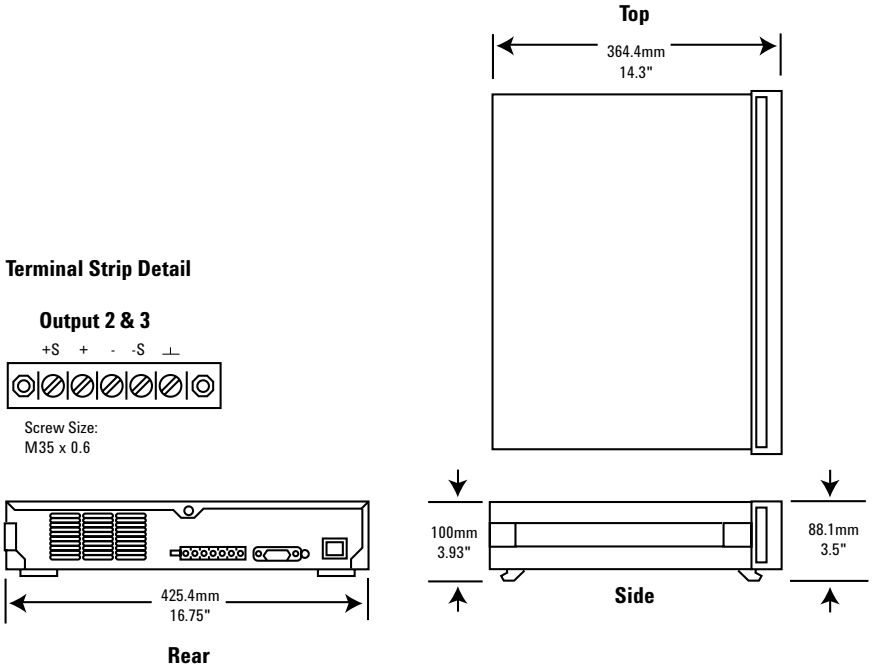


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Mobile Communications DC Sources
40-100 W (Continued)

Agilent Models: 66332A



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Mobile Communications DC Sources
14565B Device Characterization Software



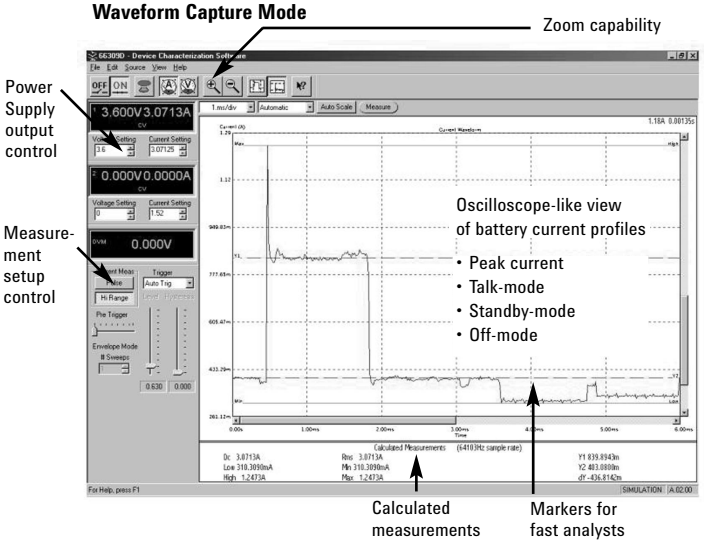
- Ideal for testing wireless and battery powered devices
- Converts Mobile Communications DC Source into a powerful bench top tool for R&D and Repair
- Easy-to-use Graphical User Interface and analysis tools
- No programming required

Simplify test and analysis in R&D or on the repair bench

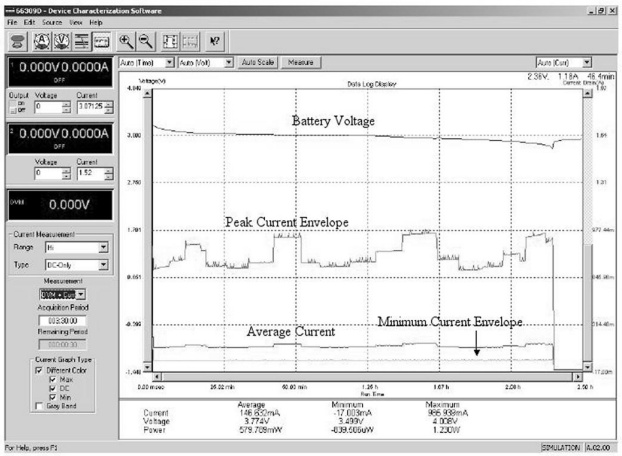
With the Agilent 14565B Device Characterization Software, testing, analyzing, and troubleshooting wireless and battery powered devices is made simple. The 14565B provides a graphical user interface that lets you easily control the Mobile Communications DC Sources. It gives you access to the Mobile Communications DC Source's high-powered measurement system and provides an oscilloscope-like view of the voltage or current waveforms of the device under test. The 14565B provides reference waveform save/recall, and provides oscilloscope-like measurement and analysis including voltage and current waveform parameter measurements, triggering, markers, zoom control, and more. By using the advanced capabilities built into the power supply, you can spend more time testing and analyzing instead of configuring and reconfiguring multiple pieces of test equipment, such as a current shunt, oscilloscope, current probe, DMM, and datalogger.

(Continued)

Waveform Capture Mode



Data Logging Mode



More detailed specifications at **www.agilent.com/find/14565B**

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Mobile Communications DC Sources
Device Characterization Software (Continued)

When coupled with the 66319B/D or the 66321B/D, the 14565B also provides Battery Drain Analysis capabilities. More than just measuring battery run time, Battery Drain Analysis allows you to characterize current out of the battery and make tradeoffs in design that impact the current drain and battery life. By providing CCDF measurements and long-term battery drain data logging, the 14565B and 66319/21 provide a complete solution for analyzing current drain so that you can optimize your device designs to achieve maximum battery run time.

Save time with test automation

New capability makes it easy to automate battery current drain analysis. The 14565B can be controlled from various programs and programming languages such as the Agilent Wireless Test Manager, NI LabView™, Agilent VEE, Microsoft Visual Basic, Microsoft Excel and others. Save valuable resource and time by automating time consuming, repetitive tasks associated with characterizing battery current drains during real world operation (like video streaming, music downloads, text messaging). The 14565B Device Characterization Software with test automation reduces setup and test time, reduces manual intervention, and provides battery drain measurement and analysis.

Key features

For R&D

- Fast and easy test setup
- Digitize current waveforms
- Accurately log battery current drain measurements from 10 seconds to 1000 hours at 64,000 measurements per second
- New automation capability provides operational control from many test applications
- Test designs simulating different battery conditions with programmable output resistance
- Zoom capability for analyzing waveform anomalies
- Adjust markers for fast measurements on digitized waveforms
- Easily document your test results
- Record test data to files for archive or analysis by other software packages

For Repair

- Compact design with multiple instrument functionality
- Fast and easy test setup
- Graphical user software, no programming required
- Dual DC outputs for replacing the main battery and the power adapter/charger power source
- Electronic load for testing the battery charger circuitry
- Programmable soft limits to protect against incorrect voltage settings

Ordering Information

14565B Device Characterization with Battery Drain Analysis & Test Automation

14565U Device Characterization Software Upgrade (provides upgrade from 14565A to 14565B Software)

Note: Battery Drain Analysis means Data Logging and CCDF measurements. These capabilities require models 66319B, 66319D, 66321B or 66321D with version A.03.00 firmware or higher and 14565B or 14565A software version 3.01 or higher.

More detailed specifications at **www.agilent.com/find/14565B**

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