

KEITHLEY

2440

The Keithley 2440 is a high-current 60W SourceMeter Instrument (SMU) designed for test applications requiring tightly coupled precision voltage and current sourcing and measurement. Part of the industry-standard Keithley Series 2400 SourceMeter family, the Model 2440 provides 5A output capability at up to 10V, and 1A output at up to 40V, making it ideal for testing high-power semiconductors, LEDs, and power management devices.

SPECIFICATIONS

General

Interfaces	GPIB (IEEE-488.2), RS-232, Digital I/O, Trigger Link
Display	12-character vacuum fluorescent display (VFD)
Maximum VA Rating	240 VA
Cooling System	Internal cooling fan
Non-volatile Setup Storage	5 user-defined instrument setups

Physical

Power Supply	100V to 240V AC, 50Hz to 60Hz, 240VA max
Operating Temperature	0°C to 50°C °C
Dimensions (W×H×D)	213 mm × 89 mm × 370 mm mm
Weight	4.1 kg kg

Source Specifications

Maximum Output Power	60 W
Voltage Source Ranges	200mV, 2V, 20V, 40V
Current Source Ranges	10μA, 100μA, 1mA, 10mA, 100mA, 1A, 5A
Voltage Source Resolution (200mV Range)	5 μV
Voltage Source Resolution (2V Range)	50 μV
Voltage Source Resolution (20V Range)	500 μV
Voltage Source Resolution (40V Range)	1 mV
Current Source Resolution (10μA Range)	500 pA
Current Source Resolution (100μA Range)	5 nA
Current Source Resolution (1mA Range)	50 nA
Current Source Resolution (10mA Range)	500 nA
Current Source Resolution (100mA Range)	5 μA
Current Source Resolution (1A Range)	50 μA
Voltage Source Accuracy (200mV Range)	±(0.02% + 600 μV)
Voltage Source Accuracy (2V Range)	±(0.02% + 600 μV)
Voltage Source Accuracy (20V Range)	±(0.02% + 2.4 mV)
Voltage Source Accuracy (40V Range)	±(0.02% + 4.8 mV)
Current Source Accuracy (10μA Range)	±(0.035% + 6 nA)
Current Source Accuracy (100μA Range)	±(0.035% + 60 nA)
Current Source Accuracy (1mA Range)	±(0.035% + 600 nA)
Current Source Accuracy (10mA Range)	±(0.035% + 6 μA)
Current Source Accuracy (100mA Range)	±(0.045% + 60 μA)
Current Source Accuracy (1A Range)	±(0.08% + 600 μA)
Current Source Accuracy (5A Range)	±(0.1% + 2.4 mA)
Voltage Compliance Range	200 μV to 42.0 V
Current Compliance Range	10 nA to 5.25 A
Source Delay Range	0 to 9999.999 s
Source Delay Resolution	100 μs

Measure Specifications

Voltage Measure Ranges	200mV, 2V, 20V, 40V
Current Measure Ranges	10μA, 100μA, 1mA, 10mA, 100mA, 1A, 5A
Voltage Measure Resolution (200mV Range)	1 μV
Voltage Measure Resolution (2V Range)	10 μV
Voltage Measure Resolution (20V Range)	100 μV
Voltage Measure Resolution (40V Range)	1 mV
Current Measure Resolution (10μA Range)	100 pA
Current Measure Resolution (100μA Range)	1 nA
Current Measure Resolution (1mA Range)	10 nA
Current Measure Resolution (10mA Range)	100 nA
Current Measure Resolution (100mA Range)	1 μA
Current Measure Resolution (1A Range)	10 μA
Current Measure Resolution (5A Range)	100 μA
Voltage Measure Accuracy (200mV Range)	±(0.012% + 300 μV)
Voltage Measure Accuracy (2V Range)	±(0.012% + 300 μV)
Voltage Measure Accuracy (20V Range)	±(0.015% + 1.5 mV)
Voltage Measure Accuracy (40V Range)	±(0.015% + 3 mV)
Current Measure Accuracy (10μA Range)	±(0.025% + 1.5 nA)
Current Measure Accuracy (100μA Range)	±(0.025% + 15 nA)
Current Measure Accuracy (1mA Range)	±(0.025% + 150 nA)
Current Measure Accuracy (10mA Range)	±(0.025% + 1.5 μA)
Current Measure Accuracy (100mA Range)	±(0.025% + 15 μA)
Current Measure Accuracy (1A Range)	±(0.035% + 1.5 mA)
Current Measure Accuracy (5A Range)	±(0.08% + 3.5 mA)
Input Impedance (200mV and 2V Ranges)	>10 ¹⁰ Ohms

Resistance Measure Specifications

Resistance Measure Ranges	2.0 Ohms to 2.0 MOhms
Resistance Measure Accuracy (2 Ohm Range)	$\pm(0.10\% + 0.003 \text{ Ohm})$
Resistance Measure Accuracy (20 Ohm Range)	$\pm(0.08\% + 0.03 \text{ Ohm})$
Resistance Measure Accuracy (200 Ohm Range)	$\pm(0.07\% + 0.3 \text{ Ohm})$
Resistance Measure Accuracy (2 kOhm Range)	$\pm(0.07\% + 3 \text{ Ohm})$
Resistance Measure Accuracy (20 kOhm Range)	$\pm(0.07\% + 30 \text{ Ohm})$
Resistance Measure Accuracy (200 kOhm Range)	$\pm(0.11\% + 300 \text{ Ohm})$
Resistance Measure Accuracy (2 MOhm Range)	$\pm(0.11\% + 3 \text{ kOhm})$

Dynamic & Sweep Capabilities

Sweep Types	Linear, Log, Custom, Source-Memory
Source-Memory Buffer Size	100 points
Data Buffer Size	5000 readings

System Speeds & Timing

Max Reading Rate to Memory	2081 readings/second
Max Reading Rate to GPIB	1750 readings/second
Integration Time (NPLC)	0.01 NPLC to 10 NPLC

Connectivity & Control Interfaces

Sense Connections	2-wire local or 4-wire remote sense
Output Terminal Types	Front and rear panel safety banana jacks
Active Guard Terminals	Guard terminal available on front and rear panels
Digital I/O Port	4-bit input/output, DB-9 female connector
Trigger Link Connectors	8-pin micro-DIN

Environmental & Safety Standards

Maximum Common Mode Voltage	250 V DC
Warm-up Time	1 hour
Operating Humidity Range	70% R.H. non-condensing at up to 35°C (derated above 35°C)
Storage Temperature Range	-25°C to 65°C
Calibration Cycle Interval	1 Year

Power & Physical Characteristics

Benchtop/Rackmount Configuration	Benchtop with removable bumpers, or 2U half-rack rackmountable
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Source Performance

Voltage Source Overshoot	< 0.1% typical (full scale step, resistive load)
Current Source Overshoot	< 0.1% typical (full scale step, resistive load)
Voltage Source Settling Time	< 250 μ s typical (to 0.1%)
Current Source Settling Time	< 250 μ s typical (to 0.1%)
Voltage Source Noise (0.1Hz - 10Hz, 200mV Range)	5 μ V p-p
Voltage Source Noise (0.1Hz - 10Hz, 2V Range)	50 μ V p-p
Voltage Source Noise (0.1Hz - 10Hz, 20V Range)	500 μ V p-p
Voltage Source Noise (0.1Hz - 10Hz, 40V Range)	1 mV p-p
Maximum Capacitive Load	Stable into 20,000 pF typical

Guard Terminals

Guard Offset Voltage	< 150 μ V typical
Maximum Guard Output Current	100 mA

System Specifications

Over Range Limit	105% of range (source and measure, except 5A range)
Over Range Limit (5A Range)	100.5% of range (source and measure)

Digital I/O

Digital I/O +5V Output Current Limit	150 mA (maximum combined current)
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Environmental

Maximum Altitude	2,000 m (6,562 ft) above sea level
Vibration Specification	MIL-PRF-28800F Class 3 Random

Compliance & Safety

Safety Compliance	Conforms to European Union Low Voltage Directive; UL 3111-1; CSA C22.2 No. 1010.1; EN 61010-1
EMC Compliance	Conforms to European Union EMC Directive

TECHNOLOGY

Source Measure Unit (SMU)

APPLICATIONS

Semiconductor testing, high-brightness LED test, power-device characterization, battery testing

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