KEITHLEY

2461

The Keithley 2461 High-Current Interactive SourceMeter (SMU) Instrument is a high-performance source measure unit capable of dual 18-bit, 1 MS/s high-speed digitizing. It features a 5-inch capacitive touchscreen interface and is designed for testing high-power materials, devices, and modules such as silicon carbide (SiC), gallium nitride (GaN), DC-DC converters, power MOSFETs, solar cells, and LEDs.

SPECIFICATIONS

General

Interfaces	GPIB, LAN (LXI Class C), USB 2.0 (Host and Device), TSP-Link, Digital I/O (9-pin D-sub), Safety Interlock
Display	5-inch color WVGA (800×480) TFT capacitive touchscreen
Warm-Up Time	1 hour

Physical

Power Supply	100 V to 240 V AC (±10%), 50 Hz / 60 Hz, 350 VA maximum
Operating Temperature	0 °C to 50 °C °C
Dimensions (W×H×D)	213 mm × 88 mm × 403 mm (without bumpers) / 224 mm × 106 mm × 427 mm (with bumpers) mm
Weight	4.12 kg

Source/Measure Specifications

Maximum Voltage	100 V
Maximum DC Current	7 A
Maximum Pulse Current	10 A
Maximum DC Power	100 W
Maximum Pulse Power	1000 W
Measurement Resolution	6½ digits
Voltage Source Ranges	200 mV, 2 V, 20 V, 100 V
Current Source Ranges	1 µA, 10 µA, 100 µA, 1 mA, 10 mA, 100 mA, 1 A, 4 A, 5 A, 7 A, 10 A
Voltage Measure Ranges	200 mV, 2 V, 20 V, 100 V
Current Measure Ranges	1 µA, 10 µA, 100 µA, 1 mA, 10 mA, 100 mA, 1 A, 4 A, 5 A, 7 A, 10 A
Basic Voltage Source Accuracy	0.015%
Basic Current Source Accuracy	0.025%
Basic Voltage Measure Accuracy	0.012%
Basic Current Measure Accuracy	0.02%

Digitizer Specifications

Digitizer Resolution	18-bit
Digitizer Maximum Sampling Rate	1 MS/s
Digitizer Channels	2 (simultaneous high-speed measurement of both voltage and current)
Digitizer Sampling Rate Range	1 kS/s to 1 MS/s
Digitizer Buffer Size	Up to 27.5 million readings
Digitizer Input Impedance	>10 GΩ for 200 mV and 2 V ranges, 10 MΩ for 20 V and 100 V ranges
Digitizer Voltage Accuracy	0.05% of range (for 200 mV to 100 V ranges)
Digitizer Current Accuracy	0.05% of range (range dependent, 10 µA to 10 A ranges)

User Interface & System

Standard Reading Buffer Capacity	> 250,000 readings
Programming Languages	SCPI, TSP (Test Script Processor)
Legacy Code Compatibility	Keithley 2400 SCPI Emulation Mode
PC Software Support	KickStart, LabVIEW, IVI-C, IVI-COM drivers

Input/Output Connectivity

Front Panel Connections	4-wire safety banana jacks, chassis ground, guard
Rear Panel Connections	8-pin high-current Phoenix terminal block
LAN Port	RJ-45, 10/100Base-T, LXI Class C compliant
GPIB Port	IEEE-488.2 compliant
USB Ports	1 x USB 2.0 Type A (front panel, host), 1 x USB 2.0 Type B (rear panel, device)
TSP-Link Ports	2 x RJ-45 connectors for system expansion
Digital I/O Port	9-pin female D-sub connector, 6 programmable lines
Safety Interlock	Rear panel 3-pin terminal block

Physical & Mechanical

Rackmount Height	2U
Rackmount Width	Half-rack width
Cooling Method	Forced air, variable-speed fan

Environmental & Compliance

Storage Temperature Range	-25 °C to 65 °C
Operating Humidity	5% to 80% RH, non-condensing (up to 35 °C)
Maximum Operating Altitude	2,000 meters (6,562 feet)
Safety Compliance	Conforms to European Union Low Voltage Directive, UL 61010-1
EMC Compliance	Conforms to European Union EMC Directive
Calibration Interval	1 year (recommended)

Pulse Specifications

Pulse Width Range	150 µs to 5 ms
Pulse Width Programming Resolution	1 µs
Maximum Pulse Duty Cycle	8%

Protection & Isolation

Overvoltage Protection Range	2 V to 110 V
Common Mode Voltage	250 V DC
Common Mode Isolation	>10 GΩ, <1000 pF

Measurement Characteristics

Voltage Sense Input Impedance	>10 GΩ
Maximum Guard Offset Voltage	< 300 µV
Sensing Modes	2-wire (local) or 4-wire (remote) sense

Source Specifications

Voltage Source Line Regulation	0.01% of range
Voltage Source Load Regulation	0.01% of range + 100 µV
Current Source Line Regulation	0.01% of range
Current Source Load Regulation	0.01% of range + 100 pA (range dependent)

Sensing and Guarding

Maximum Sense Lead Resistance	100 Ω (for rated accuracy)
Maximum Force-Sense Voltage Drop	5 V (maximum drop between Force HI and Sense HI, or Force LO and Sense LO)

Pulse Mode

Pulse Current Rise Time	< 30 µs (typical, 10% to 90%)

System Performance

Maximum Reading Rate to I/O	> 250,000 readings/s (via digitizer)

TECHNOLOGY

Source Measure Unit (SMU)

APPLICATIONS

High-power semiconductor testing, battery testing, power conversion analysis, and materials characterization