KEITHLEY

2614B

The Keithley 2614B is a dual-channel System SourceMeter (SMU) instrument designed for benchtop and laboratory applications. It integrates a highly stable voltage and current source with high-precision measurements of voltage, current, and resistance in a 2U half-rack chassis.

SPECIFICATIONS

General

Interfaces	GPIB, LAN (LXI Class C), USB 2.0 (Device and Host)
Display	Dual-line vacuum fluorescent display (VFD)
Warm-up Time	2 hours
Maximum Power Consumption	240 VA
Temperature Coefficient	±(0.15 × accuracy specification) per °C (0 °C to 18 °C and 28 °C to 50 °C)
Cooling	Forced air, variable speed
Recommended Calibration Interval	1 year

Physical

Power Supply	100 V to 240 V AC, 50 Hz to 60 Hz, 240 VA max.
Operating Temperature	0 °C to 50 °C °C
Dimensions (W×H×D)	213 mm × 89 mm × 460 mm mm
Weight	5.5 kg kg
Form Factor	2U half-rack

System Configuration

Number of Channels	2
Maximum Output Power	60.6 W (30.3 W per channel)
Maximum Voltage Limit	200 V DC
Maximum Current Limit	1.5 A DC
Sensing Modes	2-wire local and 4-wire remote sensing
Maximum Common Mode Voltage	250 V DC

Voltage Source

Voltage Source Ranges	200 mV, 2 V, 20 V, 200 V
Voltage Source Programming Resolution (200 mV Range)	5 µV
Voltage Source Programming Resolution (2 V Range)	50 µV
Voltage Source Programming Resolution (20 V Range)	500 µV
Voltage Source Programming Resolution (200 V Range)	5 mV
Voltage Source Accuracy (200 mV Range)	0.02% + 375 µV
Voltage Source Accuracy (2 V Range)	0.02% + 600 µV
Voltage Source Accuracy (20 V Range)	0.02% + 5 mV
Voltage Source Accuracy (200 V Range)	0.02% + 50 mV

Current Source

Current Source Ranges	100 nA, 1 µA, 10 µA, 100 µA, 1 mA, 10 mA, 100 mA, 1 A, 1.5 A, 10 A
Current Source Programming Resolution (100 nA Range)	2 pA
Current Source Programming Resolution (1 µA Range)	20 pA
Current Source Programming Resolution (10 µA Range)	200 pA
Current Source Programming Resolution (100 µA Range)	2 nA
Current Source Programming Resolution (1 mA Range)	20 nA
Current Source Programming Resolution (10 mA Range)	200 nA
Current Source Programming Resolution (100 mA Range)	2 µA
Current Source Programming Resolution (1.5 A Range)	50 µA
Current Source Accuracy (100 nA Range)	0.06% + 100 pA
Current Source Accuracy (1 µA Range)	0.03% + 800 pA
Current Source Accuracy (10 µA Range)	0.03% + 5 nA
Current Source Accuracy (100 µA Range)	0.03% + 60 nA
Current Source Accuracy (1 mA Range)	0.03% + 500 nA
Current Source Accuracy (10 mA Range)	0.03% + 5 µA
Current Source Accuracy (100 mA Range)	0.03% + 50 µA
Current Source Accuracy (1.5 A Range)	0.06% + 4 mA

Voltage Measure

Voltage Measurement Ranges	200 mV, 2 V, 20 V, 200 V
Voltage Measurement Resolution (200 mV Range)	100 nV
Voltage Measurement Resolution (2 V Range)	1 µV
Voltage Measurement Resolution (20 V Range)	10 µV
Voltage Measurement Resolution (200 V Range)	100 µV
Voltage Measurement Accuracy (200 mV Range)	0.015% + 225 µV
Voltage Measurement Accuracy (2 V Range)	0.015% + 350 µV
Voltage Measurement Accuracy (20 V Range)	0.015% + 5 mV
Voltage Measurement Accuracy (200 V Range)	0.015% + 50 mV
Voltage Measurement Input Impedance	> 10 GΩ (on 200 mV and 2 V ranges)

Current Measure

Current Measurement Ranges	100 nA, 1 µA, 10 µA, 100 µA, 1 mA, 10 mA, 100 mA, 1 A, 1.5 A
Current Measurement Resolution (100 nA Range)	100 fA
Current Measurement Resolution (1 µA Range)	1 pA
Current Measurement Resolution (10 µA Range)	10 pA
Current Measurement Resolution (100 µA Range)	100 pA
Current Measurement Resolution (1 mA Range)	1 nA
Current Measurement Resolution (10 mA Range)	10 nA
Current Measurement Resolution (100 mA Range)	100 nA
Current Measurement Resolution (1.5 A Range)	1 µA
Current Measurement Accuracy (100 nA Range)	0.05% + 100 pA
Current Measurement Accuracy (1 µA Range)	0.025% + 500 pA
Current Measurement Accuracy (10 µA Range)	0.025% + 1.5 nA
Current Measurement Accuracy (100 µA Range)	0.02% + 25 nA
Current Measurement Accuracy (1 mA Range)	0.02% + 200 nA
Current Measurement Accuracy (10 mA Range)	0.02% + 2.5 µA
Current Measurement Accuracy (100 mA Range)	0.02% + 20 µA
Current Measurement Accuracy (1.5 A Range)	0.05% + 3.5 mA

Dynamic & Sweep

Maximum Sweep Rate	20,000 readings/s (to memory)
A/D Converter Type	Integrating
Integration Time Range	0.001 PLC to 25 PLC
Reading Buffer Capacity	140,000 readings

Software & Control

Command Languages	TSP (Test Script Processor)
Embedded Software	TSB Express
Command Emulation	Not supported

Connectivity & Interfaces

Rear Panel Connectors	8-pin quick-disconnect terminal blocks

Environmental

Storage Temperature Range	-25 °C to +65 °C
Operating Humidity	0% to 70% RH (0 °C to 35 °C), derate 3% RH/°C up to 50 °C (non-condensing)
Maximum Operating Altitude	2000 m
Vibration	MIL-PRF-28800F Class 3 Random

Protection

Overvoltage Protection	User-programmable, 0 V to 210 V

Source Performance

Voltage Source Noise (10 Hz - 20 MHz)	< 20 mV p-p, < 3 mV RMS (typical, 20 V range)

Measurement Performance

Common Mode Isolation	> 1 GΩ, < 4500 pF (typical)

Pulsed Capability

Maximum Pulsed Current	10 A (at 20 V range)
Minimum Pulse Width	100 µs
Maximum Pulse Duty Cycle	10%

Connectivity

TSP-Link Expansion Interface	Not supported
Front Panel USB Host Support	USB flash drives for storage, script loading, and firmware upgrades

Performance

Contact Check Function	Not supported
High-Capacitance Mode	Supported
A/D Converter Resolution	24-bit
Maximum Voltage Between Force and Sense	3 V
Maximum Sense Lead Resistance	10 Ω per lead
Source/Measure Overrange	101% of source range, 102% of measure range
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

Inputs & Outputs

Output Connectors	Quick-disconnect screw terminal blocks

Power Supply

Power Line Frequency	50 Hz / 60 Hz
Input Voltage Range	100 V to 240 V AC (auto-sensing)

Compliance

Safety Compliance	Conforms to European Union Low Voltage Directive; UL61010-1
EMC Compliance	Conforms to European Union EMC Directive

TECHNOLOGY

Source Measure Unit (SMU)

APPLICATIONS

Precision DC sourcing and measurement, semiconductor device characterization, component testing, and material testing.