KEITHLEY

6517B

The Keithley 6517B is a 5½-digit electrometer and high-resistance meter designed for low-current, high-resistance, voltage, and charge measurements. It combines highly sensitive measurement capabilities with a built-in dual-range 1000 V DC voltage source, making it a standard for material characterization, resistivity measurements, and component testing.

SPECIFICATIONS

General

Interfaces	GPIB (IEEE-488.2), RS-232, Digital I/O, Trigger Link, Safety Interlock
Display	5.5-digit Vacuum Fluorescent Display (VFD)
Emulation Modes	Keithley 6517

Physical

Power Supply	100 V to 240 V AC, 50 Hz to 60 Hz, 100 VA maximum
Operating Temperature	0°C to 50°C °C
Dimensions (W×H×D)	214 mm × 90 mm × 369 mm mm
Weight	5.4 kg

Resistance Measurement

Resistance Measurement Range	100 Ω to 10^16 Ω
Resistance Display Resolution	Up to 5½ digits

Current Measurement

Current Measurement Ranges	20 pA, 200 pA, 2 nA, 20 nA, 200 nA, 2 µA, 20 µA, 200 µA, 2 mA, 20 mA
Minimum Current Resolution	100 aA
Input Bias Current	<3 fA
Current Measurement Accuracy (20 pA range)	±(1.0% + 8 fA)
Current Measurement Accuracy (200 pA range)	±(1.0% + 10 fA)
Current Measurement Accuracy (2 nA range)	±(0.2% + 500 fA)
Current Measurement Accuracy (20 nA range)	±(0.1% + 500 fA)
Current Measurement Accuracy (200 nA range)	±(0.1% + 5 pA)
Current Measurement Accuracy (2 µA range)	±(0.1% + 50 pA)
Current Measurement Accuracy (20 µA range)	±(0.1% + 500 pA)
Current Measurement Accuracy (200 µA range)	±(0.1% + 5 nA)
Current Measurement Accuracy (2 mA range)	±(0.1% + 50 nA)
Current Measurement Accuracy (20 mA range)	±(0.1% + 500 nA)
Input Voltage Burden	<20 µV (<100 µV on 20 mA range)

Voltage Measurement

Voltage Measurement Ranges	2 V, 20 V, 200 V
Voltage Measurement Accuracy (2 V range)	±(0.025% + 4 counts)
Voltage Measurement Accuracy (20 V range)	±(0.025% + 3 counts)
Voltage Measurement Accuracy (200 V range)	±(0.06% + 3 counts)
Voltage Measurement Resolution	10 µV (on 2 V range)
Input Impedance	>200 TΩ in parallel with <20 pF

Charge Measurement

Charge Measurement Ranges	2 nC, 20 nC, 200 nC, 2 µC
Charge Measurement Accuracy	±(0.4% + 4 counts)
Charge Measurement Resolution	10 fC (on 2 nC range)

DC Voltage Source

Voltage Source Output Ranges	±100 V, ±1000 V
Voltage Source Accuracy (100 V range)	±(0.15% + 10 mV)
Voltage Source Accuracy (1000 V range)	±(0.15% + 100 mV)
Voltage Source Resolution (100 V range)	5 mV
Voltage Source Resolution (1000 V range)	50 mV
Maximum Source Current (100 V range)	10 mA
Maximum Source Current (1000 V range)	1 mA
Current Limit (Compliance)	Programmable (up to 10 mA on 100 V range, up to 1 mA on 1000 V range)

Measurement Timing and Speed

Maximum Measurement Rate	Up to 425 readings/s

Measurement Support and Advanced Functions

Resistivity Calculations	Volume Resistivity, Surface Resistivity (with compatible fixtures)
Built-in Test Sequences	Capacitor Leakage, Diode Leakage, Resistivity, Surface Insulation Resistance (SIR), Voltage Sweep
Mathematical Functions	mX+b, Percent, Reciprocal (1/X), Logarithmic
Limit Testing	Go/No-Go testing with high/low limit outputs
Internal Memory Capacity	Up to 50,000 readings
Temperature Measurement Range	-25°C to 150°C (with Model 6517-TP probe)
Humidity Measurement Range	0% to 100% RH (with Model 6517-RH probe)

Connectivity and Interfaces

Input Connector	3-slot Triaxial
Analog Output	2 V full scale (non-inverting)
Safety Interlock	4-pin

Power and Physical Characteristics

Rack Mount Compatibility	Yes (using optional rack mount kits)

Environmental and Safety Compliance

Operating Humidity Range	0% to 70% RH (non-condensing) up to 35°C
Storage Temperature Range	-25°C to 65°C
Warm-up Time	1 hour to rated accuracy

Accessories and Configuration Options

Compatible Resistivity Test Fixture	Keithley Model 8009
Compatible Temperature Probe	Keithley Model 6517-TP
Compatible Humidity Probe	Keithley Model 6517-RH

Voltage Source

Voltage Source Load Regulation (100V Range)	< 0.005% of range + 2 mV (for 0 to 20 mA load change)
Voltage Source Load Regulation (1000V Range)	< 0.005% of range + 20 mV (for 0 to 1 mA load change)
Voltage Source Noise (100V Range)	< 1.5 mV p-p (10 Hz to 1 MHz)
Voltage Source Noise (1000V Range)	< 3.0 mV p-p (10 Hz to 1 MHz)
Voltage Source Settling Time	< 8 ms (100 V range), < 50 ms (1000 V range)
Voltage Source Temperature Coefficient	±(0.005% of setting + 1 mV)/°C (100 V range), ±(0.005% of setting + 10 mV)/°C (1000 V range)

Performance

Common Mode Rejection Ratio (CMRR)	> 120 dB (at DC, 50 Hz or 60 Hz with 1 kΩ in LO lead)
Normal Mode Rejection Ratio (NMRR)	> 60 dB (at 50 Hz or 60 Hz, 1 PLC or greater)
A/D Converter Resolution	20-bit
A/D Converter Integration Time	0.01 PLC to 10 PLC

Inputs & Outputs

Digital I/O Outputs	4 open-collector outputs (100 mA max sink current, 30 V max clamp voltage)
Digital I/O Inputs	1 TTL-compatible input
Trigger Link	6 independent trigger lines

Measurement Features

High Resistance Measurement Method	Alternating Polarity Method

Analog Outputs

2V Analog Output Level	±2.0 V full scale (non-inverting)
Preamp Output Level	±2.0 V full scale (inverting)

Environmental

Operating Altitude	Up to 2000 m (6562 ft) above sea level
Storage Altitude	Up to 12,000 m

Standards & Compliance

Safety Conformance	Conforms to European Union Directive 73/23/EEC, EN 61010-1
EMC Conformance	Conforms to European Union Directive 89/336/EEC, EN 61326-1

TECHNOLOGY

Electrometer / Megohmmeter

APPLICATIONS

High-resistance materials testing, low-current measurement, sensor characterization, and insulator testing

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