

KEYSIGHT TECHNOLOGIES (AGILENT HP)

41501A

The Keysight (Agilent) 41501A is an SMU and Pulse Generator Expander designed to extend the capabilities of the 4155A/B and 4156A/B Semiconductor Parameter Analyzers. It is not a standalone system, but rather a mainframe expansion unit that can house high-current SMUs, medium-power SMUs, and Pulse Generator Units (PGUs) to handle more complex semiconductor device characterization tasks.

SPECIFICATIONS

General

Interfaces	Dedicated expander interface (connects directly to 4155/4156 mainframe)
Display	None (status LED indicators only; displays on connected mainframe)
Warm-up Time	40 minutes

Physical

Power Supply	90 V to 264 V AC, 47 Hz to 63 Hz, 350 VA max
Operating Temperature	5 °C to 40 °C °C
Dimensions (W×H×D)	338 mm × 235 mm × 450 mm mm
Weight	17 kg (with 2 PGUs and 1 HCSMU) kg

System Compatibility

Supported Mainframes	Keysight/Agilent 4155A, 4155B, 4156A, 4156B
----------------------	---

System Configuration

Slot Capacity	4 slots (for HCSMU, MPSMU, and PGU modules)
---------------	---

Pulse Generator Unit (PGU) Performance

Pulse Generator Unit (PGU) Channels	Up to 2 channels (with Option 402 or 420)
PGU Amplitude Range (into High Impedance)	-40 V to +40 V
PGU Amplitude Range (into 50 Ω)	-20 V to +20 V
PGU Output Impedance	50 Ω or low impedance
PGU Pulse Period Range	1.0 μs to 9.99 s
PGU Pulse Period Resolution	100 ns
PGU Pulse Width Range	1.0 μs to 9.99 s
PGU Pulse Delay Range	0 s to 9.99 s
PGU Transition Time Range (Rise/Fall)	100 ns to 10 ms

High Current SMU (HCSMU) Performance

High Current SMU (HCSMU) Support	1 channel (with Option 402, 410, 411, or 412)
HCSMU Maximum Current (DC)	100 mA
HCSMU Maximum Current (Pulse)	1 A
HCSMU Maximum Voltage (DC)	200 V
HCSMU Maximum Voltage (Pulse)	200 V

Medium Power SMU (MPSMU) Performance

Medium Power SMU (MPSMU) Support	Up to 2 channels (1 channel with Option 411, 2 channels with Option 412)
MPSMU Maximum Current	100 mA
MPSMU Maximum Voltage	100 V

Environmental

Operating Humidity Range	8% to 80% RH (non-condensing)
Cooling Method	Forced air cooling with rear-panel fan
Storage Temperature Range	-20 °C to +60 °C
Storage Humidity Range	5% to 90% RH (non-condensing)

High Current SMU (HCSMU)

HCSMU Current Measurement Resolution	10 pA
HCSMU Voltage Measurement Resolution	2 μ V
HCSMU Connector Type	Triaxial (Force/Sense)
HCSMU Pulse Width Range	100 μ s to 1 ms
HCSMU Maximum Pulse Duty Cycle	3%

Medium Power SMU (MPSMU)

MPSMU Current Measurement Resolution	10 fA
MPSMU Voltage Measurement Resolution	2 μ V
MPSMU Connector Type	Triaxial (Force/Sense)

Pulse Generator Unit (PGU)

PGU Pulse Period Accuracy	$\pm(1\% + 10 \text{ ns})$
PGU Pulse Width Accuracy	$\pm(3\% + 2 \text{ ns})$
PGU Pulse Delay Accuracy	$\pm(3\% + 2 \text{ ns})$
PGU Connector Type	BNC

TECHNOLOGY

Analog and digital semiconductor measurement expansion technology

APPLICATIONS

Semiconductor device characterization, pulse generation, and high-current parameter analysis

