

KEYSIGHT TECHNOLOGIES (AGILENT HP)

41421B

The HP 41421B is a 1-slot Medium Power Source/Monitor Unit (MPSMU) module designed for the HP 4142B Modular DC Source/Monitor mainframe. It offers precision DC voltage/current sourcing and measurement capabilities up to ± 100 V and ± 100 mA (max 2 W), and supports pulsed measurements with high resolution.

SPECIFICATIONS

General

Interfaces	None (internal mainframe interface; HP 4142B mainframe provides GPIB)
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Physical

Power Supply	Power provided by HP 4142B mainframe backplane
Operating Temperature	5 to 40 °C
Weight	1.0 kg

Module Overview

Module Type	Medium Power Source/Monitor Unit (MPSMU)
Compatible Mainframes	HP 4142B Modular DC Source/Monitor
Required Mainframe Slot Count	1 slot
Number of Channels	1
Maximum Output Power	2 W
Maximum Output Voltage	± 100 V
Maximum Output Current	± 100 mA
Primary Operating Modes	V source (constant or pulse) and I monitor, I source (constant or pulse) and V monitor
Special Measurement Modes	V source (constant only) and V monitor, I source (constant only) and I monitor (in High speed spot, Analog search, and Quasi-pulsed spot measurements)
Compliance Feature	Limits output voltage (V compliance) or current (I compliance) to prevent device damage
Compliance Resolution	Same resolution as the output voltage or current within the maximum output range

Voltage Source Specifications

Voltage Source Range (2 V)	Maximum output ± 100 mA
Voltage Source Range (20 V)	Maximum output ± 100 mA
Voltage Source Range (40 V)	Maximum output ± 50 mA
Voltage Source Range (100 V)	Maximum output ± 20 mA

Current Source Specifications

Current Source Range (1 nA to 10 mA)	Maximum output ± 100 V
Current Source Range (100 mA)	Maximum output ± 20 V

Timing & Pulse Mode Specifications

Pulse Width Range	1 ms to 50 ms
Pulse Width Resolution	100 μ s
Pulse Period Range	10 ms to 500 ms
Pulse Period Resolution	100 μ s
Maximum Pulse Duty Cycle	50%
Pulse Current Polarity Restriction	Pulse base current and pulse current must have the same polarity

Front Panel Connectors

Force Connector	Triaxial
Sense Connector	Triaxial

Voltage Source Resolution

Voltage Source Resolution (2 V Range)	100 μ V
Voltage Source Resolution (20 V Range)	1 mV
Voltage Source Resolution (40 V Range)	2 mV
Voltage Source Resolution (100 V Range)	5 mV

Current Source Resolution

Current Source Resolution (1 nA Range)	100 fA
Current Source Resolution (10 nA Range)	1 pA
Current Source Resolution (100 nA Range)	10 pA
Current Source Resolution (1 μ A Range)	100 pA
Current Source Resolution (10 μ A Range)	1 nA
Current Source Resolution (100 μ A Range)	10 nA
Current Source Resolution (1 mA Range)	100 nA
Current Source Resolution (10 mA Range)	1 μ A
Current Source Resolution (100 mA Range)	10 μ A

Voltage Measurement Resolution

Voltage Measurement Resolution (2 V Range)	20 μ V (High-Resolution ADC)
Voltage Measurement Resolution (20 V Range)	200 μ V (High-Resolution ADC)
Voltage Measurement Resolution (40 V Range)	400 μ V (High-Resolution ADC)
Voltage Measurement Resolution (100 V Range)	1 mV (High-Resolution ADC)

Current Measurement Resolution

Current Measurement Resolution (1 nA Range)	20 fA (High-Resolution ADC)
Current Measurement Resolution (10 nA Range)	100 fA (High-Resolution ADC)
Current Measurement Resolution (100 nA Range)	1 pA (High-Resolution ADC)
Current Measurement Resolution (1 μ A Range)	10 pA (High-Resolution ADC)
Current Measurement Resolution (10 μ A Range)	100 pA (High-Resolution ADC)
Current Measurement Resolution (100 μ A Range)	1 nA (High-Resolution ADC)
Current Measurement Resolution (1 mA Range)	10 nA (High-Resolution ADC)
Current Measurement Resolution (10 mA Range)	100 nA (High-Resolution ADC)
Current Measurement Resolution (100 mA Range)	1 μ A (High-Resolution ADC)

Environmental

Operating Humidity	5% to 80% RH (non-condensing)
Storage Temperature	-40 °C to +70 °C
Storage Humidity	5% to 90% RH (non-condensing)

Accuracy (Voltage Source)

Voltage Source Accuracy (2 V Range)	$\pm(0.05\%$ of setting + 400 μ V)
Voltage Source Accuracy (20 V Range)	$\pm(0.05\%$ of setting + 3 mV)
Voltage Source Accuracy (40 V Range)	$\pm(0.05\%$ of setting + 6 mV)
Voltage Source Accuracy (100 V Range)	$\pm(0.05\%$ of setting + 15 mV)

Accuracy (Voltage Measurement)

Voltage Measurement Accuracy (2 V Range)	$\pm(0.05\%$ of reading + 400 μ V)
Voltage Measurement Accuracy (20 V Range)	$\pm(0.05\%$ of reading + 3 mV)
Voltage Measurement Accuracy (40 V Range)	$\pm(0.05\%$ of reading + 6 mV)
Voltage Measurement Accuracy (100 V Range)	$\pm(0.05\%$ of reading + 15 mV)

Accuracy (Current Source)

Current Source Accuracy (1 nA Range)	$\pm(0.5\% \text{ of setting} + 3 \text{ pA} + 10 \text{ fA} \times V_o)$ [V_o : output voltage in Volts]
Current Source Accuracy (10 nA Range)	$\pm(0.25\% \text{ of setting} + 15 \text{ pA} + 100 \text{ fA} \times V_o)$ [V_o : output voltage in Volts]
Current Source Accuracy (100 nA Range)	$\pm(0.25\% \text{ of setting} + 100 \text{ pA} + 1 \text{ pA} \times V_o)$ [V_o : output voltage in Volts]
Current Source Accuracy (1 μ A Range)	$\pm(0.2\% \text{ of setting} + 1 \text{ nA} + 10 \text{ pA} \times V_o)$ [V_o : output voltage in Volts]
Current Source Accuracy (10 μ A Range)	$\pm(0.2\% \text{ of setting} + 10 \text{ nA} + 100 \text{ pA} \times V_o)$ [V_o : output voltage in Volts]
Current Source Accuracy (100 μ A Range)	$\pm(0.2\% \text{ of setting} + 100 \text{ nA} + 1 \text{ nA} \times V_o)$ [V_o : output voltage in Volts]
Current Source Accuracy (1 mA Range)	$\pm(0.2\% \text{ of setting} + 1 \text{ \muA} + 10 \text{ nA} \times V_o)$ [V_o : output voltage in Volts]
Current Source Accuracy (10 mA Range)	$\pm(0.2\% \text{ of setting} + 10 \text{ \muA} + 100 \text{ nA} \times V_o)$ [V_o : output voltage in Volts]
Current Source Accuracy (100 mA Range)	$\pm(0.2\% \text{ of setting} + 100 \text{ \muA} + 1 \text{ \muA} \times V_o)$ [V_o : output voltage in Volts]

Accuracy (Current Measurement)

Current Measurement Accuracy (1 nA Range)	$\pm(0.5\% \text{ of reading} + 3 \text{ pA} + 10 \text{ fA} \times V_m)$ [V_m : measurement voltage in Volts]
Current Measurement Accuracy (10 nA Range)	$\pm(0.25\% \text{ of reading} + 15 \text{ pA} + 100 \text{ fA} \times V_m)$ [V_m : measurement voltage in Volts]
Current Measurement Accuracy (100 nA Range)	$\pm(0.25\% \text{ of reading} + 100 \text{ pA} + 1 \text{ pA} \times V_m)$ [V_m : measurement voltage in Volts]
Current Measurement Accuracy (1 μ A Range)	$\pm(0.2\% \text{ of reading} + 1 \text{ nA} + 10 \text{ pA} \times V_m)$ [V_m : measurement voltage in Volts]
Current Measurement Accuracy (10 μ A Range)	$\pm(0.2\% \text{ of reading} + 10 \text{ nA} + 100 \text{ pA} \times V_m)$ [V_m : measurement voltage in Volts]
Current Measurement Accuracy (100 μ A Range)	$\pm(0.2\% \text{ of reading} + 100 \text{ nA} + 1 \text{ nA} \times V_m)$ [V_m : measurement voltage in Volts]
Current Measurement Accuracy (1 mA Range)	$\pm(0.2\% \text{ of reading} + 1 \text{ \muA} + 10 \text{ nA} \times V_m)$ [V_m : measurement voltage in Volts]
Current Measurement Accuracy (10 mA Range)	$\pm(0.2\% \text{ of reading} + 10 \text{ \muA} + 100 \text{ nA} \times V_m)$ [V_m : measurement voltage in Volts]
Current Measurement Accuracy (100 mA Range)	$\pm(0.2\% \text{ of reading} + 100 \text{ \muA} + 1 \text{ \muA} \times V_m)$ [V_m : measurement voltage in Volts]

Guard Specifications

Guard Offset Voltage	$\pm 2 \text{ mV max}$
Maximum Guard Capacitance	100 pF

Safety & Limits

Maximum Common Mode Voltage	$\pm 42 \text{ V}$
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TECHNOLOGY

Source/Monitor Unit (SMU)

APPLICATIONS

Semiconductor parameter analysis and DC characterization

Generated by SpecAtlasHub (specatlashub.com). Specifications are compiled from available sources and are subject to change — verify critical values against the manufacturer before purchase.