

KEYSIGHT TECHNOLOGIES (AGILENT HP)

N6781A

The Keysight N6781A is a 2-quadrant Source/Measure Unit (SMU) module specifically designed for battery drain analysis in mobile devices and low-power IoT equipment. It features patented seamless dynamic current measurements, enabling engineers to measure microamp-level sleep currents and amp-level active currents without glitches. Operating within the N6705 DC Power Analyzer or N6700 Modular Power System mainframes, the N6781A combines programmable voltage sourcing, programmable output resistance (battery emulation), and high-speed 18-bit digitizing of voltage and current.

SPECIFICATIONS

General

Interfaces	Via mainframe (USB, LAN with LXI, GPIB)
Display	None (uses mainframe display)
Product Type	Source/Measure Unit (SMU) Module
Number of Channels	1
Mainframe Slot Occupancy	1 slot
Mainframe Compatibility	Keysight N6705A/B/C, N6700B/C, N6701A, N6702A
Calibration Interval	1 Year

Physical

Power Supply	Draws power from N6700 series or N6705 mainframe
Operating Temperature	0 to 55 °C °C
Dimensions (W×H×D)	34.7 mm × 128.4 mm × 290.8 mm mm
Weight	1.23 kg kg

Output Ratings

Maximum Output Power	20 W
High Voltage Output Range	0 to 20 V
Low Voltage Output Range	0 to 6 V
High Voltage Current Limit	±1 A
Low Voltage Current Limit	±3 A
Operating Quadrants	2-Quadrant (Sources and sinks current)

Measurement Capabilities

A/D Converter Resolution	18-bit
Maximum Measurement Sampling Rate	200 kHz
Measurement Interval	5 μ s
Simultaneous V & I Measurement	Yes
Seamless Current Range Switching	Yes
Voltage Measurement Ranges	20 V, 6 V, 100 mV
Current Measurement Ranges	3 A, 100 mA, 1 mA, 10 μ A

Connectivity & Auxiliary

Auxiliary DVM Input	Yes
Auxiliary DVM Input Range	-20 V to +20 V

Battery Emulation

Programmable Output Resistance	Yes
Programmable Output Resistance Range	-40 m Ω to 1 Ω

Protection

Over-Voltage Protection (OVP)	Yes
Over-Current Protection (OCP)	Yes
Over-Temperature Protection (OTP)	Yes
Isolation Voltage	240 VDC (maximum to chassis ground)

Programming Accuracy

Voltage Programming Accuracy (20 V Range)	0.025% + 1.8 mV
Voltage Programming Accuracy (6 V Range)	0.025% + 600 μ V
Current Programming Accuracy (3 A Range)	0.04% + 1.5 mA
Current Programming Accuracy (1 A Range)	0.04% + 1 mA

Measurement Accuracy

Voltage Measurement Accuracy (20 V Range)	0.025% + 1.2 mV
Voltage Measurement Accuracy (100 mV Range)	0.025% + 75 μ V
Current Measurement Accuracy (3 A Range)	0.03% + 250 μ A
Current Measurement Accuracy (100 mA Range)	0.025% + 10 μ A
Current Measurement Accuracy (1 mA Range)	0.025% + 100 nA
Current Measurement Accuracy (10 μ A Range)	0.025% + 8 nA

Auxiliary DVM Accuracy

Auxiliary DVM Accuracy (20 V Range)	0.025% + 1.2 mV
Auxiliary DVM Accuracy (1 V Range)	0.025% + 75 μ V

Output Characteristics

Voltage Ripple & Noise (20 Hz to 20 MHz)	1.2 mV RMS, 12 mV peak-to-peak
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Programming Resolution

Voltage Programming Resolution (20 V Range)	200 μ V
Voltage Programming Resolution (6 V Range)	60 μ V
Voltage Programming Resolution (200 mV Range)	2 μ V
Current Programming Resolution (3 A Range)	40 μ A
Current Programming Resolution (1 A Range)	15 μ A

Measurement Resolution

Voltage Measurement Resolution (20 V Range)	125 μ V
Voltage Measurement Resolution (100 mV Range)	1 μ V
Current Measurement Resolution (3 A Range)	8 μ A
Current Measurement Resolution (100 mA Range)	250 nA
Current Measurement Resolution (1 mA Range)	2.5 nA
Current Measurement Resolution (10 μ A Range)	25 pA

Regulation

Load Regulation (Voltage)	700 μ V
Load Regulation (Current)	100 μ A (3 A range)
Line Regulation (Voltage)	50 μ V
Line Regulation (Current)	50 μ A (3 A range)

Auxiliary DVM

Auxiliary DVM Input Impedance (20 V Range)	10 M Ω
Auxiliary DVM Input Impedance (1 V Range)	> 10 G Ω

Noise and Ripple

Current Ripple & Noise (CC RMS)	200 μ A (3 A range, 20 Hz to 20 MHz)
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Transient Response

Transient Voltage Recovery Time	< 30 μ s (to within 75 mV for a 1.5 A load step)
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Output Terminal Features

Maximum Sense Lead Drop Compensation	1 V per lead
Maximum Load Capacitance (Normal Mode)	2.2 μ F
Maximum Load Capacitance (High Capacitance Mode)	150 μ F

TECHNOLOGY

Source/Measure Unit (SMU)

APPLICATIONS

Battery Drain Analysis & Battery Emulation

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