Semight

S3030F

Single-Channel High-voltage Precision Source Meter

Version 1.0

Semight

Product Description

Semight S3030F Compact, cost-effective single-channel high-voltage, high-power power supply measurement unit, capable of simultaneously outputting and measuring voltage and current, providing a maximum power output of ±3500 V, ±120 mA (DC), and 180W, and can be used in a wide range of applications The application is in the testing and research fields of power semiconductor characteristics, GaN, SiC characterization, composite materials, high voltage leakage current, etc. S3030F supports traditional SMU SCPI commands make the migration of test code easy and fast, can support multi-machine synchronization, and can be integrated into production test systems to improve system testing efficiency and reduce costs.

Key Features

Feature	Benefit
Integrated 4-quadrant sourcing and measuring capabilities	Easily and accurately measure current and voltage using a single instrument without the need to manually change any connections.
Measurement range: ±3500 V, ±120mA(DC)	Easily implement high-voltage testing without connecting multiple low-voltage power supplies in series to test high-voltage device characteristics
Minimum measurement resolution up to 1fA/100 uV	Can make low-level measurements using a low-cost bench-top SMU that were previously only possible using a more expensive semiconductor device analyzer
Fast measurement	Up to 1M ADC sampling rate, NPLC and sampling rate optional setting
User-friendly front panel GUI with 5.0 inch capacitive touchscreen supports both graphical and numerical view modes	Can quickly and easily perform measurements and display data on the front panel, thereby greatly speeding up interactive test, characterization and debug operations
Free quick V/I control software	Can make measurements remotely from a PC without the need to program
Supports legacy and default SCPI commands	Conventional SCPI commands provide some compatibility with older SMU code (such as Keithley 2600 series) to minimize code conversion work
Synchronization	Highspeed/ low - delay multi-channel synchronization with hardware technology
Digital I/O	Flexibly configured High-speed Digital I/O, support threshold value triggering, so as to realize efficient interaction between output measured values and user system
Compact appearance, equipped with USB3.0 and LAN interface	Easily integrates into rack and stacked systems.

Applications

Semight S3030F is specially designed for the characterization and testing of high-voltage electronic and power semiconductor devices, such as Diodes, FETs and IGBTs, as well as other components that require high voltage, fast response and accurate measurement of voltage and current.

- Power semiconductor device characterization and testing.
- Characterization of GaN, SiC and other composite materials and devices.

Product Indicators

Technical Specification:

Temperature :23 ℃ ± 5 ℃

Humidity :30% to 70% RH

Calibration period:1 Year

Measurement speed: 1PLC (power line cycle)

After 60 minutes warm-up, ambient temperature changes less than ± 3 ℃

Voltage Source specifications:

Voltage setting accuracy	Range	Programming resolution	Accuracy(1 year)± (% reading+offset)	Typical noise(RMS) 0.1Hz-10Hz
	±3500 V	40 mV	0.02%+600 mV	50 mV
	±2500 V	30 mV	0.02%+450 mV	40 mV
	±1500 V	20 mV	0.02%+300 mV	25 mV
	±600 V	7mV	0.02%+120 mV	10 mV
	±200 V	3mV	0.02%+40 mV	3 mV
Temperature Coefficient	±(0.15 × accuracy)/°C (0℃-18℃,28℃-50℃)			
Set time	<5 ms (typical)			
Overshoot	<± 1 % (Typical. Norma mode. Step is 10 % to 90 % range, full range, resistive load)			
Noise 10Hz-20MHz	1500 V voltage source, 120 mA resistive load, < 200 mV RMS			

Current Source specifications:

Current setting accuracy	Range	Programming resolution	Accuracy(1 year) ±(% reading+offest)	Typical noise(RMS) 0.1Hz-10Hz
	±120 mA1	3 uA	0.02% + 35 μA	120 uA
	±20 mA	400 nA	0.02% + 15 μA	20 uA
	±10 mA	200 nA	0.02% + 3 uA	10 uA
	±1 mA	20 nA	0.02% + 300 nA	1 uA
	±100 μA	2 nA	0.02% + 30 nA	100 nA
	±10 μA	200 pA	0.03% + 5 nA	10 nA
	±1 μA	20 pA	0.03% + 1 nA	1 nA
	±100 nA	2 pA	0.2% +100 pA+Vo x 100 fA	100 pA
	±10 nA	200 fA	0.2% + 10 pA+ Vo x 10 fA	10 pA
	±1 nA	20 fA	0.2% + 5 pA+ Vo x 1 fA	1 pA
Temperature Coefficient	±(0.15 × accuracy)/°C (0℃-18℃,28℃-50℃)			
Set time	<10 ms (typical)			
Overshoot	<± 1 % (Typical. Norma mode. Step is 10 % to 90 % range, full range, resistive load)			

1，120mA range only supports 1500V and below voltage range.

Voltage measurement specifications:

	Range	Measurement resolution	Accuracy(1 year)±(% reading+offset)
Voltage measurement accuracy	±3500 V	1 mV	0.02%+600 mV
	±2500 V	1mV	0.02%+450 mV
	±1500 V	1 mV	0.02%+300 mV
	±600 V	100 uV	0.02%+120 mV
	±200 V	100 uV	0.02%+40 mV
Temperature Coefficient	±(0.15 × accuracy)/°C (0℃-18℃,28℃-50℃)		

Current measurement specifications:

	Range	Measurement resolution	Accuracy(1 year) ±(% reading+oddset)
Current measurement accuracy	±120 mA1	100 nA	0.02% + 35 μA
	±20 mA	10 nA	0.02% + 15 μA
	±10 mA	10 nA	0.02% + 3 uA
	±1 mA	1 nA	0.02% + 300 nA
	±100 μA	100 pA	0.02% + 30 nA
	±10 μA	10 pA	0.03% + 5 nA
	±1 μA	1 pA	0.03% + 1 nA
	±100 nA	100 fA	0.2% +100 pA+Vo x 100 fA
	±10 nA	10 fA	0.2% + 10 pA+ Vo x 10 fA
	±1 nA	1 fA	0.2% + 5 pA+ Vo x 1 fA
Temperature Coefficient	±(0.15 × accuracy index)/°C (0℃-18℃,28℃-50℃)		

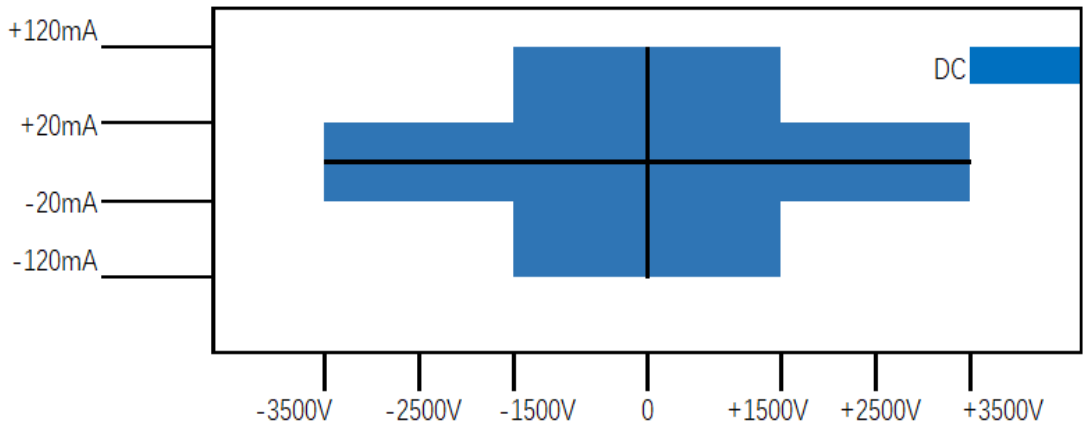
1，120mA range only supports 1500V and below voltage range.

Resistance measurement specifications (4W):

	Range	Measurement resolution	Test current	Typical accuracy (1 Year)± (% reading+ offset)
Ohm measurement accuracy	100 Ω	100 μΩ	100 mA	0.075% + 400 mΩ
	1 kΩ	1 mΩ	10 mA	0.07% + 4 Ω
	10 kΩ	10 mΩ	1 mA	0.07% + 40 Ω
	100 kΩ	100 mΩ	100 μA	0.07% + 400 Ω
	1 MΩ	1 Ω	10 μA	0.10% + 4 kΩ
	10 MΩ	10 Ω	1 μA	0.15% + 40 kΩ
	100 MΩ	100 Ω	100 nA	0.32% + 400 kΩ
	1 GΩ	1 KΩ	10 nA	0.32% + 4 MΩ
	10 GΩ	10 KΩ	1 nA	0.72% + 40 MΩ
Temperature Coefficient	±(0.15 × accuracy)/°C (0℃-18℃,28℃-50℃)			
Source I mode,manual Ohm measurement (4-wire)	Total error = Vmeas/Isrc = R reading x (gain error % of V range + gain error % of I range + offset error of I source range/Isrc value %) + (offset error of V measure range/Isrc value) Example:I source value=10mA at 10mA range V measure range=200V range Total error (% reading + offset) =(0.02%+0.02%+3μA/10mA)+(40mV/10mA) ≈0.07%+4Ω			

Note: Measured voltage = default measured current * measured resistance ≤10.5V

DC I-V output capability



Supplemental characteristics

Sensing mode	2-wire or 4-wire (Remote-sensing) connections
Maximum sense lead resistance	1 kΩ (nominal accuracy)
Max voltage between Force and Sense	2V
Maximum output voltage in output connector	> Full scale 101%
Sweep	Sweep step time: from 20 μs to 16 s, Max: 64K point
Auto range	Support, turn off output is recommended for overshoot sensitive equipment before range change
Source delay	Support, It is recommended that users set appropriate source delay to obtain higher accuracy
Over temperature protection	The output will be turned off (also disable operation) when the SMU internal temperature is detected higher than 85 degrees. When the temperature returns to less than 65 degrees, operation recover
Other abnormal protection	Power reset, recover operation or hardware damage

Communication port

LAN		1000BASE-T/100BASE-T
USB		USB3.0 HOST(front)
		USB3.0 DEVICE(back)
Digital I/O DB9 MAX input voltage: 5.25 V Min input voltage: -0.25 V Min logic H input voltage: 2.1 V Max logic L input voltage: 0.7 V Max source current: 2 mA Max sink current: -50 mA	Pin5	GND
	Pin6	IO1, Digital I/O, Synchronous signal input
	Pin7	IO2, Digital I/O, Synchronous signal output

Environmental specifications

Environment	For use in indoor facilities
Operating	0 ℃ to +50 ℃, 30 % to 70 % non-condensing
Storage	-30 ℃ to 70 ℃, 10 % to 90 % non-condensing
Altitude	Operating: 0 m to 2000 m, Storage: 0 m to 4600 m
Warm-up	1 hour
Dimensions(mm)	430 * 596 * 113 (foot pad/handle/ rotary knob)
Weight	Net weight 23 kg

Ordering information

Output connector, quick reference, USB flash disk(includes PDF manuals、quick I/V Measurement Software and drivers).

Product number	
S3030F	Single-Channel High-voltage Precision Source Mete

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Visit www.semight.com for more information.

*This information is subject to change without notice.