

Precision Source/Measure Unit SMU5991/SMU5992



Features

- 0.01pA current output and measurement resolution;
- 100nV voltage output and resolution
- $\pm 210\text{V}$ maximum voltage output; $\pm 3.03\text{A}$ (DC)/ $\pm 10.5\text{A}$ (pulse) maximum current output.
- Support DC, pulse, sweep and list output.
- Minimum sampling interval 1 μs
- Built-in I/V curve sweep function, time-domain waveform scrolling display function
- The pulse width of the pulse output can be as small as 50 μs
- The output filter time constant (or cutoff frequency) can be freely set to achieve any frequency response output
- Two-wire / Four-wire measurement
- 14-level sorting function, including Grading and Sorting modes.
- Math operation function, moving average filter function, deviation subtraction function
- Semiconductor parameter analysis function to quickly generate characteristic curves of commonly used devices.
- Four basic modes of voltage source, current source, voltmeter, ammeter or resistance meter
- Delta low resistance test method, which can effectively compensate the measurement error caused by thermal emf.

Model	SMU5991C	SMU5991B	SMU5991A	SMU5991	SMU5992B	SMU5992A	SMU5992		
Specifications									
Channel	1			2					
Max. Output	Voltage	$\pm 63\text{ V}$	$\pm 210\text{ V}$						
	Current	DC	$\pm 1.515\text{ A}$	$\pm 3.03\text{ A}$					
Impulse		-	-	$\pm 10.5\text{ A}$	$\pm 10.5\text{ A}$	-	$\pm 10.5\text{ A}$	$\pm 10.5\text{ A}$	
Power Source	Display	5 ½	5 ½	5 ½	6 ½	5 ½	5 ½	6 ½	
	Resolution	Voltage	1 μV	1 μV	1 μV	0.1 μV	1 μV	1 μV	0.1 μV
		Current	1 pA	0.1 pA	1 pA	0.01 pA	0.1 pA	1 pA	0.01 pA
Measurement	Display	6 1/2							
	Resolution	Voltage	0.1 μV						
		Current	0.1 pA	0.01 pA	0.1 pA	0.01 pA	0.1 pA	0.1 pA	0.01 pA
Voltage Range	200 mV~60 V	200 mV~200 V							
Min. Time Interval	50 μs	20 μs	10 μs	1 μs	20 μs	10 μs	1 μs		

Model		SMU5991C	SMU5991B	SMU5991A	SMU5991	SMU5992B	SMU5992A	SMU5992
Voltage Source (Accuracy : % Reading + Offset)								
Range	± 200 mV	Prog. Resolution	100 nV					
		Accuracy	± (0.015% + 225 µV)					
	± 2 V	Prog. Resolution	1 µV					
		Accuracy	± (0.02% + 350 µV)					
	± 20 V	Prog. Resolution	10 µV					
		Accuracy	± (0.015% + 5 mV)					
	± 200 V	Prog. Resolution	100 µV					
		Accuracy	± (0.015% + 50 mV)					
Voltage Measurement (Accuracy : Reading % + Bias)								
Range	± 200 mV	Meas. Resolution	0.1 µV					
		Accuracy	± (0.015% + 225 µV)					
	± 2 V	Meas. Resolution	1 µV					
		Accuracy	± (0.02% + 350 µV)					
	± 20 V	Meas. Resolution	10 µV					
		Accuracy	± (0.015% + 5 mV)					
	± 200 V	Meas. Resolution	100 µV					
		Accuracy	± (0.015% + 50 mV)					
Current Source (Accuracy : % Reading + Offset)								
Range	± 10 nA	Prog. Resolution	0.01 pA					
		Accuracy	± (0.10% + 50 pA)					
	± 100 nA	Prog. Resolution	0.1 pA					
		Accuracy	± (0.06% + 100 pA)					
	± 1 µA	Prog. Resolution	1 pA					
		Accuracy	± (0.025% + 500 pA)					
	± 10 µA	Prog. Resolution	10 pA					
		Accuracy	± (0.25% + 1.5 nA)					
	± 100 µA	Prog. Resolution	100 pA					
		Accuracy	± (0.02% + 25 nA)					
	± 1 mA	Prog. Resolution	1 nA					
		Accuracy	± (0.02% + 200 nA)					
	± 10 mA	Prog. Resolution	10 nA					
		Accuracy	± (0.02% + 2.5 µA)					
	± 100 mA	Prog. Resolution	100 nA					
		Accuracy	± (0.02% + 20 µA)					
	± 1 A	Prog. Resolution	1 µA					
		Accuracy	± (0.03% + 1.5 mA)					
	± 1.5 A	Prog. Resolution	1 µA					
		Accuracy	± (0.05% + 3.5 mA)					
± 3 A	Prog. Resolution	10 µA						
	Accuracy	± (0.4% + 7 mA)						
± 10 A (Impulse)	Prog. Resolution	10 µA						
	Accuracy	± (0.4% + 25 mA)						
Current Measurement (Accuracy : % Reading + Offset)								
Range	± 10 nA	Meas. Resolution	0.01 pA					
		Accuracy	± (0.10% + 50 pA)					
	± 100 nA	Meas. Resolution	0.1 pA					
		Accuracy	± (0.06% + 100 pA)					
	± 1 µA	Meas. Resolution	1 pA					
		Accuracy	± (0.025% + 500 pA)					
	± 10 µA	Meas. Resolution	10 pA					
		Accuracy	± (0.025% + 1.5 nA)					
	± 100 µA	Meas. Resolution	100 pA					
		Accuracy	± (0.02% + 25 nA)					

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	± 1 mA	Meas. Resolution	1 nA					
		Accuracy	± (0.02% + 200 nA)					
	± 10 mA	Meas. Resolution	10 nA					
		Accuracy	± (0.02% + 2.5 µA)					
	± 100 mA	Meas. Resolution	100 nA					
		Accuracy	± (0.02% + 20 µA)					
	± 1 A	Meas. Resolution	1 µA					
		Accuracy	± (0.03% + 1.5 mA)					
	± 1.5 A	Meas. Resolution	1 µA					
		Accuracy	± (0.05% + 3.5 mA)					
	± 3 A	Meas. Resolution	10 µA					
		Accuracy	± (0.4% + 7 mA)					
	± 10 A	Meas. Resolution	10 µA					
		Accuracy	± (0.4% + 25 mA)					
Pulse Source (pulse width refers to the time from 10% rising edge to 90% falling edge)								
Minimum Programmable Pulse Width		50 µs						
Pulse Width Programming Resolution		1 µs						
Max. Voltage of DC or Impulse	210 V	Max Peak Current	0.105 A					
		Max Base Current	0.105 A					
		Impulse Width	50 µs ~ 99999.9s					
		Max Duty Cycle	99.9999%					
	21 V	Max Peak Current	1.515 A					
		Max Base Current	1.515 A					
		Impulse Width	50 µs ~ 99999.9s					
		Max Duty Cycle	99.9999%					
	6 V	Max Peak Current	3.03 A					
		Max Base Current	3.03 A					
		Impulse Width	50 µs ~ 99999.9s					
		Max Duty Cycle	99.9999%					
Impulse Only	200 V	Max Peak Current	1.515 A					
		Max Base Current	50 mA					
		Impulse Width	50 µs ~ 2.5 ms					
		Max Duty Cycle	2.5%					
	180 V	Max Peak Current	1.05 A					
		Max Base Current	50 mA					
		Impulse Width	50 µs ~ 10 ms					
		Max Duty Cycle	2.5%					
	200 V	Max Peak Current	10.5 A					
		Max Base Current	0.5 mA					
		Impulse Width	50 µs ~ 1 ms					
		Max Duty Cycle	2.5%					
Resistance Measurement (Auto Resistance Measurement Mode, 4 Wire, 2 V Range)								
Range	2 Ω	Resolution	1 µΩ					
		Test Current	1 A					
		Current Range	1 A					
		Accuracy	0.2% + 0.00035 Ω					
	20 Ω	Resolution	10 µΩ					
		Test Current	100 mA					
		Current Range	100 mA					
		Accuracy	0.06% + 0.0035 Ω					
	200 Ω	Resolution	100 µΩ					
		Test Current	10 mA					
		Current Range	10 mA					
		Accuracy	0.065% + 0.035 Ω					

Model		SMU5991C	SMU5991B	SMU5991A	SMU5991	SMU5992B	SMU5992A	SMU5992
	2 k Ω	Resolution	1 m Ω					
		Test Current	1 mA					
		Current Range	1 mA					
		Accuracy	0.06% + 0.35 Ω					
	20 k Ω	Resolution	10 m Ω					
		Test Current	100 μ A					
		Current Range	100 μ A					
		Accuracy	0.065% + 3.5 Ω					
	200 k Ω	Resolution	100 m Ω					
		Test Current	10 μ A					
		Current Range	10 μ A					
		Accuracy	0.06% + 35 Ω					
	2 M Ω	Resolution	1 Ω					
		Test Current	1 μ A					
		Current Range	1 μ A					
		Accuracy	0.095% + 350 Ω					
	20 M Ω	Resolution	10 Ω					
		Test Current	100 nA					
		Current Range	100 nA					
		Accuracy	0.18% + 3.5 k Ω					
200 M Ω	Resolution	10 Ω						
	Test Current	10 nA						
	Current Range	10 nA						
	Accuracy	1.08% + 35 k Ω						
General Specifications								
Input Power		90 V ~ 264 V, 47 Hz to 63 Hz, 250 VA Maximum						
Operating Condition		0 $^{\circ}$ C to 55 $^{\circ}$ C, 30% to 80% RH						
Storage Condition		- 30 $^{\circ}$ C to 70 $^{\circ}$ C, 10% to 90% RH						
Display		7 inch capacitive touch screen, Resolution 800 x 480						
Standard Interface		RS232, USB						
Dimension (W X H X D)		235 x 154 x 530 mm						
Weight		8.5 kg (Single Channel) / 10 kg (Dual Channel)						
Accessories		Stanadrd : Test Probe, Banana Plug, PC Software, Power Cord, USB Cable						
		Optional : GPIB Adapter Board, Low Noise Filter, Kelvin Probe set, Banan to Triaxial Adapter, Test Fixture						

Subject to change

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