

Datasheet

Source Measure Unit

Stock No. : Model :

260-2861 **RSSM-20H10**



FEATURES

- Maximum Output $\pm 210V/\pm 1.05A/22W$
- Built-in 4 Sequence Output Modes (Stair, Log, SRC-MEM, Custom), up to 2500 Points
- OVP /OTP Protection Function
- 0.012% Basic Measure Accuracy with $6\frac{1}{2}$ -digit Resolution
- Variable Sampling Speed
- SDM (Source Delay Measure) Cycle
- 2-, 4-, and 6-wire Remote V-source and Measure Sensing
- Variable Display Digits
- Built-in Limit Function
- Built-in 5 Calculation Functions
- 4.3" TFT LCD, Digital Number Keyboard
- Built-in RTC Clock
- Interface: RS-232, USBTMC, LAN, GPIB (Optional)

Streamline Your Characteristic Analysis

RSSM-20H10 is a Source Measure Unit that provides highly stable DC power and instrument-grade 6½-digit multimeter measurements. While operating, it can be used as a voltage source, current source, voltmeter, ammeter, and ohmmeter, which is uniquely ideal for the evaluation of component characteristics and the test applications of production, including nanomaterials and components, semiconductor architecture, organic materials, high-efficiency illumination, passive components and material characteristics analysis, etc.

RSSM-20H10 provides four-quadrant operation of $\pm 210V/\pm 1.05A/22W$. The first and third quadrants operate as power supplies to supply power to the load. The second and fourth quadrants function as loads to consume power internally. Voltage value, current value and resistance value can be measured while operating the power supply or load function with an accuracy of 0.012% and a resolution of $1\mu V/10pA/10\mu\Omega$.

With respect to sampling rate, RSSM-20H10 supports a sampling rate of up to 50k points/second, which can accurately analyze the characteristics of the DUT. With the large 4.3-inch screen, all measurement settings, parameters and results can be completely displayed on the screen. The SDM (Source Delay Measure) function is provided to delay sampling when the signal changes so as to prevent the unstable signal from being captured and cause misjudgment. There are four built-in sequence output modes (Stair, Log, SRC-MEM, Custom), which can support up to 2500 points of sequence variation output.

Pertaining to protection, RSSM-20H10 provides OVP/OTP modes. The design of OVP allows users to self-define the range of OVP. OTP can effectively prevent errors caused by temperature drift during the test process. For interfaces, this product supports standard SCPI commands and provides RS-232, USBTMC, LAN, GPIB (optional) interfaces to meet users' different interface needs.

SPECIFICATIONS

MAXIMUM RANGE		Parameter	Value							
		Voltage	$\pm 210V$							
		Current	$\pm 1.05A$							
		Power	22W							
		Voltage Resolution	$1\mu V$							
		Current Resolution	10pA							
SOURCE	DC Voltage	Output Voltage	$\pm 21V / \pm 1.05A, \pm 210V / \pm 105 mA$							
		Current Limit	Min. 0.1% of range							
		Programming Resolution & Accuracy *1	Range	$\pm 200.000mV$	$\pm 2.00000V$	$\pm 20.0000V$	$\pm 200.000V$			
			Resolution	$1\mu V$	$10\mu V$	$100\mu V$	1mV			
			Accuracy	$\pm(0.02\%+600\mu V)$	$\pm(0.02\%+600\mu V)$	$\pm(0.02\%+2.4mV)$	$\pm(0.02\%+24mV)$			
		Load Regulation	0.01% of range + 100 μV							
		Line Regulation	0.01% of range							
		Overshoot	<0.1% typical (full scale step, resistive load, 10mA range)							
		Recovery Time (1000% Load Change)	<250 μs (within 0.1% plus load regulation errors, 1A and 100mA compliance)							
		Ripple and Noise	4mVrms(20Hz~1MHz) / 10mVpp(20Hz~1MHz)							
	Temperature Coefficient	$\pm(0.15 \times \text{accuracy specification})/^{\circ}C$ (0°~18°C & 28°~50°C)								
	DC Current	Output Current	$\pm 1.05A / \pm 21V, \pm 105 mA / \pm 210V$							
		Voltage Limit	Min. 0.1% of range							
		Programmed Source Resolution & Accuracy *1	Range	$\pm 1.00000\mu A$	$\pm 10.0000\mu A$	$\pm 100.000\mu A$	$\pm 1.00000mA$	$\pm 10.0000mA$	$\pm 100.000mA$	$\pm 1.00000A$
			Resolution	10pA	100pA	1nA	10nA	100nA	1 μA	10 μA
Accuracy			$\pm(0.035\%+600pA)$	$\pm(0.033\%+2nA)$	$\pm(0.031\%+20nA)$	$\pm(0.034\%+200nA)$	$\pm(0.045\%+2\mu A)$	$\pm(0.066\%+20\mu A)$	$\pm(0.27\%+900\mu A)$	
Load Regulation		0.01% of range + 100pA								
Line Regulation		0.01% of range								
Overshoot		<0.1% typical (1mA step, RL = 10k Ω , 20V range)								
Temperature Coefficient		$\pm(0.15 \times \text{accuracy specification})/^{\circ}C$ (0°~18°C & 28°~50°C)								
General		Output Settling Time *2	100 μs typical time							
	Output Rise Time ($\pm 30\%$)	300 μs , 200V range, 100mA compliance ; 150 μs , 20V range, 100mA compliance								
	DC Floating Voltage	Output can be floated up to $\pm 250VDC$								
	Remote Sense	Up to 1V drop per load lead								
	Compliance Accuracy	Add 0.3% of range and $\pm 0.02\%$ of reading to base specification								
	Range Change Overshoot *3	Adjacent range changes between 200mV, 2V and 20V ranges, 100mV typical								
	Minimum Compliance Value	0.1% of range								
	Command Processing Time *4	Autorange On: 10ms, Autorange Off: 7ms								

SPECIFICATIONS

MEASUREMENT	Voltage	Input Resistance	>10 GΩ								
		Measurement Resolution & Accuracy	Range	±200.000mV	±2.00000V	±20.0000V	±200.000V	±200.000V	±200.000V		
			Resolution	1µV	10µV	100µV	1mV	10mV	100µA		
	Accuracy		±(0.012%+300µV)	±(0.012%+300µV)	±(0.012%+300µV)	±(0.015%+1.5mV)	±(0.015%+1.5mV)	±(0.015%+1.5mV)			
	Temperature Coefficient	±(0.15 x accuracy specification) / °C (0°-18°C & 28°-50°C)									
	Current	Voltage Burden (4-wire mode)	<1mV								
		Programmed Source Resolution & Accuracy *1	Range	±1.00000µA	±10.0000µA	±100.000µA	±1.00000mA	±10.00000mA	±100.000mA	±1.00000A	
			Resolution	10pA	100pA	1nA	10nA	100nA	1µA	10µA	
	Accuracy		±(0.029%+300pA)	±(0.027%+700pA)	±(0.025%+6nA)	±(0.027%+60nA)	±(0.035%+600nA)	±(0.055%+6µA)	±(0.22%+570µA)		
	Temperature Coefficient	±(0.1 x accuracy specification) / °C (0°-18°C & 28°-50°C)									
Resistance	Range	Resolution	<2.00000Ω	2.00000Ω	20.0000Ω	200.000Ω	2.00000kΩ	20.0000kΩ			
		Test current	---	10µΩ	100µΩ	1mΩ	10mΩ	100mΩ			
		Accuracy	Source IACC+Meas.VACC	Source IACC+Meas.VACC	±(0.1%+0.003Ω), Normal ±(0.07%+0.001Ω), Enhanced	±(0.08%+0.03Ω), Normal ±(0.05%+0.01Ω), Enhanced	±(0.07%+0.3Ω), Normal ±(0.05%+0.1Ω), Enhanced	±(0.06%+3Ω), Normal ±(0.04%+1Ω), Enhanced			
		Resolution	200.000kΩ	2.00000MΩ	20.0000MΩ	200.000MΩ	>200.000MΩ	---			
		Test current	1Ω	10Ω	100Ω	1kΩ	---	---			
		Accuracy	10µA	5µA	0.5µA	100nA	---	---			
		Temperature Coefficient	±(0.15 x accuracy specification) / °C (0°-18°C & 28°-50°C)								
		Source I mode, Manual OHMS	Total uncertainty = I source accuracy + V measure accuracy (4-wire remote sense)								
		Source V mode, Manual OHMS	Total uncertainty = V source accuracy + I measure accuracy (4-wire remote sense)								
		6-wire OHMS Mode	Available using active ohms guard and guard sense. Max. Guard Output Current: 50mA (except 1A range). Accuracy is load dependent								
Guard Output Impedance	<0.1Ω in ohms mode										
SYSTEM SPEED *5	Maximum Range Change Rate	75/second									
	Maximum Measure Auto Range Time	40ms (fixed source) *6									
	Sequence Reading Rates *7 (rdg./second) for 60Hz (50Hz)	Speed	NPLC / Trig Origin	Measure		Source-Measure *9		Source-Measure Pass/Fail test *8, *9		Measure Memory *9	
				TO MEMORY	TO GPIB	TO MEMORY	TO GPIB	TO MEMORY	TO GPIB	TO MEMORY	TO GPIB
		Fast	0.01 / internal	2081 (2030)	1198 (1210)	1551 (1515)	1000 (900)	902 (900)	809 (840)	165 (162)	164 (162)
		488.2	0.01 / external	1239 (1200)	1079 (1050)	1018 (990)	916 (835)	830 (830)	756 (780)	163 (160)	162 (160)
		Medium	0.1 / internal	510 (433)	509 (433)	470 (405)	470 (410)	389 (343)	388 (343)	133 (126)	132 (126)
		488.2	0.1 / external	438 (380)	438 (380)	409 (360)	409 (365)	374 (333)	374 (333)	131 (125)	131 (125)
	Normal	1 / internal	59 (49)	59 (49)	58 (48)	58 (48)	56 (47)	56 (47)	44 (38)	44 (38)	
	488.2	1 / external	57 (48)	57 (48)	57 (48)	57 (47)	56 (47)	56 (47)	44 (38)	44 (38)	
Single Reading Operation Rates (rdg./second) for 60Hz (50Hz)	Speed	NPLC / Trig Origin	Measure		Source-Measure *9		Source-Measure Pass/Fail test *8, *9				
			TO GPIB	TO GPIB	TO GPIB	TO GPIB					
			Fast(488.2)	0.01 / internal	256 (256)	79 (83)	79 (83)				
			Medium(488.2)	0.1 / internal	167 (166)	72 (70)	69 (70)				
Normal(488.2)	1 / internal	49 (42)	34 (31)	35 (30)							
Component Interface Handler Time for 60Hz (50Hz) *8, *10	Speed	NPLC / Trig Origin	Measure		Source-Measure Pass/Fail test *9, *11						
			TO GPIB	TO GPIB							
			Fast	0.01 / internal	1.04 ms (1.08 ms)	0.5 ms (0.5 ms)	4.82 ms (5.3 ms)				
			Medium	0.1 / internal	2.55 ms (2.9 ms)	0.5 ms (0.5 ms)	6.27 ms (7.1 ms)				
Normal	1 / internal	17.53 ms (20.9 ms)	0.5 ms (0.5 ms)	21.31 ms (25.0 ms)							
SYSTEM GENERAL	Load Impedance	Stable into 20,000pF typical									
	Differential Mode Voltage	250VPk									
	Common Mode Voltage	250VDC									
	Common Mode Isolation	>10GΩ, <1000pF									
	Over Range	105% of range, source and measure									
	Max. Voltage Drop	5V									
	Max. Sense lead Resistance	1MΩ									
	Sense Input Impedance	>100GΩ									
	Guard Offset Voltage	<150µV, typical									
	Source Output Modes	Fixed DC level, Memory List (mixed function), Stair (linear and log)									
	Source Memory List	100 points max									
	Memory Buffer	5,000 readings @ 5 digits (two 2,500 point buffers). Includes selected measured value(s) and time stamp. Lithium battery backup(3 yr + battery life)									
	Programmability	IEEE-488.2 (SCPI), RS-232; 5 user-definable power-up states plus factory default and *RST.									
	Digital I/O Connector	Active low input. Start of test, end of test, 3 category bits.; +5V@ 300mA supply.; 1 trigger input, 4 TTL/Relay Drive outputs (33V@500mA, diode)									
	Remote Interface	USB/GPIB/LAN/RS-232									
	Insulation	Chassis and terminal: 20MΩ or above (DC 500V); Chassis and AC cord: 30MΩ or above (DC 500V)									
	Operation Environment	Indoor use, Altitude: ≤ 2000m Ambient temperature: 0 - 40°C Relative humidity: ≤ 80%; Installation category: II, Pollution degree: 2									
	Storage Environment	Temperature: -20°C - 70°C; Humidity: <80%									
Input Power	100-240VAC, 50-60Hz										
Power Consumption	80W										
Dimensions & Weight	214 (W) x 86 (H) x 356.5 (D) mm, Approx. 4.8kg										

- NOTE:**
- Speed = Normal (1 NPLC). For 0.1 PLC, add 0.005% of range to offset specifications, except 200mV, 1A ranges, add 0.05%. For 0.01 PLC, add 0.05% of range to offset specifications, except 200mV, 1A ranges, add 0.5%.
 - Required to reach 0.1% of final value after Command is processed. Resistive load. 10µA to 100mA range.
 - Overshoot into a fully resistive 100kΩ load, 10Hz to 1MHz BW, adjacent ranges: 100mV typical, except 20V/200V.
 - Maximum time required for the output to begin to change following the receipt of: SOURce: VOLTage|CURRent <nr> Command.
 - Reading rates applicable for voltage or current measurements, autorange off, filter off, display off, trigger delay = 0, and binary reading forma.
 - Purely resistive lead. 1µA and 10µA ranges <65ms.
 - 1000 point sweep was characterized with the source on a fixed rang.
 - Pass/Fail test performed using one high limit and one low math limit.
 - Includes time to re-program source to a new level before making measurement.
 - Time from falling edge of START OF TEST signal to falling edge of END OF TEST signal.
 - Command processing time of: SOURce: VOLTage|CURRent: TRIGgered <nr> Command not included.

Specifications subject to change without notice.

ORDERING INFORMATION

RSSM-20H10 with GPIB Source Measure Unit
 RSSM-20H10 Source Measure Unit

ACCESSORIES

Quick Start manual x 1, Test Lead GTL-207A x 1, Alligator Clip x 2

OPTIONAL ACCESSORIES

SM-01 Digital I/O Adapter, Convert DB15 to DB9 + 8-pin micro-DIN
 SM-02 Digital I/O Adapter, Convert DB15 to DB37 + 8-pin micro-DIN
 GTL-258 GPIB Cable (25 pin Micro-D Connector)
 GTL-246 USB Cable (USB 2.0 A-B Type, approx.. 1200mm)