ANPMU200-10(F) Series 6½-Digit High Precision Integrated Pulse Source Measure Unit



Product Overview

The ANPMU200-10(F) is a high precision, high-resolution, and multifunctional supply measure unit (SMU). It adopts a combined technology of a low-noise power supply and high-precision measurement, supports four-quadrant operation, and features low noise, high precision, and fast response.

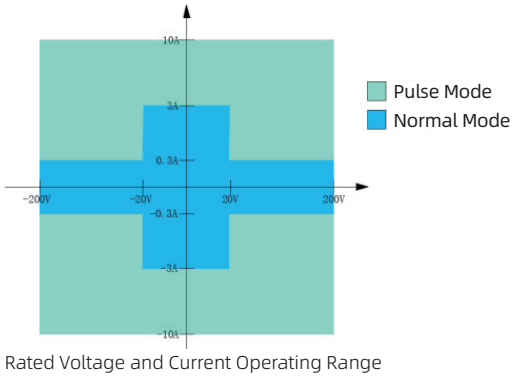
It offers a wide range of voltage and current output and measurement capabilities, supporting maximum±210V voltage as well as ±3.15A current output and measurement. It also features a pulse mode across the full voltage range, supporting ±10A pulse current output with a pulse power of up to 2kW. Additionally, it includes resistance and power measurement functions, supporting both two-terminal and four-terminal measurement modes. It features multiple voltage and current ranges, with a maximum display digits of 6½-digit, and a minimum resolution down to 10nV/10fA. It is equipped with functions such as sweeping, scripting, and support for flowchart editing, and provides a rich set of communication interfaces. The ANPMU200-10(F) Supply Measure Unit All-in-one Machine plays a crucial role in fields such as semiconductors, materials science, and optoelectronic devices.

Product Features

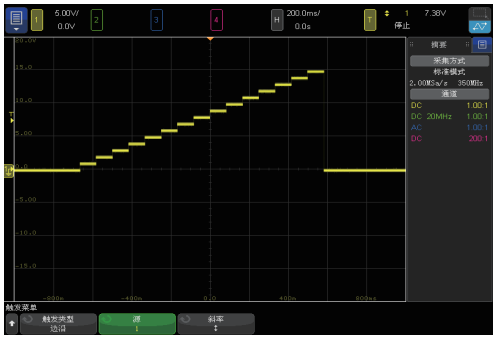
- Four-quadrant full-scale operation;
- Wide source and measurement range: Voltage ±210V, Current ±3.15A.
- Low-noise linear power supply technology with output noise < 3mVrms.
- 2kW instantaneous pulse power, supporting 200V/10A pulse output.
- Voltage, current, resistance, and power measurement can be performed in both CV and CC modes.
- Support both front and rear panel output and measurement, and supports 2-wire and 4-wire measurement methods.
- A built-in high precision integrating ADC for precision measurement, and dual-channel high-speed digital ADC to meet high-speed sampling test requirements.
- 6½-digit measurement display with minimum voltage/current resolution down to 10nV/10fA.
- High measurement accuracy: Up to 0.002% at the optimum point.
- Voltage measurement input impedance > 10GΩ.
- 5-inch color touchscreen for easy operation and intuitive display.
- Data statistics interface with line chart and table views.
- Voltage limit, current limit, and overtemperature protection functions.
- Rich waveform editing functions supporting sweep, pulse, flowchart, and script modes.
- Multiple communication interfaces: Serial port, LAN port, GPIB, and user-configurable digital I/O.
- Multi-unit synchronous testing via A-LINK with multiple supply measure units.
- Support triaxial shielded cable connection for effective noise reduction and high precision measurement.

Product Functions

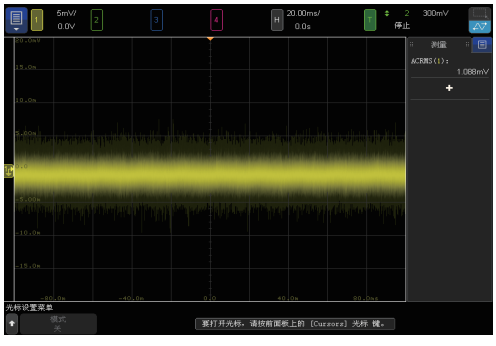
- Testing of discrete devices and passive components, such as diodes, BJTs, FETs, resistors, etc.
- Testing of semiconductor structures such as wafers and thin films.
- Testing of new materials such as graphene and nanomaterials.
- Testing of optoelectronic devices such as LEDs, AMOLEDs, photovoltaics, and solar cells.
- Testing of electrochemical applications such as cyclic voltammetry, battery charge/discharge cycles, and electrodeposition.
- Material characterization including resistivity, Hall effect, and high-ohmic resistance testing.



Rated Voltage and Current Operating Range



Output Voltage Waveform in Scanning Mode



Output Noise <3m Vrms

Technical Specifications /

Product Model			ANPMU200-10(F)				
Input	Input Voltage		100V~240Vac 47Hz~63Hz				
	Input Power		≤300W				
	Power Factor		≥0.95				
Output	Output Power		60W (pulse 2KW)				
	Rated Voltage/ Current		±200V-±0.3A or ±20V-±3A (pulse ±200V-±10A)				
	Over-range Output		105%				
	Noise 10Hz-20MH		≤3m Vrms (constant voltage, resistive load)				
	Voltage Overshoot		≤0.1% + 10mV (resistive load, step size from 10% to 90% of range)				
	Current Overshoot		≤0.1% (resistive load, step size from 10% to 90% of range)				
	Overshoot When Switching Between Adjacent Voltage Ranges		≤250mV (100kΩ load, 20MHz bandwidth)				
	Overshoot When Switching Between Adjacent Current Ranges		≤250mV/R (resistive load, 20MHz bandwidth)				
	Open-circuit Voltage Settling Time		200V range (0.3A current range)				≤600μS
			20V, 2V, 200mV, 20mV ranges (3A, 1A, 0.3A current ranges)				≤150μS
	Short-circuit Current Settling Time		3A, 1A, 0.3A, 100mA, 10mA, 1mA, 100μA, 10μA ranges (20V voltage range)				≤200μS
			1μA, 100nA, 10nA ranges (20V voltage range)				≤5mS
	CV Output Performance	Range	20mV	200mV	2V	20V	200V
		Output Resolution	500nV	5μV	50μV	500μV	5mV
		Output Accuracy ± (% Setting Value + Voltage)	0.100%+200μV	0.015%+200μV	0.020%+300μV	0.015%+2.4mV	0.015%+24mV
		Noise RMS (<10Hz)	1μV	1μV	10μV	100μV	1mV
	CC Output Performance	Range	10nA	100nA	1μA	10μA	100μA
		Output Resolution	500fA	5pA	50pA	500pA	5nA
		Output Accuracy ± (% Setting Value + Current)	0.100%+100pA	0.060%+150pA	0.025%+400pA	0.025%+1.5nA	0.020%+15nA
		Noise RMS (<10Hz)	40pA	40pA	40pA	40pA	400pA
		Range	1mA	10mA	100mA	0.3A/1A	3A/10A
		Output Resolution	50nA	500nA	5μA	50μA	500μA
		Output Accuracy ± (% Setting Value + Current)	0.020%+150nA	0.020%+1.5μA	0.025%+15μA	0.067%+900μA	0.150%+6mA
		Noise RMS (<10Hz)	5nA	40nA	100nA	3μA	125μA
	Pulse Output Performance	Voltage	200V				20V
		Current	10A	7A	1A		10A
		Pulse Width	1mS	2.5mS	10mS		10mS
		Duty Ratio	3%	3%	20%		20%

Technical Specifications /

Product Model			ANPMU200-10(F)				
Measurement	Maximum Display Digits		6½-digit				
	Voltage Measurement Performance	Range	20mV	200mV	2V	20V	200V
		Measurement Resolution	10nV	100nV	1μV	10μV	100μV
		Integration AD Measurement Accuracy: ±(%Reading Value+Voltage)	0.100%+150μV	0.012%+200μV	0.012%+300μV	0.015%+1mV	0.015%+10mV
		Digital AD Measurement Accuracy: ±(%Reading Value+Voltage)	0.05%+1.2mV	0.05%+1.2mV	0.05%+1.2mV	0.05%+8mV	0.05%+40mV
	Current Measurement Performance	Range	10nA	100nA	11μA	10μA	100μA
		Measurement Resolution	10fA	100fA	1pA	10pA	100pA
		Integration AD Measurement Accuracy: ±(%Reading Value+Current)	0.10%+50pA	0.060%+100pA	0.025%+300pA	0.025%+700pA	0.02%+6nA
		Digital AD Measurement Accuracy: ±(%Reading Value+Current)	0.05%+4nA	0.05%+4nA	0.05%+4nA	0.05%+8nA	0.05%+80nA
		Range	1mA	10mA	100mA	0.3A/1A	3A/10A
		Measurement Resolution	1nA	10nA	100nA	1μA	10μA
		Integration AD Measurement Accuracy: ±(%Reading Value+Current)	0.02%+60nA	0.02%+600nA	0.025%+6μA	0.03%+500μA	0.15%+10mA
		Digital AD Measurement Accuracy: ±(%Reading Value+Current)	0.05%+800nA	0.05%+8μA	0.05%+80μA	0.05%+1mA	0.15%+10mA
	Resistance Measurement Performance	Range	<2Ω	2Ω/20Ω	200Ω	2kΩ	20kΩ
		Default Resolution	1μΩ	1μΩ/10μΩ	100μΩ	1mΩ	10mΩ
		Default Test Current	User-defined settings	100mA	10mA	1mA	100μA
		Accuracy ±(% Reading Value+ Resistance)	Source IACC + Measure VACC	0.098%+0.003Ω	0.077%+0.03Ω	0.066%+0.3Ω	0.063%+3Ω
		Range	200kΩ	2MΩ	20MΩ	200MΩ	>200MΩ
		Default Resolution	100mΩ	1Ω	10Ω	100Ω	–
		Default Test Current	10μA	1μA	1μA	100nA	User-defined settings
		Accuracy ±(% Reading value+ Resistance)	0.065%+30Ω	0.11%+300Ω	0.11%+1000Ω	0.655%+10kΩ	Source IACC + Measure VACC
	Integral AD Measurement Time		0.01~10.00PLC				
	Digital High-speed AD Sampling Rate		1~1000000				
	Calibration Cycle		1 year				
	Warm-up Time		60 min				
	Recommended Operating Temperature		23±5℃				
	Temperature Coefficients		±(0.15 x accuracy indicator)/℃ (0℃-18℃, 28℃-50℃)				
Communication Interface			RS485/232 (select one of the two), LAN, GPIB, digital I/O				
Dimension(W*H*D mm)			215*88*500, excluding the protective sheath. 230*120*530 including the protective sheath.				

Remarks: 1. The output accuracy and measurement accuracy are the accuracies measured within one year after calibration under an ambient temperature of 23±5℃, with the integration AD sampling time set to 1 PLC and the digital AD sampling rate set to 1000;
2. The maximum output current in conventional mode is 3.15 A, and the currents greater than 3.15 A can only be output in pulse mode.

* The above specifications are subject to change without notice.