SDM4055A
SDM4055A-SC
Digital Multimeter

Data Sheet

EN01A

SIGLENT TECHNOLOGIES CO.,LTD

SDM4055A
SDM4055A-SC

Product Overview

SDM4055A is a 5½ digits digital multimeter, with outstanding measurement accuracy and touchable screen, is a product designed for high-precision, multifunctional, and automatic measurement needs.

Main Functions

Basic Measurement Functions

- DC Voltage Measurement
- DC Current Measurement
- True-RMS AC Voltage Measurement
- True-RMS AC Current Measurement
- 2/4-Wire Resistance Measurement
- Capacitance Measurement
- Continuity Test
- Diode Test
- Frequency Measurement
- Period Measurement
- Temperature Measurement

Math Functions

Max, Min, Average, Standard Deviation, dBm/dB, Limits

Data Log Function

0.1 s ~ 3600 s interval time can be set. Up to 2M points can be logged to Memory and 360M points can be logged to File(s). Up to 100 hours of logging time

Application fields

- Research Laboratory
- Development Laboratory
- Repair and Maintenance
- Calibration Laboratory
- Automatic Production Test

Main Features

- 5-inch TFT-LCD display with a resolution of 800 * 480, paired with a touchable screen and a brand-new UI
- Real 5½ digit (220,000 count) readings resolution
- Reading rate from 5 rdgs/s to 4.8k rdgs/s, and support: Fast, Medium and Slow mode
- 512MB RAM, capable of saving up to 2M readings for caching, support timestamp
- 256MB Nand Flash, supports storage of various types of files such as readings, images, configuration files
- 4 trigger modes: auto trigger, single trigger, external trigger and level trigger
- 4 display modes: numerical, bar meter, trend chart and histogram
- True-RMS AC Voltage and AC Current Measurements
- Support automatic switching between 10 A high current and 3 A low current measurement modes, and can test up to 30 A when paired with an external shunt
- Support RTD, thermocouple and user-defined sensor
- Support dual display and probe hold functions
- Support SCPI remote control commands
- Equipped with EasyDMM-X host computer control and sampling software
- Communications interface: USB Device (optional USB-GPIB adapter), USB Host, LAN
- Other interface: VMC output, Trigger input
- Remote access support for VNC, web servers
- Chinese and English menu, and built-in help system for easy information retrieval

Model and Key Specifications

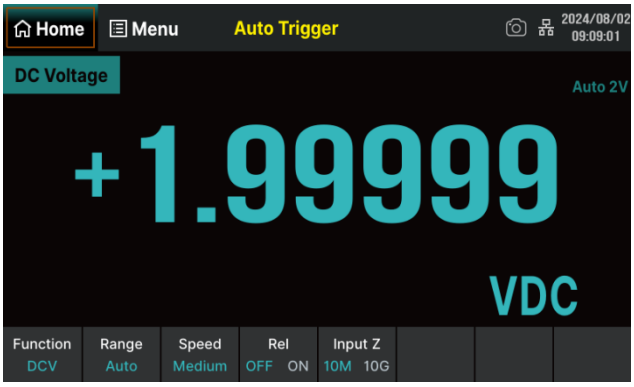
Model	SDM4055A	SDM4055A-SC [1]
Number of Digits	5½	
DCV Basic Accuracy	150 ppm	
Max Reading Rate	4,800 rdgs/s	
Memory	Up to 2 million readings	
Support Scanner	No	Yes
DCV Range	200 mV ~ 1000 V	
ACV Range	200 mV ~ 750 V, 20 Hz ~ 100 kHz	
DCI Range	200 uA ~ 10 A	
ACI Range	20 mA ~ 10 A, 20 Hz ~ 10 kHz	
2/4-Wire Resistance Range	200 Ω ~ 100 MΩ	
Continuity / Diode	Buzzer, 4 V max	
Frequency / Period Range	20 Hz ~ 1 MHz	
Temperature	RTD, thermocouple	
Capacitance Range	2 nF ~ 10 mF	
IO	USB Host, USB Device, LAN, GPIB (optional)	
External Interface	Exit trigger, VMC out	
Display Screen	5-inch TFT touchable display screen	

Note:

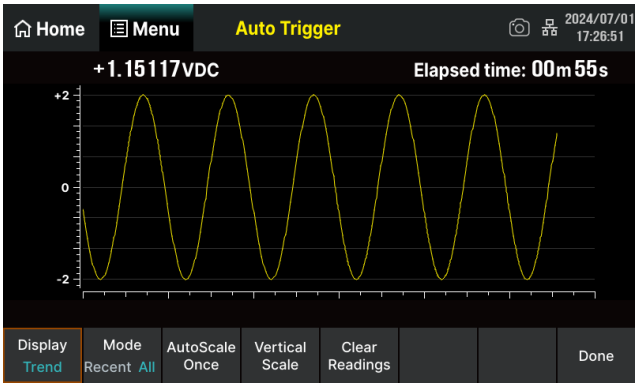
[1] For policy and regulatory reasons, this scanner model is not available in some regions, please contact the local distributor for more information.

Characteristics

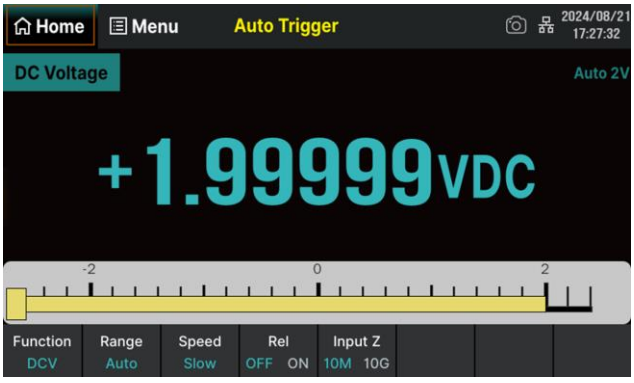
Numerical Display



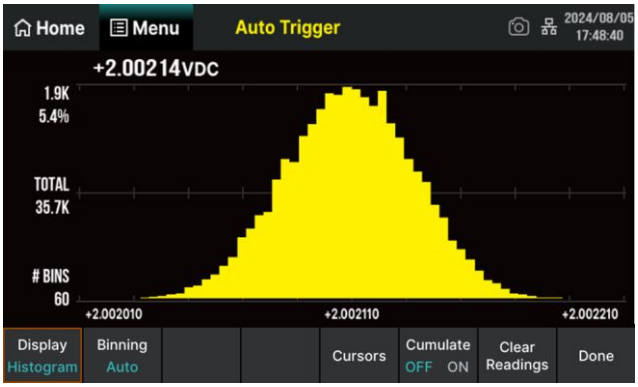
Trend Chart



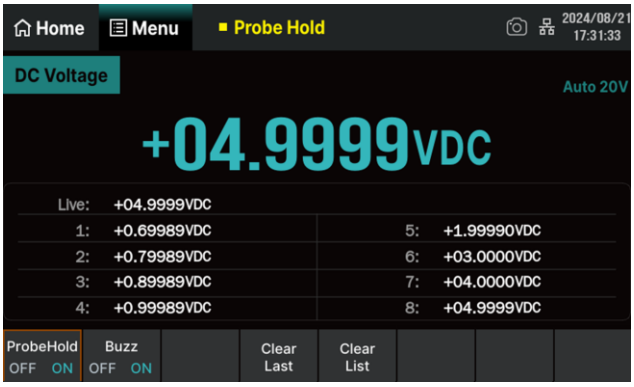
Bar Meter



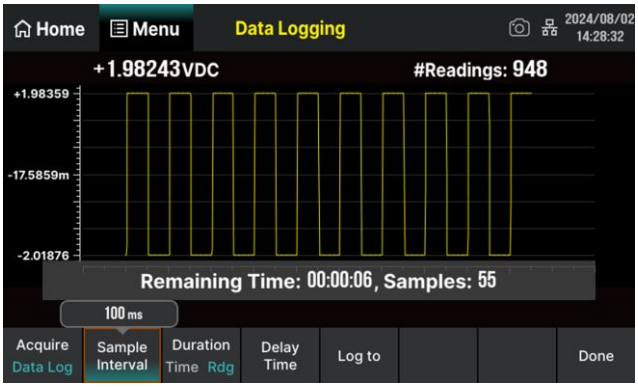
Histogram



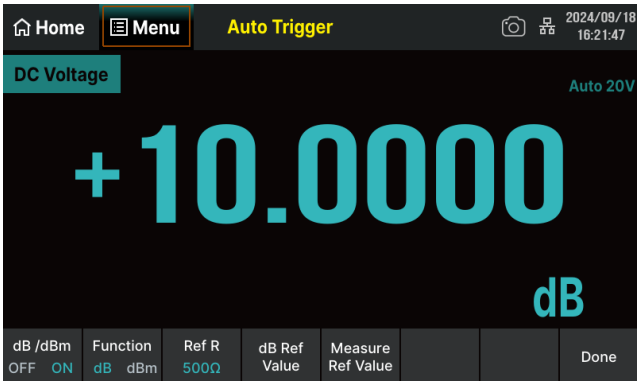
Probe Hold



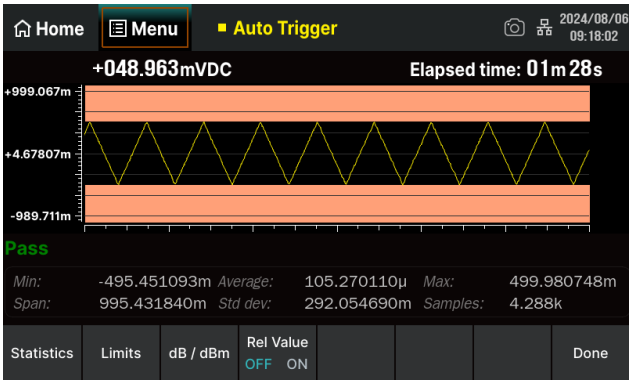
Data Log



dB/dBm Calculator



Statistics and Limits



Specifications

DC Characteristics

			Accuracy: ± (% of Reading + % of Range) [1]	
Function	Range [2]	Test Current or Load Voltage	1 Year TCAL ℃ ±5 ℃	Temperature Coefficient 0 ℃ ~ (TCAL ℃-5 ℃) (TCAL ℃+5 ℃) ~ 50 ℃
DC Voltage	200 mV		0.015+0.004	0.0015+0.0005
	2 V		0.015+0.003	0.0010+0.0005
	20 V		0.015+0.004	0.0020+0.0005
	200 V		0.015+0.003	0.0015+0.0005
	1000 V		0.015+0.003	0.0015+0.0005
DC Current	200 µA	< 8 mV	0.055+0.005	0.003+0.001
	2 mA	< 80 mV	0.055+0.005	0.002+0.001
	20 mA	< 0.05 V	0.095+0.020	0.008+0.001
	200 mA	< 0.5 V	0.070+0.008	0.005+0.001
	2 A	< 0.1 V	0.170+0.020	0.013+0.001
	10 A [4]	< 0.3 V	0.250+0.010	0.008+0.001
Resistance [3]	200 Ω	1 mA	0.030+0.005	0.0030+0.0006
	2 kΩ	1 mA	0.020+0.003	0.0030+0.0005
	20 kΩ	100 µA	0.020+0.003	0.0030+0.0005
	200 kΩ	10 µA	0.020+0.010	0.0030+0.0005
	2 MΩ	1 µA	0.040+0.004	0.0040+0.0005
	10 MΩ	200 nA	0.250+0.003	0.0100+0.0005
	100 MΩ	200 nA ‖ 10 MΩ	1.75+0.004	0.2000+0.0005
Diode Test	2.0 V [5]	1 mA	0.05+0.01	0.0050+0.0005
	4 V	100 µA	0.05+0.01	0.0050+0.0005
Continuity Test	2000 Ω	1 mA	0.05+0.01	0.0050+0.0005

Notes:

[1] Specifications are for 0.5 hour warm-up, “Slow” measurement rate and calibration temperature 18 °C ~ 28 °C.

[2] 10% over range on all ranges except for DCV 1000 V and DCI 10 A range.

[3] Specifications are for 4-wire resistance measurement or 2-wire resistance measurement using “Ref” operation. Without “Ref” operation, add 0.2 Ω additional error in 2-wire resistance measurement.

[4] 30 seconds OFF after 30 seconds ON is recommend for the continuous current that over DC 7 A or AC 7 Arms.

[5] Accuracy specifications are only for voltage measuring at input terminal. The typical value of current source is 1 mA. Voltage drop at diode junction may vary with current source.

AC Characteristics

Accuracy: ± (% of Reading + % of Range) [1]

Function	Range [2]	Frequency Range	1 Year TCAL ℃ ± 5 ℃	Temperature Coefficient 0 ℃ ~ (TCAL ℃ - 5 ℃) (TCAL ℃+5 ℃) ~ 50 ℃
True-RMS AC Voltage [3]	200 mV	20 Hz ~ 45 Hz	1.5+0.10	0.01+0.005
		45 Hz ~ 20 kHz	0.2+0.05	0.01+0.005
		20 kHz ~ 50 kHz	1.0+0.05	0.01+0.005
		50 kHz ~ 100 kHz	3.0+0.05	0.05+0.010
	2 V	20 Hz ~ 45 Hz	1.5+0.10	0.01+0.005
		45 Hz ~ 20 kHz	0.2+0.05	0.01+0.005
		20 kHz ~ 50 kHz	1.0+0.05	0.01+0.005
		50 kHz ~ 100 kHz	3.0+0.05	0.05+0.010
	20 V	20 Hz ~ 45 Hz	1.5+0.10	0.01+0.005
		45 Hz ~ 20 kHz	0.2+0.05	0.01+0.005
		20 kHz ~ 50 kHz	1.0+0.05	0.01+0.005
		50 kHz ~ 100 kHz	3.0+0.05	0.05+0.010
	200 V	20 Hz ~ 45 Hz	1.5+0.10	0.01+0.005
		45 Hz ~ 20 kHz	0.2+0.05	0.01+0.005
		20 kHz ~ 50 kHz	1.0+0.05	0.01+0.005
		50 kHz ~ 100 kHz	3.0+0.05	0.05+0.010
	750 V	20 Hz ~ 45 Hz	1.5+0.10	0.01+0.005
		45 Hz ~ 20 kHz	0.2+0.05	0.01+0.005
		20 kHz ~ 50 kHz	1.0+0.05	0.01+0.005
		50 kHz ~ 100 kHz	3.0+0.05	0.05+0.010
True-RMS AC Current [4]	20 mA	20 Hz ~ 45 Hz	1.5+0.10	0.015+0.015
		45 Hz ~ 2 kHz	0.50+0.10	0.015+0.006
		2 kHz ~ 10 kHz	2.50+0.20	0.015+0.006
	200 mA	20 Hz ~ 45 Hz	1.5+0.10	0.015+0.005
		45 Hz ~ 2 kHz	0.50+0.10	0.015+0.005
		2 kHz ~ 10 kHz	2.50+0.20	0.015+0.005
	2 A	20 Hz ~ 45 Hz	1.5+0.20	0.015+0.005
		45 Hz ~ 2 kHz	0.50+0.20	0.015+0.005
		2 kHz ~ 10 kHz	2.50+0.20	0.015+0.005
	10 A [5]	20 Hz ~ 45 Hz	1.5+0.15	0.015+0.005
		45 Hz ~ 2 kHz	0.50+0.15	0.015+0.005
		2 kHz ~ 10 kHz	2.50+0.20	0.015+0.005

Additional Error in AC Measurement

Additional Crest Factor Errors (not sine) [6]	
Wave Crest Coefficient	Error (% Range)
1-2	0.05
2-3	0.3

Notes:

[1] Specifications are for 0.5 hour warm-up, measurement speed "Slow", and calibration temperature 18 ℃ ~ 28 ℃.

[2] 10% over range on all ranges except for ACV 750 V and ACI 10 A range.

[3] Specifications are for sine wave amplitude > 5% of range. For inputs within 1% to 5% of range and frequency < 50 kHz, add 0.1% of range additional error.

[4] Specifications are for sine wave amplitude > 5% of range. For inputs within 1% to 5% of range, add 0.1% of range additional error.

[5] 30 seconds OFF after 30 seconds ON is recommend for the continuous current that over DC 7 A or AC 7 Arms.

[6] Specifications are for frequency < 100 Hz.

Frequency and Period Characteristics

				Accuracy: ± (% of Reading+ % of Range) [1]
Function	Range	Frequency Range	1 Year TCAL ℃±5 ℃	Temperature Coefficient 0 ℃ ~ (TCAL℃- 5 ℃) (TCAL ℃+5 ℃) ~ 50 ℃
Frequency, Period	200 mV ~ 750 V [2]	20 Hz ~ 2 kHz	0.01+0.003	0.002+0.001
		2 kHz ~ 20 kHz	0.01+0.003	0.002+0.001
		20 kHz ~ 200 kHz	0.01+0.003	0.002+0.001
		200 kHz ~ 1 MHz	0.01+0.006	0.002+0.002

Notes:

[1] Specifications are for 0.5 hour warm-up.

[2] Except for special marks, the AC input voltage is 15% to 110% of range when < 100 kHz and 30% to 110% of range when > 100 kHz. 750 V range is limited to 750 Vrms. The accuracy is 10 times of reading accuracy in table when the AC voltage is at 200 mV range.

Capacitance Characteristics

Accuracy: ± (% of Reading + % of Range) [1]				
Function	Range [2]	Max Test Current	1 Year TCAL ℃ ±5 ℃	Temperature Coefficient 0 ℃ ~ (TCAL ℃-5 ℃) (TCAL ℃ +5 ℃) ~ 50 ℃
Capacitance	2 nF	200 nA	3+1.0	0.08+0.002
	20 nF	200 nA	1+0.5	0.02+0.001
	200 nF	2 µA	1+0.5	0.02+0.001
	2 µF	10 µA	1+0.5	0.02+0.001
	200 µF	100 µA	1+0.5	0.02+0.001
	10 mF	1 mA	2+0.5	0.02+0.001

Notes:

[1] Specifications are for 0.5 hour warm-up and "Ref" operation. Using of non-film capacitor may generate additional errors.

[2] Specifications are for from 1% to 110% on 2 nF range and from 10% to 110% on other ranges.

Temperature Characteristics

Accuracy: ± (% of Reading + % of Range) [1]					
Function	Probe Type	Probe Model	Working Temperature Range [2]	1 Year TCAL ℃ ± 5 ℃	Temperature Coefficient 0 ℃ ~ (TCAL ℃-5 ℃) (TCAL ℃ + 5 ℃) ~ 50 ℃
Temperature	RTD [3]	α = 0.00385	-200 ℃ ~ 660 ℃	0.16 ℃	0.08+0.002 ℃
	TC [4] [5]	B	0 ℃ ~ 1820 ℃	0.76 ℃	0.14 ℃
		E	-150 ℃ ~ 1000 ℃	0.5 ℃	0.02 ℃
		J	-150 ℃ ~ 1200 ℃	0.5 ℃	0.02 ℃
		K	-100 ℃ ~ 1372 ℃	0.5 ℃	0.03 ℃
		N	-100 ℃ ~ 1300 ℃	0.5 ℃	0.04 ℃
		R	300 ℃ ~ 1768 ℃	0.5 ℃	0.09 ℃
		S	400 ℃ ~ 1768 ℃	0.6 ℃	0.11 ℃
		T	-100 ℃ ~ 400 ℃	0.5 ℃	0.03 ℃

Notes:

[1] Specifications are for 0.5 hour warm-up, not include probe error.

[2] The temperature measurement function can also be applied outside the optimum range, but the measurement accuracy has certain errors.

[3] Specifications are for 4-wire measure or 2-wire measure under "Ref" operation.

[4] Relative to cold junction temperature, accuracy is based on ITS-90. Built-in cold junction temperature refers to the temperature inside the banana jack and its accuracy is ±3.5 ℃.

[5] During calibration and verification, "Ref Temp-Ext" is preferred for measurement.

Data Log

Function	Specification
Data Source	DCV, ACV, DCI, ACI, Resistance, Capacitance, Frequency, Period, Temperature
Sample Interval	1 ms ~ 3600 s
Log Sample Capacity	Log to Memory: up to 2,000,000 points. Log to File: up to 360,000,000 points
Duration	Up to 100 hours
Delay	Up to 100 hours

Measuring Method and other Characteristics

DC Voltage	
Input Resistance	200 mV and 2V ranges: 10 MΩ or > 10 GΩ selectable
	20 V, 200 V and 1000 V ranges: 10 MΩ ± 2%
Input Bias Current	< 90 pA, 25 ℃, typical
Input Protection	1000 V on all ranges
CMRR	120 dB. For the 1 KΩ unbalanced resistance in LO lead, max ±500 VDC peak
NMRR	60 dB at “slow” measurement rate
Resistance	
Testing Method	2-wire resistance or 4-wire resistance selectable
Input Protection	1000 V on all ranges
DC Current	
Shunt Resistor	200 μA range sampling voltage < 8 mV
	20 mA range sampling voltage < 8 mV
	1 Ω for 20 mA, 200 mA ranges
	0.01 Ω for 2 A, 10 A ranges
Input Protection	Internal 10 A, 1000 V Time-Lag fuse
Continuity / Diode Test	
Measurement Method	1 mA ±5% constant-current source or open-circuit voltage
Beeper	Yes
Continuity Threshold	Adjustable
Input Protection	1000 V on all ranges

True-RMS AC Voltage	
Measurement Method	AC-Coupled True-RMS measurement with up to 1000 V DC of bias on any range
Wave Crest Factor	≤ 3 at full scale
Input Impedance	1 MΩ ± 2% in parallel with < 100 pF capacitance on all ranges
AC Filter Bandwidth	20 Hz ~ 100 kHz
CMRR	60 dB. For the 1 KΩ unbalanced resistance and common mode frequency < 60 Hz in LO lead, max ± 500 VDC peak
True-RMS AC Current	
Measurement Method	DC Coupled to the fuse and shunt; AC Coupled the True-RMS measurement (measure the AC components only)
Wave Crest Factor	≤ 3 at full scale
Max Input	< 10 Arms (RMS current including DC component)
Shunt Resistor	1 Ω for 20 mA, 200 mA ranges
	0.01 Ω for 2 A, 10 A ranges
Input Protection	Internal 10 A, 1000 V Time-Lag fuse
Frequency / Period	
Measurement Method	Reciprocal-counting technique, AC-Coupled input using AC voltage measurement function
Measurement Considerations	All frequency counters are susceptible to error when measuring low-voltage, low-frequency signals
	Shielding inputs from external noise pickup is critical for minimizing measurement errors
Capacitance Measuring	
Measurement Method	Measure the rate of change of voltage generated during the current flowing the capacitance
Connection Type	2-wire
Input Protection	1000 V on all ranges
Temperature Measuring	
Measurement Method	Support for TC and RTD types of sensors
Measurement Considerations	The built-in cold junction temperature tracks the temperature inside the banana jack. The change of the temperature in banana jack may cause additional error. When using the built-in cold junction compensation, connect the sensor terminal of the thermocouple to the banana jack and allow it warm up for more than 3 minutes to minimize the error
Trigger and Memory	
Samples / Trigger	1 ~ 10000
Trigger Delay	6 ms ~ 10000 ms optional
External Trigger Input	Input Level: 5 V TTL compatible (High level when the input terminal is opening)
	Trigger Condition: rising and falling selectable
	Input Impedance: ≥ 20 kΩ//500 pF

	Min Pulse: 500 μs
VMC Output	Level: 5 V TTL compatible
	Output Polarity: positive and negative optional
	Output Impendence: 200 Ω, typical
Math Functions	
Min / Max / Average / Standard deviation, dBm, dB, Limits	

General Specifications

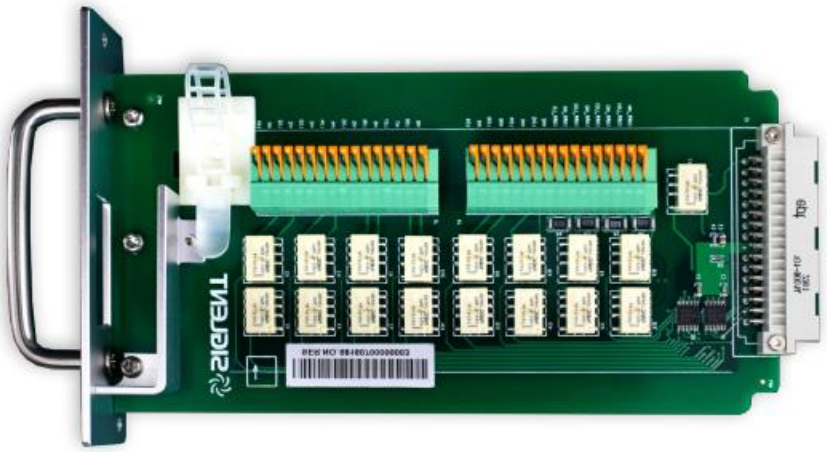
Power Supply	
AC 100 V ~ 120 V	50/60 Hz
AC 200 V ~ 240 V	50/60 Hz
Consumption	30 VA max
Mechanism	
Dimension (length * width * height)	379*260*103 mm
Weight	3.8 kg
Other Characteristics	
Display Screen	5-inch TFT display screen with resolution 800*480
Operation Environment	Full accuracy for 0 ℃ to 50 ℃; Full accuracy to 40 ℃, 80% RH, non-condensing
	Storage temperature: -20 ℃ ~ 70 ℃
	Altitude: up to 2000 meters
Remote Interface	LAN, USB Device, USB Host, GPIB (optional)
Programmer Language	SCPI-compliant with the latest widely used multimeter command sets
Warm-up Time	30 minutes

Standard			
Electromagnetic Compatibility	Compliant with EMC directive (2014/30/EU), compliant with or superior to IEC 61326-1:2020/EN61326-1:2021 (basic requirements)		
	Conducted Emission	CISPR 11/EN 55011	CLASS A group 1, 150 kHz ~ 30 MHz
	Radiated Emission	CISPR 11/EN 55011	CLASS A group 1, 30 MHz ~ 1 GHz
	Electro-Static Discharge (ESD)	IEC 61000-4-2/EN 61000-4-2	4.0 kV (touch), 8.0 kV (air)
	RF Electromagnetic Field Immunity	IEC 61000-4-3/EN 61000-4-3	10 V/m (80 MHz to 1 GHz) 3 V/m (1.4 GHz to 2 GHz) 1 V/m (2.0 GHz to 2.7GHz)
	Electrical Fast Transient (EFT)	IEC 61000-4-4/EN 61000-4-4	2 kV (AC input port)
	Surge	IEC 61000-4-5/EN 61000-4-5	1 kV (Line to Line) 2 kV (Line to Earth)
	RF Continuous Conduction Immunity	IEC 61000-4-6/EN 61000-4-6	3 V, 0.15 ~ 80 MHz
	Voltage Dips and Short Interruptions	IEC 61000-4-11/EN 61000-4-11	Voltage Dips: 0% UT during 1 cycle

			40% UT during 10/12 cycles 70% UT during 25/30 cycles Short Interruptions: 0% UT during 250/300 cycles
Safety	Compliant with: UL 61010-1:2012 Ed.3+R:06Jun2023 CSA C22.2#61010-1:2012 Ed.3+U1; UL 61010-2-030:2018 Ed.2 CSA C22.2#61010-2-030:2018 Ed.2; A1; U2; CE-LVD VOC/EN 61010-1:2010/A1:2019, EN IEC 61010-2-030:2021/A11:2021		

Scanner card SC1016

The scanner card SC1016 is a multiplexer that provides multi-point measurement capabilities to the SDM4055A-SC. The scanner features 12 multi-purposes + 4 current channels and supports the following measurement functions: DCV, ACV, DCI, ACI, 2WR, 4WR, CAP, FREQ, DIODE, CONT and TEMP (RTD and Thermocouple). It provides a convenient and versatile solution for test applications that require multiple measurement points or signals and is an ideal tool for R&D burn-in and production testing.



Specifications

To achieve the best performance from the product, please read this guide carefully.

Items [1][2]	Specifications
Max AC Voltage	125 rms or 175 V peak, 100 kHz, 0.3 A switched, 125 VA (resistive load)
Contact Life	> 100000 operations, at 1 A 30 VDC (at 0.5 Hz) > 100000 operations, at 0.3 A 125 VDC (at 0.5 Hz)
Contact Resistance	75 mΩ (maximum at 6 VDC, 1 A)
Channel to Channel Switching Time	280 ms (typical)
Maximum Switching Voltage	250 VAC, 220 VDC
Maximum Switching Power	62.5 VA / 30 W
Insulation Resistance	Minimum 1 GΩ
Connect Type	Clamp terminal, #24 AWG wire size

Notes:

[1] To avoid damage to the instrument, do not pull out the scanner card during instrument active, and wait until the instrument is powered off before performing the corresponding operation.

[2] Keep the front panel inputs floating when using the scanner card to avoid damage to the switch and electrical shock from the front panel inputs.

Channel Capabilities

Function	No. of wires	No. of channels
DCV / ACV [1]	2 wires (H, L)	12 (CH1 ~ CH12)
DCI / ACI [2]	2 wires (H, L)	4 (CH13 ~ CH16) (2A Range)
2 W Resistance	2 wires (H, L)	12 (CH1 ~ CH12)
4 W Resistance	4 wires (H, L, HS, LS)	6 (CH1 ~ CH6 for HI/LO) (CH7~CH12 for HS/LS)
Capacitance	2 wires (H, L)	12 (CH1 ~ CH12)
Diode / Continuity	2 wires (H, L)	12 (CH1 ~ CH12)
Period / Frequency	2 wires (H, L)	12 (CH1 ~ CH12)
Temp (Thermocouple)	2 wires (H, L)	12 (CH1 ~ CH12)
Temp (RTD)	2 wires (H, L)	12 (CH1 ~ CH12)

Notes:

[1] Input signal is limited: < 125 VAC, 100 VDC.

[2] Continuous current limited: < 2.2 A. Accuracy: ± (% 3 of reading+0.02% of range).

Ordering Information

Product Model	Description
SDM4055A	5.5 digits high-precision multimeter
SDM4055A-SC	5.5 digits high-precision multimeter with 16 channel scanner cards

Standard Configurations	Quantity
Power Cord	1
Test Leads	2
Alligator Clips	2
USB Cable	1
Quick Start	1
Warranty Card	1
Upper Computer Software	Free download from official website

Optional Configurations	Model
USB-GPIB Adapter	USB-GPIB
30 A Diverter	SCD30A

About SIGLENT

SIGLENT is an international high-tech company, concentrating on R&D, sales, production and services of electronic test & measurement instruments.

SIGLENT first began developing digital oscilloscopes independently in 2002. After more than a decade of continuous development, SIGLENT has extended its product line to include digital oscilloscopes, isolated handheld oscilloscopes, function/arbitrary waveform generators, RF/MW signal generators, spectrum analyzers, vector network analyzers, digital multimeters, DC power supplies, electronic loads and other general purpose test instrumentation. Since its first oscilloscope was launched in 2005, SIGLENT has become the fastest growing manufacturer of digital oscilloscopes. We firmly believe that today SIGLENT is the best value in electronic test & measurement.

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