

SDM3055 Digital Multimeter



DataSheet-2019.01

SDM3055

SDM3055-SC

Product Overview

The SDM3055/SDM3055-SC is a digital multimeter designed with 5 1/2 digits readings resolution and dual-display, especially fitting to the needs of high-precision, multifunction and automatic measurement.

Application fields

- Research Laboratory
- Development Laboratory
- Repair and Maintenance
- Calibration Laboratory
- Automatic Production Test
- General bench-top use

User-Friendly Design

- 4.3" TFT-LCD, 480*272 display
- Supports dual-display, Chinese and English Menu
- Built-in front panel accessible help system
- File management (support for U-disc and local storage)

Math Function

Basic Measurement Function

- DC Voltage: 200 mV - 1000 V
- DC Current: 200 μ A - 10 A
- AC Voltage: True-RMS, 200 mV - 750 V
- AC Current: True-RMS, 20 mA - 10 A
- 2/4-Wire Resistance: 200 Ω - 100 M Ω
- Capacitance: 2 nF - 10000 μ F
- Continuity Test: Range is fixed at 2 k Ω
- Diode Test: Adjustable range is 0 - 4V
- Frequency Measurement: 20 Hz - 1 MHz
- Period Measurement: 1 μ s - 0.05 s
- Temperature: Support for TC and RTD sensor

Math Function

- Max, Min, Average, Standard Deviation, dBm/dB, Relative Measurement, Pass/Fail Histogram, TrendChat

Main Features

- Real 5 1/2 digits readings resolution (240, 000 counts)
- Up to 150 rdgs/s measurement speed
- True-RMS AC Voltage and AC Current measuring
- 1 Gb Nand flash size, Mass storage configuration files and data files
- Built-in cold terminal compensation for thermocouple temperature measurements
- With easy, convenient and flexible PC software: EasyDMM
- standard interfaces: USB Host, LAN (Optional Accessories USB-GPIB Adapter)
- Scanner Card SC1016 (Only for SDM3055-SC)
- Support remote control operation via SCPI commands. Compatible with commands of main stream multimeters



Specifications

DC Characteristics

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

| Function | Range ^[2] | Test current or Load voltage | 1 Year 23 °C ± 5 °C | Temperature coefficient 0 °C ~ 18 °C 28 °C ~ 50 °C |
|---------------------------|-----------------------|------------------------------|------------------------|--|
| 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 ^[4] | | 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 ^[5] | < 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 ^[6] | 1 mA | 0.05 + 0.01 | 0.0050 + 0.0005 |
| | 4V | 100 μA | 0.05 + 0.01 | 0.0050 + 0.0005 |
| Continuity Test | 2000 Ω | 1 mA | 0.05 + 0.01 | 0.0050 + 0.0005 |

Remarks:

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

[2] 20% over range on all ranges except for DCV 1000 V, ACV 750 V, DCI 10 A and ACI 10 A.

[3] Specifications are for 4-wire measure or 2-wire measure under "REF" operation. ±0.2 Ω of extra errors will be generated if perform 2-wire measure without " REF " operation.

[4] Plus 0.02 mV of error per 1 V after the first ±500 VDC.

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

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

AC Characteristics

| Function | Range ^[2] | Frequency Range | 1 Year 23 °C±5 °C | Temperature coefficient 0 °C~ 18 °C 28 °C~ 50 °C |
|---------------------------------------|----------------------|-----------------|----------------------|---|
| 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 wave crest factor error (not Sine) ^[6]

| Wave crest coefficient | Error (% Range) |
|------------------------|-----------------|
| 1 - 2 | 0.05 |
| 2 - 3 | 0.2 |

Remarks:

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

[2] 20% over range on all ranges except for DCV 1000 V, ACV 750 V, DCI 10 A and ACI 10 A.

[3] Specifications are for amplitude of sine wave input > 5% of range. For inputs from 1% to 5% of range and < 50 kHz, add 0.1% of range extra error. For 50 kHz to 100 kHz, add 0.1% of range extra error.

[4] Specifications are for sine wave input > 5% of range. 0.1% errors will be added when the range of input sine wave is 1% to 5% .

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

[6] For frequency < 100Hz



Frequency and Period CharacteristicAccuracy± (% of Reading + % of Range)^[1]

| Function | Range | Frequency Range | 1 Year 23 °C±5 °C | Temperature coefficient 0 °C~ 18 °C 28 °C~ 50 °C |
|----------------------|------------------------------|------------------|----------------------|---|
| 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 |

Remarks:

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

[2] Except for special marks, the AC input voltage is 15% to 120% of range when < 100 kHz and 30% to 120% of range when > 100 kHz. 750 V range is limited to 750 Vrms. The accuracy is 10 times % of reading when the measurement range of AC voltage is in 200 mV range

Capacitance CharacteristicAccuracy± (% of Reading + % of Range)^[1]

| Function | Range ^[2] | Max Testing Current | 1 Year 23 °C±5 °C | Temperature coefficient 0 °C~ 18 °C 28 °C~ 50 °C |
|-------------|----------------------|---------------------|----------------------|---|
| 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 |
| | 10000 µF | 1 mA | 2 + 0.5 | 0.02 + 0.001 |

Remarks:

[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 120% on 2 nF range and ranges from 10% to 120% on other ranges.

Temperature CharacteristicAccuracy± (% of Reading + % of Range)^[1]

| Function | Probe Type | Probe Model | Working Temperature Range | 1Year 23 °C±5 °C | Temperature coefficient 0 °C~18 °C 28 °C~50 °C |
|-------------|--------------------|-------------|---------------------------------|---------------------|---|
| Temperature | RTD ^[2] | a = 0.00385 | -200 °C ~ 660 °C | 0.16 °C | 0.08 + 0.002 |
| | TC ^[3] | B | 0 °C ~ 1820 °C | 0.76 °C | 0.14 °C |
| | | E | -270 °C ~ 1000 °C | 0.5 °C | 0.02 °C |
| | | J | -210 °C ~ 1200 °C | 0.5 °C | 0.02 °C |
| | | K | -270 °C ~ 1372 °C | 0.5 °C | 0.03 °C |
| | | N | -270 °C ~ 1300 °C | 0.5 °C | 0.04 °C |
| | | R | -270 °C ~ 1768 °C | 0.5 °C | 0.09 °C |
| | | S | -270 °C ~ 1768 °C | 0.6 °C | 0.11 °C |
| | | T | -270 °C ~ 400 °C | 0.5 °C | 0.03 °C |

Remarks:

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

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

[3] Built-in cold terminal compensation for thermocouple, accuracy is ± 2 °C.

Measuring Method and other Characteristics

| DC Voltage | |
|-----------------------|---|
| Input Resistance | 200 mV and 2 V Range 10 M Ω or >10 G Ω selectable |
| | 20 V, 200 V and 1000 V Range 10 M Ω \pm 2% |
| Input Bias Current | < 90 pA, 25 $^{\circ}$ C |
| Input Protection | 1000 V on all ranges |
| CMRR | 120 dB (For the 1 K Ω unbalanced resistance in LO lead, max \pm 500 VDC) |
| NMRR | 60 dB at " slow " measurement rate |
| | 20 dB are added if open the "AC" filter. |
| Resistance | |
| Testing Method | 4-wire resistance or 2-wire resistance selectable |
| Input Protection | 1000 V on all ranges |
| DC Current | |
| Shunt Resistor | 200 μ A sampling voltage < 8 mV |
| | 2 mA sampling voltage < 8 mV |
| | 1 Ω for 20 mA, 200 mA 1 Ω |
| | 0.01 Ω for 2 A, 10 A |
| Input Protection | Rear panel : accessible 10 A,250 V fast-melt fuse Internal :12 A,250 V slow-melt fuse |
| Continuity/Diode Test | |
| Measurement Method | 1 mA \pm 5% constant-current source or open-circuit voltage |
| Beeper | yes |
| Continuity Threshold | Adjustable |
| Input Protection | 1000 V |
| True-RMS AC Voltage | |
| Measurement Method | AC Coupled true RMS measure – up to 1000 V DC bias are permitted on every range. |
| Wave Crest Factor | \leq 3 at full scale |
| Input Impedance | 1 M Ω \pm 2% in parallel with <100 pF on all ranges |
| AC Filter Bandwidth | 20 Hz \sim 100 KHz |
| CMRR | 60 dB (For the 1 K Ω imbalance resistance among Lo lead and <60 Hz, Max \pm 500 VDC) |
| True-RMS AC Current | |
| Measurement Method | DC Coupled to the fuse and shunt; AC Coupled the True-RMS measurement (measures the AC components only) |
| Wave Crest Factor | \leq 3 at full scale |
| Max Input | <10 A (include DC component) |
| Shunt Resistor | 1 Ω for 20 mA, 200 mA 1 Ω ; 0.01 Ω for 2 A, 10 A |
| Input Protection | Rear panel : accessible 10 A,250 V fast-melt fuse Internal :12 A,250 V slow-melt fuse |
| Frequency/Period | |
| Measurement Method | Reciprocal-counting technique, AC Coupled input, AC voltage or AC current measurement function |
| Measure Attentions | Errors are leaded into all frequency counters when measuring low voltage or loe frequency signal. |

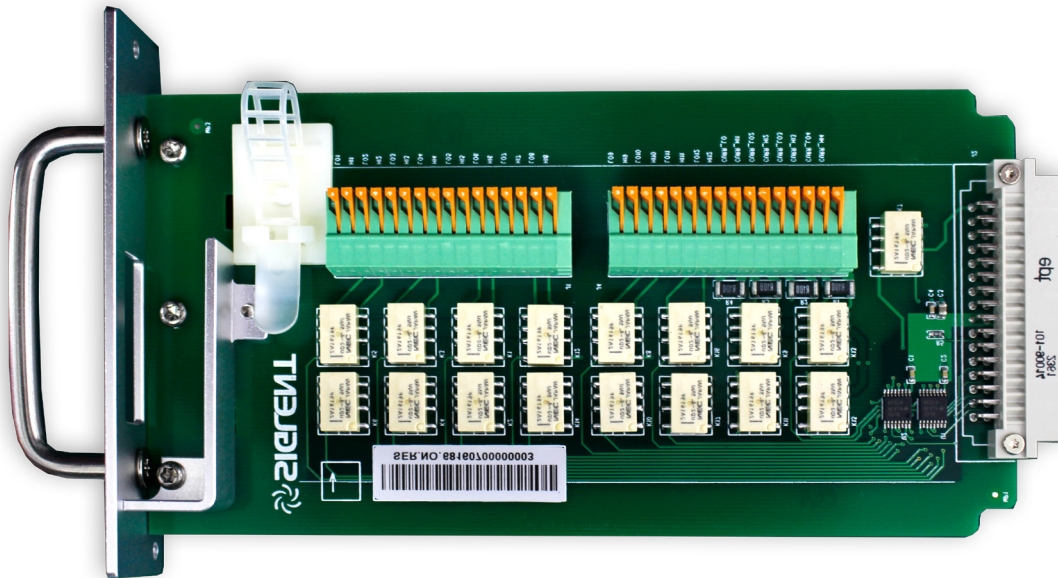
| Capacitance Measuring | | |
|--|---|--|
| Measurement Method | Measure the rate of change of voltage generated during the current flowing the capacitance | |
| Connection Type | 2-wire | |
| Input Protection | 1000 V on all ranges | |
| Temperature Measuring | | |
| Measurement Method | Support for TC and RTD types of sensor | |
| 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 | TTL compatible (High level when left input terminal is hanging in the air) |
| | Trigger Condition | Rising and Falling selectable |
| | Input Impedance | $\geq 20\text{ K}\Omega/400\text{ pF}$, DC-coupled |
| | Min Pulse | 500 us |
| VMC | Level | TTL compatible |
| | Output Polarity | Positive and negative optional |
| | Output Impedance | 200 Ω , typical |
| History Records | | |
| Volatile Memory | 10 K reading of history records | |
| Nonvolatile Memory | 1 Gb Nand Flash, Mass storage configuration files and data files, Support U-disk external storage | |
| Math Functions | | |
| Min/Max/Average, dBm, dB, Pass/Fail, Relative, Standard deviation, Hold, histogram, Trend chart, Bar chart | | |

General Specifications

| Power Supply | |
|------------------------------|--|
| AC 100 V ~ 120 V | 50/60 Hz |
| AC 200 V ~ 240 V | 50/60 Hz |
| Consumption | 20 VA max |
| Mechanism | |
| Dimension | 282 mm × 260 mm × 105 mm |
| Weight | 3.33 Kg |
| Other Characteristics | |
| Display Screen | 4.3" TFT-LCD with resolution 480 * 272 |
| Operation Environment | Full accuracy from 0 °C to 50 °C, 80% RH and 40 °C, non condensing |
| | Storage Temperature: -20 °C - 70 °C |
| | Shock and Vibration: conforming to MIL-T-28800E, 5 level (only for sine) |
| | Height above sea level: up to 3000 meters |
| Safety | Conforming to IEC61010-1:2001. Measure CAT I 1000 V/CAT II 600V Class of pollution: 2 |
| Remote Interface | USB-GPIB, 10/100 Mbit LAN, USB2.0 Full Speed Device&Host |
| Programing Language | Standard SCPI, compatible with commands of main stream multimeters |
| Warm Up Time | 30 minutes |

Scanner card SC1016 (Only for SDM3055-SC)

The SIGLENT Scanner Card SC1016 is a multiplexer that provides multi-point measurement capabilities to the SDM3055-SC. The scanner features 12 multi-purpose + 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.

| | |
|---------------------------|--|
| Max AC Voltage | 125 rms or 175 V peak, 100kHz, 0.3 A switched, 125VA (resistive load) |
| Contact Life | > 100000 operations, at 1 A 30VDC (at 0.5Hz) > 100000 operation, at 0.3 A 125VDC (at 0.5Hz) |
| Contact Resistance | 75 mΩ (maximum at 6 VDC, 1A) |
| Actuation Time | 180ms maximum on/off (channel to channel) |
| Maximum switching voltage | 250 VAC, 220 VDC |
| Maximum switching power | 62.5 VA / 30W |
| Insulation Resistance | Minimum 1 GΩ |
| Connect Type | Clamp terminal, # 24 AWG wire size |

Remark: To avoid electrical shock and personal injury, please don't use the product to measure signals that published specification.

Channel Capabilities

| Item | 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) |
| 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) |

Remark:[1] Voltage range: < 125 VAC, 100 V DC

[2] For continuous current < 2.2 A, Accuracy \pm (% 3 (reading) + 0.02% (range)).

Product Model and Distinction

| Model | SDM3055 | SDM3055-SC |
|---------------------|---------|------------|
| Scanner card SC1016 | × | √ |

Ordering Information

| Standard Accessories | |
|-----------------------------------|------------------|
| Power Cord -1 | |
| USB Cable -1 | |
| Quick Start -1 | |
| Warranty Card -1 | |
| EasyDMM ^[1] | Software |
| Test Leads and Alligator Clips -2 | |
| Optional Accessories | |
| USB-GPIB | USB-GPIB adapter |

[1]The latest version of EasyDMM can be downloaded for free from the SDM3000 series of digital multimeter. Please see our web site at www.siglent.com for more information

SDM3055 Digital Multimeter

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, function/arbitrary waveform generators, digital multimeters, DC power supplies, spectrum analyzers, isolated handheld oscilloscopes and other general purpose test instrumentation. Since its first oscilloscope, the ADS7000 series, 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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