

SDM3065X Series Digital Multimeter



DataSheet-2018.04

SDM3065X

SDM3065X-SC

Product Overview

The SDM3065X / SDM3065X-SC is a 6 1/2 digit DMM(digital multimeter with 2,200,000 counts) incorporating a dual -display. The SDM3065X series is especially well-suited for the needs of high-accuracy and high-precision applications measurement.

Application fields

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



Main Function

Basic Measurement Function

- DC Voltage: 200 mV - 1000 V
- DC Current: 200 μA - 10 A
- AC Voltage: True-RMS, 200 mV - 750 V
- AC Current: True-RMS, 200 μA - 10 A
- 2/4-Wire Resistance: 200Ω - 100 MΩ
- Capacitance: 2 nF - 100 mF
- Continuity Test: Range is fixed at 2 kΩ
- Diode Test: Adjustable range is 0 - 4V.
- Frequency Measurement: 3 Hz - 1 MHz
- Period Measurement: 1 μs - 333.33 ms
- Temperature: Support for TC and RTD sensors

Math Function

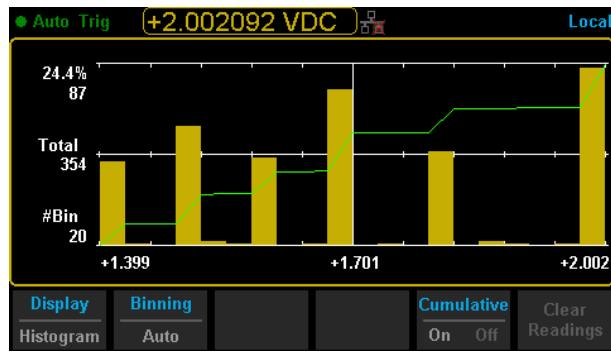
- Max, Min, Average, Standard Deviation, dBm/dB, Relative Measurement, Pass/Fail Histogram, Trend Chart, Bar Meter, etc.

Main Features

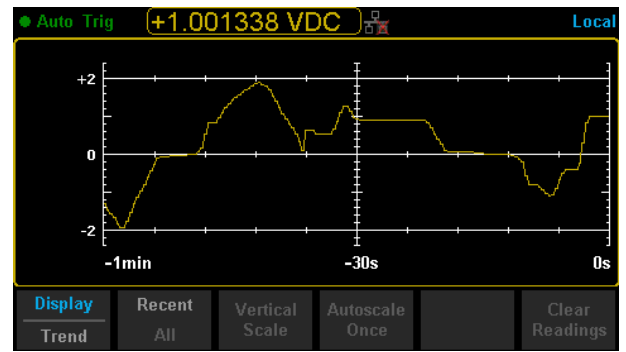
- 4.3" TFT-LCD, 480*272
- Real 6 1/2 digits readings resolution (2,200,000 counts)
- 1Gb Nand flash size, Mass storage configuration files and data files
- True-RMS AC Voltage and AC Current measuring
- Supports double display, Chinese and English Menu
- File management (support for U-disc and local storage)
- Built-in cold terminal compensation for thermocouple
- Comes with easy, convenient and flexible any sensor measurement control software: EasyDMM
- Standard interfaces: USB Device, USB Host, LAN (Optional Accessories: USB-GPIB Adapter)
- Scanner Card SC1016 (Only for SDM3065X-SC)
- Standard interfaces: USB Device, USB Host, LAN (Optional Accessories: USB-GPIB Adapter and Scanner Card SC1016)
- Built-in Hlep system makes information acquisition easier
- Support remote control operation via SCPI commands. Compatible with commands of other main stream multimeters
- Supports intelligent management system for laboratory based on BS framework and LAN.

Special Features

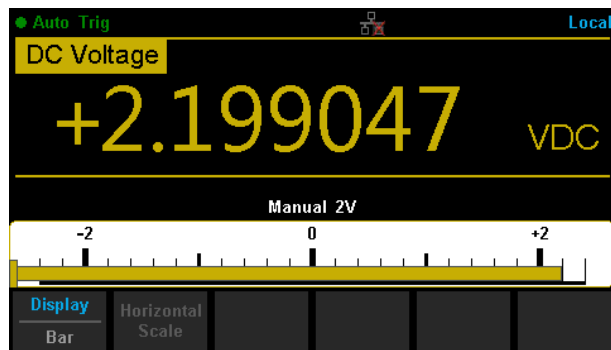
Histogram



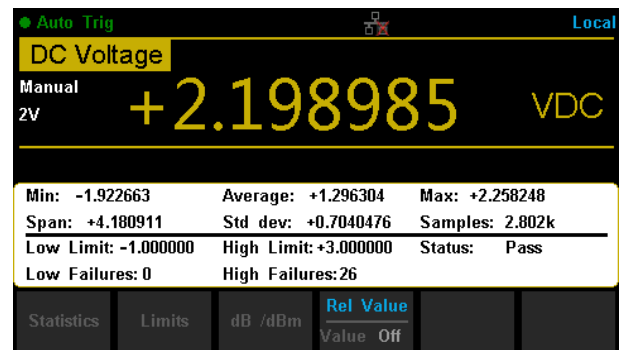
Trend Chart



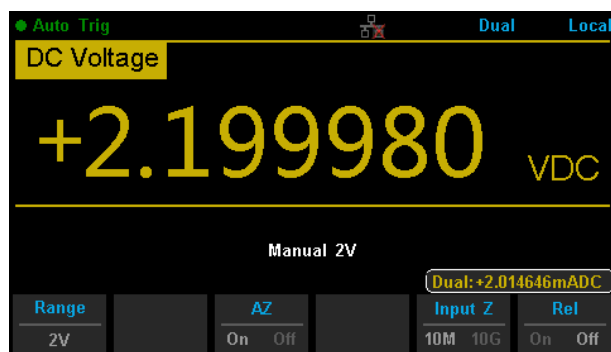
"Analog" Bar Display



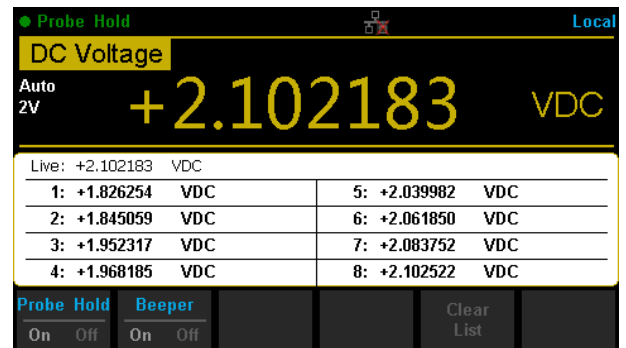
Statistics



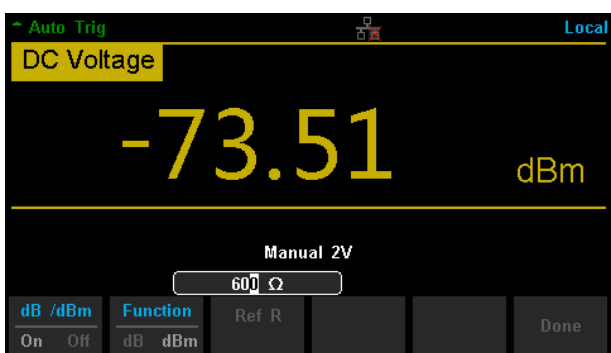
Dual Measurement Display



Hold Measurement



dBm Hold Measurement



Interface



DC Characteristics

Accuracy \pm (% of reading + % of range) ^[1]

| Function | Range ^[2] | Test Current Or Burden Voltage | 24Hour ^[3] TCAL °C ± 1 °C | 90day TCAL °C ± 5 °C | 1Year TCAL °C ± 5 °C | Temperature coefficient 0 °C to (TCAL °C -5 °C) (TCAL °C +5 °C) to 50 °C |
|---------------------------|---------------------------|--------------------------------|--|--------------------------|--------------------------|--|
| DC Voltage | 200.0000 mV | | 0.0020 + 0.0015 | 0.0030 + 0.0020 | 0.0040 + 0.0023 | 0.0005 + 0.0003 |
| | 2.000000 V | | 0.0015 + 0.0004 | 0.0020 + 0.0004 | 0.0035 + 0.0006 | 0.0005 + 0.0001 |
| | 20.00000 V | | 0.0020 + 0.0003 | 0.0030 + 0.0004 | 0.0040 + 0.0004 | 0.0005 + 0.0001 |
| | 200.0000 V | | 0.0020 + 0.0005 | 0.0040 + 0.0004 | 0.0050 + 0.0005 | 0.0005 + 0.0001 |
| | 1000.000 V ^[4] | | 0.0020 + 0.0005 | 0.0040 + 0.0008 | 0.0055 + 0.0008 | 0.0005 + 0.0001 |
| DC Current | 200.0000 μ A | < 0.03V | 0.009 + 0.010 | 0.040 + 0.005 | 0.050 + 0.005 | 0.0020 + 0.0026 |
| | 2.000000 mA | < 0.25V | 0.007 + 0.001 | 0.030 + 0.001 | 0.050 + 0.002 | 0.0020 + 0.0001 |
| | 20.00000 mA | < 0.07 V | 0.006 + 0.008 | 0.030 + 0.005 | 0.050 + 0.005 | 0.0020 + 0.0015 |
| | 200.0000 mA | < 0.7V | 0.009 + 0.001 | 0.030 + 0.001 | 0.050 + 0.002 | 0.0020 + 0.0001 |
| | 2.000000 A | < 0.12 V | 0.045 + 0.015 | 0.080 + 0.005 | 0.100 + 0.012 | 0.0050 + 0.0008 |
| | 10.00000 A ^[5] | < 0.6 V | 0.090 + 0.002 | 0.120 + 0.005 | 0.150 + 0.005 | 0.0050 + 0.0018 |
| Resistance ^[6] | 200.0000 Ω | 1 mA | 0.0030 + 0.0031 | 0.008 + 0.005 | 0.010 + 0.004 | 0.0006 + 0.0006 |
| | 2.000000 K Ω | 1 mA | 0.0020 + 0.0005 | 0.008 + 0.001 | 0.010 + 0.001 | 0.0006 + 0.0001 |
| | 20.00000 K Ω | 100 μ A | 0.0020 + 0.0005 | 0.008 + 0.001 | 0.010 + 0.001 | 0.0006 + 0.0001 |
| | 200.0000 K Ω | 10 μ A | 0.0020 + 0.0005 | 0.008 + 0.001 | 0.010 + 0.001 | 0.0006 + 0.0001 |
| | 1.000000 M Ω | 2 μ A | 0.0020 + 0.0010 | 0.010 + 0.001 | 0.012 + 0.001 | 0.0010 + 0.0002 |
| | 10.00000 M Ω | 200 nA | 0.015 + 0.001 | 0.030 + 0.001 | 0.040 + 0.001 | 0.0030 + 0.0005 |
| | 100.0000 M Ω | 200 nA 10 M Ω | 0.300 + 0.010 | 0.800 + 0.010 | 0.800 + 0.010 | 0.1500 + 0.0002 |
| Diode Test ^[7] | 0~ 2V | 1 mA | 0.002 + 0.009 | 0.008 + 0.020 | 0.010 + 0.020 | 0.0010 + 0.0020 |
| | 2~ 4V | 1 mA | 0.002 + 0.010 | 0.008 + 0.020 | 0.010 + 0.020 | 0.0010 + 0.0020 |
| Continuity Test | 2000.0 Ω | 1 mA | 0.002 + 0.010 | 0.008 + 0.020 | 0.010 + 0.020 | 0.0010 + 0.0020 |

Remarks:

- [1] Specifications are for 90-minute warm-up and 100NPLC integration time. For integration time <100NPLC, add the appropriate "RMS Noise Adder" listed in the following table.
- [2] 10% over range on all ranges except DCV 1000V and DCI 10A range.
- [3] Relative to calibration standards.
- [4] For each additional volt over ± 500 V, add 0.03mV error.
- [5] For continuous current > 7A DC or 7A AC RMS, 30 seconds ON and 30 seconds OFF.
- [6] Specifications are for 4-wire resistance measurement or 2-wire resistance measurement using REL operation. Without REL operation, add 0.2 Ω additional error in 2-wire resistance measurement.
- [7] Accuracy specifications for the voltage measured at the input terminal only. 1 mA test current is typical. Variation in the current source will create some variation in the voltage drop across a diode junction. Adjustable voltage range : 0~ 4V.

Performance Versus Integration Time – 50 Hz (60 Hz) Power-line Frequency

| Integration Time | Resolution ^[1] | NMRR ^[2] | Readings/s ^[3] | | RMS Noise Adder ^[4] (% of Range) | | | |
|---|---------------------------|---------------------|---------------------------|-------|---|---|--------------------------|---|
| | | | 50Hz | 60Hz | DCV 20V | DCV 2V 200V Resistance 2K Ω 20K Ω | DCV 1000V DCI 2 mA 200mA | DCV 200mV Resistance 200 Ω DCI 10A |
| Number of Power line Cycles ^[5] (NPLC) | (ppm Range) | (dB) | | | | | | |
| 0.005(0.006) | 2.7 | 0 | 10000 | 10000 | 0.0006 | 0.0008 | 0.0015 | 0.0040 |
| 0.05 (0.06) | 1.6 | 0 | 1000 | 1000 | 0.0004 | 0.0005 | 0.0008 | 0.0025 |
| 0.5 (0.6) | 1 | 0 | 100 | 100 | 0.0003 | 0.0003 | 0.0006 | 0.0025 |
| 1 | 0.22 | 60 | 50 | 60 | 0 | 0.0001 | 0.0002 | 0.0005 |
| 10 | 0.08 | 60 | 5 | 6 | 0 | 0 | 0 | 0.0002 |
| 100 | 0.035 | 60 | 0.5 | 0.6 | 0 | 0 | 0 | 0 |

Remarks:

[1] Typical value. Resolution is defined as the typical 20V range RMS noise.

[2] Normal mode rejection ratio for power-line frequency $\pm 0.1\%$. For power-line frequency $\pm 1\%$, subtract 20 dB. For $\pm 3\%$, subtract 30dB.

[3] Maximum rate for DCV, DCI, 2-wire resistance and 4-wire resistance functions.

[4] The basic DC accuracy specifications include RMS noise at 100 NPLC. For <100 NPLC, add "RMS Noise Adder" to the basic DC accuracy specifications.

[5] When Power Supply of frequency is 60Hz, the cycles is 0.006, 0.06, 0.6,1,10,100 NPLC.

SFDR & SINAD^[1]

| Function | Range | Spurious-Free Dynamic Range (SFDR) | Signal-to-Noise-and-Distortion (SINAD) |
|----------|-------|------------------------------------|--|
| DCV | 200mV | 80 | 75 |
| | 2V | 76 | 80 |
| | 20V | 78 | 72 |
| | 200V | 80 | 78 |
| | 1000V | 82 | 80 |
| DCI | 200uA | 90 | 70 |
| | 2mA | 90 | 80 |
| | 20mA | 85 | 70 |
| | 200mA | 80 | 75 |
| | 2A | 70 | 60 |

[1] Typical value. -1dBFS, 1k Hz single tone. 100 us aperture time and auto zero off.

AC Characteristics

Accuracy \pm (% of reading + % of range)^[1]

| Function | Range ^[2] | Frequency Range | 24 Hour ^[3] TCAL °C $\pm 1^\circ\text{C}$ | 90 Day TCAL °C $\pm 5^\circ\text{C}$ | 1 Year TCAL °C $\pm 5^\circ\text{C}$ | Temperature coefficient 0 °C to (TCAL °C -5 °C) (TCAL °C +5 °C) to 50 °C |
|---------------------------------------|----------------------|-----------------|--|--|--|--|
| True-RMS AC Voltage ^[4] | 200.0000mV | 3Hz- 5Hz | 1.00 + 0.03 | 1.00 + 0.04 | 1.00 + 0.04 | 0.100 + 0.004 |
| | | 5Hz-10Hz | 0.35 + 0.03 | 0.35 + 0.04 | 0.35 + 0.04 | 0.035 + 0.005 |
| | | 10Hz-20kHz | 0.04 + 0.03 | 0.05 + 0.04 | 0.06 + 0.04 | 0.005 + 0.004 |
| | | 20kHz-50kHz | 0.10 + 0.05 | 0.11 + 0.05 | 0.12 + 0.05 | 0.011 + 0.005 |
| | | 50kHz-100kHz | 0.55 + 0.08 | 0.60 + 0.08 | 0.60 + 0.08 | 0.060 + 0.008 |
| | | 100kHz- 300kHz | 4.00 + 0.50 | 4.00 + 0.50 | 4.00 + 0.50 | 0.20 + 0.02 |
| | 2.000000 V | 3Hz- 5Hz | 1.00 + 0.02 | 1.00 + 0.03 | 1.00 + 0.03 | 0.100 + 0.003 |
| | | 5Hz-10Hz | 0.35 + 0.02 | 0.35 + 0.03 | 0.35 + 0.03 | 0.035 + 0.003 |
| | | 10Hz-20kHz | 0.04 + 0.02 | 0.05 + 0.03 | 0.06 + 0.03 | 0.005 + 0.003 |
| | | 20kHz-50kHz | 0.10 + 0.04 | 0.11 + 0.05 | 0.12 + 0.05 | 0.011 + 0.005 |
| | | 50kHz-100kHz | 0.55 + 0.08 | 0.60 + 0.08 | 0.60 + 0.08 | 0.060 + 0.008 |
| | | 100kHz- 300kHz | 4.00 + 0.50 | 4.00 + 0.50 | 4.00 + 0.50 | 0.20 + 0.02 |
| | 20.00000 V | 3Hz- 5Hz | 1.00 + 0.03 | 1.00 + 0.04 | 1.00 + 0.04 | 0.100 + 0.004 |
| | | 5Hz-10Hz | 0.35 + 0.03 | 0.35 + 0.04 | 0.35 + 0.04 | 0.035 + 0.004 |
| | | 10Hz-20kHz | 0.04 + 0.04 | 0.07 + 0.04 | 0.08 + 0.04 | 0.008 + 0.004 |
| | | 20kHz-50kHz | 0.10 + 0.05 | 0.12+ 0.05 | 0.15 + 0.05 | 0.012 + 0.005 |
| | | 50kHz-100kHz | 0.55 + 0.08 | 0.60 + 0.08 | 0.60 + 0.08 | 0.060 + 0.008 |
| | | 100kHz- 300kHz | 4.00 + 0.50 | 4.00 + 0.50 | 4.00 + 0.50 | 0.20 + 0.02 |
| | 200.0000 V | 3Hz- 5Hz | 1.00 + 0.02 | 1.00 + 0.03 | 1.00 + 0.03 | 0.100 + 0.003 |
| | | 5Hz-10Hz | 0.35 + 0.02 | 0.35 + 0.03 | 0.35 + 0.03 | 0.035 + 0.003 |
| | | 10Hz-20kHz | 0.04 + 0.02 | 0.07 + 0.03 | 0.08 + 0.03 | 0.008 + 0.003 |
| | | 20kHz-50kHz | 0.10 + 0.04 | 0.12+ 0.05 | 0.15 + 0.05 | 0.012 + 0.005 |
| | | 50kHz-100kHz | 0.55 + 0.08 | 0.60 + 0.08 | 0.60 + 0.08 | 0.060 + 0.008 |
| | | 100kHz- 300kHz | 4.00 + 0.50 | 4.00 + 0.50 | 4.00 + 0.50 | 0.20 + 0.02 |
| 750.0000V ^[5] | 3Hz- 5Hz | 1.00 + 0.02 | 1.00 + 0.03 | 1.00 + 0.03 | 0.100 + 0.003 | |
| | 5Hz-10Hz | 0.35 + 0.02 | 0.35 + 0.03 | 0.35 + 0.03 | 0.035 + 0.003 | |
| | 10Hz-20kHz | 0.04 + 0.02 | 0.07 + 0.03 | 0.08 + 0.03 | 0.008 + 0.003 | |
| | 20kHz-50kHz | 0.10 + 0.04 | 0.12+ 0.05 | 0.15 + 0.05 | 0.012 + 0.005 | |
| | 50kHz-100kHz | 0.55 + 0.08 | 0.60 + 0.08 | 0.60 + 0.08 | 0.060 + 0.008 | |
| | 100kHz- 300kHz | 4.00 + 0.50 | 4.00 + 0.50 | 4.00 + 0.50 | 0.20 + 0.02 | |

| Function | Range ^[2] | Frequency Range | 24 Hour ^[3] T C A L °C ±1°C | 90 Day T C A L °C ±5°C | 1Year T C A L °C ±5°C | Temperature coefficient 0°C to (TCAL°C -5°C)) TCAL°C +5°C) to 50°C |
|---------------------------------------|----------------------|-----------------|--|------------------------------|-----------------------------|---|
| True-RMS AC Current ^[8] | 200.0000 uA | 3Hz- 5Hz | 1.10 + 0.06 | 1.10 + 0.06 | 1.10 + 0.06 | 0.200 + 0.005 |
| | | 5Hz-10Hz | 0.35 + 0.06 | 0.35 + 0.06 | 0.35 + 0.06 | 0.100 + 0.005 |
| | | 10Hz-5kHz | 0.15 + 0.06 | 0.15 + 0.06 | 0.15 + 0.06 | 0.015 + 0.005 |
| | | 5kHz-10kHz | 0.35 + 0.70 | 0.35 + 0.70 | 0.35 + 0.70 | 0.030 + 0.005 |
| | 2.000000mA | 3Hz- 5Hz | 1.00 + 0.04 | 1.00 + 0.04 | 1.00 + 0.04 | 0.100 + 0.005 |
| | | 5Hz-10Hz | 0.30 + 0.04 | 0.30 + 0.04 | 0.30 + 0.04 | 0.035 + 0.005 |
| | | 10Hz-5kHz | 0.12 + 0.04 | 0.12 + 0.04 | 0.12 + 0.04 | 0.015 + 0.005 |
| | | 5kHz-10kHz | 0.20 + 0.25 | 0.20 + 0.25 | 0.20 + 0.25 | 0.030 + 0.005 |
| | 20.00000mA | 3Hz- 5Hz | 1.10 + 0.06 | 1.10 + 0.06 | 1.10 + 0.06 | 0.200 + 0.005 |
| | | 5Hz-10Hz | 0.35 + 0.06 | 0.35 + 0.06 | 0.35 + 0.06 | 0.100 + 0.005 |
| | | 10Hz-5kHz | 0.15 + 0.06 | 0.15 + 0.06 | 0.15 + 0.06 | 0.015 + 0.005 |
| | | 5kHz-10kHz | 0.35 + 0.70 | 0.35 + 0.70 | 0.35 + 0.70 | 0.030 + 0.005 |
| | 200.0000mA | 3Hz- 5Hz | 1.00 + 0.04 | 1.00 + 0.04 | 1.00 + 0.04 | 0.100 + 0.006 |
| | | 5Hz-10Hz | 0.30 + 0.04 | 0.30 + 0.04 | 0.30 + 0.04 | 0.035 + 0.006 |
| | | 10Hz-5kHz | 0.10 + 0.04 | 0.10 + 0.04 | 0.10 + 0.04 | 0.015 + 0.006 |
| | | 5kHz-10kHz | 0.20 + 0.25 | 0.20 + 0.25 | 0.20 + 0.25 | 0.030 + 0.006 |
| | 2.000000 A | 3Hz- 5Hz | 1.10 + 0.06 | 1.10 + 0.06 | 1.10 + 0.06 | 0.100 + 0.006 |
| | | 5Hz-10Hz | 0.35 + 0.06 | 0.35 + 0.06 | 0.35 + 0.06 | 0.035 + 0.006 |
| | | 10Hz-5kHz | 0.15 + 0.06 | 0.15 + 0.06 | 0.15 + 0.06 | 0.015 + 0.006 |
| | | 5kHz-10kHz | 0.35 + 0.70 | 0.35 + 0.70 | 0.35 + 0.70 | 0.030 + 0.006 |
| 10.00000A ^[5] | 3Hz- 5Hz | 1.10 + 0.08 | 1.10 + 0.10 | 1.10 + 0.10 | 0.100 + 0.008 | |
| | 5Hz-10Hz | 0.35 + 0.08 | 0.35 + 0.10 | 0.35 + 0.10 | 0.035 + 0.008 | |
| | 10Hz-5kHz | 0.15 + 0.08 | 0.15 + 0.10 | 0.15 + 0.10 | 0.015 + 0.008 | |

| Additional Low Frequency Errors (% of reading) | | | | Additional Crest Factor Errors (non-sine wave) ^[7] | |
|--|-----------|---------|---------|---|---------------------|
| Frequency | AC Filter | | | Crest Factor | error(% of reading) |
| | > 3Hz | > 20 Hz | > 200Hz | | |
| 10Hz-20Hz | 0 | 0.74 | -- | 1 - 2 | 0.05 |
| 20Hz-40Hz | 0 | 0.22 | -- | 2 - 3 | 0.2 |
| 40Hz-100Hz | 0 | 0.06 | 0.73 | 3 - 4 | 0.4 |
| 100Hz- 200Hz | 0 | 0.01 | 0.22 | 4 - 5 | 0.5 |
| 200Hz-1kHz | 0 | 0 | 0.18 | | |
| > 1kHz | 0 | 0 | 0 | | |

Remarks:

[1] Specifications are for 90-minute warm-up, > 3Hz ac filter and sine wave input.

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

[3] Relative to calibration standards.

[4] Specifications are for sine wave input >5% of range. For inputs within 1% and 5% of range and <50 kHz, add 0.1% of range additional error. For 50 kHz to 100k Hz, add 0.13% of range additional error.

[5] ACV 750 range limited to 8×10^7 Volt-Hz. For input over 300V rms, add 0.7mV error for each additional volt.

[6] For continuous current > DC 7A or AC RMS 7A, 30 seconds ON and 30 seconds OFF.

[7] For frequency below 100 Hz, the specification of slow filter is only for sine wave input.

[8] Specifications are for sine wave input >5% of range. For inputs within 1% to 5% of range, add 0.1% of range additional error. Specifications are typical values for 200uA and 2mA, 2A and 10A ranges when frequency >1k Hz.

Frequency and Period Characteristics

Accuracy± (% of Reading)^{[1][2]}

| Function | Range | Frequency Range | 24 Hour ^[3] TCAL °C ±1 °C | 90 Day TCAL °C ±5 °C | 1 Year TCAL °C ±5 °C | Temperature coefficient 0 °C to (TCAL °C - 5 °C) (TCAL °C + 5 °C) to 50 °C |
|----------------------|--------------------|-----------------|--|----------------------------|----------------------------|--|
| Frequency, Period | 200 mV to 750 V | 3 Hz – 5Hz | 0.07 | 0.07 | 0.07 | 0.005 |
| | | 5 Hz – 10 Hz | 0.04 | 0.04 | 0.04 | 0.005 |
| | | 10 Hz – 40 Hz | 0.02 | 0.02 | 0.02 | 0.001 |
| | | 40 Hz – 300 KHz | 0.005 | 0.006 | 0.007 | 0.001 |
| | | 300 KHz – 1 MHz | 0.005 | 0.006 | 0.007 | 0.001 |

| Frequency | Gate Time (Resolution) | | | |
|---------------|------------------------|--------------|----------------|------------------|
| | 1s (0.1ppm) | 0.1 s (1ppm) | 0.01 s (10ppm) | 0.001 s (100ppm) |
| 3 Hz– 5Hz | 0 | 0.12 | 0.12 | 0.12 |
| 5 Hz– 10 Hz | 0 | 0.17 | 0.17 | 0.17 |
| 10 Hz–40 Hz | 0 | 0.20 | 0.20 | 0.20 |
| 40 Hz–100 Hz | 0 | 0.06 | 0.21 | 0.21 |
| 100 Hz–300 Hz | 0 | 0.03 | 0.21 | 0.21 |
| 300Hz–1 KHz | 0 | 0.01 | 0.07 | 0.07 |
| > 1 K Hz | 0 | 0 | 0.02 | 0.02 |

Remarks:

[1] Specifications are for 90 minutes warm-up, using 1s gate time.

[2] For frequency ≤ 300 kHz, the specification is the 10% to 110% of range of the AC input voltage. For frequency > 300 kHz, the specification is the 20% to 110% of range of the AC input voltage. The maximum input is limited to 750V rms or 8 × 10⁷ Volts-Hz (whichever is less). The 200 mV range is full range input or input that is larger than the full range. For 20mV to 200mV, multiply % of reading error × 10.

[3] Relative to calibration standards.

Capacitance Characteristic

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

| Function | Range ^[2] | Test Current | 1 Year TCAL °C ±5 °C | Temperature coefficient 0 °C to (TCAL °C - 5 °C) (TCAL °C + 5 °C) to 50 °C |
|-------------|----------------------|--------------|-------------------------|---|
| Capacitance | 2.0000 nF | 10 μA | 2 + 2.4 | 0.05 + 0.06 |
| | 20.000 nF | 10 μA | 1 + 0.1 | 0.05 + 0.01 |
| | 200.00 nF | 100 μA | 1 + 0.1 | 0.01 + 0.01 |
| | 2.0000 μF | 100 μA | 1 + 0.1 | 0.01 + 0.01 |
| | 20.000 μF | 1 mA | 1 + 0.1 | 0.01 + 0.01 |
| | 200.00 μF | 1 mA | 1 + 0.1 | 0.01 + 0.01 |
| | 2.0000 mF | 1 mA | 1 + 0.1 | 0.01 + 0.01 |
| | 20.000 mF | 1 mA | 1 + 0.1 | 0.01 + 0.01 |
| | 100.00 mF | 1 mA | 3 + 0.1 | 0.05 + 0.02 |

Remarks:

[1] Specifications are for 90 minutes warm-up and using REL operation. Additional errors may be caused by non-film capacitors.

[2] Specifications are the 1% to 110% of range on 2nF range and 10% to 110% of range on all other ranges

Temperature Characteristics

Accuracy± (% of Reading)^[1]

| Function | Probe Type | Type | Optimum Range | 1 Year TCAL °C ±5°C | Temperature coefficient 0°C to (TCAL °C - 5°C) (TCAL °C + 5°C) to 50°C |
|-------------|--|-----------|-----------------|---------------------|---|
| Temperature | RTD ^[2] (R0 is 49Ω to 2.1kΩ) | α=0.00385 | -200°C ~ 660°C | 0.16°C | 0.01°C |
| | | B | 0°C ~ 1820°C | 0.76 °C | 0.14°C |
| | Thermocouple ^[3] | 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 ~ 1370°C | 0.5°C | 0.03°C |
| | | N | -270°C ~ 1300°C | 0.5°C | 0.04°C |
| | | R | -270°C ~ 1760°C | 0.5°C | 0.09°C |
| | | S | -270°C ~ 1760°C | 0.6°C | 0.11°C |
| | | T | -270°C ~ 400°C | 0.5°C | 0.03°C |

Remarks:

[1] Specifications are for 90 minutes warm-up. Exclusive of sensor error.

[2] Specification is for 4WR sensor measurement or 2WR measurement using REL operation.

[3] 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 ± 2.5 °C .

Measurement Rate

Measurement rate^[3]

| Function | Setting | Integration | Readings/s 50Hz (60Hz) |
|--|--------------------|-------------|------------------------|
| DC Voltage DC Current 2 - wire Resistance 4 - wire Resistance | 0.005 (0.006) NPLC | 100(100)us | 10000 (10000) |
| | 0.05 (0.06) NPLC | 1 (1)ms | 1000 (1000) |
| | 0.5 (0.5) NPLC | 4 (4)ms | 100 (100) |
| | 1 NPLC | 20(16.7)ms | 50 (60) |
| | 10 NPLC | 200(167)ms | 5 (6) |
| | 100 NPLC | 2(1.67)s | 0.5 (0.6) |
| AC Voltage AC Current | 3Hz AC Filter | | 0.5 |
| | 20Hz | | 2 |
| | 200Hz | | 50 |
| Frequency and Period ^[1] | 1s Gate time | | 1 |
| | 0.1s | | 10 |
| | 0.01s | | 100 |
| | 0.001s | | 500 |
| Capacitance ^[2] | 100mF Range | | 0.5 |

Remarks:

[1] 20 V range, 1k Hz input.

[2] The measurement period changes with the capacitance under test.

[3] Auto zero off , auto range off.

Measuring Method and other Characteristics

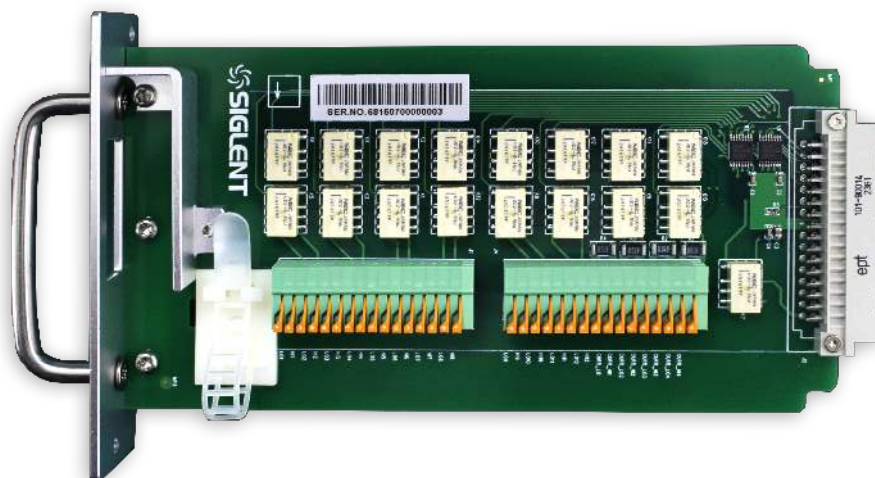
| DC Voltage | |
|---|---|
| Input Resistance | 200 mV, 2 V, 20 V ranges: Selectable 10 M Ω or > 10 G Ω (For these ranges, input beyond ± 26 V are clamped through 106 k Ω (typical)) |
| | 200 V and 1000 V ranges: 10 M Ω \pm 1% |
| Input Offset Current | 50 pA, 25 $^{\circ}$ C ,typical |
| Input Protection | 1000 V |
| CMRR (common mode rejection ratio) | 140 dB for 1 k Ω unbalance in LO lead, \pm 500 VDC peak maximum |
| Resistance | |
| Measurement Method | Selectable 4-wire or 2-wire resistance |
| | Current source referenced to LO input |
| Open-circuit Voltage | Limited to <10V |
| Max. Lead Resistance (4-wire) | 10% of range per lead for 200 Ω , 2 k Ω ranges, 1 k Ω per lead on all other ranges |
| Offset Compensation | Available on 200 Ω , 2k Ω and 20 k Ω ranges |
| Input Protection | 1000 V on all ranges |
| DC Current | |
| Shunt Resistor | 100 Ω for 200 u A, 2 m A |
| | 1 Ω for 20 m A , 200 m A |
| | 0.01 Ω for 2 A, 10 A |
| Input Protection | Rear panel : accessible 10 A,250 V Time-Lag fuse |
| | Internal 12A, 250V Time-Lag fuse |
| Continuity / Diode Test | |
| Measurement Method | 1 m A \pm 5% constant-current source or open-circuit voltage |
| Response Time | 300 samples/sec, with audible tone |
| Beeper | Yes |
| Diode Threshold | Adjustable from 0 to 4 V |
| Continuity Threshold | Adjustable from 1 Ω to 2 K Ω |
| Input Protection | 1000 V |
| Settling Time Considerations | |
| Reading settling times are affected by source impedance, cable dielectric characteristics and input signal changes. The default measurement delay is selected to the correct reading for most measurements. | |
| Measurement Considerations | |
| Teflon or other high-impedance, low-dielectric absorption wire insulation is recommended for these measurements | |
| True RMS AC Voltage | |
| Measurement Method | AC-coupled True-RMS measurement with up to 400 V DC of bias at on any range. |
| Crest Factor | \leq 5 at full range |
| Input Impedance | 1M Ω \pm 2% in parallel with <150pF capacitance on any range |
| Input Protection | 750V rms on all ranges |
| AC Filter Bandwidth | Slow : 3 Hz \sim 300 KHz |
| | Medium : 20 Hz \sim 300 KHz |
| | Fast : 200 Hz \sim 300 KHz |
| CMRR (common mode rejection ratio) | 70 dB, for the 1 k Ω unbalance in LO lead, < 60 Hz, \pm 500 VDC peak maximum |

| True RMS AC Current | |
|--|---|
| Measurement Method | Direct coupled to the fuse and shunt; AC-coupled True RMS measurement (Measure the AC component only). |
| Crest Factor | ≤ 3 at full range |
| Max. Input | DC + AC current peak value < 300% of range. The RMS current < 10 A rms including the DC component. |
| Shunt Resistor | 100Ω for 200uA , 2mA |
| | 1Ω for 20mA,200mA |
| | 0.01Ω for 2A,10A |
| Input Protection | Externally accessible 10A,250V Time-Lag fuse |
| | Internal 12A, 250 V Time-Lag fuse |
| Settling Time Considerations | |
| <p>The default measurement delay is selected to give first reading correctly for most measurements. Make sure the RC circuit of input terminal has been fully settled (about 1s) before reading the accurate measurement.</p> <p>Applying > 300 Vrms (or > 5Arms) will cause self-heating in signal-conditioning components and these errors are included in the instrument specifications. Internal temperature changes due to self-heating may cause additional errors on lower AC voltage ranges. The additional error will be lower than 0.02% of reading and will generally dissipate within a few minutes.</p> | |
| Frequency and Period | |
| Measurement Method | Reciprocal-counting technique, AC-coupled input using the AC voltage function. |
| Input Impedance | 1 MΩ ± 2% in parallel with < 150 pF capacitance on any range |
| Input Protection | 750 V rms on all ranges |
| Measurement Considerations | All frequency counters are susceptible to error when measuring low-voltage, low-frequency signals. Shielding inputs from external noise is recommended |
| Settling Time Considerations | Errors will occur when attempting to measure the frequency or period of an input following a dc offset voltage change. Make sure the RC circuit of input terminal has been fully settled (about 1s) before reading the accurate measurement. |
| Capacitance Measurement | |
| Measurement Method | Apply constant current into the capacitance, and measure the voltage changing rate. |
| Connection Type | 2-wire |
| Input Protection | 1000 V on all ranges |
| Measurement considerations | Since small capacitance measurements are susceptible to the external noise, shielding inputs from external noise pickup is critical for minimizing measurement errors. |
| Temperature Measurement | |
| 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. |

| Triggering and Storage | |
|--|--|
| Trigger | Pre-trigger or Post-trigger, Internal Trigger or External Trigger, Rising Edge Trigger or Falling Edge Trigger |
| Time Base Resolution | 40us, 0.01% Accuracy |
| Trigger Delay | 0 to 1000s |
| Reading Sensitivity | 0.01%、0.1%、1% or 10% reading |
| Single Trigger Samples | 1 to 599999999 |
| External Trigger Input | Level: TTL compatible |
| | Trigger: Selectable rising edge or falling edge |
| | Input Impedance: $\geq 30K\Omega//500pF$ |
| | Delay: $< 50 \mu s$ |
| | Maximum Rate: 300/s |
| VMC Output | Minimum Pulse Width: $2 \mu s$ |
| | Level: 5V TTL Compatible |
| | Output Polarity: Positive and negative optional |
| | Output Impedance : 200Ω , typical |
| Pulse Width: about $2\mu s$ | |
| History Records | |
| Volatile Memory | 10K reading of history records |
| Nonvolatile Memory | 1Gb Nand Flash, Mass storage configuration files and data files, Supports 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 | 45 Hz — 66 Hz |
| AC 200 V ~ 240 V | 45 Hz — 66 Hz |
| Detect the power-line frequency automatically at power-on, 400Hz defaults to 50Hz | |
| Power Consumption | 25VA max |
| Mechanism | |
| Dimension | (length×width×height): 345.45mm×260.29mm×107.21mm |
| Weight | 3.377Kg (Net weight) |
| Other characteristics | |
| Display Screen | 4.3 "TFT-LCD with resolution 480*272 |
| Working Environment | Full accuracy for 0 °C to 50 °C |
| | Full accuracy to 40 °C , 80% R.H., Non-coagulation |
| | Storage Temperature — 20°C to 70°C |
| | Shock and Vibration: conforming to MIL-T-28800E, III, 5 level (only for sine) |
| | Height above sea level: up to 3000 meters |
| EMC | Conforming to EMC (2004/108/EC) and EN 61326-1:2013 |
| Safety | IEC 61010-1; EN 61010-1; UL 61010-1; CAN/CSA-C22.2 No. 61010-1 Measurement CAT I 1000 V/CAT II 600 V |
| Remote Interface | 10/100Mbit LAN, USB2.0 Full Speed Device, Host |
| Programming Language | Standard SCPI, compatible with commands of main stream multimeters |
| Warm Up Time | 90 minutes |

Scanner card SC1016 (Only for SDM3065X-SC)

The SIGLENT Scanner Card SC1016 is a multiplexer that provides multi-point measurement capabilities to the SDM3065X-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 | 125V rms or 175V peak, 100kHz, 0.3 A switched, 125VA (resistive load) |
| Contact Life | > 100000 operations, at 1A 30VDC (at 0.5 Hz) > 100000 operations, at 0.3A 125VDC (at 0.5 Hz) |
| Contact Resistance | 75 mΩ (maximum at 6VDC, 1A) |
| Actuation Time | 180ms maximum on/off (channel to channel) |
| Maximum switching voltage | 250 VAC, 220 VDC |
| Maximum switching power | 62.5VA / 30W |
| Insulation Resistance | Minimum 1GΩ (500VDC) |
| Connector Type | Clamp terminal, #24 AWG wire size |

Remarks: To avoid electrical shock and personal injury, please don't use the product to measure signals that exceed the 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 Only) |
| 2W Resistance | 2 wires (H , L) | 12 (CH1 ~ CH12) |
| 4W Resistance | 4 wires (Input H , L + sense H , L) | 6 pairs (CH1 [input] & CH7[sense], 2&8, •••, 6&12) |
| 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) |

Remarks:[1]Voltage range : <125VAC , 110VDC

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

Product Model and Distinction

| Model | SDM3065X | SDM3065X-SC |
|---------------------|----------|-------------|
| Scanner card SC1016 | × | √ |

Ordering Information

| Standard Accessories | |
|-----------------------------------|------------------|
| Power Cord -1 | |
| USB Cable -1 | |
| Quick Start -1 | |
| warranty Card -1 | |
| EasyDMM ^[1] | software system |
| 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

SDM3065X Series 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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