

5 ½ Digital Multimeter SMM5055



Product Overview

The SMM 5055 is a 5 ½ digit digital multimeter with a dual-readout display and is especially well suited for the needs of high precision, multifunction and automatic measurement applications.

Main Features

- 5 ½ digits reading resolution
- Up to 150 rdgs/s measurement speed
- True-RMS AC Voltage and AC Current measurement
- 1GB Nand flash size, Mass storage configuration files and data files.
- Built-in cold terminal compensation for thermocouple temperature measurements.
- Standard Interface : USB Device, USB Host, LAN
- Support remote control via commands and compatible with commands of main stream multimeters.
- File management (support for U-disk and local storage)
- Includes computer software
- 4.3" TFT - LCD, 480*272 display
- Built - in front panel accessible help System

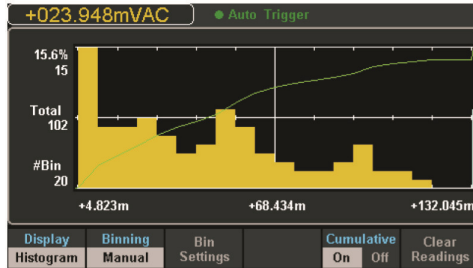
Application Fields

- Research & Development Laboratory
- Calibration Laboratory
- Repair and maintenance
- Automatic Product Test
- General bench top use

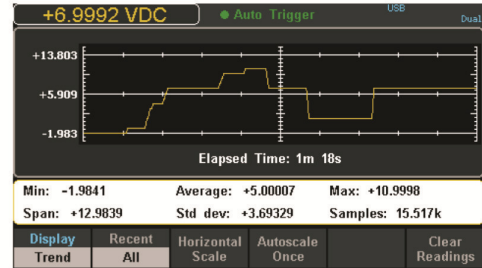
Main Functions

- Basic Measurement Functions
- 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 : Range is fixed at 2.0 V
- 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 Trending, Bar Chart

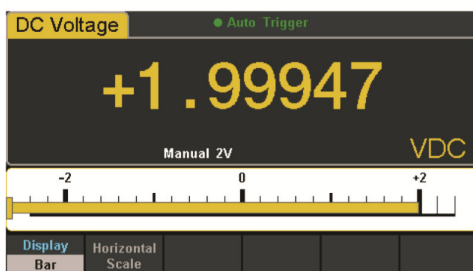
Special Features



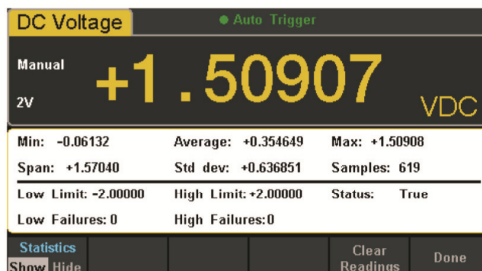
Histogram



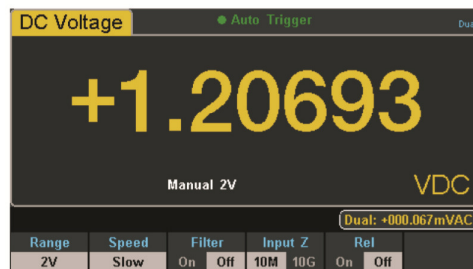
Trend Chart



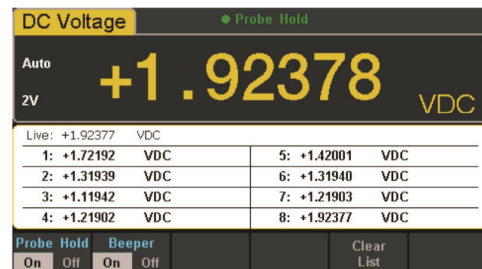
Bar Chart



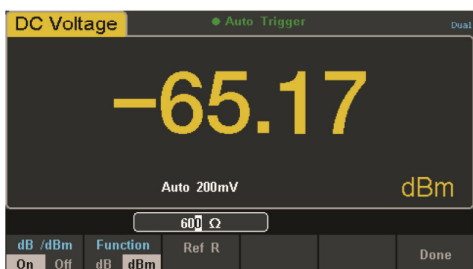
Statistics



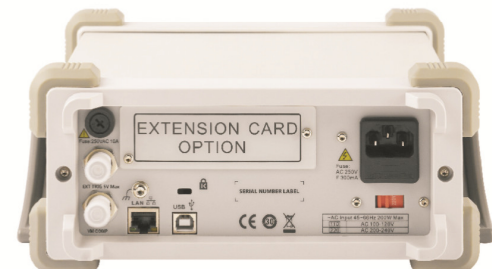
Double Display



Hold Measurement



dBm Measurement



Interface

Specification

DC Characteristic

Accuracy \pm (% of Reading + % of Range)⁽¹⁾

Function	Range ⁽²⁾	Test Current of Load voltage	1 Year 23°C \pm 5°C	Temperature coefficients 28°C \pm 5°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 μ A	< 8 mV	0.055+0.005	0.003+0.0001
	2 mA	< 80 mV	0.055+0.005	0.002+0.0001
	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
	2K Ω	1 mA	0.020+0.003	0.0030+0.0005
	20K Ω	1 μ A	0.020+0.003	0.0030+0.0005
	200K Ω	10 μ A	0.020+0.010	0.0030+0.0005
	2M Ω	1 μ A	0.040+0.004	0.0040+0.0005
	10M Ω	200 nA	0.250+0.003	0.0100+0.0005
	100M Ω	200 nA 10MW	1.75+0.004	0.2000+0.0005
Diode Test	2.0V ⁽⁶⁾	1 mA	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 calibration temperature 180C-280C.
- (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. \pm 0.2 ... 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 that the first \pm 500 VDC
- (5) 30 seconds OFF after 30 seconds on is recommend foe the continuous current that higher than DC 7 A or AC RMS 7 A.
- (6) Accuracy specification 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 Characteristic

Accuracy \pm (% of Reading + % of Range)⁽¹⁾

Function	Range ⁽²⁾	Frequency Range	1 Year 23°C \pm 5°C	Temperature coefficients 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

AC Characteristic

Accuracy ± (% of Reading + % of Range)⁽¹⁾

Function	Range ⁽²⁾	Frequency Range	1 Year 23°C ± 5°C	Temperature coefficients 0°C -18°C 28°C -50°C
True – RMS AC Voltage ⁽³⁾	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	0.5 + 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 180C-280C.
- (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.
- (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.

Frequency and Period Characteristic

Accuracy ± (% of Reading + % of Range)⁽¹⁾

Function	Range	Frequency Range	1 Year 23°C ± 5°C	Temperature coefficients 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.

Capacitance Characteristic

Accuracy ± (% of Reading + % of Range)⁽¹⁾

Function	Range ⁽²⁾	Max Testing Current	1 Year 23°C ± 5°C	Temperature coefficients 0°C -18°C 28°C -50°C
Capacitance	2 nF	10 µA	3 + 1.0	0.08+ 0.002
	20 nF	10 µA	1 + 0.5	0.02+ 0.001
	200 nF	100 µA	1 + 0.5	0.02+ 0.001
	2µF	100 µA	1 + 0.5	0.02+ 0.001
	20 µF	1 mA	1 + 0.5	0.02+ 0.001
	200 µF	1 mA	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" operating. 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 Characteristic

Accuracy ± (% of Reading + % of Range)⁽¹⁾

Function	Probe Type	Probe Model	Working	1 Year 23°C ± 5°C	Temperature coefficients 0°C -18°C 28°C -50°C
Temperature	RTD ⁽²⁾	α = 0.00385	- 200°C - 660°C	0.16°C	0.08+ 0.002
	TC ⁽³⁾	B	20°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 - 1370°C	0.5°C	0.03°C
		N	- 270°C - 1300°C	0.5°C	0.04°C
		R	- 50°C - 1760°C	0.5°C	0.09°C
		S	- 50°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 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 ±10C.

Measuring Method and Other Characteristics

DC Voltage	
Input Resistance	200mV 2V Range 10 M Ω or 10 G Ω selectable
	20V, 200V and 1000 V Rang 10 M Ω \pm 10 Ω
Input Bias Current	< 90pA, 25°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 "slow" measurement rate
	20 dB are added if open the "AC" fitter
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 < 80 mV
	1 Ω for 20 mA, 200mA
	0.01 Ω for 2 A, 10A
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	1mA \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	1M Ω \pm 2% in parallel with < 100 pF on all ranges
AC Filter Bandwidth	20 Hz - 100 KHz
CMRR	60 dB (For the 1 K Ω imbalance resistance among Lo ead and < 60 Hz, Max \pm 500VDC)
True-RMS AC Current	
Measurement Method	DC Coupled to the fuse and shunt ; AC coupled the True - RMS measurement (measures the AC)
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 2A, 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	Error are leaded into all frequency counters when measuring low voltage or low 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 range	
Temperature Measuring		
Measurement Method	Support for TC and RTD types of sensor	
Trigger and Memory		
Sample / Trigger	1 – 10000	
Sample / Trigger	6 ms - 10000ms 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	≥ 20 K W // 400 F.DC - coupled
	Min Pulse	500 μ S
VMC Output	Level	TTL Compatible
	Output Polarity	Straight and negative optional
	Output Impedence	200 Ω, typical
History Records		
Volatile Memory	10 K reading of history records	
Nonvolatile Memory	1 Gb Nand Flash, Mess storage configuration files and data files, Support U-disk external storage.	
Math Function		
Min/Max/Average, dBm, dB, Pass/Fail, Relative, Standard deviation, Hold, histogram, Trend chart, Bar chart		
General Specification		
Power Supply		
AC 100 V - 120 V	400 Hz	
AC 100 V - 240 V	50/ 66 Hz	
Consumption	20 VA max	
Mechanical		
Dimension	282 mm x 260 mm x 105 mm	
Weight	3.33 Kg	
General Specifications		
Display Screen	4.3" TFT - LCD with resolution 480 x 272	
Operation Environment	Fully accuracy from - 0°C - 50°C, 80% RH and 40°C, non condensing	
	Storage Temperature - 20°C - 70°C	
	Shock and Vibration conforming to MIL - T 28800E, III Calss, 5 level (only for sine)	
	Height above sea level : up to 3000 meters	
Electromagnetic Compatibility	2004/1081 EC Directive, Applicable standards EN61326 - 1:2013	
Safety	Conforming to IEC 61010-1:2010. Measure CAT I 1000V/CAT 600V Class of pollution : 2	
Remote Interface	USB-GPIB (only for SDM 3055 A), 10/100 Mbit LAN, USB2.0 Full speed Device & Host	
Programmer Language	Standard SCPL, compatible with commands of main stream multimeters	
Warm Up Time	30 minutes	


Standard Accessories	Power Cord
	Two Test Leads, Two Alligator Clips
	USB Cable
	CD

Subject to change without Notice


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Scientific Mes-Technik Pvt. Ltd.

B-14, Pologround, Industrial Estate, Indore 452 015, India

 0731-2422330/31/32/33

 0731-2422334

 sales@scientificindia.com

 www.scientificindia.com




Bengaluru 080-23452635

 bangalore@scientificindia.com


Kolkata +919673162333

 kolkata@scientificindia.com


Chennai 044-42054180

 chennai@scientificindia.com


Mumbai +919850901735

 mumbai@scientificindia.com


Gujarat +917567463752

 gujarat@scientificindia.com


New Delhi +918889912554

 ndelhi@scientificindia.com

Hyderabad +917095228811

 hyderabad@scientificindia.com

Pune +919850901735

 pune@scientificindia.com