GDM-9061 Specifications

The specifications apply when the GDM-9061 is powered on for at least 60 minutes.

(with optional GPIB)

Note :

- All specifications are ensured only under a single display.
- At least 1 hour of warm-up time is required before applying these specifications.
- Make sure that the Sense LO terminal to Input LO is limited to 2Vpk, the Sense HI to Sense LO terminals are limited to 200Vpk and the Input LO to earth is limited to 500Vpk. CAT II 300V. MAX DC1000V, AC 750V

Function	Range (2)	Resolution	Input Resistance etc.	24 Hour TCAL± 1°C	90 Day TCAL± 5°C	1 Year TCAL± 5°C	Temperature Coefficient 0°~ 18°C / 28°~ 55°C
DC Characteristics						Accuracy : ± (% of reading + % of range)	
DC Voltage (1)	100.0000 mV	0.1µV	10MΩ or >10GΩ	0.0030 + 0.0030	0.0040 + 0.0035	0.0050 + 0.0035	0.0005 + 0.0005
	1.000000 V	1µV	10MΩ or >10GΩ	0.0020 + 0.0006	0.0035 + 0.0007	0.0048 + 0.0007	0.0005 + 0.0001
	10.00000 V	10µV	10MΩ or >10GΩ	0.0015 + 0.0004	0.0020 + 0.0005	0.0035 + 0.0005	0.0005 + 0.0001
	100.0000 V	0.1mV	10MΩ±1%	0.0020 + 0.0006	0.0035 + 0.0006	0.0050 + 0.0006	0.0005 + 0.0001
	1000.000 V	1mV	10MΩ±1%	0.0025 + 0.0006	0.0040 + 0.0010	0.0050 + 0.0010	0.0005 + 0.0001
Resistance (1)(3)	100.0000 Ω	100µΩ	1mA	0.003 + 0.0030	0.008 + 0.004	0.010 + 0.004	0.0008 + 0.0005
	1.000000 kΩ	1mΩ	1mA	0.002 + 0.0005	0.008 + 0.001	0.010 + 0.001	0.0008 + 0.0001
	10.00000 kΩ	10mΩ	100µA	0.002 + 0.0005	0.008 + 0.001	0.010 + 0.001	0.0008 + 0.0001
	100.0000 kΩ	100mΩ	10µA	0.002 + 0.0005	0.008 + 0.001	0.010 + 0.001	0.0008 + 0.0001
	1.000000 MΩ	1Ω	5µA	0.002 + 0.0010	0.008 + 0.001	0.010 + 0.001	0.0010 + 0.0002
	10.00000 MΩ	10Ω	500nA	0.015 + 0.0010	0.020 + 0.001	0.040 + 0.001	0.0030 + 0.0004
	100.0000 MΩ	100Ω	500nA//10MΩ	0.300 + 0.0100	0.800 + 0.010	0.800 + 0.010	0.1500 + 0.0002
DC Current (1)(6)	100.0000 µA	100pA	< 0.011 V	0.010 + 0.020	0.040 + 0.025	0.050 + 0.025	0.002 + 0.003
	1.000000 mA	1nA	< 0.11 V	0.007 + 0.006	0.030 + 0.006	0.050 + 0.006	0.002 + 0.001
	10.00000 mA	10nA	< 0.04 V	0.007 + 0.020	0.030 + 0.020	0.050 + 0.020	0.002 + 0.002
	100.0000 m A	100nA	< 0.4 V	0.010 + 0.004	0.030 + 0.005	0.050 + 0.005	0.002 + 0.001
	1.000000 A	1µA	< 0.7 V	0.050 + 0.006	0.080 + 0.010	0.100 + 0.010	0.005 + 0.001
	3.000000 A	1µA	< 2.0 V	0.180 + 0.020	0.200 + 0.020	0.200 + 0.020	0.005 + 0.002
	10.00000 A	10µA	< 0.5 V	0.100 + 0.010	0.120 + 0.010	0.150 + 0.010	0.005 + 0.001
Continuity (1)	1000.000 Ω	0.001Ω	1 mA	0.002 + 0.030	0.008 + 0.030	0.01 + 0.030	0.001 + 0.002
Diode Test (1)(4)	5.00000 V	10µV	1 mA	0.002 + 0.030	0.008 + 0.030	0.01 + 0.030	0.001 + 0.002
DC Ratio (1)(5)	—	—	—	± (DC Input accuracy + DC Reference accuracy)			

AC Characteristics							Accuracy : ± (% of reading + % of range)
True RMS AC Voltage (7)(8)(9)(10)	100.0000 mV	0.1µV	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 + 0.03	0.05 + 0.04	0.06 + 0.04	0.005 + 0.003
			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	0.200 + 0.020
	1.000000 V to 750.000 V	1µV ~ 1mV	3Hz - 5Hz	1.00 + 0.02	1.00 + 0.03	1.00 + 0.03	0.100 + 0.004
			5Hz - 10Hz	0.35 + 0.02	0.35 + 0.03	0.35 + 0.03	0.035 + 0.004
			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	0.200 + 0.020
True RMS AC Current (6)(7)(9)(10)	100.0000 µA 10.00000 mA	< 0.011 V < 0.04 V	3Hz – 5Hz	1.00 + 0.04	1.00 + 0.04	1.00 + 0.04	0.100 + 0.006
			5Hz – 10Hz	0.35 + 0.04	0.35 + 0.04	0.35 + 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	0.18 + 0.04	0.18 + 0.04	0.18 + 0.04	0.030 + 0.006
	1.000000 mA 100.0000 mA	< 0.11 V < 0.4 V	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	0.15 + 0.04	0.15 + 0.04	0.15 + 0.04	0.030 + 0.006
	1.000000 A	< 0.7 V	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	0.15 + 0.04	0.15 + 0.04	0.15 + 0.04	0.030 + 0.006
	3.000000 A	< 0.2 V	3Hz – 5Hz	1.00 + 0.04	1.00 + 0.04	1.00 + 0.04	0.100 + 0.006
			5Hz – 10Hz	0.35 + 0.04	0.35 + 0.04	0.35 + 0.04	0.035 + 0.006
			10Hz – 5kHz	0.23 + 0.04	0.23 + 0.04	0.23 + 0.04	0.015 + 0.006
			5kHz – 10kHz	0.23 + 0.04	0.23 + 0.04	0.23 + 0.04	0.030 + 0.006
	10.00000 A	< 0.5 V	3Hz – 5Hz	1.10 + 0.04	1.10 + 0.04	1.10 + 0.04	0.100 + 0.006
			5Hz – 10Hz	0.35 + 0.04	0.35 + 0.04	0.35 + 0.04	0.035 + 0.006
			10Hz – 5kHz	0.15 + 0.04	0.15 + 0.04	0.15 + 0.04	0.015 + 0.006
			5kHz – 10kHz	0.35 + 0.04	0.35 + 0.04	0.35 + 0.04	0.030 + 0.006
Frequency and Period Characteristics							Accuracy : ± (% of reading)
Frequency / Period (11)(12)(13)(14)	100.0000mV to 750.000V	—	3Hz - 5Hz	0.100	0.100	0.100	0.100
			5Hz - 10Hz	0.050	0.050	0.050	0.035
			10Hz - 40Hz	0.030	0.030	0.030	0.015
			40Hz -1MHz	0.006	0.006	0.006	0.015

Temperature Characteristics							
Temperature (RTD) (15)	-200 °C ~ -100 °C	0.001 °C	—	—	—	0.09 °C	0.004 °C / °C
	-100 °C ~ -20 °C	0.001 °C	—	—	—	0.08 °C	0.005 °C / °C
	-20 °C ~ 20 °C	0.001 °C	—	—	—	0.06 °C	0.005 °C / °C
	20 °C ~ 100 °C	0.001 °C	—	—	—	0.08 °C	0.005 °C / °C
	100 °C ~ 300 °C	0.001 °C	—	—	—	0.12 °C	0.007 °C / °C
	300 °C ~ 600 °C	0.001 °C	—	—	—	0.22 °C	0.009 °C / °C
Temperature (Thermocouples) (15)	-200 to +1000 °C	0.002 °C	E	—	—	0.2 °C	0.03 °C / °C
	-210 to +1200 ˚C	0.002 °C	J	—	—	0.2 °C	0.03 °C / °C
	-200 to +400 °C	0.002 °C	T	—	—	0.3 °C	0.04 °C / °C
	-200 to +1372 ˚C	0.002 °C	K	—	—	0.3 °C	0.04 °C / °C
	-200 to +1300 ˚C	0.003 °C	N	—	—	0.4 °C	0.05 °C / °C
	-50 to +1768 ˚C	0.01 °C	R	—	—	1 °C	0.14 °C / °C
	-50 to +1768 ˚C	0.01 °C	S	—	—	1 °C	0.14 °C / °C
	+350 to +1820 ˚C	0.01 °C	B	—	—	1 °C	0.14 °C / °C
Temperature (Thermistor) (15)	–80 ° to 150 °C	0.01 °C	—	—	—	0.01 °C	0.003 °C / °C
Capacitance Characteristics						Accuracy : ± (% of reading + % of range)	
Capacitance (16)	1.000 nF	—	2.00 + 2.00	2.00 + 2.00	2.00 + 2.00	0.05 + 0.01	2.00 + 2.00
	10.00 nF	—	2.00 + 1.00	2.00 + 1.00	2.00 + 1.00	0.05 + 0.01	2.00 + 1.00
	100.0 nF	—	2.00 + 0.40	2.00 + 0.40	2.00 + 0.40	0.05 + 0.01	2.00 + 0.40
	1.000 µF	—	2.00 + 0.40	2.00 + 0.40	2.00 + 0.40	0.05 + 0.01	2.00 + 0.40
	10.00 µF	—	2.00 + 0.40	2.00 + 0.40	2.00 + 0.40	0.05 + 0.01	2.00 + 0.40
	100.0 µF	—	2.00 + 0.40	2.00 + 0.40	2.00 + 0.40	0.05 + 0.01	2.00 + 0.40
Display		4.3" color TFT WQVGA (480x272) with LED backlight					
Interface		RS -232C, USB host/device, LAN, Digital I/O; GPIB(optional)					
Power Source		AC 100 V / 120 V / 220 V / 240 V ±10%					
Power Line Frequency		50 Hz / 60 Hz and 400 Hz ±10%					
Power Consumption		Max. 25VA					
Dimensions		267(W) x 107(H) x 302(D) mm ~ with bumper 220(W) x 88 (H) x 277(D) mm ~ without bumper					
Weight		Approx. 3.53kg without option					

[1]. DC Specification: In addition to the availability that requires warm-up of 60 minutes, it must be set in 5/s speed rate (60/s speed rate for Continuity and Diode), A-Zero on.

[2]. The entire range of measurement will pass the set range by 20% except the tests of 1000 DCV, 750 ACV, 3 A DC, 3A AC, 10 A DC, 10A AC and diode.

[3]. This specification applies to 4-wire resistance measurement, whilst it requires using "REL" function for offset on 2-wire resistance measurement. 2-wire resistance measurement will cause additional error of 0.2 Ω if REL function is not executed.

[4]. This specification applies to the voltage measured from input terminal. 1 mA test current is the typical value. The change of current source leads to the variation in buck of diode junction.

[5]. Accuracy is ± (DC Input accuracy + DC Reference accuracy), where Input accuracy = DC Voltage accuracy for the Input HI to LO (in % of the Input voltage), and Reference accuracy = DC Voltage accuracy for the HI to LO (Sense) Reference (in % of the Reference voltage).

[6]. The 10 A range of measurement is available for the terminals on front panel only. Due to power factor resulting in temperature rise, 2 mA increment per one ampere when input is greater than 5 A rms.

[7]. AC Specification: It will be available after 60 minutes of warm-up, sine wave as well as 1/s speed rate.

[8]. Specifications are for sinewave input >5% of range. For inputs from 1% to 5% of range and <50 kHz, add 0.1% of range additional error. For 50 kHz to 100 kHz, add 0.13% of range. The measurement range of 750 ACV is limited within the range of 7.5 x 10^7 Volt–Hz.

[9]. Three speed settings provided for low-frequency performance: 1/s (3 Hz), 5/s (20 Hz), 20/s (200 Hz). Additional errors will Not occur for the frequency greater than the filter settings.

[10]. Specifications are for sinewave input >5% of range, and is beyond 10 µA AC. For inputs from 1% to 5% of range, add 0.1% of range additional error.

[11]. This specification will be available after 60 minutes of warm-up and sine wave input, unless stated otherwise. This specification applies to 1s gate time.

[12]. This specification is available when both sine wave and square wave input ≥ 100 mV. For the input of 10 mV to 100 mV, the % of reading error needs to be multiplied by 10 times.

[13]. The amplitude range is from 10% to 120% and is lower than 750 ACV.

[14]. The input ≥ 60 mV, for 300 k ~ 1 MHz, within 100mV range.

[15]. The actual measurement range and test lead error will be constrained by the adopted test lead. The test lead accuracy adder covers all errors of measurements and ITS-90 temperature change.

[16]. Specifications are for film Capacitance inputs that are greater than 10% range