GSM-20H10
Precision Source Meter

CE | RS-232 | USB | LAN | GPIB

GW INSTEK
Simply Reliable

GSM-20H10 is a precision source meter, which can accurately utilize voltage or current and measure voltage and/or current at the same time. Its power supply and measurement range is ±210V / ±1.05A / 22W, and it incorporates the practical functions of a digital multimeter (DMM), power supply, precision source meter, and electronic load. This product provides an accurate measurement accuracy of 0.012%, as well as a multimeter function with 6.5-digit high resolution, and the measurement accuracy can reach up to 1uV/10pA.

GSM-20H10 can be applied to many applications, such as battery characteristic evaluation, semiconductor characteristic testing, and various electronic material characteristic evaluation, etc. For resistance measurement, it supports up to 6-wire measurement function, which can measure more accurately compared to general equipment that only supports 4-wire measurement.

With respect to sampling rate, GSM-20H10 supports a sampling rate of up to 50k points/second, which can accurately analyze the characteristics of the DUT. Through the large 4.3-inch screen, all measurement settings, parameters and results can be completely displayed on the screen. The SDM (Source Delay Measure) function is provided to delay sampling when the signal changes, so as to prevent the unstable signal from being captured and cause misjudgment. There are four built-in sequence output modes (Stair, Log, SRC-MEM, Custom), which can support up to 2500 points of sequence variation output.

Pertaining to protection, GSM-20H10 provides OVP/OTP mode. The design of OVP allows users to self-define the range of OVP. OTP can effectively prevent errors caused by temperature drift during the test process. For interfaces, this product supports standard SCPI commands and provides GPIB, RS-232, USB Device/HOST, LAN interfaces to meet the different interface needs of users.

FEATURES

* Maximum Output ±210V/±1.05A/22W
* 0.012% Basic Measure Accuracy with 6½-digit Resolution
* 2-, 4-, and 6-wire Remote V-source and Measure Sensing
* Variable Sampling Speed (Fast/Medium/Normal/High/Other)
* SDM (Source Delay Measure) Measurement Cycle
* Built-in 4 Sequence Output Modes (Stair, Log, SRC-MEM, Custom), up to 2500 Points
* Built-in Limit Function, Supports 11 Groups of Limit Tests
* OVP /OTP Protection Function
* Built-in 5 Calculation Functions
* 4.3-inch TFT LCD
* Provide Digital Number Keyboard Input
* Standard SCPI GPIB, RS-232 , USB(USBTMC), LAN

APPLICATIONS

* Semiconductor Device Characteristic Testing
* Energy and Efficiency Characteristic Testing
* Sensor Characteristic Testing
* Organic Material Characteristic Testing
* Nanomaterial Characteristic Testing

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SPECIFICATIONS

	CHANNELS			1

Source (1 Year) 23°C ±5°C

MAX. RANGE

		Value
DIGITS		6 ½
OUTPUT	VOLTAGE	± 210 V
	CURRENT	±1.05A
	POWER	22W
RESOLUTION	VOLTAGE	5µV
	CURRENT	50pA

VOLTAGE

Spec	Value
TEMPERATURE COEFFICIENT (0°~18°C & 28°~50°C)	±(0.15 × accuracy specification)/°C
CURRENT LIMIT	Min. 0.1% of range
SOURCE/SINK LIMITS	±21V@±1.05A, ±210V@±105 mA
LINE/LOAD REGULATION	Line : 0.01% of range/Load : 0.01% of range + 100µV
OVERSHOOT	<0.1% typical (full scale step,resistive load,10mA range)

NOISE (Peak-Peak)				
RANGE	200.000mV	2.00000V	20.0000V	200.000V
0.1Hz - 10Hz	5µV	50µV	500µV	5mV
10Hz–1MHz		10mV		

RESOLUTION & ACCURACY				
RANGE	±200.000mV	±2.00000V	±20.0000V	±200.000V
PROG. RESOLUTION	5µV	50µV	500µV	5mV
ACCURACY	±(0.02% + 600µV)	±(0.02% + 600µV)	±(0.02% + 2.4mV)	±(0.02% + 24mV)

CURRENT

Spec	Value
TEMPERATURE COEFFICIENT (0°~18°C & 28°~50°C)	±(0.15 × accuracy specification)/°C
VOLTAGE LIMIT	Min. 0.1% of range
SOURCE/SINK LIMITS	±1.05A@±21V, ±105mA@±210V
LINE/LOAD REGULATION	Line : 0.01% of range/Load : 0.01% of range + 100pA
OVERSHOOT	<0.1% typical (1mA step, RL = 10kΩ, 20V range)

NOISE (Peak-Peak) (0.1Hz - 10Hz)							
RANGE	1.00000µA	10.0000µA	100.000µA	1.00000mA	10.0000mA	100.000mA	1.00000A
NOISE	5pA	5nA	50nA	500nA	50µA	1µA	100µA

RESOLUTION & ACCURACY							
RANGE	±1.00000µA	±10.0000µA	±100.000µA	±1.00000mA	±10.0000mA	±100.000mA	±1.00000A
PROG. RESOLUTION	50pA	500pA	5nA	50nA	500nA	5µA	50µA
ACCURACY	±(0.035%+600pA)	±(0.033%+2nA)	±(0.031%+20nA)	±(0.034%+200nA)	±(0.045%+2µA)	±(0.066%+20µA)	±(0.27%+900µA)

Spec	Value
TRANSIENT RESPONSE TIME	30µs minimum
OUTPUT SETTLING TIME	100µs Typical time
OUTPUT SLEW RATE (±30%)	0.5V/µs, 200V range, 100mA compliance ; 0.08V/µs, 20V range, 100mA compliance
DC FLOATING VOLTAGE	Output can be floated up to ±250VDC
REMOTE SENSE	Up to 1V drop per load lead
COMPLIANCE ACCURACY	Add 0.3% of range and ±0.02% of reading to base specification
RANGE CHANGE OVERSHOO T	100mV typical
MINIMUM COMPLIANCE VALUE	0.1% of range
COMMAND PROCESSING TIME	Autorange On : 10ms/Autorange Off : 7ms

Measurement (1 Year) 23°C ±5°C

MAX. RANGE

		Value
Digit		6½
RESOLUTION	VOLTAGE	1µV
	CURRENT	10pA

VOLTAGE

Spec	Value
TEMPERATURE COEFFICIENT (0°~18°C & 28°~50°C)	±(0.15 × accuracy specification)/°C
INPUT RESISTANCE	>10 GΩ

RESOLUTION & ACCURACY				
RANGE	±200.000mV	±2.00000V	±20.0000V	±200.000V
MEAS. RESOLUTION	1µV	10µV	100µV	1mV
MEAS. ACCURACY	±(0.012%+300µV)	±(0.012%+300µV)	±(0.015%+1.5mV)	±(0.015%+10mV)

CURRENT

Spec	Value
TEMPERATURE COEFFICIENT (0°~18°C & 28°~50°C)	±(0.1 × accuracy specification) / °C
VOLTAGE BURDEN	< 1mV

RESOLUTION & ACCURACY							
RANGE	±1.00000µA	±10.0000µA	±100.000µA	±1.00000mA	±10.0000mA	±100.000mA	±1.00000A
MEAS. RESOLUTION	10pA	100pA	1nA	10nA	100nA	1µA	10µA
MEAS. ACCURACY	±(0.029%+300pA)	±(0.027%+700pA)	±(0.025%+6nA)	±(0.027%+60nA)	±(0.035%+600nA)	±(0.055%+6µA)	±(0.22%+570µA)

RESISTANCE

Spec	Value
TEMPERATURE COEFFICIENT (0°~18°C & 28°~50°C)	±(0.15 × accuracy specification)/°C

RESOLUTION & ACCURACY								
RANGE	<2.00000Ω	2.00000Ω	20.0000Ω	200.000Ω	2.00000KΩ	20.0000KΩ	20.0000KΩ	20.0000KΩ
RESOLUTION	–	10µΩ	100µΩ	1mΩ	10mΩ	100mΩ	1Ω	10Ω
TEST CURRENT	–	–	100mA	10mA	1mA	100µA	10µA	1µA
NORMAL ACCURACY	Source IACC+Meas.VACC	–	±(0.1%+0.003 Ω)	±(0.08%+0.03 Ω)	±(0.07%+0.3 Ω)	±(0.06%+3 Ω)	±(0.07%+30 Ω)	±(0.11%+300 Ω)
ENHANCED ACCURACY		Source IACC+Meas.VACC	±(0.07%+0.001 Ω)	±(0.05%+0.01 Ω)	±(0.05%+0.1 Ω)	±(0.04%+1 Ω)	±(0.05%+10 Ω)	±(0.05%+100 Ω)
RANGE	20.0000MΩ	200.000MΩ	>200.000MΩ					
RESOLUTION	100Ω	1kΩ	–					
TEST CURRENT	1µA	100nA	–					
NORMAL ACCURACY	±(0.11%+1k Ω)	±(0.66%+10k Ω)	Source IACC+Meas.VACC				– –	
ENHANCED	±(0.05%+500 Ω)	±(0.35%+5k Ω)						

Spec	Value
SOURCE I MODE, MANUAL OHMS	Total uncertainty = I source accuracy
SOURCE V MODE, MANUAL OHMS	Total uncertainty = V source accuracy
6-WIRE OHMS MODE	Available using active ohms guard and guard sense
GUARD OUTPUT IMPEDANCE	<0.1Ω in ohms mode

SYSTEM SPEEDS

MEASUREMENT

Spec	Value
MAXIMUM RANGE CHANGE RATE	75/second
MAXIMUM MEASURE AUTORANGE TIME	40ms (fixed source)

SWEEP OPERATION READING RATES (rdg./second) for 60Hz (50Hz)

	Fast	IEEE-488.1	Fast	IEEE-488.2	Medium	IEEE-488.2	Normal	IEEE-488.2
NPLC/TRIGGER ORIGIN	0.01/Internal	0.01/External	0.01/Internal	0.01/External	0.10/Internal	0.10/Internal	1.00/Internal	1.00/Internal
MEASUREMENT TO MEMORY	2081 (2030)	1239 (1200)	2081 (2030)	1239 (1200)	510 (433)	438 (380)	59 (49)	57 (48)
MEASUREMENT TO GPIB	1754	1254	1198 (1210)	1079 (1050)	509 (433)	438 (380)	59 (49)	57 (48)
SOURCE-MEASUREMENT TO MEMORY	1551 (1515)	1018 (990)	1551 (1515)	1018 (990)	470 (450)	409 (360)	58 (48)	57 (48)
SOURCE-MEASUREMENT TO GPIB	1369	1035	1000 (900)	916 (835)	470 (410)	409 (365)	58 (48)	57 (47)
SOURCE-MEASUREMENT PASS/FALL. TEST TO MEMORY	902 (900)	830 (830)	902 (900)	830 (830)	389 (343)	374 (333)	56 (47)	56 (47)
SOURCE-MEASUREMENT PASS/FALL. TEST TO GPIB	981	886	808 (840)	756 (780)	388 (343)	374 (333)	56 (47)	56 (47)
SOURCE-MEMORY TO MEMORY	165 (162)	163 (160)	165 (162)	163 (160)	133 (126)	131 (125)	44 (38)	44 (38)
SOURCE-MEMORY TO GPIB	165	163	164 (162)	162 (160)	132 (126)	131 (125)	44 (38)	44 (38)

SINGLE READING OPERATION READING RATES (rdg./second) for 60Hz (50Hz)

NPLC/TRIGGER ORIGIN	0.01/Internal	0.01/Internal	0.10/Internal	1.00/Internal
MEASUREMENT TO GPIB	537	256 (256)	167 (166)	49 (42)
SOURCE-MEASUREMENT TO GPIB	140	79 (83)	72 (70)	34 (31)
SOURCE-MEASUREMENT PASS/FALL. TEST	135	79 (83)	69 (70)	35 (30)

COMPONENT INTERFACE HANDLER TIME for 60Hz (50Hz)

Spec	Value
NPLC/TRIGGER ORIGIN	Fast : 0.01/External Medium : 0.10/External Normal : 1.00/External
MEASURE TO GPIB	Fast : 1.04ms (1.08ms) Medium : 2.55ms (2.9ms) Normal : 17.53ms (20.9ms)
SOURCE PASS/FALL. TEST TO GPIB	Fast : 4.82ms (5.3ms) Medium : 6.27ms (7.1ms) Normal : 21.31ms (25.0ms)

GENERAL

Spec	Value
LOAD IMPEDANCE	Stable into 20,000pF typical
DIFFERENTIAL MODE VOLTAGE	250 V Pk
COMMON MODE VOLTAGE	250V DC
COMMON MODE ISOLATION	>10 GΩ, <1000pF
OVERRANGE	105% of range, source and measure
MAX.VOLTAGE DROP (BETWEEN INPUT/OUTPUT AND SENSE TERMINALS)	5V
MAX. SENSE LEAD RESISTANCE	1MΩ for rated accuracy
SENSE INPUT IMPEDANCE	>100 GΩ
GUARD OFFSET VOLTAGE	<150µV, typical
SOURCE OUTPUT MODES	Fixed DC level / Memory List (mixed function) / Stair (linear and log)
SOURCE MEMORY LIST	100 points max
MEMORY BUFFER	5,000 readings @ 5 digits (two 2,500 point buffers). Includes selected
PROGRAMMABILITY	IEEE-488 (SCPI-1995.0), RS-232
	5 user-definable power-up states plus factory default and *RST
DIGITAL INTERFACE — OUTPUT ENABLE	Active low input
DIGITAL INTERFACE — HANDLER INTERFACE	Start of test, end of test, 3 category bits. +5V@ 300mA supply
DIGITAL INTERFACE — DIGITAL I/O	1 trigger input, 4 TTL/Relay Drive outputs (33V @ 500mA, diode clamped)
POWER SUPPLY	90-264VAC, 50/60Hz, 50–60Hz (automatically detected at power up)
POWER CONSUMPTION	190W
REMOTE/LOCATION CONNECTOR	RS-232, USB(TMC), GPIB, LAN
OPERATION ENVIRONMENT	Indoor use, Altitude: ≤ 2000m , Ambient temperature: 0 ~ 40°C, Relative humidity: ≤ 80%, Installation category: II, Pollution degree: 2
STORAGE ENVIRONMENT	TEMPERATURE: -20°C ~ 70°C , HUMIDITY: < 80%
DIMENSIONS & WEIGHTS	214 (W) x 86 (H) x 356.5 (D) mm, Approx. 4.8kg
ACCESSORIES	CD-ROM (User manual x1, Quick Start manual x1), Test lead GTL-207A x 1, GTL-203A x 1, GTL-204A x 1

Specifications subject to change without notice.   GSM-Series_E_D1DH_202201

ORDERING INFORMATION

GSM-20H10   Precision Source Meter

ACCESSORIES
CD (User manual) x 1, Power cord , Test lead (GTL-207A x 1,GTL-203A x 1, GTL-204A x 1)

OPTIONAL ACCESSORIES
GTL-246 USB Cable (USB 2.0 Type A-Type B Cable,4P)   **GTL-258** GPIB Cable, 2000mm

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