

GSM-20H10系列

高精度源錶

GW INSTEK
Simply Reliable



GSM-20H10是一台精密的電源量測設備(Source Meter)，是一台可以精確地使用電壓或電流，並同時量測電壓和/或電流的儀器。其電源與量測範圍為 $\pm 210V / \pm 1.05A / 22W$ ，其結合了數位萬用電錶(DMM)、電源供應器、準確電流源、電子負載的實用功能。本產品提供了0.012%的精準量測準確度，以及具備6位半高解析度的電錶功能，在量測的精度上最高可達 $1\mu V/10pA$ 。

GSM-20H10可適用的應用很多，如電池的特性評估、半導體的特性測試、各種電子材料的特性評估等都是可以量測的。在電阻的量測部分，支援最高六線式的量測功能，相較於一般設備僅支援4線式量測，能夠量測到更精準的數值。

取樣的速度上，GSM-20H10支援最高50k點/每秒的取樣速度，可更精準地針對待測物的特性進行分析。透過4.3吋的大尺寸螢幕，更可以將所有的量測設定、參數與結果都完整的顯示在屏幕上。支援SDM (Source Delay Measure)功能，可設定信號產生變化時，延後進行採樣，避免穩定前的信號被擷取進去造成誤判。內建四種程序輸出模式(Stair, Log, SRC-MEM, Custom)，最多可支援2500個點的程序變化輸出。

GSM-20H10在保護上，提供了OVP/OTP保護模式；在OVP的設計上，使用者可自訂OVP的範圍，而OTP的保護則可有效防止在測試過程中因溫度偏移造成的錯誤。在介面部分，本產品支援標準的SCPI指令，提供GPIB, RS-232, USB Device/HOST, LAN等介面，滿足使用者不同的介面需求。

SPECIFICATIONS NOTE :

1. Speed = Normal (1 NPLC). For 0.1 PLC, add 0.005% of range to offset specifications, except 200mV, 1A ranges, add 0.05%. For 0.01 PLC, add 0.05% of range to offset specifications, except 200mV, 1A ranges, add 0.5%.
2. Required to reach 0.1% of final value after Command is processed. Resistive load. 10 μA to 100mA range.
3. Overshoot into a fully resistive 100k Ω load, 10Hz to 1MHz BW, adjacent ranges : 100mV typical, except 20V/200V.
4. Maximum time required for the output to begin to change following the receipt of : SOURce : VOLTage|CURRent <nr> Command.
5. Reading rates applicable for voltage or current measurements, autorange off, filter off, display off, trigger delay = 0, and binary reading forma.
6. Purely resistive load. 1 μA and 10 μA ranges <65ms.
7. 1000 point sweep was characterized with the source on a fixed rang.
8. Pass/Fail test performed using one high limit and one low math limit.
9. Includes time to re-program source to a new level before making measurement.
10. Time from falling edge of START OF TEST signal to falling edge of END OF TEST signal.
11. Command processing time of : SOURce : VOLTage|CURRent : TRIGgered <nr> Command not included.

特點

- * 最大量測/輸出範圍: $\pm 210V / \pm 1.05A / 22W$
- * 量測準確率: 0.012%, 6 數位電表解析度
- * 支援 2 / 4 / 6 線式量測
- * 4.3 吋 TFT LCD 顯示(可顯示 I-V, X-t 等曲線在LCD上)
- * 提供數字鍵輸入
- * 內建 RTC 時鐘
- * 提供可變的取樣速度(High/Normal/Medium/Low/Other)
- * 提供信號延遲量測 SDM(Source Delay Measure)功能
- * 內建四種程序模式(Stair, Log, SRC-MEM, Custom), 最高可達2500點
- * 內建限制線功能，提供11組限制線測試(PASS/FAIL)
- * 提供 OVP/OTP 保護功能
- * 內建五種運算功能
- * 提供標準介面 GPIB, RS-232, USB Device/HOST, LAN

應用範圍

- * 電池特性評估
- * 二極體特性測試
- * 電子材料特性評估
- * 元件I-V特性測試
- * 材料電阻率測試

規格												
MAXIMUM RANGE	Voltage	±210V										
	Current	±1.05A										
	Power	22W										
	Voltage Resolution	1µV										
	Current Resolution	10pA										
SOURCE	DC Voltage	Output Voltage	±21V / ±1.05A, ±210V / ±105 mA									
		Current Limit	Min. 0.1% of range									
		Programming Resolution & Accuracy *1	Range	±200.000mV	±2.00000V	±20.0000V	±200.000V	±200.000V	±200.000V	±200.000V		
			Resolution	1µV	10µV	100µV	1mV	1mV	1mV	1mV		
			Accuracy	±(0.02%+600µV)	±(0.02%+600µV)	±(0.02%+2.4mV)	±(0.02%+24mV)	±(0.02%+24mV)	±(0.02%+24mV)	±(0.02%+24mV)		
		Load Regulation	0.01% of range + 100µV									
		Line Regulation	0.01% of range									
	Overshoot	<0.1% typical (full scale step, resistive load, 10mA range)										
	Recovery Time (1000% Load Change)	<250µs (within 0.1% plus load regulation errors, 1A and 100mA compliance.)										
	Ripple and Noise	4mVrms(20Hz~1MHz) / 10mVpp(20Hz~1MHz)										
	Temperature Coefficient	±(0.15 × accuracy specification) / °C (0°~18°C & 28°~50°C)										
	DC Current	Output Current	±1.05A / ±21V, ±105 mA / ±210V									
		Voltage Limit	Min. 0.1% of range									
		Programmed Source Resolution & Accuracy *1	Range	±1.00000µA	±10.0000µA	±100.000µA	±1.00000mA	±10.0000mA	±100.000mA	±1.00000A		
Resolution			10pA	100pA	1nA	10nA	100nA	1µA	10µA			
Accuracy			±(0.035%+600pA)	±(0.033%+2nA)	±(0.031%+20nA)	±(0.034%+200nA)	±(0.045%+2µA)	±(0.066%+20µA)	±(0.27%+900µA)			
Load Regulation		0.01% of range + 100pA										
Line Regulation		0.01% of range										
Overshoot	<0.1% typical (1mA step, RL = 10kΩ, 20V range)											
Temperature Coefficient	±(0.15 × accuracy specification) / °C (0°~18°C & 28°~50°C)											
General	Output Settling Time *2	100µs typical time										
	Output Rise Time (±30%)	300µs, 200V range, 100mA compliance; 150µs, 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 Overshoot *3	Adjacent range changes between 200mV, 2V and 20V ranges, 100mV typical										
	Minimum Compliance Value	0.1% of range										
	Command Processing Time *4	Autorange On: 10ms, Autorange Off: 7ms										
		Input Resistance	>10 GΩ									
	MEASUREMENT	Voltage	Measurement Resolution & Accuracy	Range	±200.000mV	±2.00000V	±20.0000V	±200.000V	±200.000V	±200.000V		
Resolution			1µV	10µV	100µV	1mV	1mV	1mV	1mV			
Accuracy			±(0.012%+300µV)	±(0.012%+300µV)	±(0.015%+1.5mV)	±(0.015%+10mV)	±(0.015%+10mV)	±(0.015%+10mV)	±(0.015%+10mV)			
Temperature Coefficient		±(0.15 × accuracy specification) / °C (0°~18°C & 28°~50°C)										
Current		Voltage Burden (4-wire mode)	< 1mV									
		Programmed Source Resolution & Accuracy *1	Range	±1.00000µA	±10.0000µA	±100.000µA	±1.00000mA	±10.0000mA	±100.000mA	±1.00000A		
			Resolution	10pA	100pA	1nA	10nA	100nA	1µA	10µA		
Accuracy			±(0.029%+300pA)	±(0.027%+700pA)	±(0.025%+6nA)	±(0.027%+60nA)	±(0.035%+600nA)	±(0.055%+6µA)	±(0.22%+570µA)			
Temperature Coefficient		±(0.1 × accuracy specification) / °C (0°~18°C & 28°~50°C)										
Resistance		Range	Resolution	<2.00000Ω	2.00000Ω	20.0000Ω	200.000Ω	2.00000kΩ	20.0000kΩ			
			Test current	---	10µA	100µA	1mΩ	10mΩ	100mΩ	100µA		
			Accuracy	Source IACC+Meas.VACC	Source IACC+Meas.VACC	±(0.1%+0.003Ω), Normal ±(0.07%+0.001Ω), Enhanced	±(0.08%+0.03Ω), Normal ±(0.05%+0.01Ω), Enhanced	±(0.07%+0.3Ω), Normal ±(0.05%+0.1Ω), Enhanced	±(0.06%+3Ω), Normal ±(0.04%+1Ω), Enhanced	±(0.06%+3Ω), Normal ±(0.04%+1Ω), Enhanced		
			Resolution	200.000kΩ	2.00000MΩ	20.0000MΩ	200.000MΩ	>200.000MΩ	---	---		
			Test current	1Ω	10Ω	100Ω	1kΩ	---	---	---		
	Accuracy		±(0.07%+300), Normal ±(0.05%+100), Enhanced	±(0.11%+3000), Normal ±(0.05%+1000), Enhanced	±(0.11%+1k), Normal ±(0.05%+5000), Enhanced	±(0.66%+10k), Normal ±(0.35%+5k), Enhanced	Source IACC+Meas.VACC	---	---			
	Temperature Coefficient		±(0.15 × accuracy specification) / °C (0°~18°C & 28°~50°C)									
Source I mode, Manual OHMS	Total uncertainty = I source accuracy + V measure accuracy (4-wire remote sense)											
Source V mode, Manual OHMS	Total uncertainty = V source accuracy + I measure accuracy (4-wire remote sense)											
6-wire OHMS Mode	Available using active ohms guard and guard sense. Max. Guard Output Current: 50mA (except 1A range). Accuracy is load dependent											
Guard Output Impedance	<0.1Ω in ohms mode											
SYSTEM SPEED *5	Maximum Range Change Rate	75/second										
	Maximum Measure Auto Range Time	40ms (fixed source) *6										
	Sequence Reading Rates *7 (rdg./second) for 60Hz (50Hz)	Speed	NPLC / Trig Origin	Measure		Source-Measure *9		Source-Measure Pass/Fail test *8, *9		Measure Memory *9		
				TO MEMORY	TO GPIB	TO MEMORY	TO GPIB	TO MEMORY	TO GPIB	TO MEMORY	TO GPIB	
		Fast	0.01 / internal	2081 (2030)	1198 (1210)	1551 (1515)	1000 (900)	902 (900)	809 (840)	165 (162)	164 (162)	
		488.2	0.01 / external	1239 (1200)	1079 (1050)	1018 (990)	916 (835)	830 (830)	756 (780)	163 (160)	162 (160)	
		Medium	0.1 / internal	510 (433)	509 (433)	470 (405)	470 (410)	389 (343)	388 (343)	133 (126)	132 (126)	
		488.2	0.1 / external	438 (380)	438 (380)	409 (360)	409 (365)	374 (333)	374 (333)	131 (125)	131 (125)	
		Normal	1 / internal	59 (49)	59 (49)	58 (48)	58 (48)	56 (47)	56 (47)	44 (38)	44 (38)	
		488.2	1 / external	57 (48)	57 (48)	57 (48)	57 (47)	56 (47)	56 (47)	44 (38)	44 (38)	
		Single Reading Operation Rates (rdg./second) for 60Hz (50Hz)	Speed	NPLC / Trig Origin	Measure		Source-Measure *9		Source-Measure Pass/Fail test *8, *9			
					TO GPIB	TO GPIB	TO GPIB	TO GPIB	TO GPIB	TO GPIB	TO GPIB	TO GPIB
	Fast(488.2)				0.01 / internal	256 (256)	79 (83)	79 (83)	79 (83)	79 (83)	79 (83)	
	Medium(488.2)	0.1 / internal	167 (166)	72 (70)	72 (70)	72 (70)	72 (70)	72 (70)				
Normal(488.2)	1 / internal	49 (42)	34 (31)	34 (31)	34 (31)	34 (31)	34 (31)					
Component Interface Handler Time for 60Hz (50Hz) *8, *10	Speed	NPLC / Trig Origin	Measure		Source Pass/Fail test		Source-Measure Pass/Fail test *9, *11					
			TO GPIB	TO GPIB	TO GPIB	TO GPIB	TO GPIB	TO GPIB				
			Fast	0.01 / internal	1.04 ms (1.08 ms)	0.5 ms (0.5 ms)	0.5 ms (0.5 ms)	4.82 ms (5.3 ms)	4.82 ms (5.3 ms)			
Medium	0.1 / internal	2.55 ms (2.9 ms)	0.5 ms (0.5 ms)	0.5 ms (0.5 ms)	6.27 ms (7.1 ms)	6.27 ms (7.1 ms)						
Normal	1 / internal	17.53 ms (20.9 ms)	0.5 ms (0.5 ms)	0.5 ms (0.5 ms)	21.31 ms (25.0 ms)	21.31 ms (25.0 ms)						
SYSTEM GENERAL	Load Impedance	Stable into 20,000pF typical										
	Differential Mode Voltage	250Vpk										
	Common Mode Voltage	250VDC										
	Common Mode Isolation	>10GΩ, <1000pF										
	Over Range	105% of range, source and measure										
	Max. Voltage Drop	5V										
	Max. Sense lead Resistance	1MΩ										
	Sense Input Impedance	>100GΩ										
	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 measured value(s) and time stamp. Lithium battery backup(3 yr + battery life)										
	Programmability	IEEE-488.2 (SCPI), RS-232; 5 user-definable power-up states plus factory default and *RST.										
	Digital I/O Connector	Active low input. Start of test, end of test, 3 category bits.; +5V@ 300mA supply.; 1 trigger input, 4 TTL/Relay Drive outputs (33V@500mA, diode)										
	Remote Interface	USB/GPIB/LAN/RS-232										
	Insulation	Chassis and terminal: 20MΩ or above (DC 500V); Chassis and AC cord: 30MΩ or above (DC 500V)										
	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%										
Input Power	100-240VAC, 50-60Hz											
Power Consumption	80W											
Dimensions & Weight	214 (W) x 86 (H) x 356.5 (D) mm, Approx. 4.8kg											

規格若有局部變更，恕不另行通知！ GSM-20H10_C_D2DH

購買資訊

GSM-20H10 with GPIB 高精度源錶
GSM-20H10 高精度源錶

附件資訊

CD User manual x 1, Quick Start manual x 1, Test Lead GTL-207A x 1, Alligator Clip x 2

選購附件

SM-01 Digital I/O Adapter, Convert DB15 to DB9 + 8-pin micro-DIN
SM-02 Digital I/O Adapter, Convert DB15 to DB37 + 8-pin micro-DIN
GTL-248 GPIB Cable, 2000mm
GTL-246 USB Cable (USB 2.0 A-B Type, approx.. 1200mm)