

任意波形信號發生器

AFG-125/AFG-225/AFG-125P/AFG-225P

使用手冊

固緯料號 NO.82AFB12500MA1



ISO-9001 認證企業

GW INSTEK

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安全指南

通常



注意

- 勿將重物置於儀器上
- 勿將易燃物置於儀器上
- 避免嚴重撞擊或不當放置而損壞儀器
- 避免靜電釋放至儀器
- 請使用匹配的連接線，切不可用裸線連接
- 若非專業技術人員，請勿自行拆裝儀器

電源



警告

- DC 輸入電壓: 5V / 2A
- 请勿输入超过 5V±5% 的电压到输入端。

保險絲



警告

- 保險絲類型: F3.15A/125V
- 請專業技術人員更換保險絲
- 請更換指定類型和額定值的保險絲
- 更換前請斷開電源插座和所有測試線
- 更換前請查明保險絲的熔斷原因

清潔儀器

- 清潔前先切斷電源
- 以中性洗滌劑和清水沾濕軟布擦拭儀器。不要直接將任何液體噴灑到儀器上
- 不要使用含苯，甲苯，二甲苯和丙酮等烈性物質的化學藥品或清潔劑

操作環境

- 地點: 室內，避免陽光直射，無灰塵，無導電污染(下注)，避免強磁場
 - 相對濕度: < 80%
 - 海拔: < 2000m
 - 溫度: 0°C~40°C
- (污染等級) AFG-200 系列屬於等級 2。污染指“可能引起絕緣強度或表面電阻率降低的外界物質，固體，液體或氣體(電離氣體)”。
- 污染等級 1: 無污染或僅乾燥，存在非導電污染，污染無影響
 - 污染等級 2: 通常只存在非導電污染，偶爾存在由凝結物引起的短暫導電
 - 污染等級 3: 存在導電污染或由於凝結原因使乾燥的非導電性污染變成導電性污染。此種情況下，設備通常處於避免陽光直射和充分風壓條件下，但溫度和濕度未受控制

存儲環境

- 地點: 室內
- 相對濕度: < 70%
- 溫度: -10°C ~ 70°C

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安全說明

本章節包含操作和存儲信號發生器時必須遵照的重要安全說明。在操作前請詳細閱讀以下內容，確保安全和最佳化的使用。

安全符號

這些安全符號會出現在本使用手冊或儀器上。



警告

警告：產品在某一特定情況下或實際應用中可能對人體造成傷害或危及生命



注意

注意：產品在某一特定情況下或實際應用中可能對產品本身或其它產品造成損壞



高壓危險



注意: 請參考使用手冊



保護導體端子



接地端子



表面高溫危險



雙層絕緣



勿將電子設備作為未分類的市政廢棄物處理。請單獨收集處理或聯繫設備供應商

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產品介紹

固緯 AFG-200 系列信號發生器，是一款便攜並能同時滿足電源需要的信號源。新穎的信號源加電源的設計，配合 GDS-2000 系列示波器使用，更能體現出此款信號源的優越性。

主要特點

型号	AFG-125	AFG-125P	AFG-225	AFG-225P
頻率範圍	1uHz-25MHz			
通道數	1	1	2	2
電源輸出	無	有	無	有

- DDS 信號發生器系列
- 全範圍 1 μ Hz 高頻率解析度
- 20ppm 頻率穩定度
- 任意波形能力
- 120 MSa/s 取樣速率
- 60 MSa/s 重建率
- 4k 點波形長度
- 10 組 4k 波形記憶體
- 顯示真實波形輸出
- 使用者自訂輸出
- DWR (直接波形重建)能力
- PC 波形編輯

特點

- 正弦波，方波，斜波，脈衝波，雜訊波標準波形
- 內部 LIN/LOG 掃描，帶標記輸出
- AM, FM, PM, FSK, SUM 調製
- 觸發的脈衝串功能
- 存儲/調取 10 組設置記憶體
- 輸出超載保護

介面

- 標配 USB 介面
- AWES (任意波形編輯軟體) PC 軟體

電源

- 2.5V/3.3V/5V 輸出
- (僅 125P/225P) • 0.6A 電流輸出

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附录

AFG-200 系列规格

The specifications apply when the function generator is powered on for at least 30 minutes under +18°C~+28°C.

AFG-200 SERIES models		CH1	CH2
Waveforms		Sine, Square, Ramp, Pulse, Noise, ARB	
Arbitrary Functions			
	Sample Rate	120 MSa/s	
	Repetition Rate	60MHz	
	Waveform Length	4k points	
	Amplitude	10 bits	
	Resolution		
	Non-Volatile Memory	4k points	
Frequency Characteristics			
Range	Sine	1uHz~25MHz	
	Square	1uHz~25MHz	
	Ramp	1MHz	
Resolution		1uHz	
Accuracy	Stability	±20 ppm	
	Aging	±1 ppm, per 1 year	
	Tolerance	≤1 mHz	
Output Characteristics			
Amplitude ^[1]	Range	1mVpp to 2.5Vpp (into 50Ω) 2mVpp to 5Vpp (open-circuit)	
	Accuracy	±2% of setting ±1 mVpp (at 1 kHz)	
	Resolution	1mV or 3 digits	
	Flatness	±1% (0.1dB) ≤100kHz ±3% (0.3 dB) ≤5MHz ±5% (0.4 dB) ≤12MHz ±10% (0.9dB) ≤25MHz (sine wave relative to 1kHz)	
	Units	Vpp, Vrms, dBm	
Offset ^[1]	Range	±1.25 Vpk ac +dc (into 50Ω) ±2.5Vpk ac +dc (Open circuit)	
	Accuracy	2% of setting + 10mV+ 0.5% of amplitude	
Waveform Output	Impedance	50Ω typical (fixed) > 10MΩ (output disabled)	

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FS	Start/Stop Freq	1uHz to Max Frequency	1uHz to Max Frequency
	Sweep Time	1ms to 500s	1ms to 500s
	Source	Internal / Manual	Internal / Manual
	Carrier Waveforms	Sine, Square, Ramp, Pulse	Sine, Square, Ramp, Pulse
PM	Modulating Waveforms	50% duty cycle square	50% duty cycle square
	Modulation Rate	2mHz to 100 kHz (INT)	2mHz to 100 kHz (INT)
	Frequency Range	1uHz to Max Frequency	1uHz to Max Frequency
	Source	Internal	Internal
SUM	Carrier Waveforms	Sine, Square, Ramp, Pulse, Noise	Sine, Square, Ramp, Pulse, Noise
	Modulating Waveforms	Sine, Square, Triangle, Upramp, Dnramp	Sine, Square, Triangle, Upramp, Dnramp
	Modulation Frequency	2mHz to 20kHz (Int)	2mHz to 20kHz (Int)
	Phase deviation	0° to 360°	0° to 360°
Sync Output	Source	Internal	Internal
	Carrier Waveforms	Sine, Square, Ramp, Pulse, Noise	Sine, Square, Ramp, Pulse, Noise
	Modulating Waveforms	Sine, Square, Triangle, Upramp, Dnramp	Sine, Square, Triangle, Upramp, Dnramp
	Modulation Frequency	2mHz to 20kHz	2mHz to 20kHz
Dual Channel Function	SUM Depth	0% to 100.0%	0% to 100.0%
	Source	Internal	Internal
	Type	Sync, Sweep Marker, Burst Marker, or Arbitrary Waveform Marker	
	Level	TTL Compatible into 50Ω	
Dual Channel Function	Assignment	Channel 1 or Channel 2	
	Polarity	Normal or Inverted	
	Fan-out	≥4 TTL Load	
	Impedance	50Ω Typical	
Dual Channel Function	Phase	-180° ~ 180°	-180° ~ 180°
	Square and Pulse	can not be change, Phase is 0°	
	Track	Synchronize phase CH2=CH1	Synchronize phase CH1=CH2
	Coupling	Frequency(Ratio or Difference) Amplitude & DC Offset	Frequency(Ratio or Difference) Amplitude & DC Offset

	Protection	Short-circuit protected Overload relay automatically disables main output	
Sine wave Characteristics	Harmonic Distortion	≤ -50 dBc	DC ~ 1MHz, Ampl > 1Vpp
		≤ -35 dBc	1MHz ~ 5MHz, Ampl > 1Vpp
		≤ -30 dBc	5MHz ~ 25MHz, Ampl > 1Vpp
Square wave Characteristics	Rise/Fall Time	≤10ns at maximum output (into 50Ω load)	
	Overshoot	<2%	
	Asymmetry	1% of period +5 ns	
	Variable duty Cycle	1.0% to 99.0% ≤100kHz 10% to 90% ≤ 1MHz 50% ≤ 25MHz	
Ramp Characteristics	Linearity	< 0.1% of peak output	
	Variable Symmetry	0% to 100% (0.1% Resolution)	
Pulse Characteristics	Period	40ns~2000s	
	Pulse Width	20ns~1999.9s	
	Overshoot	<2%	
	Accuracy	0.1%+20ns	
	Jitter	20ppm +10ns	
AM Modulation	Carrier Waveforms	Sine, Square, Ramp, Pulse, Arb	Sine, Square, Ramp, Pulse, Arb
	Modulating Waveforms	Sine, Square, Triangle, Upramp, Dnramp	Sine, Square, Triangle, Upramp, Dnramp
	Modulating Frequency	2mHz to 20kHz	2mHz to 20kHz
	Depth	0% to 120.0%	0% to 120.0%
FM Modulation	Source	Internal	Internal
	Carrier Waveforms	Sine, Square, Ramp, Pulse, Arb	Sine, Square, Ramp, Pulse, Arb
	Modulating Waveforms	Sine, Square, Triangle, Upramp, Dnramp	Sine, Square, Triangle, Upramp, Dnramp
	Modulating Frequency	2mHz to 20kHz (Int)	2mHz to 20kHz (Int)
Sweep	Peak Deviation	DC to Max Frequency	DC to Max Frequency
	Source	Internal	Internal
Sweep	Waveforms	Sine, Square, Ramp, Pulse, Arb	Sine, Square, Ramp, Pulse, Arb
	Type	Linear or Logarithmic	Linear or Logarithmic

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Burst	Waveforms	Sine, Squa, Ramp, Arb	Sine, Squa, Ramp, Arb
	Frequency	1uHz~15 MHz(sine)	1uHz~15 MHz(sine)
		1uHz~15 MHz(Squa)	1uHz~15 MHz(Squa)
		1uHz~1 MHz (Ramp)	1uHz~1 MHz (Ramp)
Trigger Delay	Burst Count	1 to 65535 cycles or Infinite	1 to 65535 cycles or Infinite
	Start/Stop Phase	-360 to +360	-360 to +360
	Internal Period	1ms to 500s	1ms to 500s
	Trigger Source	Single or Internal Rate	Single or Internal Rate
Power(only AFG-125P/225P)	N-Cycle, Infinite	0s to 655350ns	0s to 655350ns
	Save/Recall	10 Groups of Setting	Memories
	Output Voltage	(2.5V/3.3V/5V)±5%	
	Output Current	0.6A	
Interface	General Specifications	USB (Device)	
	Power Source	DC 5V	
	Power Consumption	10 W (Max)	
	Operating Environment	Temperature to satisfy the specification : 18 ~ 28°C Operating temperature : 0 ~ 40°C Relative Humidity: < 80%, 0 ~ 40°C Installation category : CAT II	
Accessories	Operating Altitude	2000 Meters	
	Storage Temperature	-10~70°C, Humidity: ≤70%	
	Dimensions (WxHxD)	215(W) x 35 (H) x 107(D) mm	
	Weight	Approx. 1kg	
Optional Accessories	Accessories	GTL-101×1(only AFG-125/125P)	GTL-101×2(only AFG-225/225P)
		GTL-105A×1 (only AFG-125P/225P)	
		Quick Start Guide ×1	
		CD (user manual + software) ×1	

NOTES:
[1] If only used USB power supply
Amplitude 1mVpp to 2Vpp (into 50Ω)
2mVpp to 4Vpp (open-circuit)
Offset ±1 Vpk ac +dc (into 50Ω)
±2 Vpk ac +dc (Open circuit)