

AFG-21000 Series



Innovation and Value in Waveform Design

The AFG-21000 Series Arbitrary Function Generators are DDS based signal generators covering the output of Sine, Square, Ramp, Noise and 20MSa/s Arbitrary waveform. The 0.1Hz resolution and 1% ~ 99% adjustable duty cycle of Square(Pulse) waveform greatly extend its application range in various fields.

The AFG-21000 Series includes 6 models in three frequency bands of 5MHz, 12MHz and 25MHz. Besides the features of AFG-21000 Series also carries additional features of AM/FM/FSK Modulation, Sweep and Frequency Counter. The 3.5" color LCD will clearly display the digital waveform parameters set through front panel. The entire Series is equipped with USB Device interface for remote control and importing waveform data from PC.

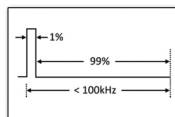
Built-In Arbitrary Waveform Function

20MSa/s sampling rate, 10 bit vertical resolution and 4k point memory equip AFG-21000 Series the arbitrary waveform capacity. User can create waveform by mean of either point by point input from front panel or PC software.



1% Adjustable Duty Cycle of Square Wave

The AFG-21000 Series provides 1% ~ 99% variable duty cycle for its square waveform output. This feature allows generating the pulse waveform to simulate a spike signal or a transient signal.



Fully Digital Entry Design

The fully digital entry design of AFG-21000 Series improves the setting uncertainty of conventional Function Generator and therefore significantly increases the accuracy of its waveform output. The 3.5" LCD screen allows user to see the parameter value change in detail when the adjustment is in progress.



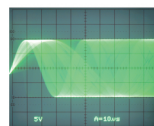
Amplitude and DC Offset Display

In addition to the setting parameters, the amplitude, DC offset values are also displayed on the LCD screen. Three amplitude units, Vpp, Vrms and dBm, can be selected and exchanged.



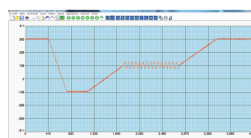
AM/FM/FSK, Sweep, Counter(AFG-2100 only)

AFG-21025/21105/21125 models are equipped with additional AM/FM/FSK Modulation, Sweep and Frequency Counter functions. The 150MHz frequency counter saves user the cost of purchasing a standalone frequency counter.



Arbitrary Waveform Editing Software

A free arbitrary waveform editing software is available which is used to edit the arbitrary waveform on PC. After completing the waveform editing, it can be downloaded to AFG through USB interface for waveform output.



FEATURES

- 0.1Hz ~ 5/12/25 MHz with in 0.1Hz Resolution
- Sine, Square, Ramp, Noise and Arbitrary Waveform
- 20MSa/s Sampling Rate, 10 bit Vertical Resolution and 4k point Memory for Arbitrary Waveform
- 1% ~ 99% Adjustable Duty Cycle for Square Waveform
- Waveform Parameter Setting Through Numeric Keypad Entry & Knob Selection
- Amplitude, DC Offset and Other Key Setting Information Shown on the 3.5" LCD Screen Simultaneously
- AM/FM/FSK Modulation, Sweep, and Frequency Counter functions (AFG-21025/21105/21125 only)
- USB Device Interface for Remote Control and Waveform Editing
- PC Arbitrary Waveform Editing Software



APPLICATIONS

- Audio Products Frequency Characteristics Measurement
- Pulse Signal as Trigger or Synchronization Signal for Electronic Product Testing
- Pulse Noise Simulation
- Reference Clock Signal of Electronic Device
- Vibration Signal Simulation
- Noise Simulation for Communication System Educational Lab

SPECIFICATIONS								
MODELS			AFG-21105	AFG-21112	AFG-21125	AFG-21005	AFG-21012	AFG-21025
WAVEFORMS			Sine, Square, Ramp, Noise, Arbitrary Waveform					
ARITRARY FUNCTION	Sample Rate		20MSa/s					
	Repetition Rate		10MHz					
	Waveform Length		4k point					
	Amplitude Resolution		10 bit					
FREQUENCY CHARACTERISTICS	Range	Sine/Square	0.1Hz~5MHz	0.1Hz~12MHz	0.1Hz~25MHz	0.1Hz~5MHz	0.1Hz~12MHz	0.1Hz~25MHz
	Resolution	Ramp	0.1Hz ~ 1MHz					
	Accuracy	Sine,Square,Ramp	0.1Hz					
		Stability	±20ppm					
		Aging	±1ppm, per 1 year					
		Tolerance	≤1mHz					
OUTPUT CHARACTERISTICS	Amplitude	Range	1mVpp~10Vpp(into 50Ω), 0.1Hz~20MHz; 2mVpp~20Vpp(open-circuit), 0.1Hz~20MHz					
		Accuracy	1mVpp~5Vpp(into 50Ω), 20MHz~25MHz; 2mVpp~10 pp(open-circuit), 20MHz~25MHz					
		Resolution	±2% of setting ±1mVpp;(at 1kHz,>10mVpp)					
		Flatness	0.1mV or 3digits					
		Units	±1%(0.1dB)≤100kHz; ±3%(0.3dB)≤5MHz; ±4%(0.4dB)≤12MHz; ±20%(2dB)≤20MHz;					
	Offset	Range	±5%(0.4dB)≤25MHz; (sine wave relative to 1 kHz)					
			Vpp, Vrms, dBm					
		±5Vpk ac+dc(into 50Ω); ±10Vpk ac+dc(open circuit); ±2.5Vpk ac+dc(into 50Ω) for						
		20MHz~25MHz; ±5Vpk ac+dc(open circuit) for 20MHz~25MHz						
	Waveform Output	Impedance	2% of setting + 5mV+ 0.5% of amplitude					
		Protection(main output)	50Ω typical (fixed); >300kΩ (output disabled)					
	SYNC Output	Level	Short-circuit protected ; Overload relay auto matically disables main output					
		Impedance	TTL-compatible into >1kΩ					
		Rise or Fall Time	50Ω nominal					
			≤25ns					
SINE WAVE CHARACTERISTICS	Harmonic Distortion		-55 dBc DC ~ 200kHz, Ampl > 0.1Vpp; -50 dBc 200kHz ~ 1MHz, Ampl > 0.1Vpp					
			-35 dBc 1MHz ~ 5MHz, Ampl > 0.1Vpp; -30 dBc 5MHz ~ 25MHz, Ampl > 0.1Vpp					
SQUAREWAVE CHARACTERISTICS	Rise/Fall Time		≤25ns at maximum output (into 50Ωload)					
	Overshoot		< 5%					
	Asymmetry		1% of period+1 ns					
	Variable Duty Cycle		1%~99%≤100kHz ; 20.0%~80.0%≤5MHz ; 40.0%~60.0%≤10MHz ; 50%≤25MHz					
			(1% Resolution for full Frequency Range)					
RAMP CHARACTERISTICS	Linearity		< 0.1% of peak output					
	Variable Symmetry		0%~100%(0.1% Resolution)					
AM MODULATION	Carrier Waveforms		Sine, Square, Triangle					
	Modulating Waveforms		Sine, Square, Triangle					
	Modulating Frequency		2 mHz~20 kHz (Int); DC~20KHz (Ext)			—		
	Depth		0%~120.0%					
	Source		Internal/External					
FM MODULATION	Carrier Waveforms		Sine, Square, Triangle					
	Modulating Waveforms		Sine, Square, Triangle					
	Modulating Frequency		2 mHz~20 kHz (Int); DC~20KHz (Ext)			—		
	Deviation		DC to Max Frequency					
	Source		Internal/External					
SWEEP	Waveforms		Sine, Square, Triangle					
	Type		Linear or Logarithmic					
	Start/Stop Frequency		0.1Hz to Max Frequency			—		
	Sweep Time		1ms~500s					
	Source		Internal/External					
FSK	Carrier Waveforms		Sine, Square, Triangle					
	Modulating Waveforms		50% duty cycle square					
	Internal Rate		2mHz~20kHz			—		
	Modulation Rate		2mHz~100kHz(INT); DC~100kHz(Ext)					
	Frequency Range		0.1Hz~Max Frequency					
	Source		Internal/External					
FREQUENCY COUNTER	Range		5Hz~150MHz					
	Accuracy		Time Base accuracy ± 1count					
	Time base		±20ppm(23°C±5°C)after 30minutes warm up			—		
	Resolution		100nHz for 1Hz, 0.1Hz for 100MHz					
	Input Impedance		1KΩ/1pf					
	Sensitivity		35mVrms~30Vms (5Hz~150MHz)					
STORE/RECALL	10 Groups of Setting Memories							
INTERFACE	USB(Device)							
DISPLAY	LCD							
POWER SOURCE	AC100 ~ 240V , 50 ~ 60Hz							
POWER CONSUMPTION	25 VA							
OPERATING ENVIRONMENT	Temperature to satisfy the specification: 18~28°C; Operating temperature: 0~40°C							
	Relative Humidity: ≤80%, 0~40°C; ≤70%, 35~40°C; Installation category: CAT II							
OPERATING ALTITUDE	2000 meters							
STORAGE TEMPERATURE	-10~70°C, Humidity: ≤70%							
DIMENSIONS & WEIGHT	266(W)×107(H)×293(D) mm ; Approx. 2.5 kg							

Specifications subject to change without notice.

ORDERING INFORMATION	
AFG-21005	5MHz Arbitrary Waveform Function Generator
AFG-21012	12MHz Arbitrary Waveform Function Generator
AFG-21025	25MHz Arbitrary Waveform Function Generator
AFG-21105	5MHz Arbitrary Waveform Function Generator
AFG-21112	12MHz Arbitrary Waveform Function Generator
AFG-21125	25MHz Arbitrary Waveform Function Generator

ACCESSORIES	
CD (user manual + software) × 1, Quick Start Guide × 1, Power cord × 1	
AFG-21105/21112/21125 - GTL-101 Test Lead × 2, Instruction Manual × 1, Power cord × 1	
AFG-21005/21012/21025 - GTL-101 Test Lead × 1, Instruction Manual × 1, Power cord × 1	
OPTIONAL ASSESSORIES	
GTL-246	USB Cable, USB 2.0 Type A - Type B, 4P
FREE DOWNLOAD	
PC Software	FreeWave software
Driver	USB driver

ISO-TECH

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