25MHz TRUE DUAL CHANNEL ARBITRARY FUNCTION GENERATOR

CE | USB Host | USB Device | PC Software

AFG-2225

FEATURES

- Wide Frequency Ranges From 1 μHz ~ 25MHz (sine wave)
- 1 μHz Resolution in Full Range
- Built-in Standard 120MSa/s, 10bit, 4k Points Arbitrary Function for Both Channels
- True Dual-Channel Output, CH2 Provides the Same Characteristics as CH1
- Dual-Channel Supports Couple, Tracking, Phase Operations
- 1% ~ 99% Adjustable Duty Cycle for Square Waveform
- Friendly User Interface for Easy Parameter Setting and Parameters Display
- Multiple Editing Methods to Edit Arbitrary Waveform Easily
- Built-in Standard AM/FM/PM/FSK/SUM/ Sweep/Burst and Frequency Counter
- USB Host/Device Interface for Remote Control and Waveform Editing

Equivalent Dual-Channel Provides Augmented Value for Customers

GW Instek is launching AFG-2225, its first basic level dual-channel arbitrary function generator, which provides superior features in its class. Both channels are equipped with same characteristics to fit dual-signal applications such as differential or IQ signaling. The outstanding cost-performance value makes the AFG-2225 a practical instrument to accelerate the development process.

The major features for both channels include 10Vpp output amplitude; 25MHz frequency bandwidth with 1uHz resolution; built-in waveforms of Sine, Square, Ramp (Triangle) and Noise. As to the 1%~99% adjustable duty cycle of Square waveform can be used as pulse signal sources. For the arbitrary waveform, user can edit the 66 built-in waveforms or create a whole new one. Moreover, AFG-2225 carries features of AM/FM/PM/FSK/SUM Modulation, Sweep, Burst and Frequency Counter, which can be applied to various communication fields.

In addition to the intuitive and friendly user interface, the 3.5-inch color LCD displays the comprehensive operation information including the true waveform presented at the output. USB Host and Device interfaces are equipped to link the AFG-2225 with other devices, which provide the flexibility of waveform generation for more practical usages. With link to GW Instek GDS-series Digital Storage Oscilloscopes (DSOs), the waveforms of interest can be captured and reconstructed. User can also use the arbitrary waveform PC software to edit the waveform and then send to AFG-2225 directly, or save the waveform into flash drive and then transfer to AFG-2225.

Full-Functions equipped Dual-channel Signal Output Capability

In most two-channel signals applications, such as digital modulation and vehicle electronic simulation signals, the similar or identical waveform capabilities are required for both channel outputs. Unlike other dual-channel AFG in this class, AFG-2225 is fully equipped with equal capabilities on dual outputs. Most of dual-channel arbitrary waveform generators in this basic level cluster offer one major channel and one minor channel, in which the minor channel only provides less functions or inferior performances. This sort of non-full-function dual-channel AFGs can not meet the requirements of reality.

Correlated Functions of Dual-channel Outputs

The two channels can be used in either independent or correlated configuration. AFG-2225 provides three correlated functions which are Couple, Tracking and Phase functions. For Couple function, two signals with a ratio or offset in amplitude or frequency can be generated. One of two signals with adjustable offset frequency is an example which can form the two-tone signals for testing the third order inter-modulation distortion of an amplifier. With Tracking function, two differential signals with equal-frequency, equal-amplitude but inverted phase can be produced. Examples such as PECL, LVPECL and LVDS digital signals or automotive sensors like temperature, speed signals are all able to be simulated by tracking function. The Phase function is designed to create two signals with specified phase offset. When user wants to create two quadrature (sine and cosine) signals, the phase offset is set to be 90 degrees in the Phase function. In conclusion, compared with other arbitrary function generators only equipped with phase function, AFG-2225 provides great convenience to fulfill the various challenges coming from modern electronic industries.

High-flexibility of Arbitrary Waveforms Editing

AFG-2225 provides 120MSa/s sampling rate, 10-bit vertical resolution, 4k-point waveform length, and the maximum waveform repeated rate of 60MHz, regarded as an outstanding arbitrary waveform capability. There are four ways for AFG-2225 to generate customized arbitrary waveforms, which are editing waveform via PC software, point-by-point editing on the panel, loading CSV file and loading the captured waveform from GW Instek GDS-Series Oscilloscopes.

The PC software editing and point-by-point editing particularly provide the way to create the user-defined and post-modification waveform. CSV file loading capability allows AFG-2225 to produce the waveforms with complicated math operation result. Engineer can use PC math software to process the integral and then send the results in CSV format to AFG-2225. With the link to GW Instek GDS-series Digital Storage Oscilloscopes (DSOs), the waveforms of interest can be captured by DSO and then reconstructed by AFG-2225. User can capture the waveform during the operation and then reconstructed by AFG-2225 for further analysis or diagnosis in the laboratory. Thus, plus the dual-channel feature, numerous derivative applications of capturing signal can be achieved.

Front Panel

APPLICATIONS

- Power Supply/Transformer Simulations
- Traditional/Motor Power Applications
- Laboratory and Educational Research
- Pulse Signal as Trigger or Synchronization
- Automotive Electronics Applications

GW INSTEK
Simply Reliable

SPECIFICATIONS

			CH1	CH2
WAVEFORMS			Sine, Square, Ramp, Pulse, Noise, ARB	
ARITRARY FUNCTION	**Sample Rate**		120MSa/s	
	Repetition Rate		60MHz	
	Waveform Length		4k points	
	Amplitude Resolution		10 bits	
	Non-Volatile Memory		4k points	
FREQUENCY CHARACTERISTICS	**Range**	**Sine/Square**	1μHz ~ 25MHz	
		Ramp	1MHz	
	Resolution		1μHz	
	Accuracy	**Stability**	±20ppm	
		Aging	±1ppm, per 1 year	
		Tolerance	≤1mHz	
OUTPUT CHARACTERISTICS	**Amplitude**	**Range**	1mVpp~10Vpp(into 50Ω), 2mVpp~20Vpp(open-circuit) 1mVpp~5Vpp(into 50Ω)for 20MHz~25MHz; 2mVpp~10 Vpp(open-circuit)for 20MHz~25MHz	
		Accuracy	±2% of setting ±1mVpp(at 1kHz/into 50Ω without DC offset)	
		Resolution	1mV or 3digits	
		Flatness	±1% (0.1dB) ≤100kHz, ±3% (0.3 dB) ≤5MHz, ±5% (0.4 dB) ≤12MHz, ±10%(0.9dB)≤25MHz (sine wave relative to 1kHz/into 50Ω)	
		Units	Vpp, Vrms, dBm	
	Offset	**Range**	±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	
		Accuracy	2% of setting+20mV+0.5% of amplitude	
	Waveform Output	**Impedance**	50Ω typical (fixed); >10MΩ (output disabled)	
		Protection	Short-circuit protected ; Overload relay automatically disables main output	
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	
SQUARE WAVE CHARACTERISTICS	**Rise/Fall Time**		≤ 25ns at maximum output (into 50Ω load)	
	Overshoot		5%	
	Asymmetry		1% of period + 5 ns	
	Variable Duty Cycle		1.0%~99%≤100kHz ; 10.0%~90.0%≤1MHz ; 50.0%≤25MHz	
RAMP CHARACTERISTICS	**Linearity**		< 0.1% of peak output	
	Variable Symmetry		0%~100%(0.1% Resolution)	
PULSE CHARACTERISTICS	**Period**		40ns ~ 2000s	
	Pulse Width		20ns ~ 1999.9s	
	Overshoot		<5%	
	Jitter		20ppm + 5ns	
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 ~ 20kHz (INT); DC ~ 20kHz (EXT)	2mHz ~ 20kHz (INT); DC ~ 20kHz (EXT)
	Depth		0% ~ 120.0%	0% ~ 120.0%
	Source		Internal / External	Internal / External
FM MODULATION	**Carrier Waveforms**		Sine, Square, Ramp	Sine, Square, Ramp
	Modulating Waveforms		Sine, Square, Triangle, Upramp, Dnramp	Sine, Square, Triangle, Upramp, Dnramp
	Modulating Frequency		2mHz ~ 20kHz (INT); DC ~ 20kHz (EXT)	2mHz ~ 20kHz (INT); DC ~ 20kHz (EXT)
	Peak Deviation		DC ~ Max Frequency	DC ~ Max Frequency
	Source		Internal / External	Internal / External
PM	**Carrier Waveforms**		Sine, Square, Ramp	Sine, Square, Ramp
	Modulating Waveforms		Sine, Square, Triangle, Upramp, Dnramp	Sine, Square, Triangle, Upramp, Dnramp
	Modulation Frequency		2mHz ~ 20kHz (INT); DC ~ 20kHz (EXT)	2mHz ~ 20kHz (INT); DC ~ 20kHz (EXT)
	Phase Deviation		0° ~ 360°	0° ~ 360°
	Source		Internal / External	Internal / External
FSK	**Carrier Waveforms**		Sine, Square, Ramp, Pulse	Sine, Square, Ramp, Pulse
	Modulating Waveforms		50% duty cycle square	50% duty cycle square
	Modulation Frequency		2mHz ~ 100 kHz (INT); DC ~ 100 kHz(EXT)	2mHz ~ 100 kHz (INT); DC ~ 100 kHz(EXT)
	Phase Deviation		1μHz ~ Max Frequency	1μHz ~ Max Frequency
	Source		Internal / External	Internal / External
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 ~ 20kHz (INT); DC ~ 20kHz (EXT)	2mHz ~ 20kHz (INT); DC ~ 20kHz (EXT)
	Phase Deviation		0% ~ 100.0%	0% ~ 100.0%
	Source		Internal / External	Internal / External
SWEEP	**Waveforms**		Sine, Square, Ramp	Sine, Square, Ramp
	Type		Linear or Logarithmic	Linear or Logarithmic
	Start/Stop Freq		1μHz to Max Frequency	1μHz to Max Frequency
	Sweep Time		1ms ~ 500s	1ms ~ 500s
	Source		Internal / External / Manual	Internal / External / Manual
BURST	**Waveforms**		Sine, Square, Ramp	Sine, Square, Ramp
	Frequency		1μHz ~ 25MHz	1μHz ~ 25MHz
	Burst Count		1 ~ 65535 cycles or Infinite	1 ~ 65535 cycles or Infinite
	Start/Stop Phase		-360 ~ +360	-360 ~ +360
	Internal Period		1ms ~ 500s	1ms ~ 500s
	Gate Source		External Trigger	External Trigger
	Trigger Source		Single, External or Internal Rate	Single, External or Internal Rate
	N-Cycle, Infinite		0s ~ 655350ns	0s ~ 655350ns
FREQUENCY COUNTER	**Range**		5Hz ~ 150MHz	
	Accuracy		Time Base accuracy±1count	
	Time Base		±20ppm (23°C ± 5°C) after 30 minutes warm up	
	Resolution		The maximum resolution is : 100nHz for 1Hz, 0.1Hz for 100MHz	
	Input Impedance		1kΩ/1pf	
	Sensitivity		35mVrms ~ 30Vms (5Hz ~ 150MHz)	
DUAL CHANNEL FUNCTION	**Phase**		-180° ~ 180°, Synchronize phase	-180° ~ 180°, Synchronize phase
	Tracking		CH2=CH1	CH1=CH2
	Coupling		Frequency(Ratio or Difference)Amplitude & DC Offset	Frequency(Ratio or Difference)Amplitude & DC Offset
	DSOlink		√	√
EXTERNAL TRIGGER INPUT	**Type**		For FSK, Burst, Sweep	
	Input Level		TTL Compatibility	
	Slope		Rising or Falling(Selectable)	
	Pulse Width		>100ns	
	Input Impedance		10kΩ, DC coupled	
EXTERNAL MODULATION INPUT	**Type**		For AM, FM, PM, SUM	
	Voltage Range		±5V full scale	
	Input Impedance		10kΩ	
	Frequency		DC ~ 20kHz	
TRIGGER OUTPUT	**Type**		For Burst, Sweep, Arb	
	Level		TTL Compatible into 50Ω	
	Pulse Width		>450ns	
	Maximum Rate		1MHz	
	Fan-out		≥4 TTL Load	
	Impedance		50Ω Typical	
SAVE/RECALL	10 Groups of Setting Memories			
INTERFACE	USB(Host & Device)			
DISPLAY	3.5" TFT LCD			
POWER SOURCE	AC100 ~ 240V , 50 ~ 60Hz			
POWER CONSUMPTION	25W (Max.)			
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			

* The specifications apply when the function generator is powered on for at least 30 minutes under +18°C~+28°C. Specifications subject to change without notice. FG-2225GD1DH

ORDERING INFORMATION

AFG-2225 25MHz True Dual Channel Arbitrary Function Generator

ACCESSORIES

User Manual CD x 1, Quick Start Manual x 1, GTL-101 Test Lead x 2, Power Cord x 1

OPTIONAL ASSESSORIES

GTL-110 BNC(M)-BNC(M) RF Cable

GTL-246 USB Cable, USB 2.0 Type A – Type B, 4P

FREE DOWNLOAD

PC Software Arbitrary Waveform Editing Software

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