



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.

AFG-2225

FEATURES

- Wide Frequency Ranges From 1 μ Hz ~ 25MHz (sine wave)
- 1 μ Hz 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



Front Panel

APPLICATIONS

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

AFG-2225



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SPECIFICATIONS				
		CH1		CH2
WAVEFORMS		Sine, Square, Ramp, Pulse, Noise, ARB		
ARBITRARY FUNCTION	Sample Rate	120MSa/s		
	Repetition Rate	60MHz		
FREQUENCY CHARACTERISTICS	Waveform Length	4k points		
	Amplitude Resolution	10 bits		
	Non-Volatile Memory	4k points		
	Range	1μHz ~ 25MHz		
OUTPUT CHARACTERISTICS	Resolution	1μHz		
	Accuracy	±20ppm		
	Aging	±1ppm, per 1 year		
	Tolerance	≤1mHz		
SINE WAVE CHARACTERISTICS	Amplitude	1mVpp~10Vpp(into 50Ω), 2mVpp~20Vpp(open-circuit)		
	Range	1mVpp~5Vpp(into 50Ω) for 20MHz~25MHz; 2mVpp~10Vpp(into 50Ω) for 20MHz~25MHz		
	Accuracy	±2% of setting ±1mVpp(at 1kHz/into 50Ω without DC offset)		
	Resolution	1mV or 3digits		
SQUARE WAVE CHARACTERISTICS	Flatness	±1% (0.1dB) ≤100kHz, ±3% (0.3 dB) ≤5MHz, ±5% (0.4 dB) ≤12MHz, ±10% (0.9dB) ≤25MHz		
	Offset	(sine wave relative to 1kHz/into 50Ω)		
	Units	Vpp, Vrms, dBm		
	Range	±5Vpk ac+dc(into 50Ω); ±10Vpk ac+dc(open circuit); ±2.5Vpk ac+dc(into 50Ω) for 20MHz~25MHz		
RAMP CHARACTERISTICS	Accuracy	±5Vpk ac+dc(open circuit) for 20MHz~25MHz		
	Waveform Output	2% of setting+20mV+0.5% of amplitude		
	Impedance	50Ω typical (fixed); >10MΩ (output disabled)		
	Protection	Short-circuit protected; Overload relay automatically disables main output		
HARMONIC DISTORTION		-55 dBc DC ~ 200kHz, Ampl > 0.1Vpp; -50 dBc 200kHz ~ 1MHz, Ampl > 0.1Vpp		
SQUARE WAVE CHARACTERISTICS		-35 dBc 1MHz ~ 5MHz, Ampl > 0.1Vpp; -30 dBc 5MHz ~ 25MHz, Ampl > 0.1Vpp		
PULSE 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, Up ramp, Dn ramp		Sine, Square, Triangle, Up ramp, Dn ramp
	Modulating Frequency	2mHz ~ 20kHz (INT); DC ~ 20kHz (EXT)		2mHz ~ 20kHz (INT); DC ~ 20kHz (EXT)
	Depth	0% ~ 120.0%		0% ~ 120.0%
FM MODULATION	Source	Internal / External		Internal / External
	Carrier Waveforms	Sine, Square, Ramp		Sine, Square, Ramp
	Modulating Waveforms	Sine, Square, Triangle, Up ramp, Dn ramp		Sine, Square, Triangle, Up ramp, Dn ramp
	Modulating Frequency	2mHz ~ 20kHz (INT); DC ~ 20kHz (EXT)		2mHz ~ 20kHz (INT); DC ~ 20kHz (EXT)
PM	Peak Deviation	DC ~ Max Frequency		DC ~ Max Frequency
	Source	Internal / External		Internal / External
	Carrier Waveforms	Sine, Square, Ramp		Sine, Square, Ramp
	Modulating Waveforms	Sine, Square, Triangle, Up ramp, Dn ramp		Sine, Square, Triangle, Up ramp, Dn ramp
FSK	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
	Carrier Waveforms	Sine, Square, Ramp, Pulse		Sine, Square, Ramp, Pulse
SUM	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
SWEEP	Carrier Waveforms	Sine, Square, Ramp, Pulse, Noise		Sine, Square, Ramp, Pulse, Noise
	Modulating Waveforms	Sine, Square, Triangle, Up ramp, Dn ramp		Sine, Square, Triangle, Up ramp, Dn ramp
	Modulation Frequency	2mHz ~ 20kHz (INT); DC ~ 20kHz (EXT)		2mHz ~ 20kHz (INT); DC ~ 20kHz (EXT)
	Phase Deviation	0% ~ 100.0%		0% ~ 100.0%
BURST	Source	Internal / External		Internal / External
	Waveforms	Sine, Square, Ramp		Sine, Square, Ramp
	Frequency	1μHz ~ 25MHz		1μHz ~ 25MHz
	Burst Count	1 ~ 65535 cycles or Infinite		1 ~ 65535 cycles or Infinite
FREQUENCY COUNTER	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
DUAL CHANNEL FUNCTION	N-Cycle, Infinite	0s ~ 655350ns		0s ~ 655350ns
	Range	5Hz ~ 150MHz		5Hz ~ 150MHz
	Accuracy	Time Base accuracy: ±1count		Time Base accuracy: ±1count
	Time Base	±20ppm (23°C ± 5°C) after 30 minutes warm up		±20ppm (23°C ± 5°C) after 30 minutes warm up
EXTERNAL TRIGGER INPUT	Resolution	The maximum resolution is: 100nHz for 1Hz, 0.1Hz for 100MHz		The maximum resolution is: 100nHz for 1Hz, 0.1Hz for 100MHz
	Input Impedance	1kΩ/1pF		1kΩ/1pF
	Sensitivity	35mVrms ~ 30Vrms (5Hz ~ 150MHz)		35mVrms ~ 30Vrms (5Hz ~ 150MHz)
	Phase	-180° ~ 180°, Synchronize phase		-180° ~ 180°, Synchronize phase
EXTERNAL MODULATION INPUT	Tracking	CH2=CH1		CH1=CH2
	Coupling	Frequency(Ratio or Difference)Amplitude & DC Offset		Frequency(Ratio or Difference)Amplitude & DC Offset
	DSOLink	✓		✓
	Type	For FSK, Burst, Sweep		For FSK, Burst, Sweep
TRIGGER OUTPUT	Input Level	TTL Compatibility		TTL Compatibility
	Slope	Rising or Falling(Selectable)		Rising or Falling(Selectable)
	Pulse Width	>100ns		>100ns
	Input Impedance	10kΩ, DC coupled		10kΩ, DC coupled
SAVE/RECALL	Type	For AM, FM, PM, SUM		For AM, FM, PM, SUM
	Voltage Range	±5V full scale		±5V full scale
	Input Impedance	10kΩ		10kΩ
	Frequency	DC ~ 20kHz		DC ~ 20kHz
OPERATING ENVIRONMENT	Type	For Burst, Sweep, Arb		For Burst, Sweep, Arb
	Level	TTL Compatible into 50Ω		TTL Compatible into 50Ω
	Pulse Width	>450ns		>450ns
	Maximum Rate	1MHz		1MHz
DIMENSIONS & WEIGHT	Fan-out	≥4 TTL Load		≥4 TTL Load
	Impedance	50Ω Typical		50Ω Typical
	10 Groups of Setting Memories			
	USB(Host & Device)			
OPERATING ENVIRONMENT	Display	3.5" TFT LCD		3.5" TFT LCD
	Power Source	AC100 ~ 240V, 50 ~ 60Hz		AC100 ~ 240V, 50 ~ 60Hz
	Power Consumption	25W (Max.)		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;		Temperature to satisfy the specification: 18~28°C; Operating temperature: 0~40°C; Relative Humidity: ≤80%, 0~40°C; ≤70%, 35~40°C;
DIMENSIONS & WEIGHT	Installation category: CAT II			Installation category: CAT II
	2000 meters			2000 meters
	Storage Temperature	-10~70°C, Humidity: ≤70%		-10~70°C, Humidity: ≤70%
	Dimensions & Weight	266(W)×107(H)×293(D) mm ; Approx. 2.5 kg		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		OPTIONAL ASSESSORIES	
AFG-2225	25MHz True Dual Channel Arbitrary Function Generator	GTL-110	BNC(M)-BNC(M) RF Cable
ACCESSORIES		GTL-246	USB Cable, USB 2.0 Type A – Type B, 4P
User Manual CD x 1, Quick Start Manual x 1, GTL-101 Test Lead x 2, Power Cord x 1		FREE DOWNLOAD	
		PC Software Arbitrary Waveform Editing Software	

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