

AFG-3051 & AFG-3081 Specifications

The specifications apply when the AFG-3051 & AFG-3081 is powered on for at least 30 minutes under +20°C~+30°C.

		AFG-3081	AFG-3051
Waveforms		Sine, Square, Ramp, Pulse, Noise, DC, Sin(x)/x, Exponential Rise, Exponential Fall, Negative Ramp	
Arbitrary Waveforms			
ARB Function		Built in	
Sample Rate		200 MSa/s	
Repetition Rate		100MHz	
Waveform Length		1M points	
Amplitude Resolution		16 bits	
Non-Volatile Memory		Ten 1M waveforms(1)	
User define Output Section		Any section from 2 to 1M points	
User define Mark Output		Any section from 2 to 1M points	
Frequency Characteristics			
Range	Sine	80MHz	50MHz
	Square		
	Triangle, Ramp	1MHz	
Resolution		1uHz	
Accuracy	Stability	±1 ppm 0 to 50℃	
		±0.3 ppm 18 to 28℃	
	Aging	±1 ppm, per 1 year	
	Tolerance	≤ 1 uHz	
Output Characteristics(2)			
Amplitude	Range	10 mVpp to 10 Vpp(into 50Ω) 20 mVpp to 20 Vpp(open-circuit)	
	Accuracy	± 1% of setting ±1 mVpp (at 1 kHz,>10 mVpp)	
	Resolution	0.1 mV or 4 digits	
	Flatness	± 1% (0.1dB) <10 MHz ± 2% (0.2 dB) 10 MHz to 50 MHz ± 10% (0.9 dB) 50 MHz to 70 MHz ± 20% (1.9 dB) 70 MHz to 80 MHz (sinewave relative to 1 kHz)	
	Units	Vpp, Vrms, dBm,	
Offset	Range	±5 Vpk ac +dc (into 50Ω) ±10Vpk ac +dc (Open circuit)	
	Accuracy	1% of setting + 2 mV+ 0.5% of amplitude	
Waveform Output	Impedance	50Ω typical (fixed) > 10MΩ (output disabled)	
	Protection	Short-circuit protected Overload relay auto-matically disables main output	
SYNC Output	Level	TTL-compatible into>1kΩ	
	Impedance	50Ω nominal	
Sinewave Characteristics			
Harmonic Distortion(5)		-60 dBc DC~1 MHz, Ampl<3 Vpp -55 dBc DC~1 MHz, Ampl>3 Vpp -45 dBc 1MHz~5 MHz, Ampl>3 Vpp -30 dBc 5MHz~80 MHz, Ampl>3 Vpp	
Total Harmonic Distortion		< 0.2%+0.1mVrms DC to 20 kHz	
Spurious (non-harmonic)(5)		-60 dBc DC~1 MHz	

	-50 dBc 1MHz~20MHz -50 dBc+ 6 dBc/octave 1MHz~80MHz	
Phase Noise	< -65dBc typical 10MHz, 30 kHz band < -47dBc typical 80MHz, 30 kHz band	
Square wave Characteristics		
Rise/Fall Time	<8 nS(3)	
Overshoot	< 5%	
Asymmetry	1% of period+1 ns	
Variable Duty Cycle	20.0% to 80.0% ≤ 25 MHz	
	40.0% to 60.0% 25 ~ 50MHz	
	50.0%(Fixed) 50 ~ 80MHz	
Jitter	0.01%+525ps < 2 MHz	
	0.1%+75ps > 2 MHz	
Ramp Characteristics		
Linearity	< 0.1% of peak output	
Variable Symmetry	0% to 100%	
Pulse Characteristics		
Period	20ns~ 2000s	
Pulse Width	8ns~ 1999.9s	
	Minimum Pulse Width:	
	8nS when FREQ≤50MHz	
	5% of setting period when FREQ≤6.5MHz	
	Resolution:	
	1nS when FREQ≤50MHz	
	1% of setting period when FREQ≤6.5MHz	
Overshoot	<5%	
Jitter	100 ppm +50 ps	
AM Modulation		
Carrier Waveforms	Sine, Square, Triangle, Ramp, Pulse, Arb	
Modulating Waveforms	Sine, Square, Triangle, Up/Dn Ramp	
Modulating Frequency	2 mHz to 20 kHz	
Depth	0% to 120.0%	
Source	Internal / External	
FM Modulation		
Carrier Waveforms	Sine, Square, Triangle, Ramp	
Modulating Waveforms	Sine, Square, Triangle, Up/Dn Ramp	
Modulating Frequency	2 mHz to 20 kHz	
Peak Deviation	DC to 80 MHz	DC to 50 MHz
Source	Internal / External	
PWM		
Carrier Waveforms	Square	
Modulating Waveforms	Sine, Square, Triangle, Up/Dn Ramp	
Modulating Frequency	2 mHz to 20 kHz	
Deviation	0% ~ 100.0% of pulse width	
Source	Internal / External	
FSK		
Carrier Waveforms	Sine, Square, Triangle, Ramp, Pulse	
Modulating Waveforms	50% duty cycle square	
Internal Rate	2 mHz to 100 kHz	
Frequency Range	DC to 80 MHz	DC to 50 MHz
Source	Internal / External	
SWEEP		
Waveforms	Sine, Square, Triangle, Arb	
Type	Linear or Logarithmic	

Direction		Up or Down	
Start F / Stop FREQ		100 uHz to 80 MHz	100 uHz to 50 MHz
Sweep Time		1 ms to 500 s	
Trigger		Single, External, Internal	
Marker		Falling edge of Mark signal (Programmable frequency)	
Source		Internal / External	
BURST			
Waveforms		Sine, Square, Triangle, Ramp	
Frequency		1 uHz to 80 MHz(4)	1 uHz to 50 MHz(4)
Burst Count		1 to 1000000 cycles or Infinite	
Start / Stop Phase		-360.0°to +360.0°	
Internal Period		1 ms to 500 s	
Gate Source		External Trigger	
Trigger Source		Single, External or Internal Rate	
Trigger Delay		N-Cycle, Infinite: 0s to 85 s	
External Modulation Input			
Type		for AM, FM, Sweep, PWM	
Voltage Range		± 5V full scale	
Input Impedance		10kΩ	
Frequency		DC to 20 kHz	
External Trigger Input			
Type		for FSK, Burst, Sweep	
Input Level		TTL Compatible	
Slope		Rising or falling(selectable)	
Pulse Width		> 100 ns	
Input Impedance		10kΩ,DC coupled	
Latency	Sweep	< 10 us (typical)	
	Burst	< 100 ns (typical)	
Jitter	Sweep	2.5 us	
	Burst	1 ns; except pulse,300 ps	
Modulation Output			
Type		for AM, FM, Sweep, PWM	
Amplitude	Range	≥ 1Vpp	
	Impedance	> 10kΩ typical (fixed)	
Trigger Output			
Type		for Burst, Sweep	
Level		TTL Compatible into 50Ω	
Pulse Width		> 450 ns	
Maximum Rate		1 MHz	
Fan-out		≧ 4 TTL load	
Impedance		50Ω typical	
Marker Output			
Type		for ARB, Sweep	
Level		TTL Compatible into 50Ω	
Fan-out		≧ 4 TTL load	
Impedance		50Ω typical	
Store/Recall		10 Groups of Setting Memories	
Interface		GPIB, RS232, USB	
Display		4.3 inch TFT LCD 480 × 3 (RGB) × 272	
System Characteristics			
Configuration Times (typical)		Function Change: Standard---->102ms	

	Pulse----->660ms Built-In Arb- >240ms Frequency Change: 24ms Amplitude Change: 50ms Offset Change: 50ms Select User Arb: < 2s for 1M points Modulation Change: < 200ms		
Arb Download Times (typical)	Binary Code		ASCII Code
	GPIOB / RS-232 (115 Kbps)	USB(Device)	USB(Host)
1M points	189 Sec	34 Sec	70 Sec
512K points	95 Sec	18Sec	35 Sec
256K points	49 Sec	9 Sec	18 Sec
64K points	16 Sec	3 Sec	6 Sec
16K points	7 Sec	830mS	1340 mS
8K points	6 Sec	490mS	780mS
4K points	6 Sec	365mS	520 mS
2K points	5 Sec	300mS	390 mS
General Specifications			
Power Source	AC100~240V , 50~60Hz		
Power Consumption	65 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		
Pollution Degree	IEC 61010 Degree 2, Indoor Use		
Storage Temperature	-10 ~ 70°C, Humidity: ≤70%		
Dimensions (WxHxD)	Bench Top : 265 (W) x 107 (H) x 374 (D)		
Weight	Approx. 4kg		
Safety Designed to	EN61010-1		
EMC Tested to	EN 55011, IEC-61326-1		
Accessories	GTL-110× 1 Instruction Manual×1 Power cord×1		
(1). A total of ten waveforms can be stored.(Every waveform can composed of 1M points maximum.)			
(2). Add 1/10th of output amplitude and offset specification per °C for operation outside of 0°C to 28°C range (1-year specification).			
(3). Edge time decreased at higher frequency.			
(4). Sine and square waveforms above 25 MHz are allowed only with an "Infinite" count.			
(5). Harmonic distortion and Spurious noise at low amplitudes is limited by a -70 dBm floor.			