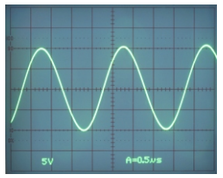
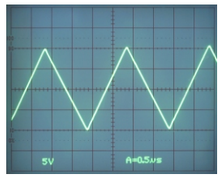
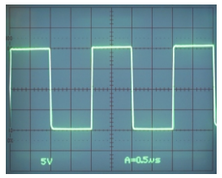
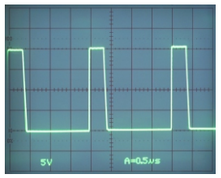
20MHz/10MHz/7MHz/4MHz DDS Function Generator

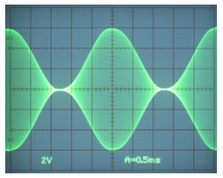
A. OUTPUT WAVEFORM

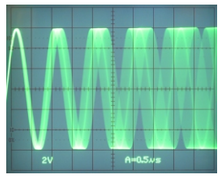

Sine Waveform

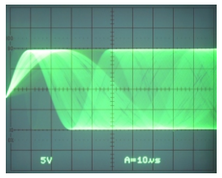

Triangle Waveform


Square Waveform


Pulse Waveform


AM Modulated Waveform

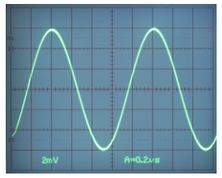
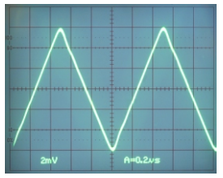

FM Modulated Waveform

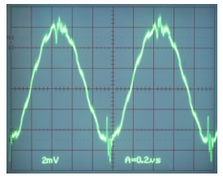
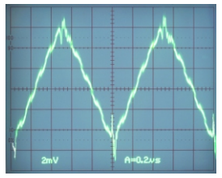

Sweep Waveform

The SFG-2000/2100 Series provide Sine, Triangle and Square waveforms with DC offset and variable duty cycle at±20ppm frequency stability and accuracy. The low drift rate and -55dBc low sine wave distortion output significantly extend product application range in various market sectors.

The TTL/CMOS output is also available for fulfilling various requirements. In addition to the basic functions, The SFG-2100 Series provide advanced functions such as AM/FM modulation, sweep mode, and Built-In Frequency Counter.

B. DDS FG VS. CONVENTIONAL FG



GW Instek SFG DDS Sine Wave & Triangle Wave



Conventional Function Generator Sine Wave & Triangle Wave

The SFG-2000/2100 Series generates signals by continuously delivering a series of sampling values from a sine waveform table (stored in RAM) to DAC (Digital to Analog Converter) for waveform construction. With a low pass filter circuit to filter out the harmonics of the DAC output and smooth the signal, the SFG-2000/2100 Series is able to provide a stable output with very low waveform distortion. This is very different from the way a conventional FG generates a signal. Since a conventional FG needs to obtain its signal by switching current sources between positive and negative directions all the time, the "Ringing" distortion occurs at the peak of the signal waveform where the switching is activated. This distortion is especially serious when the output amplitude is low. For the SFG-2000/2100 DDS FG, however, the waveform distortion remains low even when the output amplitude is at only 2mVpp.

3 MHz DDS Function Generator

For educational institutions, the SFG-1003/1013 direct digital synthesis (DDS) signal generator is the most affordable option for accurate waveform generation. It supports outputs of up to 3MHz and includes a voltage display. Using DDS technology embedded in an FPGA chip, the SFG-1003/1013 generates waveforms with high precision and high stability for customers that need accurate signals.

SFG-1003/1013 (3MHz)

CE

FEATURES

- DDS Technology and FPGA Design
- Frequency Range : 0. 1Hz ~ 3MHz
- High Frequency Accuracy : ±20ppm
- High Frequency Stability : ±20ppm
- Max. Frequency Resolution : 100 mHz
- Low Distortion Sine Wave : -55dBc, 0. 1Hz~200 kHz
- Voltage Display (Only SFG-1013)

SELECTION GUIDE

MAIN FUNCTION \ MODEL	SFG-1003	SFG-1013
Frequency	3 MHz	3 MHz
Offset	✓	✓
TTL Output	✓	✓
-40dB Attenuation	✓	✓
Voltage display	—	✓

SPECIFICATIONS

MAIN	
Output Function	Sine, Square, Triangle, TTL
Frequency Range(For Sine, Square)	0.1Hz ~ 3MHz
Frequency Range(For Triangle)	0.1Hz ~ 1MHz
Frequency Resolution	0.1Hz maximum
Frequency Stability	±20ppm
Frequency Accuracy	±20ppm
Aging	±5ppm/year
Amplitude Range	10Vp-p (into 50Ω load)
Amplitude Accuracy	±20% at maximum position (only SFG-1013)
Impedance	50Ω±10%
Attenuator	-40dB±1dB×1
DC Offset	＜-5V ~ ＞5V (into 50Ω load)
Duty Control Range	25% ~ 75% below 1MHz (for square wave only)
Display	6-digit LED display
Output Control	ON/OFF selector
SINE WAVE	
Harmonics Distortion	Maximum Amplitude attenuation to 1/10 of any panel settings, TTL OFF ≥ -55dBc, 0.1Hz ~ 200kHz ≥ -40dBc, 0.2MHz ~ 2MHz ≥ -35dBc, 2MHz ~ 3MHz
Flatness (at maximum amplitude relative to 1kHz)	＜±0.3dB, 0.1Hz ~ 1MHz ＜±0.5dB, 1MHz ~ 2MHz ＜± 1dB, 2MHz ~ 3MHz
TRIANGLE WAVE	
Linear	≥98%, 0.1Hz ~ 100kHz ; ≥95%, 100kHz ~ 1MHz
SQUARE WAVE	
Symmetry	5% of period+4ns, 0.1Hz ~ 100kHz
Rise or Fall Time	≤ 100ns at maximum output (into 50Ω load)
TTL OUTPUT	
Level	≥ 3Vp-p
Fan Out	20 TTL load
Rise or Fall Time	≤ 25ns
GENERAL	
Operation Environment	Indoor use, altitude ＜2000m Ambient Temperature : 0℃ ~ 40℃ Relative Humidity: ＜ 80% at 0℃ ~ 40℃ Up to 70% at 35℃ ~ 40℃ Installation category II Pollution Degree 2
POWER SOURCE	
	AC 100V/120V/220V/240V± 10%, 50/60Hz
STORAGE CONDITION	
Temperature	-10℃ ~ 70℃
Humidity	70% (Maximum).
DIMENSION & WEIGHT	
251(W) x 91(H) x 291(D) mm, Approx. 2.1kg	

ORDERING INFORMATION

SFG-1003 3 MHz DDS Function Generator
SFG-1013 3 MHz DDS Function Generator with Voltage Display

ACCESSORIES :
User manual x1, Power cord x 1, Test lead GTL-101 x 1