

## 20 MHz/10MHz/7MHz/4MHz DDS FUNCTION GENERATOR



SFG-2100 Series (20/10/7/4 MHz)



SFG-2000 Series (20/10/7/4 MHz)



### FEATURES

- \* DDS Technology and FPGA Chip Design
- \* Frequency Range: 0.1Hz~4/7/10/20 MHz
- \* High Frequency Accuracy : ±20ppm
- \* High Frequency Stability : ±20ppm
- \* Frequency Resolution : 100mHz
- \* Low Distortion Sine Wave : -55dBc, 0.1Hz ~ 200kHz
- \* Front Panel Setting Save/Recall with 10 Groups of Setting Memories
- \* Built-in 9 Digits, 150MHz/High Resolution Counter (SFG-2100 Series Only)
- \* INT/EXT AM/FM Modulation (SFG-2100 Series Only)
- \* LIN/LOG Sweep Mode (SFG-2100 Series Only)

Based on the Direct Digital Synthesized (DDS) technology and unique FPGA design, the SFG-2000/2100 Series Function Generators are built with exceptionally high performance far exceeding that of any conventional function generators at a very competitive price. Stable output frequency, low distortion, and fine frequency resolution are the most remarkable characteristics of this product series.

The SFG-2000/2100 Series include four members in each family at 4MHz, 7MHz, 10MHz and 20MHz bandwidth (pervid), The SFG-2100 Series have additional functions of Sweep, AM/FM modulation, and External Counter. As a result of the ±20ppm stability level and output waveform accuracy, The SFG-2000/2100 Series well fit into a wide variety of applications, such as signal generator for experiment labs, reference signal for PLL (Phase Locked Loop), and calibration and adjustment source for electronic devices.

SPECIFICATIONS		SFG-2000 Series				SFG-2100 Series			
MAIN		SFG-2004	SFG-2007	SFG-2010	SFG-2020	SFG-2104	SFG-2107	SFG-2110	SFG-2120
Frequency	Range(For Sine, Square)	0.1Hz~4MHz	0.1Hz~7MHz	0.1Hz~10MHz	1Hz~20MHz	0.1Hz~4MHz	0.1Hz~7MHz	0.1Hz~10MHz	1Hz~20MHz
	Range(For Triangle)	0.1Hz~1MHz (1Hz~1MHz for SFG-2020/2120)							
Resolution	Stability	±20 ppm							
	Accuracy	±20 ppm							
Output Function	Aging	±5 ppm / year							
	Amplitude Range	Sine, Square, Triangle							
Impedance	Attenuator	2mV ~ 10Vpp (into 50Ω load)							
	DC Offset	50Ω ±10%							
Duty Control	Range Resolution	-20dB ±1dB x2							
	Display	<-5V ~ +5V (into 50Ω load)							
SINE WAVE	Harmonics Distortion	20% to 80%, 2Hz~1MHz (Square wave only)							
	Flatness(Relative to 1kHz)	1% 9 digits LED display							
TRIANGLE WAVE	Linearity	≥98%, 0.1Hz~100kHz; ≥95%, 100kHz~1MHz							
	Symmetry	±1% of period + 4ns, 0.1Hz~100kHz							
SQUARE WAVE	Rise or Fall Time	≤25ns at maximum output. (into 50Ω load)							
	CMOS OUTPUT	Level: 4Vpp ±1Vpp ~ 15Vpp ±1Vpp adjustable; Rise or Fall Time ≤120ns							
TTL OUTPUT	Level	≥3Vpp							
	Fan Out	20 TTL load							
SWEEP OPERATION	Rise and Fall Time	≤25ns							
	Rate Time Mode	—				100:1 ratio max. and adjustable(*) 1Sec~30Sec adjustable(**) Lin./Log. switch selector			
AMPLITUDE MODULATION	Depth & Modulation	0~100%; 400Hz(INT), DC~1MHz(EXT)							
	Frequency	—				100Hz~5MHz(-3dB) ≤10Vpp for 100% modulation			
FREQUENCY MODULATION	Carrier BW	—							
	EXT Modulation Sensitivity	—							
FREQUENCY MODULATION	Deviation & Modulation	≥±50kHz, center at 1MHz, 400Hz fixed(INT), 1kHz fixed(EXT)							
	Frequency	—				≤10Vpp for 10% modulation (center at 1kHz)			
FREQUENCY COUNTER	EXT Modulation Sensitivity	—							
	Range	5Hz~150MHz							
Accuracy	Time base	Time base accuracy ±1 count							
	Resolution	±20ppm (23°C ±5°C) after 30 minutes warm up							
Input Impedance	Sensitivity	100nHz for 1Hz; 0.1Hz for 100MHz							
	Sensitivity	1MΩ/150pf ≤35mVrms (5Hz~100MHz) ≤45mVrms (100MHz~150MHz)							

NOTE: 1.(\*) In order to get the maximum sweep span, the sweep time needs to be tuned on when adjusting the sweep span.  
2.(\*\*) When the sweep time is too long, the stop frequency will reach and stay at the maximum frequency of the instrument until the end of the sweep cycle.



SFG-2100 Series

Rear Panel



SPECIFICATIONS		SFG-2000 Series				SFG-2100 Series			
		SFG-2004	SFG-2007	SFG-2010	SFG-2020	SFG-2104	SFG-2107	SFG-2110	SFG-2120
STORE/RECALL FUNCTION		10 groups of panel settings							
POWER SOURCE		AC115V ±10%, AC230V ±10%/-15%, 50/60Hz							
DIMENSION & WEIGHT		266(W)×107(H)×293(D) mm; Approx. 3.1kg				266(W)×107(H)×293(D) mm; Approx. 3.2kg			

ORDERING INFORMATION	
SFG-2004	4MHz DDS Function Generator
SFG-2007	7MHz DDS Function Generator
SFG-2010	10MHz DDS Function Generator
SFG-2020	20MHz DDS Function Generator
SFG-2104	4MHz DDS Function Generator with Counter, Sweep & AM, FM Modulation
SFG-2107	7MHz DDS Function Generator with Counter, Sweep & AM, FM Modulation
SFG-2110	10MHz DDS Function Generator with Counter, Sweep & AM, FM Modulation
SFG-2120	20MHz DDS Function Generator with Counter, Sweep & AM, FM Modulation
ACCESSORIES:	
User manual x 1, Power Cord x 1	
GTL-101 test lead x 1 (SFG-2000 Series)	
GTL-101 test lead x 2 (SFG-2100 Series)	

SELECTION GUIDE		4MHz		7MHz		10MHz		20MHz	
FREQUENCY RANGE	MODEL	SFG-2004	SFG-2104	SFG-2007	SFG-2107	SFG-2010	SFG-2110	SFG-2020	SFG-2120
DUTY		✓	✓	✓	✓	✓	✓	✓	✓
TTL/CMOS		✓	✓	✓	✓	✓	✓	✓	✓
DC OFFSET		✓	✓	✓	✓	✓	✓	✓	✓
LIN/LOG SWEEP		✓	✓	✓	✓	✓	✓	✓	✓
AM/FM MODULATION		✓	✓	✓	✓	✓	✓	✓	✓
EXT COUNTER		✓	✓	✓	✓	✓	✓	✓	✓