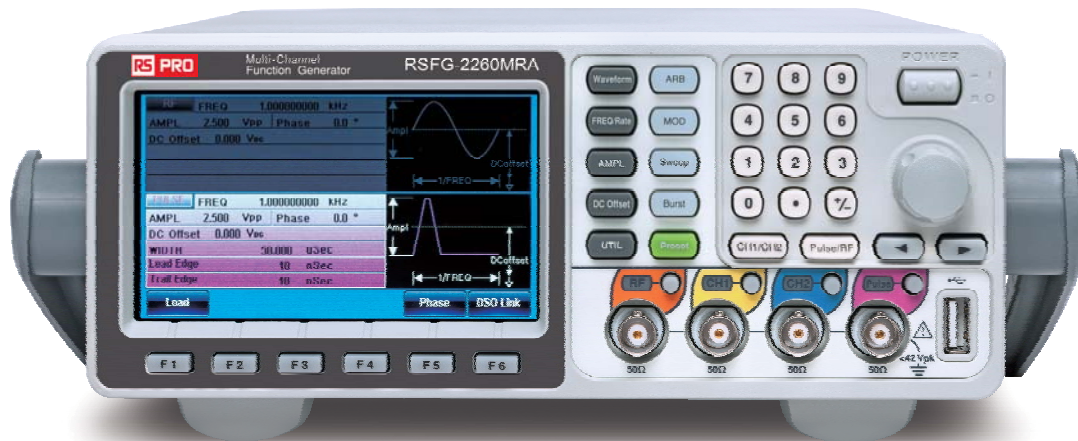


Datasheet

Multi-Channel Function Generator

Stock No. : Model :

1919722	RSFG-2110	1919725	RSFG-2230M
1919723	RSFG-2120MA	1919726	RSFG-2260M
1919724	RSFG-2160MR	1919727	RSFG-2260MRA



FEATURES

- **Maximum Five Output Channels**
 - 2 Equivalent Performance Arbitrary Channels Frequency : 1 μ Hz ~ 10/20/30/60MHz
 - RF Channel Frequency (FG/ARB/MOD) : 320MHz
 - Pulse Generator Frequency : 25MHz
 - Power Amplifier : Low Frequency, 5Hz~100kHz, 20dB/20W(limited by current setting)
- True Point by Point Output Arbitrary Waveform Function : 200MSa/s, 100MHz Repetition Rate, 14-bit Resolution, 16k Points Memory Depth
- Earth Ground Isolation Design Among I/O Terminals and Instrument Chassis
- Frequency Counter : 150MHz, 8-bit Frequency Resolution
- AM/FM/PM/ASK/FSK/PSK/SUM/PWM Modulation
- Built-in Medical and Automotive Electronic Waveforms
- USB Host/USB Device/LAN (RSFG-22XX only)
- 4.3 Inch TFT Color Display

SPECIFICATIONS						
	CH1 (Function With ARB)	CH2 (Function With ARB)	25MHz Pulse Generator	RF Generator (Function With ARB)	Power Amplifier	Modulation/Sweep/ Burst/Frequency Counter
RSFG-2110	• 10MHz		•			
RSFG-2120MA	• 20MHz		•		•	•
RSFG-2160MR	• 60MHz		•	• 320MHz		•
RSFG-2230M	• 30MHz	• 30MHz	•			•
RSFG-2260M	• 60MHz	• 60MHz	•			•
RSFG-2260MRA	• 60MHz	• 60MHz	•	• 320MHz	•	•
CH1/CH2						
WAVEFORMS	Standard		Sine, Square, Triangle, Ramp, Pulse, Noise			
ARBITRARY FUNCTIONS	Arb Function Waveform Length Amplitude Resolution Non-volatile Memory User-defined Output Section		Built-in 16k points 14 bits 10sets 16k points(1) From point 2 ~ 16384			
FREQUENCY	Range		Square: 60MHz(Max.); Triangle,Ramp: 5MHz; Others: Sine: 60MHz(Max.) Square: 25MHz(Max.); Triangle,Ramp: 1MHz			
CHARACTERISTICS	Resolution Accuracy Stability Aging Tolerance		1μHz ±20 ppm ±1 ppm, per 1 year ≤ 1μHz			
OUTPUT CHARACTERISTICS (2)	Amplitude Range Accuracy Resolution Flatness Units		1mVpp ~ 10 Vpp(into 50Ω) ; 2mVpp ~ 20 Vpp (open-circuit) ±2% of setting ±1 mVpp (at 1 kHz/into 50Ω without DC offset) 0.1mV or 4 digits ± 1% (0.1dB) ≅ 1MHz ; ± 3% (0.3dB) ≅ 50 MHz ; ± 16% (1.5dB) ≅ 60MHz (sinewave relative to 1 kHz/into 50Ω) Vpp, Vrms, dBm			
OFFSET	Range Accuracy		±5 Vpk AC + DC (into 50Ω); ±10Vpk AC + DC (open circuit) ±(1% of setting + 5mV + 0.5% of amplitude)			
WAVEFORM OUTPUT	Impedance Protection		50Ω typical (fixed); > 10MΩ (output disabled) Short-circuit protected; Overload relay automatically disables main output			
SYNC OUTPUT	Range Impedance		TTL-compatible into>1kΩ 50Ω standard			
SINE WAVE CHARACTERISTICS (3)	Harmonic Distortion Total Harmonic Distortion		-60 dBc DC ~ 200kHz, Ampl > 0.1 Vpp -55 dBc 200kHz ~ 1 MHz, Ampl > 0.1 Vpp ; -45 dBc 1MHz ~ 10 MHz, Ampl > 0.1Vpp ; -35 dBc 10MHz ~ 30MHz, Ampl > 0.1Vpp ; -27 dBc 30MHz ~ 60MHz, Ampl > 0.1Vpp < 0.1% (Ampl>1Vpp) DC~100 kHz			
SQUARE WAVE CHARACTERISTICS	Overshoot Asymmetry Variable duty Cycle Jitter		<5% 1% of period +5 ns 0.01% to 99.99% (limited by the current frequency setting) 20ppm + 500ps(4)			
RAMP CHARACTERISTICS	Linearity Variable Symmetry		< 0.1% of peak output 0% ~ 100%			
PULSE CHARACTERISTICS	Frequency Pulse Width Variable duty Cycle Overshoot Jitter		1μHz ~ 25MHz ≅ 20ns 0.01% ~ 99.99% (limited by the current frequency setting) <5% 20ppm + 500ps(4)			
PULSE GENERATOR						
PULSE GENERATOR	Amplitude Offset Frequency Pulse Width Variable duty Cycle Leading and Trailing Edge Time(5) Overshoot Jitter		1mVpp ~ 2.5 Vpp (into 50Ω) ; 2mVpp ~ 5 Vpp (open-circuit) ±1 Vpk AC + DC (into 50Ω) ; ±2Vpk AC + DC (Open circuit) 1μHz ~ 25MHz 20ns ~ 999.7ks(limited by the current frequency setting) 0.1% ~ 99.9%(limited by the current frequency setting) 10ns ~ 20s (1ns resolution)(limited by the current frequency and pulse width settings) <5% 100ppm + 500ps(4)			
RF GENERATOR						
ARBITRARY FUNCTIONS	ARB function Sample Rate Repetition Rate Waveform Length Amplitude Resolution User-defined output section Jitter		Built-in 200 MSa/s 100MHz 16k points 14 bits From point 2~16384 20ppm +5ns			
FREQUENCY CHARACTERISTICS	Range Resolution Accuracy Stability Aging Tolerance		1μHz~320MHz(DDS) / 1μHz~60MHz(ARB) for RSFG-2XXXMR Square: 25MHz(max); Triangle, Ramp: 1MHz 1 μHz ±20 ppm ±1 ppm, per 1 year ≅ 1 μHz			

SPECIFICATIONS		
OUTPUT CHARACTERISTICS(2)	Amplitude(into 50Ω) Accuracy Resolution Flatness	1mVpp to 1 Vpp (RSFG-2XXXMR) ±2% of setting ±1 mVpp(at 1 kHz/into 50Ω without DC offset) 1mV or 3 digits ±1%(0.1dB) ≤ 1 MHz; ±3%(0.3dB) ≤ 50 MHz; ±10%(0.9dB) ≤ 160MHz; ±35%(3.5dB) ≤ 320MHz (sinewave relative to 1 kHz/into 50Ω)
OFFSET WAVEFORM OUTPUT SINE WAVE CHARACTERISTICS(3)	Impedance Harmonic Distortion Total Harmonic Distortion	±1 Vpk AC +DC (into 50Ω); ±2Vpk AC +DC (Open circuit) 50Ω typical(fixed); >10MΩ (output disabled) -60 dBc <200kHz; -55 dBc 200kHz~1 MHz; -45 dBc 1MHz~10 MHz; -30 dBc 10MHz~320MHz < 0.1% (Ampl>1Vpp) DC~100 kHz
SQUARE WAVE CHARACTERISTICS	Rise/Fall Time Overshoot Asymmetry Variable duty Cycle Jitter	<15ns <5% 1% of period +5 ns 0.01% to 99.99%(limited by the current frequency setting) 20ppm+500ps(4)
RAMP CHARACTERISTICS	Linearity Variable Symmetry	< 0.1% of peak output 0% to 100%
MODULATION/ SWEEP	Modulation Type Sweep type Source Modulating Frequency	AM,FM,PM,FSK,PWM (The detail same as CH1 modulation specification) Frequency INT/EXT (INT only for AM,FM,PM, PWM) Sine-DDS 5μs~327.68ms (Resolution:5μs); Sine-ARB 2mHz~20kHz(Resolution:1mHz)
PSK	Carrier Waveforms Modulating Waveforms Internal Frequency Phase Range Source	Sine-DDS 50% duty cycle square 2 mHz to 1 MHz 0° ~ 360.0° Internal / External
ASK	Carrier Waveforms Modulating Waveforms Internal Frequency Amplitude Range Source	Sine-DDS 50% duty cycle square 2 mHz to 1 MHz 1mVpp to 10Vpp Internal / External
POWER AMPLIFIER		
POWER AMPLIFIER	Input Impedance Input Voltage Working Mode Gain Output Power (RL=8Ω) Output Voltage Output Current Rise/Fall Time Full Power Bandwidth Overshoot Total Harmonic Distortion Ground Isolation	10kΩ 1.25Vpmax Constant Voltage 20dB 20W (Square) 12.5Vpmax 1.6Amax <2.5μs 5Hz ~ 100kHz 5% < 0.1% (Ampl >1Vpp); 20Hz ~ 20 kHz 42Vpk max
ADVANCED FUNCTIONS		
AM MODULATION	Carrier Waveforms Modulating Waveforms Modulating Frequency Depth Source	Sine, Square, Triangle, Ramp, Pulse, Arb Sine, Square, Triangle, Upramp, Dnramp 2mHz ~ 20kHz(Int); DC ~ 20kHz(Ext) 0% ~ 120.0% Internal / External
FM MODULATION	Carrier Waveforms Modulating Waveforms Modulating Frequency Peak Deviation Source	Sine, Square, Triangle, Ramp Sine, Square, Triangle, Upramp, Dnramp 2mHz ~ 20kHz(Int); DC ~ 20kHz DC to max frequency Internal / External
PM	Carrier Waveforms Modulating Waveforms Modulation Frequency Phase Deviation Source	Sine, Square, Triangle, Ramp Sine, Square, Triangle, Upramp, Dnramp 2mHz ~ 20kHz 0° ~ 360.0° Internal / External
SUM	Carrier Waveforms Modulating Waveforms Modulation Frequency SUM Depth Source	Sine, Square, Triangle, Ramp Sine, Square, Triangle, Upramp, Dnramp 2mHz ~ 20kHz 0% ~ 100.0% Internal / External
PWM	Carrier Waveforms Modulating Waveforms Modulation Frequency Phase Deviation Source	Square Sine, Square, Triangle,Upramp, Dnramp 2mHz ~ 20kHz 0% ~ 100.0% pulse width Internal / External
FSK	Carrier Waveforms Modulating Waveforms Internal Frequency Frequency Range Source	Sine, Square, Triangle, Ramp, Pulse 50% duty cycle square 2 mHz to 1 MHz 1μHz to max frequency Internal / External
SWEEP	Waveforms Type Sweep Direction Start/Stop Freq Sweep Time Source Trigger Marker Source	Sine, Square, Triangle, Ramp Linear or Logarithmic Sweep up or sweep down 1μHz to max frequency 1ms to 500s Internal / External Single, External, Internal Marker signal on falling edge (programmable) Internal / External

SPECIFICATIONS		
BURST	Waveforms Frequency Pulse Count Start/Stop Phase Internal Frequency Gate Source Trigger Source	Sine, Square, Triangle, Ramp Max Frequency 25MHz (sine, square); 1MHz (triangle, ramp) 1~1000000 Cycles or infinite -360.0° ~ +360.0° 1 us ~ 500 s External Trigger Single, External, Internal
TRIGGER DELAY	NCycle, Infinite	0s ~ 100 s
EXTERNAL TRIGGER INPUT	Type Input Level Slope Pulse Width Input Impedance	For FSK, Burst, Sweep TTL Compatibility Rising or Falling (selectable) >100ns 10kΩ, DC coupled
EXTERNAL MODULATION INPUT	Type Voltage Range Input Impedance Frequency Ground Isolation	For AM, FM, PM, SUM, PWM ±5V full scale 10kΩ DC ~ 20kHz 42Vpk max
TRIGGER OUTPUT	Type Level Pulse Width Maximum Rate Fan-out Impedance	For ARB, Burst, Sweep TTL Compatible into 50Ω >450ns 1MHz ≥ 4 TTL Load 50Ω Typical
FREQUENCY COUNTER	Range Accuracy Time Base Resolution Input Impedance Sensitivity Ground Isolation	5Hz ~ 150MHz Time Base accuracy: ±1 count ±20ppm (23°C ±5°C) The maximum resolution is : 100nHz for 1Hz, 0.1Hz for 100MHz 1kΩ/1pf 35mVrms ~ 30Vrms (5Hz ~ 150MHz) 42Vpk max
Dual Channel Function (CH1/CH2)	Phase Track Coupling Dsolink	-180° ~ -180° Synchronize phase CH2=CH1 Frequency (Ratio or Difference); Amplitude & DC Offset ✓
OTHER	Store/Recall Interface Display	10 Groups of Setting Memories LAN (RSFG-22XX Series only), USB 4.3 inch TFT LCD, 480 × 3 (RGB) × 272
GENERAL SPECIFICATIONS	Power Source Power Amplifier Source Power Consumption Operating Environment Operating Altitude Pollution Degree Storage Temperature Dimensions & Weight	AC 100~240V, 50~60Hz DIP switch, AC 100~120V/AC 220~240V, 50~60Hz (RSFG-2120MA, RSFG-2260MRA only) 30W or 80W(with power amplifier) 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 2000 Meters IEC 61010 degree 2, Indoor use -10 ~ 70°C, Humidity : ≤ 70% 266(W) x 107(H) x 293(D) mm ; Approx. 2.5kg

The specifications apply when the function generator is powered on for at least 30 minutes under +20°C~+30°C

Note : (1). A total of ten waveforms can be stored. (Every waveform can be composed of a maximum of 16k points)

- (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). DC offset set to zero (5). Only Pluse channel support
 (4). Jitter specification for RF Generator: 20ppm +5ns (6). Only one channel output

ORDERING INFORMATION

1919722	RSFG-2110	10MHz Single Channel Arbitrary Function Generator with Pulse Generator
1919723	RSFG-2120MA	20MHz Single Channel Arbitrary Function Generator with Pulse Generator, Modulation, Power Amplifier
1919724	RSFG-2160MR	60MHz Single Channel Arbitrary Function Generator with Pulse Generator, Modulation, 320MHz RF Signal Generator
1919725	RSFG-2230M	30MHz Dual Channel Arbitrary Function Generator with Pulse Generator, Modulation
1919726	RSFG-2260M	60MHz Dual Channel Arbitrary Function Generator with Pulse Generator, Modulation
1919727	RSFG-2260MRA	60MHz Dual Channel Arbitrary Function Generator with Pulse Generator, Modulation, 320MHz RF Signal Generator, Power Amplifier

ACCESSORIES :

Quick Start Guide x 1, CD-ROM with RSFG Software and User Manual x 1

GTL-101 BNC-Alligator test lead x 1 (RSFG-2110/2120/2120MA/2160MR)

GTL-101 BNC-Alligator test lead x 2 (RSFG-2230M/2260M/2260MRA)

OPTIONAL ACCESSORIES

GTL-246 USB Type A to Type B cable

FREE DOWNLOAD

PC Software Arbitrary Waveform Editing Software