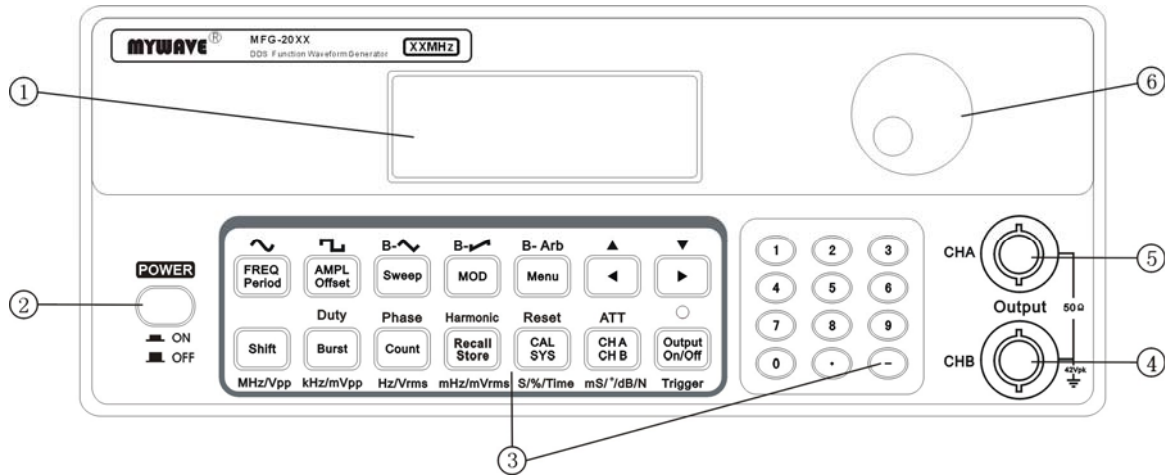# MFG-2000 Series
DDS Function Generator

◆ Main Features

- Direct Digital Synthesis (DDS) technology, 2 independent output channels

- LCD display, English/Chinese menu

- 32 kinds built-in pre-stored waveforms in Channel B

- Minimum stable output waveform: 1mV(50Ω)

- Multiple modulation functions: FM, AM, FSK, ASK, PSK

- Frequency sweep, amplitude sweep, burst and CHA&CHB add functions

- Over voltage, over current, output short-circuit and reverse voltage protections

- Optional parts: RS232, USB interface, 200MHz frequency counter, 7W(8Ω) power amplifier
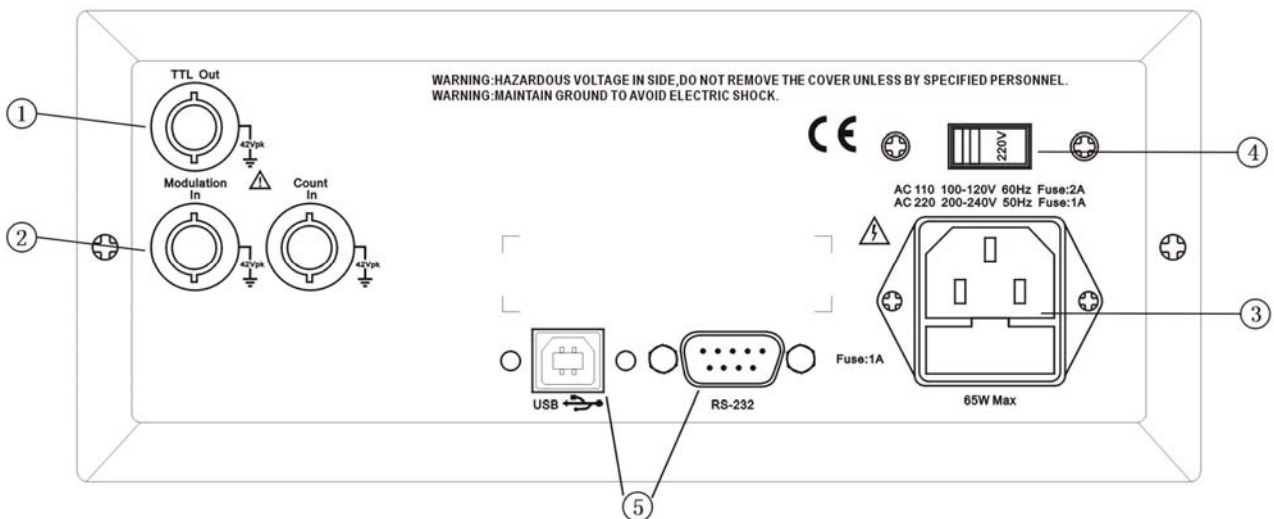
◆ Front Panel and Real Panel

Front Panel

1. LCD display
4. Channel B output

2. Power switch
5. Channel A output

3. Keypad
6. Rotary knob

Real Panel

1. TTL output (BNC)
3. Power connector with fuse
5. RS232/USB connector

2. Modulation/External signal input (BNC)
4. AC110V/220V power selection switch

◆ **Technical Specifications**

Model	MFG-2010	MFG-2020	MFG-2040	MFG-2060
Frequency range(sine)	40μHz~10MHz	40μHz~20MHz	40μHz~40MHz	40μHz~60MHz
Output Characteristics of Channel A				
Waveform Characteristics				
Waveform type	sine, square, pulse, DC			
Waveform length	4 ~ 16000 points			
Sample rate	180MSa/s			
Waveform amplitude resolution	10bits			
Sinusoidal harmonic rejection	≥50dBc (≤1MHz), ≥ 40dBc (1MHz ~ 20MHz), ≥30dBc (20MHz ~ 40MHz)			
Sine wave total distortion	≤0.5 % (20Hz ~ 200kHz)			
Pulse and square rise/fall time	≤20ns			
Pulse and square overshoot	≤5%			
Square wave duty cycle	50%			
Pulse wave duty cycle	0.1%~ 99.9%			
Frequency Characteristics				
Frequency range (sine)	2kHz ~ the maximum frequency, resolution: 40 mHz 40μHz ~ 2kHz, resolution: 40μHz			
Frequency range (square)	40μHz~20MHz			
Frequency range (pulse)	40μHz~10MHz			
Frequency accuracy	$\pm(5\times10^{-5}+40\text{mHz})$			
Frequency stability	$\pm5\times10^{-6}$/3 hours			
Amplitude Characteristics				
Amplitude range	2mVpp ~ 20Vpp (high impedance)			
Amplitude resolution	20mVpp (amplitude>2Vpp), 2mVpp (amplitude<2Vpp)			
Amplitude accuracy	±(1%+2mVrms) (high impedance, true RMS, frequency at 1kHz)			
Amplitude stability	±0.5%/3 hours			
Amplitude flatness	±5% (frequency<1MHz), ±10% (frequency between 1MHz ~ 10MHz), ±20% (frequency between 10MHz ~ 60MHz)			
Output impedance	50Ω			
Sine wave amplitude setting range (50Ω)	1mVpp ~ 10Vpp, when output frequency ≤10MHz 1mVpp ~ 5Vpp, when output frequency ≤40MHz 1mVpp ~ 2Vpp, when output frequency ≥ 40MHz			
Amplitude setting range (high impedance)	2mVpp ~ 20Vpp, when output frequency ≤10MHz 2mVpp ~ 10Vpp, when output frequency ≤40MHz 2mVpp ~ 4Vpp, when output frequency ≥40MHz			
Offset Characteristics				
Offset range	±10V (high impedance)			
Resolution	20mVdc			
Offset accuracy	±(1%+20mVdc)			
Sweep Characteristics				
Sweep type	frequency sweep, amplitude sweep			
Sweep range	free to set the start and stop points			

Sweep time	100ms~900s
Sweep direction	Up, Down, Up-Down
Sweep mode	linear, logarithmic
Control mode	auto sweep or manual sweep
Frequency Modulation Characteristics	
Modulation signal	internal or external waveforms
FM deviation	0%~20%
Amplitude Modulation Characteristics	
Modulation signal	internal or external waveforms
AM depth	0%~120%
Shift Keying Characteristics	
FSK	free to set carrier frequency and hop frequency
ASK	free to set carrier amplitude and hop amplitude
PSK	hop phase 0~360°, resolution 11.25°
Alternative rate	10ms~60s
Output Characteristics of Channel B	
Waveform Characteristics	
Waveform type	32 kinds of waveforms, like sine, square, triangle, sawtooth, ladder etc.
Waveform length	1024 points
Sample rate	12.5MSa/s
Waveform amplitude resolution	8bits
Frequency Characteristics	
Frequency range	Sine: 10mHz~1MHz Other waveforms: 10mHz~100kHz
Frequency resolution	10mHz
Frequency accuracy	$\pm(1\times10^{-5}+10\text{mHz})$
Amplitude Characteristics	
Amplitude range	50mVpp~20Vpp (high impedance)
Amplitude resolution	20mVpp
Output impedance	50Ω
Harmonic Characteristics (channel B frequency is the harmonic wave of channel A)	
Harmonic time	0.1 ~ 250.0 times
Harmonic frequency	<1MHz
Phase adjustment	coarse adjustment: 11.25 degree/step, fine adjustment: 2 degree/step
Burst Characteristics (channel B signal is used as burst signal)	
Frequency of Channel B	40mHz ~ 1MHz
Burst Frequency	10mHz ~ 50kHz
Burst count	1~65000 cycles
Burst mode	continuous burst and single burst
TTL Output Characteristics	
Waveform characteristics	Square, rise/fall time≤20ns
Frequency characteristics	same as sine wave of channel A
Amplitude characteristics	TTL, CMOS compatible, low level<0.3V, high level>4V
Common Characteristics	
Power source	Voltage: AC220V±10%, AC110V±10% (Pay attention to the position of

	voltage selection switch)
	Frequency: 50Hz ±5% Power: <45VA
Environment	Temperature: 0~40℃ Humidity: <80%
Operation characteristics	Key operation for all functions, menu display, rotary dial adjustment
Display	LCD display, English, Chinese (simplified), Chinese (traditional)
Manufacturing technology	Surface Mount Technology, Integrated Circuit. High reliability and stability.
Accessories	Power cord, Q9 test lead, Q9 BNC-clip test lead, Operation manual RS232 cable (optional), RS232 interface software CD (optional) USB cable (optional), USB interface software CD (optional)
Dimension	Machine dimension: 385(D)×260(W)×110(H)mm Chassis dimension: 415(D)×295(W)×195(H)mm
Weight	3.5kg
Optional Parts Characteristics	
Remote interface	USB Universal Serial Bus Interface RS232 serial interface
Frequency counter	Testing frequency range: 1Hz~200MHz Input signal amplitude: 100mVpp~20Vpp
Power amplifier	Max. output power: 7W (8Ω), 1W (50Ω) Max. output voltage: 22Vpp Frequency bandwidth: 1Hz~200kHz

Shenzhen Mywave Instrument Co., Ltd.

Address: 3F North, 36 Building, Yangmen Industrial Zone, Dakan, Xili,
        Nanshan District, Shenzhen, P.R. China
Post code: 518055
Tel: 0755-86114586/86114587   Fax: 0755-86164270
Http://www.szmywave.com   E-mail:mw@szmywave.com