# 5MHz~20MHz LOW-COST DDS FUNCTION GENERATOR

**DFG-2005/2010/2020**

*The DFG-2000 series LOW-COST function generators with maximum frequency of 5MHz, 10MHz and 20MHz were designed based on Direct Digital Synthesis (DDS) technology providing flexible performance and system features for basic scientific and industrial requirements. These models are equipped with 8 bit resolution, 100MSa/s sampling rate, 1024 pts memory length and 32 built-in waveforms for various waveforms for different needs.*

*The DFG-2000 series have additional functions of multiple modulations of FM, FSK, ASK and PSK, 200MHz external frequency counter, 40 sets memories and multiple protections. Low-cost, stable output frequency, high accuracy and low distortion make DFG-2000 series an ideal solution for an accurate and affordable signal source for industrial, scientific research and educational applications.*


**DFG-2020**

**DFG-2005**

**DFG-2010**

## Features

- Max. output frequency of 5MHz/10MHz/20MHz
- 2 output channels
- Direct Digital Synthesis technology (DDS)
- Min. output amplitude 1mV (50Ω) with good stability
- Sampling rate 100MSa/s, vertical resolution 8 bits and waveform length 1024 points
- 32 built-in waveforms
- 40 sets save & recall for panel settings
- Modulations: FM, FSK, ASK, PSK
- Frequency sweep, amplitude sweep, burst and TTL output functions
- Over voltage, over current, short circuit and reverse voltage protections
- High speed rotary dial and keypad input
- Standard 200MHz external frequency counter
- RS-232 interface for PC remote control
- RS232 cable & RS232 to USB cable provided

DFG-2005/2010/2020

# Technical Specification

| Model | | DFG-2005 | DFG-2010 | DFG-2020 |
|---|---|---|---|---|
| **Output frequency** | | 1μHz~5MHz | 1μHz~10MHz | 1μHz~20MHz |
| **Waveform** | | | | |
| Output waveform | | 32 built-in waveforms, including Sine, Square, Triangle, Ramp, Pulse, etc. | | |
| Waveform length | | 1024 points | | |
| Vertical resolution | | 8 bits | | |
| Sampling rate | | 100MSa/s | | |
| Sine | Harmonic distortion | ≥40dBc (<1MHz); ≥35dBc (1~20MHz) | | |
| | Total distortion | ≤1% (20Hz~200kHz) | | |
| Square | Rise/fall time | ≤35ns | | |
| | Overshoot | ≤10% | | |
| | Duty cycle | 1%~99% | | |
| **Frequency** | | | | |
| Range | Sine | 1μHz~5MHz | 1μHz~10MHz | 1μHz~20MHz |
| | Square | 1μHz~5MHz | | |
| | Other | 1μHz~1MHz | | |
| Resolution | | 1μHz | | |
| Accuracy | | $\pm 5 \times 10^{-5}$ | | |
| Stability | | $\pm 5 \times 10^{-6}$/3hours | | |
| **Output characteristics** | | | | |
| Amplitude | Range | 2mVpp~20Vpp (open circuit, ≤10MHz) | | |
| | | 2mVpp~15Vpp (open circuit, 10MHz~15MHz) | | |
| | | 2mVpp~8Vpp (open circuit, 15MHz~20MHz) | | |
| | Resolution | 20mVpp (amplitude>2Vpp); 2mVpp (amplitude<2Vpp) | | |
| | Accuracy | ±(1%+2mVrms) (open circuit, 1kHz, sine) | | |
| | Stability | ±0.5% /3hours | | |
| | Flatness | ±5% (<10MHz); ±10% (>10MHz) | | |
| | Output impedance | 50Ω | | |
| Offset | Range | ±10V (open circuit, attenuation 0 dB) | | |
| | Resolution | 20mVdc | | |
| | Accuracy | ±(1%+20mVdc) | | |
| **Sweep** | | | | |
| Parameter | | Frequency, Amplitude | | |
| Range | | Free to set start and stop point | | |
| Time | | 100ms~900s | | |
| Direction | | Up, Down, Up-Down | | |
| Mode | | Linearity, Logarithmic | | |
| Control | | Auto sweep or manual sweep | | |
| **Frequency Modulation (FM)** | | | | |
| Carrier signal | | CHA signal | | |
| Modulating signal | | CHB or external signal | | |
| Deviation | | 0%~20% | | |

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|---|---|---|---|
| **Shift Keying** | | | |
| FSK | Free to set the hop frequency and the carrier frequency | | |
| ASK | Free to set the hop amplitude and the carrier amplitude | | |
| PSK | Hop phase: 0~360°, resolution: 1° | | |
| Alternative rate | 10ms~60s | | |
| **Burst** | | | |
| Carrier signal | CHA signal | | |
| Trigger signal | TTL_A signal | | |
| Burst counts | 1~65000 cycles | | |
| Trigger source | Internal TTL, External, Single | | |
| **CHB output characteristics** | | | |
| Output waveform | 32 built-in waveforms, including Sine, Square, Triangle, Ramp, Pulse, etc. | | |
| Waveform length | 1024 points | | |
| Vertical resolution | 8 bits | | |
| Sampling rate | 12.5MSa/s | | |
| Frequency range | Sine: 1μHz~1MHz; Other: 1μHz~100kHz | | |
| Frequency resolution | 1μHz | | |
| Frequency accuracy | $\pm 1 \times 10^{-5}$ | | |
| Amplitude range | 50mVpp~20Vpp (open circuit) | | |
| Amplitude resolution | 20mVpp | | |
| Output impedance | 50Ω | | |
| CHB signal is used as burst signal | | | |
| Carrier signal | CHB signal | | |
| Trigger signal | TTL_B signal | | |
| Burst counts | 1~65000 cycles | | |
| Trigger source | Internal TTL, External, Single | | |
| **TTL output** | | | |
| Waveform | Square, rise/fall time ≤20ns | | |
| Frequency | 10mHz~1MHz | | |
| Amplitude | TTL, CMOS compatible, low<0.3V, high>4V | | |
| **Frequency counter** | | | |
| Frequency range | 1Hz~200MHz | | |
| Input amplitude | 100mVpp~20Vpp | | |
| **General** | | | |
| Operation characteristics | Key operation for all functions, Menu display, Rotary dial adjustment | | |
| Display | Mono LCD | | |
| Interface | Optional RS-232 interface | | |
| Operating environment | 0~40℃, <80%RH | | |
| Power source | AC110V/220V±10% selectable, 50/60Hz, Max. 45VA | | |
| Standard accessories | Power cord x1, Operation manual x1, BNC-BNC cable x1, Test lead x1, Software CD x1, USB Cable x1, RS-232 cable x1 | | |
| Dimension (WxHxD) | 260x110x385mm | | |
| Weight | 3.5kg | | |