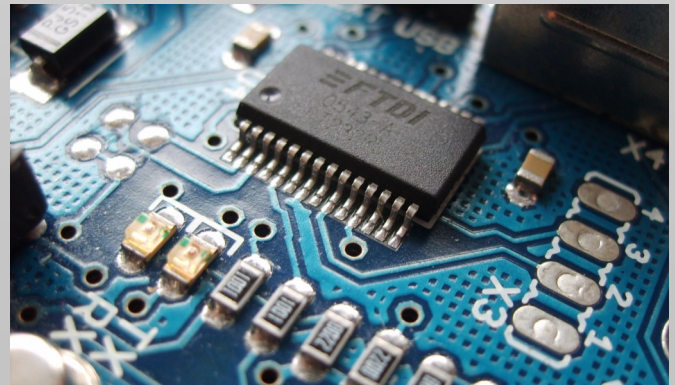# MFG-950
## Function/Waveform Generator



## Overview:

The MFG-950 is arbitrary waveform/function generator with maximum frequency of 10MHz, 20MHz and 40MHz. The MFG-950 is based on DDS (Direct Digital Synthesis) technology providing outstanding performance and system features for basic scientific and industrial requirements.
The 10 bits resolution, 180MSa/s sampling rate, 16k pts memory length, 32 built-in waveforms and 8 user-defined arbitrary waveforms create various waveforms for different needs. Free PC software for USB and RS-232 interfaces control, multiple modulations (FM, AM, FSK,PSK), 40 sets memories and multiple-protection designs make MFG-950 series an ideal solution for an accurate and affordable signal source for industrial, scientific research and educational applications.

## Features:

● Max. output frequency 10MHz/20MHz/40MHz
● 2 output channels
● 3.5-inch TFT LCD display
● Direct Digital Synthesis technology (DDS)
● Minimum output amplitude: 1mV, Maximum resolution:1μVpp
● Sampling rate 180MSa/s, vertical resolution 10 bits, waveform length 16000 points
● 32 built-in waveforms and 8 user-defined arbitrary waveforms from CHB
● 40 sets panel setting save & recall
● Modulations: FM, AM, FSK, PSK
● Frequency sweep, amplitude sweep, burst and CHA & CHB Add functions
● Over voltage protection, over current protection, short circuit protection, reverse voltage protection
● Numeric keyboard and rotary dial for data input
● Standard parts: USB interface, RS-232 interface, 200MHz frequency counter
● Optional parts: power amplifier

| Parameter | Value |
|---|---|
| **Model** | MFG-950 |
| Frequency range | 40µHz~10MHz |
| **Waveform (CHA)** | |
| Type | Sine, Square, Pulse, DC |
| Length | 4~16000 points |
| Vertical resolution | 10 bits |
| Sampling rate | 180MSa/s |
| Harmonic distortion of sine | ≥50dBc (<1MHz); ≥45dBc (1~10MHz); ≥40dBc (10~20MHz); ≥30dBc (>20MHz) |
| Total distortion of sine | ≤0.1% (20Hz~200kHz) |
| Rise/fall time of pulse & square | ≤20ns |
| Overshoot of pulse & square | ≤5% |
| Duty cycle of square | 50.0% |
| Duty cycle of pulse | 1%~99% (≤1MHz) |
| **Frequency (CHA)** | |
| Since | 40µHz~10MHz |
| Square | 40µHz~10MHz |
| Pulse | 40µHz~10MHz |
| Internal standard frequency | Temperature compensation 26MHz |
| Resolution | 40µHz (40µHz~2kHz); 40mHz (>2kHz) |
| Accuracy | ±(5×10-5+40mHz) |
| Stability | ±1×10-6 /3hours (small TCXO) |
| **Amplitude (CHA)** | |
| Range | 1mVpp~20Vpp (high impedance) |
| Resolution | 1µVpp (high impedance) |
| Accuracy | ±(1%+1mVrms) (high impedance, RMS, frequency 1kHz) |
| Stability | ±0.5% /3hours |
| Flatness | ±5% (frequency <5MHz); ±10% (frequency 5~10MHz); ±20% (frequency >10MHz) |
| Output impedance | 50Ω |
| Amplitude setting range of sine (50Ω) | 1mVpp~10Vpp, when output frequency ≤10MHz 1mVpp~7Vpp, when output frequency ≤40MHz |
| Amplitude setting range (high impedance) | 1mVpp~20Vpp, when output frequency ≤10MHz 1mVpp~14Vpp, when output frequency ≤40MHz |
| **DC Offset (CHA)** | |
| Range | ±10V (high impedance, attenuation 0 dB) |
| Resolution | 20mVdc |
| Accuracy | ±(1%+20mVdc) |
| **Sweep (CHA)** | |
| Parameter | Frequency, Amplitude |
| Range | Free to set starting point and end point |
| Time | 100ms~600s |
| Direction | Up, Down, Up-Down |
| Mode | Linearity, Logarithmic |
| Control | Auto sweep or manual sweep |
| **Frequency Modulation (FM) (CHA)** | |
| Carrier signal | Sine or square, frequency range same as main signal |
| Modulating mode | Internal or external |
| Modulating signal | CHB or external signal |
| Modulating signal frequency | Same as CHB signal |
| FM deviation | 0%~20% |
| External input signal amplitude | 20Vpp (-10V~+10V) |
| External FM | Carrier frequency accuracy ≤10-3, modulation error ≤ ±20% |

| Parameter | Value |
|---|---|
| **Amplitude Modulation (AM) (CHA)** | |
| Carrier signal | Sine or square, frequency range same as main signal |
| Modulating mode | Internal or external |
| Modulating signal | CHB or external signal |
| Modulating signal frequency | Same as CHB signal |
| Distortion | ≤2% |
| AM depth | 0%~120% |
| Relative modulating error | ≤±5% |
| External input signal amplitude | 20Vpp (-10V~+10V) |
| **Shift Keying (CHA)** | |
| FSK | Free to set the hop frequency and the carrier frequency |
| PSK | Hop phase: 0~360°, resolution: 11.25° |
| Control | Internal |
| Alternative rate | 10ms~60s |
| **Waveform (CHB)** | |
| Type | 32 built-in waveforms, including Sine, Square, Triangle, Saw tooth, Ladder, etc. And 8 user-defined arbitrary waveforms |
| Length | 1024 points |
| Vertical resolution | 8 bits |
| Sampling rate | 100MSa/s |
| **Frequency (CHB)** | |
| Range | Sine: 10mHz~1MHz; Other: 10mHz~50kHz |
| Resolution | 40mHz |
| Accuracy | ±(1×10-5+40mHz) |
| **Amplitude (CHB)** | |
| Range | 100mVpp~20Vpp (high impedance) |
| Resolution | 2mVpp |
| Output impedance | 50Ω |
| **Harmonic (CHB)** | |
| CHB signal is used as the harmonic signal of CHA | |
| Number of times | 0.1~250.0 times |
| Frequency | <1MHz |
| Phase adjustment | 1°/step |
| **Burst (CHB)** | |
| CHB signal is used as burst signal | |
| Frequency of CHB | 40mHz~1MHz |
| Burst frequency | 10mHz~50kHz |
| Burst count | 1~65000 cycles |
| Trigger mode | Internal, Single, TTL |
| **Frequency counter** | |
| Testing frequency range | 1Hz~200MHz |
| Input signal amplitude | 100mVpp~20Vpp |
| **Remote Control** | USB interface, RS-232 interface |
| **General** | |
| Operation characteristics | Key operation for all functions, Menu display, Rotary dial adjustment |
| Display | TFT LCD |
| Language | English, Chinese (simplified), Chinese (traditional) |
| Power source | AC110V/220V±10% selectable, 50/60Hz, Max. 45VA |
| Environmental condition | 0~40℃, <80%RH |
| Standard accessories | Power cord x1, Operation manual x1, Software CD x1, USB cable x1, RS-232 cable x1, BNC-BNC cable x1, Test lead x1 |
| Dimension | 385x260x110mm |
| Weight | 4kg |