Quality&**Precise**

MAXWELLON MXF20A

1μHz~5/10/20MHz

DDS Function Generator/counter

2023

Maxwellon

This instrument is a precision test instrument, with the function of output function signal, frequency modulation, amplitude modulation, FSK, PSK, burst, frequency sweep and other signals. In addition, this instrument also has the function of frequency measurement and counting. This instrument is an ideal test equipment for electronic engineers, electronic laboratories, production lines, teaching and scientific research.

Key Feature

- Direct Digital Compositing (DDS) is used.
- The output frequency of the main waveform is 1μHz ~ 50MHz.
- The output amplitude of small signal can reach 1mV.
- The duty cycle resolution of the pulse wave is as high as 1/1000.
- Digital frequency modulation and amplitude modulation have high resolution and accuracy.
- The burst mode has the function of continuous phase adjustment.
- The frequency sweep output can be arbitrarily set to the starting point and end frequency.
- The phase adjustment resolution is up to 0.1 degrees.
- Amplitude modulation system 1% ~ 100% can be set arbitrarily.
- More than 30 kinds of output waveforms.
- It has the function of frequency measurement and counting.
- The chassis is beautiful and generous, and the key operation is comfortable and flexible.
- It has a second output, which can control the phase difference with the first signal.

Specification

Function Signal Generator		
1. Waveform Characteristics		
Main Waveform	Type	Sine wave, square wave
	Waveform amplitude resolution	12 bits
	Sampling rate	200Msa/s
	Sine wave harmonic distortion	≤ -50dBc (frequency ≤ 5MHz)
		≤ -45dBc (frequency ≤ 10MHz)
		≤ -40dBc (frequency ≤ 20MHz)
		≤ -35dBc (frequency ≤ 20MHz)
	Sine wave distortion	≤ 0.2% (frequency: 20Hz~100kHz)
	Square wave rise and fall time	≤25ns(MXF05A ≤ 28ns)
	Note: Sine wave harmonic distortion, sine wave distortion, square wave rise and fall time test conditions: output amplitude 2Vp-p (high resistance), ambient temperature 25°C±5°C	
Store Waveform	Type	26 waveforms including sine wave, square wave, pulse wave, triangular wave, serrated wave, stepped wave, etc. TTL waveform (only MXF20A, output frequency is the same as the main waveform)
	Waveform length	4096 point
	Waveform amplitude resolution	12 bits
	pulse duty factor	1.0% ~ 99.9% (frequency≤10kHz); 10% ~ 90% (10kHz ~ 100kHz)
	Pulse wave rise and fall time	≤1us
	DC output error	≤±10%+10mV (output voltage range 10mV~10V)
TTL waveform output (MXF05A,MXF10A)	Output frequency	same as the main waveform
	Output amplitude	Low level<0.5 V; High level>2.5 V
	Output impedance	600 Ω

Function Signal Generator		
2. Frequency characteristics		
Frequency range	Main waveform	Sine wave 1 μ Hz~5MHz; Square wave 10Hz~5MHz (MXF05A)
		Sine wave 1 μ Hz~10MHz; Square wave 10Hz~10MHz (MXF10A)
		Sine wave 1 μ Hz~20MHz; Square wave 10Hz~20MHz (MXF20A)
		Sine wave 1 μ Hz~30MHz; Square wave 10Hz~20MHz (MXF30A)
		Sine wave 1 μ Hz~50MHz; Square wave 10Hz~20MHz (MXF50A)
	Store Waveform	1μHz ~ 100kHz
Resolution		1μHz
Frequency error		≤±5×10^{-4}
Frequency stability		±5×10^{-5}
3. Amplitude characteristic		
Amplitude range	f≤20MHz	1mV ~ 20Vp-p (High resistance); 0.5mV ~ 10Vp-p (50Ω)
	f>20MHz	-56dBm ~ +13dBm
Max Resolution		2μVp-p (High resistance)
		1μVp-p (50Ω)
Amplitude error		≤ ±2%+1mV (frequency 1kHz sine wave)
Amplitude stability		±1 % /3 hours
Flatness	Sine wave	±5%(f≤5MHz)
		±10%(f>5MHz)
	Other waveforms	±5%(f≤50 kHz)
		±20%(f>50 kHz)
Output Impedance		50Ω
Amplitude unit		Vp-p, mVp-p, Vrms, mVrms, dBm
4.Offset characteristics		
DC offset(High resistance)		±(10V-Vpk ac)
Max Resolution		2μV (High resistance)
		1μV (50Ω)
Offset error		≤ ± (10%+10mV) (high resistance)
5. AM characteristic		
Carrier Signal		The waveform is a sine wave, with the same frequency range as the main waveform
Modulation Mode		Internal or External
Modulation Signal		Internal 5 waveforms (sine, square, triangular, ascending sawtooth, descending sawtooth) or external input signals
Modulated Signal Frequency		1Hz~20kHz (internal); 100Hz~10kHz (external)
Distortion		≤ 1% (modulation signal frequency 1kHz sine wave)
Modulation Depth		1% ~ 100%
Relative Modulation Error		≤ ±5% +0.5 (modulation signal frequency 1kHz sine wave)
External Input Signal Amplitude		3Vp-p(-1.5V~ +1.5V)
6. FM characteristics		
Carrier Signal		The waveform is a sine wave, with the same frequency range as the main waveform
Modulation Mode		Internal or External
Modulation Signal		Internal 5 waveforms (sine, square, triangular, ascending sawtooth, descending sawtooth) or external input signals
Modulated Signal Frequency		1Hz~10kHz (internal); 100Hz~10kHz (external)
Frequency Offset		The Max. frequency offset of frequency modulation is 50% of the carrier frequency, and (the frequency offset + the carrier frequency) < (the Max. operating frequency+100 kHz)
External frequency modulation		Carrier frequency accuracy ≤ 10^{-2}, frequency deviation error ≤ ± 20%
Distortion		≤ 1% (modulation signal frequency 1kHz sine wave)
Relative modulation error		≤ ± 5% Set value ± 50Hz (modulation signal frequency 1kHz sine wave)

Function Signal Generator	
External input signal amplitude	3Vp-p (-1.5V~ +1.5V)
FSK	Frequency 1 and frequency 2 can be set arbitrarily
Control Mode	Internal or external (external control: TTL level, low level F1; high level F2)
Alternating Rate	0.1ms ~ 800s
7. PM characteristics	
Basic signal	The waveform is a sine wave, with the same frequency range as the main waveform
PSK	Phase 1 (P1) and Phase 2 (P2); Range: 0.1~360.0 °
Resolution	0.1 °
Alternating time interval	0.1ms~800s
Control method	internal or external (external control TTL level, low level P2, high level P1)
8. Burst	
Basic signal	The waveform is a sine wave, with the same frequency range as the main waveform
Burst count	1-30000 cycles and COUNT ≤ 800 * Freq (Hz)
Burst signal alternating time interval	0.1ms~800s
Control mode	internal (automatic)/external (single manual button triggering, external input TTL pulse rising edge triggering)
9. Frequency Sweep characteristics	
Signal waveform	Sine wave
Sweep Range	The frequency range of the scanning starting point is the same as the main waveform
	Scan termination point frequency range is the same as the main waveform
Sweep Time	1ms~800s (linear)
	100ms~800s (logarithmic)
Sweep step time	1ms~800s (step sweep)
Sweep interval	0ms~800s (step sweep)
Sweep Mode	Linear sweep, logarithmic sweep, and step sweep
External trigger signal frequency	≤ 1kHz (linear)
	≤ 10Hz (logarithmic)
Control Mode	Internal (automatic)/External (single manual button trigger, external input TTL pulse rising edge trigger)
10. Modulated signal output	
Output Frequency	1Hz ~ 20kHz
Output Waveform	sine wave, square wave, triangle, rising sawtooth, falling sawtooth
Output Amplitude	5Vp-p ± 5% (Sine wave, frequency ≤ 10kHz)
Output Impedance	600 Ω
11.External standard frequency input	
Signal amplitude: 3Vp-p	
Signal frequency 10MHz	
12. Storage characteristics	
Storage parameters	The frequency value, amplitude value, waveform, DC offset value, and functional status of the signal.
Storage capacity	10 signals
Reproduction mode	Call up all stored signals with corresponding serial numbers
Storage time	10 years
13. Computational characteristics	
When entering and displaying data, you can use both frequency and period values, and you can use both amplitude RMS values and amplitude peak-to-peak and dBm values.	
14. Operational characteristics	
In addition to the direct input of the digital health, the data can be continuously adjusted using the adjustment knob for flexible operation.	

Counter

Frequency measurement range	Frequency Measurement		10Hz ~ 100MHz
	Counting Repetition Rate		≤50MHz
Input characteristics	Min. Input Voltage	ATT on	50mVrms (frequency: 100Hz ~ 50MHz)
			100mVrms (frequency: 10Hz ~ 100MHz)
		ATT closed	0.5Vrms (frequency: 100Hz ~ 50MHz)
			1Vrms (frequency: 10Hz ~ 100MHz)
	Max. Allowable Input Voltage		100Vp-p (frequency ≤ 100kHz)
			20Vp-p (frequency ≤ 100MHz)
	Impedance		R>500kΩ
			C<30PF
	Coupling mode		AC
	Waveform		Sine wave, square wave
	Low Pass Filter	The cutoff frequency	100kHz
		In band attenuation	≤ -3 dB
		Out of band attenuation	≥ -30 dB (frequency>1MHz)
Measurement time			10ms~10s continuously adjustable
Display digit			8 (gate time>5s)
Counting capacity			≤4.29×10^{9}
Counting control mode			manual
Measurement error			time base error ± trigger error (if the signal-to-noise ratio of the measured signal is better than 40dB, the trigger error is ≤ 0.3)
Time Base	Category		Small temperature compensated crystal oscillator
	Nominal frequency		10MHz
	Stability		better than ± 1×10^{-6} (22°C ± 5°C)

Others

Conditions

Power supply voltage:198~242V
Frequency:47~53Hz
Power consumption:<35W
Environmental temperature:0~40°C

Physical property

Chassis size: 255×370×100 (mm)
Using surface mount technology and large-scale integrated circuits, it has high reliability, small size, and light weight.
11 bit high brightness VFD display.

Program control

This machine is equipped with an RS232C serial interface, which can form an automatic testing system with other instruments under the control of a computer.

Option

1.This machine can be purchased with USB interface (option 1) or RS485 interface (option 2), which can form an automatic testing system with other instruments under the control of a computer.
2.High stability time base (option 3)
This machine can choose to purchase high stability time based crystal oscillators or small temperature compensated crystal oscillators, which make the output signal more accurate and stable.
3.Power amplifier module ≥ 3W (option 4)
4.B output module (option 5)

Ordering Information

Model

Model	Name	Description
MXF05A	DDS Function Generator/Counter	1μHz ~ 5MHz
MXF10A	DDS Function Generator/Counter	1μHz ~ 10MHz
MXF20A	DDS Function Generator/Counter	1μHz ~ 20MHz
MXF30A	DDS Function Generator/Counter	1μHz ~ 30MHz
MXF50A	DDS Function Generator/Counter	1μHz ~ 50MHz

Standard

No.	Name	Qty.
1	BNC - Double clip cable	1 pc
2	BNC test cable	1 pc
5	Power cord	1 pc
6	Product User Manual	1 pc
7	Product qualification certificate	1 pc
8	0.5A/2220V fuse (installed in the socket)	2 pc

Option

No.	Name	Qty.
1	USB interface	1 pc
2	RS-485 interface	1 pc
3	High stability time base	1 pc
4	Power plug-in	1 pc
5	Dual plug-in	1 pc
6	50 Ω impedance matcher	1 pc

Maxwellon Electronic Instruments Co.,LTD.

Factory: No.6 XiangJiang Road, Qingdao 266000, China
Tel: 0086 13816527810

Sales Office: NO.153 Zhuzhou Rd.,Laoshan District, Qingdao 266100, China.
Tel: 0086-532-80977508
Fax: 0086-532-80977508

Sales: Sales@Maxwellon.com
Web: www.maxwellon.com