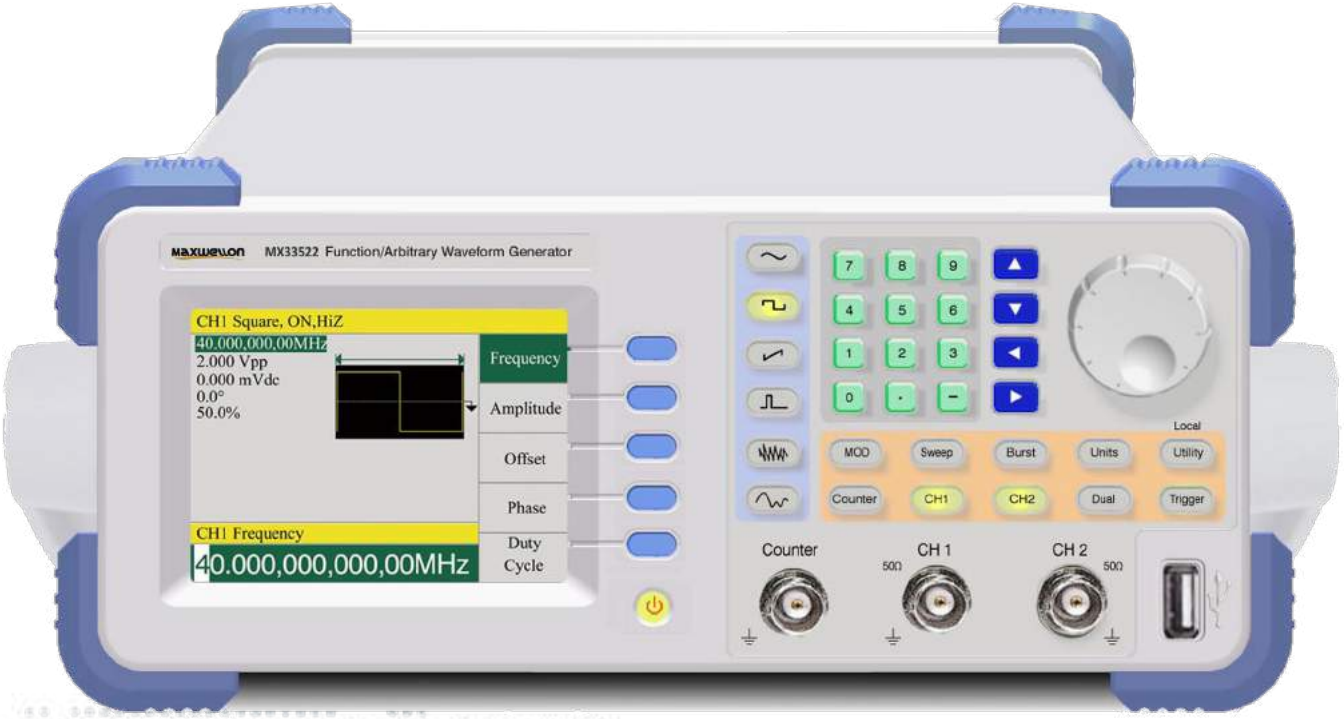
Quality&**Precise**



MAXWELLON MX33522

1μHz~88/128/160MHz

Function/Arbitrary Generator

2023

Maxwellon

MX33522 Function/Arbitrary Wave Signal Generator is a signal generator that utilizes the latest unique digital filtering technology, capable of outputting high-precision, high stability, low distortion, and low jitter signal waveforms. It can be equipped with any waveform signal generation module. Help you accelerate development speed, improve product quality and reliability.

Key Feature

- Adopting the latest unique digital filtering technology to achieve low jitter output, with edge jitter ≤ 50ps rms
- Embedded 400MSa/s arbitrary waveform generator
- Accurate pulse waveform with adjustable edges
- Sinusoidal waveform output 1 μ Hz~160MHz/128MHz/88MHz
- Small signal amplitude can reach 1mVpp (50 Ω)
- All digital modulation
- Output multiple standard waveforms
- The chassis design is beautiful and generous, and the button operation is comfortable and flexible
- Large screen TFT LCD display, user-friendly and intuitive interface
- Built-in 16384 points downloadable arbitrary waveform generation memory
- Optional GPIB interface
- Optional LAN interface
- Built in counter with 8 digits/s and 1000MHz bandwidth

Specification

Waveform Characteristics		
Output Waveform	Sine, Square, Ramp, Pulse, Noise, Arb, DC	
Frequency Accuracy	Frequency error: ≤ ± 5 × 10^{-6}	
	Frequency stability: ± 1 × 10^{-6}	
Sine	Frequency range	1μHz ~ 88 MHz (MX33522-88), Resolution 1μHz
		1μHz ~ 128 MHz (MX33522-128), Resolution 1μHz
		1μHz ~ 160 MHz (MX33522-160), Resolution 1μHz
	Harmonic distortion	≤ -50dBc (DC ≤ f ≤1MHz)
		≤ -45dBc (1MHz ≤ f ≤10MHz)
		≤ -35dBc (10MHz ≤ f ≤100MHz)
		≤ -30dBc (100MHz ≤ f ≤160MHz)
	Total distortion (0dBm)	≤0.2% (1Vpp, DC ≤ f ≤20 kHz)
	Phase Noise (100kHz offset)	-116dBc/Hz
Square	Frequency range	1μHz ~ 50 MHz, Resolution 1μHz
	Rising/ Falling Edge	5ns fixed value
	Duty cycle	0.1% ~ 99.9%
	Resolution	0.1%
	Overshoot	≤3%
	Edge jitter	≤50ps rms
Ramp	Frequency range	1μHz ~ 4 MHz, Resolution 1μHz
	Symmetry	0.0% ~ 100.0% (0% refers to negative Ramp waves, 100% refers to positive Ramp waves, and 50% refers to triangular waves)
	Resolution	0.1%
	Non linearity	≤0.1%

Pulse	Frequency range	1μHz ~ 40 MHz, Resolution 1μHz
	Rising/ Falling Edge	5ns ~ 1us (Independently variable), Resolution 0.1ns
	Duty cycle	0.1% ~ 99.9%, Resolution 0.1%
	Pulse width	≥ 12 ns, Resolution 0.1ns
	Overshoot	≤3%
	Edge jitter	≤100ps rms
Noise	400 MHz bandwidth white noise (-3 dB)	
	Recurrence period greater than 20 years	
Arbitrary	Frequency	1μHz ~ 40MHz, Resolution 1μHz
	Waveform length	16384 Samples
	Amplitude resolution	14 bits
Amplitude Characteristic		
Amplitude Range	1mVpp~ 10Vpp f ≤40MHz (50Ω)	
	1mVpp~ 5Vpp 40MHz < f ≤100MHz (50Ω)	
	1mVpp~ 2.5Vpp 100MHz < f ≤130MHz (50Ω)	
	1mVpp~ 1.5Vpp 130MHz < f ≤160MHz (50Ω)	
Resolution	±0.3dBm + 1mVpp	
Flatness (Relative to 1100kHz, 1V)	f ≤ 10MHz: ≤±0.2 dB	
	10MHz < f ≤ 60MHz: ≤±0.4 dB	
	60MHz < f ≤100MHz: ≤±0.8 dB	
	100MHz < f ≤160MHz: ≤±1.0 dB	
Accuracy	± 1% set value ± 1mVpp (at 1kHz)	
Offset Characteristic		
Offset level range	±(10 VDC –AC peak value) (High Z)	
	±(5 VDC –AC peak value) (50 Ω)	
	Vpp ≤ 2 (Vmax - | Voffset |). (Vmax varies for different frequency bands)	
Resolution	4 significant digits	
Accuracy	± 1% offset setting value ± 0.25% amplitude setting value ± 2mV	
AM/DSB		
Carrier Waveform	Sine, Square, Ramp, Pulse, Noise, Arb	
Modulation Waveform	Sine, Square, Triangle, Ramp, nRamp, Noise, Arb	
Modulation Frequency	Internal	1mHz ~ 1MHz, Resolution 1mHz
	External	DC ~50 kHz(-3dB)
Modulation Depth	0.0%~ 120.0%, Resolution 0.1%	
	Accuracy: ±1.0%	
Modulation Source	Int/Ext	
FM		
Carrier Waveform	Sine, Square, Ramp, Pulse	
Modulation Waveform	Sine, Square, Triangle, upRamp, dnRamp, Noise, Arb	
Modulation Frequency	Internal	1μHz to Carrier Frequency, Resolution 1μHz
Modulation Source	Int/Ext	
PM		
Carrier Waveform	Sine, Square, Ramp, Pulse	
Modulation Waveform	Sine, Square, Triangle, upRamp, dnRamp, Noise, Arb	
Modulation Frequency	Internal	1mHz ~ 1MHz, Resolution 1mHz
	External	DC ~50 kHz (-3dB)
Modulation Depth	0.00°~360.0°; Resolution 0.1°	
Modulation Source	Int/Ext	

Pulse Width Modulation (PWM)		
Carrier Waveform	Pulse	
Modulation Waveform	Sine, Square, Triangle, upRamp, dnRamp, Noise, Arb	
Modulation Frequency	Internal	1mHz ~ 1MHz, Resolution 1mHz
	External	DC ~50 kHz (-3dB)
Modulation Depth	0.0ns ~ width - 12 ns; Resolution 0.1ns	
Modulation Source	Int/Ext	
FSK		
Carrier Waveform	Sine, Square, Ramp, Pulse	
Frequency-Hopping	1μHz ~ FMAX (Sine) 1μHz ~ 50 MHz (Square) 1μHz ~ 40 MHz (Pulse/Arb) 1μHz ~ 4 MHz (Ramp) Resolution 1μHz	
Switching Rate	1mHz ~1 MHz; Resolution 1mHz	
Modulation Source	Int/Ext	
BPSK		
Carrier Waveform	Sine, Square, Ramp, Pulse, Arb	
Phase Jump	0.0° ~ 360.0°; Resolution 0.1°	
Switching Rate	1mHz ~1 MHz; Resolution 1mHz	
Modulation Source	Int/Ext	
ASK		
Carrier Waveform	Sine, Square, Ramp, Pulse	
Switching Rate	1mHz ~1MHz; Resolution 1mHz	
Modulation Source	Int/Ext	
SUM		
Carrier Waveform	Sine, Square, Ramp, Pulse, Noise, Arb	
Modulated Waveform	Sine, Square, Triangle, upRamp, dnRamp, Noise, Arb	
Modulation Frequency	Internal	1mHz ~ 1MHz, Resolution 1mHz
	External	DC ~50 kHz (-3dB)
Modulation Depth	0.0%~ 100.0%, Resolution 0.1%	
Modulation Source	Int/Ext	
QFSK		
Carrier Waveform	Sine, Square, Ramp, Pulse	
Hopping Frequency	1μHz ~ FMAX(Sine) 1μHz ~ 50 MHz(Square) 1μHz ~ 40 MHz (Pulse/Arb) 1μHz ~ 4 MHz(Ramp) Resolution 1μHz	
Switching rate	1mHz ~1 MHz; Resolution 1mHz	
Trigger source	Int/Ext	
QPSK		
Carrier Waveform	Sine, Square, Ramp, Pulse, Arb	
Phase Jump	0.0° ~ 360.0°; Resolution 0.1°	
Switching Rate	1mHz ~1 MHz; Resolution 1mHz	
Modulation Source	Int/Ext	

Sweep	
Carrier Waveform	Sine, Square, Ramp, Pulse
Start Frequency	1μHz ~ FMAX(Sine) 1μHz ~ 50 MHz(Square) 1μHz ~ 40 MHz(Pulse/Arb) 1μHz ~ 4 MHz(Ramp) Resolution 1μHz
Termination Frequency	1μHz ~ FMAX(Sine) 1μHz ~ 50 MHz(Square) 1μHz ~ 40 MHz(Pulse/Arb) 1μHz ~ 4 MHz(Ramp) Resolution 1μHz
Sweep Mode	Linear/Log
Sweep Time	0.001s ~ 3600s; resolution 1mSec
Hold Time	0.000s ~ 3600s; resolution 1mSec
Return Time	0.000s ~ 3600s; resolution 1mSec
Trigger Source	Internal/External/Single
Burst	
Carrier Waveform	Sine, Square, Ramp, Pulse, Arb
Burst Mode	N Cycle/Gated
Start Phase	0.0° ~ 360.0°; Resolution 0.1°
Number of burst waveforms	1 ~ 1000000; Resolution 1
Interval	1μS ~ 1000 S; Resolution 1μS
Trigger Source	Internal/External/Single
Counter	
Measurement Function	Frequency, cycle, pulse width (positive), duty cycle
Frequency Input Range	10Hz ~1000 MHz
Input coupling method	AC / DC
Input high-frequency suppression	High frequency noise suppression (Filter) The cutoff frequency is approximately 100kHz In band attenuation: ≤ -3 dB Out of band attenuation: ≥ -30 dB (f>1MHz)
Measurement Accuracy	8 digits/s
Sync	
Output Port	BNC
Output Impedance	50 Ω
Output	
Output Port	BNC
Output impedance	50 Ω overload protection
Trig In	
Input Port	BNC
Input impedance	10 kΩ, DC coupling
input voltage	Low level 0 V~0.4 V, high level>2.3 V, maximum 3.5 V
Minimum pulse width	100ns
Mod In	
Input Port	BNC
Input Impedance	5 kΩ
Input Level	± 6Vpk=100% modulation
Input Bandwidth	DC~50 kHz (-3dB typical value)

10MHz Out	
Input Port	BNC
Input Impedance	50 Ω AC coupling (nominal value)
Input Frequency	10 MHz
Input Level	>1Vpp
10MHz In	
Input Port	BNC
Input Impedance	1 kΩ | | 20pF, AC coupling (nominal value)
Input Frequency	10 MHz ± 50 Hz
Input Voltage	1Vpp ~ 3.3 Vpp
Interface	
Interface Configuration	USB, LAN(option), GPIB(option)
Arb Storage Depth	
Volatile Memory	16384 points
Mechanical Properties	
Dimensions	260mm × 105mm ×290mm
Weight	2.5kg
Work Environment	
Storage Temperature	-30˚C~70˚C
Working Temperature	0˚C~55˚C
Working Humidity	5%~80% relative humidity
Preheating Time	60 minutes
External Power Supply	
Supply Voltage	198 ~ 242VAC (47 ~ 53Hz)
Power Consumption	< 40 W

Working Mode and Carrier Waveform

Working Mode / Carrier Waveform	AM	FM	PM	PWM	DSB	FSK	BPSK	ASK	SWEEP	BURST	SUM	QFSK	QPSK
SINE	●	●	●		●	●	●	●	●	●	●	●	●
SQUARE	●	●	●		●	●	●	●	●	●	●	●	●
RAMP	●	●	●		●	●	●	●	●	●	●	●	●
PULSE	●	●	●	●	●	●	●	●	●	●	●	●	●
NOISE	●				●			●			●		
ARB	●	●	●		●	●	●	●	●	●	●	●	●

Carrier and Modulation Waveform

Mod Waveform / Carrier	SINE	SQUARE	TRIANGLE	UP RAMP	DN RAMP	NOISE	ARB
SINE	●	●	●	●	●	●	●
SQUARE	●	●	●	●	●	●	●
RAMP	●	●	●	●	●	●	●
PULSE	●	●	●	●	●	●	●
NOISE	●	●	●	●	●		●
ARB	●	●	●	●	●	●	

Ordering Information

Model

Model	Name	Description
MXSP33522-88	Function/Arbitrary Generator	1μHz ~ 88 MHz
MXSP33522-128	Function/Arbitrary Generator	1μHz ~ 128 MHz
MXSP33522-160	Function/Arbitrary Generator	1μHz ~ 160 MHz

Standard

No.	Name	Qty.
1	USB communication cable	1 pc
2	BNC test cable	1 pc
3	BNC double clip cable	1 pc
4	Power cord	1 pc
5	Product User Manual	1 pc
6	Product Qualification Certificate	1 pc
7	0.5A/2220V fuse (installed in socket)	2 pc
8	USB driver and testing software	1 pc
9	Arbitrary wave generation software	1 pc
10	LAN interface and testing software	1 pc

Option

No.	Name	Qty.
1	GPIB interface	1 pc
2	LAN interface	1 pc

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