

KEYSIGHT TECHNOLOGIES (AGILENT HP)

33210A

The Keysight (formerly Agilent) 33210A is a highly reliable 10 MHz function and arbitrary waveform generator that delivers exceptional stability, low distortion, and versatile signal generation capabilities. Standard waveforms include sine, square, ramp, triangle, noise, and pulse with variable edge times, with an option (Option 002) for full 14-bit, 50 MSa/s arbitrary waveform generation. Featuring standard USB, GPIB, and LAN (LXI Class C) interfaces, the 33210A easily integrates into automated test environments while providing an intuitive front panel and graphical display for benchtop operation.

SPECIFICATIONS

General

Interfaces	USB 2.0, LAN (LXI Class C), GPIB (IEEE-488.2)
Display	Graphical LCD with backlighting (supports text and graph modes)

Physical

Power Supply	100 - 240 V ($\pm 10\%$) @ 50 - 60 Hz; 100 - 127 V @ 50 - 400 Hz; < 50 VA power consumption
Operating Temperature	0 °C to 55 °C °C
Dimensions (W×H×D)	261.1 mm × 103.8 mm × 303.2 mm (with bumpers) mm
Weight	3.4 kg kg

Waveform Generation & Frequency

Number of Channels	1 channel
Standard Waveforms	Sine, Square, Ramp, Triangle, Pulse, Noise, DC
Arbitrary Waveforms	Optional (Option 002)
Frequency Resolution	1 mHz

Sine Wave Performance

Sine Frequency Range	1 mHz to 10 MHz
Sine Amplitude Flatness (< 100 kHz)	± 0.1 dB
Sine Amplitude Flatness (100 kHz to 5 MHz)	± 0.15 dB
Sine Amplitude Flatness (5 MHz to 10 MHz)	± 0.2 dB
Sine Harmonic Distortion (DC to 20 kHz)	-70 dBc @ 1 Vpp
Sine Harmonic Distortion (20 kHz to 100 kHz)	-65 dBc @ 1 Vpp
Sine Harmonic Distortion (100 kHz to 1 MHz)	-50 dBc @ 1 Vpp
Sine Harmonic Distortion (1 MHz to 10 MHz)	-40 dBc @ 1 Vpp
Total Harmonic Distortion (DC to 20 kHz)	< 0.04%
Spurious Noise (Non-Harmonic, < 10 MHz)	-70 dBc (DC to 1 MHz), -70 dBc + 6 dB/octave (1 MHz to 10 MHz)
Phase Noise (10 kHz offset, typical)	-115 dBc/Hz

Square & Pulse Performance

Square Frequency Range	1 mHz to 10 MHz
Square Rise/Fall Time	< 20 ns
Square Overshoot	< 2%
Square Duty Cycle (to 5 MHz)	20% to 80% (to 10 MHz)
Pulse Frequency Range	1 mHz to 5 MHz

Ramp, Triangle, and Noise Performance

Ramp/Triangle Frequency Range	1 mHz to 100 kHz
Ramp Linearity	< 0.1% of peak output (to 10 kHz)
Ramp Symmetry Range	0.0% to 100.0%
Noise Bandwidth	7 MHz (typical)
Noise Type	White Gaussian

Arbitrary Waveform Characteristics

Arbitrary Vertical Resolution (Option 002)	14 bits (including sign)
Arbitrary Sample Rate (Option 002)	50 MSa/s
Arbitrary Non-Volatile Memory (Option 002)	4 waveforms of 8k points each

Modulation, Sweep, and Burst

Modulation Types	AM, FM, PM, FSK, PWM
AM Modulating Source	Internal or External
AM Modulation Depth	0.0% to 120.0%
PM Phase Deviation	0.0 to 360.0 degrees
FSK Keying Rate	2 mHz to 100 kHz
Sweep Type	Linear or Logarithmic
Sweep Direction	Up or Down
Sweep Time	1 ms to 500 s
Burst Type	Triggered (1 to 50,000 cycles), Infinite, Gated
Burst Start/Stop Phase	-360.0 to +360.0 degrees
Internal Modulating Frequency	2 mHz to 20 kHz

Inputs & Outputs

Main Output Impedance	50 Ω (typical) or High-Z
Main Output Amplitude Range (50 Ohm)	10 mVpp to 10 Vpp
Main Output Amplitude Range (Open Circuit)	20 mVpp to 20 Vpp
Main Output DC Offset Range (50 Ohm)	± 5 V pk AC+DC
Main Output DC Offset Range (Open Circuit)	± 10 V pk AC+DC
Main Output Units	Vpp, Vrms, dBm
Main Output Isolation	42 Vpk to earth
Sync Output Impedance	50 Ω (nominal)
External Modulation Input Range	± 5 V full scale
External Modulation Input Impedance	10 k Ω
External Trigger Input Level	TTL compatible
External Trigger Input Slope	Rising or Falling (selectable)

System Interfaces & Control

Programming Languages	SCPI-1993, IEEE-488.2
State Storage Memory Slots	4 user-storable states

Environmental & Regulatory

Storage Temperature Range	-30 °C to +70 °C
Operating Altitude	Up to 3,000 meters
Warm-Up Time	1 hour

Trigger Characteristics

External Trigger Input Impedance	> 10 kOhm, DC coupled
External Trigger Minimum Pulse Width	100 ns
Trigger Output Level	TTL compatible into > 1 kOhm
Trigger Output Pulse Width	> 400 ns (typical)
Trigger Output Impedance	50 Ohm (typical)

General Specifications

Main Output Protection	Short-circuit protected; overload automatically disables main output
Power Line Frequency	50 Hz to 60 Hz (100 V to 240 V), 400 Hz (100 V to 127 V)
Power Consumption	50 VA max
Acoustic Noise	30 dBA (typical)
LXI Compliance	LXI Class C

Modulation & Sweep

Burst Count Range	1 to 50,000 cycles, or Infinite
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Pulse Performance

Pulse Period Range	200 ns to 2000 s
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Arbitrary Waveforms

Arbitrary Waveform Frequency Range (Option 002)	1 mHz to 3 MHz
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Main Output

Phase Range	-360° to +360°
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Interfaces

Web Browser Control Interface	Built-in Web Server
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Options

Phase-Lock Timebase Reference Option	Option 001
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Modulation

FM Modulation Source	Internal / External
PM Modulation Source	Internal / External
FSK Modulation Source	Internal / External

TECHNOLOGY

Direct Digital Synthesis (DDS)

APPLICATIONS

Electronic testing, sensor simulation, education, R&D, and automated test system integration

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