KEYSIGHT TECHNOLOGIES (AGILENT HP)

33522B

The Keysight (formerly Agilent) 33522B is a 2-channel, 30 MHz multifunction waveform generator. It utilizes proprietary Trueform signal generation technology, combining the benefits of Direct Digital Synthesis (DDS) and point-by-point architectures to deliver exceptionally low jitter, advanced waveform sequencing, and high-fidelity signals. The instrument features a 250 MSa/s sampling rate, 16-bit vertical resolution, and standard 1 MSa/channel memory, with comprehensive capabilities for generating arbitrary waveforms, standard functions, and complex modulated signals.

SPECIFICATIONS

General

Display	4.3-inch Color TFT WQVGA (480x272) with LED backlight
Recommended Calibration Interval	1 year

Physical

Power Supply	100 - 240 V at 50/60 Hz; 100 - 120 V at 400 Hz (< 45 W, < 130 VA)
Operating Temperature	0 to 55 °C
Dimensions (W×H×D)	261.1 × 103.8 × 303.2 (with bumpers) mm
Weight	3.3 kg

General Characteristics

Number of Channels	2
Standard Waveforms	Sine, square, ramp, pulse, triangle, Gaussian noise, PRBS, DC
Built-In Arbitrary Waveforms	Cardiac, exponential fall, exponential rise, Gaussian pulse, Haversine, Lorentz, D-Lorentz, negative ramp, sinc
Sampling Rate	1 µSa/s to 250 MSa/s
Vertical Resolution	16 bits
Memory Depth (Per Channel)	1 MSa standard (16 MSa with Option MEM)

Frequency Characteristics

Bandwidth	30 MHz
Arbitrary Waveform Sample Rate Resolution	1 µSa/s
Sine Frequency Range	1 µHz to 30 MHz
Square Frequency Range	1 µHz to 30 MHz
Pulse Frequency Range	1 µHz to 30 MHz
Frequency Resolution	1 µHz

Amplitude and Offset

Amplitude Range (into 50 Ohms)	1 mVpp to 10 Vpp
Amplitude Range (into Open Circuit)	2 mVpp to 20 Vpp
Output Impedance	50 Ω (nominal)
Maximum Output Voltage	±42 Vpk (isolated connector shells)

Signal Characteristics - Sine

Total Harmonic Distortion (THD)	< 0.04%
Non-Harmonic Spurious	< -75 dBc

Signal Characteristics - Square and Pulse

Rise/Fall Time	8.4 ns

Waveform Sequencing

Sequence Length	1 to 512 steps
Segment Repeat Count	1 to 1,000,000, or infinite

Modulation Specifications

Operating Modes	Continuous, modulate, frequency sweep, burst, output gate
Supported Modulation Types	AM, FM, PM, FSK, BPSK, PWM, Sum

Inputs and Outputs

Sync/Marker Output Connector	Front-panel BNC, isolated
Sync Output Impedance	50 Ω (nominal)
Sync Output Level (into 50 Ohms)	1.5 Vpp (nominal)
Sync Output Level (into Open Circuit)	3 Vpp (nominal)
Modulation Input Connector	Rear-panel BNC, isolated
Modulation Input Voltage Range	±5 V full-scale
Modulation Input Impedance	5 kΩ (nominal)
Modulation Input Bandwidth (-3 dB)	0 Hz to 100 kHz (typ)
External Trigger Input Connector	Rear-panel BNC, chassis-referenced

Frequency Reference

High-Stability Timebase Accuracy (Option OCX)	±0.1 ppm (1 year)

Waveform Characteristics

Square / Pulse Jitter (rms)	< 40 ps (typical)
Pulse Minimum Width	16 ns
Pulse Edge Time (10% to 90%)	8.4 ns to 1 µs (adjustable)

Amplitude & Offset

DC Offset Range (into 50 Ω)	±5 Vpk (AC + DC)
DC Offset Range (into Open Circuit)	±10 Vpk (AC + DC)

Modulation & Sweep

AM Depth Range	0% to 120%
FM Peak Deviation	1 µHz to 15 MHz
Sweep Time	1 ms to 3600 s

Outputs

Output Isolation	42 Vpk maximum to earth ground
Short-Circuit Protection	Indefinite to ground

General Specifications

Warm-up Time	1 hour

Environmental

Storage Temperature	-40 °C to 70 °C
Operating Altitude	Up to 3,000 meters
Shock and Vibration	MIL-PRF-28800F Class 3

Sweep

Sweep Direction	Up or Down

Burst

Burst Count	1 to 100,000,000 cycles, or Infinite
Burst Phase	-360° to +360°

Modulation

PM Phase Deviation Range	0 to 360°

Compliance

Safety Compliance	EN 61010-1, UL 61010-1, CSA C22.2 No. 61010-1
EMC Compliance	EN 61326-1, CISPR 11 Group 1 Class A

TECHNOLOGY

Trueform Signal Generation

APPLICATIONS

Arbitrary Waveform Generation