16 MHz Arbitrary Function Generator

AFG310 • AFG320

Features and Benefits

- Two Functions in One Instrument
  - Function Generator
  - Arbitrary Waveform Generator
- AFG320 Offers Two Independent Channels
- Load Waveforms Directly from any Tektronix Digital Oscilloscope via the GPIB Interface
- Windows-based WaveWriter™ Waveform Editing Software Package Included for Convenient Creation and Editing of Arbitrary Waveforms
- All Functions Including Waveform Creation and Editing Accessible via the Front Panel
- Optional Rack Mount Kit for System Applications

Applications

- Design and Test
- Automotive
- Industrial
- Biomedical
- Sensor Simulation
- Manufacturing Test

AFG310/320

FUNCTION GENERATOR

The AFG300 Series is an excellent 16 MHz function generator with built-in arbitrary waveform capabilities. The instruments support standard waveforms including sine, square, triangle, ramp, pulse, DC, and noise. In addition, it has a frequency sweep function and three operating modes: Continuous, Triggered, and Burst.

ARBITRARY WAVEFORM GENERATION

With a sampling rate of 16 MS/s, 12-bits vertical resolution, and a non-volatile memory that holds four 16,384-point waveforms, the AFG300 Series are powerful tools for simulating complex waveforms. Waveshapes can be downloaded directly from a Tektronix DSO, created with the included WaveWriter™ for Windows waveform editing software package, or entered via the front panel.

WAVEFORM IMPORT FUNCTION

The AFG300 Series supports waveform import function to receive waveforms from Tektronix DSOs (TDS Series and 2400 Series) and arbitrary waveform generators (AWG 2000 Series and AFG 2000 Series) via GPIB. This capability makes the AFG300 Series perfect accessories for Tektronix DSOs.

CHARACTERISTICS

Output Channels –
AFG310: 1.
AFG320: 2.

Standard Waveforms – Sine, square, triangle, ramp, pulse, DC, and Noise.

Arbitrary Waveforms –
Waveform Length: 10 to 16384 points.
Vertical Resolution: 12 bits.
Sample Rate: 16 MS/s.
Non-volatile Memory: Four 16 K waveforms.

Output Frequency –
Sine, Square: 0.01Hz to 16 MHz.
Triangle, Ramp, Pulse: 0.01Hz to 100 kHz.
Noise (Gaussian): Maximum 8 MHz bandwidth

.Arbitrary Waveform:
Repetition rate: 0.01 Hz to 1.6 MHz
Resolution: 7 digits.
Accuracy: 50 ppm

Output Characteristics –
Amplitude (into 50 Ω): 50 mV_{p-p} to 10 V_{p-p}.
  Accuracy: ±(1% of setting + 5 mV) at 1 kHz, no offset.
Flatness (at 1 V amplitude relative to 1 kHz):
  <100 kHz: ±1%.
  100 kHz to 1 MHz: ±1.5%.
  1 MHz to 16 MHz: ±3%.
Offset (into 50 Ω):
  505 mV_{p-p} to 10 V_{p-p} amplitude: peak amplitude + offset is limited to +5V or -5V.
  50 mV_{p-p} to 500 mV_{p-p} amplitude: –0.75 V to+0.75 V.
  Accuracy: ±(1% of setting +5 mV).
Resolution: 5 mV.
Output Impedance: 50 Ω.
Isolation: 42 V peak maximum relative to earth ground.
Phase:
  Range: ±360 degrees.
  Resolution: 1 degree.

Certified for CE Marking.

GPIB IEEE-488 *Product(s) complies with IEEE Standard 488.1-1987, and with Tektronix Standard Codes and Formats.*

See Tektronix on the World Wide Web: http://www.tek.com

ISO 9001 *Tektronix Measurement products are manufactured in ISO registered facilities.*

Tektronix

16 MHz Arbitrary Function Generator

AFG310 • AFG320

CHARACTERISTICS (CONTD)

Sine Wave Spectral Purity –
Harmonic Distortion:
DC to 20 kHz: –70 dBc.
20 kHz to 100 kHz: –60 dBc.
100 kHz to 1 MHz: –45 dBc.
1 MHz to 16 MHz: –35 dBc.

Total Harmonic Distortion:
20 kHz: 0.05% at 1 V amplitude.

Signal Characteristics –
Square:
Rise/Fall Time: ≤20 ns.
Overshoot: <2%.
Pulse:
Rise/Fall Time: <100 ns.
Duty Cycle: 1% to 99% of period.
Triangle, Ramp Pulse, Arbitrary:
Jitter: 2 ns at 100 kHz.

Modulation –
AM:
Source: External only.
Carrier: Up to 16 MHz.
Modulation: Any internal waveform plus Arb.
Frequency: DC to 20 kHz.
Depth:
1 V: 100%.
0 V: 50%.
–1 V: 0%.
2 V_{p-p} for 100% modulation.
FM:
Source: Internal only.
Modulation: Sine, Square, Triangle, Arb.
Frequency: 0.01 Hz to 10 kHz.
Deviation: 0.01 Hz to 8 MHz.
FSK (frequency shift keying):
Source: Internal only.
Mode: Trigger, Burst.
Frequency range: 0.01 Hz to 16 MHz.
Key rate: 0.01 Hz to 50 kHz.
Number of keys: 2.

Frequency Sweep –
Type: Linear or logarithmic.
Direction: Up or down.
Start/Stop Frequency: 0.01 Hz to 16 MHz.
Time: 1 ms to 100 s.
Mode: Continuous, Trigger, Burst.

Operating Mode –
Continuous: The selected waveform is output continuously.
Triggered: One period of the selected waveform is output each time a trigger occurs.
Trigger source: Manual, External.
Burst: The selected waveform is output with a specified number of cycles each time a trigger occurs.
Carrier frequency: Up to 16 MHz.
Count: 1 to 60,000 cycles/burst (100 s maximum except sine wave or square wave) or infinite.
Start phase: –360 to +360 degrees.
Trigger source: Manual, External.

Inputs/Outputs –
Front Panel:
Main output: Ch 1, Ch 2 (AFG320 only).
External Trigger (Burst) input:
TTL input.
Pulse Width: 1 µs minimum.
10 kΩ input impedance.
Rear Panel:
Sync Output: TTL level.
External AM modulation:
2 V_{p-p} = 100% modulation.
10 kΩ input impedance.
GPIB Interface (IEEE 488.2).

Memory –
Type: Non-volatile.
Setup Storage: 20.
Arbitrary Waveform Storage: 4.

ENVIRONMENTAL, EMC, SAFETY

Temperature Range –
Operating: 0° to +50° C.
Non-operating: –20° to +60° C.

Humidity –
Operating:
At or below +40° C: 0 to 95%.
+40° to +50° C: 0 to 75%.

Random Vibration –
Operating: 0.31 g_{RMS} from 5 to 500 Hz, 10 minutes.
Non-operating: 2.46 g_{RMS} from 5 to 500 Hz, 10 minutes.

Shock –
Non-operating: 294 m/s^2 (30 G), half-sine, 11 ms duration.

EMC Compliance –
Meets intent of Directive 89/396/EEC for Electromagnetic Compatibility.
Australian AN/NZS 2064.1/2

Safety Compliance –
UL1244.
CSA-C22.2 No. 231.
EN 61010-1.

POWER

Line Voltage – 90 to 132 V AC, 180 to 250 V AC.

Line Frequency –
90 to 250 V: 48 to 63 Hz.
90 to 127 V: 48 to 440 Hz.

PHYSICAL

Dimensions	mm	in.
Height	99	3.9
Width	214	8.4
Depth	411	16.2

Weight		kg	lb.
Net	AFG310	5.4	11.9
Net	AFG320	5.6	12.3

WARRANTY

Three years parts and labor.

ORDERING INFORMATION

AFG310
Single-channel Programmable Arbitrary Function Generator.

AFG320
Dual-channel Programmable Arbitrary Function Generator.

Includes: User Manual, Calibration Certificate, Power Cord (U.S. 115 V), WaveWriter™ Software and Manual.

Calibration Data Report - Opt. D1

RECOMMENDED ACCESSORIES

Rack Mount Kit – Order 016-1674-00.

INTERNATIONAL POWER PLUG OPTIONS

Opt A1 to A5.

TEKTRONIX MEASUREMENT SERVICE

Tektronix CAL and REP Service programs allow you to pre-purchase genuine Return to Tektronix Service. Ask your Distributor for details.

For further information, contact Tektronix:

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