Arbitrary Function Generators

AFG300 Series Delivers Five Functions in One Tool

Function Generator
The AFG300 Series is an excellent 16 MHz function generator with built-in arbitrary waveform, burst, sweep, and modulation capabilities. The instruments support standard waveforms including sine, square, triangle, ramp, pulse, DC and noise. Its sweep function includes Linear and Logarithmic (up or down) while operating in the Continuous, Triggered, and Burst modes.

Arbitrary Waveform Generation
With a sample rate of 16 MS/s, 12-Bit vertical resolution and a non-volatile memory that holds four 16,384-point waveforms, the AFG300 Series are powerful tools for simulating complex waveforms. Waveforms can be downloaded directly from selected Tektronix oscilloscopes and arbitrary waveform generators via GPIB, created with the standard ArbExpress waveform editing software package, or entered via the front panel.

Features & Benefits
Five Functions in One Instrument
- Function Generator
- Arbitrary Waveform Generator
- Burst Generator
- Sweep Generator
- Modulation Source

AFG320 Offers Two Independent Channels
Load Waveforms Directly from Selected Tektronix Digital Oscilloscopes via the GPIB Interface

Windows-based ArbExpress™ 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 Rackmount Kit for System Applications

Applications
Design and Test
Automotive
Education
Industrial
Biomedical
Sensor Simulation
Manufacturing Test

1 Function Generators • www.tektronix.com/signal_sources
Arbitrary Function Generators
► AFG310 • AFG320

► Characteristics
Output Channels –
AFG310: 1.
AFG320: 2.
Standard Waveforms – Sine, Square, Triangle, Ramp, Pulse, DC and Noise.
User Waveforms – (Preprogrammed samples)
USR1: Sin (x)/x.
USR2: Double Exponential Pulse.
USR3: Damped Sine Wave.
USR4: NRZ Random Signal.
Arbitrary Waveforms –
Waveform Length: 10 to 16,384 points.
Vertical Resolution: 12-Bit.
Sample Rate: 16 MS/s.
Nonvolatile Memory: Four 16 k waveforms.
Output Frequency –
Sine, Square: 0.01 Hz to 16 MHz.
Triangle, Ramp, Pulse: 0.01 Hz to 100 kHz.
Noise (Gaussian): Maximum 8 MHz bandwidth.
Arbitrary Waveform:
Repetition Rate: 0.01 Hz to 1.6 MHz.
Accuracy: 50 ppm.
Output Characteristics –
Amplitude (into 50 Ω): 50 mVp-p to 10 Vp-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):
50 mVp-p to 10 Vp-p, amplitude at peak amplitude + offset is limited to +5 V or −5 V.
50 mVp-p to 500 mVp-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°.
Resolution: 1°.
Sine Wave Spectral Purity –
Harmonic Distortion:
DC to 20 kHz: −65 dBc.
20 kHz to 100 kHz: −60 dBc.
100 kHz to 1 MHz: −65 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 200 kHz.
Depth:
1 V: 100%.
0 V: 50%.
−1 V: 0%.
2 Vp-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.
**Arbitrary Function Generators**

**AFG310**
- Single-channel Programmable Arbitrary Function Generator.

**AFG320**
- Dual-channel Programmable Arbitrary Function Generator.

**Environmental, EMC, Safety**
- **Temperature Range**
  - Operating: 0 °C to +50 °C.
  - Nonoperating: −20 °C to +60 °C.
- **Humidity**
  - Operating: At or below +40 °C: 0 to 95%.
  - Nonoperating: +40 °C to +50 °C: 0 to 75%.
- **Random Vibration**
  - Operating: 0.31 GRMS from 5 to 500 Hz, 10 minutes.
  - Nonoperating: 2.46 GRMS from 5 to 500 Hz, 10 minutes.
- **Shock**
  - Nonoperating: 294 m/s² (30 G), half-sine, 11 ms duration.
- **EMC Compliance**
  - Australian ANZ25 2064.1.2.
- **Safety**
  - UL1244, CSA231, EN61010-1, IEC61010-1.

**Power**
- **Line Voltage**
  - 90 to 132 V AC: 48 to 63 Hz.
  - 90 to 127 V: 48 to 440 Hz.
- **Line Frequency**
  - 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 Characteristics**

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**Ordering Information**

**AFG310**
- Single-channel Programmable Arbitrary Function Generator.

**AFG320**
- Dual-channel Programmable Arbitrary Function Generator.

**Recommended Accessories**
- Rackmount Kit — Order 016-1674-00.

**Power Plug Options**

**Service**
- Tektronix CAL and REP Service programs allow you to pre-purchase genuine Return to Tektronix Service. Ask your Distributor for details.
- Opt. D3 – Calibration Data Report 3 Years (with Option C3).

**Warranty**
- Three years parts and labor.