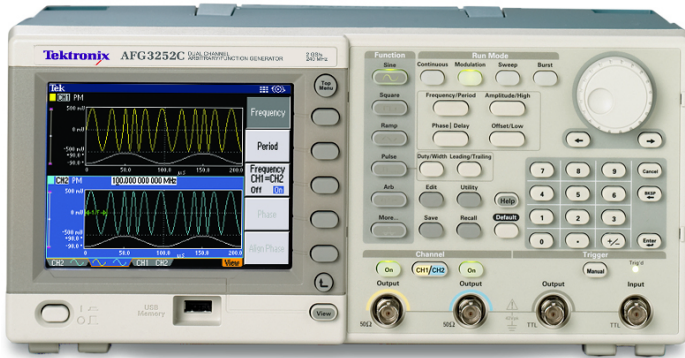


Arbitrary/Function Generators

AFG3000C Series Datasheet



Unmatched performance, versatility, intuitive operation, and affordability make the AFG3000C Series of Function, Arbitrary Waveform, and Pulse Generators the most useful instruments in the industry.

Key performance specifications

- 10 MHz, 25 MHz, 100 MHz, or 240 MHz sine waveforms
- 14 bits, 250 MS/s, 1 GS/s, or 2 GS/s arbitrary waveforms
- Amplitude up to 20 V_{p-p} into 50 Ω loads

Key features

- 5.6 in. display for full confidence in settings and waveform shape
- Multi-language and intuitive operation saves setup time
- Pulse waveform with variable edge times
- AM, FM, PM, FSK, PWM
- Sweep and burst
- Dual-channel models save cost and bench space
- USB connector on front panel for waveform storage on memory device
- USB, GPIB, and LAN
- LabVIEW and LabWindows/IVI-C drivers

Applications

- Electronic test and design
- Sensor simulation
- Functional test
- Education and training

Superior performance and versatility

Users can choose from 12 different standard waveforms. Arbitrary waveforms can be generated up to 128 K in length at high sampling rates. On pulse waveforms, leading and trailing edge time can be set independently. External signals can be connected and added to the output signal. Dual-channel models can generate two identical or completely different signals. All instruments feature a highly stable time base with only ±1 ppm drift per year.

Intuitive user interface shows more information at a single glance

Color TFT LCD screen on all models shows all relevant waveform parameters and graphical wave shape at a single glance. This gives full confidence in the signal settings and lets you focus on the task at hand. Shortcut keys provide direct access to frequently used functions and parameters. Others can be selected conveniently through clearly structured menus. This reduces the time needed for learning and relearning how to use the instrument. Look and feel are identical to the world's most popular TDS3000 Oscilloscopes.

ArbExpress™ software included for creating waveforms with ease

With this PC software waveforms can be seamlessly imported from any Tektronix oscilloscope, or defined by standard functions, equation editor, and waveform math.

Specifications ¹

All specifications apply to all models unless noted otherwise.

Model overview

| | AFG3011C | AFG3021C, AFG3022C | AFG3051C, AFG3052C | AFG3101C, AFG3102C | AFG3251C, AFG3252C |
|-----------|--|--------------------|--------------------|--------------------|--------------------|
| Channels | 1 | 1 / 2 | 1 / 2 | 1 / 2 | 1 / 2 |
| Waveforms | Sine, Square, Pulse, Ramp, Triangle, Sin(x)/x, Exponential Rise and Decay, Gaussian, Lorentz, Haversine, DC, Noise | | | | |

General characteristics

Sine waves

| | AFG3011C | AFG3021C, AFG3022C | AFG3051C, AFG3052C | AFG3101C, AFG3102C | AFG3251C, AFG3252C |
|--|--|--|--|---|---|
| Frequency range | 1 μ Hz to 10 MHz | 1 μ Hz to 25 MHz | 1 μ Hz to 50 MHz | 1 μ Hz to 100 MHz | 1 μ Hz to 240 MHz |
| Sine wave in Burst Mode | 1 μ Hz to 5 MHz | 1 μ Hz to 12.5 MHz | 1 μ Hz to 25 MHz | 1 μ Hz to 50 MHz | 1 μ Hz to 120 MHz |
| Effective maximum frequency out | 10 MHz | 25 MHz | 50 MHz | 100 MHz | 240 MHz |
| Amplitude flatness (1 V_{p-p}) | <5 MHz: ± 0.15 dB ≥ 5 MHz to 10 MHz: ± 0.3 dB | <5 MHz: ± 0.15 dB ≥ 5 MHz to 20 MHz: ± 0.3 dB ≥ 20 MHz to 25 MHz: ± 0.5 dB | <5 MHz: ± 0.15 dB ≥ 5 MHz to 45 MHz: ± 0.3 dB ≥ 45 MHz to 50 MHz: ± 0.5 dB | <5 MHz: ± 0.15 dB ≥ 5 MHz to 25 MHz: ± 0.3 dB ≥ 25 MHz to 100 MHz: ± 0.5 dB | <5 MHz: ± 0.15 dB ≥ 5 MHz to 25 MHz: ± 0.3 dB ≥ 25 MHz to 100 MHz: ± 0.5 dB ≥ 100 MHz to 200 MHz: ± 1.0 dB ≥ 200 MHz to 240 MHz: ± 2.0 dB |
| Amplitude flatness (1 V_{p-p}), typical | <5 MHz: ± 0.11 dB ≥ 5 MHz to 10 MHz: ± 0.2 dB | <5 MHz: ± 0.06 dB ≥ 5 MHz to 25 MHz: ± 0.02 dB | <5 MHz: ± 0.06 dB ≥ 5 MHz to 50 MHz: ± 0.02 dB | <5 MHz: ± 0.03 dB ≥ 5 MHz to 50 MHz: ± 0.02 dB ≥ 50 MHz to 100 MHz: ± 0.03 dB | <5 MHz: ± 0.03 dB ≥ 5 MHz to 50 MHz: ± 0.02 dB ≥ 50 MHz to 100 MHz: ± 0.02 dB ≥ 100 MHz to 200 MHz: ± 0.03 dB ≥ 200 MHz to 240 MHz: ± 0.04 dB |
| Harmonic distortion (1 V_{p-p}) | 10 Hz to 20 kHz: < -60 dBc ≥ 20 kHz to 1 MHz: < -55 dBc ≥ 1 MHz to 5 MHz: < -45 dBc ≥ 5 MHz to 10 MHz: < -45 dBc | 10 Hz to 20 kHz: < -70 dBc ≥ 20 kHz to 1 MHz: < -60 dBc ≥ 1 MHz to 10 MHz: < -50 dBc ≥ 10 MHz to 25 MHz: < -40 dBc | 10 Hz to 20 kHz: < -70 dBc ≥ 20 kHz to 1 MHz: < -60 dBc ≥ 1 MHz to 5 MHz: < -50 dBc ≥ 5 MHz to 50 MHz: < -40 dBc | 10 Hz to 1 MHz: < -60 dBc ≥ 1 MHz to 5 MHz: < -50 dBc ≥ 5 MHz to 100 MHz: < -37 dBc | 10 Hz to 1 MHz: < -60 dBc ≥ 1 MHz to 5 MHz: < -50 dBc ≥ 5 MHz to 25 MHz: < -37 dBc ≥ 25 MHz to 240 MHz: < -30 dBc |
| Harmonic distortion (1 V_{p-p}), typical | 10 Hz to 20 kHz: < -73 dBc ≥ 20 kHz to 1 MHz: < -72 dBc ≥ 1 MHz to 5 MHz: < -65 dBc ≥ 5 MHz to 10 MHz: < -56 dBc | 10 Hz to 20 kHz: < -77 dBc ≥ 20 kHz to 1 MHz: < -72 dBc ≥ 1 MHz to 25 MHz: < -55 dBc | 10 Hz to 20 kHz: < -75 dBc ≥ 20 kHz to 1 MHz: < -72 dBc ≥ 1 MHz to 5 MHz: < -65 dBc ≥ 5 MHz to 50 MHz: < -56 dBc | 10 Hz to 1 MHz: < -72 dBc ≥ 1 MHz to 5 MHz: < -66 dBc ≥ 5 MHz to 100 MHz: < -43 dBc | 10 Hz to 1 MHz: < -67 dBc ≥ 1 MHz to 5 MHz: < -74 dBc ≥ 5 MHz to 25 MHz: < -57 dBc ≥ 25 MHz to 240 MHz: < -43 dBc |

¹ The given typical values are not warranted. But 80% or more manufactured units will perform to the level indicated at room temperature (approximately 25 °C).

General characteristics

| | | | | | |
|---|--|--|--|---|---|
| Spurious(1 V_{p-p}) | 10 Hz to 1 MHz: < -60 dBc ≥1 MHz to 10 MHz: < -50 dBc | 10 Hz to 1 MHz: < -60 dBc ≥1 MHz to 25 MHz: < -50 dBc | 10 Hz to 1 MHz: < -60 dBc ≥1 MHz to 50 MHz: < -50 dBc | 10 Hz to 1 MHz: < -60 dBc ≥1 MHz to 25 MHz: < -50 dBc ≥25 MHz to 100 MHz: < -50 dBc + 6 dBc/octave | 10 Hz to 1 MHz: < -50 dBc ≥1 MHz to 25 MHz: < -47 dBc ≥25 MHz to 240 MHz: < -47 dBc + 6 dBc/octave |
| Spurious(1 V_{p-p}), typical | 10 Hz to 1 MHz: < -61 dBc ≥1 MHz to 10 MHz: < -68 dBc | 10 Hz to 1 MHz: < -71 dBc ≥1 MHz to 25 MHz: < -68 dBc | 10 Hz to 1 MHz: < -71 dBc ≥1 MHz to 50 MHz: < -69 dBc | 10 Hz to 1 MHz: < -71 dBc ≥1 MHz to 25 MHz: < -63 dBc ≥25 MHz to 50 MHz: < -87 dBc ≥50 MHz to 100 MHz: < -52 dBc | 10 Hz to 1 MHz: < -63 dBc ≥1 MHz to 25 MHz: < -57 dBc ≥25 MHz to 50 MHz: < -51 dBc ≥50 MHz to 100 MHz: < -69 dBc ≥100 MHz to 240 MHz: < -55 dBc |
| Phase noise, typical | < -110 dBc/Hz at 10 MHz, 10 kHz offset, 1 V _{p-p} | | | | |
| Residual clock noise | -63 dBm | -63 dBm | -63 dBm | -57 dBm | -57 dBm |

Square waves

| | AFG3011C | AFG3021C, AFG3022C | AFG3051C, AFG3052C | AFG3101C, AFG3102C | AFG3251C, AFG3252C |
|------------------------------|-----------------|---------------------------|---------------------------|---------------------------|---------------------------|
| Frequency range | 1 μHz to 5 MHz | 1 μHz to 25 MHz | 1 μHz to 40 MHz | 1 μHz to 50 MHz | 1 μHz to 120 MHz |
| Rise/fall time | ≤50 ns | ≤9 ns | ≤7 ns | ≤5 ns | ≤2.5 ns |
| Jitter (RMS) | 500 ps | 500 ps | 300 ps | 200 ps | 100 ps |
| Jitter (RMS), typical | <210 ps | <60 ps | <60 ps | <35 ps | <35 ps |

Ramp waves

| | AFG3011C | AFG3021C, AFG3022C | AFG3051C, AFG3052C | AFG3101C, AFG3102C | AFG3251C, AFG3252C |
|---------------------------|----------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| Frequency range | 1 μHz to 100 kHz | 1 μHz to 500 kHz | 1 μHz to 800 kHz | 1 μHz to 1 MHz | 1 μHz to 2.4 MHz |
| Linearity, typical | ≤0.2% of peak output | ≤0.1% of peak output | ≤0.1% of peak output | ≤0.15% of peak output | ≤0.2% of peak output |
| Symmetry | 0% to 100.0% | | | | |

Pulse waves

| | AFG3011C | AFG3021C, AFG3022C | AFG3051C, AFG3052C | AFG3101C, AFG3102C | AFG3251C, AFG3252C |
|-------------------------------|--|---------------------------|---------------------------|---------------------------|---------------------------|
| Frequency range | 1 mHz to 5 MHz | 1 mHz to 25 MHz | 1 mHz to 40 MHz | 1 mHz to 50 MHz | 1 mHz to 120 MHz |
| Pulse width | 80.00 ns to 999.99 s | 16 ns to 999.99 s | 12 ns to 999.99 s | 8.00 ns to 999.99 s | 4.00 ns to 999.99 s |
| Resolution | 10 ps or 5 digits | | | | |
| Pulse duty | 0.001% to 99.999% (Limitations of pulse width apply) | | | | |
| Edge transition time | 50 ns to 625 s | 9 ns to 625 s | 7 ns to 625 s | 5 ns to 625 s | 2.5 ns to 625 s |
| Resolution | 10 ps or 4 digits | | | | |
| Lead delay: range | (Continuous Mode): 0 ps to Period (Triggered/Gated Burst Mode): 0 ps to Period - [Pulse Width + 0.8 * (Leading Edge Time + Trailing Edge Time)] | | | | |
| Lead delay: resolution | 10 ps or 8 digits | | | | |

General characteristics

| | | | | | |
|-----------------------|---------|--------|--------|--------|--------|
| Overshoot, typical | <5% | | | | |
| Jitter (RMS) | 500 ps | 500 ps | 300 ps | 200 ps | 100 ps |
| Jitter (RMS), typical | <210 ps | <60 ps | <60 ps | <35 ps | <35 ps |

Other waveforms

| | AFG3011C | AFG3021C, AFG3022C | AFG3051C, AFG3052C | AFG3101C, AFG3102C | AFG3251C, AFG3252C |
|-------------------------|---|-----------------------|-----------------------|---------------------|-----------------------|
| Frequency range | 1 μ Hz to 100 kHz | 1 μ Hz to 500 kHz | 1 μ Hz to 800 kHz | 1 μ Hz to 1 MHz | 1 μ Hz to 2.4 MHz |
| Noise bandwidth (-3 dB) | 10 MHz | 25 MHz | 50 MHz | 100 MHz | 240 MHz |
| Noise type: | White Gaussian | | | | |
| Internal noise add | When activated, output signal amplitude is reduced to 50% | | | | |
| Level | 0.0% to 50% of amplitude (V_{p-p}) setting | | | | |
| Resolution | 1% | | | | |
| DC (into 50 Ω) | -10 V to +10 V | -5 V to +5 V | -5 V to +5 V | -5 V to +5 V | -2.5 V to +2.5 V |

Arbitrary waveforms

| | AFG3011C | AFG3021C, AFG3022C | AFG3051C, AFG3052C | AFG3101C, AFG3102C | AFG3251C, AFG3252C |
|--------------------------------------|----------------------|----------------------|---|---|---|
| Frequency range | 1 mHz to 5 MHz | 1 mHz to 12.5 MHz | 1 mHz to 25 MHz | 1 mHz to 50 MHz | 1 mHz to 120 MHz |
| Arbitrary waveforms in Burst Mode | 1 mHz to 2.5 MHz | 1 mHz to 6.25 MHz | 1 mHz to 12.5 MHz | 1 mHz to 25 MHz | 1 mHz to 60 MHz |
| Effective analog bandwidth (-3 dB) | 8 MHz | 70 MHz | | 100 MHz | 225 MHz |
| Nonvolatile memory | 4 waveforms | | | | |
| Memory: Sample rate (1K=1024 points) | 2 to 128 K: 250 MS/s | 2 to 128 K: 250 MS/s | 2 to 16 K: 1 GS/s >16 K to 128 K: 250 MS/s | 2 to 16 K: 1 GS/s >16 K to 128 K: 250 MS/s | 2 to 16 K: 2 GS/s >16 K to 128 K: 250 MS/s |
| Vertical resolution | 14 bits | | | | |
| Rise/fall time | \leq 80 ns | \leq 14 ns | \leq 10 ns | \leq 8 ns | \leq 3 ns |
| Jitter (RMS) | 4 ns | 4 ns | 1 ns at 1 GS/s 4 ns at 250 MS/s | 1 ns at 1 GS/s 4 ns at 250 MS/s | 500 ps at 2 GS/s 4 ns at 250 MS/s |

Amplitude

| | AFG3011C | AFG3021C, AFG3022C | AFG3051C, AFG3052C | AFG3101C, AFG3102C | AFG3251C, AFG3252C |
|--------------------------------|--|--|---|---|---|
| Range, 50 Ω Load | 20 mV _{p-p} to 20 V _{p-p} | 10 mV _{p-p} to 10 V _{p-p} | 10 mV _{p-p} to 10 V _{p-p} | 20 mV _{p-p} to 10 V _{p-p} | \leq 200 MHz: 50 mV _{p-p} to 5 V _{p-p} >200 MHz: 50 mV _{p-p} to 4 V _{p-p} |
| Range (open circuit or High Z) | 40 mV _{p-p} to 40 V _{p-p} | 20 mV _{p-p} to 20 V _{p-p} | 20 mV _{p-p} to 20 V _{p-p} | 40 mV _{p-p} to 20 V _{p-p} | \leq 200 MHz: 100 mV _{p-p} to 10 V _{p-p} >200 MHz: 100 mV _{p-p} to 8 V _{p-p} |
| Accuracy | \pm (2% of setting +2 mV) (1 kHz sine wave, 0 V offset, >20 mV _{p-p} amplitude) | \pm (1% of setting +1 mV) (1 kHz sine wave, 0 V offset, >10 mV _{p-p} amplitude) | | | |

General characteristics

| | | |
|-----------------------------|--|--|
| Accuracy, typical | $\pm(1\% \text{ of setting} + 5 \text{ mV})$ (1 kHz sine wave, 0 V offset, $>20 \text{ mV}_{p-p}$ amplitude) | $\pm(0.5\% \text{ of setting} + 0.5 \text{ mV})$ (1 kHz sine wave, 0 V offset, $>10 \text{ mV}_{p-p}$ amplitude) |
| Resolution | 0.1 mV _{p-p} , 0.1 mV _{RMS} , 1 mV, 0.1 dBm or 4 digits | |
| Units | V _{p-p} , V _{RMS} , dBm (sine wave only) and Volt (high/low setting) | |
| Output impedance | 50 Ω | |
| Load impedance setting | Selectable: 50 Ω, 1 Ω to 10.0 kΩ, High Z (Adjusts displayed amplitude according to selected load impedance) | |
| Isolation | 42 V _{pk} maximum to earth | |
| Short-circuit protection | Signal outputs are robust against permanent shorts against floating ground | |
| External voltage protection | To protect signal outputs against external voltages use fuse adapter 013-0345-xx | |

DC offset

| | AFG3011C | AFG3021C, AFG3022C | AFG3051C, AFG3052C | AFG3101C, AFG3102C | AFG3251C, AFG3252C |
|--------------------------------|---|--|--|------------------------------------|-------------------------------------|
| Range (50 Ω load) | $\pm(10 \text{ V}_{pk} - \text{Amplitude}_{p-p} \div 2)$ | $\pm(5 \text{ V}_{pk} - \text{Amplitude}_{p-p} \div 2)$ | $\pm(5 \text{ V}_{pk} - \text{Amplitude}_{p-p} \div 2)$ | $\pm 5 \text{ V}_{pk} \text{ DC}$ | $\pm 2.5 \text{ V}_{pk} \text{ DC}$ |
| Range (open circuit or High Z) | $\pm(20 \text{ V}_{pk} - \text{Amplitude}_{p-p} \div 2)$ | $\pm(10 \text{ V}_{pk} - \text{Amplitude}_{p-p} \div 2)$ | $\pm(10 \text{ V}_{pk} - \text{Amplitude}_{p-p} \div 2)$ | $\pm 10 \text{ V}_{pk} \text{ DC}$ | $\pm 5 \text{ V}_{pk} \text{ DC}$ |
| Accuracy | $\pm(2\% \text{ of } \text{setting} + 10 \text{ mV} + 1\% \text{ of amplitude } (V_{p-p}))$ | $\pm(1\% \text{ of } \text{setting} + 5 \text{ mV} + 0.5\% \text{ of amplitude } (V_{p-p}))$ | | | |
| Resolution | 1 mV | | | | |

System characteristics

| | |
|---------------------------------|---|
| Frequency resolution | 1 μHz or 12 digits |
| Internal frequency reference | |
| Stability | All except ARB: $\pm 1 \text{ ppm}$, 0 °C to 50 °C ARB: $\pm 1 \text{ ppm} \pm 1 \text{ μHz}$, 0 °C to 50 °C |
| Aging | $\pm 1 \text{ ppm per year}$ |
| Phase (except DC, noise, pulse) | |
| Range | -180° to +180° |
| Resolution | 0.01° (sine), 0.1° (other waveforms) |
| Internal noise add | When activated, output signal amplitude is reduced to 50% |
| Level | 0.0% to 50% of amplitude (V _{p-p}) setting |
| Resolution | 1% |
| Main output | 50 Ω |

System characteristics

Remote programming: GPIB, LAN 10BASE-T / 100BASE-TX, USB 1.1
 configuration times, max, typical
 Compatible with SCPI-1999.0 and IEEE 488-2 standards

| | USB | LAN | GPIB |
|---|--------|--------|--------|
| Function change | 81 ms | 81 ms | 81 ms |
| Frequency change (except Pulse) | 2.5 ms | 6 ms | 3.2 ms |
| Frequency change (Pulse) | 40 ms | 37 ms | 32 ms |
| Amplitude change | 90 ms | 97 ms | 90 ms |
| Select user ARB (4k points from USB Memory) | 48 ms | 50 ms | 49 ms |
| Select user ARB (128k points from USB Memory) | 260 ms | 266 ms | 240 ms |

| Remote programming: data download time for 4000 point waveform data, typical | USB | LAN | GPIB |
|--|-------|-------|--------|
| | 47 ms | 78 ms | 320 ms |

| | |
|-----------------------------------|--|
| Power source | 100-240 V, 47-63 Hz, or 115 V, 360-440 Hz |
| Power consumption | Less than 120 W |
| Warm up time, typical | 20 minutes |
| Power on self-diagnosis, typical | <10 s |
| Acoustic noise, typical | <50 dBA |
| Display | 5.6 in. Color TFT LCD |
| User interface and Help languages | English, French, German, Japanese, Korean, Portuguese, Simplified and Traditional Chinese, Russian (user selectable) |

Modulation characteristics

AM, FM, PM

| | |
|-------------------------------|--|
| Carrier waveforms | All except Pulse, Noise, and DC |
| Source | Internal/external |
| Internal modulating waveform | Sine, square, ramp, noise, ARB (AM: maximum waveform length 4,096; FM/PM: maximum waveform length 2,048) |
| Internal modulating frequency | 2 mHz to 50.00 kHz |
| AM modulation depth | 0.0% to +120.0% |
| Min FM peak deviation | DC |
| Max FM peak deviation | See following table, |
| PM phase deviation | -360.0° to +360.0° |

Pulse width modulation

| | |
|------------------|-------------------|
| Carrier waveform | Pulse |
| Source | Internal/external |

Modulation characteristics

| | |
|--------------------------------------|---|
| Internal modulating waveform | Sine, square, ramp, noise, ARB (maximum waveform length 2,048) |
| Internal modulating frequency | 2 mHz to 50.00 kHz |
| Deviation | 0% to 50.0% of pulse period |

Max FM peak deviation

| | AFG3011C | AFG3021C, AFG3022C | AFG3051C, AFG3052C | AFG3101C, AFG3102C | AFG3251C, AFG3252C |
|---------------|-----------------|---------------------------|---------------------------|---------------------------|---------------------------|
| Sine | 5 MHz | 12.5 MHz | 25 MHz | 50 MHz | 120 MHz |
| Square | 2.5 MHz | 12.5 MHz | 20 MHz | 25 MHz | 60 MHz |
| ARB | 2.5 MHz | 6.25 MHz | 12.5 MHz | 25 MHz | 60 MHz |
| Others | 50 kHz | 250 kHz | 400 kHz | 500 kHz | 1.2 MHz |

Frequency shift keying

| | |
|--------------------------------------|----------------------------------|
| Carrier waveforms | All, except Pulse, Noise, and DC |
| Source | Internal/external |
| Internal modulating frequency | 2 mHz to 1,000 MHz |
| Number of keys | 2 |

Sweep

| | |
|---|-------------------------------------|
| Waveforms | All, except Pulse, Noise, and DC |
| Type | Linear, logarithmic |
| Sweep time | 1 ms to 300 s |
| Hold/return time | 0 ms to 300 s |
| Max total sweep time | 300 s |
| Resolution | 1 ms or 4 digits |
| Total sweep time accuracy, typical | ≤0.4% |
| Min start/stop frequency | All except ARB: 1 μHz ARB: 1 mHz |
| Max start/stop frequency | See chart, below |

Sweep: max start/stop frequency

| | AFG3011C | AFG3021C, AFG3022C | AFG3051C, AFG3052C | AFG3101C, AFG3102C | AFG3251C, AFG3252C |
|---------------|-----------------|---------------------------|---------------------------|---------------------------|---------------------------|
| Sine | 10 MHz | 25 MHz | 50 MHz | 100 MHz | 240 MHz |
| Square | 5 MHz | 25 MHz | 40 MHz | 50 MHz | 120 MHz |
| ARB | 5 MHz | 12.5 MHz | 25 MHz | 50 MHz | 120 MHz |
| Others | 100 kHz | 500 kHz | 800 kHz | 1 MHz | 2.4 MHz |

Burst

| | |
|---------------------------------|--|
| Waveforms | All, except Noise and DC |
| Type | Triggered, gated (1 to 1,000,000 cycles or Infinite) |
| Internal trigger rate | 1 μs to 500.0 s |
| Gate and trigger sources | Internal, external, remote interface |

Auxiliary input characteristics

| | |
|--------------------------|---|
| Modulation inputs | Channel 1, Channel 2 |
| Input range | All except FSK: ± 1 V FSK: 3.3 V logic level |
| Impedance | 10 k Ω |
| Frequency range | DC to 25 kHz (122 kS/s) |

External Triggered/Gated Burst input

| | |
|---------------------------------|---|
| Level | TTL compatible |
| Impedance | 10 k Ω |
| Pulse width | 100 ns minimum |
| Slope | Positive/negative, selectable |
| Trigger delay | 0.0 ns to 85.000 s |
| Trigger delay resolution | 100 ps or 5 digits |
| Jitter (RMS), typical | Burst: <500 ps (trigger input to signal output) |

10 MHz reference input

| | |
|-------------------------------------|---|
| Impedance | 1 k Ω , AC coupled |
| Required input voltage swing | 100 mV _{p-p} to 5 V _{p-p} |
| Lock range | 10 MHz \pm 35 kHz |

External channel 1 add input

| | |
|--------------------|---|
| | AFG3101C, AFG3102C, AFG3251C, AFG3252C only |
| Impedance | 50 Ω |
| Input range | -1 V to +1 V (DC + peak AC) |
| Bandwidth | DC to 10 MHz (-3 dB) at 1 V _{p-p} |

Auxiliary output characteristics

Trigger output (Channel 1)

| | |
|------------------------------|--|
| Level | Positive TTL level pulse into 1 k Ω |
| Impedance | 50 Ω |
| Jitter (RMS), typical | AFG3011C/21C/22C: 500 ps AFG3051C/52C: 300 ps AFG3101C/02C: 200 ps AFG3251C/52C: 100 ps |
| Max frequency | 4.9 MHz (4.9 MHz to 50 MHz: A fraction of the frequency is output; >50 MHz: no signal is output) |

Clock reference out (10 MHz)

| | |
|------------------|---|
| | AFG3101C, AFG3102C, AFG3251C, AFG3252C only |
| Impedance | 50 Ω , AC coupled |
| Amplitude | 1.2 V _{p-p} into 50 Ω load |

Physical characteristics

Benchtop configuration

Dimensions

| | |
|---------------|---------------------|
| Height | 156 mm (6.2 in.) |
| Width | 329.6 mm (13.0 in.) |
| Depth | 168.0 mm (6.6 in.) |

Weight

| | |
|-----------------|-------------------|
| Net | 4.5 kg (9.9 lb.) |
| Shipping | 5.9 kg (12.9 lb.) |

EMC environmental and safety characteristics

Temperature

| | |
|----------------------|------------------|
| Operating | 0 °C to +50 °C |
| Non-operating | -30 °C to +70 °C |

Humidity

| | |
|------------------|-------------------------|
| Operating | ≤ +40 °C: ≤80% |
| | > +40 °C to 50 °C: ≤60% |

Altitude

Up to 3,000 m (10,000 ft.)

EMC compliance

| | |
|-----------------------|----------------------------------|
| European Union | EU Council Directive 2004/108/EC |
|-----------------------|----------------------------------|

Safety

UL 61010-1:2004
CAN/CSA C22.2 No. 61010-1:2004
IEC 61010-1:2001

Ordering information

Arbitrary function generators

| | |
|-----------------|--|
| AFG3011C | 1 µHz to 10 MHz sine wave, 1-channel arbitrary function generator |
| AFG3021C | 1 µHz to 25 MHz sine wave, 1-channel arbitrary function generator |
| AFG3022C | 1 µHz to 25 MHz sine wave, 2-channel arbitrary function generator |
| AFG3051C | 1 µHz to 50 MHz sine wave, 1-channel arbitrary function generator |
| AFG3052C | 1 µHz to 50 MHz sine wave, 2-channel arbitrary function generator |
| AFG3101C | 1 µHz to 100 MHz sine wave, 1-channel arbitrary function generator |
| AFG3102C | 1 µHz to 100 MHz sine wave, 2-channel arbitrary function generator |
| AFG3251C | 1 µHz to 240 MHz sine wave, 1-channel arbitrary function generator |
| AFG3252C | 1 µHz to 240 MHz sine wave, 2-channel arbitrary function generator |

Instrument options

Power plug options

| | |
|----------|--|
| Opt. A0 | North America power plug (115 V, 60 Hz) |
| Opt. A1 | Universal Euro power plug (220 V, 50 Hz) |
| Opt. A2 | United Kingdom power plug (240 V, 50 Hz) |
| Opt. A3 | Australia power plug (240 V, 50 Hz) |
| Opt. A5 | Switzerland power plug (220 V, 50 Hz) |
| Opt. A6 | Japan power plug (100 V, 50/60 Hz) |
| Opt. A10 | China power plug (50 Hz) |
| Opt. A11 | India power plug (50 Hz) |
| Opt. A12 | Brazil power plug (60 Hz) |
| Opt. A99 | No power cord |

Manual options

| | |
|----------|-----------------------------------|
| Opt. L0 | English (071-1631-xx) |
| Opt. L1 | French (071-1632-xx) |
| Opt. L2 | Italian (071-1669-xx) |
| Opt. L3 | German (071-1633-xx) |
| Opt. L4 | Spanish (071-1670-xx) |
| Opt. L5 | Japanese (071-1634-xx) |
| Opt. L6 | Portuguese (071-3042-xx) |
| Opt. L7 | Simple Chinese (071-1635-xx) |
| Opt. L8 | Traditional Chinese (071-1636-xx) |
| Opt. L9 | Korean (071-1637-xx) |
| Opt. L10 | Russian (071-1638-xx) |
| Opt. L99 | No manual |

Service options

| | |
|--------------|---|
| Opt. C3 | Calibration Service 3 Years |
| Opt. C5 | Calibration Service 5 Years |
| Opt. D1 | Calibration Data Report |
| Opt. D3 | Calibration Data Report 3 Years (with Opt. C3) |
| Opt. D5 | Calibration Data Report 5 Years (with Opt. C5) |
| Opt. R5 | Repair Service 5 Years (including warranty) |
| Opt. R5DW | Repair Service Coverage 5 Years (includes product warranty period). 5-year period starts at time of instrument purchase |
| Opt. SILV400 | Standard warranty extended to 5 years |

Standard accessories

Accessories

- Quick-start user manual
- Power cord
- USB cable
- CD-ROM with specifications and performance verification manual,
- Programmer manual
- Service manual
- LabView and IVI drivers
- CD-ROM with ArbExpress™ software
- NIST-traceable calibration certificate.
- 3-year warranty on parts and labor

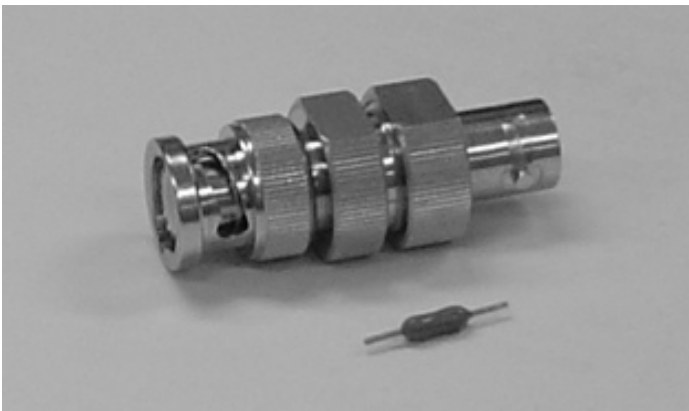
Warranty

Three-year warranty on parts and labor.

Recommended accessories

Accessories

| | |
|------------------------------|-------------|
| Rackmount kit | RM3100 |
| Fuse adapter, BNC-P to BNC-R | 013-0345-xx |
| Fuse set, 3 pcs, 0.125 A. | 159-0454-xx |
| BNC cable shielded, 3 ft. | 012-0482-xx |
| BNC cable shielded, 9 ft. | 012-1256-xx |
| GPIB cable, double shielded | 012-0991-xx |
| 50 Ω BNC terminator | 011-0049-02 |



Datasheet



Tektronix is registered to ISO 9001 and ISO 14001 by SRI Quality System Registrar.



Product(s) complies with IEEE Standard 488.1-1987, RS-232-C, and with Tektronix Standard Codes and Formats.

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For Further Information. Tektronix maintains a comprehensive, constantly expanding collection of application notes, technical briefs and other resources to help engineers working on the cutting edge of technology. Please visit www.tektronix.com.

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Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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