TEKTRONIX

AFG3102C

The Tektronix AFG3102C is a high-performance 100 MHz, dual-channel Arbitrary Function Generator utilizing Direct Digital Synthesis (DDS) technology. Featuring a high sampling rate of 1 GS/s and 14-bit vertical resolution, it delivers precise waveform creation for demanding electronic test and measurement applications. With standard USB, LAN, and GPIB interfaces, it integrates seamlessly into automated test setups.

SPECIFICATIONS

General

Interfaces	USB Host, USB Device, LAN (LXI Class C), GPIB
Display	5.6 in. Color TFT LCD (320 x 240 resolution)

Physical

Power Supply	100 V to 240 V AC, 50 Hz to 60 Hz or 115 V AC, 360 Hz to 440 Hz, < 120 W power consumption
Operating Temperature	0 °C to +50 °C °C
Dimensions (W×H×D)	329.5 mm x 156.3 mm x 168.0 mm mm
Weight	4.5 kg kg

Channel Characteristics

Number of Channels	2
Operating Modes	Continuous, Modulation, Sweep, Burst

Waveform Generation

Standard Waveforms	Sine, Square, Pulse, Ramp, Noise, DC, Sin(x)/x, Gaussian, Lorentz, Exponential Rise, Exponential Decay, Haversine
Sampling Rate	1 GS/s
Vertical Resolution	14 bits
Arbitrary Waveform Length	2 to 128,000 points
Non-Volatile Waveform Memory	4 waveforms

Frequency Specifications

Sine Frequency Range	1 mHz to 100 MHz
Square Frequency Range	1 mHz to 50 MHz
Pulse Frequency Range	1 mHz to 50 MHz
Ramp Frequency Range	1 mHz to 1 MHz
Arbitrary Waveform Frequency Range	1 mHz to 50 MHz
Frequency Resolution	1 µHz or 12 digits
Frequency Accuracy	±1 ppm
Aging Rate per Year	±1 ppm

Pulse & Square Wave Characteristics

Rise/Fall Time (Pulse)	≤ 5.0 ns
Overshoot (Pulse)	< 5% (typical)
Pulse Width Range	8.0 ns to 999.99 s
Pulse Width Resolution	10 ps or 5 digits
Duty Cycle Range	0.001% to 99.999% (frequency dependent)
Jitter (RMS)	< 100 ps (typical)

Amplitude and Output Characteristics

Amplitude Range (into 50 Ω)	10 mVp-p to 10 Vp-p (frequency dependent)
Amplitude Range (Open Circuit)	20 mVp-p to 20 Vp-p (frequency dependent)
Amplitude Accuracy	±(1% of setting + 1 mV)
Amplitude Resolution	0.1 mVp-p, mVrms, dBm, Vp-p, or Vrms
DC Offset Range	±5 Vpk (into 50 Ω)
DC Offset Accuracy	±(1% of |setting| + 5 mV + 0.5% of amplitude)
Output Impedance	50 Ω
Output Protection	Short circuit protected
Main Output Connector Type	BNC

Modulation, Sweep, and Burst

Modulation Types	AM, FM, PM, FSK, PWM
Internal Modulation Sources	Sine, Square, Ramp, Noise, Arbitrary
AM Modulation Depth	0.0% to 120.0%
FM Peak Deviation Range	1 mHz to 50 MHz
FSK Keying Rate	2 mHz to 1 MHz
Sweep Type	Linear, Logarithmic
Sweep Time Range	1 ms to 300 s
Burst Count Range	1 to 1,000,000 cycles, or Infinite

Clock, Trigger, and Synchronization

External Reference Input Frequency	10 MHz
External Reference Output Frequency	10 MHz
Trigger Input Impedance	10 kΩ
Trigger Output Impedance	50 Ω

Physical and Environmental

Storage Temperature Range	-30 °C to +70 °C

Compliance and Standards

Safety Standards	UL61010-1, CAN/CSA-C22.2 No. 61010-1, EN 61010-1
EMC Compliance	EN 61326-1:2006, Class A

Performance (Sine)

Sine Harmonic Distortion (DC - 20 kHz)	<-70 dBc (10 Hz to 20 kHz, at 1 Vp-p)
Sine Harmonic Distortion (20 kHz - 1 MHz)	<-60 dBc (at 1 Vp-p)
Sine Harmonic Distortion (1 MHz - 5 MHz)	<-50 dBc (at 1 Vp-p)
Sine Harmonic Distortion (5 MHz - 10 MHz)	<-40 dBc (at 1 Vp-p)
Sine Harmonic Distortion (10 MHz - 50 MHz)	<-35 dBc (at 1 Vp-p)
Sine Harmonic Distortion (50 MHz - 100 MHz)	<-30 dBc (at 1 Vp-p)
Total Harmonic Distortion (THD)	<0.2% (10 Hz to 20 kHz, 1 Vp-p, typical)
Sine Phase Noise	<-110 dBc/Hz (at 10 MHz, 10 kHz offset, 0 dBm, typical)
Sine Amplitude Flatness (<100 kHz)	±0.1 dB (at 1 Vp-p, relative to 1 kHz)
Sine Amplitude Flatness (100 kHz - 5 MHz)	±0.15 dB (at 1 Vp-p, relative to 1 kHz)
Sine Amplitude Flatness (5 MHz - 20 MHz)	±0.3 dB (at 1 Vp-p, relative to 1 kHz)
Sine Amplitude Flatness (20 MHz - 50 MHz)	±0.5 dB (at 1 Vp-p, relative to 1 kHz)
Sine Amplitude Flatness (50 MHz - 100 MHz)	±1.0 dB (at 1 Vp-p, relative to 1 kHz)

Performance (Pulse)

Pulse Lead/Trail Edge Transition Time	2.5 ns to 625 s
Pulse Edge Resolution	10 ps or 4 digits
Pulse Delay Range	0 ps to 85 s
Pulse Delay Resolution	10 ps or 5 digits

Performance (Ramp)

Ramp Symmetry Range	0.0% to 100.0%

Performance (Noise)

Noise Bandwidth (-3 dB)	100 MHz
Noise Type	White Gaussian

Modulation & Sweep

Phase Modulation Deviation Range	0.0° to 180.0°
PWM Deviation Range	0.0% to 50.0% of pulse period
Internal Modulation Frequency Range	2 mHz to 50 kHz (AM, FM, PM, PWM)
Sweep Modes	Auto, Manual, Triggered

Inputs & Outputs

External Modulation Input Bandwidth	DC to 25 kHz
External Modulation Input Voltage Range	±1.0 V full scale
External Modulation Input Impedance	10 kΩ
External Reference Input Sensitivity	100 mVp-p to 5 Vp-p
External Reference Input Lock Range	10 MHz ±10 kHz
External Reference Input Impedance	1 kΩ (AC coupled)
Trigger Input Minimum Pulse Width	100 ns
Channel Add Input Impedance	50 Ω
Channel Add Input Level	±1 V full scale

General & Environmental

Warm-up Time	20 minutes
Operating Altitude	Up to 3,000 m (10,000 ft)
Non-operating Altitude	Up to 12,192 m (40,000 ft)
Power Consumption	Less than 120 W

Display

Display Size	5.6 in (142 mm)
Display Resolution	320 × 240 pixels

Trigger

Trigger Source	Internal, External, Manual

System & Interfaces

Programming Language	SCPI-1999, IEEE 488.2 compatible
USB Port Configuration	1x USB Host (front panel, USB 2.0), 1x USB Device (rear panel, USB 2.0)

Environmental

Acoustic Noise	<50 dBA

TECHNOLOGY

Direct Digital Synthesis (DDS)

APPLICATIONS

Electronic Test and Measurement