TEKTRONIX

AFG3021B

The Tektronix AFG3021B is a 1-channel 25 MHz Arbitrary/Function Generator from the AFG3000 Series. Featuring a 250 MS/s sample rate, 14-bit vertical resolution, 128 kpoint arbitrary waveform memory depth, and ±1 ppm/year frequency stability, it provides versatile signal generation for design, testing, and manufacturing applications.

SPECIFICATIONS

General

Interfaces	USB (Front Host & Rear Device), GPIB, LAN (10/100 Base-T)
Warm-Up Time	20 minutes

Physical

Power Supply	100 V to 240 V AC, 47 Hz to 63 Hz / 115 V AC, 360 Hz to 440 Hz, < 120 W
Operating Temperature	0 °C to +50 °C °C
Dimensions (W×H×D)	329.6 mm × 156.3 mm × 168.0 mm mm
Weight	4.5 kg kg

Signal & Waveform Performance

Number of Channels	1
Standard Output Waveforms	Sine, Square, Pulse, Ramp, Triangle, Sin(x)/x, Exponential Rise, Exponential Decay, Gaussian, Lorentz, Haversine, Noise, DC
Sine Wave Frequency Range	1 µHz - 25 MHz
Square Wave Frequency Range	1 µHz - 12.5 MHz
Ramp/Triangle Frequency Range	1 µHz - 250 kHz
Pulse Frequency Range	1 mHz - 12.5 MHz
Arbitrary Waveform Frequency Range	1 mHz - 12.5 MHz
Frequency Resolution	1 µHz or 12 digits
Frequency Accuracy	±1 ppm, 0 °C to 50 °C
Frequency Stability / Aging Rate	±1 ppm per year

Waveform Characteristics & Purity

Sine Total Harmonic Distortion (THD)	< 0.2% (10 Hz to 20 kHz, 1 Vp-p)
Sine Phase Noise	-110 dBc/Hz @ 10 kHz offset (10 MHz, 1 Vp-p)
Square Wave Rise/Fall Time	≤ 18 ns
Square Wave Jitter	< 500 ps rms
Pulse Width Range	30 ns to 999.99 s
Pulse Edge Transition Time Range	18 ns to 0.625 × pulse period

Arbitrary Waveform Capabilities

Waveform Length	2 to 128,000 points
Vertical Resolution	14 bits
Sample Rate	250 MS/s
Non-Volatile Memory Capacity	4 waveforms

Modulation, Sweep & Burst Modes

Modulation Types	AM, FM, PM, FSK, PWM
AM Modulation Depth	0.0% to 120.0%
FM Maximum Deviation	12.5 MHz
PM Phase Deviation	0.0° to 180.0°
Sweep Types	Linear, Logarithmic
Sweep Time Range	1 ms to 300 s
Burst Count	1 to 1,000,000 cycles or Infinite

Output Specifications

Output Impedance	50 Ω
Output Amplitude Range (into 50 Ω)	10 mVp-p to 10 Vp-p
Output Amplitude Range (Open Circuit)	20 mVp-p to 20 Vp-p
Amplitude Accuracy	±(1% of setting + 1 mVp-p) @ 1 kHz sine, 0 V offset, > 10 mVp-p
DC Offset Range	±5 V into 50 Ω, ±10 V into open circuit

Inputs & Auxiliary Interfaces

Main Output Connector Type	BNC (front panel)
External Modulation Input	BNC (rear panel), ±1.0 V full scale, 10 kΩ input impedance
Reference Clock Input	BNC (rear panel), 10 MHz
Reference Clock Output	BNC (rear panel), 10 MHz

Environmental & Safety Standards

Storage Temperature	-30 °C to +70 °C
Operating Altitude	Up to 3,000 m (9,843 ft)
Safety Certifications	UL 61010-1, CAN/CSA C22.2 No. 61010-1, EN 61010-1, IEC 61010-1

Waveform Characteristics

White Noise Bandwidth (-3 dB)	25 MHz

Sine Wave Performance

Sine Flatness (< 5 MHz)	±0.15 dB
Sine Flatness (5 MHz to 25 MHz)	±0.3 dB
Non-Harmonic Spurious (DC to 25 MHz)	DC to 1 MHz: < -60 dBc, 1 MHz to 25 MHz: < -50 dBc

Square Wave Performance

Square Wave Overshoot	< 5%

Modulation

Internal Modulation Frequency Range	2 mHz to 50 kHz
PWM Deviation Range	0% to 50% of pulse period

Outputs

Short Circuit Protection	Yes

Software & Control

Included Software	ArbExpress

Performance

Ramp Symmetry Range	0.0% to 100.0%
Ramp Linearity	< 0.1% of peak output at 1 kHz

Modulation & Sweep

Internal Modulation Source Waveforms	Sine, Square, Ramp, Noise, Arbitrary
Trigger Sources	Internal, External, Manual

Inputs & Outputs

External Modulation Input Voltage Range	±1.0 V full scale
External Modulation Input Impedance	10 kΩ
External Trigger Input Impedance	1 kΩ

Power & Environmental

AC Line Voltage Range	100 V to 240 V AC (±10%)
AC Line Frequency Range	47 Hz to 63 Hz (100 V to 240 V), 390 Hz to 440 Hz (115 V)
Power Consumption	< 120 W

TECHNOLOGY

Direct Digital Synthesis (DDS)

APPLICATIONS

Electronic testing, design verification, sensor simulation, functional test, education