

TEKTRONIX

AWG5002

The Tektronix AWG5002 is a 2-channel Arbitrary Waveform Generator from the AWG5000 Series. It combines a 14-bit digital-to-analog converter with sample rates up to 600 MS/s, allowing for highly accurate mixed-signal, RF, and high-speed digital pattern generation.

SPECIFICATIONS

General

Interfaces	USB 2.0 (6 ports), LAN (10/100/1000 Base-T Ethernet), GPIB (IEEE-488.2), VGA, PS/2
Display	10.4-inch TFT color LCD touch screen, 1024 × 768 (XGA)
Warm-up Time	20 minutes

Physical

Power Supply	100 to 240 V AC, 47 to 63 Hz, 450 W maximum
Operating Temperature	10 to 40 °C
Dimensions (W×H×D)	457 × 245 × 462 mm
Weight	19.5 kg
Cooling Clearance	150 mm (6 in) on rear and sides

Channel Configuration & Core Architecture

Number of Channels	2
DAC Resolution	14 bits
Sampling Rate	10 MS/s to 600 MS/s
Sampling Rate Resolution	8 digits
Run Modes	Continuous, Triggered, Gated, Sequence
Output Configuration	Differential or Single-ended

Arbitrary Waveform Performance

Waveform Memory Depth	16 Mpoints per channel (32 Mpoints with Option 01)
Minimum Segment Length	1 point
Waveform Granularity	1 point
Analog Bandwidth (Normal Output)	110 MHz (-3 dB)
Analog Bandwidth (Direct Output)	150 MHz (-3 dB)
Rise/Fall Time (Normal Output)	< 3.2 ns (10% to 90%)
Rise/Fall Time (Direct Output)	< 2.3 ns (10% to 90%)
Overshoot (Normal Output)	< 3%
Overshoot (Direct Output)	< 10%
Total Jitter	150 ps (typical)

Standard Waveform Performance

Standard Waveform Shapes	Sine, Square, Pulse, Ramp, Triangle, Sinc, Exponential Decay, Gaussian, Noise
Sine Spurious-Free Dynamic Range (SFDR)	-70 dBc at 1 MHz, -62 dBc at 10 MHz, -50 dBc at 50 MHz (typical)
Sine Harmonic Distortion	<-55 dBc at 1 MHz, <-45 dBc at 10 MHz, <-37 dBc at 50 MHz
Sine Phase Noise	-110 dBc/Hz at 10 kHz offset (10 MHz, typical)

Output Characteristics

Output Impedance	50 Ω
Amplitude Range (Normal Output)	50 mVp-p to 2.0 Vp-p (into 50 Ω)
Amplitude Range (Direct Output)	50 mVp-p to 1.0 Vp-p (into 50 Ω)
Amplitude Accuracy	$\pm(1.5\%$ of amplitude + 2 mV)
Amplitude Resolution	1 mV
DC Offset Range (Normal Output)	-1.0 V to +1.0 V (into 50 Ω)
DC Offset Accuracy	$\pm(2.0\%$ of offset + 10 mV)
DC Offset Resolution	1 mV
Filters	20 MHz, 50 MHz, 100 MHz (Bessel low-pass)
Channel-to-Channel Delay Range	-5 ns to 5 ns
Channel-to-Channel Delay Resolution	10 ps

Sequencing & Modulation

Maximum Number of Sequence Steps	8000
Maximum Loop Count	1 to 65536
Sequence Advance Modes	Auto, Trigger, Event

Trigger & Synchronization

Trigger Sources	External, Internal, Manual
External Trigger Input Impedance	1 k Ω or 50 Ω
External Trigger Threshold Range	-5.0 V to +5.0 V
External Trigger Threshold Resolution	0.1 V
External Trigger Minimum Pulse Width	20 ns
Trigger Jitter	< 150 ps RMS (typical)
Internal Reference Frequency Accuracy	± 1 ppm
Internal Reference Aging Rate	± 1 ppm per year
External Reference Input Frequency	10 MHz, 20 MHz, 100 MHz (within ± 10 ppm)
External Reference Input Range	0.2 Vp-p to 3.0 Vp-p (into 50 Ω)
Reference Output Frequency	10 MHz
Reference Output Amplitude	1.2 Vp-p (into 50 Ω)
Marker Outputs	2 per channel
Marker Output Amplitude	-1.0 V to 2.4 V (into 50 Ω)
Marker Output Rise/Fall Time	< 150 ps (20% to 80%)

System Connectivity & Control

Front Panel Controls	Rotary knob, keypad, touch screen
Operating System	Windows XP Professional
Internal Hard Drive Capacity	≥ 80 GB
Optical Drive	CD-R/W or DVD-R/W
USB Ports	6 $\times$ USB 2.0 (2 front, 4 rear)
LAN Interface	10/100/1000 Base-T (RJ-45)
GPIB Interface	IEEE-488.2
Video Output	VGA (D-sub 15-pin)
Keyboard/Mouse Connectors	PS/2
Auxiliary Inputs	External Trigger, 10 MHz Reference In, Event Input, ADD Input

Power & Environmental Specifications

Storage Temperature Range	-20 $^{\circ}$ C to +60 $^{\circ}$ C
Operating Humidity Range	5% to 80% RH (non-condensing)
Operating Altitude	Up to 3,000 meters (10,000 feet)
Storage Altitude	Up to 12,192 meters (40,000 feet)

Physical Characteristics & Compliance

Form Factor	Benchtop (rackmount kit available)
Electromagnetic Compatibility (EMC)	EC Council Directive 2004/108/EC, EN61326
Safety Certifications	UL 61010-1, CAN/CSA-C22.2 No. 61010-1, EN 61010-1

Clock

External Clock Input Frequency	10 MHz to 600 MHz
External Clock Input Amplitude	0.2 Vp-p to 2.0 Vp-p
External Clock Input Impedance	50 Ω , AC coupled

Auxiliary Inputs

External Add Input Impedance	50 Ω , DC coupled
External Add Input Range	-1.0 V to +1.0 V
External Add Input Bandwidth	DC to 30 MHz (-3 dB)

Digital Outputs (Option 03)

Digital Channels (Option 03)	28 bits (14 bits per channel)
Digital Interface Level (Option 03)	LVDS (Low Voltage Differential Signaling)
Digital Connector Type (Option 03)	68-pin MDR (Mini D-Ribbon)

Marker Outputs

Marker Delay Range	-5 ns to +5 ns (relative to analog output)
Marker Delay Resolution	10 ps

Environmental

Operating Vibration	0.27 Grms, 5 Hz to 500 Hz
Non-operating Vibration	2.28 Grms, 5 Hz to 500 Hz

Waveform Generation

Waveform Memory (Option 01)	32 Mpoints/channel
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Auxiliary Outputs

Trigger Output Impedance	50 Ω
Trigger Output Level	> 1.0 V into 50 Ω

Software & Control

Included Software	ArbExpress Waveform Utility
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Maintenance

Calibration Interval	1 year
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TECHNOLOGY

Arbitrary Waveform Generation

APPLICATIONS

Mixed signal, IQ, and IF signal generation; receiver stress testing; wireless/telecom research

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