

DS345 Function/ARB Generator

Frequency range

	Max. Frequency	Resolution
Sine	30.2 MHz	1 μ Hz
Square	30.2 MHz	1 μ Hz
Ramp	100 kHz	1 μ Hz
Triangle	100 kHz	1 μ Hz
Noise	10 MHz	(Gaussian weighting)
Arbitrary	10 MHz	40 MHz/N (sample rate)

Output

Source impedance	50 Ω
Grounding	Output may float up to ± 40 V (AC + DC) relative to earth ground.

Amplitude

Range	0.01 to 10 Vpp (50 Ω), 20 Vpp (Hi-Z)
Resolution	3 digits (DC offset: 0 V)
Sine wave accuracy (0 V DC offset)	
5 to 10 Vpp	± 0.2 dB (1 μ Hz to 20 MHz) ± 0.3 dB (20 MHz to 30.2 MHz)
0.01 to 5 Vpp	± 0.4 dB (1 μ Hz to 20 MHz) ± 0.5 dB (20 MHz to 30.2 MHz)
Square wave accuracy	
5 to 10 Vpp	± 3 % (1 μ Hz to 100 kHz) ± 6 % (100 kHz to 20 MHz) ± 15 % (20 MHz to 30.2 MHz)
0.01 to 5 Vpp	± 5 % (1 μ Hz to 100 kHz) ± 8 % (100 kHz to 20 MHz) ± 18 % (20 MHz to 30.2 MHz)
Triangle, ramp, arbitrary accuracy	± 3 % (>5 Vpp) ± 5 % (<5 Vpp)

DC Offset

Range	± 5 V (limited such that $ V_{AC\ peak} + V_{DC} < 5$ V)
Resolution	3 digits (VAC = 0)
Accuracy	1.5 % of setting + 0.2 mV (DC only) ± 0.8 mV to ± 80 mV, depending on AC and DC settings

Sine Wave

Spurious components	<-55 dBc (non-harmonic)	
Phase noise	<-50 dBc in a 30 kHz band centered on the carrier, exclusive of discrete spurious signals	
Sub-harmonic	<-50 dBc	
Harmonic distortion	Level <-55 dBc <-45 dBc <-35 dBc <-25 dBc	Frequency Range DC to 100 kHz 0.1 to 1 MHz 1 to 10 MHz 10 to 30 MHz

Square Wave

Rise/fall time	<15 ns (10 to 90 %), at full output
Asymmetry	<1 % of period + 4 ns
Overshoot	<5 % of peak to peak amplitude at full output

Ramps, Triangle and Arbitrary Waveforms

Rise/fall time	45 ns (10 MHz Bessel filter)
Linearity	± 0.5 % of full-scale output
Settling time	<1 μ s to settle within 0.1 % of final value at full output

Arbitrary Waveforms

Sample rate	40 MHz/N, N = 1 to $2^{34}-1$
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Memory length 8 to 16,300 points
Resolution 12 bits (0.025 % of full scale)
Phase

Range $\pm 7199.999^\circ$ with respect to arbitrary starting phase
Resolution 0.001°
Amplitude Modulation

Source Internal (sine, square, triangle or ramp) or External
Depth 0 to 100 % AM or DSBSC
Rate 0.001 Hz to 10 kHz internal, 15 kHz max. external
Distortion < -35 dB at 1 kHz, 80 % depth
DSB carrier < -35 dB typ. at 1 kHz modulation rate (DSBSC)
External input ± 5 V for 100 % modulation, 100 k Ω impedance, 15 kHz bandwidth
Frequency Modulation

Source Internal (sine, square, triangle, ramp or arbitrary)
Rate 0.001 Hz to 10 kHz
Span 1 mHz to 30.2 MHz (100 kHz for triangle, ramp)
Phase Modulation

Source Internal (sine, square, triangle, ramp)
Rate 0.001 Hz to 10 kHz
Span $\pm 7199.999^\circ$
Frequency Sweep

Type Linear or log, phase continuous
Waveform Up, down, up-down, single sweep
Time 0.001 s to 1000 s
Span 1 mHz to 30.2 MHz (to 100 kHz for triangle, ramp)
Markers Two markers may be set at any sweep point (TTL output)
Sweep output 0 to 10 V linear ramp signal, synchronized to sweep
Burst Modulation

Waveform Any waveform except noise may be burst modulated
Frequency Sine, square to 1 MHz
Triangle, ramp to 100 kHz
Arbitrary to 40 MHz sample rate
Count 1 to 30,000 cycles/burst (1 μ s to 500 s burst time limits)
Trigger Generator

Source Single, Internal, External, Line
Rate (internal) 0.001 Hz to 10 kHz (2-digit resolution)
External trigger Positive or negative edge, TTL
Output TTL level
Standard Timebase

Accuracy ± 5 ppm (20 $^\circ$ C to 30 $^\circ$ C)
Aging 5 ppm/year
Input 10 MHz/N ± 2 ppm (N = 1 to 8) 1 Vpp minimum input level
Output 10 MHz, > 1 Vpp sine into 50 Ω
Optional Timebase

Type Ovenized AT-cut oscillator
Stability < 0.01 ppm, 20 $^\circ$ C to 60 $^\circ$ C
Aging < 0.001 ppm/day
Allan variance (1 s) $< 5 \times 10^{-11}$
General

Interfaces Optional RS-232 (300 to 19.2 kbaud, DCE) and GPIB with DOS based arbitrary waveform software (AWC). All instrument functions

Non-volatile memory	controllable over the interfaces.
Dimensions	Nine sets of instrument settings can be saved and recalled
Weight	8.5" × 3.5" × 13" (WHL)
Power	10 lbs.
Warranty	50 W, 100/120/220/240 VAC, 50/60 Hz
	One year parts and labor on defects in materials and workmanship