



WAVECREST

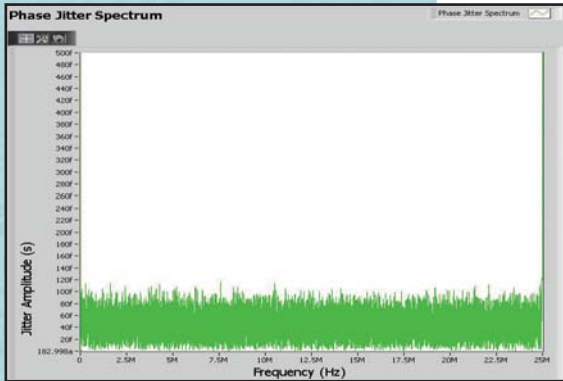
Be certain of the signal you send.

SSA

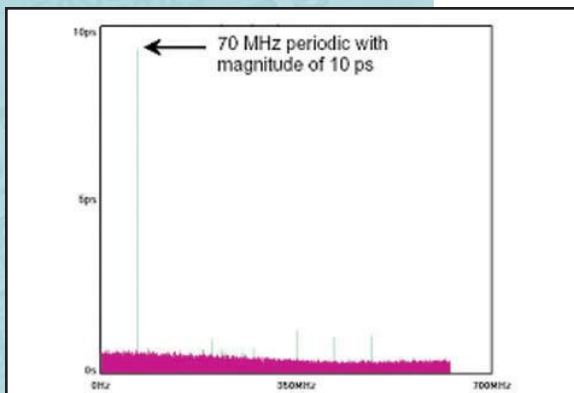
Signal Source Analyzers

specifications

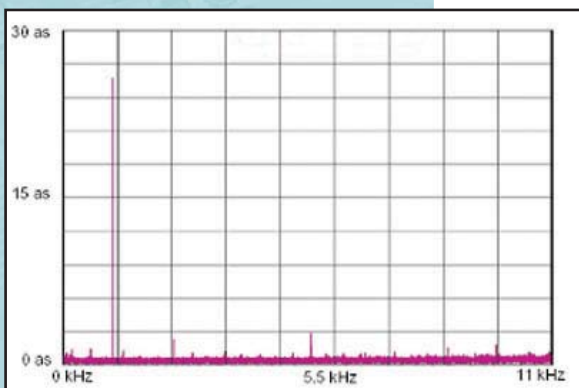
timing



Plot 1



Plot 2



Plot 3

Jitter

Timing Bandwidth >35 GHz

Gaussian Noise Floor <150 fs typical (plot 1)

The frequency range for jitter measurements is $0.04 \text{ Hz} - f_c/2$
Allen Variance and wander (internal reference) $(1s) 5e10^{-11}$

Plot 2 illustrates the capability of the instrument to isolate periodic components and quantify jitter over a user-defined bandwidth. The plot shows a spectral view of jitter measured from 12 kHz to 613 MHz of a 2.5 GHz sine wave. A 70 MHz sine wave was added to the carrier having a magnitude of 10 ps. Post processing filters provide the ability to determine the rms noise over a bandwidth.

The Low Frequency Modulation tool provides the capability of measuring low frequency (<100 kHz) periodic components on a carrier. Plot 3 shows the spectral view of jitter over 1 clock period from 0.04 Hz to 10 kHz of a 2 GHz sinewave modulated with a 100 Hz peak deviation 1 kHz sinewave. The 1 kHz spectral component has a magnitude of 25 as and the background noise is <1 as.

NOTE: 1 attosecond (as) equals 10^{-18} sec.

Phase Noise

<-150 dBc/Hz @ 10 kHz, 1MHz, and 10 MHz offsets

Extremely wide offset from 1kHz to $f_c/2$

RMS jitter bandpass: 12kHz to 20MHz, 50kHz to 80MHz; or custom selection and programmable roll-off

Transfer Function

2nd or 3rd order PLL

No external stimulus required

Standard Timing Measurements and Features

Phase noise, Random Jitter, Deterministic Jitter, Total Jitter, Periodic Jitter, Skew, Propagation Delay, Phase Jitter, Period Jitter, Cycle-to-Cycle Jitter, Pulse Width Jitter, RMS Jitter over a bandwidth, Duty Cycle, Frequency, Damping Factor, Natural Frequency, Lock Range, Lock-in Time, Pull-in Time, Pull-out Range, Noise Bandwidth, PSD of Noise, Poles and Zeros.

oscilloscope

Oscilloscope Performance

Each input to the SSA channel has an integrated sampling oscilloscope to provide accurate and repeatable amplitude measurements. This section describes the performance characteristics of the amplitude engine:

Analog Bandwidth (-3 dB)	15 GHz
Rise Time	23 ps (10% to 90%, calculated from $RT=0.35/BW$)
Input Dynamic Range	+1.0V to -1.0V (Single-ended)
RMS Noise	1.5mV

Horizontal System

Delay	
Minimum	>24ns
Maximum	100 μ s
Oscilloscope timebase jitter (rms)*	<1 ps + 10 ppm of delay setting

*Any additional trigger error will increase this value

Timebase Delay Accuracy	<8 ps + 0.1% of delay
Time Interval Resolution	300 fs

Vertical System

Vertical Resolution	250 μ V
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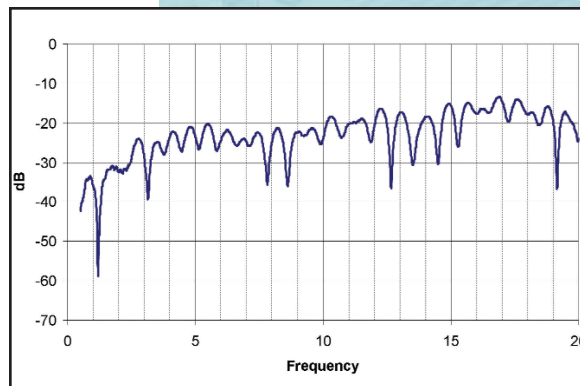
Trigger Modes

Self Trigger (Using Pattern Marker)	up to 15 GHz
External Trigger	up to 15 GHz

Standard Amplitude Measurements and Features

Rise Time, Fall Time, Overshoot, Undershoot, Vmax, Vmid, Vmin, Vtop, Vbase, Vpk-pk, Vamp, VRMS, VAVG, Horizontal and Vertical histograms and statistics, Amplitude FFT (Spectrum of the waveform)

Note: Typical measurements provide non-warranted information about system performance or capabilities.



Plot 4

Return Loss

With respect to 50 Ω is greater than 15 dB from 50 MHz to 12 GHz as shown

mainframe

GENERAL SPECIFICATIONS

Power requirements

Voltage	100-120 VAC \pm 10%, 200-240 VAC \pm 10%
Frequency	47-63 Hz
Power	800 Watts for a five-channel system

Environmental Requirements

Operating Temp. Range	15 - 40°C
Temp. Range for Calibration	Cal temp \pm 5°C
Humidity	0-85% R.H. (non-condensing)

Over Voltage Installation

Category	CATII
Pollution Degree	2 per IEC664

Dimensions	23.25"L \times 17"W \times 8.7"H 19" rack mountable
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Weight	42 lbs
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Model	Offset	Fc	Bandwidth
SSA-20	.04 Hz-Fc/2	.50 KHz-2 GHz	15 GHz
SSA-50	.04 Hz-Fc/2	.50 KHz-5 GHz	15 GHz
SSA-150	.04 Hz-Fc/2	.50 KHz-15 GHz	15/35 GHz

All specifications are subject to change without notice. For the most updated information, please check our website at www.wavecrest.com



WAVECREST

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Channels	2 or 5 channel, single-ended/differential
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Voltage Performance

Input voltage range	\pm 1.0 V
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The Input Voltage Range is defined as the minimum and maximum input voltage levels, relative to chassis ground, that the inputs can safely accept and meet performance specifications.

Electrical Input	Female SMA
Input Sensitivity	50 mVpp differential 100 mVpp single-ended

Hardware Resolution	200 fs
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Internal timebase reference

Frequency	10 MHz
Aging/year (after 24 hrs on)	1.5×10^{-7}
Aging/day (after 24 hrs on)	1×10^{-9}
Aging/sec short term (after 1 hr on)	5×10^{-11}
Accuracy	1×10^{-6}

Internal calibration source

Frequency	900.108 MHz \pm 60 ppm
Amplitude.	1.3 Vpp \pm 0.1V

Display	Color TFT-LCD, 10.4" diagonal, 1024 \times 768 pixels
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External Inputs and Outputs.	3 USB ports (2 on front, 1 on back panel) GPIB 10/100BaseT Ethernet Parallel Port, 25 pin D-sub RS-232, 9 pin D-sub VGA, 15 pin D-sub
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Data Storage	10 Gb (min.) internal hard drive
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