

## Specification of Dynamic Signal Analyzer

### Measurement Groups

Groups FFT, Octave Analysis, Swept-Sine

### Frequency

Range	102.4 kHz or 100 kHz (both displays have the same range)
FFT spans	195.3 mHz to 102.4 kHz or 191 mHz to 100 kHz. The two displays can have different spans and start frequencies.
FFT resolution	100, 200, 400 or 800 lines
Real-time bandwidth	102 kHz (highest FFT span with continuous data acquisition and averaging)
Accuracy	25 ppm from 20 °C to 40 °C

## Dynamic Range

Dynamic range	90 dB typical, 80 dB guaranteed.
FFT and Octave Swept-Sine	145 dB
	Includes spurs, harmonic and intermodulation distortion and alias products.
	Excludes alias responses at extremes of span.
Harmonic distortion	<-80 dB (single tone in band)
Intermod. distortion	<-80 dB (two tones in band, each less than -6.02 dBfs)
Spurious	<-80 dBfs
Alias responses	<-80 dBfs (single tone outside of span, <0 dBfs, less than 1 MHz)
Full-span FFT noise floor	-100 dBfs typ. (input grounded, >-30 dBV, Hanning window, 64 rms averages)
Residual DC response	<-30 dBfs (FFT with Auto-Cal on)

### Amplitude Accuracy

Single channel	$\pm 0.2$ dB (excluding windowing)
Cross channel	$\pm 0.05$ dB (DC to 102.4 kHz) (transfer function measurement, both inputs on the same range, rms averaged)

### Phase Accuracy

Single channel	$\pm 3.0$ deg. relative to external TTL trigger (-50 dBfs to 0 dBfs, frequency <10.24 kHz, center of frequency bin, DC coupled).
Cross channel	$\pm 0.5$ deg. (DC to 51.2 kHz) $\pm 1.0$ deg. (DC to 102.4 kHz)

## Signal Inputs

Number of inputs	2
Full-scale input range	-50 dBV (3.16 mVp) to +34 dBV (50 Vp) in 2 dB steps
Maximum input level	57 Vp
Input configuration	Single-ended (A) or differential (A-B)
Input impedance	1 M $\Omega$ + 50 pF
Shield to chassis	Floating mode: 1 M $\Omega$ + 0.01 $\mu$ F. Grounded mode: 50 $\Omega$ . Shields grounded in (A-B) mode
Max. shield voltage	4 Vp
AC coupling	0.16 Hz cutoff frequency
CMRR	90 dB at 1 kHz (input range <0 dBV) 80 dB at 1 kHz (input range <10 dBV) 50 dB at 1 kHz (input range $\geq$ 10 dBV)
ICP signal conditioning	Current source: 4.8 mA

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A-weight filter	Open circuit voltage: +26 V
Crosstalk	Type 0 tolerance, ANSI standard S1.4-1983 (10 Hz to 25.6 kHz) <-145 dB below signal (input to input and source to inputs, 50 $\Omega$ receiving input source impedance)
Input noise	<10 nVrms/ $\sqrt{\text{Hz}}$ above 200 Hz (<-160 dBVrms/ $\sqrt{\text{Hz}}$ )
<b>Trigger Input</b>	
Modes	Free run, Internal, External, or External TTL
Internal	Level adjustable to $\pm 100\%$ of input scale, positive or negative slope. Min. trigger level: 5 % of input range
External	Level adjustable to $\pm 5$ V in 40 mV steps, positive or negative slope. Input impedance: 1 M $\Omega$ Max. input: $\pm 5$ V Min. trigger amplitude: 100 mV
External TTL	Requires TTL level to trigger (low <0.7 V, high >3.0 V)
Post-trigger	Measurement record is delayed up to 8192 samples after the trigger.
Pre-trigger	Measurement record starts up to 8192 samples prior to the trigger.
<b>Transient Capture</b>	
Mode	Continuous data recording
Maximum rate	262,144 samples/s for both inputs
Maximum capture Length	2 Msamples (normal) to 8 Msamples (with optional memory)
<b>Octave Analysis</b>	
Standards	Conforms to ANSI standard S1.11- 1986, Order 3, Type 1-D and IEC 225-1966
Frequency range	<i>Single channel</i> 1/1 Octave 0.125 Hz to 32 kHz 1/3 Octave 0.100 Hz to 40 kHz 1/12 Octave 0.091 Hz to 12.3 kHz <i>Two channels</i> 1/1 Octave 0.125 Hz to 16 kHz 1/3 Octave 0.100 Hz to 20 kHz 1/12 Octave 0.091 Hz to 6.17 kHz
Accuracy	<0.2 dB (1 second stable average, single tone at band center)
Dynamic range	80 dB (1/3 Octave, 2 second stable average) per ANSI S1.11-1986
Sound level	Impulse, Peak, Fast, Slow and $L_{eq}$ per ANSI S1.4-1983 Type 0 and IEC 651-1979 Type 0
<b>Source Output</b>	
Amplitude range	0.1 mVp to 5 Vp
Amplitude resolution	0.1 mVp (output >500 mVp)
DC offset	<10.0 mV (typ.)
Offset adjust	$\pm 5$ VDC (sine, two-tone)
Output impedance	<5 $\Omega$ , $\pm 100$ mA peak output current
<b>Sine Source</b>	
Amplitude accuracy	$\pm 1\%$ of setting, 0 Hz to 102.4 kHz 0.1 Vp to 5.0 Vp, High-Z load
Harmonics, sub-harm. & spurious	0.1 Vp to 5 Vp <-80 dBc (fundamental <30 kHz) <-75 dBc (fundamental <102 kHz)
<b>Two-Tone Source</b>	
Amplitude accuracy	$\pm 1\%$ of setting, 0 Hz to 102.4 kHz 0.1 Vp to 5 Vp, High-Z load
Harmonics, sub-harm.	<-80 dBc, 0.1 Vp to 2.5 Vp
<b>White Noise Source</b>	
Time record	Continuous or burst
Bandwidth	DC to 102.4 kHz or limited to span
Flatness	<0.25 dBpp (typ.), <1.0 dBpp (max.), 5000 rms averages
<b>Pink Noise Source</b>	

Bandwidth	DC to 102.4 kHz
Flatness	<2.0 dBpp, 20 Hz to 20 kHz (using averaged 1/3 Octave Analysis)

#### **Chirp Source**

Time record	Continuous or Burst
Output	Sine sweep across the FFT span
Flatness	$\pm 0.25$ dB (amplitude: 1.0 Vp)

#### **Swept-Sine Source**

Auto functions	Source level, input range and frequency resolution
Dynamic range	145 dB

#### **Arbitrary Source**

Amplitude range	$\pm 5$ V
Record length	2 Msamples (playback from arbitrary waveform memory or capture buffer). Variable output sample rate.

#### **General**

CRT monitor	Monochrome/Color, 800H by 600V resolution
Interfaces	IEEE-488.2, RS-232 and printer interfaces standard. All instrument functions can be controlled through computer interfaces. A PC keyboard input should be provided for additional flexibility.
Hardcopy	Print to dot matrix and PCL compatible printers. Plot to HP-GL or postscript plotters. Print/plot to RS-232 or IEEE-488.2 interfaces or to disk file. Additional file formats include GIF, PCX and EPS.
Data storage	USB drive
Preamplifier power	Power connector needed
Power	70 W, 100/120/220/240 VAC, 50/60 Hz

