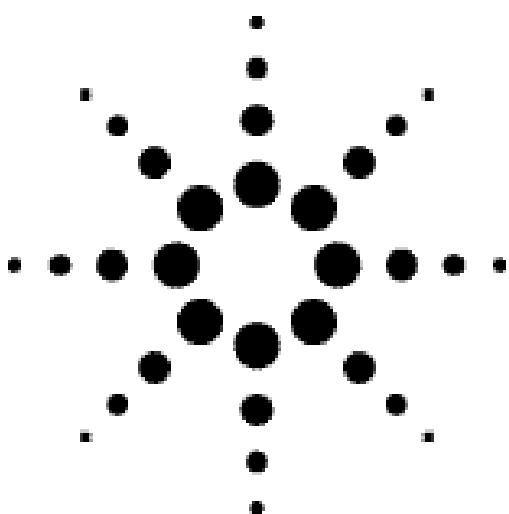


# 35665A 2-Channel DC to 102.4 kHz Dual Channel Dynamic Signal Analyzer

Data Sheet



## Product Specifications

### Frequency

#### RANGE

One Channel Mode (CH. 1): 102.4 kHz

Two Channel Mode (Ch 1 & 2): 51.2 kHz

#### RESOLUTION

100, 200, 400 or 800 lines resolution

Frequency resolution = frequency span/number of lines resolution

Minimum frequency resolution

One Channel Mode: 244 uHz

Two Channel Mode: 122 uHz

#### SPANS

One Channel Mode: 102.4 kHz to 0.19531 Hz

Two Channel Mode: 51.2 kHz to 0.097656 Hz

#### ACCURACY $\pm 30$ ppm

Real Time Bandwidth

Fast Average On:  $\geq 12.8$  kHz

#### MEASUREMENT RATE

401 point FFT display, fast average on

One Channel mode:  $\geq 33$  averages/second (typical)

Two channel mode:  $\geq 15$  averages/second (typical)

DISPLAY UPDATE RATE:  $\geq 8$  updates/second (typical)

401 point FFT display, fast average off

### Amplitude/Phase

INPUT RANGES (full scale): +27 dBVrms (31.7 Vpk) to

-51 dBVrms (3.99 mVpk)

in 2 dB steps

AMPLITUDE RESOLUTION: 0.016% of full scale (typical)

ABSOLUTE AMPLITUDE ACCURACY:  $\pm 2.92\%$  (0.25 dB) of reading  
 $\pm 0.025\%$  of full scale

#### CROSS-CHANNEL GAIN ACCURACY

Source = Full scale:  $\pm 0.04\text{dB}$

Source = -20dB full scale:  $\pm 0.08\text{dB}$

#### CROSS-CHANNEL PHASE ACCURACY

Source = full scale:  $\pm 0.5\text{ deg}$

Source = -20 dB full scale:  $\pm 0.5\text{ deg}$

### Dynamic Range

#### FULL SPAN FFT NOISE FLOOR

Input Range 27 to -35 dBVrms:  $< -76\text{ dBfs}$  (-85 dBfs typical)

Input Range -37 to -51 dBVrms:  $< (-112 - \text{Range})\text{ dBfs}$

SPURIOUS FREE DYNAMIC RANGE:  $< -72\text{ dBfs}$

(Includes Spurs, Harmonic Distortion, Intermodulation Distortion, Alias Products)

#### Zoom Mode Alias Responses

1.5% to 98.5% of the Frequency Span:  $< -72\text{ dBfs}$

Lower and Upper 1.5% of Frequency Span:  $< -65\text{ dBfs}$

#### INPUT NOISE LEVEL

Above 1280 Hz:  $< -140\text{ dBVrms} / (\text{Sq. R})\text{Hz}$

160 Hz to 1.28 kHz (6.4kHz span):  $< -130\text{ dBVrms} / (\text{Sq. R})\text{Hz}$

### Input

INPUT RANGES: -51 dBVrms to +27 dBVrms

INPUT IMPEDANCE: 1M ohm  $\pm 30\%$

$< \text{or} = 100\text{ pico Farad}$

#### Low Side to Chassis Impedance

Floating Mode: 1M ohm  $\pm 30\%$  (typical)

$< 0.01\text{ micro Farad}$  (typical)

AC COUPLING:  $< 3\text{ dB}$  Rolloff at 1Hz

#### COMMON MODE REJECTION

-51 dBVrms to -11 dBVrms Ranges:  $> 80\text{ dB}$  (typical)

-9 dBVrms to +9 dBVrms Ranges:  $> 60\text{ dB}$  (typical)

+11 dBVrms to +27 dBVrms Ranges  $> 40\text{ dB}$  (typical)

COMMON MODE RANGE (floating mode):  $\pm 4\text{ V pk}$

#### IEPE SIGNAL CONDITIONING

Current Source:  $4.25 \pm 1.5\text{ mA}$

Open Circuit voltage: +26 to +32 Vdc

### Trigger/Tachometer

TRIGGER MODES: Internal, External TTL, Source, HP-IB

**MAXIMUM TRIGGER DELAY**

Post Trigger: 8191 seconds

Pre Trigger: 8191 samples

PULSES PER REVOLUTION: 0.5, 1 to 2048 (Integer Steps)

RPM ACCURACY:  $\pm 100$  ppm

**TRIGGER LEVEL RANGE**

Low Range: -4V to +4V

High Range: -20V to +20V

**TRIGGER LEVEL RESOLUTION**

Low range: 100 mV

High Range: 500 mV

RPM RANGE:  $5 < \text{RPM} < 220,759$

MAXIMUM TRIGGER PULSE RATE: 800 kHz

**Source Output**

AMPLITUDE RANGE:  $\pm 5$  V peak

**AMPLITUDE RESOLUTION**

Voltage  $\geq 0.2$  Vrms: 2.5 mVpeak

Voltage  $< 0.2$  Vrms: 0.25 mVpeak

RESIDUAL DC OFFSET:  $\pm 10.0$  mV

OUTPUT IMPEDANCE:  $< 5$  ohms

SOURCE TYPE: Sine, random, pink noise, chirp

**Options**

**COMPUTED ORDER TRACKING**

Pulses per Revolution: 0.5, 1 to 2048 (integer steps)  
(Max Order x Max RPM) / 60

On line (real-time)

1 Channel Mode:  $\leq$  to 25,600 Hz

2 Channel Mode:  $\leq$  to 12,800 Hz

Capture playback

1 Channel Mode:  $\leq$  to 102,400 Hz

2 Channel Mode:  $\leq$  to 51,200 Hz

Specified for  $5 < \text{RPM} < 220,759$  RPM (on line)

$5 < \text{RPM} < 491,519$  RPM (capture playback);

and Number of Orders  $< \text{or} = 200$ .



Software Limits at  $5 \leq \text{RPM} \leq 491,519$ ;  
and Number of Orders  $\leq 200$   
Delta Order: 1/128 to 1/1

Resolution  
(Maximum Order) / (Delta Order):  $< 200$

RPM Accuracy:  $\pm 100$  ppm

Maximum RPM Ramp Rate: 750 RPM/second (typical)  
1 and 2 Channel Mode  
1000 to 10,000 RPM Run-up  
Maximum Order = 10  
Delta Order = 0.1  
RPM Step = 30

## REAL TIME OCTAVE ANALYSIS - OPTION 1D1

### STANDARDS

ANSI Standard S1.11 - 1996, Order 3, Type 1-D, Extended and  
Optional Frequency Ranges  
IEC Standard 651-1979 Type 0 Impulse, and ANSI S1.4

1/1 OCTAVE RANGE (at centers): 0.0613 Hz to 16 kHz

1/3 OCTAVE RANGE (at centers): 0.08 Hz to 32 kHz

1/12 OCTAVE RANGE (at centers): 0.09145 Hz to 12.338 kHz

### 1/3 OCTAVE UPDATE RATE

1 Channel Mode  
16 kHz Bandwidth 12 Updates/Second (Typical)  
32 kHz Bandwidth 5 Updates/Second (Typical)  
2 Channel Mode 8 Updates/Second (Typical)  
(16 kHz, 32 kHz Bandwidths)

### 1/3 OCTAVE DYNAMIC RANGE

2 Second Stable Average:  $> 80$  dB as per ANSI S1.11-1986  
Total power limited by the for full scale ranges from  
input noise level 50 mV<sub>peak</sub> to 31.7 V<sub>peak</sub>

### STABLE AVERAGE RANGE

One Channel Mode Real-Time Bandwidth = 32 kHz  
Two Channel Mode Real-Time Bandwidth = 16 kHz

## SWEPT SINE MEASUREMENTS - OPTION 1D2

DYNAMIC RANGE:  $> 130$  dB (typical)  
Input auto range on  
100 msec integration

### SWEEP TIMES:

51.2 Hz to 51.2 kHz span  
11 dBV rms source level



100 ms integration time approximately 76 sec (typical)  
10 ms integration time approximately 25 sec (typical)  
5 cycle integration time approximately 16 sec (typical)  
100 cycle integration time approximately 25 sec (typical)

#### CROSS-CHANNEL AMPLITUDE/PHASE ACCURACY

Ch. 1 range = Ch. 2 range:  $\pm 0.04$  dB  
 $\pm 0.5$  deg

#### Abbreviations

Zoom mode = Start frequency  $> 0$  Hz  
dBVrms = dB relative to 1 Volt rms.  
dBfs = dB relative to full scale amplitude range.  
Full scale is approx. 2 dB below ADC overload.  
FS is fs = Full Scale; synonymous with Input Range.  
RS = Resistance of source or termination connected to Agilent 35665A's input (from high to low).  
Vs = voltage applied to Agilent 35665A's input.  
Vpk = Peak of the ac Voltage  
Rload = Load resistance connected to Agilent 35665A's source  
CF = center frequency  
Typical = typical, non-warranted, performance  
specification included to provide general product information