

## SPECIFICATIONS

# Chapter 8

## 8 Specifications

Unless otherwise stated, specifications are valid for an ambient temperature range of 0 to 50°C, image rejection on, amplitude of signal applied less than the reference level.

### 8.1 Frequency

**Frequency Range:** 100 kHz to 12.4 GHz

**Span Modes:** (Center Frequency + Span) or (Start + Stop Frequencies)

**Maximum Span:** 12.4 GHz

**Minimum Span:** 10 Hz or Zero Span

**Internal Frequency Reference Accuracy:**  $\pm 1$  ppm

Optional Reference:  $\pm 0.1$  ppm

**Frequency Readout Accuracy:** reference error  $\pm 1$  sample <sup>(1)</sup>

**Marker Accuracy:** reference error  $\pm 1$  sample

**Resolution Bandwidth:** 0.1Hz to 250KHz and 6MHz<sup>(2)</sup>

**Spectral Purity**

Residual FM, 3 kHz Audio LPF, 15 kHz IF BW: **[0.1 Hz + 4 Hz / GHz] typical RMS FM** (e.g. 2 GHz RF would have 8.1 Hz RMS FM). Increasing IF BW increases residual FM.

Note 1: 1 sample typically represents approximately 40% of the selected RBW

Note 2: 6 MHz RBW available only above 200 MHz

### 8.2 Amplitude (RBW $\leq 100$ KHz)

**Range:** 1dB Gain Compression to Displayed Average Noise Level (DANL)

**1dB Gain Compression:** (attenuator set to 30 dB):  $>12$ dBm Typical

**Displayed Average Noise Level:** 0dB input attenuation, 1Hz RBW

Frequency	DANL 1 Hz RBW	Test Conditions
100 kHz to 10 MHz	<b>-147 dBm</b>	RF Atten = 0 dB RBW = VBW RBW $\leq 100$ KHz Ref Lvl -70 dBm Vid Avg = 16 Image Reject ON
10 MHz to 100 MHz	<b>-151 dBm</b>	
100 MHz to 3 GHz	<b>-152 dBm</b>	
3 GHz to 5.5 GHz	<b>-145 dBm</b>	
5.5 GHz to 7 GHz	<b>-149 dBm</b>	
7 GHz to 8 GHz	<b>-147 dBm</b>	
8 GHz to 11 GHz	<b>-134 dBm</b>	
11 GHz to 12.4 GHz	<b>-129 dBm</b>	

**Absolute Accuracy (<6 GHz, Reference level  $\leq 0$  dBm):**  $\pm 1.5$ dB<sup>(1)</sup>

**Absolute Accuracy (<12.4 GHz, Reference level  $\leq 0$  dBm):**  $\pm 2.5$ dB<sup>(1)</sup>

Note 1: RBW  $\leq 100$  kHz

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**Relative Accuracy (Reference level  $\leq 0$  dBm):**  $\pm 0.25$  dB

**Maximum Safe Input Level (preamp off, 15 dB atten):** +20dBm

**DC Volts:**  $< \pm 16$ V absolute maximum

### Residual Responses (6.5 KHz RBW, 0 dB RF Atten)

Frequency Range	Signal Level	Test Conditions
100 kHz to 10 MHz	$< -100$ dBm	0 dB RF Atten, -70 dBm reference level RBW = VBW = 6.5 KHz Video Averaging = 16 Image Reject ON
10 MHz to 8 GHz	$< -93$ dBm	
8 GHz to 11 GHz	$< -82$ dBm	
11 GHz to 12.4 GHz	$< -85$ dBm	

**Spurious Responses ( $\leq 100$  KHz span, CW tone input):** ,  $< -80$  dBm typical with SPUR REJECT on

Typical Maximum LO Feedthrough (all conditions)	
$< 1$ GHz	$< -57$ dBm
1 GHz to 12.4 GHz	$< -47$ dBm

## 8.3 Sweep

**Zero Span Sweep Time** 0.1 ms to 10 sec,  $\pm 0.1\%$

All other sweeps times are estimates reported after sweep completes.

**Maximum I/Q sample rate:** 486k/sec

**Sweep Trigger:** free run, single, video, external

**External Trigger:** 3.3V CMOS/TTL input

## 8.4 Measuring Receiver

**FM Accuracy**  $\pm 1\%$  typical

**AM Accuracy**  $\pm 1\%$  typical

**Synchronous Level Detector (15 KHz IF BW, timebases locked)**

100 KHz to 1 GHz +0 dBm to  $-125$  dBm after 10 min warmup  $\pm 0.25$ dB

1 GHz to 4 GHz +0 dBm to  $-115$  dBm after 10 min warmup  $\pm 0.25$ dB

**Average Level Detector, 15 KHz IF BW**

100 KHz to 4 GHz +0 dBm to  $-70$  dBm after 10 min warmup,  $\pm 0.25$ dB

**Maximum IF Bandwidth** 240 KHz

**Audio Filters:**

Low Pass: Digital Windowed Sinc, selectable cutoff

Band Pass: Selectable center frequency, narrow-band recursive, 160 Hz 3 dB bandwidth

**Maximum sample rate:** 486K/sec

## 8.5 Inputs and Outputs

- 1) BNC 10 MHz Reference In/Out / 63 MHz IF Output
- 2) BNC Shared
  - o Self Test Output
  - o SYNC Out
  - o Sweep Trigger In
- 3) SMA RF Input
- 4) USB 2.0 to host computer