TEKTRONIX

RSA3308A

The Tektronix RSA3308A is a high-performance Real-Time Spectrum Analyzer (RTSA) designed for the seamless capture and analysis of time-varying, transient, or periodic RF signals. Operating over a wide frequency range from DC up to 8 GHz with a real-time bandwidth of 15 MHz, it features Tektronix's proprietary Frequency Mask Trigger (FMT) and up to 256 MB of internal acquisition memory. This instrument provides simultaneous, time-correlated views in frequency, time, and modulation domains, making it ideal for vector signal analysis, digital demodulation, and troubleshooting embedded RF designs.

SPECIFICATIONS

General

Interfaces	GPIB (IEEE-488.2), LAN (10/100 Base-T), USB, VGA, PS/2 Keyboard/Mouse
Display	8.4-inch active-matrix color TFT LCD, 640 × 480 pixels

Physical

Power Supply	90 V to 250 V AC, 47 Hz to 63 Hz, 350 VA maximum
Operating Temperature	10 °C to 40 °C °C
Dimensions (W×H×D)	425 mm × 215 mm × 512 mm mm
Weight	19 kg kg

Frequency Specifications

Baseband Frequency Range	DC to 20 MHz
RF Frequency Range	15 MHz to 8 GHz
Overall Frequency Range	DC to 8 GHz
Center Frequency Tuning Resolution	0.1 Hz
Frequency Reference Aging per Year	±1 × 10^-6 (Standard), ±1 × 10^-7 (Option 1D)
Frequency Reference Aging per Day	±1 × 10^-9 (Standard), ±2 × 10^-10 (Option 1D)
Frequency Reference Temperature Drift	±2 × 10^-6 (10 °C to 40 °C, Standard), ±1 × 10^-8 (Option 1D)
Span Range (Spectrum Analyzer Mode)	10 Hz to 8 GHz, 0 Hz (zero span)
Span Range (Real-Time Mode)	100 Hz to 15 MHz
Span Accuracy	±1%
Resolution Bandwidth (RBW) Range (SA Mode)	1 Hz to 10 MHz
RBW Shape Factor (Gaussian Filter)	< 4.1:1 (typical)

Real-Time Spectrum Analysis (RTSA) Capabilities

Real-Time Bandwidth (RTBW)	15 MHz
Spectrum Processing Rate	Up to 48,000 spectrums per second
Frequency Mask Trigger (FMT) Frequency Resolution	1 bin (based on 1024-point FFT)
Multi-Domain Analysis	Simultaneous, time-correlated views in frequency, time, and modulation domains

Amplitude and Dynamic Range

Measurement Range	DANL to +30 dBm
Maximum Safe Input Level (RF Input)	+30 dBm (RF Attenuation ≥ 10 dB, 0 V DC)
1 dB Compression Point	-15 dBm (0 dB RF Attenuation)
Displayed Average Noise Level (DANL) at 1 GHz	-150 dBm/Hz (-152 dBm/Hz typical)
Displayed Average Noise Level (DANL) at 3 GHz	-150 dBm/Hz (-152 dBm/Hz typical)
Displayed Average Noise Level (DANL) at 8 GHz	-142 dBm/Hz (-144 dBm/Hz typical)
Displayed Average Noise Level (DANL) at Baseband	-145 dBm/Hz (-147 dBm/Hz typical)
Third-Order Intermodulation Distortion (TOI)	+15 dBm (typical at 2 GHz, 0 dB RF attenuation)
Second Harmonic Distortion	-70 dBc (typical, 10 MHz to 1.5 GHz carrier)
Phase Noise at 10 kHz Offset (1 GHz carrier)	-100 dBc/Hz (-105 dBc/Hz typical)
Phase Noise at 100 kHz Offset (1 GHz carrier)	-105 dBc/Hz (-110 dBc/Hz typical)
Phase Noise at 1 MHz Offset (1 GHz carrier)	-125 dBc/Hz (-132 dBc/Hz typical)
Overall Amplitude Accuracy (RF)	±1.2 dB (15 MHz to 3 GHz, 20 °C to 30 °C)
Amplitude Flatness (Baseband)	±0.5 dB (DC to 20 MHz)
Amplitude Flatness (RF, 15 MHz to 3 GHz)	±1.2 dB (RF Attenuation ≥ 10 dB)
Amplitude Flatness (RF, 3 GHz to 8 GHz)	±1.7 dB (RF Attenuation ≥ 10 dB)

Triggering and Gating

Trigger Modes	Free Run, Triggered
Trigger Source	RF Input, External Trigger, Line
Trigger Position Range	0% to 100% of acquisition length
Frequency Mask Trigger Bandwidth	Up to 15 MHz
Internal Level Trigger Range	0 to -100 dBfs

Acquisition and Memory

ADC Resolution	14 bits
Real-Time Sampling Rate	51.2 MS/s (Baseband / IQ)
Standard IQ Memory Depth (Samples)	16.384 Msamples (64 MB)
Option 02 IQ Memory Depth (Samples)	65.536 Msamples (256 MB)
Acquisition Modes	Real-time, Sweep, Time-domain, Triggered

Measurement and Analysis Functions

Standard Measurements	Channel Power, ACPR, OBW, Carrier-to-Noise (C/N), Spurious emission, SEM, dBm/Hz
Analog Demodulation Formats	AM, FM, PM
Digital Modulation Analysis Formats (Option 21)	BPSK, QPSK, OQPSK, π/4-DQPSK, 8PSK, 16QAM, 32QAM, 64QAM, 128QAM, 256QAM, GMSK, GFSK, ASK, FSK, MSK
Spectrogram Analysis Capability	Time-resolved frequency and amplitude display

Inputs and Outputs

RF Input Connector Type	Type N (female)
RF Input Impedance	50 ohms
RF Input VSWR (15 MHz to 3 GHz)	< 1.4:1 (with 10 dB RF attenuation)
RF Input VSWR (3 GHz to 8 GHz)	< 1.8:1 (with 10 dB RF attenuation)
10 MHz Reference Input	BNC (female), 50 ohms, -10 dBm to +6 dBm
10 MHz Reference Output	BNC (female), 50 ohms, > -3 dBm
Trigger Output	BNC (female), TTL level
Analog IF Output (Option 03)	BNC (female), 50 MHz

System, Display and Storage

Operating System	Windows XP Professional Embedded
Internal Storage Type	2.5-inch IDE Hard Disk Drive
Floppy Disk Drive	3.5-inch, 1.44 MB
Warm-up Time	20 minutes (typical)

Power, Physical and Environmental

Storage Temperature Range	-20 °C to 60 °C
Relative Humidity (Operating)	20% to 80% RH (non-condensing)
Operating Altitude	Up to 3,000 meters (10,000 feet)
Storage Altitude	Up to 12,190 meters (40,000 feet)

RF Input & Attenuation

RF Input Attenuation Range	0 to 50 dB (10 dB steps)
Reference Level Setting Range (RF)	-50 dBm to +30 dBm (1 dB steps)
Reference Level Setting Range (Baseband)	-30 dBm to +20 dBm (1 dB steps)

Dynamic Range & Distortion

Residual Spurious Response (Baseband)	-100 dBm (typical, RF Attenuation 0 dB)
Residual Spurious Response (RF, 15 MHz to 3 GHz)	-90 dBm (typical, RF Attenuation 0 dB)
Residual Spurious Response (RF, 3 GHz to 8 GHz)	-85 dBm (typical, RF Attenuation 0 dB)
Image Response	-70 dBc (typical, Span 10 MHz)

Trigger Specifications

External Trigger Input Impedance	10 kΩ (approximately)
External Trigger Input Level Range	-5 V to +5 V

Digital Modulation Analysis (Option 21)

Digital Modulation Symbol Rate Range	10 kS/s to 12.8 MS/s

Power Requirements

AC Input Voltage	90 to 250 V AC
AC Input Frequency	47 to 63 Hz
Power Consumption	350 VA (maximum)

Standards & Compliance

Safety Standards	UL61010-1, CAN/CSA C22.2 No. 61010-1, EN61010-1
Electromagnetic Compatibility (EMC)	EN61326-1, AS/NZS 2064

RF Input

Preselector Range	3.5 GHz to 8 GHz

Preamplifier (Option 1A)

Option 1A Frequency Range	100 MHz to 3 GHz
Option 1A Gain	20 dB (nominal)

Real-Time Spectrum Analysis

Minimum Event Duration for 100% POI (15 MHz Span)	51.2 µs

Inputs & Outputs

Analog IF Output Frequency	20 MHz (Option 03)
Analog IF Output Bandwidth	20 MHz (-3 dB) (Option 03)
Digital IQ Output Data Format	LVDS (Option 05)

Frequency Reference

Reference Output Level	> 0 dBm
Reference Input Level Range	-10 dBm to +6 dBm

Display & Audio

Display Size	8.4 in (213 mm)
Display Resolution	640 × 480 pixels

Interfaces

GPIB Interface Standard	IEEE 488.2
LAN Interface	10/100 Base-T (RJ-45)
VGA Output Port	15-pin D-sub

TECHNOLOGY

Real-Time Spectrum Analysis

APPLICATIONS

RF Signal Diagnostics, Digital Demodulation, Transient Capture, Vector Signal Analysis