ADVANTEST

R3131

The Advantest R3131 is a 3 GHz Personal Spectrum Analyzer designed for RF measurement, installation, and maintenance applications. It features a frequency range of 9 kHz to 3 GHz, a wide dynamic range, and built-in functions for high-accuracy signal analysis.

SPECIFICATIONS

General

Interfaces	GPIB (IEEE-488), RS-232, Centronics printer port
Display	5.7-inch monochrome LCD with backlight
Warm-up Time	15 minutes

Physical

Power Supply	100 to 240 VAC, 50/60 Hz, power consumption <= 100 VA
Operating Temperature	0 to +50 °C °C
Dimensions (W×H×D)	350 × 177 × 420 mm mm

Frequency Specifications

Frequency Range	9 kHz to 3 GHz
Frequency Span Range	50 kHz to 3 GHz, plus Zero Span
Reference Frequency Aging Rate	±2 ppm/year
Reference Frequency Temperature Stability	±5 ppm (0 °C to 50 °C)
Marker Frequency Counter Resolution	1 Hz to 1 kHz

Spectral Purity and Noise

Phase Noise at 20 kHz Offset	<= -100 dBc/Hz
System Displayed Average Noise Level (DANL)	-113 dBm @ 1 GHz (1 kHz RBW, 10 Hz VBW, 0 dB input attenuation)

Amplitude and Dynamic Range Specifications

Amplitude Measurement Range	+20 dBm to Average Noise Level
Maximum Safe RF Input Level (Power)	+30 dBm (with >= 10 dB input attenuation)
Maximum Safe DC Input Voltage	0 VDC
Input Attenuator Range	0 to 50 dB
Input Attenuator Steps	10 dB
Display Log Scale Range	10, 5, 2, 1 dB/div (10 divisions)
Display Linear Scale	10%/div of reference level

Bandwidth (RBW / VBW)

Resolution Bandwidth (RBW) Range	1 kHz to 1 MHz
Resolution Bandwidth (RBW) Steps	1, 3 sequence
Video Bandwidth (VBW) Range	10 Hz to 1 MHz
Video Bandwidth (VBW) Steps	1, 10 sequence

Sweep and Trigger

Sweep Time Range (Span > 0)	50 ms to 500 s
Sweep Time Range (Zero Span)	50 µs to 500 s

RF Inputs and Outputs

RF Input Connector Type	N-type (female)
RF Input Impedance	50 Ω (nominal)
Calibration Output Frequency	30 MHz
Calibration Output Level	-20 dBm

User Interface and Display

Display Size	5.7-inch

Environmental and Standards Compliance

Storage Temperature Range	-20 to +60 °C
Maximum Operating Humidity	85% RH (non-condensing)

Frequency

Frequency Resolution	1 Hz
RBW Shape Factor (60 dB / 3 dB)	< 15:1

Amplitude

Calibration Accuracy	±0.5 dB (at 30 MHz)
Frequency Response	±1.0 dB (100 kHz to 3.0 GHz, attenuator at 10 dB)
Display Scale Fidelity	±1.5 dB / 90 dB (log scale)
RBW Switching Uncertainty	±0.3 dB (after calibration, referenced to 3 kHz RBW)
Input Attenuator Switching Accuracy	±1.1 dB (at 10 dB reference, 100 kHz to 3.0 GHz, 20 to 50 dB)

Dynamic Range

Second Harmonic Distortion	<-70 dBc (mixer level -30 dBm, input frequency > 10 MHz)
Third Order Intermodulation Distortion	<-70 dBc (for two -30 dBm tones at mixer, >10 MHz, 50 kHz spacing)
1 dB Gain Compression	> -5 dBm (mixer level, input frequency > 10 MHz)

Inputs & Outputs

External Reference Input Frequency	10 MHz
External Reference Input Level	-5 dBm to +5 dBm
Internal Reference Output Frequency	10 MHz
External Trigger Input Impedance	10 kΩ (nominal, DC-coupled)
External Trigger Input Level	TTL level (0 to 5 V)

Tracking Generator (Option 74)

TG Frequency Range	100 kHz to 3.0 GHz (Option 74)
TG Output Level Range	0 to -50 dBm (Option 74, 0.1 dB steps)
TG Output Impedance	50 Ω (Option 74)

Measurement Suite / Features

Detection Modes	Normal, Positive Peak, Negative Peak, Sample
Trace Functions	Write, Max Hold, View, Average
EMI Filters	9 kHz, 120 kHz (6 dB bandwidth)

Sweep

Trigger Modes	Free Run, Single, Video, External, Line

Storage

Storage Drive	3.5-inch FDD (MS-DOS format)

Power

Power Consumption	200 VA or less

Performance

Input VSWR	<= 1.5:1 (100 kHz - 3 GHz, input attenuation >= 10 dB)
Residual Response	<= -80 dBm (10 MHz - 3 GHz, input attenuation 0 dB)
Local Oscillator Emission	<= -70 dBm (with 10 dB input attenuation)

Storage & Interface

Internal Memory Capacity	10 states and traces

TECHNOLOGY

Superheterodyne Spectrum Analyzer

APPLICATIONS

RF Spectrum and Signal Analysis