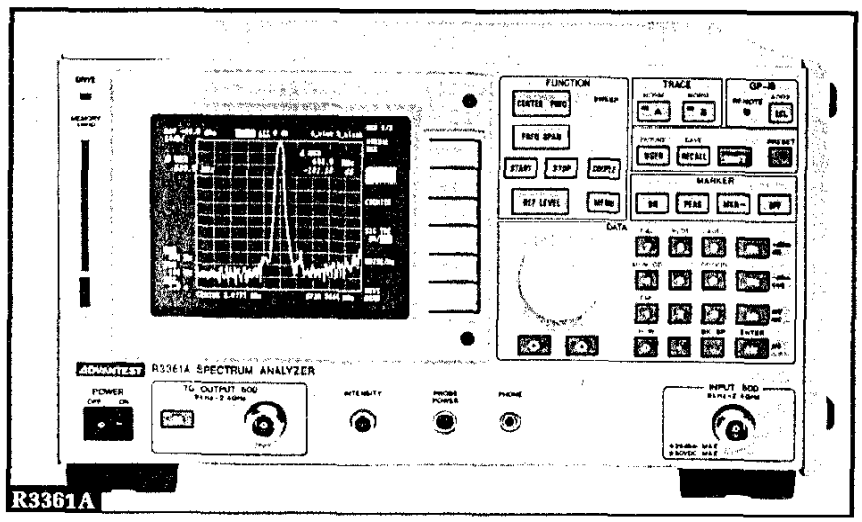
SPECTRUM ANALYZERS

R3261A R3261AN R3261B R3361A R3361AN R3361B Spectrum Analyzers

Easy-to-use portable spectrum analyzers offering high performance and unique functions.

R3261A, R3261AN, R3261B, R3361A, R3361AN, R3361B

- Total Level Accuracy of 1 dB (typical)
- User-Defined Functions
- Measuring Window Function
- 120 dB Display Range
- Built-in Tracking Generator (R3361A, R3361AN, R3361B)



R3261/R3361 Series Spectrum Analyzers

The R3261/R3361 Series spectrum analyzers use a synthesized technique to cover wide frequency bands; 9 kHz to 2.6 GHz (R3261A/R3361A) or 9 kHz to 3.6 GHz (R3261B/3361B). These compact analyzers also offer high-performance functions such as the 1 Hz resolution frequency setting function and 1 Hz resolution frequency counter function.

The R3261/R3361 Series spectrum analyzers are easy to operate because they incorporate unique features such as the user-defined functions and measuring window function. Weighing only 15 kg (33 lb.) the analyzers are small and useful for measurement and analysis of all kinds, from maintenance to research and development. The EMC measuring function, field strength measuring function, and audio-visual equipment analysis function for VCRs and 8-mm video equipment are also available.

The analyzers have an internal controller function (Opt. 15), parallel I/O, and GPIB interface for line connection and automatic measurement, so the user can create the ideal system configuration.

1 HZ RESOLUTION SYNTHESIZER

The R3261/R3361 Series portable spectrum analyzers are based upon a synthesized system, so the center and start/stop frequencies can be set with a resolution of 1 Hz. Accurate and quick setting of the measuring frequencies is extremely useful when the frequency of a radio system already known is measured or the start/stop frequency must be set correctly. The synthesizer, featuring 1 Hz resolution, is a powerful tool ideal for waiting, receiving, or spot measurement in the zero span mode.

CHOOSE FROM SIX MODELS, DEPENDING UPON YOUR APPLICATION

The R3261/R3361 Series consists of six models. All models feature high performance and a set of features and functions for various applications.

	R3261A	R3261AN	R3261B	R3361A	R3361AN	R3361B
Frequency Range	9 kHz to 2.6 GHz	9 kHz to 2.6 GHz	9 kHz to 3.6 GHz	9 kHz to 2.6 GHz	9 kHz to 2.6 GHz	9 kHz to 3.6 GHz
Input Impedance	50 Ω	75 Ω	50 Ω	50 Ω	75 Ω	50 Ω
Internal Tracking Generator	Not available	Not available	Not available	Standard	Standard	Standard
Memory Card	Standard	Standard	Standard	Standard	Standard	Standard
Controller Function	Opt. 15	Opt. 15	Opt. 15	Opt. 15	Opt. 15	Opt. 15
Occupied Bandwidth Measurement, Adjacent-Channel Leakage, Power Measurement	Opt. 04	Opt. 04	Opt. 04	Opt. 04	Opt. 04	Opt. 04
Burst Signal Analysis	Opt. 12	Opt. 12	Opt. 12	Opt. 12	Opt. 12	Opt. 12

ADVANTEST

To order, contact your local sales office (listed on the inside back cover) or call the National Marketing Center at 1-800-426-2200, Ext. 99

GPIB IEEE-488 The R3261A, R3261AN, R3261B, R3361A, R3361AN, R3361B comply with IEEE Standard 488.1-1987.

Spectrum Analyzers

R3261A **R3361A**
R3261AN **R3361AN**
R3261B **R3361B**

1 HZ RESOLUTION FREQUENCY COUNTER

The frequency counter built into the R3261/R3361 Series features 1 Hz resolution. One of the advantages of these analyzers is that they can measure the modulated frequency or spurious frequency of a radio system that cannot be measured with an ordinary frequency counter, simply by setting a marker. The R3261/R3361 Series can measure a frequency very accurately in the counter mode even when the marker point is slightly off the peak point. In addition, the ability to measure weaker signals than a frequency counter can extend the application range from broadband panoramic measurement to weak signal measurement.

MANUAL SWEEP FUNCTION FOR SPOT MEASUREMENT

EMC measurements using the quasi-peak (QP) detector require an extended sweep time. However, the time required to measure the peak value can be shortened using the manual sweep function.

CREATE YOUR OWN UNIQUE MENU

The R3261/R3361 Series spectrum analyzers are very functional, yet very easy to use because of the user-defined functions and define functions. The built-in microprocessor (in some instruments) improves the measurement accuracy and functions but, at the same time, may make the systems very difficult to use. As a solution to this problem, the software menu method was developed. However, this method was still not satisfactory. The new concept employed in the R3261/R3361 solves these problems:

- **User-defined function.** If the user defines a necessary function on the USER key in the same way as on the function keys of a personal computer. A unique menu can be created.
- **Define function.** The define function enables the user to change the software key menu manually. With this function, you can create a unique system by changing the key functions that were defined before the system was shipped from the factory.

FAST MEASUREMENT WITH MEASURING WINDOW FUNCTION

The R3261/R3361 Series has a measuring window function. In conventional analysis, the user picks up only necessary portions from all the display data with a marker. However, you may need to specify a certain range of data for the analysis. This is accomplished by the measuring window function. The window specification may include not only a frequency but a level. The frequency and level are not fixed but can be specified to arbitrary values for flexible analysis. In addition, since marker and sweep operations are possible in a range set by the frequency and level, the measuring time can be reduced greatly.

INTERNAL TRACKING GENERATOR AND 120 dB DISPLAY RANGE

The R3361A/R3361AN/R3361B have an internal tracking generator to dynamically measure the resonant characteristic of a high-Q element or the frequency response of a dielectric filter. In addition, the 120 dB dynamic-range display guarantees a 110 dB dynamic measurement range for frequency response measurement with the tracking generator. Therefore, even high stop-band attenuation can be measured.

The wide frequency range (R3361A: 9 kHz to 2.6 GHz, R3361B: 9 kHz to 3.6 GHz) enables the passing characteristic of sub-microwave filters for the new mobile communication systems and their reflection characteristics using bridges to be measured with high precision. A log sweep is also available.

CONTROLLER FUNCTION FOR AUTOMATIC MEASUREMENT (OPTIONAL)

An optional controller function can be installed in the R3261/R3361 Series. The function understands the easy-to-use BASIC language and controls not only itself but also other GBIB equipment connected through the GPIB interface. When creating a program, you can use your own terminal or personal computer in the terminal mode. The parallel I/O controls parallel I/O equipment including small jigs for automatic measurement, according to instructions from the controller function. This function works efficiently in a small space at low cost, so it is ideal for small systems. The created program, measuring conditions, and waveform data can be stored in the IC memory so that the program can be run using this unit alone.

Characteristics

FREQUENCY RELATED

Measuring Frequency Range – R3261A, R3261AN, R3361A, R3361AN: 9 kHz to 2.6 GHz. R3261B, R3361B: 9 kHz to 3.6 GHz.

Central Frequency Setting Resolution – 1 Hz.

Central Frequency Display Accuracy – Span ≤2 MHz: ±(3% of span + central frequency x reference oscillator accuracy + 20 Hz). Span >2 MHz: +(2% of span + central frequency x reference oscillator accuracy + 20 kHz).

Reference Oscillator – Switching by internal or external input (10 MHz).

Internal Reference Oscillator Stability – $+2 \times 10^{-9}$/day, $\pm 2 \times 10^{-7}$/year.

Frequency Span – Linear mode: R3261A/AN/, R3361A/AN: 1 kHz to 2.6 GHz and zero. R3261B/R3361B: 1 kHz to 3.6 GHz and zero. Log mode: 1, 2, or 3 decades selected between 10 kHz and 1000 MHz.

Frequency Span Accuracy – Span < 2 MHz: ≤±3% of span. Span >2 MHz: ≤±5% of span.

Frequency Stability – Residual FM: 10 MHz ≤ span < 2 MHz: 50 kHz p-p or less. Span >2 MHz: 2 kHz p-p or less. Span ≤2 MHz: 20 Hz p-p or less. Frequency drift: Span ≤2 MHz: 300 Hz/min. or less.

Sideband Noise – At 20 kHz offset f ≤ 3.0 GHz, –105 dBc/Hz; f ≤ 3.6 GHz, –101 dBc/Hz.

Resolution – 3 dB bandwidth: 30 Hz to 1 MHz; switchable in 1 to 3 steps. 6 dB bandwidth: 200 Hz, 9 kHz, 120 kHz. Selectivity: ≤15:1 (60 dB: 3 dB). Bandwidth accuracy: ≤20%.

Marker Accuracy – Normal mode: Central frequency display accuracy + span accuracy. Counter Mode: Display frequency x reference oscillator accuracy ±1 count.

R3261A R3261AN R3261B R3361A R3361AN R3361B Spectrum Analyzers

AMPLITUDE RELATED

Amplitude Measuring Range – R3261A, R3261B, R3361A, R3361B: –130 dBm to +25 dBm. R3261AN, R3361AN: –19 dBμV to +132 dBμV

Screen Display Range –
Log mode: 10 dB/div.: 120 dB. 10 dB/div.: 80 dB. 5 dB/div.: 50 dB. 2 dB/div.: 20 dB. 1 dB/div.: 10 dB.
Linear mode: 10 div.
QP mode: 80 dB (10 dB/div.) when measuring range is 70 dB

Display Linearity –
Log mode: ±2.0 dB/110 dB, ±1.5 dB/70 dB, ±1.0 dB/10 dB, ±0.2 dB/1 dB.
Linear mode: ±5% of full scale.
QP mode: ±2.0 dB/70 dB, ±1.0 dB/40 dB.

Reference Level Display Range – R3261A, R3261B, R3361A, R3361B: –109.9 dBm to +40.0 dBm, 0.715 μV to 22.4 V. R3261AN, R3361AN: +0.1 dBμV to +150 dBμV, 1.01 μV to 31.6 V.

Reference Level Accuracy (after automatic calibration) –

	R3261A/R3261B R3361A/R3361B	R3261AN R3361AN
≤±0.3 dB	0 dBm to –50 dBm	+110 dBμV to +60 dBμV
≤±0.7 dB	+20 dBm to –70 dBm	+130 dBμV to +40 dBμV

Dynamic Range

Average noise level – (resolution bandwidth – 300 Hz, Video bandwidth 1 Hz, Input attenuator 0 dB, Frequency range 10 MHz or more): R3261A, R3261B, R3361A, R3361B: –120 dBm + 1.55 f (GHz) dB. R3261AN, R3361AN: –10 dBμV +1.55 f (GHz) dB.

Secondary and tertiary distortion – ≤–70 dB at –30 dBm input, Input attenuator: 0 dB, Frequency: 10 MHz or more.

Frequency response –

	R3261A/R3261B R3361A/R3361B	R3261AN R3361AN
100 Hz to 2 GHz	≤±0.5 dB	≤±0.5 dB
9 kHz to 2.6 GHz	≤±1.0 dB	
9 kHz to 3.6 GHz		≤±1.5 dB

Residual response – R3261A, R3261B, R3361A, R3361B: ≤–100 dBm; Termination: 50 Ω. R3261AN, R3361AN: ≤–11 dBμV; Termination: 75 Ω.

Resolution Bandwidth Switching Accuracy – ≤±0.3 dB after automatic calibration.

Video Filter – 1 Hz to 1 MHz; switchable in 1 or 10 steps.

SWEEP RELATED

Sweep Time – 50 ms to 1000 s and manual sweep.

Sweep Time Accuracy – ≤3%.

Trigger Modes – FREE RUN, LINE, VIDEO, EXT, TV-V, and SINGLE.

TRACKING GENERATOR SPECIFICATIONS (R3361A, R3361AN, R3361B)

Frequency Range – R3361A/R3361AN: 9 kHz to 2.6 GHz. R3361B: 9 kHz to 3.6 GHz.

Output Level Range – R3361A, R3361B: 0 dBm to –50 dBm. R3361AN: +105 dBμV to 55 dBμV setting in 1 dB steps.

Output Level Accuracy – ≤±0.5 dB (30 MHz, –10 dBm, 20°C to 30°C).

Output Level Flatness –

	R3361A/R3361B (at –10 dBm output)	R3361AN (at +95 dBμV output)
100 kHz to 1.0 GHz	≤0.7 dB	≤0.7 dB
9 kHz to 2.6 GHz	≤1.5 dB	≤1.5 dB
9 kHz to 3.6 GHz	≤2.0 dB	≤2.0 dB

Output Level Switching Accuracy (at 0 dBm/+95 dBμV output) – 100 kHz to 1.0 GHz: ≤±1.0 dB. 9 kHz to 2.6 GHz: ≤±2.0 dB. 9 kHz to 3.6 GHz: ≤±3.0 dB.

Output Spurious (at 0 dBm/+105 dBμV output) – Harmonic spurious: ≤–20 dB. Non-harmonic spurious: ≤30 dB.

Tracking Generator Leakage – R3361A/R3361B. Frequency ≤3.0 GHz. ≤–110 dBm. Frequency ≤3.6 GHz: ≤–100 dBm. R3361AN: ≤+1 dBμV.

Output Impedance – R3361A, R3361B: Approximately 50 Ω.
R3361AN: Approximately 75 Ω.

Output VSWR (at ≤–10 dBm/+95 dBμV output) – 100 Hz to 2 GHz: ≤1.5. 9 kHz to 3.6 GHz: ≤2.0.

Output Connector – N type.

Spectrum Analyzers

R3261A **R3361A**
R3261AN **R3361AN**
R3261B **R3361B**

INPUT RELATED

Input Impedance – R3261A, R3261B, R3361A, R3361B: 50 Ω. R3261AN, R3361AN: 75 Ω.

VSWR (at input attenuator ≥10 dB) – 100 kHz to 2 GHz: ≤1.5. 9 kHz to 3.6 GHz: ≤2.0.

Input Connector – N type.

Maximum Input Level – R3261A, R3261B, R3361A, R3361B: +25 dBm (attenuator ≥30 dB), 50 VDC max. R3261AN, R3361AN: +132 dBm (attenuator ≥30 dB), ±50 VDC max.

Input Attenuator – 0 to 50 dB in 10 dB steps.

Input Attenuator Switching Accuracy – ≤1.0 dB (≤2.0 GHz), ≤1.5 dB (≤3.6 GHz) at input attenuator 10 dB.

Detection Modes – NORMAL, POSI, NEGA, and SAMPLE.

INPUTS/OUTPUTS

External Memory Function – IC memory card.

GPIB Data Output/Remote Control – Data output and remote control through internal GPIB interface.

Direct Plotting – Hard copy output of all display data to Tektronix HC100 Opt. 01, or other HPGL plotters through internal GPIB interface.

Voice Monitor Output – AM and FM with approximately, 8 Ω earphone.

Probe Power Source: – ±15 V, 4-Pin connector.

ENVIRONMENTAL

Ambient Temperature – 0°C to +50°C. Relative Humidity: 85% or less.

Storage Temperature – –20°C to +60°C.

Safety – This product has been safety tested by Advantest to IEC 348 specifications.

POWER REQUIREMENTS

Operating voltage – Standard: 90 to 132 Volts. Opt. 40: 198 to 250 Volts.

Power Consumption – Less than 220 VA.

Frequency – 48 to 66 Hz.

CRT – 5.5 in.

PHYSICAL CHARACTERISTICS

Dimensions (approx.)	mm	in.
Height	177	7.0
Width	330	13.0
Depth	450	17.7
Weight	**kg**	**lb.**
R3261A, R3261AN, R3261B	15	33
R3361A, R3361AN, R3361B	17	37.5

ORDERING INFORMATION

R3261A
Spectrum Analyzer **$12,900**
Includes: Power Cord, BNC-to-BNC Cable, N-Type BNC Cable, N-to-BNC Adapter, N-Type N-to-BNC Adapter, Memory Card, Instruction Manual.

R3261AN
Spectrum Analyzer **$12,900**
Includes: Power Cord, BNC-to-BNC Cable, N-Type BNC Cable, N-to-BNC Adapter, N-Type N-to-BNC Adapter, Memory Card, Instruction Manual.

R3261B
Spectrum Analyzer **$18,200**
Includes: Power Cord, BNC-to-BNC Cable, N-Type BNC Cable, N-to-BNC Adapter, N-Type N-to-BNC Adapter, Memory Card, Instruction Manual.

R3361A
Spectrum Analyzer **$18,500**
Includes: Power Cord, BNC-to-BNC Cable, N-Type BNC Cable, N-to-BNC Adapter, N-Type N-to-BNC Adapter, Memory Card, Instruction Manual.

R3361AN
Spectrum Analyzer **$18,500**
Includes: Power Cord, BNC-to-BNC Cable, N-Type BNC Cable, N-to-BNC Adapter, N-Type N-to-BNC Adapter, Memory Card, Instruction Manual.

R3361B
Spectrum Analyzer **$23,500**
Includes: Power Cord, BNC-to-BNC Cable, N-Type BNC Cable, N-to-BNC Adapter, N-Type N-to-BNC Adapter, Memory Card, Instruction Manual.

Opt. 04 – Occupied bandwidth measurement/ adjacent-channel leakage power measurement ..... **+$900**
Opt. 12 – Gated sweep ..... **+$1,950**
Opt. 15 – Controller function (including parallel I/O and serial I/O) ..... **+$1,950**
Opt. 40 – 198 to 250 VAC operation ..... **NC**
Opt. 70 – Multi-marker option Max. ..... **+$500**

RECOMMENDED ACCESSORIES

See Page 424 for complete selection information.

PROBES

FET Probe – DC to 900 MHz (Requires 1101A). Order P6201 ..... **$1,550**
FET Probe – DC to 500 MHz. Order P6202A **$1,025**
50 Ω Divider Probe P6155 – DC to 3.5 GHz, 6 ft. Order P6156 ..... **$265**
Current Probe – 935 Hz to 120 MHz. Order P6022 ..... **$595**
Plotter – Order Tektronix HC100 Opt. 01 ..... **$1,260**
Carrying Case – Order R16211A **$500**
Front Cover – Order A02804 ..... **$200**
Transit Case – Order R16056A **$1,000**
Memory Card – Set of five 32 KB cards. Order A09505 ..... **$500**
Memory Card – Set of five 128 KB cards. Order A09506 ..... **$1,400**
Preamplifier – 9 kHz to 1 GHz, ≥ 25 dB. Order R14601 ..... **$995**
SWR Bridge – 50 MHz to 2 GHz, 50Ω, Type N connectors. Order 60NF50 ..... **$4,275**
Rackmount Set – Conforms to EIA standards. Order A02455 ..... **$300**

ADVANTEST

To order, contact your local sales office (listed on the inside back cover) or call the National Marketing Center at 1-800-426-2200, Ext. 99

GPIB IEEE-488

The R3261A, R3261AN, R3261B, R3361A, R3361AN, R3361B comply with IEEE Standard 488.1-1987.