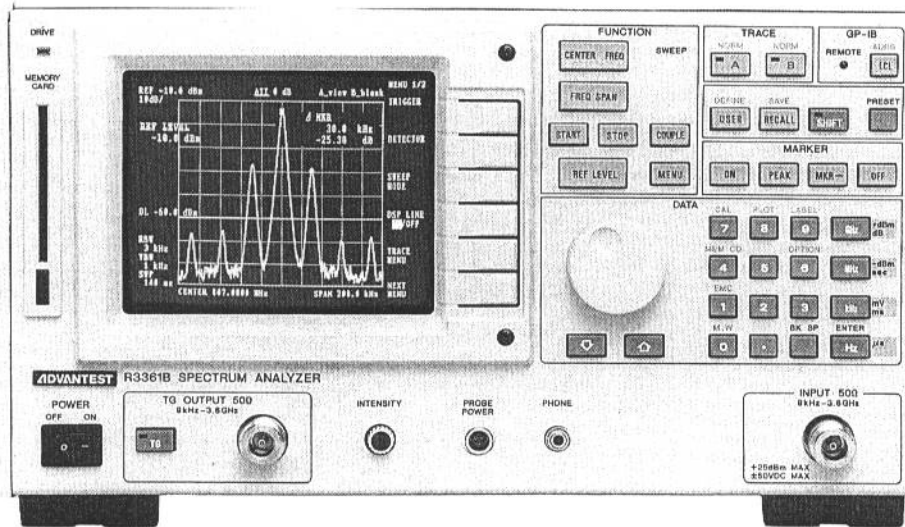


Spectrum Analyzers

9 kHz to 2.6 GHz/3.6 GHz

R3261A/3261B/3361A/3361B

- Total Level Accuracy of 1 dB
- User-Defined Functions
- Measuring Window Function
- 120 dB Display Range



R3261/3361 Series Spectrum Analyzers

The R3261/3361 Series spectrum analyzers use a synthesized technique to cover wide frequency bands: 9 kHz to 2.6 GHz (R3261A/3361A) or 9 kHz to 3.6 GHz (R3261B/3361B). ADVANTEST's long experience in RF technology and software calibration technology have enabled a total level accuracy of 1 dB. These compact analyzers also offer high-performance functions such as the 1 Hz resolution frequency setting function and 1 Hz resolution frequency counter function.

ADVANTEST's spectrum analyzers are easier to operate than conventional analyzers because they incorporate new ideas such as the user-defined functions and measuring window function. Weighing only 15 kg, 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 audiovisual equipment analysis function for VCRs and 8-mm video equipment are also available.

The analyzers have an internal controller function, 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 R3261/3361 Series portable spectrum analyzers are based on the synthesized system, so the central 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.

■ 1 Hz Resolution Frequency Counter

The frequency counter built into the R3261/3361 Series features 1 Hz resolution.

One of the advantages of 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 R3261/3361 Series model 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.

■ 70 dB QP Dynamic Range

Most conventional spectrum analyzers conduct EMC measurement in the QP measuring dynamic range of 40 dB. The R3261/3361 Series models, however, can measure the EMC in the dynamic range up to 70 dB. This assures reliable measurement even when the overload coefficient is taken into account. In addition, the optional preselector R3551 extends system to an EMC receive system with a wide dynamic range.

■ Unique Audio Monitor and Marker Pause Functions

You may often want to monitor an audio signal during field strength measurement or EMC measurement. The R3261/3361 Series has a marker pause function to monitor an audio not only in the zero span mode but also in the panoramic reception mode. The spectrum analyzers are carefully designed with the internal detection function and the FM and AM volume adjustment function.

Manual Sweep Function for Spot Measurement

The sweep time in EMC or QP measurement is extremely long to complete measurement. But the sweep time when measuring the peak value is extremely short and measurement can be done in a short time. So the QP value is usually measured first at the peak, then at the necessary position. The manual sweep function of the R3261/3361 Series is a very handy and unique function to measure only a point specified by turning the rotary knob on the front panel. If you use the manual sweep function for QP measurement even once, you will wonder how you ever managed without it.

This is recommended for EMC measurement using ADVANTEST's spectrum analyzer.

Create Your Own Unique Menu

The R3261/3361 Series spectrum analyzers are very functional, yet very easy to use because of the user-defined functions and define functions. The microprocessor built in to many measuring instruments improved the measurement accuracy and functions but they also made 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. ADVANTEST's new concept solves most of these problems.

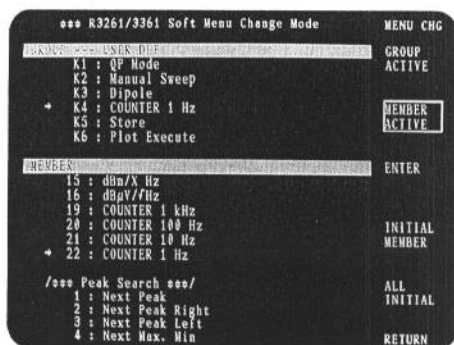
User-defined function

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.

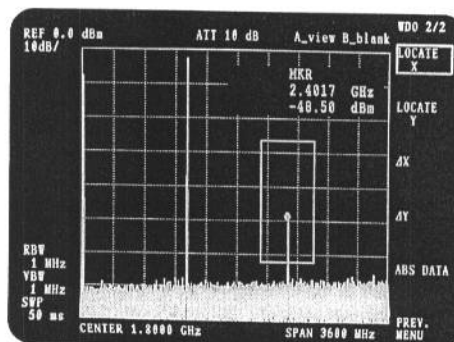
Define function

The define function enables the user to change the software key menu manually. With this function, the user can create a unique system by changing the key functions that were defined before the system was shipped from ADVANTEST.



Fast Measurement with Measuring Window Function

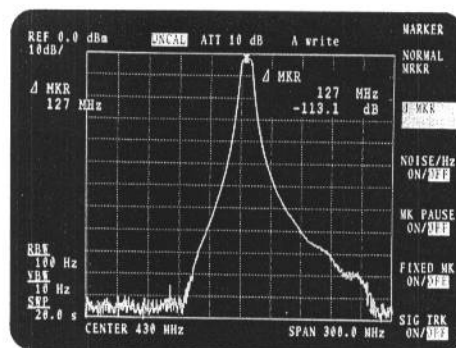
The R3261/3361 Series models have a measuring window function. In conventional analysis, the user picks up only necessary portions from all the display data with a marker. However, you may need to specify a certain range of data for the analysis. This is accomplished by the measuring window function. 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/3361B has an internal tracking generator (TG) to dynamically measure the resonant characteristic of a high Q element or the frequency characteristic of a dielectric filter. In addition, the 120 dB dynamic-range display guarantees a 110 dB dynamic measurement range for frequency characteristic measurement with the tracking generator. Therefore, even when the filter has a great attenuation range, it can be measured one at a time.

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 R3261/3361 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.

Spectrum Analyzers

9 kHz to 2.6 GHz/3.6 GHz

R3261A/3261B/3361A/3361B

Specifications

Frequency Specifications

Measuring frequency range: 9 kHz to 2.6 GHz (R3261A/3361A)
9 kHz to 3.6 GHz (R3261B/3361B)

Central frequency setting resolution: 1 Hz

Central frequency display accuracy:

- ±(3% of span + central frequency × reference oscillator accuracy + 20 Hz)
... at span ≤ 2 MHz
- ±(2% of span + central frequency × reference oscillator accuracy + 50 kHz)
... at span > 2 MHz

Reference oscillator:

Switching by internal or external input (10 MHz)

Internal reference oscillator stability: $\pm 2 \times 10^{-6}/\text{day}$, $\pm 2 \times 10^{-7}/\text{year}$

Frequency span:

- Linear mode 1 kHz to 2.6 GHz and zero (R3261A/3361A)
1 kHz to 3.6 GHz and zero (R3261B/3361B)
- Log mode 1, 2, or 3 decades selected between 10 kHz and 1000 MHz

Frequency span accuracy: $\leq \pm 3\%$ of span Span > 2 MHz
 $\leq \pm 5\%$ of span Span ≥ 2 MHz

Frequency stability:

- | | | |
|-----------------|--------------------|---------------|
| Residual FM | 50 kHzp-p or less | Span > 10 MHz |
| | 2 kHzp-p or less | Span > 2 MHz |
| | 20 Hzp-p or less | Span ≤ 2 MHz |
| Frequency drift | 300 Hz/min or less | Span ≤ 2 MHz |

Sideband noise: ≤ -105 dBc/Hz at 20 kHz offset ≤ 3.0 GHz
 ≤ -101 dBc/Hz at 20 kHz offset ≤ 3.6 GHz

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 $\leq 15:1$ (60 dB:3 dB)
- Bandwidth accuracy $\leq 20\%$

Marker accuracy:

- Normal mode
central frequency display accuracy + span accuracy
- Counter mode
display frequency × reference oscillator accuracy ± 1 count

Amplitude Specifications

Amplitude measuring range: -130 dBm to +25 dBm

Screen display range:

- Log mode 120 dB (10 dB/div), 80 dB (10 dB/div), 50 dB (5 dB/div),
20 dB (2 dB/div), 10 dB (1 dB/div)
- 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 $\pm 5\%$ of full scale
- QP mode ± 2.0 dB/70 dB, ± 1.0 dB/40 dB

Reference level display range:

-109.9 dBm to +40.0 dBm, 0.715 μ V to 22.4 V

Reference level accuracy:

- ≤ 0.3 dB (0 to -50 dBm),
- ≤ 0.7 dB (+20 to -70 dBm) after automatic calibration

Dynamic range:

Average noise level -121 dBm + 1.55 f (GHz) dB ... Resolution bandwidth:
300 Hz, video band width: 1 Hz, input, attenuator: 0 dB, and frequency
range: 10 MHz or more

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

Frequency response

- $\leq \pm 1.0$ dB 100 kHz to 2 GHz,
- ≤ 2.0 dB 9 kHz to 3.6 GHz

Log mode, input attenuator: 10 dB, temperature: 20°C to 30°C

Residual response ≤ -100 dBm

Input attenuator: 0 dB, termination: 50 Ω , frequency: 500 kHz or more

Resolution bandwidth switching accuracy:

$\leq \pm 0.3$ dB after automatic calibration

Video filter:

1 Hz to 1 MHz; switchable in 1 or 10 steps

Sweep Specifications

Sweep time: 50 ms to 1000 s and manual sweep

Sweep time accuracy: $\leq 3\%$

Trigger modes: FREE RUN, LINE, VIDEO, EXT, TV-V, and SINGLE

Input Specifications

Input impedance:

- approx. 50 Ω
- VSWR ≤ 1.5 (≤ 2.0 GHz), ≤ 2.0 (≤ 3.6 GHz)

Input connector: N type

Maximum input level: +25 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

Tracking Generator Specifications (R3361A/3361B)

Frequency range: 9 kHz to 2.6 GHz (R3361A)
9 kHz to 3.6 GHz (R3361 B)

Output level range: 0 dBm to -50 dBm; setting in 1-dB steps

Output level accuracy: $\leq \pm 0.5$ dB (30 MHz, -10 dBm, 20°C to 30°C)

Output level flatness: at -10 dBm output
 $\leq \pm 0.7$ dB 100 kHz to 1.0 GHz
 $\leq \pm 2.0$ dB 9 kHz to 3.6 GHz

Output level switching accuracy: at -10 dBm output
 $\leq \pm 1.0$ dB 100 kHz to 1.0 GHz
 $\leq \pm 2.0$ dB 9 kHz to 2.4 GHz
 $\leq \pm 3.0$ dB 9 kHz to 3.6 GHz

Output spurious: at 0 dBm output

Harmonic spurious: ≤ -20 dB

Non-harmonic spurious: ≤ -30 dB

TG leakage: ≤ -100 dBm ≤ 3.0 GHz
 ≤ -100 dBm ≤ 3.6 GHz

Output impedance: approx. 50 Ω

Output VSWR: at ≤ -10 dBm output
 ≤ 1.5 100 kHz to 2 GHz
 ≤ 2.0 9 kHz to 3.6 GHz

Output connector: N type

Other Output Specifications

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 R9833 or HPGL plotter through internal GPIB interface

Voice monitor output: AM ant FM with approx. 8 Ω earphone

Probe power source: ± 15 V, 4-pin connector

General Specifications

Operating environment:

Ambient temperature 0°C to 50°C.

Relative humidity 85% or less

Storage environment temperature: -20°C to 60°C

Power requirement: Specify when ordering

Option	Standard	40
Power-supply voltage	90 to 132	198 to 250

48 to 66 Hz

Power consumption: Less than 220 VA

Outside dimensions: approx. 330 (W) \times 177 (H) \times 450 (D) mm

Weight: approx. 15 kg (R3261A/3261B)
approx. 17 kg (R3361A/3361B)

Options

Option Occupied frequency bandwidth measurement/adjacent channel leakage power measurement

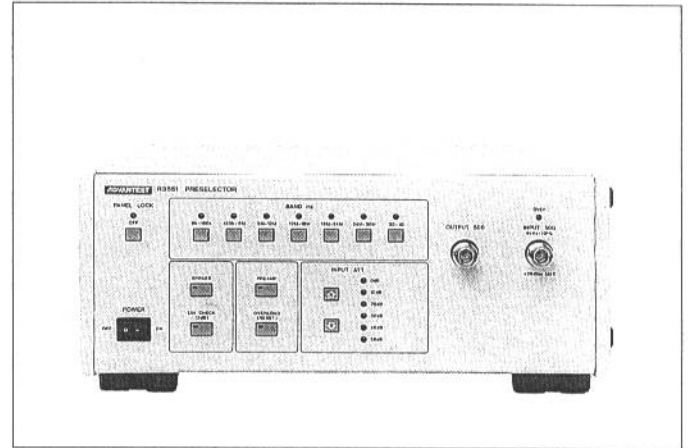
Option Controller function

Option Intermittent signal measurement

Option Parallel I/O

Option Serial I/O

Accessories (Sold separately)



R3551 Preselector

The R3551 Preselector helps a spectrum analyzer for EMI measurement. A spectrum analyzer can monitor all the frequencies panoramically and features high measurement speed. However, it is easily saturated by large input signals. The R3551 solves this problem and enables the analyzer to measure even 100 Hz, 0.044 μ Vsec, and 100 V large input signals meeting the CISPR standards.

- Prevention of spectrum analyzer from being saturated by 100 V, 0.044 μ V sec, large input signals
- 30 dB higher sensitivity by the built-in preamplifier
- Completely interlocked with the spectrum analyzer
- Frequency correction amplifier for high-precision measurement
- Overload detector built in
- Linearity check function for easy saturation check
- GPIB

Specifications

Measuring range: 9 kHz to 1 GHz

Input connector: approx. 50 Ω , N type

Output connector: N type

Input attenuator: 0 to 50 dB in 10-dB steps

Preamplifier: 30 dB \pm 1.5 dB

Linearity check: 3 dB attenuator

Bypass circuit: 1.5 dB or less insertion loss (at 9 kHz to 1 GHz)

Input protection switch: Activated at +20 dBm \pm 2 dB

Peak power: 100 W/10 μ s or less (input attenuator: 20 dB or more)

Sweep time: 1 s or less at each setting

Frequency characteristic: ± 2 dB (9 kHz to 1 GHz after system calibration)

Bandwidth: 30 MHz (3 dB, typ.)

Off resonance: 40 dB (typ.)

Operating environment:

Temperature 0°C to + 50°C

Relative humidity 85% or less

Power requirements: Specify when ordering

Option No.	Standard	32	42	44
Power-supply voltage	90 to 110	103 to 132	198 to 242	207 to 250

48 to 66 Hz, 75 VA or less

Outside dimensions: approx. 330 (W) \times 132 (H) \times 450 (D) mm