

Test Equipment Solutions Datasheet

Test Equipment Solutions Ltd specialise in the second user sale, rental and distribution of quality test & measurement (T&M) equipment. We stock all major equipment types such as spectrum analyzers, signal generators, oscilloscopes, power meters, logic analysers etc from all the major suppliers such as Agilent, Tektronix, Anritsu and Rohde & Schwarz.

We are focused at the professional end of the marketplace, primarily working with customers for whom high performance, quality and service are key, whilst realising the cost savings that second user equipment offers. As such, we fully test & refurbish equipment in our in-house, traceable Lab. Items are supplied with manuals, accessories and typically a full no-quibble 2 year warranty. Our staff have extensive backgrounds in T&M, totalling over 150 years of combined experience, which enables us to deliver industry-leading service and support. We endeavour to be customer focused in every way right down to the detail, such as offering free delivery on sales, covering the cost of warranty returns BOTH ways (plus supplying a loan unit, if available) and supplying a free business tool with every order.

As well as the headline benefit of cost saving, second user offers shorter lead times, higher reliability and multivendor solutions. Rental, of course, is ideal for shorter term needs and offers fast delivery, flexibility, try-before-you-buy, zero capital expenditure, lower risk and off balance sheet accounting. Both second user and rental improve the key business measure of Return On Capital Employed.

We are based near Heathrow Airport in the UK from where we supply test equipment worldwide. Our facility incorporates Sales, Support, Admin, Logistics and our own in-house Lab.

All products supplied by Test Equipment Solutions include:

- No-quibble parts & labour warranty (we provide transport for UK mainland addresses).
- Free loan equipment during warranty repair, if available.
- Full electrical, mechanical and safety refurbishment in our in-house Lab.
- Certificate of Conformance (calibration available on request).
- Manuals and accessories required for normal operation.
- Free insured delivery to your UK mainland address (sales).
- Support from our team of seasoned Test & Measurement engineers.
- ISO9001 quality assurance.

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Spectrum Analyzers

9 kHz to 2.6 GHz / 3.6 GHz

R3261/3361 Series

- **Wide Frequency Range:**
9 kHz to 2.6 GHz (R3261C/3261CN/3361C/3361CN)
9 kHz to 3.6 GHz (R3261D/3361D)
- **Total Level Accuracy of 1 dB**
(Typical Value)
- **CRT Display 120 dB**
- **Memory Card, GPIB Port Provided Standard**
- **Internal TG (R3361C/3361CN/3361D)**
- **Controller Function (Option)**



Used by NHK Japanese, Defense Agency

(Photo is R3261D)

R3261/3361 Series Spectrum Analyzers

The R3261/3361 Series are compact and lightweight spectrum analyzers which use a synthesized technique to cover wide frequency bands: 9 kHz to 2.6 GHz (R3261C/3261CN/3361C/3361CN) or 9 kHz to 3.6 GHz (R3261D/3361D).

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 a central frequency with a 1 Hz resolution, start/stop frequency setting and an internal frequency counter with a 1 Hz resolution.

■ Total Level Accuracy of 1 dB (Typ.)

By adding software calibration technology to ADVANTEST's long experience in RF technology, the R3261/3361 Series achieves a total level accuracy of 1 dB (typical value). With this technology, highly accurate level measurements are possible without worrying about linearity error due to IF stage log amp or RBW switching.

■ Choose From 6 Models, Depending Upon Your Application

	R3261C	R3261CN	R3261D	R3361C	R3361CN	R3361D
Frequency range	9 kHz to 2.6 GHz		9 kHz to 3.6 GHz	9 kHz to 2.6 GHz		9 kHz to 3.6 GHz
Input impedance	50 Ω	75 Ω	50 Ω	75 Ω	50 Ω	50 Ω
Tracking generator function	-		Standard			
IC memory card function			Standard			
Occupied bandwidth measurement			Standard			
Adjacent channel leakage power measurement			Standard			
Intermittent signal measurement, serial I/O						
Intermittent signal measurement, controller			Option 80			
Function			Option 81			

■ 1 Hz Resolution Synthesizer and Frequency Counter

Although portable, the R3261/3361 Series uses a synthesized system, so the central and start/stop frequencies can be set with a resolution of 1 Hz.

Frequency measurements with a 1 Hz resolution can be done with the internal frequency counter. Spectrum analyzers can not only measure transmitter carrier waves, but can also measure modulated frequencies highly accurately, which cannot be done with ordinary frequency counters.

■ Unique Sound Monitor Mode and Marker Pause Mode

When measuring electric field strength or doing EMC measurements, there is often the need to monitor the sound. As well as having a conventional sound monitor in zero span mode, by means of a marker pause function, the R3261/3361 Series can monitor sound while doing panoramic reception measurements.

■ 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.

Spectrum Analyzers

9 kHz to 2.6 GHz/3.6 GHz

R3261/3361 Series (Continued from previous page)

Specifications

Frequency

Measuring frequency range:

R3261C/3261D/3361C/3361D	R3261D/3361D
9 kHz to 2.6 GHz	9 kHz to 3.6 GHz

Central frequency setting resolution: 1 Hz

Central frequency display accuracy:

- $\pm(3\%$ of span + central frequency \times reference oscillator accuracy + 20 Hz) ... at span \leq 2 MHz
- $\pm(2\%$ of span + central frequency \times reference oscillator accuracy + 50 Hz) ... at span \leq 2 MHz

Reference oscillator:

Switching by internal or external input (10 MHz)

Internal reference oscillator stability: $\pm 2 \times 10^{-8}$ /day, $\pm 2 \times 10^{-7}$ /year aging

Temperature stability: $\pm 5 \times 10^{-8}$ (0 to 50°C, +25°C reference)

Frequency span:

Linear mode: 1 kHz to 2.6 GHz (R3261D/3361D; 3.6 GHz) and zero

Log mode: 1, 2, or 3 decades selected between 10 kHz to 1000 MHz

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

Frequency stability:

Residual FM: 50 kHz_{p-p} or less Span > 10 MHz
 2 kHz_{p-p} or less 10 MHz \geq Span > 2 MHz
 20 Hz_{p-p} or less Span \leq 2 MHz

Frequency drift: 300 Hz/min or less Span \leq 2 MHz
 (At stable temperature after 1 hr. warm-up)

Sideband noise: ≤ -105 dBc/Hz, $f \leq 3.0$ GHz, 20 kHz offset
 ≤ -101 dBc/Hz, $f \leq 3.6$ GHz, 20 kHz offset

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: $\leq 20\%$

Marker accuracy:

Normal mode: Central frequency display accuracy + span accuracy

Counter mode: Display frequency \times reference oscillator accuracy ± 1 count (span \leq 100 MHz)

Amplitude

Amplitude measuring range:

R3261C/3261D/3361C/3361D	R3261CN/3361CN
-130 dBm to +25 dBm	-19 dB μ V to +132 dB \leq V

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: $\pm 2.0/110$ dB, $\pm 1.5/70$ dB, $\pm 1.0/10$ dB, $\pm 0.2/1$ dB

Linear mode: $\pm 5\%$ of full scale

QP mode: ± 2.0 dB/70 dB, $\pm 1.0/40$ dB

Reference level display range:

R3261C/3261D/3361C/3361D	R3261CN/3361CN
-109.9 to +40.0 dBm 0.715 μ V to 22.4 V	+0.1 to +150 dB μ V 1.01 μ V to 31.6 V

Reference level accuracy: (After automatic calibration)

	R3261C/3261D/3361C/3361D	R3261CN/3361CN
$\leq \pm 0.3$ dB	0 to -50 dBm	+110 to +60 dB μ V
$\leq \pm 0.7$ dB	+20 to -70 dBm	+130 to +40 dB μ V

Dynamic range:

Average noise level

R3261C/3261D/3361C/3361D	R3261CN/3361CN
-121 dBm + 1.55f(GHz)dB	-10 dB μ V + 1.55f(GHz)dB

Resolution bandwidth: 300 Hz, video band width: 1 Hz, input attenuator: 0 dB, and frequency: 10 MHz or more

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

Frequency response

R3261C/3261D/3361C/3361D	R3261CN/3361CN		
$\leq +0.5$ dB	100 kHz to 2 GHz	$\leq +0.5$ dB	100 kHz to 2 GHz
$\leq +1.0$ dB	9 kHz to 3.6 GHz	$\leq +1.5$ dB	9 kHz to 2.6 GHz

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

Residual response

R3261C/3261D/3361C/3361D	R3261CN/3361CN
≤ -100 dBm Termination: 50 Ω	≤ 11 dB μ V Termination: 75 Ω

Input attenuator: 0 dB, termination, 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

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

Input impedance:

R3261C/3261D/3361C/3361D	R3261CN/3361CN
50 Ω	75 Ω

VSWR ≤ 1.5 100 kHz to 2 GHz at input attenuator ≥ 10 dB

VSWR ≤ 2.0 9 kHz to 3.6 GHz

Input connector: N type

Maximum input level:

R3261C/3261D/3361C/3361D	R3261CN/3361CN
+25 dBm (attenuator ≥ 30 dB) ± 50 VDC max.	+132 dB μ V/(input 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) with input attenuator 10 dB reference

Detection Modes: NORMAL, POSI, NEGA, and SAMPLE

Tracking Generator Specifications (R3361C/3361CN/3361D)

Frequency range: 9 kHz to 2.6 GHz (R3361C/3361CN)

9 kHz to 3.6 GHz (R3361D)

Output level range:

R3361C/3361D	R3361CN
0 to -50 dBm	+105 to 55 dB μ V

Setting in 1-dB steps

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

Output level flatness:

R3361C/3361D	R3361CN
≤ 0.7 dB 100 kHz to 1.0 GHz ≤ 1.5 dB 100 kHz to 2.6 GHz ≤ 2.0 dB 9 kHz to 3.6 GHz	≤ 0.7 dB 100 kHz to 1.0 GHz ≤ 1.5 dB 100 kHz to 2.0 GHz ≤ 2.0 dB 9 kHz to 2.6 GHz
} at -10 dBm	
} at +95 dB μ V output	