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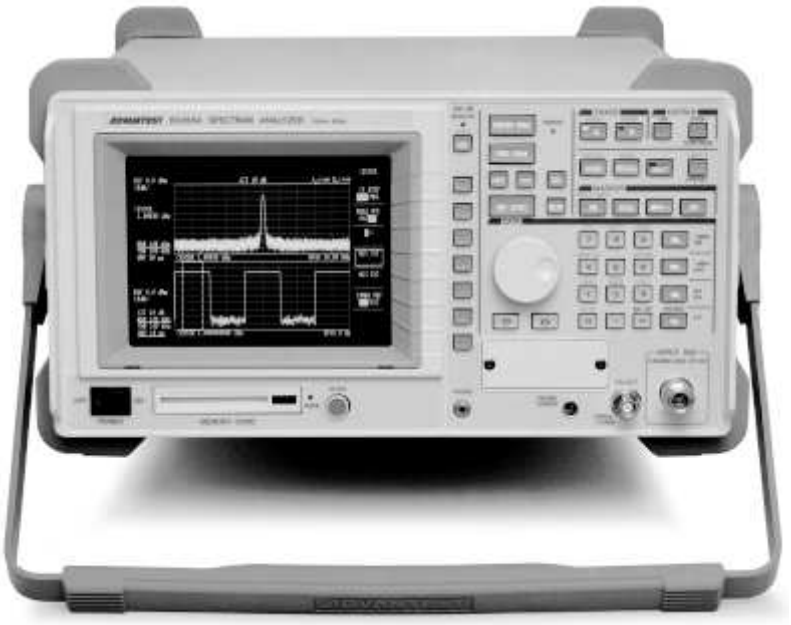
Find the *Advantest R3265A* at our website: *Click HERE*

Spectrum Analyzers

100 Hz to 8 GHz

R3265A/3365A

- High-Input Sensitivity: –145 dBm
- High-Speed Sweep of 5 µs/div and Digital Read output
- Gated Sweep Function
- Memory Card Function
- BASIC Controller Function
- Variety of I/O Interfaces
  GPIB, Serial I/O (RS232C), Modulation Accuracy Interface



R3265A/3365A
Spectrum Analyzers

R3265A/3265AP/3365A Series offers a large–sized CRT screen in a portable unit and a wide frequency range, allowing measurements from 100 Hz to 8 GHz in a single sweep. Due to a newly developed high purity synthesizer, the series also provides excellent spectral purity of –110 dBc/Hz at 2.6 GHz (10 kHz offset frequency).
This unit performs especially well in measuring the spurious emission intensity of new mobile communications equipment, the bandwidth of occupied frequencies and signal leakage from adjacent channels. In the low–noise mode, the series has a high-input sensitivity of –145 dBm (1 MHz to 3.6 GHz), so it can easily measure low level signals.
The R3265A Series is provided with a BASIC controller as a standard feature. This feature allows measured data or set conditions to be stored and the free construction of automatic measurement systems without the need for external controllers.
A preselector for low frequencies has been added to the R3265A, enabling the unit to realize a dynamic range of 100 dB and higher for carrier waves of 250 MHz and higher. The R3365A has a built–in tracking generator and is ideal for measuring frequency characteristics when setting up or maintaining digital radio base stations.

Selection Guide

	R3265A	R3365A
Frequency measuring range	100 Hz to 8 GHz	
Tracking generator	–	❍
Preselector	❍	❍

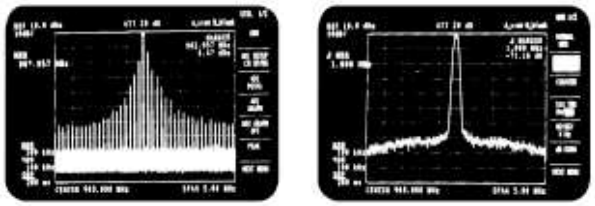
❍ : Internal preselector from 500 Hz

■ Resolution Bandwidths of 10 Hz to 3 MHz

For frequency resolution, the R3265A Series incorporates a narrow-band (10 Hz) IF bandwidth filter that can separate nearby signals from the wide IF bandwidth filter (3 MHz) which improve the measurement sensitivity to a pulsed RF signal. The series can thus be used for a wide variety of measurements.
The narrow-band IF bandwidth filter also incorporates a digital IF filter, thus enabling both nearby signal characteristic measurements with high selectivity as well as high-speed measurements.

■ Gated Sweep Function

The R3265A Series includes a burst signal (TDMA and video signals) analysis function as a standard feature. When combined with the high-speed sweep function, this function can be used to monitor the transmission power in an arbitrary one-time slot of a TDMA signal or to analyze the noise in one horizontal line of a TV signal.



Normal Gated sweep

Monitoring the carrier signal in a pulsed RF signal

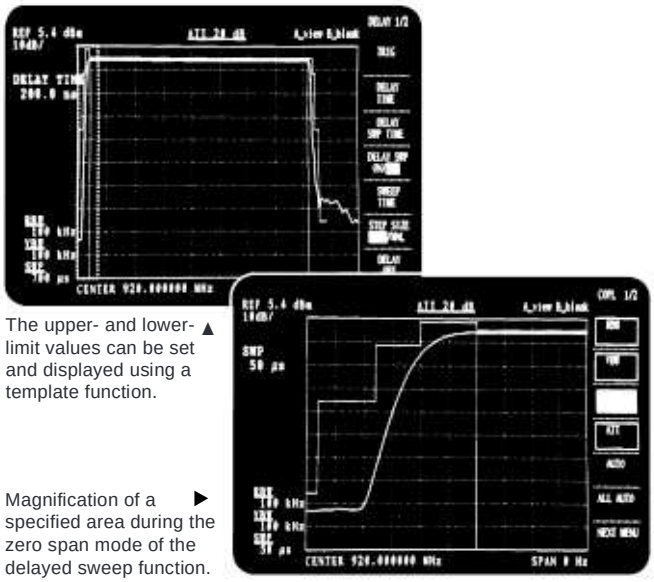
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For Research and Development of the Next Generation of Mobile Communication Systems

R3265A/3365A

■ High-Speed Sweep of 5 µs/div

The R3265A Series uses a high-speed digitizer to perform high-speed sweeps of 5 µs/div during zero span. This data can also be averaged using an averaging function. This function is ideally suited for monitoring the mean transmission power and duration of Time Division Multiple Access (TDMA) signals that are used in the Global System Mobile (GSM) digital car telephone system in Europe and in the next-generation of car telephone systems in Japan and the U.S.A. An arbitrary range can be expanded using a delayed sweep function.

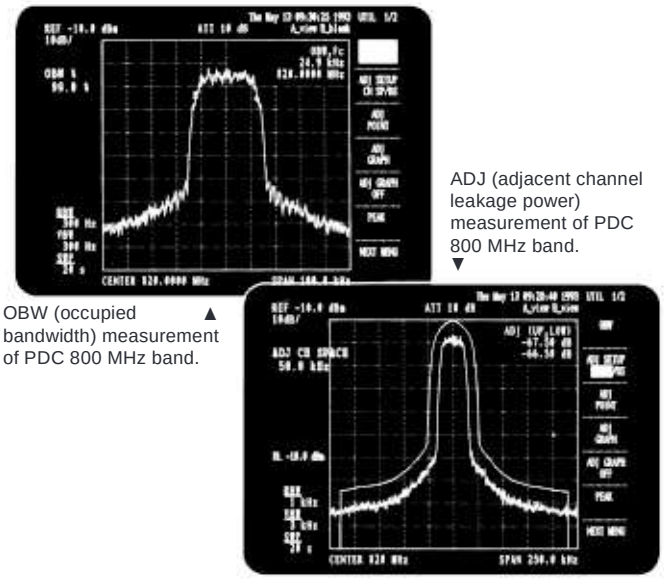


The upper- and lower-limit values can be set and displayed using a template function. ▲

Magnification of a specified area during the zero span mode of the delayed sweep function. ▶

■ Measurement of Occupied Bandwidths and Adjacent-Channel Leakage Power

By calculating the measured spectrum data, the R3265A Series can easily measure the occupied bandwidth of a radio transmission characteristic and the leakage power of an adjacent channel. A carrier frequency is also displayed when the occupied bandwidth is measured. The leakage power from an adjacent channel can be measured in a dynamic range of 70 dB (typical value) due to the excellent signal purity of the series.

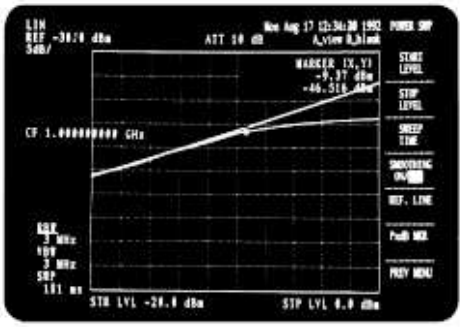


OBW (occupied bandwidth) measurement of PDC 800 MHz band. ▲

ADJ (adjacent channel leakage power) measurement of PDC 800 MHz band. ▼

■ Power Sweep Function Ideal For Measuring Amplifier Linearity and Saturation Point (R3365A Only)

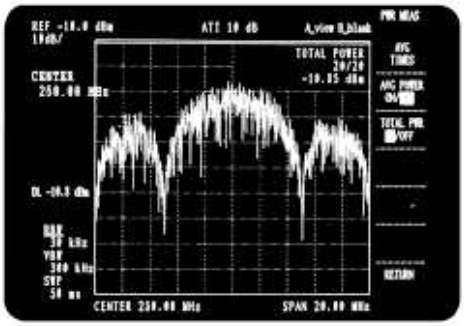
The R3365A has a Power Sweep Function which sweeps the output level. This function has been made possible through a newly developed attenuator in the tracking generator output section which used a semiconductor switch. The level sweep with a 30 dB/0.1 dB step sweep range provides high precision measurements of amplifier input/output characteristics.



▲ Amplifier 1 dB gain compression point measurement

■ Full Range of Digital Radio Evaluation Functions

In addition to its functions for doing burst signal analysis and measuring occupied bandwidth and adjacent channel leakage power, the R3265A Series has added a total power and average power measurement function and a quasi–analog display function. A built–in digital modulation analysis interface is also included, so that modulation accuracy can be easily measured just by connecting the R3541A/B Digital Modulation Analysis Unit (sold separately).



▲ Total power measurement of spread spectrum

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R3265A/3365A (Continued from previous page)

Specifications

Frequency

Frequency range: 100 Hz to 8 GHz
Frequency band

R3265A/3365A
100 Hz to 3.6 GHz
3.5 to 7.5 GHz
7.4 to 8 GHz

Preselector: 3.5 GHz to 8 GHz using YIG tuned preselector
Frequency readout accuracy (Start, Stop, CF, Marker): ± (freq readout × freq reference accuracy + span × span accuracy + 0.15 × RBW + 10 Hz)
Span accuracy: ± 3% (span > 2 MHz), ± 5% (span ≤ 2 MHz)
Count frequency marker:
Resolution: 1 Hz to 1 kHz
Count accuracy (S/N ≥ 25 dB): ± (marker freq × freq reference accuracy + 5 Hz + 1 LSD)
Delta marker count accuracy : ± (delta marker freq × freq reference accuracy + 10 Hz + 2 LSD)
Frequency reference accuracy: ± 2 × 10^{-8}/day, ± 1 × 10^{-7}/year, ± 5 × 10^{-9}/day (Opt. 21)
Frequency stability:
Residual FM (zero span): <3 Hz/0.1s
Drift (after warm up 1 hr.): <2.5 kHz × sweep time (minute) (50 kHz < span ≤ 2 MHz)
<60Hz × sweep time (minute) (Span ≤ 50 kHz)

Spectral purity:

Offset	f ≤ 2.6 GHz	f > 2.6 GHz
1 kHz	<–100 dBc/Hz	<–95 dBc/Hz
10 kHz	<–110 dBc/Hz	<–108 dBc/Hz
20 kHz	<–110 dBc/Hz	<–108 dBc/Hz
100 kHz	<–114 dBc/Hz	<–110 dBc/Hz

Frequency span:
Lin span: Range: 200 Hz to 8 GHz, zero span
Accuracy: ± 3% (span > 2 MHz), ± 5% (span ≤ 2 MHz)
Log span: Range: 1 kHz to 1 GHz, 1, 2, 3 decades selected
Accuracy: ± (10% + stop freq × 0.1%)
Resolution bandwidth (3dB):
Range: 10 Hz to 3 MHz 1, 3, 10 sequence
Accuracy: ± 15% 100 Hz to 1 MHz, ± 25% 30 Hz (25°C ± 10°C), 3 MHz, ± 50% 10 Hz to 100 Hz (digital IF)
Bandwidth (6 dB): 200 Hz, 9 kHz, 120 kHz, 1MHz (Accuracy 10%)
Conformed to CISPR standard
Video bandwidth range: 1 Hz to 3 MHz 1, 3, 10 sequence

Amplitude

Amplitude range: +30 dBm to average display noise level
Display range: 10 × 10 division graticule
Log: 10, 5, 2, 1, 0.5, 0.2, 0.1 dB/div
Linear: 10% of reference level/div
QP log: 40 dB(5 dB/div)
Input attenuator range: 0 to 70 dB (10 dB step)
Dynamic Range
Maximum dynamic range:
Distortion characteristic for 1 dB gain compression to noise level:

Frequency range	**R3265A/3365A**
200 MHz to 3.6 GHz	132 dB – 1.55 × f (GHz)
10 MHz to 3.6 GHz	130 dB – 1.55 × f (GHz)

Displayed average noise level: 10 Hz RBW (digital IF), 0 dB input atten, 20 times avg.

Frequency range	R3265A/3365A
1 kHz	–100 dBm
10 kHz	–110 dBm
100 kHz	–111 dBm
1 MHz	–135 dBm
10 MHz to 3.6 GHz	–(140 – 1.55 × f (GHz)) dBm
10 MHz to 3.6 GHz (low noise mode)	–(145 – 1.55 × f (GHz)) dBm
3.5 to 8 GHz	–135 dBm

Gain compression (1 dB):

Frequency range	R3265A/3365A
>10 MHz	–10 dBm (mixer level)
>200 MHz	–8 dBm (mixer level)

Spurious response:
Second harmonic distortion

R3265A/3365A	Reference input frequency range	Mixer level
<–70 dBc	100 MHz to 1.8 GHz	–30 dBm
<–60 dBc	10 MHz to 1.8 GHz	–30 dBm
<–100 dBc	>1.75 GHz	–10 dBm

Third order intermodulation distortion

R3265A/3365A	Reference input frequency range	Mixer level
<–70 dBc	200 MHz to 3.6 GHz	–30 dBm
<–60 dBc	10 MHz to 3.6 GHz	
<–75 dBc	>3.5 GHz	

Amplitude Accuracy
Frequency response:
In band flatness (10 dB input atten)

R3265A/3365A	Frequency range
± 1.5 dB	100 Hz to 3.6 GHz
± 1.0 dB	50 MHz to 2.6 GHz
± 1.5 dB	3.5 MHz to 7.5 GHz
± 1.5 dB	7.4 MHz to 8 GHz

Additional uncertainty due to band switching: ± 0.5 dB
Frequency response referenced to CAL signal (10 dB input atten): ± 3 dB 100 Hz to 8 GHz
Calibrator accuracy: –10 dBm ± 0.3 dB
IF gain uncertainty: After automatic calibration
< ± 0.5 dB (0 to –50 dBm), < ±0.7 dB (0 to –80 dBm)
Scale fidelity (After automatic calibration)
Log: ± 0.2 /1 dB, ± 1 /10 dB, ± 1.5 /90 dB
Linear: ± 5% of reference level
QP mode log: ± 1.0 /30 dB, ± 2 /40 dB, ± 1.0 /40 dB (25°C ± 10°C)
Input attenuator switching accuracy: referenced to 10 dB, 20 to 70 dB switching
± 1.1 / 10 dB step, 2.0 dB max, 0 to 8 GHz
Resolution bandwidth switching uncertainty:
At reference RBW: 300 kHz, after automatic calibration
≤ ± 0.3 dB 100 Hz to 3 MHz
≤ ± 1 dB 30 Hz
≤ ± 1.5 dB 10 to 100 Hz (digital IF)
Pulse digitization uncertainty: (pulse response mode PRF > 700/sweep time) Peak to Peak
Log: 1.2 dB (RBW ≤ 1 MHz), 3 dB (RBW: 3 MHz)
Linear: 4% of ref level (RBW ≤ 1 MHz), 12% of ref level (RBW: 3 MHz)

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R3265A/3365A

SWEEP

Sweep time:
- SPAN = 0: 50 µs to 1000 s and manual sweep
- SPAN ≥ 200 Hz: 20 ms to 1000 s and manual sweep
- Accuracy: ± 3%

Sweep trigger: Free run, line, single, video, TV-H, TV-V, external

Demodulation

Spectrum demod:
- Modulation type: AM and FM
- Audio output: Speaker and phone jack with volume control
- Marker pause time: 100 ms to 1000 s

Inputs/Outputs

RF Input:
- Connector type: N type female
- Impedance: 50 Ω (nominal)
- VSWR (input atten ≥ 10 dB, at set frequency):
  - < 1.5 : 1 for ≤3.6 GHz (nominal)
  - < 2.0 : 1 for >3.6 GHz (nominal)
- LO emission level (average):
  - < –80 dBm (typical valve), 10 dB input atten, 0 to 26.5 GHz

Video output:
- Connector: BNC female, rear panel
- Impedance (AC coupled): 75Ω (nominal)
- Amplitude: Approx. 1 $V_{p\text{-}p}$ (Composite video signal), 75Ω termination

External trigger input:
- Connector BNC female, rear panel
- Impedance 10 kΩ (nominal), DC coupled
- Trigger level TTL level

Gate input:
- Connector BNC female, rear panel
- Impedance 10 kΩ (nominal), DC coupled
- Sweep stop Between LOW and TTL level
- Sweep Between HIGH and TTL level

Probe power: 4 pin connector front panel
- Voltage: +15V, –15V
- Current: 150 mA max, each

Phone output: Demodulated audio
- Connector: Subminiature Monophonic jack, front panel
- Power output: 0.2 watt, 8Ω (nominal)

GPIB plotter:
- IEEE–488, bus connector
- R9833, HP7470A, HP7475A, HP7440A, HP7550A

Delayed Sweep

Trigger signal source: External trigger signal, VIDEO trigger, TV–V trigger (onset or fall slope can be selected)
Delay time: 200 ns to 1.5 s with a resolution of 100 ns
Delayed sweep time: 50 µs to 1000 s (the resolution is the same as that set in the sweep time.)

Gated Sweep

Trigger signal source:
Frequency domain analysis
- External trigger input (TTL level), Gate input (TTL level)
- IF DET trigger
  - Trigger level variable at IF DET monitor
  - Span 7 MHz max.
  - Usable input pulse width 100 µs min.
  - Through or lowpass filter selectable

Time domain analysis
- External trigger input (TTL level), Gate input (TTL level)
- IF DET trigger
  - Trigger level variable at IF DET monitor
  - Usable input pulse width 100 µs min.
  - Through or lowpass filter selectable
- Gate position: 300 ns to 100 ms with resolution of 100 ns
- Gate width: 1 µs to 1.5 s with a resolution of 100 ns

Tracking Generator (R3365A)

Frequency range: 100 kHz to 3.6 GHz
Output level: –3 to –30 dBm in 0.1 dB steps
Output level flatness: ± 3.0 dB (100 kHz to 3.6 GHz)
Output level accuracy: ± 0.5 dB (25 MHz, –10 dBm output, 25°C ± 10°C)
Vernier accuracy: ± 0.5 dB (25 MHz, –10 dBm output, 25°C ± 10°C)
Output spurious:
- Harmonic –15 dBc max.
- Non–harmonic –25 dBc max. (with 3 dBm output)

Dynamic range: –110 dBm (1 MHz to 3 GHz)
–100 dBm (3 to 3.6 GHz)
Power sweep range: 30 dB (0.1 dB steps)

General Specifications

Operating conditions:
- Operating temperature: 0 to 50°C
- Storage temperature: –20 to 60°C
- Humidity: RH 85% max.

Power supply: Automatically selects 100 or 220 VAC
100 VAC:
- Voltage: 90 to 132V
- Power consumption: Max. 400 VA
- Frequency: 48 to 440 Hz

220 VAC:
- Voltage: 198 to 250V
- Power consumption: Max. 400 VA
- Frequency: 48 to 66 Hz

Mass: 22 kg (nominal, excluding options, front cover and accessories)
Dimensions: 177 (H) × 353 (W) × 450 (D) mm (excluding handle, feet and front cover)

Accessories

Product	Model	Remarks
Power cable	A01412	
Input cable	MC-61	Connector UG-88/U
Input cable	MI-09	Connector 3DW-P2
Converter adaptor	JUG-201A-U	N-BNC converter
IC memory card		One card (32 K bytes)
Front cover		

Options

Option 07	Interface for R3553 Preselector
Option 10	Level calibration
Option 21	± 5 × 10^{-9}/day crystal
PR326503-IC	GSM-MS measurement software Execution environment: R3265A/3271A, R3365A/3371A
PR326513-IC	GSM-BS measurement software Execution environment: R3265A/3271A, R3365A/3371A
*1	DECT measurement software Execution environment: R3265A/3271A, R3365A/3371A
*2	PCN-MS measurement software Execution environment: R3265A/3271A, R3365A/3371A
*3	PCN-BS measurement software Execution environment: R3265A/3271A, R3365A/3371A

*1, *2, *3; Please contact office for details

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