Real-Time Spectrum Analyzers

▶ RSA3303A • RSA3308 • WCA230A • WCA280A

Trigger, Capture, Analyze Radar, 3G or Other Time-varying RF Signals

Get Fast Resolution to Complex Problems with Trigger, Capture and Analysis Tools

See the frequency and amplitude of your RF signal change over time in a single view. With only a single acquisition, the RSA3300A and WCA200A Series Real-Time Spectrum Analyzers (RTSA) capture a continuous time record of changing RF events and enables time-correlated analysis in the frequency, time and modulation domains. You get the functionality of a vector signal analyzer, a wide band spectrum analyzer, plus the unique trigger-capture-analyze capability of RTSA – in one transportable package.

▶ Features & Benefits

Trigger

- Tektronix' Exclusive Frequency Mask Trigger Makes Event-based Capture of Transient RF Signals Easy By Triggering on Any Change in the Frequency Domain

Capture

- All Input Signals up to 15 MHz[*1] Spans Are Seamlessly Captured Into Memory
- Long Record Length Enables Complete Analysis Over Time Without Making Multiple Acquisitions
- Interfaces With TekConnect® Probes for RF and Baseband Probing

Analyze

- Gain a Unique Understanding of Time-varying Transient RF Signals
- Spectrogram Provides a Revealing Picture of RF Signal Frequency and Amplitude Behavior Over Time – Not Possible With a Swept Spectrum Analyzer
- Multi-domain Analysis Enables Fast, Complete Signal Analysis in Frequency, Time, Code and Modulation Domains Without Making Multiple Measurements
- Simple Capture and Analysis on RFID Interrogator and Response Signals
- Comprehensive Pulse Measurement Suite
- General Purpose Digital Modulation Analysis
- Spectrum Analyzer View for Traditional Wide Band Signal Analysis
- 3G Measurement Versatility with W-CDMA, cdma2000, 1X EVDO, HSUPA, HSDPA, TD-SCDMA RF and Modulation Analysis (WCA200A only)
- Signal Source Analysis Simplifies Phase Noise, Jitter and Frequency Settling Measurements

▶ Applications

System Integration of 3G and Other RF Systems

Radar and Pulsed RF Signal Characterization

RFID System Development and Troubleshooting

General Purpose Phase Noise and Jitter Signal Analysis

Characterization of Interfering or Unknown Signals in Spectrum Monitoring and Surveillance

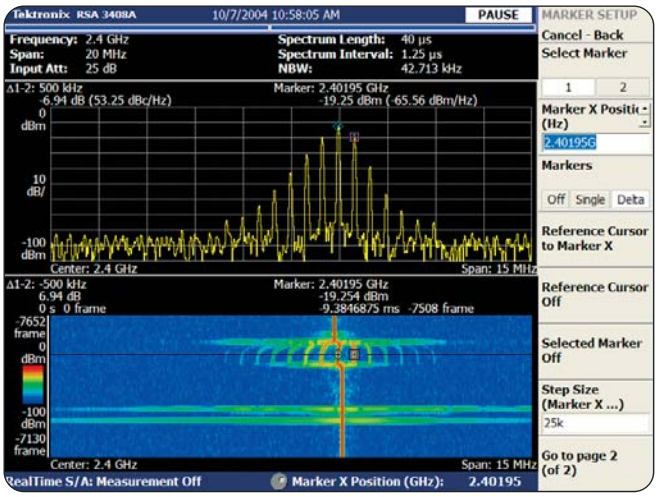
Troubleshooting RF Components, Modules or Systems

Getting Answers to Elusive EMI Diagnostic Problems

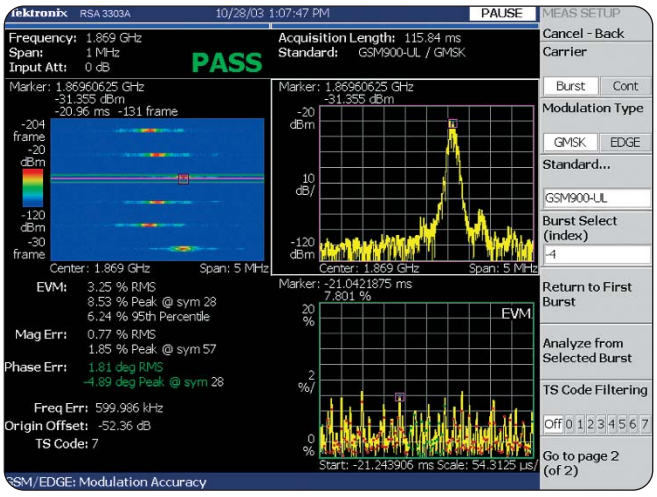
[*1] 20 MHz bandwidth at Baseband.

Tektronix

Enabling Innovation



► High-resolution spectrogram reveals transient signal behavior that translates to rapid problem solving. Here, 500 kHz sidebands are revealed as part of the transient behavior of a hopping signal as it switches frequencies.



► Time-correlated, multi-domain view provides a new level of insight into design or operational problems not possible with conventional analysis solutions.

Trigger

Patented 15 MHz bandwidth Frequency Mask Trigger (FMT) makes it easy to capture transient, low duty-cycle or other difficult-to-capture signals. An FMT mask is simply configured using a mouse and it can be set up for one or many frequency bands within an analysis span. FMT can monitor for signal appearance/disappearance or change in amplitude, frequency, bandwidth, spectral shape, and more – all while the instrument user is working on another task. A Power Trigger, working in the time domain and at any real-time analysis span, can be armed to monitor for a user-set power threshold to be crossed during a moment in time. A power detector determines total power of all signals in a span which is compared to the user-set threshold.

Capture

Capture once – make multiple measurements as needed. All signals in a real-time analysis span – including transients, low duty-cycle and other difficult-to-measure events – are captured together into deep memory where signal data can be accessed at the user's convenience. Record lengths vary depending on span selected – up to 2.56 s at 15 MHz span, 40.96 s at 1 MHz span or 4096 s at 10 kHz span with Deep Memory Opt. 02. Real-time capture of small signals is enhanced by –74 dBc third order IM, plus very good phase noise performance and sensitivity. A solid performance front-end serves not only real-time and wide band spectrum analysis modes, but also on-board vector signal analysis functionality.

The RTPA2A Real-Time Probe Adapter extends the capabilities of the Real-Time Spectrum Analyzers (RTSA) by offering additional tools to make debugging today's high-performance electrical designs easier. Using the RTPA2A with Tektronix RTSA, design engineers can benefit from Tektronix' industry-leading active and differential probes to measure signals on SMD pins or other challenging circuit features.

Analyze

Time-correlated multi-domain analysis provides engineers with unique insight into time-varying signal behavior, resulting in fast analysis and problem solving. Time-correlated measurements can be made across the frequency, time and modulation domains. The analysis display called Spectrogram has the ability to overlap individual spectra as close as 40 ns, providing an intuitive view of signal changes over time, ideal for such things as frequency hopping, pulsed signals, modulation switching, settling time, bandwidth changes, relative timing of appearing and intermittent signals. The RTSAs introduce analysis capabilities that advance productivity for engineers working on components or in RF system design, integration and performance verification or operations engineers working in networks, spectrum monitoring or surveillance.

► Example Applications Benefiting from Key RSA3300A and WCA200A Capabilities

Analysis Feature	RF Communications Systems	Cellular Devices	Radar, Pulsed Signal Transmission	Surveillance, Spectrum Monitoring	RFID
Hi-res Spectrogram	X	X	X	X	X
Multi-domain Correlation	X	X	X	X	X
Cellular Standards Analysis (Multiple Options)		X		X	
Advanced Measurement Suite (Opt. 21)	X		X	X	X
AM, FM, PM Analysis	X		X	X	
Pulsed RF Signal Analysis	X		X	X	
Pulse Spectrum	X	X	X	X	
AM/AM, AM/PM and 1 dB Compression (Opt. 21)	X	X	X		

TekConnect® Probe Adapter for Real-Time Spectrum Analyzers

The RTPA2A Real-Time Probe Adapter extends the capabilities of the Real-Time Spectrum Analyzers (RTSA) by offering additional tools to make debugging today's high-performance electrical designs easier. Using the RTPA2A with Tektronix RTSA, design engineers can benefit from Tektronix' industry-leading active and differential probes to measure signals on SMD pins or other challenging circuit features.

▸ Characteristics

Trigger-related

Trigger Mode –
Free run (triggered by acquisition), Triggered (triggered by event), Single or Continuous.
Trigger Event Source –
Power (span BW), Frequency Mask (Opt. 02), External.
Pre-/Post-trigger Setting –
Trigger position settable within 0% to 100% of total acquisition length.
Trigger Marker Position Timing Uncertainty (Power and External Trigger) – ±2 sample points.

Frequency Mask Trigger (Opt. 02)

Mask Resolution – 1 bin.
Level Range –
0 dBfs[*2] to –60 dBfs at 10 dB/div vertical scale.
Bandwidth –
Up to 15 MHz: Start frequency ≥20 MHz.
Up to 20 MHz: Start frequency <20 MHz.
Mask Shape – User-defined.
Minimum Horizontal Mask Setting Resolution –
<0.2% of span.
Uncertainty – ±2 frames.

[*2] dBfs: dB relative to full scale.

Power Trigger

Level Range – 0 dBfs to –40 dBfs.

External Trigger

Threshold Voltage – –1.5 V to +1.5 V.
Threshold Voltage Setting Resolution – 0.1 V.
Input Impedance – >2 kΩ.

Trigger Output

Voltage (Output Current <1 mA) –
High: >2.0 V; Low: <0.4 V.

Capture-related

Real-time Capture Bandwidth –
15 MHz RF; 20 MHz baseband; 20 MHz using Opt. 03 IQ inputs.
A/D Converter – 51.2 MS/s, 14 bits.
Minimum Acquisition Length in RTSA/Time/Demod Modes – 1024 samples.
Maximum Acquisition Length in RTSA/Time/Demod Modes –
16,384,000 samples; 65,636,000 samples, Opt. 02.
Acquisition Length Setting Resolution in RTSA/Time/Demod Modes –
Acquisition Memory Size –
16.4 Msamples; 65.6 Msamples, Opt. 02.
Block Size (number of frames) –
1 to 16,000; 1 to 64,000, Opt. 02.

▶ Memory Depth (Time) and Maximum Time Resolution

Span	Sample Rate (For I and Q)	Record Length	Record Length (Opt. 02)	Spectrum Frame (Time)	Max Time (Resolution)
20 MHz (Baseband)	25.6 MS/s	0.64 s	2.56 s	40 µs	40 ns
15 MHz	25.6 MS/s	0.64 s	2.56 s	40 µs	40 ns
10 MHz	12.8 MS/s	1.28 s	5.12 s	80 µs	80 ns
5 MHz	6.4 MS/s	2.56 s	10.24 s	160 µs	160 ns
2 MHz	3.2 MS/s	6.4 s	20.48 s	320 µs	320 ns
1 MHz	1.6 MS/s	12.8 s	40.96 s	640 µs	640 ns
500 kHz	800 kS/s	25.6 s	81.92 s	1.28 ms	1.25 µs
200 kHz	320 kS/s	64 s	204.8 s	3.2 ms	3.2 µs
100 kHz	160 kS/s	128 s	409.6 s	6.4 ms	6.4 µs
50 kHz	80 kS/s	256 s	819.2 s	12.8 ms	12.8 µs
20 kHz	32 kS/s	640 s	2048 s	32 ms	32 µs
10 kHz	16 kS/s	1280 s	4096 s	64 ms	64 µs
5 kHz	8 kS/s	2560 s	8192 s	128 ms	128 µs
2 kHz	3.2 kS/s	6400 s	20480 s	320 ms	320 µs
1 kHz	1.6 kS/s	12800 s	40960 s	640 ms	640 µs
500 Hz	800 kS/s	25600 s	81920 s	1.28 s	1.28 ms
200 Hz	320 S/s	64000 s	204800 s	3.2 s	3.2 ms
100 Hz	160 S/s	128000 s	409600 s	6.4 s	6.4 ms

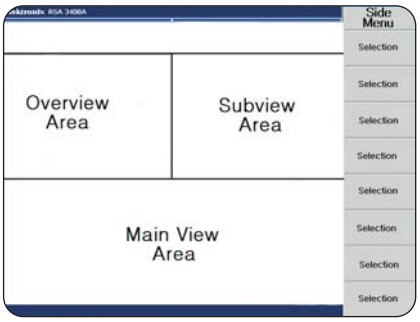
Analysis-related

▶ Measurement Functions by Mode

Mode	Measurements
SA	Channel Power, Adjacent Channel Power Ratio, Occupied Bandwidth, Emission Bandwidth, Carrier-to-Noise Ratio, Carrier Frequency
RTSA	Channel Power, Adjacent Channel Power Ratio, Occupied Bandwidth, Emission Bandwidth, Carrier-to-Noise Ratio, Carrier Frequency
Time	IQ vs. Time, Power vs. Time, Frequency vs. Time, CCDF, Crest Factor Pulse Measurements: Pulse Width, Pulse Peak Power, On/Off Ratio, Pulse Ripple, Pulse Repetition Interval, Duty Cycle, Pulse-Pulse Phase, Channel Power, OBW, EBW, Frequency Deviation (Min pulse length, 20 samples; Max pulse length, 360,000 samples)
Analog Demod	IQ vs. Time, AM Depth, FM Deviation, PM Deviation, Pulse Spectrum

▶ Views by Mode

Mode	Views
SA	Spectrum
SA/Spectrogram	Spectrum, Spectrogram
RTSA	Spectrum, Spectrogram
Time	Overview: Power vs. Time, Spectrogram Subview: Spectrum Main view: Measurement Result
Analog Demod	Overview: Power vs. Time, Spectrogram Subview: Spectrum Main view: Measurement Result



▶ Screen layout, to identify analysis view locations as described in chart at left.

Measurement Speed

Screen Update Rate –
2 MHz Span, Auto RBW: 19.4/s.
Remote Measurement Rate and GPIB Transfer Rate (2 MHz span, auto RBW, spectrum data) –
1.87 waveforms/s, or 6,000 samples/s.
RF Center Frequency Switching Time –
<10 ms for 10 MHz frequency change.
500 ms for 3 GHz frequency change.

Traces, Displays, Detectors

Traces – Two traces, Spectrum Analyzer mode.
Displays –
Up to three time-correlated, user-selected displays.
Detector – RMS.
Trace Types –
Normal (RMS), Average, Max Hold, Min Hold.
Display Detection – Max, Min, Max/Min.

Modulation Analysis

Analog
AM
Minimum Input Level – –40 dBfs, typical.
PM
Minimum Input Level – –40 dBfs, typical.
PM Scale, Max, Min – ±180º.
FM
Minimum Input Level – –40 dBfs, typical.
Range – ±Span/2 from center frequency.

Demodulation Accuracy

Analog
AM (–10 dBfs signal, input at CF, 10% to 60% modulation depth) – ±2%.
PM (-10 dBfs signal, input at CF) – ±3º.
FM (-10 dBfs signal, input at CF) – ±1% of span.

RF Performance

Frequency

Frequency Range –
RSA3308A/WCA280A: DC to 8 GHz.
RSA3303A/WCA230A: DC to 3 GHz.
Center Frequency Setting Resolution – 0.1 Hz.
Frequency Marker Readout Accuracy, Baseband –
$\pm(RE^{*3} \times MF^{*4} + 0.001 \times Span + 0.2)$ Hz.
Frequency Marker Readout Accuracy, RF –
$\pm(RE \times MF + 0.001 \times Span + 2)$ Hz.
Span Accuracy – ±1 bin.
RBW Filter Bandwidth Accuracy – 0.1%.
Reference Frequency –
Aging per Day –
1×10^{-9} (after 30 days of operation).
Aging per Year –
1×10^{-7} (after 30 days of operation).
Temperature Drift – 1×10^{-7} (10 ºC to 40 ºC).
Total Frequency Error –
2×10^{-7} (within one year of calibration).
Reference Output Level – >0 dBm.
External Reference Input –
10 MHz, –10 dBm to + 6 dBm.
Frequency Span –
Range, Spectrum Analyzer Mode –
50 Hz to 3 GHz (start frequency ≥40 MHz).
0 Hz to 40 MHz (stop frequency <40 MHz).
Range, Real-Time Spectrum Analyzer Mode –
100 Hz to 15 MHz (RF).
0 Hz to 20 MHz (baseband).
Resolution Bandwidth Range –
1 Hz to 10 MHz, automatically selected or user-defined.
Accuracy – Within 6.0% ±0.1%.
Shape Characteristic –
Gaussian with <5:1 shape factor (3:60 dB).
Rectangular, Nyquist, Root Nyquist shapes may also be selected.

*3 RE: Reference Frequency Error.

*4 MF: Marker Frequency (Hz).

Minimum Settable RBW (Extended Resolution ON)

Frequency	RBW
Span >2 GHz	100 kHz
1 GHz <Span ≤2 GHz	50 kHz
500 MHz <Span ≤1 GHz	20 kHz
20 MHz <Span ≤500 MHz	10 kHz
500 kHz <Span ≤20 MHz	1 kHz
200 kHz <Span ≤500 kHz	500 Hz
100 kHz <Span ≤200 kHz	200 Hz
50 kHz <Span ≤100 kHz	100 Hz
20 kHz <Span ≤50 kHz	50 Hz
10 kHz <Span ≤20 kHz	20 Hz
5 kHz <Span ≤10 kHz	10 Hz
2 kHz <Span ≤5 kHz	5 Hz
1 kHz <Span ≤2 kHz	2 Hz
100 Hz <Span ≤1 kHz	1 Hz

Noise Bandwidth Range, RTSA Mode –
313.18 MHz to 400.87 kHz.
FFT Performance –
Number of Samples per Frame –
64 to 8192 (65,536 samples per frame, extended resolution).
Window Types –
Rectangular, Parzen, Welch, Sine-Lobe, Hanning, Sine-cubed, Sine-to-the-4th, Hamming, Blackman, Rosenfield, Blackman-Harris 3A, Blackman-Harris 3B, Blackman-Harris 4A, Blackman-Harris 4B, FlatTop.

Stability

▶ Noise Sidebands, dBc/Hz

Offset	At 1 GHz CF		At 2 GHz CF		At 6 GHz CF	
	Spec	Typical	Spec	Typical	Spec	Typical
1 kHz	–100	–103	–96	–99	–87	–90
10 kHz	–105	–108	–104	–107	–104	–107
20 kHz	–105	–108	–105	–108	–105	–108
30 kHz	–105	–108	–105	–108	–105	–108
100 kHz	–112	–115	–112	–115	–112	–115
1 MHz	–132	–135	–132	–135	–128	–131
5 MHz	–135	–138	–135	–138	–130	–133
7 MHz	–135	–138	–135	–138	–130	–133

Residual FM –
2 $Hz_{pk\text{-}pk}$, typical.

Amplitude

Measurement Range –
Displayed average noise level to MAX safe input.
Input Attenuator Range –
RF/Baseband Input – 0 dB to 50 dB, 5 dB step.
IQ Input (Opt. 03) – 0 dB to 30 dB, 10 dB step.
Input Attenuator Setting Uncertainty –
±0.5 dB (at 50 MHz).
Maximum Safe Input Level –
Average Continuous (RF band, RF ATT ≥10 dB) –
+30 dB.
MAX DC Voltage –
±0.2 V, RF.
±5 V, Baseband.
±5 V, IQ input with Opt. 03.
Log Display Range – 10 µdB/div to 10 dB/div.
Linear Display Scale – 10 divisions.
Linear Display Units –
dBm, dBµV, V, Watts, Hz for FM Demod,
Degrees for PM Demod.
Marker Readout Resolution, Log – 0.01 dB.
Marker Readout Resolution, Linear – 0.001 µV.

Absolute Amplitude Accuracy at Calibration Point (Baseband at 25 MHz, –10 dBm signal, 0 dB ATT, 20 °C to 30 °C) – ±0.3 dB.
Absolute Amplitude Accuracy at Calibration Point (RF at 100 MHz, –20 dBm signal, 0 dB ATT, 20 °C to 30 °C) – ±0.5 dB.
Reference Level Setting Range –
1 dB step, RF, –50 dBm to +30 dBm.
5 dB step, Baseband, –30 dBm to +20 dBm.
5 dB step, IQ, –10 dBm to +20 dBm.
Reference Level Accuracy (–10 dBm to –50 dBm at 100 MHz, 10 dB ATT, 20 °C to 30 °C) – ±0.2 dB.
Level Linearity in Display Range –
±0.2 dB, spec; ±0.12 dB, typical.

Spurious Response

1 dB Compression (RF ATT = 0 dB, 2 GHz CF) –
+2 dBm.
3rd Order Inter-modulation Distortion (Ref Level = +5 dBm, RF ATT: adjusted for optimum, total signal power = –7 dBm, CF = 2 GHz) – –74 dBc.
2nd Harmonic Distortion (–30 dBm tone at input mixer, 10 MHz to 1750 MHz) – –56 dBc, typical.

Displayed Average Noise Level, Specified, dBm/Hz

Frequency	Spec
10 MHz	–151
2 GHz	–150
3 GHz	–150
7 GHz[*5]	–142

Displayed Average Noise Level, Typical, dBm/Hz

Frequency	Typical
1 kHz to 10 kHz	–144
10 kHz to 10 MHz	–151
10 MHz to 100 MHz	–151
100 MHz to 1 GHz	–150
1 GHz to 2 GHz	–150
2 GHz to 3 GHz	–150
3 GHz to 5 GHz[*5]	–142
5 GHz to 8 GHz[*5]	–142

[*5] Frequency >3 MHz available on RSA3308A, WCA280A only.

▶ Frequency Response, 20 °C to 30 °C, RF ATT ≥10 dB

Frequency	Spec	Typical
100 kHz to 40 MHz	±0.5 dB	±0.3 dB
40 MHz to 3.0 GHz	±1.2 dB	±0.5 dB
3.0 GHz to 6.5 GHz[*5]	±1.7 dB	±1.0 dB
5 GHz to 8 GHz[*5]	±1.7 dB	±1.0 dB

[*5] Frequency >3 MHz available on RSA3308A, WCA280A only.

Inputs and Outputs

Front Panel
Input Connectors –
N type, RF/Baseband; BNC type, IQ, Opt. 03.
Input Impedance – 50 Ω.
Preamp Power Connector –
LEMO 6 pin connector – Pin 1: NC; Pin 2: ID1; Pin 3: ID2; Pin 4: –12 V; Pin 5: GND; Pin 6: +12 V.
External Preamp (Opt. 1A) –
100MHz to 3GHz, 20 dB gain, 6.5 dB Noise Figure at 2 GHz (typical).

Rear Panel
10 MHz REF OUT – 50 Ω, BNC, >–3 dBm.
10 MHz REF IN – 50 Ω, BNC, –10 dBm to +6 dBm.
Ext Trig In –
Ext Trig, BNC, High: 1.6 V to 5.0 V, Low: 0 V to 0.5 V.
GPIB Interface – IEEE 488.2.
Trigger Out –
50 Ω, BNC, High: >2.0 V, Low: <0.4 V (output current 1 mA).

Side Panel
LAN Interface – Ethernet 10/100Base-T (Standard).
Serial Interface – USB 1.1, 2 ports.
VGA Output – VGA compatible, 15 D-sub.

▶ Residual Response

Frequency	Spec
1 to 40 MHz (Span = 20 MHz, Ref Lvl = –30 dBm, RBW = 100 kHz)	–93 dBm
0.5 to 3.5 GHz (Span = 3 GHz, Ref Lvl = –30 dBm, RBW = 100 kHz)[*5]	–90 dBm
3.5 to 6.5 GHz (Span = 3 GHz, Ref Lvl = –30 dBm, RBW = 100 kHz)[*5]	–85 dBm
3.5 to 8 GHz (Span = 3 GHz, Ref Lvl = –30 dBm, RBW = 100 kHz)[*5]	–85 dBm

▶ Spurious Response with Signal

Frequency	Spec
0 MHz (Span = 10 MHz, Ref Lvl = 0 dBm, RBW –50 kHz, Signal Frequency = 25 MHz, Signal Level = –5 dBm)	–73 dBc
2 GHz (Span = 10 MHz, Ref Lvl = 0 dBm, RBW –50 kHz, Signal Frequency = 2 GHz, Signal Level = –5 dBm)	–73 dBc
5 GHz (Span = 10 MHz, Ref Lvl = 0 dBm, RBW –50 kHz, Signal Frequency = 5 GHz, Signal Level = –5 dBm)[*5]	–70 dBc
7 GHz (Span = 10 MHz, Ref Lvl = 0 dBm, RBW –50 kHz, Signal Frequency = 7 GHz, Signal Level = –5 dBm)[*5]	–70 dBc

[*5] Frequency >3 MHz available on RSA3308A, WCA280A only.

▶ VSWR, RF ATT >10 dB

Frequency	Spec	Typical
300 kHz to 10 MHz	—	<1.4:1
10 MHz to 3 GHz	—	<1.3:1
2.5 GHz	<1.4:1	—
7.5 GHz	<1.8:1	—

General Characteristics

Temperature –
Operating: +10 ºC to +40 ºC.
Storage: –20 ºC to +60 ºC.
Warm-up Time – 20 min.
Altitude –
Operating: Up to 3000 m (10,000 ft.).
Non-operating: Up to 12,000 m (40,000 ft.).
Safety and EMI Compatibility –
UL 61010-1; CSA C22.2 No. 61010-1-04; IEC61010, Second Edition (Self Declaration).
Low Voltage Directive 73/23/EEC, amended by 93/68/EEC; EN61010-1: 2001 Safety Requirements for Electrical Equipment for Measurement Control and Laboratory Use.
EC Council EMC Directive 89/336/EEC, amended by 93/68/EEC.
EN61326-1: 1997 Product Family Standard for Electrical Equipment for Measurement, Control and Laboratory Use-EMC Requirements.
Electromagnetic Compatibility Framework: 1992 AS/NZS 2064.1/2 (Industrial, Scientific and Medical Equipment).
Power Requirements –
100 VAC to 240 VAC, 47 Hz to 63 Hz.
Power Consumption – 400 VA max.
Data Storage – Internal HDD (40 GB), USB port, FDD.
Weight, without options – 19 kg, 42 lbs.
Dimensions –
Without bumpers and feet: 215 mm (H) x 425 mm (D) x 425 mm (W).
With bumpers and feet: 238 mm (H) x 470 mm (D) x 445 mm (W).
Calibration Interval – 1 year.
Warranty – 1 year.
GPIB – SCPI-compatible.

▸ Ordering Information

WCA230A, WCA280A

Real-Time Spectrum Analyzer WCA230A, DC – 3 GHz.

Real-Time Spectrum Analyzer WCA280A, DC – 8 GHz.

Includes: User manual, programmer's manual, power cord, BNC-N adapter, USB keyboard and mouse.

Product Options[*6]

Opt. 02 – 65.5 MSample Deep Memory, Frequency Mask Trigger.

Opt. 03 – IQ, Differential IQ Inputs.

Opt. 23 – W-CDMA Uplink Analysis.

Opt. 24 – GSM/EDGE Analysis.

Opt. 25 – CDMA 1X Forward/Reverse Link Analysis.

Opt. 26 – 1X EVDO Forward/Reverse Link Analysis.

Opt. 27 – 3GPP Release 5 Downlink (HSDPA) Analysis.

Opt. 28 – TD-SCDMA Analysis.

Opt. 40 – GPP Release 6 (HSUPA) Analysis.[*7]

Opt. 1A – External Preamp, 100 MHz to 3 GHz, 20 dB gain, 6.5 dB Noise Figure at 2 GHz (typical).

Opt. 1R – Rackmount kit.

Opt. SASW – USB Stand-alone Software Key.

[*6] Specifications for Options 21 through 40 can be found in the Real-Time Spectrum Analyzer Software Options datasheet on www.tektronix.com/rsa.

[*7] Option 23 and Option 27 are required for 3GPP Release 6 (HSUPA) Analysis in addition to Option 40.

Upgrades

WCA2UP 02 – 65.5 MSample Deep Memory, Frequency Mask Trigger.

WCA2UP 03 – IQ, Differential IQ Inputs.

WCA2UP 23 – W-CDMA Uplink Analysis (customer-installable).

WCA2UP 24 – GSM/EDGE Analysis (customer-installable).

WCA2UP 25 – cdma2000 1x Analysis (customer-installable).

WCA2UP 26 – 1x EV-DO Analysis (customer-installable).

WCA2UP 27 – 3GPP Release 5 Downlink (HSDPA) Analysis (customer-installable).

WCA2UP 28 – TD-SCDMA Analysis Software (customer-installable).

RSA34UP40 – 3GPP Release 6 (HSUPA) Analysis Software Upgrade (customer-installable).[*8]

WCA2UP 1A – External Preamp, 100 MHz – 3 GHz, 20 dB gain, 6.5 dB Noise Figure at 2 GHz (typical).

WCA2UP 1R – Rackmount kit upgrade for WCA200A Series.

WCA2UP IF – Installation labor for WCA2UPxx (no calibration required).

WCA2UP IFC – Installation labor for WCA2UPxx (with calibration).

RSA3SASW – USB Stand-alone Software Key.

[*8] Option 23 and Option 27 are required for 3GPP Release 6 (HSUPA) Analysis in addition to Option 40.

Real-Time Spectrum Analyzers

► **RSA3303A • RSA3308 • WCA230A • WCA280A**

RSA3303A, RSA3308A

Real-Time Spectrum Analyzer RSA3303A, DC – 3 GHz.

Real-Time Spectrum Analyzer RSA3308A, DC – 8 GHz.

Includes: User manual, programmer's manual, power cord, BNC-N adapter, USB keyboard and mouse.

Product Options[*9]

Opt. 02 – 65.5 MSample Deep Memory, Frequency Mask Trigger.

Opt. 03 – IQ, Differential IQ Inputs.

Opt. 21 – Advanced Measurement Suite Software.

Opt. 1A – External Preamp, 100 MHz to 3 GHz, 20 dB gain, 6.5 dB Noise Figure at 2 GHz (typical).

Opt. 1R – Rackmount kit.

Opt. SASW – USB Stand-alone Software Key.

Upgrades

RSA3UP 02 – 65.5 MSample Deep Memory, Frequency Mask Trigger.

RSA3UP 03 – IQ, Differential IQ Inputs.

RSA3UP 21 – Advanced Measurement Suite (customer-installable).

WCA2UP 1A – External Preamp, 100 MHz to 3 GHz, 20 dB gain, 6.5 dB Noise Figure at 2 GHz (typical).

WCA2UP 1R – Rackmount kit upgrade for RSA3300A Series.

RSA3UP IF – Installation labor for RSA3UPxx (no calibration required).

RSA3UP IFC – Installation labor for RSA3UPxx (with calibration).

RSA3SASW – USB Stand-alone Software Key.

[*9] Specifications for Options 21 through 40 can be found in the Real-Time Spectrum Analyzer Software Options datasheet, on www.tektronix.com/rsa.

Accessories

RTPA2A – Probe Adapter box for TekConnect® Probes.

119-4146-00 – RF Near Field Passive Probe Kit.

International Power Plugs

Opt. A0 – North America power.

Opt. A1 – Universal Euro power.

Opt. A2 – UK power.

Opt. A3 – Australia power.

Opt. A4 – North America power, 240 V.

Opt. A5 – Switzerland power.

Opt. A6 – Japan power.

Opt. A10 – China power.

Opt. A99 – No power cord.

Service Options

Opt. C3 – Calibration Service 3 years.

Opt. C5 – Calibration Service 5 years.

Opt. D1 – Calibration Data Report.

Opt. D3 – Calibration Data Report 3 years (with Opt. C3).

Opt. D5 – Calibration Data Report 5 years (with Opt. C5).

Opt. R3 – Repair Service 3 years.

Opt. R5 – Repair Service 5 years.

Language Options

Opt. L0 – English User/Programmer manual.

Opt. L5 – Japanese User/Programmer manual.

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Our most up-to-date product information is available at:
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Product(s) are manufactured in ISO registered facilities.

Product(s) complies with IEEE Standard 488.1-1987, RS-232-C, and with Tektronix Standard Codes and Formats.

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