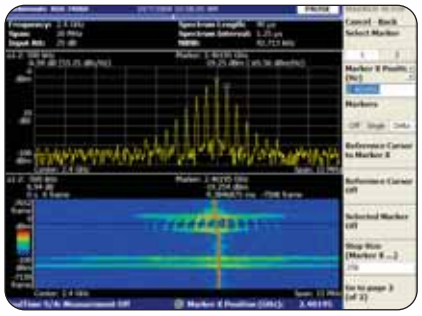
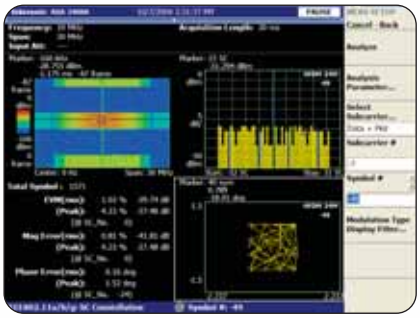
Real-Time Spectrum Analyzers

▶ RSA3408A

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



▶ 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.

Get Fast Resolution to Complex Problems with Enhanced Triggering, More Capture Bandwidth and Great New Analysis Tools

See signals and events you've been missing with conventional analysis tools. With only a single acquisition, the RSA3408A Real-Time Spectrum Analyzer (RTSA) captures 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.

▶ Features & Benefits

Trigger

– Tektronix Exclusive 36 MHz[*1] Frequency Mask Trigger Makes Easy Event-based Capture of Transient RF Signals by Triggering on Any Change in the Frequency Domain

Capture

– All Signals in Up to 36 MHz[*1] Spans Are Seamlessly Captured into Memory

– Up to 1.28 s Record Length at 36 MHz Span Provides Complete Analysis Over Time Without Making Multiple Acquisitions

Analyze

– Gain a Unique Understanding of Time-varying RF Signals

– Enabling Engineers to View Signal Instabilities and Transients that They Never Knew Existed

– 802.11a/b/g Measurement Suite

– Comprehensive Pulsed Analysis Suite

– General Purpose Digital Modulation Analysis

– Spectrum Analyzer View for Traditional Wide Band Signal Analysis

– Broad range of 3G Measurement Capabilities

▶ Applications

System Integration of WLAN, 3G and Other RF Systems

Radar and Pulsed RF Signal Characterization

RFID System Development and Troubleshooting

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] 40 MHz bandwidth at baseband.

Tektronix

Enabling Innovation

Trigger

Unparalleled 36 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 RSA3408A deep memory where signal data can be accessed at the user's convenience. Record lengths vary depending on span selected – up to 1.28 seconds at 36 MHz span, 51.2 seconds at 1 MHz span or 5120 seconds at 10 kHz span with Deep Memory Option 02. Real-Time capture of small signals is enhanced by –78 dBc third order IM and 66 dB 3GPP ACLR (TM1, 16 channel), 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.

Analyze

Time-correlated multi-domain analysis provides engineers with unique insight to 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 20 nsec, 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 RSA3408A introduces 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 RSA3408A Capabilities

Analysis Feature	RF Communications Systems	WLAN	Cell. Wireless + WLAN devices	Radar, Pulsed Signal Transmission	Surveillance, Spectrum Monitoring	RFID
Hi-res Spectrogram	X	X	X	X	X	X
Multi-domain Correlation	X	X	X	X	X	X
802.11a/b/g Analysis (Opt. 29)		X	X		X	
Cellular Standards Analysis (multiple options)			X		X	
General Purpose Digital Modulation Analysis (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	
2ASK, 2FSK Analysis + Manchester, Miller, NRZ Decoding (Opt. 21)	X					X
AM/AM, AM/PM and 1 dB Compression (Opt. 21)	X	X	X	X		
Digital IQ Output (Opt. 05)	X			X	X	
Removable HDD (Opt. 06)	X			X	X	

▸ 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.

Power Trigger

Level Range – 0 dBfs[*1] to –40 dBfs.

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

Frequency Mask Trigger (Opt. 02)

Mask Resolution – 1 bin.
Level Range –
0 dBfs to –60 dBfs[*1] at 10 dB/div vertical scale.
Bandwidth –
Up to 36 MHz: Start frequency ≥40 MHz.
Up to 40 MHz: Start frequency <40 MHz.
Real-Time Event Detection Bandwidth (1024 point FFT) –
100% probability of event detection at all real-time spans.
Minimum Event Duration –
1 frame time; events lasting less than one frame time will result in degraded Frequency Mask Trigger accuracy.
Mask Shape – User-defined.
Minimum Horizontal Mask Setting Resolution –
<0.2% of span.
Uncertainty – ±2 frames.

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 –
36 MHz, RF; 40 MHz, baseband; 40 MHz using Opt. 03 IQ inputs.
A/D Converter – 102.4 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 – 1024 samples.
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 (Option 02)	Spectrum Frame (Time)	Max Time (Resolution)
40 MHz (baseband)	51.2 MS/s	0.32 s	1.28 s	20 µs	20 ns
36 MHz	51.2 MS/s	0.32 s	1.28 s	20 µs	20 ns
20 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	2.56 MS/s	6.4 s	25.6 s	400 µs	400 ns
1 MHz	1.28 MS/s	12.8 s	51.2 s	800 µs	800 ns
500 kHz	640 kS/s	25.6 s	102.4 s	1.6 ms	1.6 µs
200 kHz	256 kS/s	64 s	256 s	4.0 ms	4.0 µs
100 kHz	128 kS/s	128 s	512 s	8.0 ms	8.0 µs
50 kHz	64 kS/s	256 s	1024 s	16 ms	16 µs
20 kHz	25.6 kS/s	640 s	2560 s	40 ms	40 µs
10 kHz	12.8 kS/s	1280 s	5120 s	80 ms	80 µs
5 kHz	6.4 kS/s	2560 s	10240 s	160 ms	160 µs
2 kHz	2.56 kS/s	6400 s	25600 s	400 ms	400 µs
1 kHz	1.28 kS/s	12800 s	51200 s	800 ms	800 µs
500 Hz	640 S/s	25600 s	102400 s	1.6 s	1.6 ms
200 Hz	256 S/s	64000 s	256000 s	4.0 s	4 ms
100 Hz	128 S/s	128000 s	512000 s	8.0 s	8 ms

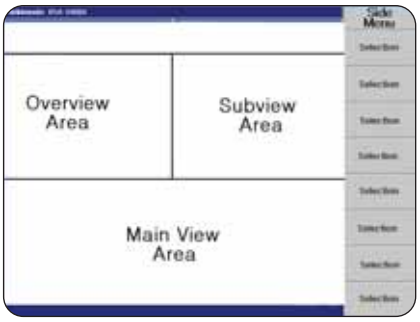
Analysis-related

▶ Measurement Functions by Mode

Mode	Measurements
SA	Channel Power, Adjacent Channel Power Ratio, Occupied Bandwidth, Emission Bandwidth, Carrier-to-Noise Ratio, Carrier Frequency, Spur Search, db/Hz Marker, dBc/Hz Marker
RTSA	Channel Power, Adjacent Channel Power Ratio, Occupied Bandwidth, Emission Bandwidth, Carrier-to-Noise Ratio, Carrier Frequency, Spur Search
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, 16,384 samples), Channel Power, Frequency Deviation, and EBW (less than 16,384 points)
Analog Demod	IQ vs. Time, AM Depth, FM Deviation, PM Deviation, Pulse Spectrum
General Purpose Digital Demod (Option 21)	Error vs. Time: EVM, Magnitude Error, Phase Error Error: Waveform Quality ρ, Frequency Error, Origin Offset PDF: Probability of Occurrence vs. Power Level AM-AM, AM-PM, 1 dB Compression, Crest Factor

▶ Views by Mode

Mode	Views
SA	Spectrum
SA/Spectrogram	Spectrum, Spectrogram
RTSA	Spectrum, Spectrogram
Time	Overview: Power vs. Time, Spectrogram Sub View: Spectrum Main View: Measurement Result
Analog Demod	Overview: Power vs. Time, Spectrogram Sub-view: Spectrum Main view: Measurement Result
Digital Demod (Option 21)	Overview: Power vs. Time, Spectrogram Sub-view or Main View: Vector diagram Constellation diagram, data displayed at symbol times Error vector diagram Eye Diagram, adjustable, 1 to 16 symbols Trellis, adjustable, 1 to 16 symbols I/Q vs. Time, EVM vs. Time Symbol Table, binary, octal or hexadecimal – Manchester, Miller and NRZ decoding available for 2ASK and 2FSK modulation AM-AM display AM-PM display CCDF display PDF display



▶ RSA3408A Screen layout, to identify analysis view locations as described in the table on the left.

▶ QPSK EVM (%), Typical

Symbol rate, per second	100 k	1 M	4 M	10 M	20 M
CF = 1 GHz	0.5	0.5	0.6	0.9	1.6
CF = 2 GHz	0.5	0.5	0.6	0.9	1.8
CF = 3 GHz	0.5	0.5	0.6	0.9	1.8
CF = 5 GHz	0.7	0.7	0.9	1.6	2.4

▶ π/4 DQPSK EVM (%), Typical

Symbol rate, per second	100 k	1 M	4 M	10 M	20 M
CF = 1 GHz	0.6	0.6	0.6	0.9	1.8
CF = 2 GHz	0.6	0.6	0.6	0.9	1.8
CF = 3 GHz	0.6	0.6	0.6	0.9	1.8
CF = 5 GHz	0.7	0.7	0.9	1.6	2.4

Measurement Speed

Screen Update Rate – 2 MHz Span, AUTO RBW : 19.4/sec.
Remote Measurement Rate and GPIB Transfer Rate (2 MHz span, auto RBW, spectrum data) – 1.87 Waveforms/sec, or 6,000 Samples/sec.
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,*1 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.

*1 dBfs: dB relative to full scale.

Digital (Option 21)

Modulation Formats – BPSK, QPSK, π/4 DQPSK, OQPSK, 8PSK, 16QAM, 32QAM, 64QAM, 128QAM, 256QAM, GMSK, GFSK, 2ASK, 2FSK.
Analysis Period – Up to 7680 sample points.
Filter Types – Measurement filters: Square root raised cosine, none.
Reference filters: Raised cosine, Gaussian, none.
Alpha/B*T Range – 0.0001 to 1, 0.0001 step.

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.

Digital (Option 21)

The following tables are examples of typical digital demodulation accuracy:

▸ 16/64 QAM EVM (%), Typical

Symbol rate, per second	100 k	1 M	4 M	10 M	20 M
CF = 1 GHz	0.5	0.5	0.5	0.7	1.2
CF = 2 GHz	0.5	0.5	0.5	0.7	1.2
CF = 3 GHz	0.5	0.5	0.5	0.7	1.2
CF = 5 GHz	0.9	0.5	0.7	1.3	2.0

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	–105	–107	–103	–105	–97	–99
10 kHz	–110	–112	–109	–111	–106	–108
20 kHz	–110	–112	–109	–111	–106	–108
30 kHz	–110	–112	–109	–111	–106	–108
100 kHz	–112	–115	–112	–115	–111	–113
1 MHz	–132	–135	–132	–135	–132	–134
5 MHz	–138	–140	–138	–140	–137	–139
7 MHz	–138	–140	–138	–140	–137	–139
10 MHz	–138	–140	–138	–140	–137	–139

RF Performance

Frequency

Frequency Range – DC to 8 GHz.
Center Frequency Setting Resolution – 0.1 Hz.
Frequency Marker Readout Accuracy, Baseband – ±(RE x MF + 0.001 x Span + 0.2) Hz.
Frequency Marker Readout Accuracy, RF – ±(RE x MF + 0.001 x Span + 2) Hz.
RE: Reference Frequency Error.
MF: Marker Frequency (Hz).
Span Accuracy – ±1 bin.
RBW Filter Bandwidth Accuracy – 0.1%.
Reference Frequency –
Aging per Day – 1 x 10^{-9} (after 30 days of operation).
Aging per Year – 1 x 10^{-7} (after 30 days of operation).
Temperature Drift – 1 x 10^{-7} (10 to 40 ºC).
Total Frequency Error – 2 x 10^{-7} (within one year after 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 20 MHz, 36 MHz (RF).
0 Hz to 40 MHz, (Baseband).

IF Flatness –

Frequency	Bandwidth	Flatness
2 GHz	≤36.6 MHz	±0.3 dB
5 GHz	≤36.6 MHz	±0.3 dB

IF Phase Linearity –

Frequency	Bandwidth	Flatness
2 GHz	≤36.6 MHz	±2.5°
5 GHz	≤36.6 MHz	±2.5°

IF Filter Bandwidth –
Resolution Bandwidth Range – 1 Hz to 10 MHz, automatically selected or user-defined.
Accuracy – Within 6.0% ±0.1%.
Shape Characteristic – Gaussian, <5:1 shape factor (3:60 dB); Rectangular, Nyquist, Root Nyquist shapes may also be selected.
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 – 250.545 mHz to 100.218 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.

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

Frequency	Spec	Typical
100 kHz to 40 MHz	±0.5 dB	±0.3 dB
40 MHz to 3.5 GHz	±1.2 dB	±0.5 dB
3.5 GHz to 6.5 GHz	±1.7 dB	±1.0 dB
5 GHz to 8 GHz	±1.7 dB	±1.0 dB

Residual FM – 2 Hz_{p-p}, typical.

Amplitude

Measurement Range – Displayed average noise level to MAX safe input.

Input Attenuator Range –
- RF/baseband input – 0 dB to 55 dB, 5 dB step.
- IQ Input (Opt 03) – 0 dB to 35 dB, 5 dB step.

Input Attenuator Setting Uncertainty (at 100 MHz, 10 dB ATT, 20 ºC to 30 ºC) – ±0.2 dB.

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, 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 ºC to 30 ºC) – ±0.3 dB.

Absolute Amplitude Accuracy at Calibration Point (RF, at 100 MHz, –20 dBm signal, 0 dB ATT, 20 ºC to 30 ºC) – ±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 ºC to 30 ºC) – ±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) – –78 dBc.

2nd Harmonic Distortion (–30 dBm tone at input mixer, 10 MHz to 1750 MHz) – –65 dBc, typical.

Displayed Average Noise Level, Specified, dBm/Hz

Frequency	Spec
10 MHz	–151
2 GHz	–150
3 GHz	–150
7 GHz	–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	–142
5 GHz to 8 GHz	–142

▶ 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)	–90 dBm
3.5 to 6.5 GHz (Span=3 GHz, Ref Lvl=–30 dBm, RBW=100 kHz)	–85 dBm
3.5 to 8 GHz (Span=3 GHz, Ref Lvl=–30 dBm, RBW=100 kHz)	–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)	–70 dBc
7 GHz (Span=10 MHz, Ref Lvl=0 dBm, RBW–50 kHz, Signal Frequency=7 GHz, Signal Level=–5 dBm)	–70 dBc

▶ 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	—

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 poles: pin 1 = NC; pin 2 = ID1; pin 3 = ID2; pin 4 = –12 V; pin 5 = GND; pin 6 = +12 V.

Rear Panel

Digital IQ Output (Option 05) –
- Connector Type – MDR (3M) 50 pin x 2.
- Data Output – I data: 16 bit LVDS; Q data: 16 bit LVDS.
- Control Output – Clock: LVDS, MAX 51.2 MHz.
- Control Input – IQ data output enabled, connecting GND enables output of IQ data.
- Clock Rising Edge to Data Transition Time (hold time) – >5 ns.
- Data Transition to Clock Rising Edge (setup time) – >5 ns.
- Data from Option 05 requires application of correction factors to IQ data to achieve similar RF performance to RSA3408A.

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 to 5.0 V, Low: 0 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 – 10/100 Base-T (Std.).
Serial Interface – USB 1.1, two ports.
VGA Output – VGA compatible, 15 DSUB.

General Characteristics

Temperature Range –
Operating: +10 ºC to +40 ºC.
Storage: –20 ºC to +60 ºC.
Warm-up Time – 20 min.
Operating 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 – 20 kg, 44 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 – One year.
Warranty – One year.
GPIB – SCPI-compatible.

▸ Ordering Information

RSA3408A

Real-Time Spectrum Analyzer, DC – 8 GHz.

Includes: User manual, Programmer's manual, power cord, BNC-N adapter, USB Keyboard and Mouse.

Options

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

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

Opt. 03 – IQ, Differential IQ Inputs.

Opt. 05 – Digital IQ Output.

Opt. 06 – Removable HDD.

Opt. 21 – General Purpose Modulation Analysis.

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. 29 – WLAN 802.11a/b/g Analysis.

Opt. 1R – Rackmount.

Accessories

RSA34RHD – Extra 40 GB Removable Hard Drive for use with Opt. 06.

International Power Plugs

Opt. A0 – North America power.

Opt. A1 – Universal EURO power.

Opt. A2 – United Kingdom power.

Opt. A3 – Australia power.

Opt. A4 – 240 V, North America power.

Opt. A5 – Switzerland power.

Opt. A6 – Japanese power.

Opt. A10 – China power.

Opt. A99 – No Power Cord.

Service

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.

Upgrades

RSA34UP

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

Opt. 03 – IQ, Differential IQ Inputs.

Opt. 05 – Digital IQ Output.

Opt. 06 – Removable HDD.

Opt. 21 – General Purpose Modulation Analysis.

Opt. 23 – W-CDMA Uplink Analysis.

Opt. 24 – GSM/EDGE Analysis.

Opt. 25 – cdma2000 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. 29 – WLAN 802.11a/b/g Analysis.

Opt. IF – Installation labor.

Opt. IFC – Installation labor + calibration.

Languages

Opt. L0 – English User/Programmers Manuals.

Opt. L5 – Japanese User/Programmers Manuals.

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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 488.2-1987 with SCPI conformance.

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