Tektronix®

Spectrum Analyzer

RSA600A Series Laboratory Spectrum Analyzer Datasheet

The RSA600A Series USB spectrum analyzers offer high bandwidth laboratory spectrum analysis in a small, very transportable package.

Features and benefits

- 9 kHz to 3.0/7.5 GHz frequency range covers a broad range of analysis needs
- 40 MHz acquisition bandwidth enables real time analysis for transient capture and vector analysis
- Amplitude accuracy of 0.2 dB to 3 GHz (95% confidence)
- Standard GPS/GLONASS/Beidou receiver
- Optional tracking generator for gain/loss, antenna and cable measurements
- Streaming capture can be used to record and play back long term events
- SignalVu-PC software offers real time signal processing with DPX Spectrum/Spectrogram to minimize time spent finding transient problems
- 100 µsec minimum signal duration with 100% probability of intercept ensure you see problems first time, every time
- Application programming interface included for development of custom programs
- Accessories including tablet PC, calibration kits, adapters and phase-stable cables offer a complete solution for design, characterization, and manufacturing

Applications

- Characterization of RF devices, subsystems, and systems
- Manufacturing test
- Mobile field operations

The RSA600 Series gives you the bandwidth and analysis tools you need to succeed

The RSA600 series brings real-time spectrum analysis and wide analysis bandwidth to solving the problems of engineers who need to characterize, validate and manufacture their designs. The heart of the system is the USB-based RF spectrum analyzer that captures 40 MHz bandwidths with great fidelity. With 70 dB dynamic range and frequency coverage to 7.5 GHz, you can fully characterize wideband signals up to 40 MHz bandwidths. The USB form factor moves the processing power to the PC of your choice, so you decide when you need more processing power or memory.

The optional tracking generator enables gain/loss measurements for quick tests of filters, amplifiers, duplexers and other components, and you can add cable and antenna measurements of VSWR, return loss, distance to fault, and cable loss as needed.

SignalVu-PC software offers rich analysis capability for your lab

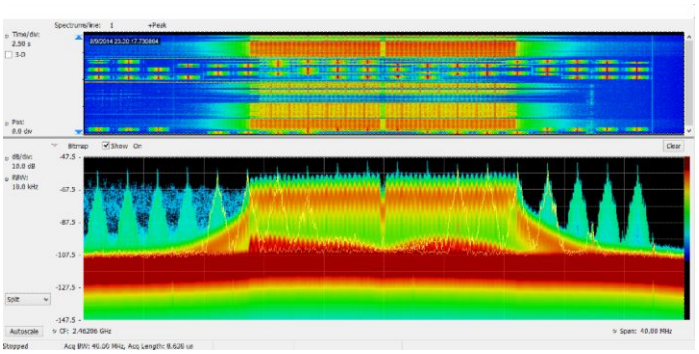
The RSA600 series operates with SignalVu-PC, a powerful program used as the basis of Tek's traditional spectrum analyzers, offering a deep analysis capability previously unavailable in low-cost laboratory solutions. Real-time processing of the DPX spectrum/spectrogram is enabled in your PC, further reducing the cost of hardware. Customers who need programmatic access to the instrument can choose either the SignalVu-PC programmatic interface or use the included application programming interface (API) that provides a rich set of commands and measurements directly. Basic functionality of the free SignalVu-PC program is far from basic. Base version measurements are shown below.

Measurements and functions included in SignalVu-PC base version

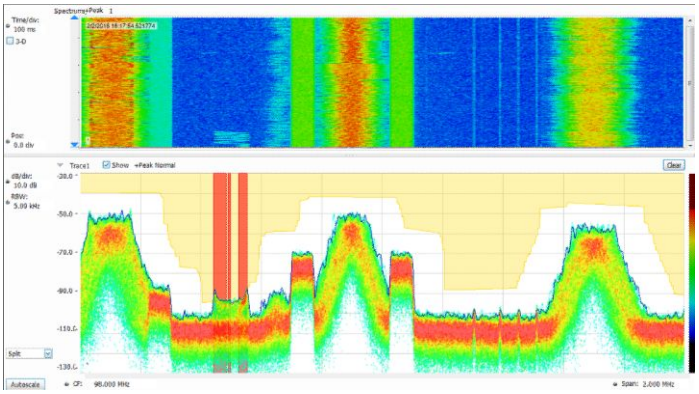
General signal analysis	Description
Spectrum analyzer	Spans from 100 Hz to 7.5 GHz, 3 traces + math and spectrogram trace, 5 markers with power, relative power, integrated power, power density and dBc/Hz functions
DPX spectrum/spectrogram	Real time display of spectrum with 100% probability of intercept of 100 usec signals in up to 40 MHz span
Amplitude, frequency, phase vs. time, RF I and Q vs. time	Basic vector analysis functions
Time overview/navigator	Enables easy setting of acquisition and analysis times for deep analysis in multiple domains
Spectrogram	Analyze and re-analyze your signal in 2-D or 3-D waterfall display
AM/FM listening	Hear and record to file FM and AM signals
Signal recording	Record 40 MHz bandwidth for re-analysis in all domains including real time spectrum analysis (requires application SV56 for Playback)
Analog modulation analysis	**Description**
AM, FM, PM analysis	Measures key AM, FM, PM parameters
RF measurements	**Description**
Spurious measurement	User-defined limit lines and regions provide automatic spectrum violation testing across the entire range of the instrument.
Spectrum emission mask	User-set or standards-specific masks.
Occupied bandwidth	Measures 99% power, -xdB down points.
Channel power and ACLR	Variable channel and adjacent/alternate channel parameters.
MCPR	Sophisticated, flexible multi-channel power measurements.
CCDF	Complementary Cumulative Distribution Function plots the statistical variations in signal level.
Signal strength with audio tone	Measures signal strength and displays a spectrum and signal strength bar for interference hunting and signal quality evaluations.

The RSA600A combined with SignalVu-PC offers advanced measurements

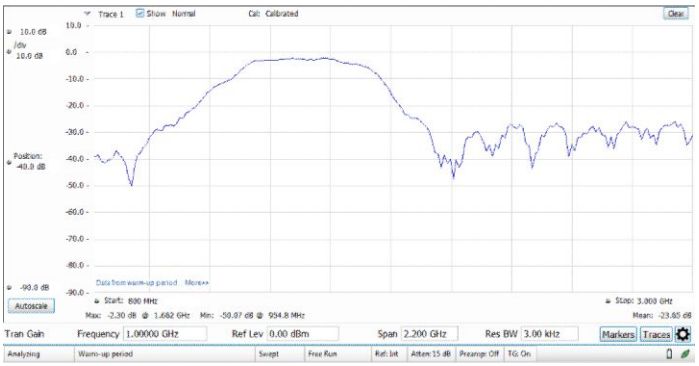
With 40 MHz of real-time bandwidth, the unique DPX spectrum/spectrogram shows you every instance of an interfering or unknown signal, even down to 100 µs in duration. The following image shows a WLAN transmission (green and orange), and the narrow signals that repeat across the screen are a Bluetooth access probe. The spectrogram (upper part of the screen) clearly separates these signals in time to show any signal collisions.



Finding unexpected signals is easy with unattended mask monitoring. A mask can be created on the DPX spectrum display, and actions taken upon every violation, including stop, save a picture, save acquisition, or send an audible alert. In the illustration below, a mask violation has occurred in red on the mask, and a picture of the screen was saved as a result. Mask testing can be used for unattended monitoring and when playing back recorded signals, enabling testing for different violations on the same signals.



The tracking generator (Option 04 on the RSA600) is controlled via SignalVu-PC. Here you can enter start-stop frequencies, set number of steps in the span, adjust reference level, and normalize the tracking generator with a calibrate function. A bandpass filter response from 800 MHz to 3 GHz is shown below.



SignalVu-PC application-specific licenses

SignalVu-PC offers a wealth of application-oriented options including:

- General-purpose modulation analysis (27 modulation types including 16/32/64/256 QAM, QPSK, O-QPSK, GMSK, FSK, APSK)
- Buetooth® analysis of Low Energy, Basic Rate and Enhanced Data Rate
- P25 analysis of phase I and phase 2 signals
- WLAN analysis of 802.11a/b/g/j/p, 802.11n, 802.11ac
- LTE™ FDD and TDD Base Station (eNB) Cell ID & RF measurements
- Mapping
- Pulse analysis
- AM/FM/PM/Direct Audio Measurement including SINAD, THD
- Playback of recorded files, including complete analysis in all domains
- Signal classification and survey

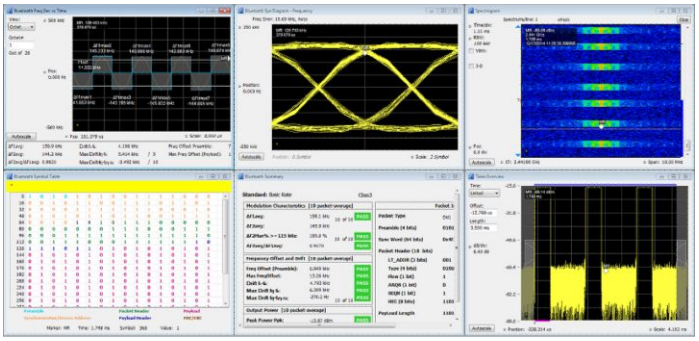
See the separate SignalVu-PC data sheet for complete details and ordering information. Selected applications are illustrated below.

General purpose modulation analysis

SignalVu-PC application SV21 bundles 27 different modulation types into a single analysis package and offers constellation displays, eye diagrams, symbol tables, trellis diagrams, modulation quality summaries and more. Symbol rates and filter types are adjustable and an internal equalizer is included for signal optimization. The illustration below is of a TETRA-standard signal modulated with pi/4DQPSK modulation at 18.0 ksymbols/sec.

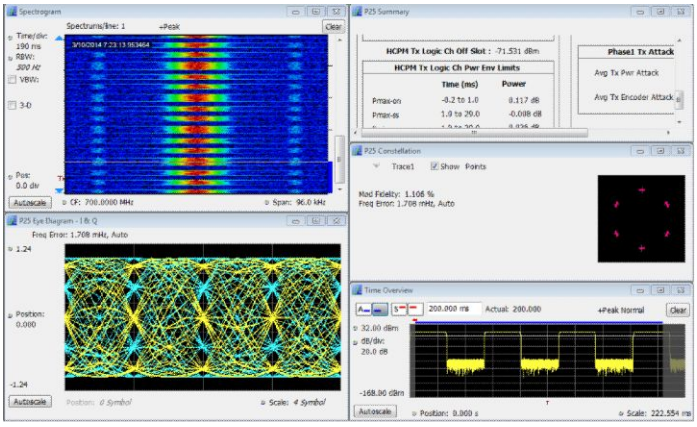
Bluetooth

With application SV27 you can perform Bluetooth SIG standard-based transmitter RF measurements in the time, frequency, and modulation domains. This application supports Basic Rate and Low Energy Transmitter measurements defined by Bluetooth SIG Test Specification RF.TS.4.1.1 for Basic Rate and RF-PHY.TS.4.1.1 for Bluetooth Low Energy. Application SV27 also automatically detects Enhanced Data Rate packets, demodulates them and provides symbol information. Data packet fields are color encoded in the Symbol table for clear identification. Pass/Fail results are provided with customizable limits and the Bluetooth presets make the different test set-ups push-button. The measurement below shows deviation vs. time, frequency offset and drift, and a measurement summary with pass/fail results.



APCO 25

SignalVu-PC application SV26 enables analysis of APCO P25 signals. The following image shows a Phase II HCPM signal being monitored for anomalies with the spectrogram while performing transmitter power, modulation, and frequency measurements to the TIA-102 standards specification.



LTE

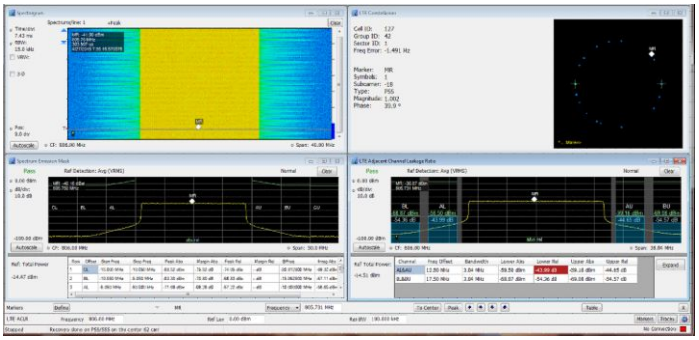
Application SV28 enables the following LTE base station transmitter measurements:

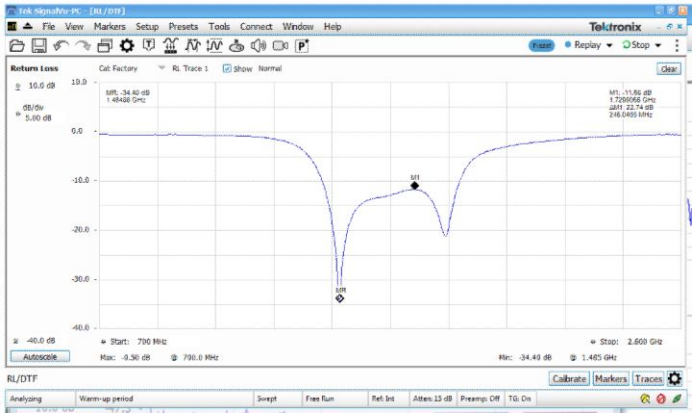
- Cell ID
- Channel power
- Occupied bandwidth
- Adjacent channel leakage ratio (ACLR)
- Spectrum emission mask (SEM)
- Transmitter off power for TDD

The measurements follow the definition in 3GPP TS Version 12.5 and support all base station categories, including picocells and femtocells. Pass/Fail information is reported and all channel bandwidths are supported.

The Cell ID preset displays the Primary Synchronization Signal (PSS) and the Secondary Synchronization Signal (SSS) in a Constellation diagram. It also provides Frequency Error.

The illustration below shows spectral monitoring with the spectrogram display combined with a Cell ID/Constellation, Spectrum Emission Mask and ACLR measurements.



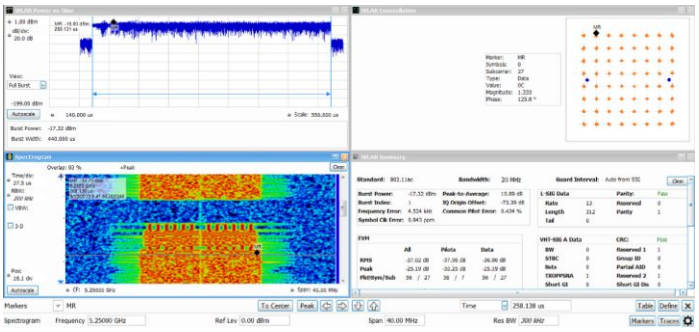


Return Loss/VSWR, distance to fault and cable loss – Perform component characterization tasks easily and cost-effectively. When equipped with the option 04 tracking generator, the RSA500A series with application license SV60xx-SVPC makes one-port measurements on cables, devices and antennas.

Return loss of a bandpass filter measured from 700 MHz to 2.6 GHz. Markers have been placed a 1.48 GHz (-34.4 dB return loss) and at 1.73 GHz (-11.68 dB return loss), indicating the best and worse match in the passband of the filter

WLAN 802.11a/b/g/j/p/n/ac

With options SV23, 24 and 25, sophisticated WLAN measurements are easy. On the 802.11ac (20 MHz) signal shown, the spectrogram shows the initial pilot sequence followed by the main signal burst. The modulation is automatically detected as 64 QAM for the packet and displayed as a constellation. The data summary indicates an EVM of -37.02 dB RMS, and burst power is measured at -17.32 dBm. SignalVu-PC applications are available for 802.11a/b/j/g/p, 802.11n, and 802.11ac to 40 MHz bandwidth.

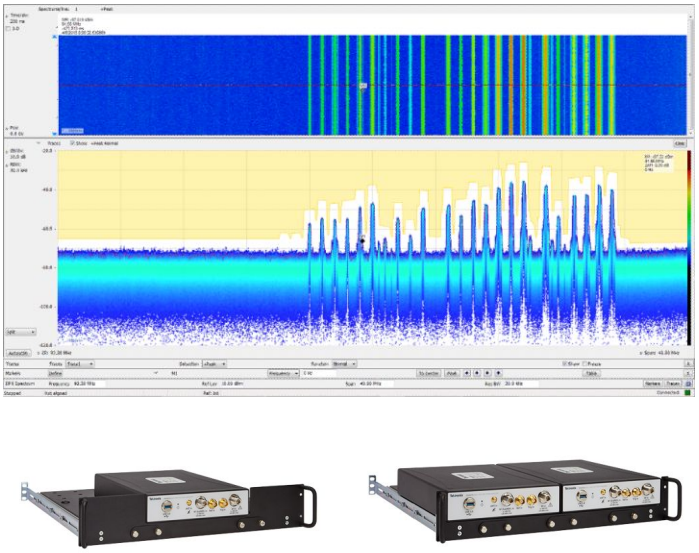


Playback

Application SV56, Playback of recorded signals, can reduce hours of watching and waiting for a spectral violation to minutes at your desk reviewing recorded data.

Recording length is limited only by storage media size, and recording is a basic feature included in SignalVu-PC. SignalVu-PC application SV56 (Playback) allows for complete analysis by all SignalVu-PC measurements, including DPX Spectrogram. Minimum signal duration specifications are maintained during playback. AM/FM audio demodulation can be performed. Variable span, resolution bandwidth, analysis length, and bandwidth are all available.

In the illustration below, the FM band is being replayed, with a mask applied to detect spectral violations, simultaneous with listening to the FM signal at the center frequency of 92.3 MHz.



Rackmount for 1 or 2 RSA600s

Specifications

All specifications are guaranteed unless noted otherwise. All specifications apply to all models unless noted otherwise.

Frequency

Frequency range

RSA603A	9 kHz to 3 GHz
RSA607A	9 kHz to 7.5 GHz

Frequency marker readout accuracy	±(RE × MF + 0.001 × Span) Hz RE: Reference Frequency Error MF: Marker Frequency [Hz]

Reference frequency accuracy

Initial accuracy at Cal (30 min warm-up)	±1 x 10^{-6}
First year aging, typical	±1 x 10^{-6} (1 year)
Cumulative error (Initial accuracy + temperature + aging), typical	3 x 10^{-6} (1 year)
Temperature drift	±0.9 x 10^{-6} (-10 to 60 °C)
External reference input	BNC connector, 50 Ω nominal
External reference input frequency	Every 1 MHz from 1 to 20 MHz plus the following: 1.2288 MHz, 2.048 MHz, 2.4576 MHz, 4.8 MHz, 4.9152 MHz, 9.8304 MHz, 13 MHz, and 19.6608 MHz. The spurious level on the input signal must be less than -80 dBc within 100 kHz offset to avoid on-screen spurious.
External reference input range	± 5 ppm
External reference input level	-10 to +10 dBm

RF input

RF input

RF Input Impedance	50 Ω
RF VSWR (RF Attn = 20 dB), typical	< 1.2 (10 MHz to 3 GHz) < 1.5 (>3 GHz to 7.5 GHz)
RF VSWR preamp ON, typical	< 1.5 (10 MHz to 6 GHz, RF ATT=10 dB, preamp on) < 1.7 (> 6 GHz to 7.5 GHz, RF ATT=10 dB, preamp on)

Maximum RF input level

Maximum DC voltage	±40 V (RF input)
Maximum safe input power	+33 dBm (RF input, 10 MHz to 7.5 GHz, RF Attn ≥ 20 dB) +13 dBm (RF input, 9 kHz to 10 MHz) +20 dBm (RF input, RF Attn < 20 dB)

RF input

Maximum safe input power (Preamp On)

+33 dBm (RF input, 10 MHz to 7.5 GHz, RF Attn ≥ 20 dB)

+13 dBm (RF input, 9 kHz to 10 MHz)

Maximum measurable input power

+30 dBm (RF input, ≥10 MHz to Fmax, RF ATT Auto)

+20 dBm (RF input, <10 MHz, RF ATT Auto)

Input RF attenuator

0 dB to 51 dB (1 dB step)

Amplitude and RF

Amplitude and RF flatness

Reference level setting range

-170 dBm to +40 dBm, 0.1 dB step, (Standard RF input)

Amplitude Accuracy at All Center Frequencies - Preamp ON (18 ℃ to 28 ℃ , 10 dB RF Attenuator)

Amplitude accuracy at all center frequencies

	18 ºC to 28 ºC	18 ºC to 28 ºC, typical (95% confidence)	-10 ºC to 55 ºC, typical
9 kHz ≤ 3.0 GHz	±0.8 dB	±0.2 dB	±1.0 dB
> 3 to 7.5 GHz	±1.5 dB	±0.6 dB	±2.0 dB

Center frequency range	18 ºC to 28 ºC	18 ºC to 28 ºC, typical (95% confidence)	18 ºC to 28 ºC, typical
100 kHz to ≤3.0 GHz	±1.0 dB	±0.5 dB	±1.0 dB
> 3 to 7.5 GHz	±1.75 dB	±0.75 dB	±3.0 dB

Preamp gain

27 dB at 2 GHz

21 dB at 6 GHz (RSA607A)

Channel response (amplitude and phase deviation), typical

For these specifications, use a flat top window for maximum CW amplitude verification accuracy with the RF attenuator setting at 10 dB.

Characteristic		Description		
Measurement center frequency	Span	Amplitude flatness, typical	Amplitude flatness, RMS, typical	Phase linearity, RMS, typical
9 kHz to 40 MHz	≤40 MHz [1]	±1.0 dB	0.60 dB	
>40 MHz to 4.0 GHz	≤20 MHz	±0.10 dB	0.08 dB	0.3°
>4 GHz to 7.5 GHz	≤20 MHz	±0.35 dB	0.20 dB	0.7°
>40 MHz to 4 GHz	≤40 MHz	±0.15 dB	0.08 dB	0.6°
>4 GHz to 7.5 GHz	≤40 MHz	±0.40 dB	0.20 dB	1.0°

Channel response (Amplitude flatness)

For these specifications, use a flat top window for maximum CW amplitude verification accuracy with the RF attenuator setting at 10 dB. The specifications are valid for the test center frequencies listed at the end of the table.

Characteristic		Description
Amplitude flatness		
	Span	
	≤20 MHz	±0.5 dB
	≤40 MHz	±0.5 dB
Test center frequencies (in MHz)		21, 30, 500, 1000, 1500, 2000, 2500, 3000, 3500, 3950, 4050, 4500, 4850, 4950, 5500, 5750, 5850, 6200, 6650, 6750, 7000, 7450

1 Span extents cannot exceed lower frequency limit of the instrument

Trigger

Trigger/Sync input, typical	Voltage range: TTL, 0.0 V to 5.0 V
	Trigger level (Schmitt trigger):
	Positive-going threshold voltage: 1.6 V min, 2.1 V max
	Negative-going threshold voltage: 1.0 V min., 1.35 V max
	Impedance: 10 k ohms with schottky clamps to 0 V, +3.4 V
External trigger timing uncertainty	>20 MHz to 40 MHz acquisition bandwidth: ±250 ns
	Uncertainty increases as acquisition bandwidth is decreased.
Power trigger	
Power trigger, typical	Range: 0 dB to -50 dB from reference level, for trigger levels > 30 dB above the noise floor.
	Type: Rising or falling edge
	Trigger re-arm time: ≤ 100 µsec
Power trigger position timing uncertainty	>20 MHz to 40 MHz acquisition bandwidth: ±250 ns
	Uncertainty increases as acquisition bandwidth is decreased.
Power trigger level accuracy	±1.5 dB for CW signal at tuned center frequency for trigger levels > 30 dB above the noise floor.
	This specification is in addition to the overall amplitude accuracy uncertainty for SA mode.

Noise and distortion

All noise and distortion measurements are made with the Preamp off, except where noted.

3rd Order IM intercept (TOI)	+12 dBm at 2.130 GHz
3rd Order IM intercept (TOI),	
Preamp off, typical	+10 dBm (9 kHz to 25 MHz)
	+15 dBm (25 MHz to 3 GHz)
	+15 dBm (3 GHz to 4 GHz, RSA607A)
	+10 dBm (4 GHz to 7.5 GHz, RSA607A)
Preamp on, typical	-20 dBm (9 kHz to 25 MHz)
	-15 dBm (25 MHz to 3 GHz)
	-15 dBm (3 GHz to 4 GHz)
	-20 dBm (4 GHz to 7.5 GHz, RSA607A)
3rd Order Inter-modulation distortion	-74 dBc at 2.130 GHz
	Each signal level -25 dBm at the RF input. 2 MHz tone separation. Attenuator = 0, Reference level = -20 dBm.

Noise and distortion

3rd Order inter-modulation distortion

Preamp off, typical

< -70 dBc (10 kHz to 25 MHz)

< -80 dBc (25 MHz to 3 GHz)

< -80 dBc (3 GHz to 4 GHz)

< -70 dBc (4 GHz to 6 GHz, RSA607A)

< -70 dBc (6 GHz to 7.5 GHz, RSA607A)

Each signal level -25 dBm at the RF input. 2 MHz tone separation. Attenuator = 0, Reference level = -20 dBm.

Preamp on, typical

< -70 dBc (9 kHz to 25 MHz)

< -80 dBc (25 MHz to 3 GHz)

< -80 dBc (3 GHz to 4 GHz)

< -70 dBc (4 GHz to 6 GHz, RSA607A)

< -70 dBc (6 GHz to 7.5 GHz, RSA607A)

Each signal level -55 dBm at the RF input. 2 MHz tone separation. Attenuator = 0, Reference level = -50 dBm.

2nd Harmonic distortion, typical

2nd Harmonic distortion

< -75 dBc (40 MHz to 1.5 GHz)

< -75 dBc (1.5 GHz to 3.75 GHz, RSA607A)

2nd Harmonic distortion, Preamp on

< - 60 dBc , 40 MHz to 3.75 GHz, input frequency

2nd Harmonic distortion intercept (SHI)

+35 dBm, 40 MHz to 1.5 GHz, input frequency

+35 dBm, 1.5 GHz to 3.75 GHz, input frequency

2nd Harmonic distortion intercept (SHI), Preamp on

+15 dBm, 40 MHz to 3.75 GHz, input frequency

Displayed average noise level (DANL)

(Normalized to 1 Hz RBW, with log-average detector)

Frequency range	Preamp on	Preamp on, typical	Preamp off, typical
500 kHz to 1 MHz	-138 dBm/Hz	-145 dBm/Hz	-130 dBm/Hz
1 MHz to 25 MHz	-153 dBm/Hz	-158 dBm/Hz	-130 dBm/Hz
>25 MHz to 1 GHz	-161 dBm/Hz	-164 dBm/Hz	-141 dBm/Hz
>1 GHz to 2 GHz	-159 dBm/Hz	-162 dBm/Hz	-141 dBm/Hz
>2 GHz to 3 GHz	-156 dBm/Hz	-159 dBm/Hz	-138 dBm/Hz
>3 GHz to 4.2 GHz, RSA607A	- dBm/Hz	- dBm/Hz	-138 dBm/Hz
>4.2 GHz to 6 GHz, RSA607A	-159 dBm/Hz	-162 dBm/Hz	-147 dBm/Hz
>6 GHz to 7.5 GHz, RSA607A	-155 dBm/Hz	-158 dBm/Hz	-145 dBm/Hz

Phase noise

Phase noise

Offset	1 GHz CF	1 GHz CF (typical)	2 GHz CF (typical)	6 GHz CF, (RSA607A) (typical)	10 MHz (typical)
10 kHz	-94 dBc/Hz	-97 dBc/Hz	-96 dBc/Hz	-94 dBc/Hz	-120 dBc/Hz
100 kHz	-94 dBc/Hz	-98 dBc/Hz	-97 dBc/Hz	-96 dBc/Hz	-124 dBc/Hz
1 MHz	-116 dBc/Hz	-121 dBc/Hz	-120 dBc/Hz	-120 dBc/Hz	-124 dBc/Hz

Integrated Phase (RMS), typical

7.45×10^{-3} radians @ 1 GHz

8.24×10^{-3} radians @ 2 GHz

9.34×10^{-3} radians @ 6 GHz

Integrated from 10 kHz to 10 MHz

Spurious response

Residual spurious response (Reference = -30 dBm, RBW = 1 kHz)

<-75 dBm (500 kHz to 60 MHz), typical

< -85 dBm (>60 MHz to 80 MHz), typical

<-100 dBm (>80 MHz to 7.5 GHz), typical

Spurious response with Signal (Image suppression)

< -65 dBc (10 kHz to < 3 GHz, Ref= -30 dBm, Atten = 10 dB, RF input Level = -30 dBm, RBW = 10 Hz)

< -65 dBc (3 GHz to 7.5 GHz, Ref= -30dBm, Atten = 10 dB, RF input Level = -30 dBm, RBW = 10 Hz)

Spurious response with signal at CF

Offset ≥ 1 MHz

Frequency	Span ≤40 MHz, swept spans >40 MHz	
		Typical
1 MHz - 100 MHz		-75 dBc
100 MHz - 3 GHz	-72 dBc	-75 dBc
3 GHz - 7.5 GHz (RSA607A)	-72 dBc	-75 dBc

Spurious response with signal at CF

(100 kHz ≤ offset <1 MHz, Span=2 MHz):

Frequency P-TYP(PRI)	Typical
1 MHz - 100 MHz	-76 dBc
100 MHz - 3 GHz	-76 dBc
3 GHz - 7.5 GHz (RSA607A)	-74 dBc [2]

Spurious response with signal at other than CF, typical

Frequency	Span ≤40 MHz, swept spans >40 MHz
1 MHz – 25 MHz (LF Band)	-73 dBc
25 MHz – 3 GHz	-73 dBc
3 GHz – 7.5 GHz (RSA607A)	-73 dBc

2 Power supply sidebands, 620-660 kHz: -67 dBc, typical

Spurious response

Spurious response with signal at half-IF [3]	
RSA603A, RSA607A	< 75 dBc, (CF: 30 MHz to 3 GHz, Ref = -30 dBm, Atten = 10 dB, RBW = 10 Hz, Span = 10 kHz) Signal frequency = 2310 MHz, RF input level = -30 dBm
RSA607A	< 77 dBc, (CF 3 G Hz to 7.5 GHz, Ref= -30 dBm, Atten = 10 dB, RBW=10 Hz, Span=10 kHz) RF input Level = -30 dBm
Local oscillator feed-through to input connector, typical	< -70 dBm, preamp off. < -90 dBm, preamp on. Attenuator = 10 dB.

Acquisition

IF bandwidth	40 MHz.
A/D converter	14 bits, 112 Ms/s.
Real-Time IF Acquisition Data	112 Ms/s, 16-bit integer samples.

ACLR

ACLR for 3GPP Down Link, 1 DPCH (2130 MHz)	-57 dB (Adjacent Channel) -68 dB w/Noise Correction (Adjacent Channel) -57 dB (First Alternate Channel) -69 dB w/Noise Correction (First Adjacent Channel)
ACLR LTE	-58 dB (Adjacent Channel) -61 dB w/Noise Correction (Adjacent Channel) -61 dB (First Alternate Channel) -63 dB w/Noise Correction (First Adjacent Channel)

GPS location

Format	GPS/GLONASS/BeiDou
GPS antenna power	3 V, 100 mA maximum
Time to first fix, maximum	Lock time ranges from 2 sec (hot) to 46 sec (cold start). -130 dBm input signal power.
Horizontal position accuracy	GPS: 2.6 m Glonass: 2.6 m BeiDou: 10.2 m GPS + Glonass: 2.6 m GPS + BeiDou: 2.6 m Test conditions: 24 hr. static, -130 dBm, full power

3 This is an input signal at half of the IF frequency.

Tracking generator (Option 04)

Tracking Generator (Option 04)	
Frequency range	9 kHz to 3 GHz
	9 kHz to 7.5 GHz
Sweep speed	6700 MHz/second, 101 points, 50 kHz RBW (11 mS per point)
	Measured using a Panasonic Toughpad FZ-G1, Intel® Core™ i5-5300U 2.3 GHz Processor, 8 GB RAM, 256 GB SSD, Windows®7 Pro.
Frequency resolution	100 Hz
TG output connector	N type
VSWR	< 1.8:1, 10 MHz to 7.5 GHz, -20 dBm output level
Maximum output power	-3 dBm
Output power level setting range	40 dB
Output power level step size	1 dB
Output power level step size accuracy	± 0.5 dB
Output level accuracy	± 1.5 dB, 10 MHz to 7.5 GHz, -20 dBm output level
Harmonics	< -22 dBc
Non-harmonic spurious	< -30 dBc; spurious < 2 GHz from TG output frequency
	< -25 dBc; spurious ≥ 2 GHz from TG output frequency
Reverse power without damage	40 Vdc, +20 dBm RF
Transmission gain measurement error	Gain of +20 to -40 dB: ±1 dB
Transmission gain measurement dynamic range	70 dB

Return Loss, Distance-to-Fault, and Cable Loss measurements

Return Loss, Distance-to-Fault, and Cable Loss measurements	
Measurements	Return Loss, Cable Loss, Distance-to-Fault
Frequency range	10 MHz to 3 GHz (RSA603A)
	10 MHz to 7.5 GHz (RSA607A)
Sweep speed [4]	5 ms/point, Return Loss measurement
	5 ms/point, Distance-to-Fault measurement
	5 ms/point, Cable Loss measurement
Frequency resolution	500 Hz
Return Loss measurement error	Return Loss of 0 to 15 dB: ±0.5 dB
	Return Loss of 15 to 25 dB: ±1.5 dB Return Loss of 25 to 35 dB: ±4.0 dB
Return Loss measurement error at 14 dB Return Loss	±1.5 dB from 10 MHz to 6.8 GHz
	±3.0 dB from 6.8 GHz to 7.5 GHz
	±1.0 dB from 10 MHz to 6.8 GHz
	±2.5 dB from 6.8 GHz to 7.5 GHz

4 201 point sweep Measured using a Panasonic Toughpad FZ-G1.

Return Loss, Distance-to-Fault, and Cable Loss measurements

Return Loss measurement range

50 dB

Interference immunity

Return Loss Measurement Error within specifications for the following conditions:

+5 dBm interferer power within 800 kHz of measurement point

+5 dBm interferer power more than 800 kHz away from measurement point

Distance-to-Fault range

1500 m or 15 dB one-way cable loss capable, user defined.

Maximum range is a function of the cable velocity factor and the frequency step size as follows:

$$\text{Range} = \left(\frac{Vp \times c}{2}\right) \times \left(\frac{N - 1}{F_{stop} - F_{start}}\right)$$

Where:

V_p = Cable velocity factor relative to the speed of light

c = Speed of light (m/s)

F_{start} = Sweep start frequency (Hz)

F_{stop} = Sweep stop frequency (Hz)

N = number of sweep points

Distance-to-Fault resolution

0.03m (RSA503A, RG-58 (Vp=0.66)), User Definable 0.01m (RSA507A, RG-58 (Vp=0.66)), User Definable

Minimum resolution is a function of the cable velocity factor and the frequency step size as follows:

$$\text{Resolution} = \left(\frac{Vp \times c}{2}\right) \times \left(\frac{1}{F_{stop} - F_{start}}\right)$$

or

$$\text{Resolution} = \left(\frac{\text{Range}}{N - 1}\right)$$

SignalVu-PC standard measurements and performance

Measurements included

General signal analysis	
Spectrum analyzer	Spans from 1 kHz to 7.5 GHz Three traces plus math and spectrogram trace Five markers with power, relative power, integrated power, power density and dBc/Hz functions
DPX Spectrum/Spectrogram	Real time display of spectrum with 100% probability of intercept of 100 µsec signals in up to 40 MHz span
Amplitude, frequency, phase vs. time, RF I and Q vs. time	Basic vector analysis functions
Time Overview/Navigator	Enables easy setting of acquisition and analysis times for deep analysis in multiple domains
Spectrogram	Analyze and re-analyze your signal with a 2-D or 3-D waterfall display
AM/FM listening	Hear, and record to file, FM and AM signals
Analog modulation analysis	
AM, FM, PM analysis	Measures key AM, FM, PM parameters
RF measurements	
Spurious measurement	User-defined limit lines and regions provide automatic spectrum violation testing across the entire range of the instrument
Spectrum emission mask	User-defined or standards-specific masks
Occupied Bandwidth	Measures 99% power, -xdB down points
Channel Power and ACLR	Variable channel and adjacent/alternate channel parameters
MCPR	Sophisticated, flexible multi-channel power measurements
CCDF	Complementary Cumulative Distribution Function plots the statistical variations in signal level

SignalVu-PC/RSA607A key characteristics

Maximum span	40 MHz real-time 9 kHz - 3 GHz swept 9 kHz - 7.5 GHz swept
Maximum acquisition time	1.0 s
Minimum IQ resolution	17.9 ns (acquisition BW = 40 MHz)
Tuning Tables	Tables that present frequency selection in the form of standards-based channels are available for the following. Cellular standards families: AMPS, NADC, NMT-450, PDC, GSM, CDMA, CDMA-2000, 1xEV-DO WCDMA, TD-SCDMA, LTE, WiMax Unlicensed short range: 802.11a/b/j/g/p/n/ac, Bluetooth Cordless phone: DECT, PHS Broadcast: AM, FM, ATSC, DVBT/H, NTSC Mobile radio, pagers, other: GMRS/FRS, iDEN, FLEX, P25, PWT, SMR, WiMax

DPX spectrum display

Spectrum processing rate (RBW = auto, trace length 801)	≤10,000/s
DPX bitmap resolution	201x801
Marker information	Amplitude, frequency, signal density

SignalVu-PC standard measurements and performance

Minimum signal duration for 100% probability of detection	100 µs Span: 40 MHz, RBW = 300 kHz (Auto) Due to the non-deterministic execution time of programs running under the Microsoft Windows OS, this specification may not be met when the host PC is heavily loaded with other processing tasks
Span range (continuous processing)	1 kHz to 40 MHz
Span range (swept)	Up to maximum frequency range of instrument
Dwell time per step	50 ms to 100 s
Trace processing	Color-graded bitmap, +Peak, -Peak, average
Trace length	801, 2401, 4001, 10401
RBW range	1 kHz to 4.99 MHz

DPX spectrogram display

Trace detection	+Peak, -Peak, Average(V_{RMS})
Trace length, memory depth	801 (60,000 traces) 2401 (20,000 traces) 4001 (12,000 traces)
Time resolution per line	1 ms to 6400 s, user selectable

Spectrum display

Traces	Three traces + 1 math trace + 1 trace from spectrogram for spectrum display
Trace functions	Normal, Average (VRMS), Max Hold, Min Hold, Average of Logs
Detector	Average (VRMS), Average, CISPR peak, +Peak, -Peak, Sample
Spectrum trace length	801, 2401, 4001, 8001,10401, 16001, 32001, and 64001 points
RBW range	10 Hz to 8 MHz

Analog modulation analysis (standard)

AM demodulation accuracy, typical	±2% 0 dBm input at center, carrier frequency 1 GHz, 1 kHz/5 kHz input/modulated frequency, 10% to 60% modulation depth 0 dBm input power level, reference level = 10 dBm, Atten=Auto
FM demodulation accuracy, typical	±1% of span 0 dBm input at center, carrier frequency 1 GHz, 400 Hz/1 kHz input/modulated frequency 0 dBm input power level, reference level = 10 dBm, Atten=Auto
PM demodulation accuracy, typical	±3% of measurement bandwidth 0 dBm input at center, carrier frequency 1 GHz, 1 kHz/5 kHz input/modulated frequency 0 dBm input power level, reference level = 10 dBm, Atten=Auto

Signal Strength display

Signal strength indicator	Located at right side of display
Measurement bandwidth	Up to 40 MHz, dependent on span and RBW setting
Tone type	Variable frequency based on received signal strength

Sweep speed

Full-span sweep speed

Full span sweep speed, typical	5500 MHz/sec (RBW = 1 MHz)
	5300 MHz/sec (RBW = 100 kHz)
	3700 MHz/sec (RBW = 10 kHz)
	950 MHz/sec (RBW = 1 kHz)
	Measured using a Panasonic Toughpad FZ-G1, Intel® Core™ i5-5300U 2.3 GHz Processor, 8 GB RAM, 256 GB SSD, Windows®7 Pro.
	Spectrum display is only measurement on screen
Tuning step time via API	1 ms

SignalVu-PC applications performance summary

AM/FM/PM and direct audio measurement (SVAxx-SVPC)

Carrier frequency range (for modulation and audio measurements)	(1/2 × audio analysis bandwidth) to maximum input frequency
Maximum audio frequency span	10 MHz
FM measurements (Mod. index >0.1)	Carrier Power, Carrier Frequency Error, Audio Frequency, Deviation (+Peak, -Peak, Peak-Peak/2, RMS), SINAD, Modulation Distortion, S/N, Total Harmonic Distortion, Total Non-harmonic Distortion, Hum and Noise
AM measurements	Carrier Power, Audio Frequency, Modulation Depth (+Peak, -Peak, Peak-Peak/2, RMS), SINAD, Modulation Distortion, S/N, Total Harmonic Distortion, Total Non-harmonic Distortion, Hum and Noise

SignalVu-PC applications performance summary

PM measurements

Carrier Power, Carrier Frequency Error, Audio Frequency, Deviation (+Peak, -Peak, Peak-Peak/2, RMS), SINAD, Modulation Distortion, S/N, Total Harmonic Distortion, Total Non-harmonic Distortion, Hum and Noise

Audio filters

Low pass, kHz: 0.3, 3, 15, 30, 80, 300, and user-entered up to 0.9 × audio bandwidth

High pass, Hz: 20, 50, 300, 400, and user-entered up to 0.9 × audio bandwidth

Standard: CCITT, C-Message

De-emphasis (µs): 25, 50, 75, 750, and user-entered

File: User-supplied .TXT or .CSV file of amplitude/frequency pairs. Maximum 1000 pairs

Performance characteristics, typical	**Conditions: Unless otherwise stated, performance is given for: Modulation rate = 5 kHz AM depth: 50% PM deviation 0.628 Radians**			
	FM	**AM**	**PM**	**Conditions**
Carrier Power accuracy	Refer to instrument amplitude accuracy			
Carrier Frequency accuracy	± 0.5 Hz + (transmitter frequency × ref. freq. error)	Refer to instrument frequency accuracy	± 0.2 Hz + (transmitter frequency × ref. freq. error)	FM deviation: 1 kHz / 10 kHz
Depth of Modulation accuracy	NA	± 0.2%+(0.01 * measured value)	NA	Rate: 1 kHz to 100kHz Depth: 10% to 90%
Deviation accuracy	± (1% × (rate + deviation)+50 Hz)	NA	± 100% * (0.01 + (measured rate/1 MHz))	FM Rate: 1 kHz to 1 MHz
Rate accuracy	± 0.2 Hz	± 0.2 Hz	± 0.2 Hz	FM deviation: 1 kHz to 100 kHz
Residual THD	0.10%	0.13%	0.1%	FM Deviation: 5 kHz Rate: 1 kHz to 10 kHz Depth: 50%
Residual SINAD	43 dB	58 dB	40 dB	Deviation 5 kHz Rate: 1 kHz to 10 kHz Depth: 50%

APCO P25 Measurements (SV26xx-SVPC)

Measurements

RF output power, operating frequency accuracy, modulation emission spectrum, unwanted emissions spurious, adjacent channel power ratio, frequency deviation, modulation fidelity, frequency error, eye diagram, symbol table, symbol rate accuracy, transmitter power and encoder attack time, transmitter throughput delay, frequency deviation vs. time, power vs. time, transient frequency behavior, HCPM transmitter logical channel peak adjacent channel power ratio, HCPM transmitter logical channel off slot power, HCPM transmitter logical channel power envelope, HCPM transmitter logical channel time alignment, cross-correlated markers

Modulation fidelity, typical

CF = 460 MHz, 815 MHz

C4FM ≤ 1.0%

HCPM ≤ 0.5%

HDQPSK ≤ 0.25%

Input signal level is optimized for best modulation fidelity.

SignalVu-PC applications performance summary

Bluetooth Measurements (SV27xx-SVPC)

Modulation formats	Basic Rate, Bluetooth Low Energy, Enhanced Data Rate - Revision 4.1.1 Packet types: DH1, DH3, DH5 (BR), Reference (LE)
Measurements	Peak Power, Average Power, Adjacent Channel Power or InBand Emission mask, -20 dB Bandwidth, Frequency Error, Modulation Characteristics including ΔF1avg (11110000), ΔF2avg (10101010), ΔF2 > 115 kHz, ΔF2/ΔF1 ratio, frequency deviation vs. time with packet and octet level measurement information, Carrier Frequency f0, Frequency Offset (Preamble and Payload), Max Frequency Offset, Frequency Drift f_1-f_0, Max Drift Rate f_n-f_0 and f_n-f_{n-5}, Center Frequency Offset Table and Frequency Drift table, color-coded Symbol table, Packet header decoding information, eye diagram, constellation diagram
Output power, In-band emissions and ACP	Level uncertainty: refer to instrument amplitude and flatness specification Measurement range: signal level > –70 dBm
Modulation characteristics	Deviation range: ±280 kHz Deviation uncertainty (at 0 dBm) <2 kHz [5] + instrument frequency uncertainty (basic rate) <3 kHz [5] + instrument frequency uncertainty (low energy) Measurement range: Nominal channel frequency ±100 kHz
Initial Carrier Frequency Tolerance (ICFT)	Measurement uncertainty (at 0 dBm): <1 kHz + instrument frequency uncertainty Measurement range: Nominal channel frequency ±100 kHz
Carrier Frequency Drift	Measurement uncertainty: <1 kHz + instrument frequency uncertainty Measurement range: Nominal channel frequency ±100 kHz

General purpose digital modulation analysis (SVMxx-SVPC)

Modulation formats	BPSK, QPSK, 8PSK, 16QAM, 32QAM, 64QAM, 256QAM, PI/2DBPSK, DQPSK, PI/4DQPSK, D8PSK, D16PSK, SBPSK, OQPSK, SOQPSK, MSK, GFSK, CPM, 2FSK, 4FSK, 8FSK, 16FSK, C4FM
Analysis period	Up to 81,000 samples
Measurement filter	Root Raised Cosine, Raised Cosine, Gaussian, Rectangular, IS-95 TX_MEA, IS-95 Base TXEQ_MEA, None
Reference Filter	Gaussian, Raised Cosine, Rectangular, IS-95 REF, None
Filter rolloff factor	α : 0.001 to 1, in 0.001 steps
Measurements	Constellation, Demod I&Q vs. Time, Error Vector Magnitude (EVM) vs. Time, Eye Diagram, Frequency Deviation vs. Time, Magnitude Error vs. Time, Phase Error vs. Time, Signal Quality, Symbol Table, Trellis Diagram
Symbol rate range	1 k symbols/s to 40 M symbols/s Modulated signal must be contained entirely within the acquisition bandwidth
Adaptive equalizer	Linear, Decision-Directed, Feed-Forward (FIR) equalizer with coefficient adaptation and adjustable convergence rate. Supports modulation types BPSK, QPSK, OQPSK, π/2-DBPSK, π/4-DQPSK, 8-PSK, 8-DSPK, 16-DPSK, 16/32/64/128/256-QAM

5 At nominal power level of 0 dBm

SignalVu-PC applications performance summary

QPSK Residual EVM (center frequency = 2 GHz), typical	0.6 % (100 kHz symbol rate)
	0.8 % (1 MHz symbol rate)
	0.8 % (10 MHz symbol rate)
	0.8 % (30 MHz symbol rate)
	400 symbols measurement length, 20 Averages, normalization reference = maximum symbol magnitude
256 QAM Residual EVM (center frequency = 2 GHz), typical	0.6 % (10 MHz symbol rate)
	0.7 % (30 MHz symbol rate)
	400 symbols measurement length, 20 Averages, normalization reference = maximum symbol magnitude
LTE Downlink RF measurements (SV28xx-SVPC)	
Standard Supported	3GPP TS 36.141 Version 12.5
Frame Format supported	FDD and TDD
Measurements and Displays Supported	Adjacent Channel Leakage Ratio (ACLR), Spectrum Emission Mask (SEM), Channel Power, Occupied Bandwidth, Power vs. Time showing Transmitter OFF power for TDD signals and LTE constellation diagram for Primary Synchronization Signal, Secondary Synchronization Signal with Cell ID, Group ID, Sector ID and Frequency Error.
ACLR with E-UTRA bands (typical, with noise correction)	1st Adjacent Channel 60 dB (RSA607A)
	2nd Adjacent Channel 62 dB (RSA607A)
Mapping (MAPxx-SVPC)	
Supported map types	Pitney Bowes MapInfo (*.mif), Bitmap (*.bmp), Open Street Maps (.osm)
Saved measurement results	Measurement data files (exported results)
Map file used for the measurements	Google Earth KMZ file
Recallable results files (trace and setup files)	MapInfo-compatible MIF/MID files
Pulse measurements (SVPxx-SVPC)	
Measurements (nominal)	Pulse-Ogram™ waterfall display of multiple segmented captures, with amplitude vs time and spectrum of each pulse. Pulse frequency, Delta Frequency, Average on power, Peak power, Average transmitted power, Pulse width, Rise time, Fall time, Repetition interval (seconds), Repetition interval (Hz), Duty factor (%), Duty factor (ratio), Ripple (dB), Ripple (%), Droop (dB), Droop (%), Overshoot (dB), Overshoot (%), Pulse- Ref Pulse frequency difference, Pulse- Ref Pulsephase difference, Pulse- Pulse frequency difference, Pulse- Pulse phase difference, RMS frequency error, Max frequency error, RMS phase error,Max phase error, Frequency deviation, Phase deviation, Impulse response (dB),Impulse response (time), Time stamp.
Minimum pulse width for detection	150 ns
Average ON power at 18 °C to 28 °C, typical	±0.3 dB + absolute amplitude accuracy
	For pulses of 300 ns width or greater, duty cycles of .5 to .001, and S/N ratio ≥ 30 dB
Duty factor, typical	±0.2% of reading
	For pulses of 450 ns width or greater, duty cycles of .5 to .001, and S/N ratio ≥ 30 dB
Average transmitted power, typical	±0.5 dB + absolute amplitude accuracy
	For pulses of 300 ns width or greater, duty cycles of .5 to .001, and S/N ratio ≥ 30 dB
Peak pulse power, typical	±1.2 dB + absolute amplitude accuracy
	For pulses of 300 ns width or greater, duty cycles of .5 to .001, and S/N ratio ≥ 30 dB
Pulse width, typical	±0.25% of reading
	For pulses of 450 ns width or greater, duty cycles of .5 to .001, and S/N ratio ≥ 30 dB

SignalVu-PC applications performance summary

Playback of recorded signals (SV56)	
Playback file type	R3F recorded by RSA306, RSA500, or RSA600
Recorded file bandwidth	40 MHz
File playback controls	General: Play, stop, exit playback
	Location: Begin/end points of playback settable from 0-100%
	Skip: Defined skip size from 73 µs up to 99% of file size
	Live rate: Plays back at 1:1 rate to recording time
	Loop control: Play once, or loop continuously
Memory requirement	Recording of signals requires storage with write rates of 300 MB/sec. Playback of recorded files at live rates requires storage with read rates of 300 MB/sec.
WLAN Measurements, 802.11a/b/g/j/p (SV23xx-SVPC)	
Measurements	WLAN power vs. time; WLAN symbol table; WLAN constellation; spectrum emission mask; error vector magnitude (EVM) vs. symbol (or time), vs subcarrier (or frequency); mag error vs symbol (or time), vs. subcarrier (or frequency); phase error vs symbol (or time), vs. subcarrier (or frequency); channel frequency response vs. symbol (or time), vs. subcarrier (or frequency); spectral flatness vs. symbol (or time), vs. subcarrier (or frequency)
Residual EVM - 802.11a/g/j /p (OFDM), 64-QAM, typical	2.4 GHz, 20 MHz BW: -39 dB
	5.8 GHz, 20 MHz BW: -38 dB
	Input signal level optimized for best EVM, average of 20 bursts, ≥16 symbols each
Residual EVM - 802.11b, CCK-11, typical	2.4 GHz, 11 Mbps: 1.3 %
	Input signal level optimized for best EVM, average of 1,000 chips, BT = .61
WLAN Measurements 802.11n (SV24xx-SVPC)	
Measurements	WLAN power vs. time; WLAN symbol table; WLAN constellation; spectrum emission mask; error vector magnitude (EVM) vs. symbol (or time), vs subcarrier (or frequency); mag error vs symbol (or time), vs. subcarrier (or frequency); phase error vs symbol (or time), vs. subcarrier (or frequency); channel frequency response vs. symbol (or time), vs. subcarrier (or frequency); spectral flatness vs. symbol (or time), vs. subcarrier (or frequency)
EVM performance - 802.11n, 64-QAM, typical	2.4 GHz, 40 MHz BW: -38 dB
	5.8 GHz, 40 MHz BW: -38 dB
	Input signal level optimized for best EVM, average of 20 bursts, ≥16 symbols each
WLAN Measurements 802.11ac (SV25xx-SVPC)	
Measurements	WLAN power vs. time; WLAN symbol table; WLAN constellation; spectrum emission mask; error vector magnitude (EVM) vs. symbol (or time), vs subcarrier (or frequency); mag error vs symbol (or time), vs. subcarrier (or frequency); phase error vs symbol (or time), vs. subcarrier (or frequency); channel frequency response vs. symbol (or time), vs. subcarrier (or frequency); spectral flatness vs. symbol (or time), vs. subcarrier (or frequency)
EVM performance - 802.11ac, 256-QAM, typical	5.8 GHz, 40 MHz BW : -38 dB
	Input signal level optimized for best EVM, average of 20 bursts, ≥16 symbols each

28 Volt noise source drive

28 Volt noise source drive output

Output Level	28 VDC @ 140 mA
Output voltage turn ON/OFF time	Turn on: 100 µS Turn off: 500 µS

Input and output ports

Inputs, outputs, and inferfaces

RF input	N type, female
External frequency reference input	BNC, female
Trigger/Sync input	BNC, female
Tracking Generator Source Output	N type, female
GPS Antenna	SMA, female
USB Device Port	USB 3.0 – Type A
USB Status LED	LED, dual color red/green LED states: Steady Red: USB power applied, or resetting Steady Green: Initialized, ready for use Blinking Green: Transferring data to host

Installation requirements

Maximum power dissipation (fully loaded)	RSA600A: 45 W maximum.
Surge current	2 A peak maximum, at 25 °C (77 °F) for ≤ 5 line cycles, after the product has been turned off for at least 30 seconds.
Cooling clearance	Bottom, top 0 mm (0 in.) with feet installed 6.3 mm (0.25 in.) without feet installed Sides 0 mm (0 in.) Rear: 38.1 mm (1.5 in.)

Physical characteristics

Physical characteristics	
Width	222.3 mm (8.75 in)
Height	75.0 mm (2.95 in)
Length	358.6 mm (14.12 in)
Net weight	2.79 kg (6.15 pounds)

Environmental and safety

Temperature	
Operating	-10 °C to +55 °C (+14 °F to +131 °F)
Non-operating	-51 °C to +71 °C (-60 °F to +160 °F)
Humidity	
	MIL-PRF-28800F Class 2
	Operating:
	5% to 95±5%RH (relative humidity) in the temperature range of +10 °C to 30 °C (+50 °F to 86 °F)
	5% to 75±5% RH above +30 °C to 40 °C (+86 °F to 104 °F)
	5% to 45±5% RH above +40 °C up to +55 °C (+86 °F to +131 °F)
	<10 °C (+50 °F) humidity is uncontrolled; non-condensing
Altitude	
Operating	Up to 3000 m (9,842 ft.)
Non-operating	Up to 12000 m (39,370 ft.)

Dynamics

Vibration	
Operating	Tektronix Class 3 Random Vibration Test at 0.31 GRMS: 5-500 Hz, 3 Axes at 10 min/axis
Non-Operating	MIL-PRF-28800F Class 3
	2.06 GRMS, 5 500 Hz, 10 minutes per axis, 3 axes (30 minutes total)
Shock	
Operating	Test method per Military Standard MIL-PRF-28800F 1-4
Non-Operating	Exceeds the requirements of Military Standard MIL-PRF-28800F
Handling and transit	
Bench handling, operating	MIL-PRF-28800F Class 3
Transit drop, non-operating	MIL-PRF-28800F Class 2

Ordering information

Models

RSA600A Series

USB Spectrum Analyzer, 40 MHz acquisition bandwidth.

The RSA600 requires a PC with Windows 7, Windows 8/8.1, or Windows 10, 64-bit operating system. A USB 3.0 connection is required for operation of the RSA600. 8 GB RAM and 20 GB free drive space is required for installation of SignalVu-PC. For full performance of the real time features of the RSA600, an Intel Core i7 4th generation processor is required. Processors of lower performance can be used, with reduced real-time performance. Storage of streaming data requires that the PC be equipped with a drive capable of streaming storage rates of 300 MB/sec.

Includes: USB 3.0 cable (2 M), A-A connection, screw lock, quick-start manual (printed), connector covers, power cord, (see power plug options), USB memory device with SignalVu-PC, API and documentation files.

Item	Description
RSA603A	USB real time spectrum analyzer, 9 kHz – 3.0 GHz, 40 MHz acquisition bandwidth
Option 04	Tracking generator, 10 MHz – 3.0 GHz
RSA607A	USB real time spectrum analyzer, 9 kHz – 7.5 GHz, 40 MHz acquisition bandwidth
Option 04	Tracking generator, 10 MHz – 7.5 GHz
RSA5600RACK	Rackmount, RSA500 and RSA600 Series. Holds 1 RSA500A or 2 RSA600A models

Options

RSA600A power plug options

Opt. A0	North America power plug (115 V, 60 Hz)
Opt. A1	Universal Euro power plug (220 V, 50 Hz)
Opt. A2	United Kingdom power plug (240 V, 50 Hz)
Opt. A3	Australia power plug (240 V, 50 Hz)
Opt. A4	North America power plug (240 V, 50 Hz)
Opt. A5	Switzerland power plug (220 V, 50 Hz)
Opt. A6	Japan power plug (100 V, 50/60 Hz)
Opt. A10	China power plug (50 Hz)
Opt. A11	India power plug (50 Hz)
Opt. A12	Brazil power plug (60 Hz)
Opt. A99	No power cord

RSA600A language options

Opt. L0	English manual
Opt. L1	French manual
Opt. L2	Italian manual
Opt. L3	German manual
Opt. L4	Spanish manual
Opt. L5	Japanese manual

Opt. L6	Portuguese manual
Opt. L7	Simplified Chinese manual
Opt. L8	Traditional Chinese manual
Opt. L9	Korean manual
Opt. L10	Russian manual
Opt. L99	No manual

RSA600A 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. R5	Repair Service 5 Years (including warranty)

Warranty

- RSA600 series warranty: 3 years.
- FZ-G1 tablet: 3-year warranty with Business Class Support (provided by Panasonic in region of purchase).

Tablet

Tablet controller available

A tablet controller intended for portable applications using the Tektronix RSA306B and RSA500A series spectrum analyzers can also be used with the RSA600A series. The Panasonic ToughPad FZ-G1 is available in limited geographies from Tektronix as shown in the ordering information below.

Item	Description	Regional availability
FZ-G1-N	Controller for USB Spectrum Analyzers, Panasonic ToughPad FZ-G1. Includes tablet, battery, digitizer pen and tether, battery charger with power cord.	Canada, Columbia, Ecuador, Mexico, Philippines, Singapore, United States
FZ-G1F	Controller for USB Spectrum Analyzers, Panasonic ToughPad FZ-G1. Includes tablet, digitizer pen and tether, battery charger with power cord	China
FZ-G1-I	Controller for USB Spectrum Analyzers, Panasonic ToughPad FZ-G1. Includes tablet, battery, digitizer pen and tether, battery charger with power cord	India
FZ-G1-E	Controller for USB Spectrum Analyzers, Panasonic ToughPad FZ-G1. Includes tablet, battery, digitizer pen and tether, battery charger with power cord.	Austria, Baltic States, Belgium, Bosnia, Bulgaria, Chile, Croatia, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Indonesia, Ireland, Italy, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, South Africa, Spain, Sweden, Thailand, Turkey
FZ-G1-U	Controller for USB Spectrum Analyzers, Panasonic ToughPad FZ-G1. Includes tablet, battery, digitizer pen and tether, battery charger with power cord.	Egypt, Kenya, Malaysia, United Kingdom
FZ-G1-B	Controller for USB Spectrum Analyzers, Panasonic ToughPad FZ-G1. Includes tablet, battery, digitizer pen and tether, battery charger with power cord	Brazil
FZ-G1-J	Controller for USB Spectrum Analyzers, Panasonic ToughPad FZ-G1. Includes tablet, battery, digitizer pen and tether, battery charger with power cord	Japan

Panasonic FZ-G1 accessories

Item	Description
FZ-VZSU84U [6]	Li-ion battery, standard capacity
FZ-VZSU88U [6]	Long-life battery pack for Panasonic ToughPad FZ-G1
FZ-BNDLG1BATCHRG[9]	Single battery charger bundle for FZ-G1. 1 charger and 1 adapter
CF-LNDDC120[9]	Lind 120 W 12-32 Volt input vehicle adapter for Tough Pad and RSA500A
TBCG1AONL-P	Panasonic Toughmate always on case for FZ-G1
TBCG1XSTP-P	Infocase Toughmate X-strap for Panasonic FZ-G1

6 Not available in China, Hong Kong, Macau or Mongolia

Licenses

SignalVu-PC application-specific modules

Application license	Description
SVANL-SVPC	AM/FM/PM/Direct Audio Analysis - Node Locked License
SVAFL-SVPC	AM/FM/PM/Direct Audio Analysis - Floating License
SVTNL-SVPC	Settling Time (frequency and phase) measurements - Node Locked License
SVTFL-SVPC	Settling Time (frequency and phase) measurements - Floating License
SVMNL-SVPC	General Purpose Modulation Analysis to work with analyzer of acquisition bandwidth <= 40 MHz or MDO - Node Locked License
SVMFL-SVPC	General Purpose Modulation Analysis to work with analyzer of acquisition bandwidth <= 40 MHz or MDO- Floating License
SVPNL-SVPC	Pulse Analysis to work with analyzer of acquisition bandwidth <= 40 MHz or MDO - Node Locked License
SVPFL-SVPC	Pulse Analysis to work with analyzer of acquisition bandwidth <= 40 MHz or MDO- Floating License
SVONL-SVPC	Flexible OFDM Analysis - Node Locked License
SVOFL-SVPC	Flexible OFDM Analysis - Floating License
SV23NL-SVPC	WLAN 802.11a/b/g/j/p measurement - Node Locked License
SV23FL-SVPC	WLAN 802.11a/b/g/j/p measurement - Floating License
SV24NL-SVPC	WLAN 802.11n measurement (requires SV23) - Node Locked License
SV24FL-SVPC	WLAN 802.11n measurement (requires SV23) - Floating License
SV25NL-SVPC	WLAN 802.11ac measurement to work with analyzer of acquisition bandwidth <= 40 MHz (requires SV23 and SV24) or MDO - Node Locked License
SV25FL-SVPC	WLAN 802.11ac measurement to work with analyzer of acquisition bandwidth <= 40 MHz (requires SV23 and SV24) or MDO - Floating License
SV26NL-SVPC	APCO P25 measurement - Node Locked License
SV26FL-SVPC	APCO P25 measurement - Floating License
SV27NL-SVPC	Bluetooth measurement to work with analyzer of acquisition bandwidth <= 40 MHz or MDO - Node Locked License
SV27FL-SVPC	Bluetooth measurement to work with analyzer of acquisition bandwidth <= 40 MHz or MDO- Floating License
MAPNL-SVPC	Mapping - Node Locked License
MAPFL-SVPC	Mapping - Floating License
SV56NL-SVPC	Playback of recorded files - Node Locked License
SV56FL-SVPC	Playback of recorded files - Floating License
SV60NL-SVPC	Return loss, VSWR, cable loss, and distance to fault - Node Locked License
SV60FL-SVPC	Return loss, VSWR, cable loss, and distance to fault - Floating License
CONNL-SVPC	SignalVu-PC live link to the MDO4000B series mixed-domain oscilloscopes - Node Locked License
CONFL-SVPC	SignalVu-PC live link to the MDO4000B series mixed-domain oscilloscopes - Floating License
SV2CNL-SVPC	WLAN 802.11a/b/g/j/p/n/ac and live link to MDO4000B to work with analyzer of acquisition bandwidth <= 40 MHz - Node Locked License
SV2CFL-SVPC	WLAN 802.11a/b/g/j/p/n/ac and live link to MDO4000B to work with analyzer of acquisition bandwidth <= 40 MHz - Floating License
SV28NL-SVPC	LTE Downlink RF measurement to work with analyzer of acquisition bandwidth <= 40 MHz or MDO - Node Locked License
SV28FL-SVPC	LTE Downlink RF measurement to work with analyzer of acquisition bandwidth <= 40 MHz or MDO - Floating License
SV54NL-SVPC	Signal survey and classification - Node Locked License
SV54FL-SVPC	Signal survey and classification - Floating License
SV60NL-SVPC	Return loss, distance to fault, VSWR, cable loss - Node Locked License (requires Option 04 on RSA500A/600A)
SV60FL-SVPC	Return loss, distance to fault, VSWR, cable loss - Floating License (requires Option 04 on RSA500A/600A)
SV30NL-SVPC	WiGig 802.11ad measurements - Node Locked License (only for offline analysis)

Application license	Description
SV30FL-SVPC	WiGig 802.11ad measurements - Floating License (only for offline analysis)
EDUFL-SVPC	Education-only version of all modules for SignalVu-PC - Floating License

Recommended accessories

Tektronix offers a wide variety of adapters, attenuators, cables, impedance converters, antennas and other accessories for the RSA600 series.

General purpose RF cables	
012-1738-00	Cable,50 Ω, 40 inch,type-N(m) to type-N(M)
012-0482-00	Cable, 50 Ω, BNC (m) 3 foot (91 cm)
Adapters	
103-0045-00	Adapter, coaxial, 50 Ω type-N(m) to type-BNC(f)
013-0410-00	Adapter, coaxial, 50 Ω type-N (f) to type-N (f)
013-0411-00	Adapter, coaxial, 50 Ω type-N (m) to type-N (f)
013-0412-00	Adapter, coaxial, 50 Ω, type-N(m) to type-N(m)
013-0402-00	Adapter, coaxial, 50 Ω type-N (m) to type-N 7/16(m)
013-0404-00	Adapter, coaxial, 50 Ω type-N(m) to type-7/16 (f)
013-0403-00	Adapter, coaxial, 50 Ω type-N(m) to type DIN 9.5(m)
013-0405-00	Adapter, coaxial, 50 Ω type-N(m) to type-DIN 9.5(f)
013-0406-00	Adapter, coaxial, 50 Ω type-N(m) to type-SMA(f)
013-0407-00	Adapter, coaxial, 50 Ω type-N(m) to type-SMA(m)
013-0408-00	Adapter, coaxial, 50 Ω type-N(m) to type-TNC(f)
013-0409-00	Adapter, coaxial, 50 Ω type-N(m) to type-TNC(m)
Attenuators and 50/75 Ω pads	
013-0422-00	Pad, 50/75 Ω, minimum loss, type-N(m) 50 Ω to type-BNC(f) 75 Ω
013-0413-00	Pad, 50/75 Ω, minimum loss, type-N(m) 50 Ω to type-BNC(m) 75 Ω
013-0415-00	Pad, 50/75 Ω, minimum loss, type-N(m) 50 Ω to type-F(m) 75 Ω
015-0787-00	Pad, 50/75 Ω, minimum loss, type-N(m) 50 Ω to type-F(f) 75 Ω
015-0788-00	Pad, 50/75 Ω, minimum loss, type-N(m) 50 Ω to type-N(f) 75 Ω
011-0222-00	Attenuator, fixed, 10 dB, 2 W, DC-8 GHz, type-N(f) to type-N(f)
011-0223-00	Attenuator, fixed, 10 dB, 2 W, DC-8 GHz, type-N(m) to type-N(f)
011-0224-00	Attenuator, fixed, 10 dB, 2 W, DC-8 GHz, type-N(m) to type-N(m)
011-0228-00	Attenuator, fixed, 3 dB, 2 W, DC-18 GHz, type-N(m) to type-N(f)
011-0225-00	Attenuator, fixed, 40 dB, 100 W, DC-3 GHz, type-N(m) to type-N(f)
011-0226-00	Attenuator, fixed, 40 dB, 50 W, DC-8.5 GHz, type-N(m) to type-N(f)
Filters, probes, demonstration board	
119-7246-00	Pre-filter, general purpose, 824 MHz to 2500 MHz, type-N (f) connector

119-7426	Pre-filter, general purpose, 2400 MHz to 6200 MHz, type-N (f) connector
119-4146-00	EMCO E/H-field probes
E/H field probes, lower cost alternative	Available from Beehive http://beehive-electronics.com/
RSA-DKIT	RSA Version 3 demo board with N-BNC adapter, case, antenna, instructions
011-0227-00	Bias-T, type N(m) RF, type N(f) RF+DC, BNC(f) Bias, 1 W, 0.5 A, 2.5 MHz-6 GHz
Chargers, Additional batteries, Cables, Cases	
WFMBA200	Replacement battery pack for RSA500A series
WFMBC200	External battery charger for WFMBA200, charges two batteries
CF-LNDDC120	Lind 120 W 12-32 Volt input vehicle adapter for RSA500A series and Panasonic Tough Pad (not available in China)
016-2109-01	Additional soft carry-case with shoulder strap
174-6810-00	Additional USB 3.0 cable (2 M), A-A connection, screw lock

Tracking generator accessories

A variety of calibration kits and phase-stabilized cables are available for the RSA600 tracking generator when used with the optional cable and antenna measurements software.

Calibration Kits for one-port measurements

Phase-stabilized cables from Tekronix for cable and antenna measurements

CALOSLNM	Calibration kit, 3-in-1, open, short, load, DC to 6 GHz, Type-N(m), 50 ohm
CALOSLNF	Calibration kit, 3-in-1, open, short, load, DC to 6 GHz, Type-N(f), 50 ohm
CALOSLNF	Calibration kit, 3-in-1, open, short, load, DC to 6 GHz, 7/16 DIN(m)
CALOSL716F	Calibration kit, 3-in-1, open, short, load, DC to 6 GHz, 7/16 DIN(f)
CALSOLT35F	Calibration kit, 4-in-1 3.5 mm (f) short, open, load, through, 13 GHz
CALSOLT35M	Calibration kit, 4-in-1 3.5 mm (m) short, open, load, through, 13 GHz
CALSOLTNF	Calibration kit, 4-in-1 type-N (f) short, open, load, through, 9 GHz
CALSOLTNM	Calibration kit, 4-in-1 type-N (m) short, open, load, through, 9 GHz
CALSOLT716F	Calibration kit, 4-in-1 7/16 (f) short, open, load, through, 6 GHz
CALSOLT716M	Calibration kit, 4-in-1 7/16 (m) short, open, load, through, 6 GHz
012-1745-00	Cable, rugged, phase-stable, type-N (m) to type-N (f), 5 ft or 1.5 m
012-1746-00	Cable, rugged, phase-stable, type-N(m) to type-N(f), 3.28 ft or 1 m
012-1747-00	Cable, rugged, phase-stable, type-N(m) to 7/16(f), 60 cm (23.6 in.)

012-1748-00	Cable, rugged, phase-stable, type-N(m) to 7/16(f), 3.28 ft or 1 m
012-1749-00	Cable, rugged, phase-stable, type-N(m) to 7/16(f), 5 ft or 1.5 m
012-1750-00	Cable, rugged, phase-stable, type-N(m) to 7/16(m), 3.28 ft or 1 m
012-1751-00	Cable, rugged, phase-stable, type-N(m) to 7/16(m), 5 ft or 1.5 m
012-1752-00	Cable, rugged, phase-stable, type-N(m) to 7/16(m), 60 cm (23.6 in.)
012-1753-00	Cable, rugged, phase-stable, type-N(m) to DIN 9.5(f), 60 cm (23.6 in.)
012-1754-00	Cable, rugged, Phase-stable, type-N(m) to DIN 9.5(f), 3.28 ft or 1 m
012-1755-00	Cable, rugged, phase-stable, type-N(m) to DIN 9.5(f), 5 ft or 1.5 m
012-1756-00	Cable, rugged, phase-stable, type-N(m) to DIN 9.5(m), 3.28 ft or 1 m
012-1757-00	Cable, rugged, phase-stable, type-N(m) to DIN 9.5(m), 5 ft or 1.5 m
012-1758-00	Cable, rugged, phase-stable, type-N(m) to DIN 9.5(m), 60 cm (23.6 in.)
012-1759-00	Cable, rugged, phase-stable, type-N(m) to TNC(f), 3.28 ft or 1 m
012-1760-00	Cable, rugged, phase-stable, type-N(m) to TNC(f), 5 ft or 1.5 m
012-1761-00	Cable, rugged, phase-stable, type-N(m) to TNC(f), 60 cm (23.6 in.)
012-1762-00	Cable, rugged, phase-stable, type-N(m) to TNC(m), 60 cm (23.6 in.)
012-1763-00	Cable, rugged, phase-stable, type-N(m) to TNC(m), 3.28 ft or 1 m
012-1764-00	Cable, rugged, phase-stable, type-N(m) to TNC(m), 5 ft or 1.5 m
012-1765-00	Cable, rugged, phase-stable, type-N(m) to type-N(f), 60 cm (23.6 in.)
012-1766-00	Cable, rugged, phase-stable, type-N(m) to type-N(f), 3.28 ft or 1 m
012-1767-00	Cable, rugged, phase-stable, type-N(m) to type-N(m), 3.28 ft or 1 m
012-1768-00	Cable, rugged, phase-stable, type-N(m) to type-N(m), 60 cm (23.6 in.)
012-1769-00	Cable, rugged, phase-stable, type-N(m) to type-SMA(f), 60 cm (23.6 in.)
012-1770-00	Cable, rugged, phase-stable, type-N(m) to type-SMA(f), 3.28 ft or 1 m
012-1771-00	Cable, rugged, phase-stable, type-N(m) to type-SMA(f), 5 ft or 1.5 m
012-1772-00	Cable, rugged, phase-stable, type-N(m) to type-SMA(m) 60 cm (23.6 in.)
012-1773-00	Cable, rugged, phase-stable, type-N(m) to type-SMA(m), 3.28 ft or 1 m
012-1774-00	Cable, rugged, phase-stable, type-N(m) to type-SMA(m), 5 ft or 1.5 m

CE

Tektronix is registered to ISO 9001 and ISO 14001 by SRI Quality System Registrar.

GPIB IEEE-488

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

Product Area Assessed: The planning, design/development and manufacture of electronic Test and Measurement instruments.

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For Further Information. Tektronix maintains a comprehensive, constantly expanding collection of application notes, technical briefs and other resources to help engineers working on the cutting edge of technology. Please visit www.tek.com.

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