# 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)
- High speed full-span sweeps (25.0 GHz/sec) for fast setup and discovery
- Standard GPS/GLONASS/Beidou receiver
- Optional tracking generator for gain/loss, antenna and cable measurements
- DataVu-PC software enables multi-unit recording in variable bandwidths
- SignalVu-PC software offers real time signal processing with DPX® Spectrum/Spectrogram to minimize time spent finding transient problems
- EMC/EMI pre-compliance and troubleshooting - CISPR detectors, predefined standards, limit lines, easy accessory setup, ambient capture, failure analysis, and report generation
- 15 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

### Applications

- Characterization of RF devices, subsystems, and systems
- Manufacturing test
- Mobile field operations
- EMI/EMC compliance testing and troubleshooting

### 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.

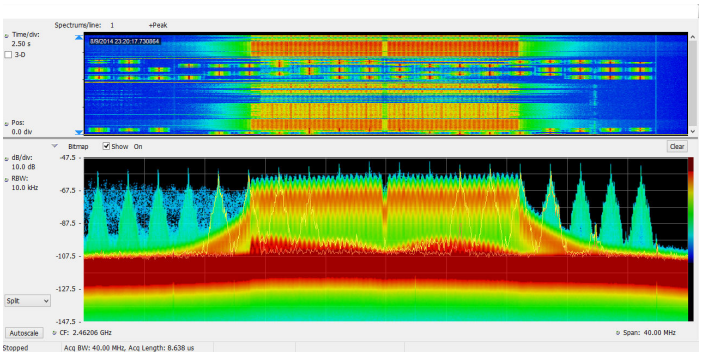
The optional tracking generator enables gain/loss measurements for quick tests of filters, amplifiers, duplexers and other components, and you can add cable and antenna measurements of VSWR, return loss, distance to fault, and cable loss as needed.

### SignalVu-PC software offers rich analysis capability for your lab

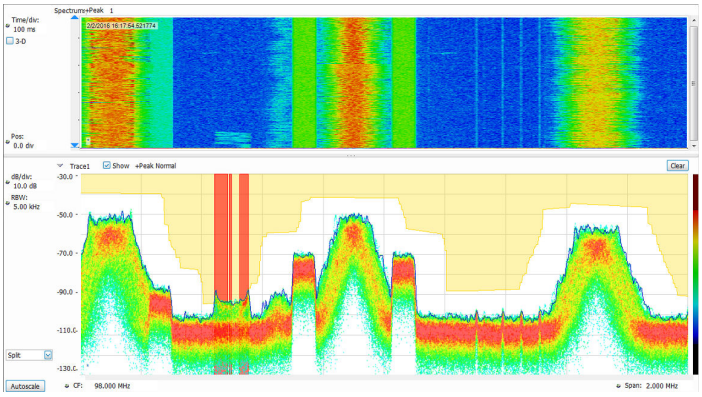
The RSA600 series operates with SignalVu-PC, a powerful program used as the basis of Tek's traditional spectrum analyzers. SignalVu-PC offers a deep analysis capability previously unavailable in low-cost laboratory solutions. Real-time processing of the DPX spectrum/spectrogram is enabled in your PC, 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.

### The RSA600A combined with SignalVu-PC offers advanced measurements

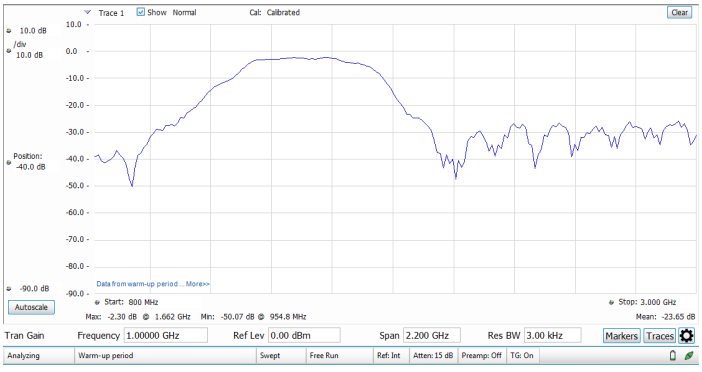
With 40 MHz of real-time bandwidth, the unique DPX® spectrum/spectrogram shows you every instance of an interfering or unknown signal, even down to 15 µs in duration. The following image shows a WLAN transmission (green and orange), and the narrow signals that repeat across the screen are a Bluetooth 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.



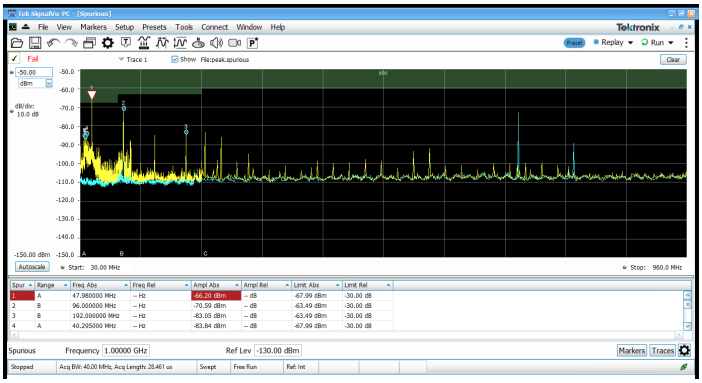
The tracking generator (Option 04 on the RSA600) is controlled via SignalVu-PC. A bandpass filter response from 800 MHz to 3 GHz is shown below. Option SV60 adds return loss, cable loss, and distance to fault.



## EMC/EMI

EMI pre-compliance and diagnostic measurements are easy with the instrument and SignalVu-PC. Transducer, antenna, preamplifier, and cable gain/loss can be entered and stored in correction files, and the standard spurious measurement feature of SignalVu-PC can be used to establish limit lines for your test. The following illustration shows a test from 30MHz to 960 MHz against the FCC Part 15 Class A limit shown shaded. The blue trace is the capture of Ambient. Violations are recorded in the results table below the graph. CISPR quasi peak and average detectors can be added with option SVQP.

The EMC pre-compliance solution can be added with option EMCVU. It supports many predefined limit lines. It also adds a wizard for easy setup of recommended antennas, LISN, and other EMC accessories with a one-button push. When using the new EMC-EMI display, you can accelerate the test by applying the time consuming quasi peak only on failures. This display also provides a push-button ambient measurement. The Inspect tool lets you measure frequencies of interest locally, removing the need for scanning.



## SignalVu-PC application-specific licenses

SignalVu-PC offers a wealth of application-oriented options available either installed on the instrument, or as a floating license that can be moved between instruments or attached to your PC. Applications include:

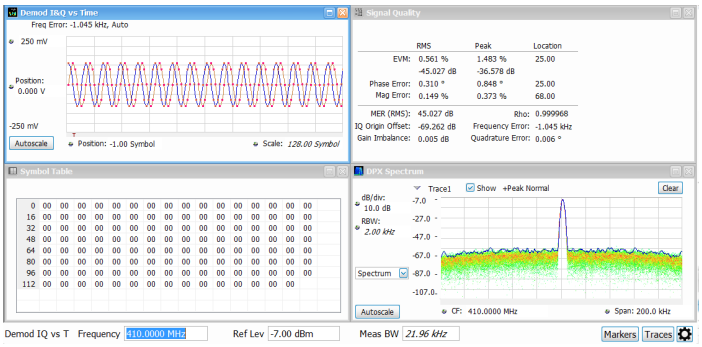
- General-purpose modulation analysis (27 modulation types including 16/32/64/256 QAM, QPSK, O-QPSK, GMSK, FSK, APSK)
- EMC/EMI analysis with CISPR peak, quasi-peak, and average detectors
- Bluetooth® analysis of Basic Rate, Low Energy, and Bluetooth 5. Some support of Enhanced Data Rate
- P25 analysis 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 and 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.

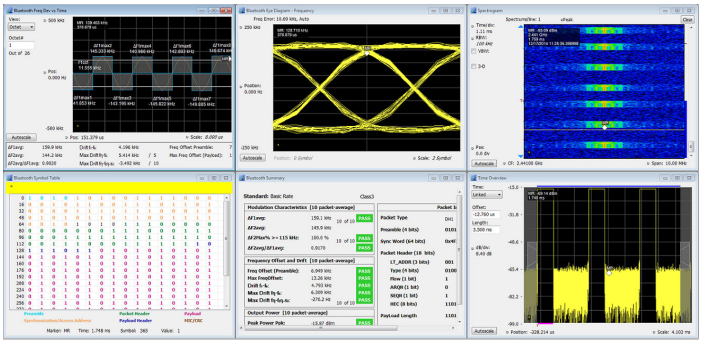
### General purpose modulation analysis

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.

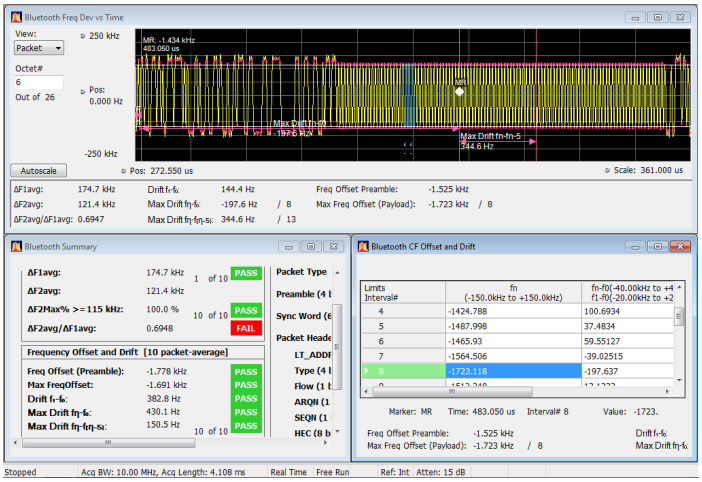


### Bluetooth

Two new options have been added to help with Bluetooth SIG standardbase transmitter RF measurements in the time, frequency and modulation domains. Option SV27 supports Basic Rate and Low Energy Transmitter measurements defined by RF.TS.4.2.0 and RF-PHY.TS.4.2.0 Test Specification. It also demodulates and provides symbol information for Enhanced Data Rate packets. Option SV31 supports Bluetooth 5 standards (LE 1M, LE 2M, LE Coded) and measurements defined in the Core Specification. Both options also decode the physical layer data that is transmitted and color-encode the fields of packet in the Symbol Table for clear identification.

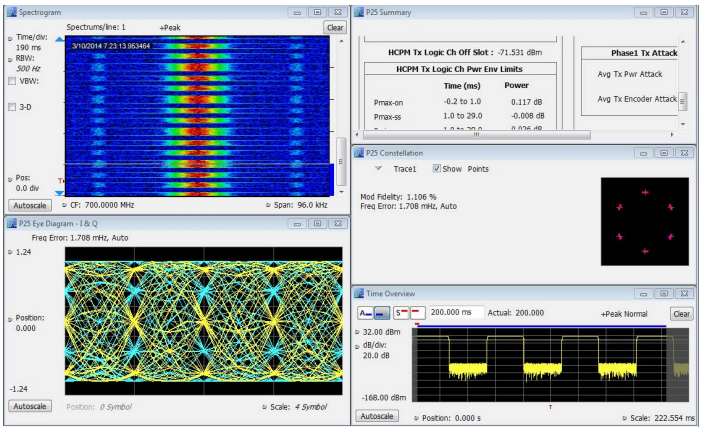


Pass/Fail results are provided with customizable limits. Measurement below shows deviation vs. time, frequency offset and drift and a measurement summary with Pass/Fail results.



### 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

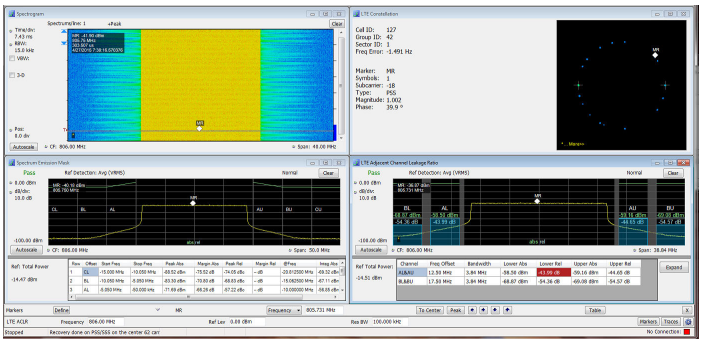
Application SV28 enables the following LTE base station transmitter measurements:

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

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.

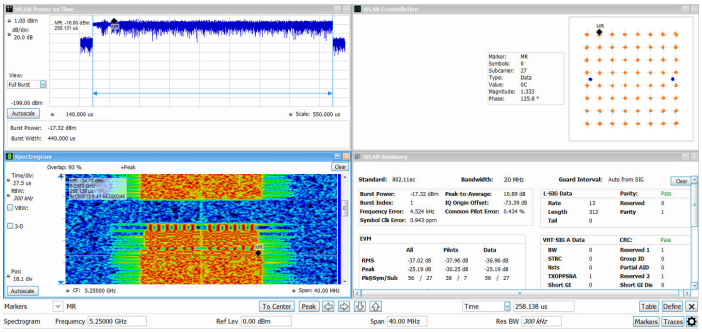
The Cell ID preset displays the Primary Synchronization Signal (PSS) and the Secondary Synchronization Signal (SSS) in a Constellation diagram. It also provides Frequency Error.

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



### 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.

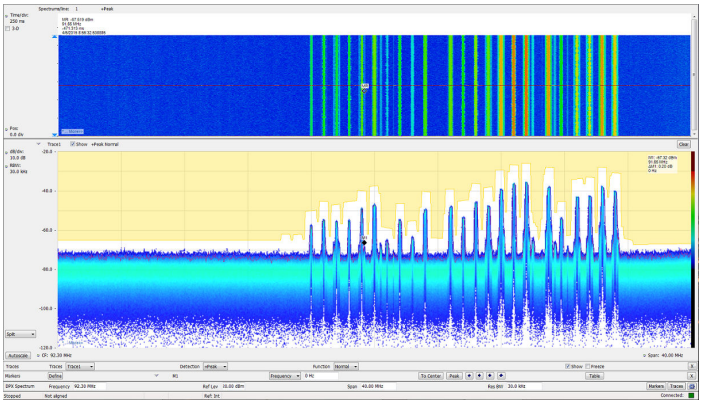


### Playback

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.



## DataVu-PC for multi-instrument recording and analysis of large recordings

DataVu-PC software can control two spectrum analyzers simultaneously with independent settings. This allows you to monitor a wide span, while recording at up to 40 MHz bandwidth at any frequency in the range of the instrument. Once recorded, DataVu-PC can find and mark signals of interest based on amplitude and frequency-mask characteristics, eliminating the need for manual inspection of long recordings. Pulse measurements are available on up to 2,000,000 pulses.

# 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<br>RE: Reference Frequency Error<br>MF: Marker Frequency [Hz] |

**Reference frequency accuracy**

| | |
|---|---|
| **Initial accuracy at Cal (30 min warm-up)** | $\pm 1 \times 10^{-6}$ |
| **First year aging, typical** | $\pm 1 \times 10^{-6}$ (1 year) |
| **Cumulative error (Initial accuracy + temperature + aging), typical** | $3 \times 10^{-6}$ (1 year) |
| **Temperature drift** | $\pm 0.9 \times 10^{-6}$ (-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.<br>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 |

## GNSS

| | |
|---|---|
| **Accuracy, when locked to GNSS** [1] | ±0.025 ppm [2] |
| **GNSS Trained Accuracy, when GNSS antenna is disconnected** [1, 3] | ±0.025 ppm [4]<br>±0.08 ppm [5] |

## RF input

| | |
|---|---|
| **RF Input Impedance** | 50 Ω |
| **RF VSWR (RF Attn = 20 dB), typical** | < 1.2 (10 MHz to 3 GHz)<br>< 1.5 (>3 GHz to 7.5 GHz) |
| **RF VSWR preamp ON, RSA603A and RSA607A, typical** | < 1.5 (10 MHz to 6 GHz, RF ATT=10 dB, preamp on)<br>< 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)<br>+13 dBm (RF input, 9 kHz to 10 MHz, RF Attn ≥ 20 dB)<br>+20 dBm (RF input, RF Attn < 20 dB) |
| **Maximum safe input power (Preamp On)** | +33 dBm (RF input, 10 MHz to 7.5 GHz, RF Attn ≥ 20 dB)<br>+13 dBm (RF input, 9 kHz to 10 MHz, RF Attn ≥ 20 dB) |
| **Maximum measurable input power** | +30 dBm (RF input, ≥10 MHz to Fmax, RF ATT Auto)<br>+20 dBm (RF input, <10 MHz, RF ATT Auto) |

| | |
|---|---|
| **Input RF attenuator** | 0 dB to 51 dB (1 dB step) |

**Sweep speed**

| | |
|---|---|
| **Full span sweep speed, typical mean** [6] | 25.0 GHz/sec (RBW = 1 MHz)<br>24.7 GHz/sec (RBW = 100 kHz)<br>15.7 GHz/sec (RBW = 10 kHz)<br>2.0 GHz/sec (RBW = 1 kHz) |

1 Tested using GPS system.

2 For use to a stability of ±0.025ppm, the unit should be powered on continuously for 2 to 5 days after initial unpacking.

3 For 24 hours continuous operation within temperature limits (see footnotes 5 and 6) after GNSS training. Refer to cumulative error specification if operating in GNSS trained mode beyond 24 hours since last training.

4 For less than 3 °C ambient temperature change after training.

5 For less than 10 °C ambient temperature change after training.

**Tuning step time via API** 2.5 ms

## Amplitude and RF

### Amplitude and RF flatness

**Reference level setting range** -170 dBm to +40 dBm, 0.1 dB step, (Standard RF input)

**Table 1: Amplitude accuracy at all center frequencies**

| Center frequency range | 18 ºC to 28 ºC |
|---|---|
| 9 kHz ≤ 3.0 GHz | ±0.8 dB |
| > 3 to 7.5 GHz | ±1.5 dB |

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

| Center frequency range | 18 ºC to 28 ºC |
|---|---|
| 100 kHz to ≤3.0 GHz | ±1.0 dB |
| > 3 to 7.5 GHz | ±1.75 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 [7] | ±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.

[6] Measured using a Panasonic Toughpad FZ-G1, Intel® Core™ i5-5300U 2.3GHz Processor, 8GB RAM, 256GB SSD, Windows®7 Pro, power management set to "High Performance". Spectrum display is only measurement on screen.

[7] Span extents cannot exceed lower frequency limit of the instrument

| 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 |

## 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.

**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)

For the RSA603A and RSA607A:

| 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 |

Table continued…

| Frequency range | Preamp on | Preamp on, typical | Preamp off, typical |
|---|---|---|---|
| >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 GHz, RSA607A | - dBm/Hz | - dBm/Hz | -138 dBm/Hz |
| >4 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 x $10^{-3}$ radians @ 1 GHz

8.24 x $10^{-3}$ radians @ 2 GHz

9.34 x $10^{-3}$ 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 | Typical |
|---|---|
| 1 MHz - 100 MHz | -76 dBc |
| 100 MHz - 3 GHz | -76 dBc |
| 3 GHz - 7.5 GHz (RSA607A) | -74 dBc [8] |

**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 |

**Spurious response with signal at half-IF [9]**

**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)

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

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

## 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).<br>-130 dBm input signal power. |
| **Horizontal position accuracy** | GPS: 2.6 m<br>Glonass: 2.6 m<br>BeiDou: 10.2 m<br>GPS + Glonass: 2.6 m<br>GPS + BeiDou: 2.6 m<br>Test conditions: 24 hr. static, -130 dBm, full power |

## Tracking generator (Option 04)

**Tracking Generator (Option 04)**

**Frequency range**

| | |
|---|---|
| Reflection | 9 kHz - 3.0 GHz (RSA603A)<br>9 kHz - 7.5 GHz (RSA607A) |
| Transmission | 10 MHz to 3 GHz (RSA603)<br>10 MHz to 7.5 GHz (RSA607A) |

| | |
|---|---|
| **Sweep speed, typical mean** | 0.192 sec/sweep, 101 points, 50 kHz RBW, 980 to 1020 MHz sweep (1.9 mS per point)<br>Measured using a Panasonic Toughpad FZ-G1, Intel® Core™ i5-5300U 2.3 GHz Processor, 8 GB RAM, 256 GB SSD, Windows®7 Pro, power management set to "High Performance". Transmission Gain display is only measurement on screen. |
| **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,10 MHz to 7.5 GHz |
| **Output power level setting range** | 40 dB, 10 MHz to 7.5 GHz |
| **Output power level step size** | 1 dB, 10 MHz to 7.5 GHz |
| **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, ≥20 MHz |
| **Non-harmonic spurious** | < -30 dBc; spurious < 2 GHz from TG output frequency<br>< -25 dBc; spurious ≥ 2 GHz from TG output frequency |
| **Reverse power without damage** | 40 Vdc, +20 dBm RF |

## SignalVu-PC standard measurements and performance

### SignalVu-PC/RSA607A key characteristics

| | |
|---|---|
| **Maximum span** | 40 MHz real-time<br>9 kHz - 3 GHz swept<br>9 kHz - 7.5 GHz swept |
| **Maximum acquisition time** | 2.0 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.<br>Cellular standards families: AMPS, NADC, NMT-450, PDC, GSM, CDMA, CDMA-2000, 1xEV-DO WCDMA, TD-SCDMA, LTE, WiMax<br>Unlicensed short range: 802.11a/b/j/g/p/n/ac, Bluetooth<br>Cordless phone: DECT, PHS<br>Broadcast: AM, FM, ATSC, DVBT/H, NTSC<br>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 spectrums per second |
| **DPX bitmap resolution** | 201 pixels vertical x 801 pixels horizontal |
| **DPX Spectrogram minimum time resolution** [10] | 1 ms<br>≤10,000 per second (span independent) |
| **Marker information** | Amplitude, frequency, signal density |

**Minimum signal duration for 100% probability of intercept (POI), typical** [10]

| Minimum signal duration for 100% POI | Test controller |
|---|---|
| 27 | Dell Desktop (Windows® 10 Enterprise, Intel® Core™ i7-4790 CPU, 3.6GHz, 8GB RAM, 256GB SSD) |
| 34 | Dell Desktop (Windows® 7 Enterprise, Intel® Core™ i7-2600 CPU, 3.4GHz, 8GB RAM, 256GB SSD) |
| 36 | Dell Desktop Latitude E6430 (Windows® 10 Enterprise, Intel® Core™ i7-3520M CPU, 2.9GHz, 8GB RAM, 750GB HD) |
| 35 | Dell Laptop Precision M4700 (Windows® 8 Enterprise, Intel® Core™ i7-3520M CPU, 2.9GHz, 8GB RAM, 750GB HD) |
| 37 | Panasonic ToughPad SAPL-TP-04 (Windows® 7 Pro, Intel® Core™ i5-5300U CPU, 2.3GHz, 8GB RAM, 256GB SSD) |

DPX settings: Span=40 MHz, RBW=300 kHz (Auto)

| | |
|---|---|
| **Span range (continuos processing)** | 1 kHz to 40 MHz |

[10] 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 (swept)** | Up to maximum frequency range of instrument |
| **Dwell time per step** | 5 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)<br>2401 (20,000 traces)<br>4001 (12,000 traces) |
| **Time resolution per line** | 1 ms to 6400 s, user selectable |

**Spectrum and Spurious display**

| | |
|---|---|
| **Traces** | Three traces + 1 math trace + 1 trace from spectrogram for Spectrum display; four traces for Spurious display |
| **Trace functions** | Normal, Average (VRMS), Max Hold, Min Hold, Average of Logs |
| **Detector** | Average (VRMS), Average (of logs), CISPR peak, +Peak, Sample for Spectrum only -Peak; when Option SVQP is enabled, CISPR Quasi Peak and Average |
| **Spectrum trace length** | 801, 2401, 4001, 8001,10401, 16001, 32001, and 64001 points |
| **RBW range** | 1.18 Hz to 8 MHz for Spectrum display |

**Analog modulation analysis (standard)**

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

**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:<br>Modulation rate = 5 kHz<br>AM depth: 50%<br>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 |

Table continued…

| Performance characteristics, typical | Conditions: Unless otherwise stated, performance is given for:<br>Modulation rate = 5 kHz<br>AM depth: 50%<br>PM deviation 0.628 Radians | | | |
|---|---|---|---|---|
| | **FM** | **AM** | **PM** | **Conditions** |
| Depth of Modulation accuracy | NA | ± 0.2%+(0.01 * measured value) | NA | Rate: 1 kHz to 100kHz<br>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<br>Rate:1 kHz to 10 kHz<br>Depth: 50% |
| Residual SINAD | 43 dB | 58 dB | 40 dB | FM Deviation 5 kHz<br>Rate: 1 kHz to 10 kHz<br>Depth: 50% |

### APCO P25 Measurements Application (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.

### Bluetooth Measurements Application (SV27xx-SVPC and SV31xx-SVPC)

**Supported standards**

Bluetooth® 4.2 Basic Rate, Bluetooth® 4.2 Low Energy, Bluetooth® 4.2 Enhanced Data Rate. Bluetooth® 5 when SV31 is enabled.

| | |
|---|---|
| **Measurements** | Peak Power, Average Power, Adjacent Channel Power or InBand Emission mask, -20 dB Bandwidth, Frequency Error, Modulation Characteristics including $\Delta F_1$avg (11110000), $\Delta F_2$avg (10101010), $\Delta F_2 > 115$ kHz, $\Delta F_2/\Delta F_1$ ratio, frequency deviation vs. time with packet and octet level measurement information, Carrier Frequency $f_0$, 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 (BR and LE), typical mean** | Supported measurements: Average power, peak power<br>Level uncertainty: refer to instrument amplitude and flatness specification<br>Measurement range: signal level > –70 dBm |
| **Modulation characteristics, typical mean** | Supported measurements: $\Delta F_1$avg, $\Delta F_2$avg, $\Delta F_2$avg/ $\Delta F_1$avg, $\Delta F_2$max%>=115kHz (basic rate), $\Delta F_2$max%>=115kHz (low energy)<br>Deviation range: ±280 kHz<br>Deviation uncertainty (at 0 dBm):<br><2 kHz [11] + instrument frequency uncertainty (basic rate)<br><3 kHz [11] + instrument frequency uncertainty (low energy)<br>Measurement range: Nominal channel frequency ±100 kHz |
| **Initial Carrier Frequency Tolerance (ICFT) (BR and LE), typical mean** | Measurement uncertainty (at 0 dBm): <1 kHz [11] + instrument frequency uncertainty<br>Measurement range: Nominal channel frequency ±100 kHz |
| **Carrier Frequency Drift (BR and LE), typical mean** | Supported measurements: Max freq. offset, drift $f_1$- $f_0$, max drift $f_n$-$f_0$, max drift $f_n$-$f_{n-5}$ (BR and LE 50 µs)<br>Measurement uncertainty: <1 kHz + instrument frequency uncertainty<br>Measurement range: Nominal channel frequency ±100 kHz |
| **In-band emissions (ACPR) (BR and LE)** | Level uncertainty: refer to instrument amplitude and flatness specification |

**General purpose digital modulation analysis (SVMxx-SVPC)**

| | |
|---|---|
| **Modulation formats** | BPSK, QPSK, 8PSK, 16QAM, 32QAM, 64QAM, 128QAM, 256QAM, π/2DBPSK, DQPSK, π/4DQPSK, D8PSK, D16PSK, SBPSK, OQPSK, SOQPSK, 16-APSK, 32-APSK, MSK, GFSK, CPM, 2FSK, 4FSK, 8FSK, 16FSK, C4FM |
| **Analysis period** | Up to 163,500 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 |
| **Maximum symbol rate** | 240 M symbols/s<br>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, DQPSK, π/2DBPSK, π/4DQPSK, 8PSK, D8SPK, D16PSK, 16/32/64/128/256-QAM, 16/32-APSK |
| **QPSK Residual EVM (center frequency = 2 GHz), typical mean** | 0.6 % (100 kHz symbol rate)<br>0.8 % (1 MHz symbol rate)<br>0.8 % (10 MHz symbol rate) |

[11] At nominal power level of 0 dBm

| | |
|---|---|
| | 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 mean** | 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 and Secondary Synchronization Signal with Cell ID, Group ID, Sector ID, RS (Reference Signal) Power 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 Pulse phase 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, typical** | 150 ns |
| **Average ON power at 18 °C to 28 °C, typical** | ±0.4 dB + absolute amplitude accuracy<br>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<br>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<br>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<br>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

**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<br>Location: Begin/end points of playback settable from 0-100%<br>Skip: Defined skip size from 73 µs up to 99% of file size<br>Live rate: Plays back at 1:1 rate to recording time<br>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); spectralflatness 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<br>5.8 GHz, 20 MHz BW: -38 dB<br>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 %<br>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); spectralflatness vs. symbol (or time), vs. subcarrier (or frequency) |
| **EVM performance - 802.11n, 64-QAM, typical** | 2.4 GHz, 40 MHz BW: -39 dB<br>5.8 GHz, 40 MHz BW: -38 dB<br>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); spectralflatness vs. symbol (or time), vs. subcarrier (or frequency) |
| **EVM performance - 802.11ac, 256-QAM, typical** | 5.8 GHz, 40 MHz BW: -38 dB<br>Input signal level optimized for best EVM, average of 20 bursts, ≥16 symbols each |

**EMC pre-compliance and troubleshooting (EMCVUxx-SVPC)**

| | |
|---|---|
| **Standards** | EN55011, EN55012, EN55013, EN55014, EN55015, EN55025, EN55032, EN60601, DEF STAN, FCC Part 15, FCC Part18, MIL-STD 461G |

| | |
|---|---|
| **Features** | EMC-EMI display, Wizard to setup accessories and limit lines, Inspect, Harmonic Markers, Level Target, Compare Traces, Measure Ambient, Report generation, Re-measure Spot |
| **Detectors** | +Peak, Avg, Avg (of logs), Avg (VRMS), CISPR QuasiPeak, CISPR Peak, CISPR Average, CISPR Average of Logs, MIL +Peak, DEF STAN Avg, DEF STAN Peak |
| **Limit lines** | Up to 3 Limit Lines with corresponding margins |
| **Resolution BW** | Set per standard or user definable |
| **Dwell time** | Set per standard or user definable |
| **Report format** | PDF, HTML, MHT,RTF, XLSX, Image File format |
| **Accessory type** | Antenna, Near Field Probe, Cable, Amplifier, Limiter, Attenuator, Filter, Other |
| **Correction format** | Gain/Loss Constant, Gain/loss table, Antenna Factor |
| **Traces** | Save/recall up to 5 traces, Math trace (trace1 minus trace2), Ambient trace |

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

| | |
|---|---|
| **Measurements** | Return Loss, Cable Loss, Distance-to-Fault (DTF) |
| **Frequency range** | 10 MHz to 3 GHz (RSA603A)<br>10 MHz to 7.5 GHz (RSA607A) |
| **Sweep speed** [12] | 5 ms/point, Return Loss measurement<br>5 ms/point, Distance-to-Fault measurement<br>5 ms/point, Cable Loss measurement |
| **Frequency resolution** | 500 Hz |
| **Return Loss measurement error** | Return Loss of 0 to 15 dB: ±0.5 dB<br>Return Loss of 15 to 25 dB: ±1.5 dB<br>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<br>±3.0 dB from 6.8 GHz to 7.5 GHz |
| **Return Loss measurement range** | 50 dB |
| **Interference immunity** | Return Loss Measurement Error within specifications for the following conditions:<br>+5 dBm interferer power within 800 kHz of measurement point<br>+5 dBm interferer power more than 800 kHz away from measurement point<br>(High power test level. Interferer not included in accuracy assessment.) |
| **Distance-to-Fault range** | 1500 m or 15 dB one-way cable loss capable, user defined<br>Maximum range is a function of the cable velocity factor and the frequency step size as follows:<br>$\text{Range} = \left(\frac{Vp \times c}{2}\right) \times \left(\frac{N - 1}{F_{stop} - F_{start}}\right)$<br>Where:<br>$V_p$ = Cable velocity factor relative to the speed of light<br>c = Speed of light (m/s)<br>$F_{start}$ = Sweep start frequency (Hz)<br>$F_{stop}$ = Sweep stop frequency (Hz)<br>N = number of sweep points |
| **Distance-to-Fault resolution** | RSA603A, (RG-58Vp=0.66): 0.03 m (User Definable) |

[12] 201 point sweep Measured using a Panasonic Toughpad FZ-G1, Intel® Core™ i5-5300U 2.3GHz Processor, 8GB RAM, 256GB SSD, Windows®7 Pro. Return Loss, Cable Loss, or Distance-to-Fault display is the only measurement on screen.

RSA607A, (RG-58Vp=0.66): 0.01 m (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

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

## 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<br>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<br>LED states:<br>Steady Red: USB power applied, or resetting<br>Steady Green: Initialized, ready for use<br>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<br>0 mm (0 in.) with feet installed<br>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**

| | |
|---|---|
| **Height** | 75.0 mm (2.95 in) |
| **Width** | 222.3 mm (8.75 in) |
| **Depth** | 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

## Instrument models

**RSA603A**: USB real time spectrum analyzer, 9 kHz - 3.0 GHz, 40 MHz acquisition bandwidth

**RSA607A**: USB real time spectrum analyzer, 9 kHz - 7.5 GHz, 40 MHz acquisition bandwidth

The RSA600 series instruments require a PC with Windows 7, Windows 8/8.1, or Windows 10, 64-bit operating system and a USB 3.0 connection. 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. A GPS antenna is not included with the instrument. See Accessories for available GPS antennas.

## Instrument options

| Option | Description |
|---|---|
| Option 04 | Tracking generator, 9 kHz to maximum frequency of instrument |

## 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** | Spanish manual |
| **Opt. L3** | Japanese manual |
| **Opt. L4** | Portuguese manual |
| **Opt. L5** | Simplified Chinese manual |
| **Opt. L6** | Korean manual |
| **Opt. L7** | 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.

## Tablet

| | |
|---|---|
| **Tablet controller available** | The Panasonic FZ-G1 Toughbook tablet controller is recommended for use with the RSA600 series for portable field applications. The Windows 10 version of the tablet is available for purchase from Panasonic at *na.panasonic.com/us/computers-tablets-handhelds/tablets/tablets/toughpad-fz-g1* and other third party Web sites. |

## Licenses

**Licenses**

A variety of optional, licensed applications are available for purchase for SignalVu-PC. These licenses can be associated with and stored on either your PC or any RSA300 series, RSA500 series, RSA600 series, and RSA7100A spectrum analyzers. Licenses can be purchased as an option to your hardware or separately as a Node-locked or a Floating license.

Contact your local Tektronix Account Manager to purchase a license. If your purchased license is not ordered as an option to your instrument, you will receive an email with a list of the applications purchased and the URL to the Tektronix Product License Web page, where you will create an account and can then manage your licenses using the Tektronix Asset Management System (AMS): http://www.tek.com/products/product-license.

AMS provides an inventory of the license(s) in your account. It enables you to check out or check in a license and view the history of licenses.

Optional applications are enabled by one of the following license types.

| License type | Description |
|---|---|
| Node locked license (NL) purchased as an option to your instrument | This license is initially assigned to a specific host id, which can be either a PC or an instrument. It can be reassociated to either a PC or another spectrum analyzer two times using Tek AMS.<br>When associated with an instrument, this license is factory-installed on that instrument at the time of manufacture. It will be recognized by any PC operating with SignalVu-PC when the instrument is connected. However, the licensed application is deactivated from the PC if the licensed instrument is disconnected.<br>This is the most common form of licensing, as it simplifies management of your applications. |

Table continued…

| License type | Description |
|---|---|
| Node locked license (NL) purchased separately | This license is initially assigned to a specific host id, which can be either a PC or an instrument. It can be reassociated to either a PC or instrument two times using Tek AMS.<br>This license is delivered via email and is associated with either your PC or with an instrument when you install the license.<br>This license should be purchased when you want your license to stay on your PC, or if you have an existing USB instrument on which you would like to install a license. |
| Floating license(FL) purchased separately | This license can be moved between different host ids, which can be either PCs or instruments. It can be reassociated to different PCs or instruments an unlimited number of times using Tek AMS.<br>This license is delivered via email and is associated with either your PC or with an instrument when you install the license.<br>This is the most flexible license and is recommended in applications where the license needs to be moved frequently. |

**SignalVu-PC application-specific modules**

The following SignalVu-PC license options are available.

| 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 |

Table continued…

| Application license | Description |
|---|---|
| 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 |
| SV31NL-SVPC | Bluetooth 5 measurements (requires SV27) - Node Locked License |
| SV31FL-SVPC | Bluetooth 5 measurements (requires SV27) - Floating License |
| MAPNL-SVPC | Mapping - Node Locked License |
| MAPFL-SVPC | Mapping - Floating License |
| SV56NL-SVPC | Playback of recorded files - Node Locked License (installed in PC controller only) |
| SV56FL-SVPC | Playback of recorded files - Floating License (installed in PC controller only) |
| CONNL-SVPC | SignalVu-PC connection to the 5 or 6 Series MSO, or MDO4000C series mixed-domain oscilloscopes - Node Locked License |
| CONFL-SVPC | SignalVu-PC connection to the 5 or 6 Series MSO, or MDO4000C series mixed-domain oscilloscopes - Floating License |
| SV2CNL-SVPC | WLAN 802.11a/b/g/j/p/n/ac and live link to 5 or 6 Series MSO, or MDO4000C 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 5 or 6 Series MSO, or MDO4000C 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) |
| SV30FL-SVPC | WiGig 802.11ad measurements - Floating License (only for offline analysis) |
| EMCVUNL-SVPC | EMC pre-compliance and troubleshooting (includes EMI CISPR detectors) - Node Locked License |
| EMCVUFL-SVPC | EMC pre-compliance and troubleshooting (includes EMI CISPR detectors) - Floating License |
| SVQPNL-SVPC | EMI CISPR detectors - Node Locked License |
| SVQPFL-SVPC | EMI CISPR detectors - Floating License |
| 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 RSA600A 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) |
| **Antennas** | |
| **119-8733-00** | Antenna, Active. GPS & GLONASS, magnetic mount, 5M cable, 3V, 8ma SMA connector, RG-174 Cable |
| **119-8734-00** | Antenna, Active, GPS and Beidou, magnetic mount, 5M cable, 3V, 8ma SMA connector, RG-174 Cable |
| **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/ |
| **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 |
| **EMI-NF-PROBE** | Near Field Probe set (Tebox TBPS01) |
| **174-6810-00** | Additional USB 3.0 cable (2 M), A-A connection, screw lock |

**Tracking generator accessories**

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

Calibration kits can be used to improve the factory calibration of the tracking generator when equipped with application SV60-Return loss, VSWR, cable loss, and distance to fault.

These phase-stabilized cables are high performance cables that are phase-stable to +- 2 degrees at 7.5 GHz, with return loss less than -20 dB. Velocity constant is 0.78. Loss at 7.5 GHz specified to be less than -1.05 dB (0.6 m), -1.61 dB (1.0 m), -2.30 dB (1.5m) (all values nominal).

*Phase-stabilized cables from Tektronix for cable and antenna measurements*

| | |
|---|---|
| **Calibration kits** | Recommended calibration kits available from Spinner at *products.spinner-group.com/rf/test-measurement/vna-test-measurement* |
| **Phase-stabilized cables** | |
| **012-1745-00** | Type-N (m) to type-N (f), 5 ft or 1.5 m |
| **012-1746-00** | Type-N(m) to type-N(m), 5 ft or 1.5 m |
| **012-1747-00** | Type-N(m) to 7/16(f), 60 cm (23.6 in.) |
| **012-1748-00** | Type-N(m) to 7/16(f), 3.28 ft or 1 m |
| **012-1749-00** | Type-N(m) to 7/16(f), 5 ft or 1.5 m |
| **012-1750-00** | Type-N(m) to 7/16(m), 3.28 ft or 1 m |
| **012-1751-00** | Type-N(m) to 7/16(m), 5 ft or 1.5 m |
| **012-1752-00** | Type-N(m) to 7/16(m), 60 cm (23.6 in.) |
| **012-1753-00** | Type-N(m) to DIN 9.5(f), 60 cm (23.6 in.) |
| **012-1754-00** | Type-N(m) to DIN 9.5(f), 3.28 ft or 1 m |
| **012-1755-00** | Type-N(m) to DIN 9.5(f), 5 ft or 1.5 m |
| **012-1756-00** | Type-N(m) to DIN 9.5(m), 3.28 ft or 1 m |
| **012-1757-00** | Type-N(m) to DIN 9.5(m), 5 ft or 1.5 m |
| **012-1758-00** | Type-N(m) to DIN 9.5(m), 60 cm (23.6 in.) |
| **012-1759-00** | Type-N(m) to TNC(f), 3.28 ft or 1 m |
| **012-1760-00** | Type-N(m) to TNC(f), 5 ft or 1.5 m |
| **012-1761-00** | Type-N(m) to TNC(f), 60 cm (23.6 in.) |
| **012-1762-00** | Type-N(m) to TNC(m), 60 cm (23.6 in.) |

| | |
|---|---|
| **012-1763-00** | Type-N(m) to TNC(m), 3.28 ft or 1 m |
| **012-1764-00** | Type-N(m) to TNC(m), 5 ft or 1.5 m |
| **012-1765-00** | Type-N(m) to type-N(f), 60 cm (23.6 in.) |
| **012-1766-00** | Type-N(m) to type-N(f), 3.28 ft or 1 m |
| **012-1767-00** | Type-N(m) to type-N(m), 3.28 ft or 1 m |
| **012-1768-00** | Type-N(m) to type-N(m), 60 cm (23.6 in.) |
| **012-1769-00** | Type-N(m) to type-SMA(f), 60 cm (23.6 in.) |
| **012-1770-00** | Type-N(m) to type-SMA(f), 3.28 ft or 1 m |
| **012-1771-00** | Type-N(m) to type-SMA(f), 5 ft or 1.5 m |
| **012-1772-00** | Type-N(m) to type-SMA(m) 60 cm (23.6 in.) |
| **012-1773-00** | Type-N(m) to type-SMA(m), 3.28 ft or 1 m |
| **012-1774-00** | Type-N(m) to type-SMA(m), 5 ft or 1.5 m |

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

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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