R&S®SZV100A
Q/V BAND RF UPCONVERTER

3 year warranty

Vector signal generation for component and satellite payload testing

Product Flyer
Version 01.01

ROHDE&SCHWARZ
Make ideas real

AT A GLANCE

Applications

Future satellite and mobile industry applications will also use frequencies in the Q/V band.

The microwave components used in such solutions demand best RF performance and suitable testing during development and verification. Amplifiers, converters, receiver modules and complete satellite payloads are examples of components that have to be tested in the Q/V band.

For satellite applications, this is primarily the frequency range between 37.5 GHz and 51.4 GHz. For IMT/5G NR applications, the band n260 frequencies from 37 GHz to 40 GHz will be used. Other frequency bands between 42.5 GHz and 52.6 GHz and higher frequency bands will be made available.

Your challenge

The trend to provide the end user with ever larger amounts of data exists not only in the mobile communications market with 5G technology, but also among satellite operators. The result is high throughput satellites (HTS) and, in the new space market, mega constellations with non-geostationary satellites (LEO, MEO).

This trend is accompanied by the use of higher frequencies, such as the Q/V band. These bands have larger allocated bandwidths for the satellite feeder links and are ideal for implementing future high bit rate data links for 5G satellite broadband, enterprise and cellular backhaul networks and for providing the end user with large amounts of data.

Solution

With its instantaneous 2 GHz modulation bandwidth, the R&S®SZV100A covers the entire frequency range from 36 GHz to 56 GHz and enables testing far beyond the bandwidth limits of typical satellite and IMT/5G NR applications.

The R&S®SMW200A vector signal generator and R&S®SZV100A Q/V band RF upconverter work together to provide continuous coverage of all satellite bands from VHF to V as well as the frequencies used in mobile communications.

The Q/V band upconverter setup consists of the R&S®SMW200A vector signal generator, R&S®SMA100B RF and microwave signal generator and R&S®SZV100A Q/V band RF upconverter. With its outstanding RF performance, the R&S®SMW200A provides the modulated, broadband wanted signal with bandwidths of up to 2 GHz. The R&S®SMA100B is responsible for the setup's highly precise, pure LO frequency.

The upconverter setup is controlled using PC control software via IP protocol in the LAN. This makes it easy to configure all devices.

The R&S®SZV100A can be reliably remotely operated at distances up to 10 m thanks to the PC control software and feeding of the LO and wanted signals.

The R&S®SZV100A's compact housing design, low weight and mounting points allow it to be mounted as close as possible to the DUT, for instance on the outside of the TVAC or on the DUT itself. This makes it possible to optimally supply the DUT with the high output power of +16 dBm.

See more: www.rohde-schwarz.com/product/SZV100A

Q/V satellite bands

Satellite band	Frequency range	Spectrum	Satellite service	Satellite link type
Q band	37.5 GHz to 39.5 GHz	shared	fixed satellite, earth exploration satellite	space-to-earth
Q band	40.5 GHz to 42.5 GHz	shared	fixed satellite, mobile satellite, broadcasting (40.5 GHz to 41 GHz)	space-to-earth
V band	42.5 GHz to 43.5 GHz	shared	fixed satellite, radio astronomy	earth-to-space
V band	47.2 GHz to 48.9 GHz	shared	fixed satellite	earth-to-space
V band	48.9 GHz to 50.2 GHz	shared	fixed satellite, earth exploration satellite (50.2 GHz to 50.4 GHz)	earth-to-space
V band	50.4 GHz to 51.4 GHz	shared	fixed satellite	earth-to-space

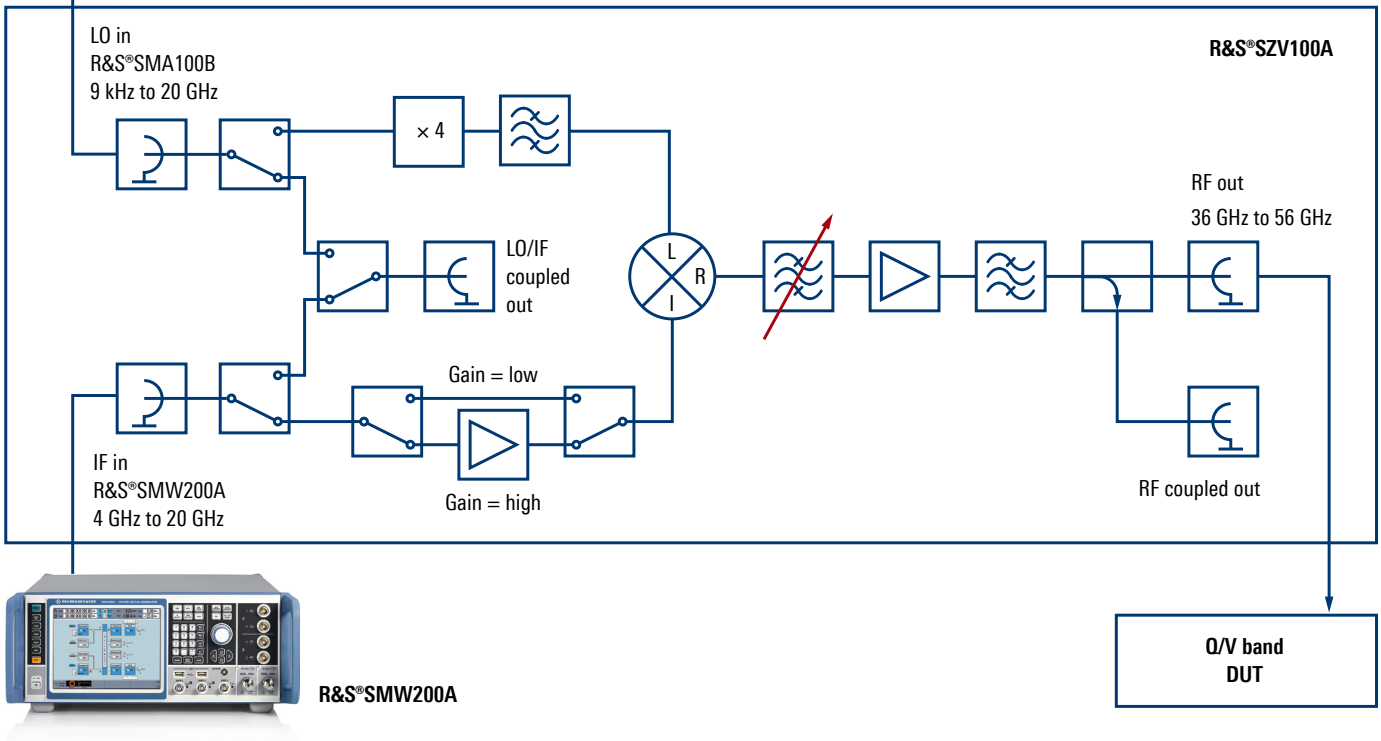
KEY FACTS

- Continuous frequency range from 36 GHz to 56 GHz across the Q/V band
- Instantaneous modulation bandwidth up to 2 GHz
- High output power up to +16 dBm (specified)
- Setup with 20 GHz R&S®SMW200A (modulated signal) and 20 GHz R&S®SMA100B (local oscillator)
- Best EVM performance using R&S®SMA100B as the local oscillator (LO) signal source
- Switchable gain modes for optimized broadband noise
- Small form factor, low weight, mounting points for outdoor TVAC mounting closest to the DUT
- Remote operation with cable length up to 10 m between signal sources and R&S®SZV100A
- PC software with graphical user interface via LAN (IP) for comfortable instrument remote control

Q/V band RF upconverter setup with R&S®SMA100B, R&S®SMW200A and R&S®SZV100A

Q/V band RF upconverter setup

R&S®SMA100B



R&S®SMW200A

BENEFITS

Large instantaneous modulation bandwidth

With its 2 GHz instantaneous modulation bandwidth, the R&S®SZV100A Q/V band RF upconverter is ideal for testing wideband transponders and very high throughput satellites (VHTS).

Excellent group delay and amplitude flatness

Very strict requirements and measurement tolerances apply when designing satellite payloads. The R&S®SZV100A Q/V band RF upconverter delivers top performance with a specified group delay flatness of ±1.5 ns and amplitude flatness of ±2.5 dB at a modulation bandwidth of 500 MHz.

Long-term RF power and frequency stability over temperature and time

Thanks to its internal calibration data and internal temperature sensors, the R&S®SZV100A Q/V band RF upconverter can maintain a constant output level of +16 dBm with minimal temperature drift and constant output frequency even during long-term measurements. This allows users to repeat measurements and compare measurement results.

Covers latest satellite bands with RF output power and calibrated signals

The R&S®SZV100A covers the latest frequency bands for satellite applications and 5G in the Q/V band while offering superior signal quality coupled with maximum output power for the calibrated wanted signal. The calibration data is stored in the R&S®SZV100A.

Designed for testing beyond the standard

The continuous frequency range from 36 GHz to 56 GHz allows the user to perform out-of-band measurements outside the typical band limits of the Q/V satellite bands.

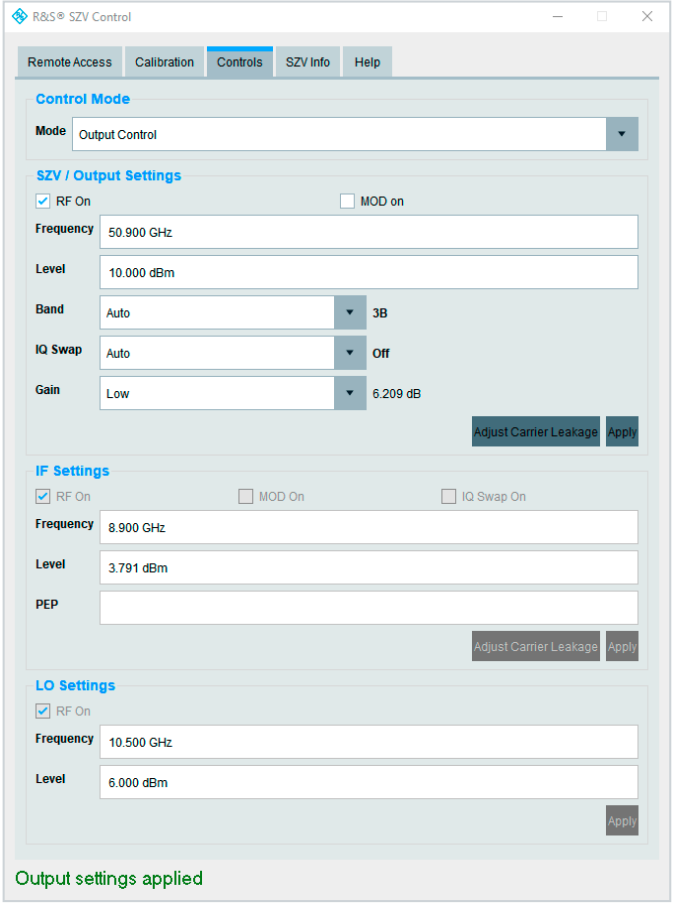
Remote operation close to the DUT with switchable gain modes

Thanks to its compact housing design and flexible mounting options, the R&S®SZV100A is ideal for remote operation with a maximum distance of up to 10 m. The gain can be switched between low and high gain mode and the output signal can be attenuated by 10 dB.

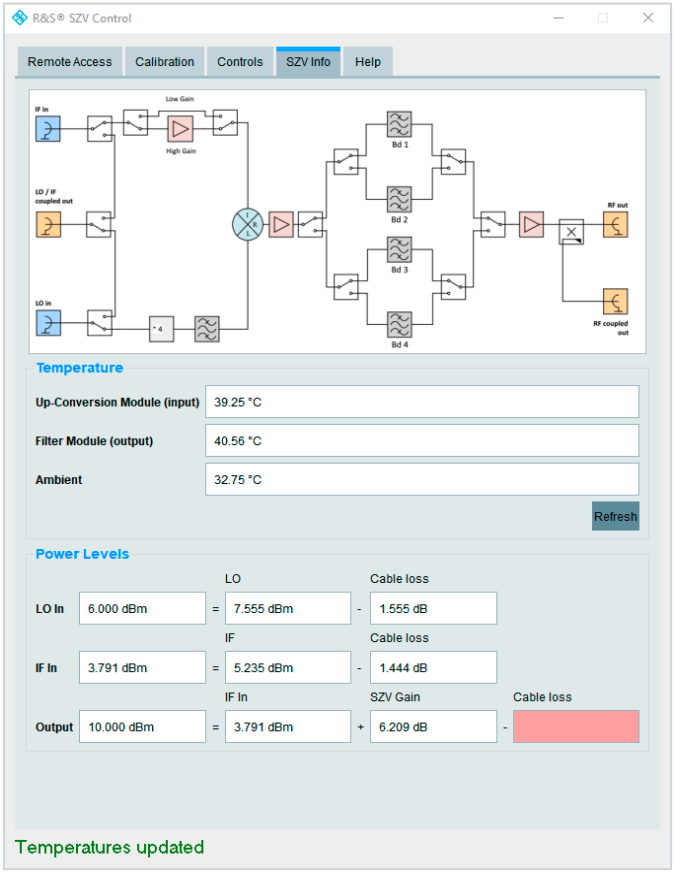
Time and cost savings

With its modular approach, the R&S®SZV100A is perfect as an external RF upconverter to extend existing test systems and continue using an existing R&S®SMW200A vector signal generator with its outstanding features.

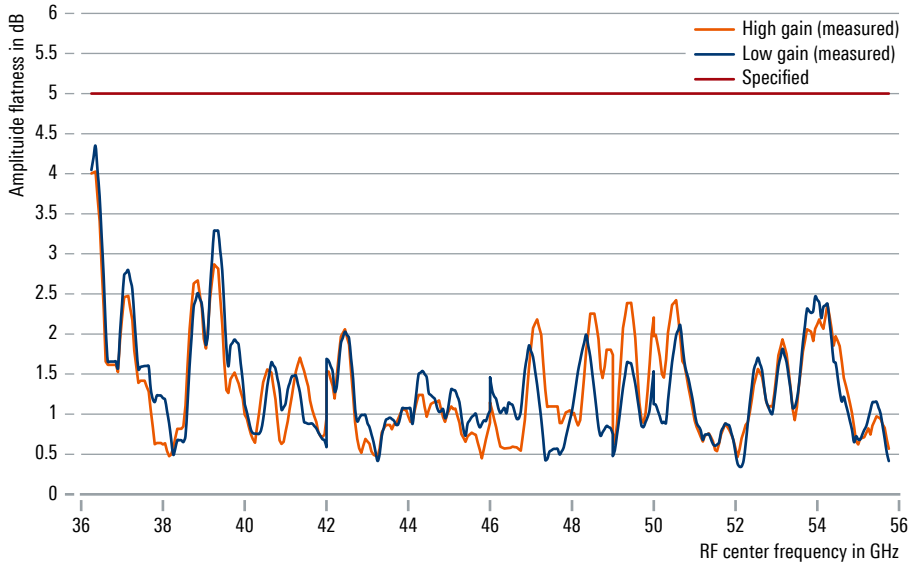
R&S®SZV remote software in output control mode



R&S®SZV remote software with instrument information on temperatures and power levels

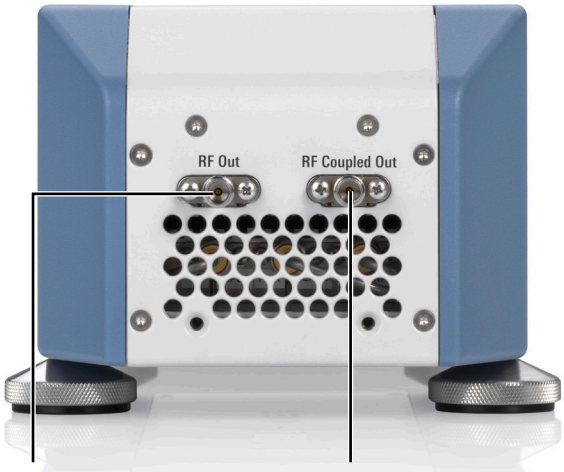


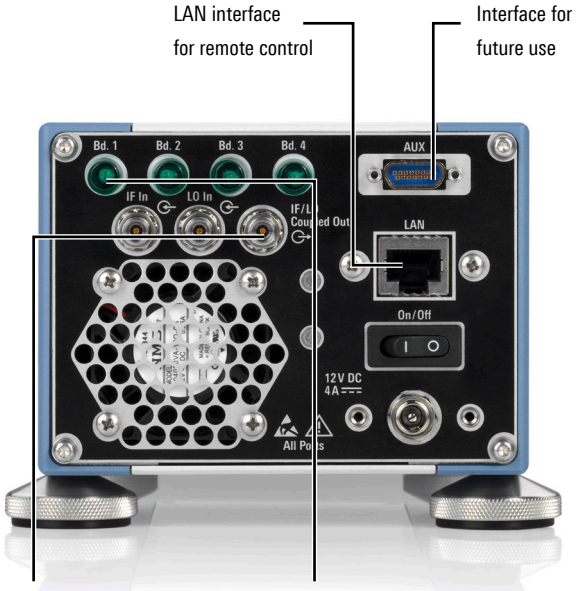
Upconversion transfer characteristics



Specified and measured RF amplitude flatness (median) versus the RF center frequency at a modulation bandwidth of 500 MHz, for low and high gain modes

R&S®SZV100A front and rear view





RF output
Frequency range: 36 GHz to 56 GHz
Output power: +16 dBm
Connector: 1.85 mm female

RF coupled output (monitoring)
Attenuation relative to RF output:
18 dB to 28 dB (meas.)
Connector: 1.85 mm female

IF input, LO input and IF/LO output (monitoring)
Connectors: 2.92 mm female

Active band indication
Band 1: 36 GHz to 43 GHz
Band 2: 41 GHz to 47 GHz
Band 3: 45 GHz to 51 GHz
Band 4: 49 GHz to 56 GHz

Service that adds value

- Worldwide
- Local and personalized
- Customized and flexible
- Uncompromising quality
- Long-term dependability

Rohde&Schwarz

The Rohde&Schwarz electronics group offers innovative solutions in the following business fields: test and measurement, broadcast and media, secure communications, cybersecurity, monitoring and network testing. Founded more than 80 years ago, the independent company which is headquartered in Munich, Germany, has an extensive sales and service network with locations in more than 70 countries.

www.rohde-schwarz.com

Sustainable product design

- ▶ Environmental compatibility and eco-footprint
- ▶ Energy efficiency and low emissions
- ▶ Longevity and optimized total cost of ownership

Certified Quality Management
ISO 9001

Certified Environmental Management
ISO 14001

Rohde&Schwarz training

www.training.rohde-schwarz.com

Rohde&Schwarz customer support

www.rohde-schwarz.com/support

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R&S®SZV100A Q/V Band RF Upconverter
Data without tolerance limits is not binding | Subject to change

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