

R&S® FE170SR | R&S® FE170ST EXTERNAL FRONTENDS



Frequency extension up to 170 GHz for
wideband signal analysis and generation



Product Brochure
Version 02.00

ROHDE & SCHWARZ

Make ideas real



AT A GLANCE

The frequency range of the R&S®FSW signal and spectrum analyzer, R&S®RTP oscilloscope and R&S®SMW200A and R&S®SMM100A vector signal generators can easily be extended to 170 GHz for wideband signal generation and analysis with the R&S®FE170SR external RX frontend and the R&S®FE170TR external TX frontend. The frontends come fully calibrated, can be extended with smart accessories and require a minimum number of connections to the base instruments, simplifying operation.

The R&S®FE170SR external RX frontend in combination with the R&S®FE170ST external TX frontend provide a compact, easy-to-use and fully calibrated solution for wideband signal generation and analysis.

The frequency range from 110 GHz to 170 GHz, also referred to as the D band, is increasingly being used for a wide range of applications such as backhaul and 6G research for future wireless communications systems.



R&S®SMW200A vector signal generator with R&S®FE170ST external TX frontend.

KEY FACTS

- ▶ Frequency range: 110 GHz to 170 GHz
- ▶ Output power: +15 dBm
- ▶ Sensitivity: -159 dBm/Hz (115 GHz to 148 GHz)
- ▶ Phase noise: -118 dBc/Hz at 1 MHz offset and 148 GHz center frequency

BENEFITS

- ▶ High-fidelity signal generation and analysis with minimal EVM
- ▶ Fully calibrated solution
- ▶ User-friendly operation
- ▶ Fully automated
- ▶ Smart accessories

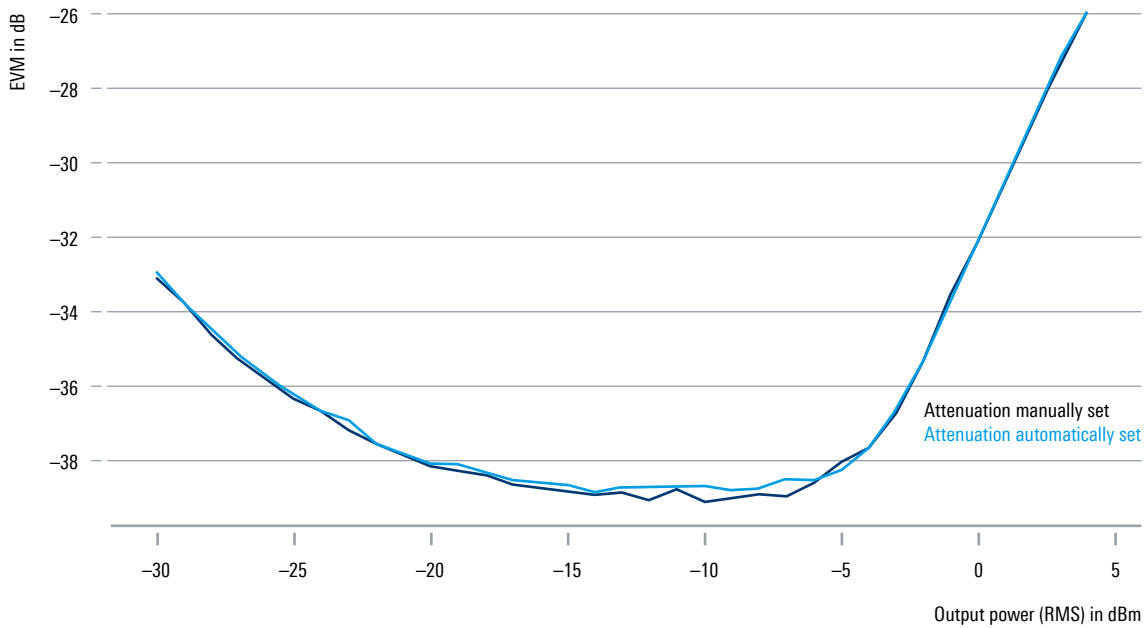


R&S®FSW signal and spectrum analyzer with R&S®FE170SR external RX frontend.

HIGH-FIDELITY SIGNAL GENERATION AND ANALYSIS WITH MINIMAL EVM

With the built-in low-phase-noise local oscillator, the R&S®FE170SR and R&S®FE170TR can produce and measure signals with exceptionally high signal fidelity.

EVM values versus RMS output power at 148 GHz center frequency in combination with an R&S®SMW200A



5G NR uplink signal with 2 GHz bandwidth and 148 GHz center frequency.



Fully calibrated solution

A fully calibrated signal generation and analysis solution reduces the time and equipment needed for setup and calibration and enhances the fidelity of the measurement.

User-friendly operation

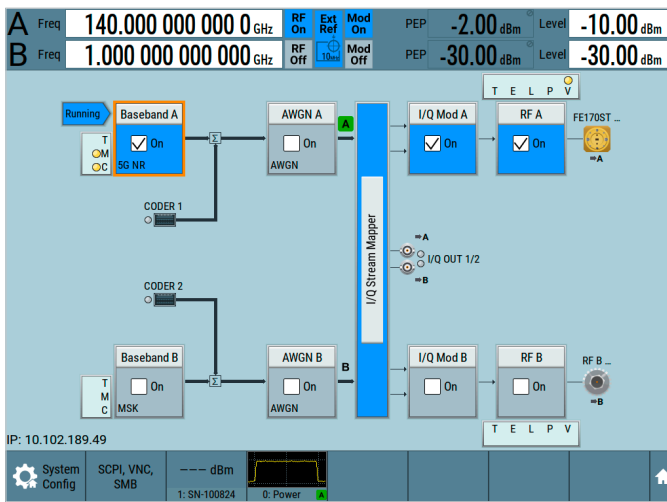
All the parameters of the frontends and connected accessories are known to the base instrument. This reduces the number of corrections needed by the user and increases confidence in the measurement.

Fully automated

Automated measurements can be easily and reliably set up since there is no need to program multiple instruments. The base instrument handles everything.

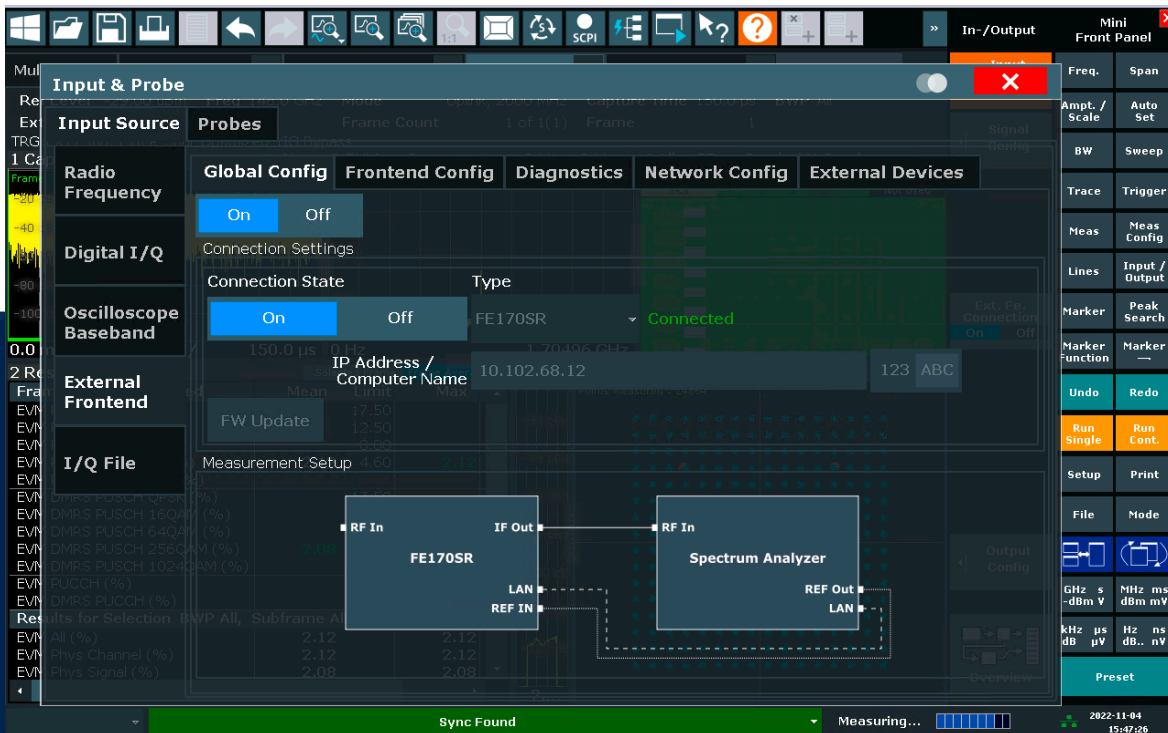
Smart accessories

Using additional devices such as filters and amplifiers is easy. The characteristics of these devices are provided to the base instrument and automatically included for a quick and reliable setup.



R&S®FE170ST setup integrated into the R&S®SMW200A firmware for full control of all relevant settings from a single GUI.

R&S®FSW GUI for controlling the R&S®FE170SR.



SPECIFICATIONS IN BRIEF

Specifications in brief

R&S®FE170SR external RX frontend

Frequency range		110 GHz to 170 GHz
Equalized bandwidth	with R&S®FSW-B8001	up to 8.3 GHz
Displayed average noise level	110 GHz ≤ f ≤ 115 GHz	-152 dBm, -155 dBm (typ.)
	115 GHz < f ≤ 148 GHz	-156 dBm, -159 dBm (typ.)
	148 GHz < f ≤ 166 GHz	-152 dBm, -155 dBm (typ.)
	166 GHz < f ≤ 170 GHz	-147 dBm, -150 dBm (typ.)
Maximum safe input level	RF attenuation = 0 dB	-7 dBm
	RF attenuation ≥ 27 dB	+20 dBm
Reference input		10 MHz, 640 MHz, 1 GHz
LAN interface		10/100BASE-T

R&S®FE170ST external TX frontend

Frequency range		110 GHz to 170 GHz
Equalized bandwidth	with R&S®SMM100A	1 GHz
	with R&S®SMW200A	2 GHz
Specified level range	110 GHz ≤ f _{out} ≤ 170 GHz	-40 dBm to -15 dBm (PEP)
Reference input		10 MHz, 640 MHz, 1 GHz
LAN interface		10/100BASE-T

More information

For detailed specifications of the R&S®FE170SR, see the data sheet (PD 3683.3694.22)

For detailed specifications of the R&S®FE170TR, see the data sheet (PD 3609.9240.22)

ORDERING INFORMATION

Designation	Type	Order No.	Remark
Wideband signal analysis			
External RX frontend, 110 GHz to 170 GHz	R&S®FE170SR	1347.9090.02	export controlled (3A001B7)
RX low-noise amplifier (LNA), 110 GHz to 170 GHz	R&S®FE170-B221	1347.95.78.02	internal LNA, mandatory option, export controlled (3A001B7)
Supported signal and spectrum analyzers			
Signal and spectrum analyzer, 2 Hz to 13.6 GHz	R&S®FSW13	1331.5003.13	
Signal and spectrum analyzer, 2 Hz to 26.5 GHz	R&S®FSW26	1331.5003.26	
Signal and spectrum analyzer, 2 Hz to 43.5 GHz	R&S®FSW43	1331.5003.43	
Signal and spectrum analyzer, 2 Hz to 50 GHz	R&S®FSW50	1331.5003.50	
Signal and spectrum analyzer, 2 Hz to 67 GHz	R&S®FSW67	1331.5003.67	
Signal and spectrum analyzer, 2 Hz to 85 GHz	R&S®FSW85	1331.5003.85	
External frontend control	R&S®FSW-K553	1350.6118.02	
Supported oscilloscope			
High-performance oscilloscope, 16 GHz	R&S®RTP164B	1803.7000.16	
External frontend control	R&S®RTP-K553	1803.6890.02	

Designation	Type	Order No.	Remark
Wideband signal generation			
External TX frontend, 110 GHz to 170 GHz	R&S®FE170ST	1347.9190.02	export controlled (3A001B7)
TX power amplifier (PA), 110 GHz to 170 GHz	R&S®FE170-Z50	1347.9584.02	external PA, optional, export controlled (3A001B4)
Supported vector signal generators			
R&S®SMW200A vector signal generator	R&S®SMW200A	1412.0000.02	
Frequency option, 100 kHz to 20 GHz	R&S®SMW-B1020	1428.5107.02	
Frequency option, 100 kHz to 31.8 GHz	R&S®SMW-B1031	1428.5307.02	
Frequency option, 100 kHz to 40 GHz	R&S®SMW-B1040	1428.8506.02	
Frequency option, 100 kHz to 40 GHz ¹⁾	R&S®SMW-B1040N	1428.8606.02	
Frequency option, 100 kHz to 44 GHz	R&S®SMW-B1044	1428.5507.02	
Frequency option, 100 kHz to 44 GHz ¹⁾	R&S®SMW-B1044N	1428.5407.02	
Frequency option, 100 kHz to 56 GHz	R&S®SMW-B1056	1438.9357.02	
Frequency option, 100 kHz to 56 GHz ¹⁾	R&S®SMW-B1056N	1438.9457.02	
Frequency option, 100 kHz to 67 GHz	R&S®SMW-B1067	1428.8106.02	
Frequency option, 100 kHz to 67 GHz ¹⁾	R&S®SMW-B1067N	1428.8306.02	
R&S®SMM100A vector signal generator	R&S®SMM100A	1440.8002.02	
Frequency option, 100 kHz to 20 GHz	R&S®SMM-B1020	1440.9309.02	
Frequency option, 100 kHz to 31.8 GHz	R&S®SMM-B1031	1440.9409.02	
Frequency option, 100 kHz to 44 GHz	R&S®SMM-B1044	1440.9509.02	
Frequency option, 100 kHz to 44 GHz ¹⁾	R&S®SMM-B1044N	1440.9609.02	
External frontend control	R&S®SMW-K553	1414.6758.02	
Bandpass filters			
Bandpass filter, 110 GHz to 136 GHz	R&S®FE170-Z01	1347.9532.02	
Bandpass filter, 126 GHz to 153 GHz	R&S®FE170-Z02	1347.9549.02	optional, can be used for R&S®FE170SR and R&S®FE170ST
Bandpass filter, 143 GHz to 170 GHz	R&S®FE170-Z03	1347.9555.02	
Recommended extras			
R&S®FE170 accessories	R&S®FE170-Z	1347.9603K02	
Height adjustment for external frontends	R&S®ZZA-FE01	1348.6550.02	

¹⁾ I/Q modulation bandwidth and minimum pulse width limited.

Warranty		
Base unit		3 years
All other items ¹⁾		1 year
Service options		
Extended warranty, one year	R&S®WE1	
Extended warranty, two years	R&S®WE2	
Extended warranty with calibration coverage, one year	R&S®CW1	Please contact your local Rohde & Schwarz sales office.
Extended warranty with calibration coverage, two years	R&S®CW2	
Extended warranty with accredited calibration coverage, one year	R&S®AW1	
Extended warranty with accredited calibration coverage, two years	R&S®AW2	

¹⁾ For installed options, the remaining base unit warranty applies if longer than one year. Exception: all batteries have a one-year warranty.

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ISO 9001

Certified Environmental Management

ISO 14001

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