

# R&S®FSV-K54 EMI Measurement Application

## Finding, classifying and eliminating electro- magnetic interference



# R&S®FSV-K54

## EMI Measurement Application

### At a glance

The R&S®FSV-K54 EMI measurement application adds EMI diagnostic functionality to the R&S®FSV signal and spectrum analyzer and the R&S®FSVR real-time spectrum analyzer. The R&S®FSV-K54 offers EMI bandwidths for commercial and military applications, detectors such as quasi-peak, CISPR-average and RMS-average, limit lines and correction factors.

All electronic devices must be tested for electromagnetic compatibility (EMC) before market approval. The ability to assess and influence the EMC behavior of products during the design phase is one of the critical factors in developing a successful product. Preventing expensive product re-development and performing smooth certification help to ensure a timely market launch.

R&S®FSV-K54 allows users to analyze the effectiveness of shielding measures and the effects of changes in the circuit or design prior to testing in the EMC lab. The R&S®FSVR real-time spectrum analyzer reliably detects even intermittent interferers and interferers that drift in frequency. It seamlessly analyzes a frequency spectrum of up to 40 MHz. The R&S®FSV-K14 option for spectrogram measurements provides information about the signal amplitude and frequency versus time.

#### Key facts

- EMI bandwidths for commercial and military standards
- Standard EMI detectors: quasi-peak, CISPR-average, RMS-average
- Linking of measurement markers to various EMI detectors
- Limit lines and transducers for typical measurement tasks
- Choice of linear or logarithmic scale on frequency axis

Product configuration in three steps		
Step 1: Select the measuring instrument		
Analyzer	R&S®FSV signal and spectrum analyzer	R&S®FSVR real-time spectrum analyzer
Spectrogram measurements	R&S®FSV-K14	•
Step 2: Add options		
EMI measurement application	R&S®FSV-K54	
CISPR 16-1-1 (Ed. 3.1) weighting detectors		•
CISPR 16-1-1 (6 dB bandwidths)		•
Parallel detectors (max. 6 traces)		•
Measurement marker function		•
Marker demodulation (R&S®FSV-B3 option required)		•
Logarithmic and linear sweep display		•
Limit lines		•
Correction factors for accessories		•
Frequency table	max. 16 points	
Remote control of LISNs (R&S®FSV-B5 option required)	manual	
Step 3: Add automation		
EMI software (PC-based)	R&S®ES-SCAN	
Definition of test sequences		•
Interactive test sequence control		•
Peak search with final measurement		•
Report generation		•
Frequency table	max. 500 points	
Remote control of LISNs (R&S®FSV-B5 option required)	automatic	

# R&S® FSV-K54 EMI Measurement Application Benefits and key features

## EMI detectors in line with CISPR 16-1-1

- Flexible allocation of EMI detectors such as quasi-peak, CISPR-average and RMS-average as well as allocation of peak and average detectors to different traces
- Fast, easy-to-read diagnostic measurements with high result reproducibility
- Easy detection of critical disturbance signal amplitudes

## Measurement bandwidths in line with CISPR and MIL-STD

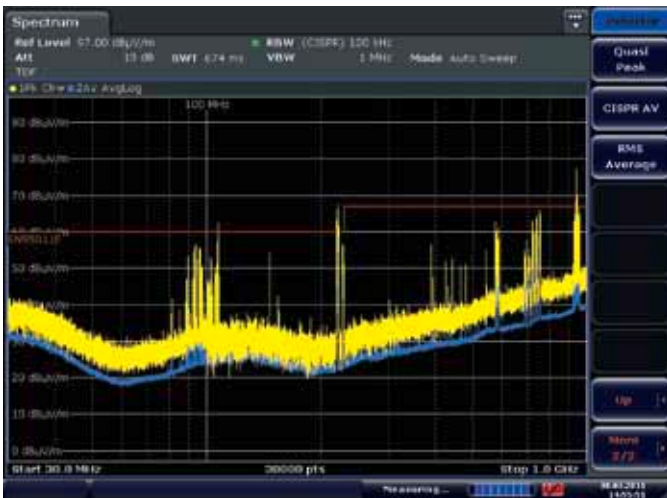
- Diagnostic measurements during development deliver the correct amplitude of the disturbance signal thanks to the 6 dB bandwidths (CISPR from 200 Hz to 1 MHz, MIL-STD from 10 Hz to 1 MHz)

## Measurement marker for evaluating EMI

- Markers can be placed on the frequency of an disturbance signal to make targeted analysis easier
- The ability to link markers to up to six traces and an associated EMI detector provides users with a direct reference to the limits
- Automatic searching for disturbance maxima for reliable detection of time-varying interferers
- Critical frequencies are entered in a peak list for fast evaluation of a frequency spectrum with respect to official EMI emission limits

## Marker demodulation

- Fast and reliable identification of AM and FM signals



Trace detector selection.



Bandwidth selection.



Measurement marker configuration.

## EMI limit lines

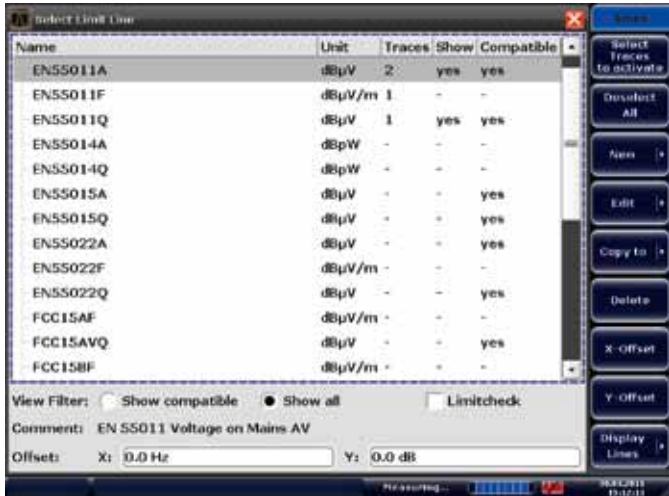
- Selection of limit lines that meet international standards
- Easy generation, editing and use of customer-specific limit lines
- Fast pass-fail test using activated limit lines

## Frequency-dependent correction value tables

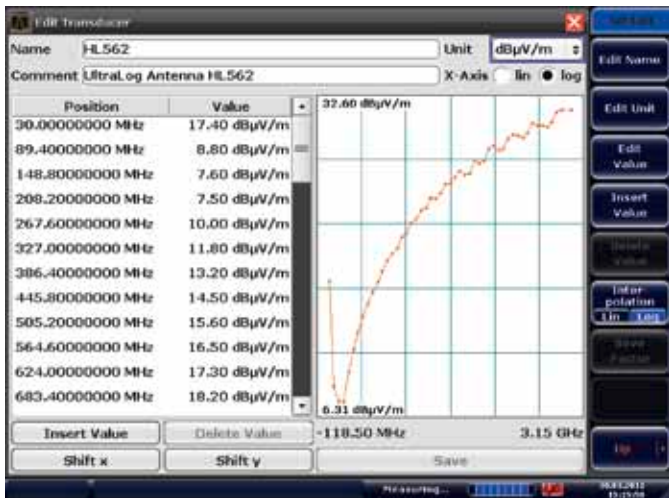
- Database with correction value tables for EMI accessories such as antennas, clamps, line impedance stabilization networks (LISN), pulse limiters, preamplifiers, cables and attenuators
- Easy generation, editing and storage of new correction tables
- High accuracy by including correction values for frequency-dependent accessories in the trace
- Combination of several correction tables possible, for example, for an antenna, a cable and a preamplifier, to compensate for the entire test setup

## Logarithmic spectrum display

- The spectrum display with logarithmic frequency axis makes it easy to analyze measurement results over a wide frequency range and allows to display limit lines in accordance with standards



EMI limit lines.

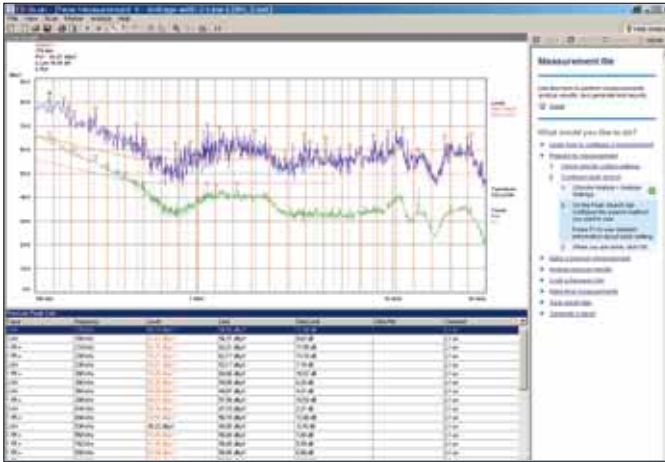


Correction value table.

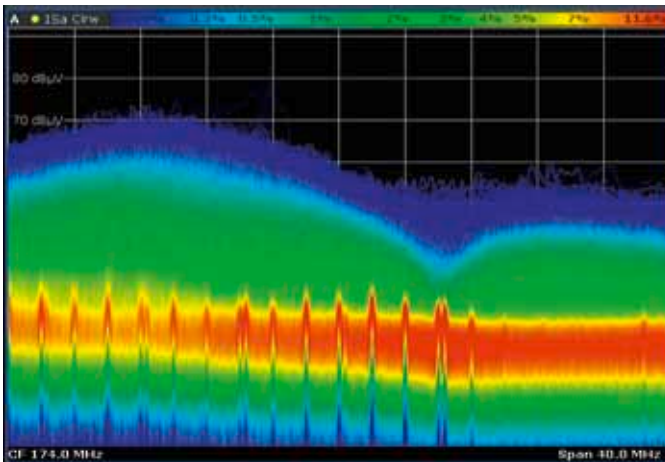


Selection menu for remote-controlled LISNs.

# Application



R&S®ES-SCAN EMI software.



Persistence mode.

## R&S®ES-SCAN EMI software

R&S®ES-SCAN is available for remote control of the R&S®FSVR and R&S®FSV analyzer families with R&S®FSV-K54 for conducted and radiated EMI measurements. R&S®ES-SCAN is a cost-effective, user-friendly Windows software package that was specially designed for EMI diagnostic measurements in product development. The main EMI measurement requirements in accordance with commercial standards have been combined in an easy-to-use application: measurement settings and storage, scan data acquisition and display with automatic data reduction, peak search with acceptance limit and selection of subranges, final measurement with worst-case selection, report generation and measurement data storage.

## EMI diagnostics with the R&S®FSVR real-time spectrum analyzer

In the example to the left, a broadband interferer (a windshield wiper motor with insufficient EMI shielding) has overlaid a pulse spectrum. The pulse spectrum is difficult to detect using classic measuring methods and equipment. In the persistence mode, the R&S®FSVR real-time spectrum analyzer uncovers the unseen. Markers and zoom functions can be used to measure the hidden signal to accurately find and eliminate the source of the interference.

# Ordering information

Description	Type	Order No.
<b>Base unit</b>		
EMI Measurement Application	R&S®FSV-K54	1310.0425.02
<b>Supported T&amp;M equipment families</b>		
Signal and Spectrum Analyzer	R&S®FSV	1307.9002.xx <sup>1)</sup>
Real-Time Spectrum Analyzer	R&S®FSVR	1311.0006.xx <sup>1)</sup>
<b>Recommended options</b>		
AM/FM Audio Demodulator	R&S®FSV-B3	1310.9516.02
Additional Interfaces	R&S®FSV-B5	1310.9539.02
Spectrogram Measurements	R&S®FSV-K14	1310.8255.02
<b>External accessories</b>		
EMI Software	R&S®ES-SCAN	1308.9270.02

<sup>1)</sup> Depending on model.

For data sheet, see 5214.5661.22 and [www.rohde-schwarz.com](http://www.rohde-schwarz.com)

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- | Worldwide
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- | Customized and flexible
- | Uncompromising quality
- | Long-term dependability

## About Rohde & Schwarz

Rohde & Schwarz is an independent group of companies specializing in electronics. It is a leading supplier of solutions in the fields of test and measurement, broadcasting, radiomonitoring and radiolocation, as well as secure communications. Established more than 75 years ago, Rohde & Schwarz has a global presence and a dedicated service network in over 70 countries. Company headquarters are in Munich, Germany.

## Environmental commitment

- | Energy-efficient products
- | Continuous improvement in environmental sustainability
- | ISO 14001-certified environmental management system

Certified Quality System  
**ISO 9001**

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