R&S®EPL1000
EMI TEST RECEIVER

Specifications

Data Sheet
Version 01.01

ROHDE&SCHWARZ
Make ideas real

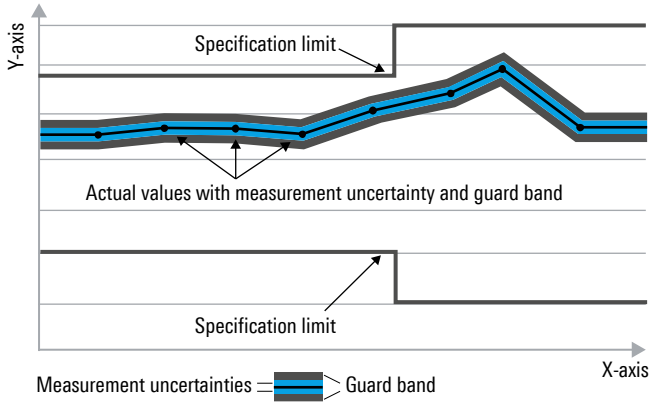
CONTENTS

Definitions

General
Product data applies under the following conditions:

- Three hours storage at ambient temperature followed by 30 minutes warm-up operation
- Specified environmental conditions met
- Recommended calibration interval adhered to
- All internal automatic adjustments performed, if applicable

Specifications with limits
Represent warranted product performance by means of a range of values for the specified parameter. These specifications are marked with limiting symbols such as <, ≤, >, ≥, ±, or descriptions such as maximum, limit of, minimum. Compliance is ensured by testing or is derived from the design. Test limits are narrowed by guard bands to take into account measurement uncertainties, drift and aging, if applicable.



Non-traceable specifications with limits (n. trc.)
Represent product performance that is specified and tested as described under “Specifications with limits” above. However, product performance in this case cannot be warranted due to the lack of measuring equipment traceable to national metrology standards. In this case, measurements are referenced to standards used in the Rohde & Schwarz laboratories.

Specifications without limits
Represent warranted product performance for the specified parameter. These specifications are not specially marked and represent values with no or negligible deviations from the given value (e.g. dimensions or resolution of a setting parameter). Compliance is ensured by design.

Typical data (typ.)
Characterizes product performance by means of representative information for the given parameter. When marked with <, > or as a range, it represents the performance met by approximately 80 % of the instruments at production time. Otherwise, it represents the mean value.

Nominal values (nom.)
Characterize product performance by means of a representative value for the given parameter (e.g. nominal impedance). In contrast to typical data, a statistical evaluation does not take place and the parameter is not tested during production.

Measured values (meas.)
Characterize expected product performance by means of measurement results gained from individual samples.

Uncertainties
Represent limits of measurement uncertainty for a given measurand. Uncertainty is defined with a coverage factor of 2 and has been calculated in line with the rules of the Guide to the Expression of Uncertainty in Measurement (GUM), taking into account environmental conditions, aging, wear and tear.

Device settings and GUI parameters are designated with the format “parameter: value”.

Non-traceable specifications with limits, typical data as well as nominal and measured values are not warranted by Rohde & Schwarz.

In line with the 3GPP standard, chip rates are specified in million chips per second (Mcps), whereas bit rates and symbol rates are specified in billion bit per second (Gbps), million bit per second (Mbps), thousand bit per second (kbps), million symbols per second (Msps) or thousand symbols per second (ksps), and sample rates are specified in million samples per second (Msample/s). Gbps, Mcps, Mbps, Msps, kbps, ksps and Msample/s are not SI units.

Specifications

Operating modes		• receiver mode • analyzer mode

Frequency

Frequency range		5 kHz to 30 MHz
Frequency resolution		0.01 Hz
Scaling		linear, logarithmic [1]
Reference frequency, internal, nominal		
Accuracy		(time since last adjustment × aging rate) + temperature drift + calibration accuracy
Aging per year	standard	1×10^{-6}
	with R&S®FPL1-B4 OCXO reference frequency option	1×10^{-7}
Temperature drift (0 °C to +50 °C)	standard	1×10^{-6}
	with R&S®FPL1-B4 OCXO reference frequency option	1×10^{-7}
Achievable initial calibration accuracy	standard	5×10^{-7}
	with R&S®FPL1-B4 OCXO reference frequency option	5×10^{-8}
Receiver scan		
Scan		max. 10 subranges with different settings
Scan types		stepped, time domain
Measurement time	stepped scan, per frequency	50 µs to 100 s
	time domain scan, per subrange	50 µs to 100 s
Number of trace points		10 000 000
Frequency step size	stepped scan	min. 1 Hz
	time domain scan	0.25 × resolution bandwidth
Time domain scan		
Frequency segment processed in parallel	RBW = 200 Hz	0.66 MHz
	RBW = 9 kHz	29.85 MHz
	RBW = 120 kHz	24.6 MHz
	RBW = 1 MHz	25.6 MHz
FFT overlap factor		≥ 93 %
Frequency readout (analyzer mode)		
Marker resolution		0.01 Hz
Uncertainty		±(marker frequency × reference uncertainty + 10 % × resolution bandwidth + ½ (span/(sweep points – 1)) + 1 Hz)
Number of sweep (trace) points	default value	1001
	range	101 to 100001
Marker tuning frequency step size	marker step size = sweep points	span / (sweep points – 1)
	marker step size = standard	span / (default sweep points – 1)
Frequency counter resolution		1 Hz
Count accuracy		±(frequency × reference uncertainty + ½ (last digit))
Display range for frequency axis		0 Hz, 10 Hz to maximum frequency
Resolution		0.1 Hz
Maximum span deviation		0.1 %
Sweep time range	span = 0 Hz	1 µs to 8000 s
	span ≥ 10 Hz, RBW ≥ 100 kHz	1 ms to 8000 s [2]
	span ≥ 10 Hz, RBW < 100 kHz	75 µs to 8000 s [3]
Sweep time accuracy	span = 0 Hz	0.1 % (nom.)
	span ≥ 10 Hz, RBW ≥ 100 kHz	3 % (nom.)

[1] Not with internal generator in tracking mode.

[2] Net sweep time without additional hardware settling time.

[3] Time for data acquisition for FFT calculation.

Preselection and preamplifier

Preselection		
State	receiver mode	always on
	analyzer mode	on/off (selectable)
Number of preselection filters		2
Bandwidths (–6 dB), nominal	10 Hz to 150 kHz	fixed lowpass filter
	150 kHz to 30 MHz	38 MHz, fixed bandpass filter
Preamplifier	switchable	
Location		in the signal path between preselection and first mixer
Gain		20 dB (nom.)

IF and resolution bandwidths

EMI filters		
Bandwidths (–6 dB)		10/100/200 Hz, 1/9/10/100/120 kHz, 1 MHz
Bandwidth uncertainty		< 3 %
Shape factor 60 dB:6 dB		< 4
Sweep filters and FFT filters		
Resolution bandwidths (–3 dB)	sweep filters	100 kHz to 10 MHz in 1/2/3/5 sequence
	FFT filters	1 Hz to 50 kHz in 1/2/3/5 sequence
Bandwidth uncertainty		< 3 % (nom.)
Shape factor 60 dB:3 dB		< 5 (nom.)
Channel filters (analyzer mode)		
Bandwidths (–3 dB)		100/200/300/500 Hz, 1/1.5/2/2.4/2.7/3/3.4/4/4.5/5/6/7.5/8.5/9/ 10/12.5/14/15/16/20/21/25/30/50/100/ 150/192/200/300/500 kHz, 1/1.228/1.5/2/3/3.75/5/10 MHz
Bandwidth uncertainty		< 2 % (nom.)
Shape factor 60 dB:3 dB		< 2 (nom.)
Video bandwidths	analyzer mode	1 Hz to 10 MHz in 1/2/3/5 sequence
Signal analysis bandwidth (equalized)	standard, analyzer mode	10 MHz (nom.)

Level

Display range		displayed noise floor up to +30 dBm
Maximum input level		
DC voltage	input	0 V
CW RF power	RF attenuation = 0 dB	
	RF preamplifier off	20 dBm (= 0.1 W)
	RF preamplifier on	13 dBm (= 0.02 W)
	RF attenuation ≥ 10 dB	
	RF preamplifier off	30 dBm (= 1 W)
	RF preamplifier on	23 dBm (= 0.2 W)
Pulse spectral density	RF attenuation = 0 dB, preselection on, RF preamplifier off	97 dB µV/MHz
Maximum pulse voltage	RF attenuation ≥ 10 dB	
	input	450 V
Maximum pulse energy	RF attenuation ≥ 10 dB, 10 µs	
	input	20 mWs
Intermodulation		
1 dB compression (two-tone)	RF attenuation = 0 dB, preselection off, RF preamplifier off	+10 dBm (nom.)
	RF attenuation = 0 dB, preselection on, RF preamplifier off	+ 10 dBm (nom.)
	RF attenuation = 0 dB, preselection on, RF preamplifier on	–15 dBm (nom.)

Third-order intercept point (TOI)	RF attenuation = 0 dB, preselection on, RF preamplifier off, level = 2 × –20 dBm, Δf > 5 × RBW or 10 kHz, whichever is larger	
	f_{in} < 10 MHz	20 dBm (nom.)
	10 MHz ≤ f_{in} < 30 MHz	> 15 dBm, 20 dBm (typ.)
	RF attenuation = 0 dB, preselection off [4], RF preamplifier off, level = 2 × –20 dBm, Δf > 5 × RBW or 10 kHz, whichever is larger	
	f_{in} < 10 MHz	20 dBm (nom.)
	10 MHz ≤ f_{in} < 30 MHz	> 20 dBm, 23 dBm (typ.)
	RF attenuation = 0 dB, preselection on, RF preamplifier on, level = 2 × –45 dBm, Δf > 5 × RBW or 10 kHz, whichever is larger	
	f_{in} < 10 MHz	–10 dBm (nom.)
	10 MHz ≤ f_{in} < 30 MHz	> –8 dBm
Second-harmonic intercept (SHI)	RF attenuation = 0 dB, level = –13 dBm, preselection off, RF preamplifier off	
	1 MHz < f_{in} ≤ 30 MHz	45 dBm (nom.)

Sensitivity

Noise indication (receiver mode)	RF attenuation = 0 dB, RF preamplifier off, termination = 50 Ω, average detector (AV)	
	9 kHz ≤ f < 100 kHz, BW = 200 Hz	< –15 dBµV
	100 kHz ≤ f < 150 kHz, BW = 200 Hz	< –15 dBµV
	150 kHz ≤ f < 1 MHz, BW = 9 kHz	< +1 dBµV
	1 MHz ≤ f < 30 MHz, BW = 9 kHz	< –4 dBµV
	RF attenuation = 0 dB, RF preamplifier on, termination = 50 Ω, average detector (AV)	
	9 kHz ≤ f < 100 kHz, BW = 200 Hz	< –25 dBµV
	100 kHz ≤ f < 150 kHz, BW = 200 Hz	< –25 dBµV
	150 kHz ≤ f < 1 MHz, BW = 9 kHz	< –9 dBµV
	1 MHz ≤ f < 10 MHz, BW = 9 kHz	< –16 dBµV
	10 MHz ≤ f < 30 MHz, BW = 9 kHz	< –12 dBµV
Displayed average noise level (DANL, analyzer mode)	RF attenuation = 0 dB, termination = 50 Ω, logarithmic scaling, normalized to 1 Hz RBW, RBW = 1 kHz, VBW = 1 Hz, sample detector, +20 °C to +30 °C	
	RF preamplifier off, preselection off	
	5 kHz ≤ f < 1 MHz	< –145 dBm, –152 dBm (typ.)
	1 MHz ≤ f < 30 MHz	< –150 dBm, –155 dBm (typ.)
	RF preamplifier off, preselection on	
	5 kHz ≤ f < 1 MHz	< –142 dBm, –147 dBm (typ.)
	1 MHz ≤ f < 30 MHz	< –142 dBm, –147 dBm (typ.)
	RF preamplifier on, preselection on (gain: 20 dB (nom.))	
	1 MHz ≤ f < 10 MHz	< –155 dBm, –158 dBm (typ.)
	10 MHz ≤ f < 30 MHz	< –152 dBm, –156 dBm (typ.)
Spurious responses	input level ≤ –13 dBm, sweep optimization: auto or dynamic, scaling linear	
Residual spurious response	RF attenuation = 0 dB	
	f ≤ 2 MHz	< –90 dBm (nom.)
	2 MHz ≤ f < 30 MHz	< –110 dBm
Level display (receiver mode)		
Level display	analog	bargraph display, separately for each detector
	digital	numeric, 0.01 dB resolution
Detectors	maximum 4 selectable	maximum peak, minimum peak, RMS, average, quasi-peak, CISPR-average, RMS-average
Units of level axis		dBm, dBµV, dBmV, dBµA, dBpW, dBpT
RF spectrum		
Logarithmic level axis		10 dB to 200 dB, in steps of 10
Frequency axis		linear or logarithmic
Number of traces		6
Detectors		maximum peak, minimum peak, RMS, average, quasi-peak, CISPR-average, RMS-average

[4] Preselection off is only available in analyzer mode. In receiver mode the preselection is permanently on.

Level display (analyzer mode)		
Logarithmic level axis		1 dB to 200 dB, in 1 dB steps
Linear level axis		10 % of reference level per level division, 10 divisions or logarithmic scaling
Number of traces		6
Trace detector		maximum peak, minimum peak, auto peak (normal), sample, RMS, average
Trace functions		clear/write, maximum hold, minimum hold, average, view
EMI detectors		quasi-peak, RMS-average, CISPR average
Measurement marker detector		maximum peak, average, quasi-peak, RMS-average, CISPR-average
Setting range of reference level		–130 dBm to (–13 dBm + RF attenuation – RF preamplifier gain), in steps of 0.01 dB
Units of level axis		dBm, dBµV, dBmV, dBµA, dBpW, V, A, W
Level measurement uncertainty		
Absolute level uncertainty at 16.667 MHz	RBW = 10 kHz, level = –10 dBm, reference level = –10 dBm, RF attenuation = 10 dB	
	+20 °C to +30 °C	
	preselection off	< 0.3 dB (σ = 0.1 dB)
	preselection on	< 0.4 dB (σ = 0.14 dB)
	0 °C to +50 °C	
	preselection off	< 0.5 dB (σ = 0.17 dB)
	preselection on	< 0.6 dB (σ = 0.2 dB)
Frequency response referenced to 16.667 MHz	RF attenuation = 10/20/30/40 dB, preselection off, RF preamplifier off, +20 °C to +30 °C	
	5 kHz ≤ f < 9 kHz	< 1 dB (nom.)
	9 kHz ≤ f < 30 MHz	< 0.3 dB (σ = 0.1 dB)
	RF attenuation = 10/20/30/40 dB, preselection on, RF preamplifier off, +20 °C to +30 °C	
	5 kHz ≤ f < 9 kHz	< 1 dB (nom.)
	9 kHz ≤ f < 30 MHz	< 0.8 dB (σ = 0.27 dB)
	any setting of RF attenuation and preselection, RF preamplifier off, 0 °C to +50 °C	
	5 kHz ≤ f < 30 MHz	< 1 dB (nom.)
	RF attenuation ≤ 20 dB, RF preamplifier on, preselection on, +20 °C to +30 °C	
	5 kHz ≤ f < 9 kHz	< 1 dB (nom.)
	9 kHz ≤ f < 30 MHz	< 0.8 dB (σ = 0.27 dB)
Attenuator switching uncertainty	f = 50 MHz, 0 dB to 55 dB, referenced to 10 dB attenuation	< 0.2 dB (σ = 0.07 dB)
Uncertainty of reference level setting		0 dB [5]
Bandwidth switching uncertainty	referenced to RBW = 10 kHz and sweep type FFT	
	sweep type = FFT (RBW < 100 kHz)	< 0.1 dB (nom.)
	sweep type = sweep (RBW ≥ 100 kHz)	< 0.2 dB (nom.)
Nonlinearity of displayed level		
Logarithmic level display	S/N > 16 dB, 0 dB to –50 dB	< 0.1 dB (σ = 0.07 dB)
Linear level display	S/N > 16 dB, 0 dB to –70 dB	5 % of reference level (nom.)
CISPR detectors	CISPR band A/B	in line with CISPR 16-1-1:2019
Total measurement uncertainty	signal level from 0 dB to –50 dB below reference level, S/N > 20 dB, sweep time = auto, sweep type = FFT, RF attenuation = 10/20/30/40 dB, preselection off, RF preamplifier off, span/RBW < 100, confidence level = 95 %, +20 °C to +30 °C	
	1 MHz ≤ f < 30 MHz	0.5 dB
	signal level from 0 dB to –50 dB below reference level, S/N > 20 dB, sweep time = auto, sweep type = FFT, RF attenuation = 10/20/30/40 dB, preselection on, RF preamplifier off/on, span/RBW < 100, confidence level = 95 %, +20 °C to +30 °C	
	1 MHz ≤ f < 30 MHz	0.8 dB

[5] The setting of the reference level affects only the graphical representation of the measurement result on the display, not the measurement itself. Therefore, the reference level setting causes no additional uncertainty in measurement results.

Measurement speed

Receiver mode		
Time domain scan	CISPR band A, 9 kHz to 150 kHz, RBW = 200 Hz or CISPR band B, 150 kHz to 30 MHz, RBW = 9 kHz; measurement time = 100 ms, peak detector	500 ms (meas.)
	CISPR band A, 9 kHz to 150 kHz, RBW = 200 Hz or CISPR band B, 150 kHz to 30 MHz, RBW = 9 kHz; measurement time = 1 s, peak detector	1.4 s (meas.)
	CISPR band A, 9 kHz to 150 kHz, RBW = 200 Hz or CISPR band B, 150 kHz to 30 MHz, RBW = 9 kHz; measurement time = 1 s, quasipeak and CISPR-average detector	≤3 s (meas.)
	CISPR band A, 9 kHz to 150 kHz, RBW = 200 Hz or CISPR band B, 150 kHz to 30 MHz, RBW = 9 kHz; measurement time = 15 s, peak detector	15.4 s (meas.)
	CISPR band A, 9 kHz to 150 kHz, RBW = 200 Hz or CISPR band B, 150 kHz to 30 MHz, RBW = 9 kHz; measurement time = 15 s, quasipeak and CISPR-average detector	≤17 s (meas.)
Local measurement and display update rate	1001 sweep points, sweep optimization set to “speed”	5 ms (200/s) (nom.)
Maximum sweep rate, remote operation [6, 7]	trace average = on	0.9 ms (1100/s) (nom.)
Remote measurement and LAN transfer [6]		3.2 ms (357/s) (nom.)
Marker peak search [6]		1.9 ms (nom.)
Center frequency tune + sweep + sweep data transfer [6]		16 ms (nom.)

Trigger functions

Trigger		
Trigger source		free run, video, external, IF power, I/Q power
Trigger offset	span ≥ 10 Hz	0 s to 20 s
	span = 0 Hz	(–sweep time) to 20 s
Maximum deviation of trigger offset		±10 ns
IF power trigger (analyzer mode)		
Sensitivity	minimum signal power	–60 dBm + RF attenuation – RF preamplifier gain
	maximum signal power	–15 dBm + RF attenuation – RF preamplifier gain
IF power trigger bandwidth		10 MHz (nom.)
Gated sweep		
Gate source		video, external, IF power,
Gate delay		0 s to 20 s, minimum resolution: 10 ns
Gate length		10 ns to 20 s, minimum resolution: 10 ns
Maximum deviation of gate length		±10 ns

[6] Measured with a PC equipped with Intel® Core™ i7 2.8 GHz and Gigabit LAN interface.

[7] Measurement is performed with a sweep count of 1000. The indicated speed is the average speed of 1 sweep.

I/Q data

Interface		GPIB or LAN interface
Memory length		max. 25 Msample I and Q
Word length of I/Q samples		14 bit
Sampling rate	standard	100 Hz to 16 MHz
Maximum signal analysis bandwidth (equalized)	standard	12.8 MHz
Signal analysis bandwidth ≤ 10 MHz		
Amplitude flatness	f_{center} ≥ 12 MHz and (1.25 × signal analysis bandwidth)	±0.3 dB (nom.)
Deviation from linear phase	f_{center} ≥ 12 MHz and (1.25 × signal analysis bandwidth)	±1° (nom.)
Signal analysis bandwidth ≤ 30 MHz		
Amplitude flatness	f_{center} ≥ 12 MHz and (1.25 × signal analysis bandwidth)	±0.5 dB (nom.)
Deviation from linear phase	f_{center} ≥ 12 MHz and (1.25 × signal analysis bandwidth)	±1.5° (nom.)

Audio demodulation

AF demodulation types		AM and FM
Audio output		loudspeaker and phone jack
Marker stop time in analyzer mode		100 ms to 60 s

Inputs and outputs

RF input		
Impedance		50 Ω
Connector		N female
VSWR	RF attenuation ≥ 10 dB, receiver mode or analyzer mode with preselection on	
	9 kHz ≤ f < 30 MHz	< 1.2
	RF attenuation ≤ 10 dB, receiver mode or analyzer mode with preselection on	
	9 kHz ≤ f < 30 MHz	< 2.0
	RF attenuation ≥ 10 dB, analyzer mode with preselection off	
	9 kHz ≤ f < 30 MHz	< 1.5 (nom.)
Setting range of attenuator	input	0 dB to 55 dB, in 1 dB steps
USB interfaces	front	2 ports, type A plug, version 2.0
	rear	2 ports, type A plug, version 3.1
Reference output		
Connector		BNC female
Impedance		50 Ω
Output frequency	internal reference	10 MHz
	external reference	same as reference input signal
Level		> 0 dBm (nom.)
Reference input		
Connector		BNC female
Impedance		50 Ω
Input frequency range		10 MHz ± 5 ppm
Required level		> 0 dBm into 50 Ω
External trigger/gate input		
Connector		BNC female
Trigger voltage		0.5 V to 3.5 V
Input impedance		10 kΩ
IEC/IEEE bus control		interface in line with IEC 625-2 (IEEE 488.2)
Command set		SCPI 1997.0
Connector		24 pin Amphenol female
Interface functions		SH1, AH1, T6, L4, SR1, RL1, PP1, DC1, DT1, C0
LAN interface		10/100/1000BASE-T
Connector		RJ-45
External monitor		
Connector		DisplayPort rev. 1.3

User port		
Connector		25 pin D-Sub female
Output		TTL compatible, 0 V/5 V, max. 15 mA
Input		TTL compatible, max. 5 V
Noise source control and power sensor		
Connectors	for R&S®NRP-Zxx power sensors	7 pin LEMOSA female
	for noise source control	BNC female
Noise source control output voltage		0 V/28 V, switchable, max. 100 mA (nom.)
IF/video/demod out (analyzer mode)		
Connector		BNC female, 50 Ω
IF out		
Bandwidth		equal to RBW setting
IF frequency		25 MHz
Output level	center frequency > 10 MHz, span = 0 Hz, signal at reference level and center frequency	0 dBm (nom.)
Video out		
Bandwidth		equal to VBW setting
Output scaling	logarithmic display scale	logarithmic
	linear display scale	linear
Output level	center frequency > 10 MHz, span = 0 Hz, signal at reference level and center frequency	1 V (nom.), open circuit
Audio output		
Loudspeaker		built-in, volume adjustable
AF out		
Connector		3.5 mm mini jack
Output impedance		10 Ω
Open-circuit voltage		up to 1.5 V, adjustable

General data

Display		21 cm LC TFT color display (10.1")
Resolution		1280 × 800 pixel (WXGA resolution)
Pixel failure rate		< 1×10^{-5}
Data storage		
Internal	standard	solid-state drive (SSD) 128 Gbyte
External		supports USB 2.0/3.1 compatible memory devices
Environmental conditions		
Temperature	operating temperature range	+0 °C to +50 °C
	storage temperature range	–20 °C to +70 °C
Climatic loading	without condensation	+40 °C at 85 % relative humidity, in line with EN 60068-2-30,
Mechanical resistance		
Vibration	sinusoidal	5 Hz to 55 Hz, 0.15 mm constant amplitude (1.8 g at 55 Hz); 55 Hz to 150 Hz, acceleration: 0.5 g constant; in line with EN 60068-2-6
	random	10 Hz to 300 Hz, acceleration: 1.2 g (RMS), in line with EN 60068-2-64
Shock		40 g shock spectrum, in line with MIL-STD-810E method no. 516.4 procedure I, MIL-PRF-28800F
EMC		in line with EMC Directive 2014/30/EU including IEC/EN 61326-1 [9, 10], IEC/EN 61326-2-1, CISPR 11/EN 55011 [9], IEC/EN 61000-3-2, IEC/EN 61000-3-3

[9] Emission limits for class B equipment.

[10] Immunity test requirement for industrial environment (EN 61326 table 2).

Recommended calibration interval		1 years
Power supply		
AC supply	with battery option	100 V to 240 V ± 10 %, 50 Hz to 60 Hz ± 5 %
Current consumption	without options	nom. 2.16 A (at 100 V) to 0.95 A (at 240 V)
	with internal battery (R&S®FPL1-B31 option in charge mode)	nom. 3 A to 1.5 A
Safety		in line with EN 61010-1, IEC 61010-1, UL 61010-1, CAN/CSA-C22.2 No. 61010-1
Test mark		CE, KCC, CSA
Dimensions and weight		
Dimensions	W × H × D	408 mm × 186 mm × 235 mm (16.06 in × 7.32 in × 9.25 in)
Net weight, nominal	without options	6.9 kg (15.2 lb)
	with internal battery	8.6 kg (18.95 lb)

Options

R&S®FPL1-B30 DC power input 12 V/24 V

Input voltage range	DC	12 V to 24 V (nom.), 10.4 V to 28 V, switch-on voltage > 11 V (meas.)
Input current	V_{in} = 12 V/24 V	13 A/6.5 A (nom.)
	V_{in} = 12 V/24 V, operating mode, without internal batteries (R&S®FPL1-B31)	6.8 A/3.2 A (meas.)
	V_{in} = 12 V/24 V, operating mode, internal batteries in charge mode	11 A/5 A (meas.)
	V_{in} = 12 V/24 V, instrument standby mode, internal batteries in charge mode	6.5 A/3.0 A (meas.)
Temperature	operating temperature range	0 °C to +40 °C
	storage temperature range	–20 °C to +70 °C

R&S®FPL1-B31 internal lithium-ion battery

Operating time		2 h (nom.)
Charge time	standby mode, AC supply	< 2 h (nom.)
	standby mode, external DC supply (R&S®FPL1-B30)	< 2 h (nom.)
	operating mode	< 4 h (nom.)
Temperature	operating temperature range, discharge	0 °C to +50 °C
	operating temperature range, charge	0 °C to + 45 °C
	storage temperature range	–20 °C to +60 °C [11]

R&S®FSV-B34 charger (only needed for charging spare batteries)

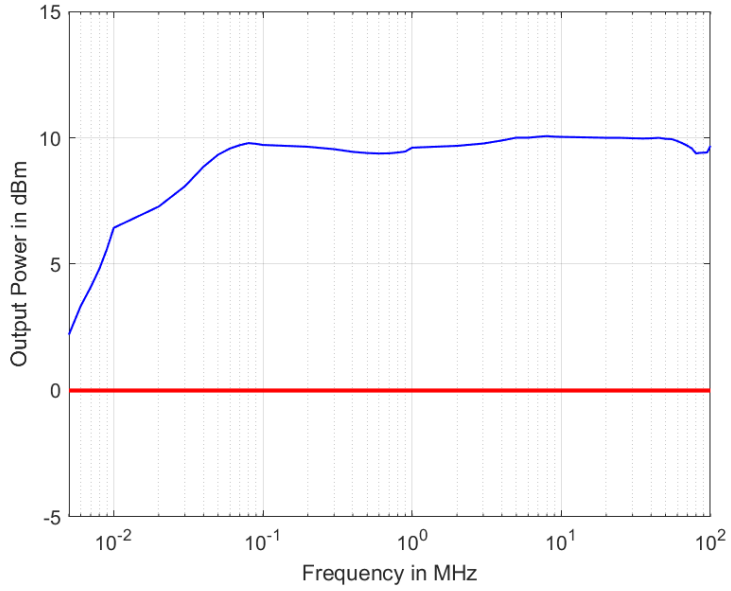
AC input voltage range		100 V to 240 V, ±10 % (nom.)
AC supply frequency		50 Hz to 60 Hz (nom.)
Power consumption		max. 300 W (nom.)
Number of charger bays		4
Dimensions	W × H × D	400 mm × 127 mm × 203 mm (15.75 in × 5 in × 8 in)
Net weight		3.1 kg (6.9 lb)

R&S®EPL1-B91 internal generator

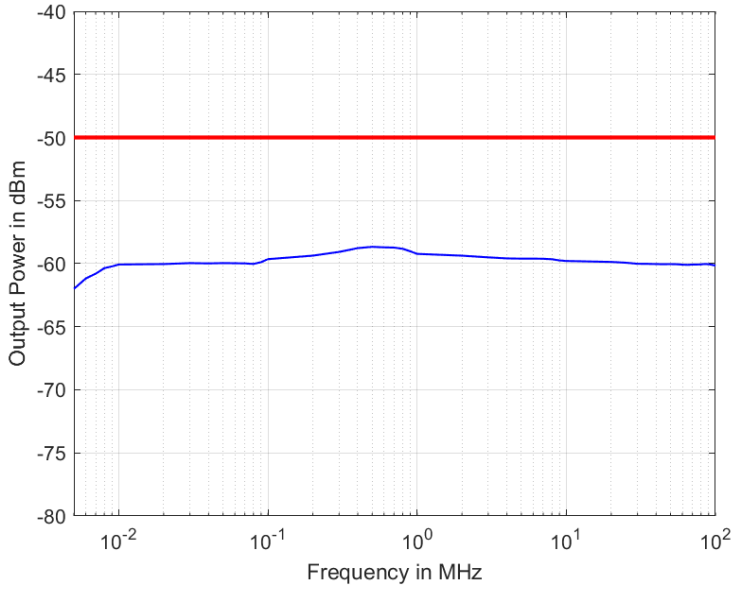
Modes		tracking generator
		independent source
		power sweep
Frequency		
Frequency range		5 kHz to 30 MHz
Setting resolution	independent CW source	0.01 Hz
Frequency offset		
Setting range		0 Hz to 30 MHz
Setting resolution		0.01 Hz
Spectral purity		
SSB phase noise	frequency = 15 MHz, output level = 0 dBm	
	carrier offset = 10 kHz	< –102 dBc (1 Hz), –108 dBc (1 Hz) (typ.)
	carrier offset = 100 kHz	< –105 dBc (1 Hz), –111 dBc (1 Hz) (typ.)
	carrier offset = 1 MHz	< –117 dB (1 Hz), –130 dBc (1 Hz) (typ.)
Harmonics	output level = 0 dBm	
	5 kHz ≤ f < 100 kHz	< –30 dBc (nom.)
	100 kHz ≤ f ≤ 30 MHz	< –30 dBc
Non-harmonic spurious	output level = 0 dBm	
	1 kHz < offset from carrier ≤ 4 MHz	–35 dBc (nom.)
	offset from carrier > 4 MHz	< –35 dBc, –45 dBc (typ.)

[11] The battery packs should be stored in an environment with low humidity, free from corrosive gas at a recommended temperature range < +21 °C. Extended exposure to temperatures above +45 °C could degrade battery performance and life.

Level		
Specified level range		–50 dBm to 0 dBm
Setting resolution		0.1 dB
Setting range		–60 dBm to +10 dBm
Absolute level uncertainty	frequency =16.667MHz, +20 °C to +30 °C, output level = –10 dBm, frequency offset = 0 Hz	< 0.5 dB
Frequency response	output level = –10 dBm, referenced to level at 16.667 MHz, +20 °C to +30 °C, frequency offset = 0 Hz	
	100 kHz ≤ f ≤ 30 MHz	< 1 dB
Level nonlinearity	for specified level range, referenced to –10 dBm output level, +20 °C to +30 °C, f ≥ 100 kHz	≤ 2 dB, < 0.5 dB (typ.)



Maximum output power versus frequency, level in dBm (meas.)



Minimum output power versus frequency, level in dBm (meas.)

Dynamic range	RBW = 1 kHz, f = 30 MHz	115 dB (nom.)
Power sweep		
Specified level range		–50 dBm to 0 dBm
Setting resolution		0.1 dB
Setting range		–60 dBm to +10 dBm
GEN output		
Connector		N female, 50 Ω
VSWR		1.5 (nom.)
Reverse power		
DC voltage		50 V
CW RF power		30 dBm (= 1 W)
Maximum pulse voltage		150 V
Maximum pulse energy	pulse duration: 10 µs	1 mWs

R&S®EPL1-K56 IF analysis

Level display (receiver mode)		
IF spectrum		
Span		max. 10 MHz
Resolution bandwidths		10 Hz to 100 kHz, in 1/2/3/5 sequence
Detector		sample
Logarithmic level axis		10 dB to 200 dB, in steps of 10 dB
Frequency axis		linear
Number of traces		3

Ordering information

Designation	Type	Order No.
EMI test receiver	R&S®EPL1000	1350.4444.10
Accessories supplied: power cable, quick start guide		

Options

Designation	Type	Order No.	Retrofittable	Remarks
OCXO reference frequency	R&S®FPL1-B4	1323.1902.02	yes	retrofit in service center
GPIB interface	R&S®FPL1-B10	1323.1890.02	yes	user-retrofittable
Replacement SSD including controller unit	R&S®EPL1-B19	1350.4450.02	yes	user-retrofittable mounted on PC board, including analyzer firmware
DC power supply, 12 V/24 V	R&S®FPL1-B30	1323.1877.02	yes	user-retrofittable
Internal lithium-ion battery	R&S®FPL1-B31	1323.1725.02	yes	retrofit in service center; including 2 battery packs and internal charging unit
Internal generator 5 kHz to 30 MHz	R&S®EPL1-B91	1350.4073.02	no	
Firmware				
AM/FM/φM measurement demodulator	R&S®FPL1-K7	1323.1731.02		
IF analysis	R&S®EPL1-K56	1350.4067.02		
EMC test software				
Essential EMI test software	R&S®ELEMI-E	5601.0030.02		
License dongle	R&S®EMCPC	5601.0018.02		

Recommended extras

Designation	Type	Order No.
Soft carrying bag for transport and outdoor operation	R&S®EPL1-Z2	1350.4309.02
H-style shoulder harness (requires R&S®EPL1-Z2 option)	R&S®EPL1-Z3	1350.4315.02
Spare lithium-ion battery pack	R&S®FPL1-Z4	1323.1677.02
Anti-glare display film for outdoor operation	R&S®FPL1-Z5	1323.1690.02
Lithium-ion battery charger for charging spare batteries	R&S®FSV-B34	1321.3950.02
19" rackmount kit	R&S®EPL1-Z6	1350.4321.02
Control cable for R&S®ENV216/R&S®ENV432/R&S®ENV420		
Length: 3 m	R&S®EZ-21	1107.2087.03
Length: 10 m	R&S®EZ-21	1107.2087.10
Accredited calibration	R&S®ACAEPL1000	Please contact your local Rohde & Schwarz sales office.

Service options		
Extended warranty, one year	R&S®WE1	Please contact your local Rohde & Schwarz sales office.
Extended warranty, two years	R&S®WE2	
Extended warranty, three years	R&S®WE3	
Extended warranty, four years	R&S®WE4	
Extended warranty with calibration coverage, one year	R&S®CW1	
Extended warranty with calibration coverage, two years	R&S®CW2	
Extended warranty with calibration coverage, three years	R&S®CW3	
Extended warranty with calibration coverage, four years	R&S®CW4	
Extended warranty with accredited calibration coverage, one year	R&S®AW1	
Extended warranty with accredited calibration coverage, two years	R&S®AW2	
Extended warranty with accredited calibration coverage, three years	R&S®AW3	
Extended warranty with accredited calibration coverage, four years	R&S®AW4	

Extended warranty with a term of one to four years (WE1 to WE4)
Repairs carried out during the contract term are free of charge [12]. Necessary calibration and adjustments carried out during repairs are also covered.

Extended warranty with calibration (CW1 to CW4)
Enhance your extended warranty by adding calibration coverage at a package price. This package ensures that your Rohde & Schwarz product is regularly calibrated, inspected and maintained during the term of the contract. It includes all repairs [12] and calibration at the recommended intervals as well as any calibration carried out during repairs or option upgrades.

Extended warranty with accredited calibration (AW1 to AW4)
Enhance your extended warranty by adding accredited calibration coverage at a package price. This package ensures that your Rohde & Schwarz product is regularly calibrated under accreditation, inspected and maintained during the term of the contract. It includes all repairs [12] and accredited calibration at the recommended intervals as well as any accredited calibration carried out during repairs or option upgrades.

[12] Excluding defects caused by incorrect operation or handling and force majeure. Wear-and-tear parts are not included.

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PD 3683.7819.22 | Version 01.01 | March 2023 (ch)
R&S®EPL1000 EMI Test Receiver
Data without tolerance limits is not binding | Subject to change

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