R&S®EVS300 ILS/VOR Analyzer

Data sheet

ROHDE&SCHWARZ

Specifications apply under the following conditions: 15 minutes warm-up time at ambient temperature, specified environmental conditions met, calibration cycle adhered to, 100ms measurement time, AUTO attenuator mode selected, and all internal automatic adjustments performed. Data without tolerances: typical values only. Data designated "nominal" applies to design parameters and is not tested.

Frequency

Frequency range		70 MHz to 350 MHz
Preselection filter ranges	marker beacon	74.7 MHz to 75.3 MHz
	ILS LLZ	108 MHz to 112 MHz
	ILS GS	320 MHz to 340 MHz
	VOR	108 MHz to 118 MHz
Frequency resolution		100 Hz
Temperature drift	–10 °C to +55 °C	1 ppm
Aging per year	after 30 days of uninterrupted operation	1 ppm

Level

Absolute level		
Maximum input power		+13 dBm
Display ranges[1]	Low Noise mode (preamplifier ON)	–120 dBm to –20 dBm
	Normal mode (preamplifier OFF)	–110 dBm to –10 dBm
	Low Distortion mode (RF attenuator ON)	–100 dBm to +20 dBm
	Autorange mode	–120 dBm to +20 dBm
Level resolution		0.1 dB
Deviation	at –30 dBm	<0.8 dB
Linearity error	in range from –70 dB to 0 dB	<0.5 dB
Inherent noise	Low Noise mode	<–115 dBm
Spurious response, inherent	without input signal, Low Noise mode	<–90 dBm
Intermodulation		
Third-order intercept point, IP3	2 × 10 dBm, $\Delta f > 200$ kHz, low dist.	>20 dBm

ILS signal analysis

R&S®EVS300 in measurement mode SINGLE. At an input level > –70 dBm specifications apply even with a measurement time of 10 ms.
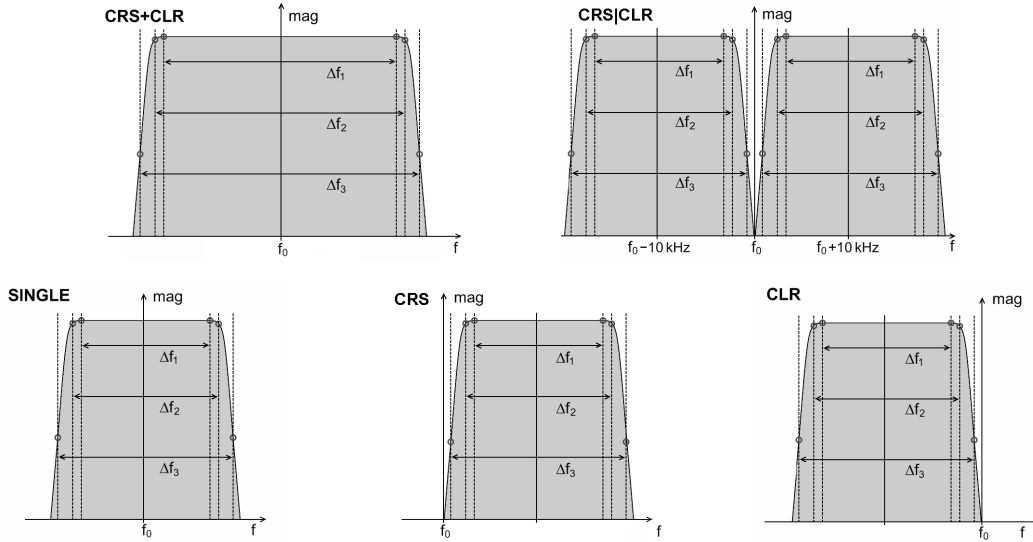
Input level range		–80 dBm to +10 dBm
Modulation depth (0 % to 95 %)		
Resolution		0.01 %
Deviation	90/150 Hz ±2.5 %[2]	≤0.5 %
Deviation	voice/identifier	≤1.0 %
AF		
Deviation	90/150 Hz ±5 Hz[2]	≤0.05 Hz
Deviation	1020 Hz ±50 Hz[2]	≤5.0 Hz
Phase angle 90/150 Hz		
Measurement range		0° to +120°or ±60°
Resolution		0.1°
Deviation		≤0.2°
DDM measurement, localizer mode		
Deviation	≤±10 % DDM	≤0.04 % DDM ±0.1 % of reading
Deviation	>±10 % DDM	≤0.04 % DDM ±0.2 % of reading
DDM measurement, glideslope mode		
Deviation	≤±20 % DDM	≤0.08 % DDM ±0.1 % of reading
Deviation	>±20 % DDM	≤0.08 % DDM ±0.2 % of reading

ILS demodulation filters (for DDM and SDM calculation)

Measurement modes		Single	CRS+CLR	CRS	CLR	CRS|CLR
Δf_1	filter flatness (ripple <0.1 dB)	12.4 kHz	32.0 kHz	12.4 kHz	12.4 kHz	12.4 kHz
Δf_2	–3 dB bandwidth	14.8 kHz	34.9 kHz	14.8 kHz	14.8 kHz	14.8 kHz
Δf_3	–60 dB stopband attenuation	18.8 kHz	39.1 kHz	18.8 kHz	18.8 kHz	18.8 kHz

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[1] Overload display if in-band or out-of-band signals are overloading.

[2] Max. frequency drift of modulation signal.

ILS demodulation filters (for DDM and SDM calculation)

Marker beacon signal analysis

Input level range		–80 dBm to +10 dBm
Modulation depth (80 % to 100 %)		
Resolution		0.01 %
Deviation	400/1300/3000 Hz ±2 %[2]	≤0.5 %
Deviation	ID tone 1020 Hz ±2 %[2]	≤1.0 %
AF		
Deviation	400/1300/3000 Hz ±50 Hz[2]	≤0.5 Hz
Deviation	ID tone 1020 Hz ±50 Hz[2]	≤5.0 Hz

VOR signal analysis

Input level range		–90 dBm to +10 dBm[3]
Azimuth		
Resolution		0.01°
Deviation		≤±0.1°[4]
AM modulation depth (0 % to 50 %)		
Resolution		0.01 %
Deviation	30/9960 Hz ±2 %[2]	≤0.5 %
Deviation	voice/identifier	≤1.0 %
Deviation	AM distortion	≤1.0 %
AF frequency		
Deviation	30 Hz ±3 Hz[2]	≤0.03 Hz
Deviation	1020 Hz ±50 Hz[2]	≤5.0 Hz
Deviation	9960 Hz ±100 Hz[2]	≤0.5 Hz
FM deviation		
Resolution		0.1 Hz
Deviation		≤0.1 Hz ±0.5 % of reading

Frequency scan (R&S®EVS-K1 option)

Frequency range		70 MHz to 350 MHz
Start/stop or center/span		user-selectable in range from 70 MHz to 350 MHz
Level measurement range	selectable	–120 dBm to +13 dBm
Resolution bandwidths		1/3/10/30 kHz
Trace functions		clear/write, average, peak hold, view

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[3] Measurement time for input range –90 dBm to –80 dBm: 500 ms.

[4] Azimuth deviation for input level –90 dBm to –80 dBm: <±0.3°.

FFT mode (R&S®EVS-K4 option)

Frequency range		20/10/5/2.5/1.25/0.625 kHz
Window functions		none/Hann/flat top
Window flatness	none	+0, –4 dB
	Hann	+0, –1.5 dB
	flat top	+0, –0.1 dB
–3 dB bandwidth	none	none: 0.2 % of span
	Hann	Hann: 0.31 % of span
	flat top	flat top: 0.8 % of span
Trace functions		clear/write, average, peak hold, view

Data logger

Simultaneously recorded parameters per record set (selectable) *1 = If *View mode Normal* selected *2 = If *View mode Distortion* selected	ILS	Measurement modes				
		Single	CRS+CLR	CRS	CLR	CRS | CLR
	STIOC (Trigger flags)	✓	✓	✓	✓	✓
	Index	✓	✓	✓	✓	✓
	Date	✓	✓	✓	✓	✓
	Time	✓	✓	✓	✓	✓
	CRS /SINGLE [kHz]	✓	✓	✓		✓
	CLR [kHz]		✓		✓	✓
	LEVEL [dBm; dBµV]	✓	✓			✓
	AM-MOD./90 Hz [%]	✓	✓			
	AM-MOD./150 Hz [%]	✓	✓			
	DDM [µA; %, 1]	✓	✓			✓
	SDM [µA; %, 1]	✓	✓			✓
	FREQ_90 [Hz]	*1	*1	*1	*1	
	FREQ_150 [Hz]	*1	*1	*1	*1	
	PHI-90/150 [°]	*1	*1	*1	*1	
	Voice-Mod. [%]	*1	*1	*1	*1	
	ID-Mod. [%]	*1	*1	*1	*1	
	ID-F.[Hz]	*1	*1	*1	*1	
	ID-Code	✓	✓	✓	✓	✓
	LEV_CLR [dBm; dBµV]		✓		✓	✓
	LEV_CRS [dBm; dBµV]	✓	✓	✓		✓
	AM-MOD_CLR /90 Hz [%]				✓	✓
	AM-MOD_CLR /150 Hz [%]				✓	✓
	DDM_CLR [µA; %, 1]				✓	✓
	SDM_CLR [µA; %, 1]				✓	✓
	AM-MOD_CRS /90 Hz [%]			✓		✓
	AM-MOD_CRS /150 Hz [%]			✓		✓
	DDM_CRS [µA; %, 1]			✓		✓
	SDM_CRS [µA; %, 1]			✓		✓
	PHI-90/90 [°]					✓
	PHI-150/150 [°]					✓
	K2/90 Hz [%]	*2	*2	*2	*2	
	K2/150 Hz [%]	*2	*2	*2	*2	
	K3/90 Hz [%]	*2	*2	*2	*2	
	K3/150 Hz [%]	*2	*2	*2	*2	
	THD/90 Hz [%]	*2	*2	*2	*2	
	THD/150 Hz [%]	*2	*2	*2	*2	
	MeasTime [ms]	✓	✓	✓	✓	✓
	MeasMode	✓	✓	✓	✓	✓
	LLZ_GS	✓	✓	✓	✓	✓
VOR	STIOC (Trigger flags) Index Date Time FREQ [MHz] MEAS.FREQ [MHz] LEVEL [dBm] AM-MOD./30 Hz [%] AM-MOD./9960 Hz [%] AM-DIST./9960 Hz [%] FREQ_30 [Hz] FREQ_9960 [Hz]					

	FREQ_FM30 [Hz]	
	BEARING(from)[°]	
	FM-DEV.[Hz]	
	FM-INDEX	
	Voice-Mod. [%]	
	ID-Mod. [%]	
	ID-F. [Hz]	
	ID-Code	
marker beacon	STIOC (Trigger flags)	
	Index	
	Date	
	Time	
	FREQ [MHz]	
	MEAS.FREQ [MHz]	
	LEVEL [dBm]	
	AM-MOD./3000 Hz [%]	
	AM-MOD./1300 Hz [%]	
	AM-MOD./4000 Hz [%]	
	FREQ_3000 [Hz]	
	FREQ_1300 [Hz]	
	FREQ_400 [Hz]	
	ID-Mod. [%]	
	ID-F. [Hz]	
	ID-CODE	
Additionally recorded parameters in all modes (ILS, VOR, marker beacon)	GPS_lat.	
	GPS_long.	
	GPS_alt [m]	
	GPS_speed [km/h]	
	GPS_date	
	GPS_time	
	GPS_Sat	
	GPS_Status	
	Temp [°C]	
	MeasTime [ms]	
	ATT.Mode	
	TrigCounter	
Data rate		up to 100 record sets / s
Number of record sets per data list		1000000
Number of data lists per mode	ILS, VOR, marker beacon	999
Graphical representation of data logger content	ILS mode	up to 3 traces
Selectable parameters for graphical representation		DDM [µA]
		DDM_CRS [µA]
		DDM_CLR [µA]
		SDM [1]
		SDM_CRS [1]
		SDM_CLR [1]
		LEVEL [dBm]
		LEV_CLR [dBm]
		LEV_CRS [dBm]
Display functions		marker, marker to peak
		vertical scaling
		horizontal scaling

Inputs and outputs (front)

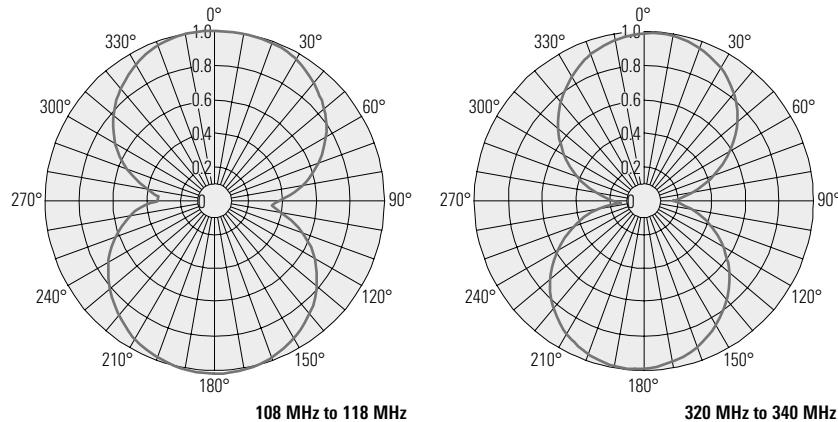|		
RF input	channel 1	N connector, 50 Ω
	channel 2, R&S®EVS-B1 option	N connector, 50 Ω
AF output		3.5 mm female connector
Antenna supply		output for feeding active antennas
USB	double connector	USB stick for data storage and software updates

Inputs and outputs (rear)

Remote interface		RS-232-C, 9-pin D-Sub connector
GPS/GSM interface	R&S®EVS-B2 and R&S®EVS-K2 options	RS-232-C, 9-pin D-Sub connector
LAN interface		RJ-45, 100BaseT
DC output		12 V, max. 300 mA
DC input		10 V to 28 V
Baseband/trigger input		BNC connector
	impedance	1 MΩ, nominal
	baseband level for 100 % modulation depth (selectable)	500 mV/5 V
	trigger level	3.3 V to 12 V, nominal
Analog output	two outputs	BNC connector
	impedance	50 Ω, nominal

General data

Display		16.4 cm/6.4" TFT color display
Resolution		640 × 480 pixels
Temperature range		
Operating temperature range		–10 °C to +55 °C
Storage temperature range		–35 °C to +70 °C
Power supply		
AC supply		100 V to 240 V AC, 1 A to 0.6 A, 47 Hz to 63 Hz
Safety		in line with EN 61010-1
Internal battery	R&S®EVS-B3 option	NiMH battery
Battery operating time	between +10 °C and +45 °C	8 h to 10 h
Recharging time		4 h
External DC power supply		10 V to 28 V, max. 3 A
Mechanical resistance		
Vibration	sinusoidal	in line with IEC 68-2-6
	random	10 Hz to 100 Hz, acceleration 1 g (rms)
Shock		40 g shock spectrum, in line with MIL-STD-810D and MIL-T-28800D
Material		
R&S®EVS-Z1		polyamide (nylon)
R&S®EVS-Z2		alloy
Dimensions		
R&S®EVS300	W × H × D	350 mm × 147 mm × 219 mm (13.78 in × 5.79 in × 8.62 in)
R&S®EVS-Z1	W × H × D	400 mm × 250 mm × 250 mm (15.75 in × 9.84 in × 9.84 in)
R&S®EVS-Z2	W × H × D	500 mm × 400 mm × 200 mm (19.69 in × 15.75 in × 7.87 in)
R&S®EVS-Z3	L × H	3.05 m × 1.05 m (120.08 in × 41.34 in) (stand dimensions, extended/retracted)
R&S®EVS-Z4	W × H × D	1200 mm × 300 mm × 80 mm (47.24 in × 11.81 in × 3.15 in)
R&S®EVS-Z5	W × H × D	150 mm × 50 mm × 80 mm (5.91 in × 1.97 in × 3.15 in)
Weight		
R&S®EVS300	with internal battery (R&S®EVS-B3 option)	5.7 kg (12.57 lb)
R&S®EVS-Z1		1.0 kg (2.20 lb)
R&S®EVS-Z2		4.4 kg (9.70 lb)
R&S®EVS-Z3		2.5 kg (5.51 lb)
R&S®EVS-Z4		2.5 kg (5.51 lb)
R&S®EVS-Z5		0.5 kg (1.10 lb)

ILS (LLZ/GS)/VOR dipole antenna (R&S®EVS-Z3 option)

Frequency range		108 MHz to 118 MHz
		320 MHz to 340 MHz
Typical impedance		50 Ω
Typical gain		–6 dBi
Polarization		horizontal
Radiation pattern		see typical directional receiving pattern
Connector		BNC female

108 MHz to 118 MHz   **320 MHz to 340 MHz**

Typical directional receiving pattern of the R&S®EVS-Z3

Ordering information

Designation	Type	Order No.
ILS/VOR Analyzer	R&S®EVS300	3544.4005.02
Options		
Second Signal Processing Unit	R&S®EVS-B1	5200.6625.02
GSM Modem	R&S®EVS-B2	5200.6631.02
Battery Pack	R&S®EVS-B3	5200.8240.02
Frequency Scan	R&S®EVS-K1	5200.6554.00
GPS Mode	R&S®EVS-K2	5200.6548.00
CRS|CLS Mode	R&S®EVS-K3	5200.9082.00
FFT Mode	R&S®EVS-K4	5201.5922.00
Recommended extras		
Weather Protection Bag	R&S®EVS-Z1	5200.5812.00
Transit Case	R&S®EVS-Z2	5200.6525.00
ILS (LLZ/GS)/VOR Dipole Antenna	R&S®EVS-Z3	5200.6577.02
Transit Case for ILS (LLZ/GS)/VOR Dipole Antenna	R&S®EVS-Z4	5200.9999.00
DC/DC Converter (10 V to 34 V, 3 A at 24 V)	R&S®EVS-Z5	5200.6619.02
ILS/VOR Test Antenna	R&S®HF108	4061.0506.02
Protective Hard Cover	R&S®EVS-Z6	5201.7760.00
Test System for R&S®EVS300	R&S®EVS-Z10	5201.7777.02
Service manual, English		3544.4486.22
Service manual, German		3544.4486.21
Accessories supplied		
External power supply (100 V to 240 V)		5200.9118.02
User manual, English		3544.4486.12
User manual, German		3544.4486.11
DC supply cable		

Certified Quality System
ISO 9001
DQS REG. NO 1954 QM

Certified Environmental System
ISO 14001
DQS REG. NO 1954 UM

For product brochure, see PD 5213.6070.12
and www.rohde-schwarz.com
(search term: EVS300)

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