

ROHDE & SCHWARZ

ETL

The Rohde & Schwarz ETL is a versatile, all-in-one TV analyzer designed for television network operators, broadcasters, and transmitter manufacturers. Combining the features of a high-precision TV test receiver, a comprehensive video/audio analyzer, and a full-featured spectrum analyzer in a single compact and portable instrument, the R&S ETL supports a wide array of analog and digital television standards and delivers highly accurate signal analysis from 500 kHz up to 3 GHz (expandable to 8 GHz).

SPECIFICATIONS

General

Interfaces	LAN (10/100/1000Base-T), USB 2.0 Host, VGA, GPIB (optional)
Display	8.4" TFT color LCD, SVGA (800 x 600 pixels)

Physical

Power Supply	100 V to 240 V AC, 50 Hz to 60 Hz / 400 Hz
Operating Temperature	0 °C to +50 °C °C
Dimensions (W×H×D)	406.5 mm × 216 mm × 460 mm mm
Weight	12.0 kg

Frequency and Amplitude Performance

Frequency Range	500 kHz to 3 GHz (expandable to 8 GHz with option ETL-B203)
Tuning Resolution	1 Hz
Frequency Span Range	0 Hz, 10 Hz to 3 GHz (or 8 GHz)
Aging Rate per Year	1 x 10 ⁻⁶ (standard), 1 x 10 ⁻⁷ with OCXO option
Maximum Safe RF Input Level (Damage Level)	+30 dBm (1 W)
Maximum DC Input Voltage	50 V
1 dB Gain Compression Point	+5 dBm (nominal, 0 dB RF attenuation)
Displayed Average Noise Level (DANL)	Typ. -140 dBm (1 GHz, 10 Hz RBW, preamplifier off)
Attenuator Range	0 dB to 50 dB
Attenuator Step Size	5 dB

Bandwidth and Sweep Characteristics

Resolution Bandwidth (RBW) Range	10 Hz to 10 MHz (in 1-3-10 steps)
Video Bandwidth (VBW) Range	1 Hz to 10 MHz
Sweep Time Range (Span > 0 Hz)	2.5 ms to 16000 s
Sweep Time Range (Zero Span)	1 us to 16000 s

Measurement Capabilities and Signal Processing

Trace Detectors	Max Peak, Min Peak, Auto Peak, RMS, Sample, Average
Supported Analog TV Standards	B/G, D/K, I, K1, L, M, N
Supported Digital TV Standards	DVB-T, DVB-H, DVB-T2, DVB-C, DVB-C2, ISDB-T, ISDB-TB, ATSC, J.83/B, DTMB (option dependent)

Inputs, Outputs and Interfaces

RF Input Connector Type	N female, 50 Ω (75 Ω with adapter/option)
External Reference Input Frequency	10 MHz (BNC)
Internal Reference Output Frequency	10 MHz (BNC)
IF Output	BNC female, 21.4 MHz

System Architecture and Display

Internal Operating System	Windows Embedded
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Physical and Environmental Specifications

Storage Temperature Range	-40 °C to +70 °C
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Standards, Compliance and Calibration

Standard Safety Compliance	IEC 61010-1, EN 61010-1
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RF Input

RF Input Impedance	50 Ω
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Interfaces

VGA Output	15-pin D-Sub
USB Interface	4 × USB 2.0 (2 on front, 2 on rear)
LAN Interface	1 × 10/100/1000Base-T (RJ-45)
GPIB Interface Option	IEEE 488 (GPIB) (with R&S FSL-B10 option)
MPEG-2 TS ASI Input/Output	BNC, 75 Ω (with R&S ETL-B281 option)

Power Options

DC Power Input	12 V to 18 V DC (with R&S ETL-B30 option)
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Measurement Accuracy

Total RF Level Uncertainty	± 0.5 dB (typ. ± 0.3 dB) for TV signals
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Spectrum Analyzer Performance

SSB Phase Noise (10 kHz offset, 1 GHz carrier)	<-100 dBc (1 Hz), typ. -103 dBc (1 Hz)
Third-Order Intercept (TOI)	> 10 dBm, typ. 15 dBm (10 MHz to 3 GHz, RF attenuation 0 dB, preamp off)
Displayed Average Noise Level (DANL, Preamp Off)	typ. -140 dBm (10 MHz to 3 GHz, 1 Hz RBW)
Displayed Average Noise Level (DANL, Preamp On)	typ. -156 dBm (10 MHz to 3 GHz, 1 Hz RBW)
Amplitude Measurement Uncertainty ($f < 3$ GHz)	< 1.0 dB, typ. 0.5 dB

Frequency Reference

Reference Frequency Accuracy Temp Stability (Standard)	1×10^{-6} (0 °C to 50 °C)
Reference Frequency Accuracy Temp Stability (with OCXO Option R&S ETL-B4)	1×10^{-7} (0 °C to 50 °C)

TV Analyzer Performance

Echo Pattern Guard Interval (DVB-T/H)	1/4, 1/8, 1/16, 1/32
Modulation Error Rate (MER) Measurement Range (DVB-T/H)	Up to 40 dB

Inputs & Outputs

CCVS Video Output Connector	BNC female, 75 Ω
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Audio

Built-in Loudspeaker	Yes
Headphone Interface	3.5 mm jack

Hardware Options

RF Preselection Option (R&S ETL-B201)	Tracking subbands (500 kHz to 3 GHz)
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Environmental

Sinusoidal Vibration Resistance	5 Hz to 150 Hz (complies with IEC 60068-2-6)
Random Vibration Resistance	10 Hz to 300 Hz (complies with IEC 60068-2-64)
Shock Resistance	40 g shock spectrum (complies with MIL-STD-810E, method 516.4, procedure I)

TECHNOLOGY

TV Test Receiver & Spectrum Analyzer

APPLICATIONS

Television broadcast analysis, transmitter installation, and network coverage testing

