KEYSIGHT TECHNOLOGIES (AGILENT HP)

8712ES

The Keysight (Agilent) 8712ES is an RF economy vector network analyzer covering a frequency range of 300 kHz to 1.3 GHz. Featuring a built-in S-parameter test set with full two-port vector-error correction, it provides fast, accurate characterization of active and passive RF components like filters, amplifiers, antennas, and cables. The 8712ES offers standard features such as a 60-dB source step attenuator, 3 to 1601 sweep points, multiple IF bandwidth choices down to 15 Hz, and a 3.5-inch floppy drive, making it a highly productive and cost-effective test solution for both production and R&D.

SPECIFICATIONS

General

Interfaces	GPIB (IEEE-488.2), RS-232-C, Parallel (Centronics), VGA Video Output, LAN (optional)
Display	9-inch diagonal monochrome CRT
Internal Non-Volatile Storage Capacity	Up to 20 instrument states and calibration sets

Physical

Power Supply	90 to 264 VAC (47 to 66 Hz), 230 VA maximum
Operating Temperature	0 to 55 °C °C
Dimensions (W×H×D)	425 mm × 179 mm × 514 mm mm
Weight	20.5 kg kg

Stimulus (Source)

Frequency Range	300 kHz to 1.3 GHz
Frequency Resolution	1 Hz
Frequency Accuracy	±5 ppm (at 25 °C ±5 °C)
Power Range (50 Ω)	-85 to +10 dBm
Power Range (75 Ω)	-85 to +5 dBm
Power Resolution	0.01 dB
Power Level Accuracy	±1.0 dB (at 0 dBm)
Power Flatness	±1.0 dB
Harmonics	< -30 dBc (at +10 dBm)
Non-Harmonic Spurious	< -30 dBc

Receiver

Narrowband Frequency Range	300 kHz to 1.3 GHz
Broadband Frequency Range	10 MHz to 1.3 GHz
Narrowband Maximum Input Level	0 dBm
Broadband Maximum Input Level (50 Ω)	+16 dBm
Broadband Maximum Input Level (75 Ω)	+14.75 dBm
Narrowband Damage Level	+20 dBm
Broadband Damage Level (50 Ω)	+20 dBm
Broadband Damage Level (75 Ω)	+18.75 dBm
Narrowband Noise Floor (< 370 kHz)	< -85 dBm
Narrowband Dynamic Range (50 Ω)	> 110 dB (370 kHz to 1.3 GHz)
Narrowband Dynamic Range (75 Ω)	> 108 dB (370 kHz to 1.3 GHz)
Broadband Dynamic Range (50 Ω)	> 66 dB (10 MHz to 1.3 GHz)
Broadband Dynamic Range (75 Ω)	> 61 dB (10 MHz to 1.3 GHz)

Test Port Characteristics

Number of Test Ports	2
Test Port Impedance	50 Ω (standard) / 75 Ω (Option 1EC)
Test Port Connectors (50 Ω)	Type-N female
Test Port Connectors (75 Ω)	Type-N female (Option 1EC)
Raw Directivity	35 dB (300 kHz to 1.3 GHz)
Raw Source Match	30 dB (300 kHz to 1.3 GHz)
Raw Load Match	18 dB (300 kHz to 1.3 GHz)
Corrected Directivity (50 Ω Type-N)	40 dB
Corrected Source Match (50 Ω Type-N)	36 dB
Corrected Load Match (50 Ω Type-N)	40 dB

Measurement Capabilities

Supported S-Parameters	S11, S21, S12, S22
Measurement Formats	Log magnitude, linear magnitude, phase, group delay, SWR, Smith chart, polar, real, imaginary
Sweep Types	Frequency sweep, power sweep
Number of Sweep Points	3 to 1601
IF Bandwidth Range	15 Hz to 6.5 kHz
IF Bandwidth Settings	15, 30, 100, 300, 1000, 3000, 6500 Hz
Measurement Channels	2 (independent)
Display Channels	2 (independent)
Calibration Types Supported	Response, Response/Isolation, 1-port, 2-port (full vector)
Limit Line Testing	Supported (up to 18 segments per channel)
Group Delay Aperture Range	0.25% to 100% of frequency span

Connectivity & Interfaces

GPIB Port	IEEE-488.2, active controller or device
Serial Port	RS-232-C (9-pin D-sub)
Parallel Port	25-pin D-sub (Centronics)
External Video Output	VGA (15-pin D-sub)
Keyboard Connector	DIN (for external PC keyboard)
External Trigger Input	BNC female
External Reference Input	10 MHz (BNC female)
External Reference Output	10 MHz (BNC female)
Auxiliary Input	BNC female

Storage

Removable Media Drive	3.5-inch floppy disk drive
File Formats Supported	MS-DOS, LIF

Environmental & Physical

Warm-up Time	30 minutes
Altitude Limits (Operating)	Up to 4,500 meters
Altitude Limits (Non-operating)	Up to 15,240 meters
Safety Standards	CSA 1010.1, EN 61010-1
Electromagnetic Compatibility	CISPR 11, EN 55011 Class A

Options

Option 1D5	High-stability frequency reference
Option 1EC	75 ohm system impedance
Option 100	Fault location and structural return loss measurement
Option 101	AM delay measurement capability
Option 1C2	HP Instrument BASIC (IBASIC) capability
Option 1F7	LAN interface and software

Performance

Sweep Time per Point (Narrowband)	0.25 ms (typical)
Sweep Time per Point (Broadband)	0.05 ms (typical)

Power

Maximum Power Consumption	230 VA
Line Voltage	90 to 132 VAC or 198 to 264 VAC (automatic selection)
Line Frequency	47 to 66 Hz

Features

Number of Markers	8 markers per channel

Receiver Performance

Narrowband Trace Noise (Magnitude)	< 0.006 dB rms (3 kHz IF BW, maximum source power)
Narrowband Trace Noise (Phase)	< 0.05° rms (3 kHz IF BW, maximum source power)
Narrowband Receiver Crosstalk (50 Ω)	100 dB (300 kHz to 1.3 GHz, maximum source power)
Narrowband Receiver Crosstalk (75 Ω)	96 dB (300 kHz to 1.3 GHz, maximum source power)
Broadband Receiver Crosstalk (50 Ω)	55 dB (10 MHz to 1.3 GHz, maximum source power)
Broadband Receiver Crosstalk (75 Ω)	50 dB (10 MHz to 1.3 GHz, maximum source power)
Receiver Dynamic Accuracy (Amplitude)	±0.20 dB (at -10 to -80 dB relative to maximum receiver input)
Receiver Dynamic Accuracy (Phase)	±1.5° (at -10 to -80 dB relative to maximum receiver input)

Interfaces & Connectivity

LAN Interface Protocols	TCP/IP, FTP, LPD (with Option 1F7)

Environmental & Safety

Environmental Compliance	MIL-T-28800D, Class 5

Options & Accessories

Option 1D5 Frequency Stability	±0.05 ppm (0 °C to 55 °C)
Option 1D5 Aging Rate	< 0.5 ppm/year

TECHNOLOGY

Vector Network Analysis

APPLICATIONS

RF Component Testing (Filters, Amplifiers, Antennas, Cables)