

HP E3238S 2 to 2650 MHz

Technical Specifications

Scanning Signal Analysis System



Specifications describe warranted performance over the temperature range of 0° to 50°C (except where noted), after a 30-minute warm-up from ambient conditions, for the system configuration listed. Supplemental characteristics identified as "typical" or "characteristic," provide useful information by giving non-warranted performance parameters. Typical performance is applicable from 20° to 30°C. For more detailed specifications refer to the technical data sheets of the individual system components.

Configuration

The performance of this system depends on its hardware and software components. This technical data is based on the following configuration. Any changes in this configuration may effect system performance.

Table 1 Configuration data

Controller	HP E1498A with 64 Mbytes RAM
ADC	HP E1430A with opt AYD, 10.24 MHz time base
DSP	HP E1485A with four option 1FL, 96002 DSP
Down Converter	HP 89431A (2-2650 MHz)
System Disk	HP E4208A (500 MByte)
rf Mux	HP E1472A (50 Ω)
Mainframe	HP E1401A (13 slot, C size)
Monitor	HP A4032A (17 inch, color)
Operating Software	HP 35688B Scanning signal analysis software

Definitions

Standard Features

(HP 35688B Scanning Signal Analysis software)

Baseband = dc to 4 MHz

 $\label{eq:dBfs} \begin{array}{l} \text{dBfs} = \text{dB} \ \text{relative to full scale amplitude range} \\ \text{setting. Full scale on the ADC module is} \\ \text{approximately 1 dB below overload.} \\ \textbf{FS or fs} = \text{Full scale; the same as amplitude range} \\ \text{or input range} \\ \textbf{RF} = > 4 \ \text{MHz} \end{array}$

Sweep types

General Search: Linear sweep (F1-F2) Advanced Directed Search (opt AS7): Linear sweep, 100 segments

Resolution

Resolution bandwidth filters Bandwidth Shape factor **Averaging** rms Peak

Tools

Mouse control

Left button: off/marker/segment ID Middle button: off/drag and drop Right button: off/trace scaling /search receiver tuning/handoff new signals/handoff all signals

Signal detection setup

Peak criterion Signal bandwidth

Threshold setup

Level mode Threshold level adjust Threshold presentation: off/line/mask

Markers

Marker search: Peak, next peak right, next peak left

Marker function: signal handoff

Receiver hand off

Hand off process: manual (mouse, menu, marker), automatic Signal type: new, all Priority Detection Duration Signal routing

Display

Measurement Data Spectrum Spectrogram (two color) Data format Log magnitude (dBm) **Display layout** Trace: A/B/C/D Handoff Receiver Handoff Log Text Editor Command Line Color Grid: off/graticules/handoffs Hand off setup: priority/detection/duration Trace selection Auto-scaling: frequency/amplitude Secure (blank): on/off

General

Handoff log

On-line help (context sensitive) File Save/load/preset mission set-up Access control via password Print: screen, file

Optional Features

Advanced Directed Search (AS7)

Specifications

RF Specifications (HP 89431A down converter. See technical data sheet for detailed performance specifications)

Frequency

Range IF (used by HP E3238S)

Amplitude

Input range Maximum safe input power Impedance VSWR

Connector Spurious free dynamic range Sensitivity Noise figure Third order intercept point Harmonic distortion

General spurious Residual responses

Baseband Specifications (HP E1430A ADC. See technical data sheet for detailed performance specifications)

Frequency

Range ADC sample rate Anti-alias filter Digital filters

Amplitude Impedance Raw ADC resolution Sensitivity Noise figure Damage input signal level Spurious free dynamic range Harmonic distortion General spurious Residual responses

- 50 dBm to + 25 dBm (5 dB steps)
+ 25 dBm (average continuous power) 50 Ω , unbalanced 1.6:1, 12.7 dB return loss (range \geq – 20 dBm) 1.8:1, 11 dB return loss (range ≤ -25 dBm) Type N 70 dB (7.5 kHz RBW, – 25 dBm range) < – 159 dBm/Hz (– 50 dBm range) > 15 dB ≥ 33 dB (above range) < - 75 dBc (≥ - 25 dBm range) < - 54 dBc (≤ - 30 dBm range) < - 70 dBc < - 80 dBfs

2 MHz to 2650 MHz

2 MHz bandwidth centered at 3 MHz

dc to 4 MHz 10.24 MSa/second 4 MHz, low pass 0.24 Hz to 2 MHz, octave steps, includes frequency translation (zoom) capability

50 Ω 23 bits - 159 dBm/Hz (- 32 dBm range) < 15 dB > + 31 dBm up to 110 dBfs < – 80 dBc or –110 dBfs (two signals present) < – 110 dBfs

< - 110 dBfs

General Specifications			
Sweep rate	1.1 GHz/second, max (7.5 kHz RBW, threshold off, signal detection off, 1000 Hz settling)		
Resolution bandwidth filters Bandwidths Filter shape (– 60 dB: – 3 dB)	60 Hz to 120 kHz (9.1:1 shape factor), in octave steps 9.1:1, 4.0:1, 2.6:1		
Averaging Modes Number of averages	rms, peak 1 to 16, in octave steps		
Hand off receiver control Number of receivers Control interfaces Pre-programmed receivers	4, maximum HP-IB, RS-232, LAN, VXI WJ 8618 VHF/UHF receiver, WJ 8615 receiver		
User interface X11 R5 Motif 1.2. (requires 40 colors)			
Antenna Input Number Compensation	1 to 16 (using HP E1472A 50 ${f \Omega}$ RF multiplexer) gain (single value), frequency range		

Frequency points collected per sweep (typical)

RBW	Frequency Points	Bytes of Data
60 Hz	25600 K	102.4 M
940 Hz	1600 K	6.4 M
7.5 kHz	200 K	0.8 M
30 kHz	50 K	0.2 M
120 kHz	12.5 K	0.05 M

Sweep Rate vs Resolution Bandwidth (typical) With averaging off, markers off, single trace





Sweep Rate vs Frequency Span and Resolution Bandwidth (typical) Without averaging





Sweep Rate vs Frequency Span and Resolution Bandwidth (typical) With rms averaging (16)



Physical Specifications (Based on configuration in Table 1. VXI module power consumption, weight, and size are included with VXI chassis.)

Environmental	VXI Chassis (HP E1401A)	Downconverter (HP 89430A)	Monitor (HP A4032A)	Disk Drive (HP E4208A)
Operating Temperature Humidity (non-condensing)	0° to 55°C 75% (40°C)	0° to 55°C 10 to 90% (40°C)	0° to 40°C 10% to 80% (40°C)	5° to 45°C 10 to 80% (40°C)
Storage				
Temperature	– 40° to 75°C	– 20° to 65°C	- 40° to 60°C	- 20° to 60°C
Humidity (non-condensing)	75% (40°C)	10% to 90% (40°C)	5% to 95%	5% to 95%
			(65°C, 24 hrs)	
Altitude	4600 m (15,000 ft)	4600 m (15,000 ft)	15333 m (50,000 ft)	n/a
Weight	22 kg (47 lbs)	25 kg (55 lbs)	22 kg (47 lbs)	n/a
Power				
110/120 VAC, 50-60 Hz	12 A	2.3 A	2.7 A	n/a
220/240 VAC, 50-60 Hz	6 A	1.2 A	1.5 A	
Size				
(mm H \times mm W \times mm D)	323 × 426 × 602	$173 \times 419 \times 495$	$414 \times 406 \times 450$	1 slot
$($ inch H \times inch W \times inch $($ D $)$	$12.7 \times 16.8 \times 23.7$	$6.8 \times 16.5 \times 19.5$	$16.7 \times 16 \times 17.7$	C size VXI

Options

Directed Search (opt AS7)

Segments Control	100 start/stop frequency, resolution bandwidth filtering, filter shape factor, average mode, number averages, sweep ratio, tuner attenuation, antenna selection, status
Edit	single/multiple bands, sort by frequency
Segment label	mouse, marker
Database	comma separate value format



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