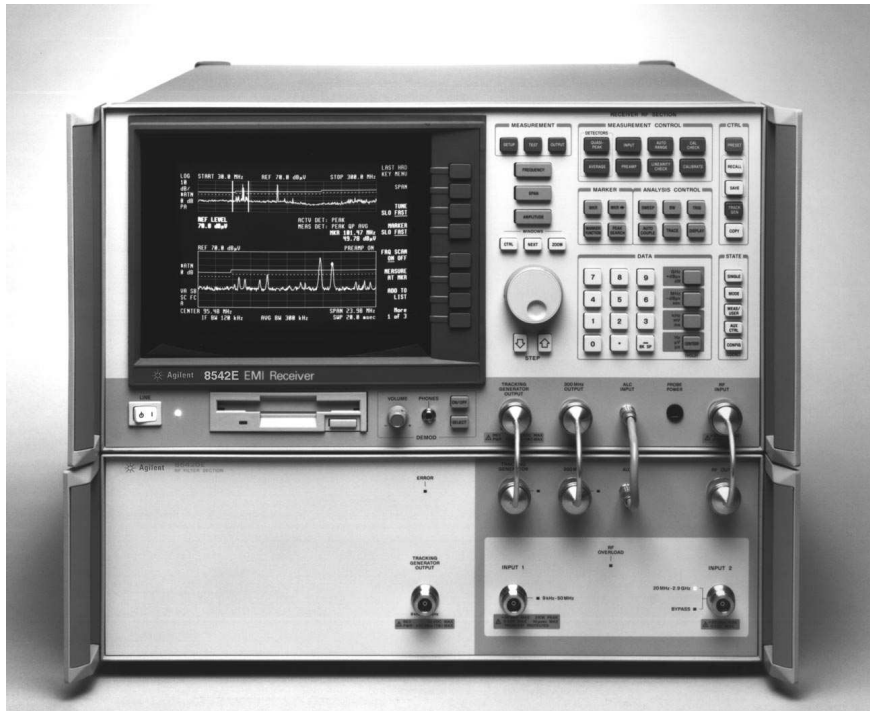




Agilent 8542E EMI Receiver Agilent 85422E Receiver RF Section Agilent 85420E RF Filter Section

Product Overview



9 kHz to 2.9 GHz

The Agilent Technologies 8542E EMI test receiver is designed for conformance testing to industry standards such as CISPR, EN, FCC, VCCI, and VDE.

Just like the Agilent 8546A EMI test receiver, the 8542E is fully CISPR 16 compliant. This includes meeting the strict requirement for ± 2 dB absolute amplitude accuracy and correct measurement of the CISPR pulse.

With an upper frequency of 2.9 GHz, the 8542E provides extended frequency coverage for:

- Testing the fundamental and first two harmonics of 900 MHz mobile communications devices,
- Performing FCC testing of devices with internally generated frequencies up to 500 MHz,
- Measuring the fundamental of the latest 2.4 GHz wireless communications devices and,
- Testing devices, such as microwave ovens, with emissions above 2 GHz.

The 8542E includes built-in measurement functions and routines which automate and speed conformance testing. The Measure at Marker function automatically measures the corrected (dBmV/m) peak, quasi peak, and average amplitude of a signal with the press of one key. The built-in DOS disk drive allows a measured, internal list of signals to be easily transferred directly to your personal computer.



Agilent Technologies

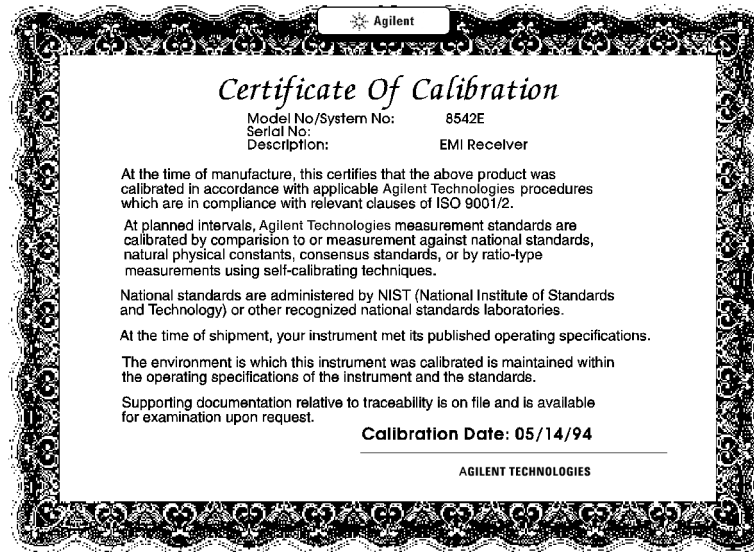
Innovating the HP Way

Measurement Confidence —an Agilent Tradition

In the EMI business, accurate measurements are essential. That is why measurement confidence is one of the cornerstones of the 8542E. We began with a robust design that met or exceeded all the recommendations of CISPR Publication 16. Next, we included RF and IF overload detectors to warn you of any possible overload condition. If overload does occur, built-in auto-ranging readjusts the receiver's IF gain and/or RF attenuation settings to automatically eliminate any overload conditions.

To insure accurate calibration of the receiver, we added features that include:

- A fully automatic calibration routine that completely calibrates the receiver with the touch of a button. All calibration signals are automatically switched internally to both inputs, so you don't have to connect or disconnect any cables on the front panel to perform a calibration.
- A built-in real-time clock that lets you program a time to start the calibration, even if the receiver is unattended. You can schedule the calibration to automatically begin before you arrive at work. The receiver will be fully calibrated and ready to start making measurements, saving you time and making you more productive.
- A Cal Check key, which you can press before measuring a signal, performs a quick calibration verification to assure that you are making accurate measurements.



A certificate of calibration, shipped with each receiver

- A Receiver Calibration Status key which displays the date of the last factory or service center calibration, and the date of the last user calibration. This capability helps you meet the goals of ISO 9000 by documenting the calibration status of your receiver. Agilent takes great care in building and testing our EMI instrumentation products. We believe ISO 9000 certification of our facilities by recognized third-party registrars complements our long standing objective to provide products and services of the highest quality and the greatest possible value to our customers. This product was manufactured in an ISO 9002 registered facility in concurrence with Agilent's quality commitment.

Support

Agilent Technologies operates many of its own EMC test facilities, so we understand how important it is to keep your test systems up and running. When you buy a 8542E, you get more than just a great EMI receiver - you also get the reliability, service, and support on which Agilent has built its reputation. With service centers, systems engineers, and customer engineers located worldwide, and the factory expertise to back them up, Agilent is ready to support you in a way no other company can.

These specifications apply to both the Agilent 8542E EMI receiver and the 85422E receiver RF section except where noted. All specifications apply over a 0 to 55 °C temperature range unless otherwise stated. The receiver will meet its specifications after two hours of storage at a constant temperature within the operating temperature range, after the receiver has been operating for thirty minutes, and after CAL ALL has been run.

Supplemental characteristics are denoted by “characteristic,” “nominal,” and “approximately;” these constitute nonwarranted functional performance information derived during the design process and are not tested on a continuing basis.

Specifications

Frequency Specifications

Tuning Range

Agilent 8542E	
Band 1	9 kHz to 50 MHz
Band 2	20 MHz to 2.9 GHz
Bypass	9 kHz to 2.9 GHz
Agilent 85422E	9 kHz to 2.9 GHz

Frequency Reference

Aging	$< \pm 1 \times 10^{-7}$ /year
Settability	$< \pm 1 \times 10^{-8}$
Temperature Stability	$< \pm 1 \times 10^{-8}$

Frequency Readout Accuracy $\pm(\text{frequency readout} \times \text{frequency reference error} + 1\% \text{ of span} + 20\% \text{ of IF bandwidth} + 100 \text{ Hz})$

Frequency Span Accuracy

Span \leq 10 MHz	$\pm 2\%$ of Span
Span $>$ 10 MHz	$\pm 3\%$ of Span

Marker Count Accuracy

Frequency Span \leq 10 MHz $\pm(\text{marker frequency} \times \text{frequency reference error} + \text{counter resolution} + 100 \text{ Hz})$
 Frequency Spans $>$ 10 MHz $\pm(\text{marker frequency} \times \text{frequency reference error} + \text{counter resolution} + 1 \text{ kHz})$

Counter Resolution

Frequency Spans \leq 10 MHz	Selectable from 10 Hz to 100 kHz
Frequency Spans $>$ 10 MHz	Selectable from 100 Hz to 100 kHz

Sweep Time

Range	20 ms. to 100 sec.
Sweep Trigger	Free Run, Single, Line, Video, External

Amplitude Specifications

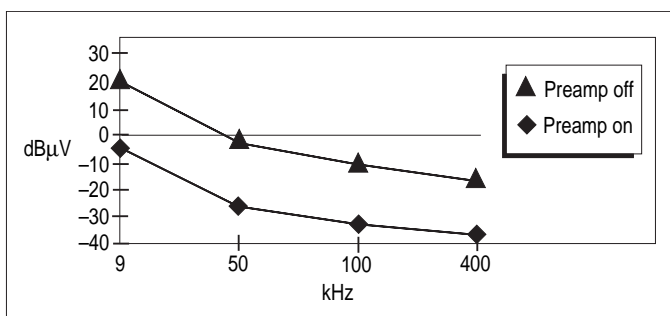
Characteristic Noise Indication with CISPR Measurement bands (0 dB attenuation, 50 Ω input termination)

		Peak	Quasi-Peak	Average
Agilent 8542E				
CISPR Band A	9 kHz to 150 kHz (200 Hz Bandwidth)			
Preamp off		15 to -15 dBμV	6 to -25 dBμV	3 to -27 dBμV
Preamp on		2 to -28 dBμV	7 to -29 dBμV	-9 to -31 dBμV
CISPR Band B	150 kHz to 30 MHz (9 kHz Bandwidth)			
Preamp off		-3 dBμV	-11 dBμV	-18 dBμV
Preamp on		-8 dBμV	-15 dBμV	-21 dBμV
CISPR Band C/D	30 MHz to 1 GHz (120 kHz Bandwidth)			
Preamp off		9 dBμV	2 dBμV	-5 dBμV
Preamp on		4 dBμV	-2 dBμV	-10 dBμV

Displayed Average Noise Level (0 dB attenuation, 50 Ω input termination, 30 Hz IF BW, 30 Hz Averaging BW)

Agilent 8542E

$f_0 \leq 400$ kHz



$f_0 > 400$ kHz

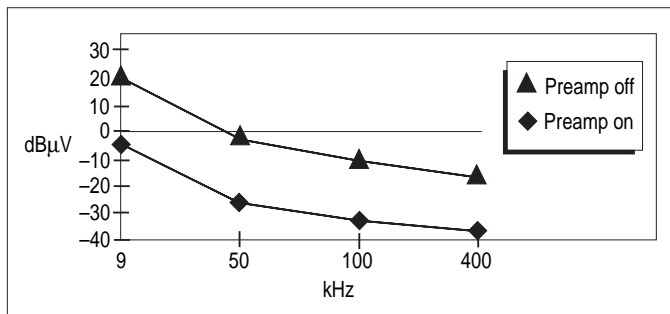
	Band 1	Band 2
	9 kHz to 50 MHz	20 MHz to 2.9 GHz
Preamp off	-31 dBμV	-31 dBμV
Preamp on	-39 dBμV	-39 dBμV

Preamp off

Preamp on

Agilent 85422E

$f_0 \leq 400$ kHz



$f_0 > 400$ kHz

Preamp off	-18 dBμV
Preamp on	-39 dBμV

Absolute Amplitude Accuracy**Agilent 8542E only**

	Band 1	Band 2
	9 kHz to 50 MHz	20 MHz to 2.9 GHz
specification	±2 dB	±2 dB
characteristic	±1 dB	±1 dB

Linear to Log Scale Switching Uncertainty

Agilent 85422E ±0.25 dB

Display Scale Fidelity

Agilent 85422E

Log Scale

Cumulative Uncertainty (0 to -66 dB from Reference Level)

3 kHz to 3 MHz IF BW ±(0.3 dB + 0.01 x dB from Ref. Level)

30 Hz to 1 kHz IF BW ±(0.4 dB + 0.01 x dB from Ref. Level)

Incremental Uncertainty (0 to -56 dB from Reference Level) ±0.4 dB/4dB

Linear Scale

±3% of Reference Level

Gain Compression (Specification is derived from measured distortion with a total power at the input mixer of -10 dBm. If the IF BW ≤ 300 Hz, this applies only if signal separation 34 kHz and signal amplitude is ≤ Ref. Level + 10 dB.)

f₀ < 10 MHz < 0.75 dBf₀ ≥ 10 MHz < 0.5 dB**Characteristic 1 dB Compression Point (Characteristics apply for f₀ > 10 MHz)**

	Band 1	Band 2
Agilent 8542E	9 kHz to 50 MHz	20 MHz to 2.9 GHz
Preamp off	89 dBμV	89 dBμV
Preamp on	77 dBμV	77 dBμV
Agilent 85422E		
Preamp off	102 dBμV	
Preamp on	75 dBμV	

Third Order Intercept Pointf₀ > 200 kHz, Signal separation > 50 kHz

	Band 1	Band 2
Agilent 8542E	9 kHz to 50 MHz	20 MHz to 2.9 GHz
Preamp off	97 dBμV	97 dBμV
Preamp on	85 dBμV	85 dBμV
Agilent 85422E		
Preamp off	112 dBμV	
Preamp on	85 dBμV	

Second Harmonic Intercept Point

	Band 1	Band 2
Agilent 8542E	9 kHz to 50 MHz	20 MHz to 2.9 GHz
f ₀ ≤ 1 GHz, ≥1.5 GHz		
Preamp off	122 dBμV	122 dBμV
Preamp on	110 dBμV	110 dBμV
1 GHz < f ₀ < 1.5 GHz		
Preamp off		117 dBμV
Preamp on		107 dBμV
Agilent 85422E		
Preamp off		134 dBμV
Preamp on		100 dBμV

Other Input Related Spurious

-65 dBc ($f_0 > 10$ MHz)

Residual Responses (0 dB attenuation, 50 Ω Input termination, Preamp on)

Agilent 8542E	9 kHz to 30 kHz	< -2 dB μ V	30 kHz to 2.9 GHz	< -10 dB μ V
Agilent 85422E	9 kHz to 150 kHz	< 2 dB μ V	150 kHz to 2.9 GHz	< -8 dB μ V

IF and Display Specifications

IF Bandwidths

Measurement (6 dB) 200 Hz, 9 kHz, 120 kHz
(conform to CISPR Publication 16)

Diagnostic (3 dB) 30 Hz to 3 MHz in 1-3-10 steps, and 5 MHz

Averaging Bandwidths 30 Hz to 3 MHz in 1-3-10 steps. Post-detection single pole low-pass filters 1, 3, and 10 Hz digital filters with anti-aliasing

Demodulation AM and FM

Detectors

Measurement Peak, Quasi-Peak, and Average
Quasi-Peak time constants conform with CISPR Publication 16

Overload

Agilent 8542E Broadband RF (band 1 and 2 only) and IF
Agilent 85422E IF

Inputs and Outputs

Front Panel Inputs

Agilent 8542E	
Input 1	9 kHz to 50 MHz, Type-N female
Input 2	9 kHz to 2.9 GHz, Type-N female
Agilent 85422E	9 kHz to 2.9 GHz, Type-N female

Preamplification

Agilent 8542E	
Bands 1 and 2	12 dB
BYPASS	27 dB
Agilent 85422E	27 dB

Maximum Safe Input Level

Agilent 8542E		
DC Voltage		0 V
Average Power		137 dB μ V (30 dBm)
Peak Pulse Power	Input 1	2000W peak for 10 μ sec, > 20 dB input attenuation
	Input 2	100W peak for 10 μ sec, 1% duty cycle, 30 dB input attenuation
Agilent 85422E		
DC Voltage		0 V (DC coupled) 50 V (AC coupled)
Average Power		137 dB μ V (30 dBm)
Peak Pulse Power		100W peak for 10 μ sec, 1% duty cycle, 30 dB input attenuation

Input VSWR

Agilent 8542E Bands 1, 2, and 3		
0 dB input attenuation		2 : 1
10 dB input attenuation	≤ 1.5 GHz	1.2 : 1
	> 1.5 GHz	1.6 : 1

Input Attenuation

Agilent 8542E	
Input Attenuator	0 to 50 dB in 10 dB steps
Linearity test attenuator	4 dB

Agilent 85422E	
Input Attenuator	0 to 70 dB in 10 dB steps

Inputs and Outputs (continued)

Input Filter Bandwidths

Agilent 85420E (all 3 dB bandwidths are characteristics)

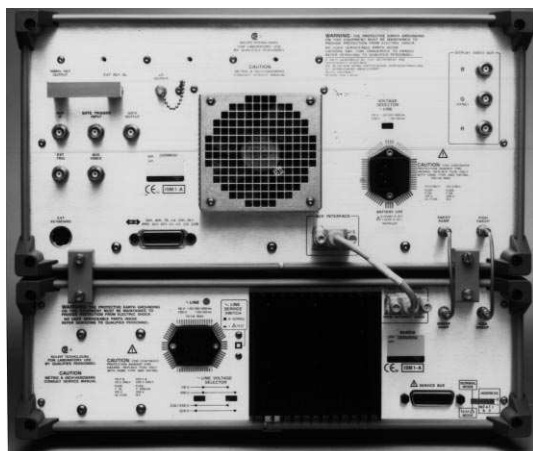
9 to 74 kHz	fixed
74 to 198 kHz	fixed
198 to 525 kHz	fixed
525 to 1025 kHz	fixed
1 to 2 MHz	fixed
2 to 6 MHz	tunable (20% 3 dB bandwidth)
6 to 17 MHz	tunable (10% 3 dB bandwidth)
17 to 29 MHz	tunable (7% 3 dB bandwidth)
29 to 52 MHz	tunable (8% 3 dB bandwidth)
52 to 98 MHz	tunable (6% 3 dB bandwidth)
98 to 152 MHz	tunable (6% 3 dB bandwidth)
152 to 216 MHz	tunable (6% 3 dB bandwidth)
216 to 330 MHz	tunable (5% 3 dB bandwidth)
330 to 500 MHz	tunable (5% 3 dB bandwidth)
.5 to 1 GHz	tunable (4% 3 dB bandwidth)
1 to 2.9 GHz	fixed

Front Panel Outputs

Tracking Generator	Type-N female, 50 Ω nominal
Probe Power	+ 15 VDC \pm 7% at 150 mA max. -12.6 VDC \pm 10% at 150 mA max. 1/8 inch monaural jack
Earphone Jack	
Agilent 85422E only	
Calibrator Signal	Type-N female, 300 MHz, -20 dBm
External ALC	Negative detector

Rear Panel Inputs and Outputs

10 MHz REF OUTPUT output amplitude	BNC female, 50 Ω > 0 dBm
EXT REF IN frequency input amplitude range	BNC female 10 MHz -2 to 10 dBm
AUX IF OUT frequency amplitude range	BNC female, 50 Ω 21.4 MHz -10 to -60 dBm
AUX VIDEO OUT amplitude range	BNC female 0 to 1 V



Inputs and Outputs (continued)

EXT KEYBOARD		Interface compatible with Agilent C1405A Option ABA keyboard and most IBM/AT non auto-switching keyboards.
EXT TRIG INPUT		BNC female
trigger level		Positive edge initiates sweep in EXT TRIG mode (TTL)
LO OUTPUT		SMA female, 50 Ω
frequency range		3 to 6.8214 GHz
HI-SWEEP IN/OUT		
input/output (85422E)		SMA female, high = sweep, low = retrace (TTL)
output (85420E)		SMA female, high = sweep, low = retrace (TTL)
SWEEP INPUT /OUTPUT		
output (85422E)		SMA female, 0 to 10 V
input (85420E)		SMA female, 0 to 10 V
REMOTE INTERFACE		
Agilent 85422E standard		GPIB
Option 023		RS-232
Agilent 85420E		GPIB compatible service port (for service use by qualified repair personnel only)
MONITOR OUTPUT		
		R, G, B (Composite video on G)
		25 kHz horizontal rate
		60 Hz vertical rate
Agilent 85422E only		
AUX INTERFACE		9-pin subminiature "D"

Tracking Generator Specifications

Output Frequency Range		9 kHz to 2.9 GHz
Output Power Level		
Range		-1 to -66 dBm
Resolution		0.1 dB
Absolute Accuracy	85422E	± 0.75 dB
(-20 dBm at 300 MHz, 25 °C \pm 100 °C)	8542E	± 0.75 dB (characteristic)

General Specifications

Storage Media Internal 3.5 inch disk drive
MByte DOS and LIF format

Temperature Range
Operating 0 to 55 °C

Storage media 4 °C to 45 °C

Storage -20 °C to 65 °C

EMI Compatibility Measurement characteristics are in compliance with CISPR Publication 16. Radiated and conducted emissions are in compliance with CISPR Publication 11/1990 Group 1 Class A. Receiver is compliant with CISPR Publication 16 at 3 V/m

Power Requirements

	Voltage	Power consumption
Agilent 8542E	90 to 132 Vrms, 47 to 440 Hz 198 to 264 Vrms, 47 to 66 Hz	On < 615 VA; < 265 W Off < 5 W
Agilent 85422E	90 to 132 Vrms, 47 to 440 Hz 198 to 264 Vrms, 47 to 66 Hz	On < 500 VA; < 180 W Off < 5 W
Agilent 85420E	90 to 132 Vrms, 47 to 440 Hz 198 to 264 Vrms, 47 to 66 Hz	On < 115 VA; < 85 W Off 0 W

Dimensions

Agilent 8542E

Width	457 mm (18 inches)
Height	365 mm (14 ³ / ₈ inches)
Depth	645 mm (25 ³ / ₈ inches)
Weight	49 kg (108 lb)

Agilent 85422E

Width	457 mm (18 inches)
Height	235 mm (9 ¹ / ₄ inches)
Depth	645 mm (25 ³ / ₈ inches)
Weight	28.1 kg (62 lb)

Agilent 85420E

Width	457 mm (18 inches)
Height	146 mm (5 ³ / ₄ inches)
Depth	645 mm (25 ³ / ₈ inches)
Weight	20.9 kg (46 lb)

Ordering Information

8542E	EMI Receiver
85422E	Receiver RF Section
85420E	RF Filter Section
Option 0B1	Add extra manual set
Option 1CM	Rack mount kit
Option 023	Substitutes RS-232 for GPIB interface
Option W30	Three-year return-to-Agilent service
8546A	6.5 GHz EMI Test Receiver data sheet, literature number 5091-8314E

Accessories

92203J	GPIB-to-Centronics Adapter (Includes a 110-120 V, 60 Hz AC adapter and NEMA (U.S.) style power cord)
92203K	GPIB-to-Centronics Adapter. No AC adapter included. (Order Agilent 82241A AC adapter with appropriate option: ABB - Europe ABG - Australia ABJ - Japan ABU - United Kingdom)
C1405A	101-key, enhanced PC keyboard
85460-20036	Replacement semi-rigid cable for front panel
8120-8154	Replacement flexible cable for rear panel (for high sweep or sweep ramp)
8120-6337	Replacement Auxilliary bus cable

Supported Printers

(Note: Printers with GPIB interfaces can be connected directly to a standard 8542E or 85422E. Printers with parallel (Centronics) interfaces require the use of an GPIB-to-Centronics adapter. Printers with RS-232 interfaces can be connected directly to an 8542E or 85422E if Option 023 is installed.)

HP ThinkJet
HP QuietJet
HP PaintJet
HP DeskJet
HP DeskJet 500
HP DeskJet 500C
HP DeskJet 550C
HP LaserJet
HP LaserJet II
HP LaserJet III
HP LaserJet 4
Epson MX-80

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you use Agilent equipment, we can verify that it works properly, help with product operation, and provide basic measurement assistance for the use of specified capabilities, at no extra cost upon request. Many self-help tools are available.

Your Advantage

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