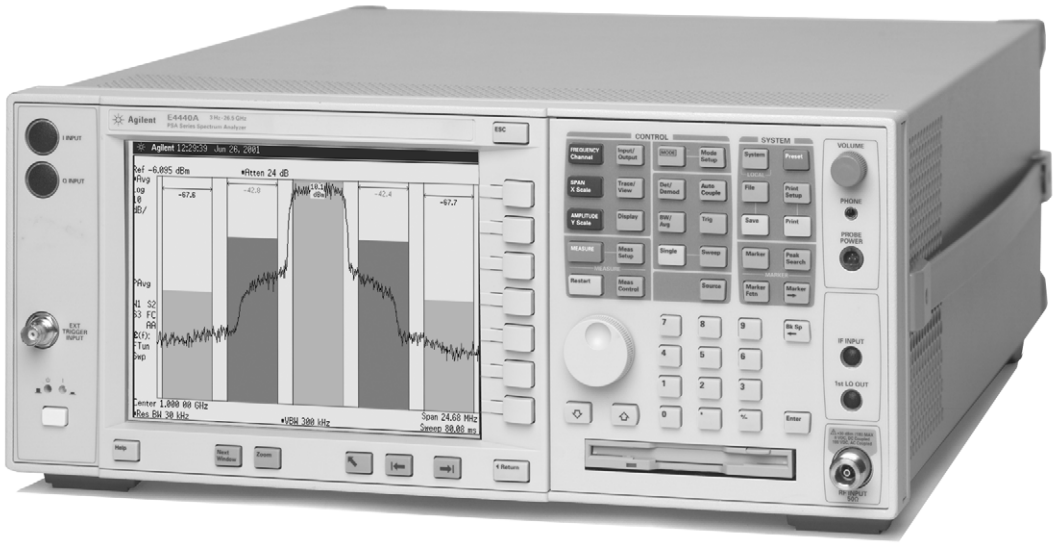
Agilent
PSA Series Spectrum Analyzers
Data Sheet

E4443A	3 Hz to 6.7 GHz
E4445A	3 Hz to 13.2 GHz
E4440A	3 Hz to 26.5 GHz
E4446A	3 Hz to 44 GHz
E4448A	3 Hz to 50 GHz



The Agilent PSA series offers high-performance spectrum analysis, up to 50 GHz, with powerful one-button measurements, a versatile feature set, and a leading-edge combination of flexibility, speed, accuracy, and dynamic range. From millimeter wave and phase noise measurements to spur searches and modulation analysis, the PSA series offers unique and comprehensive high-performance solutions to R&D and manufacturing engineers in cellular and emerging wireless communications, aerospace, and defense.

Agilent Technologies

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Definitions and conditions

Specifications describe the performance of parameters covered by the product warranty and apply over 0 to 55°C unless otherwise noted. Typical describes additional product performance information that is not covered by the product warranty. It is performance beyond specifications that 80% of the units exhibit with a 95% confidence level over the temperature range 20 to 30°C. Typical performance does not include measurement uncertainty.

Nominal values indicate expected performance, or describe product performance that is useful in the application of the product, but is not covered by the product warranty.

The analyzer will meet its specifications when:

- stored a minimum of 2 hours within the operating temperature range and turned on for at least 30 minutes with **Auto Align On** selected.
- the instrument is within its one year calibration cycle.
- **Align All Now** has been performed within the past 24 hours or when the temperature changes 3°C.
- the instrument is under auto couple control, except that Auto Sweep Time = Accy.
- DC coupling applied if center frequency is < 20 MHz.

This PSA series data sheet is a summary of the complete specifications and conditions, which are available in the *PSA Series Specification Guide.*

The *PSA Series Specification Guide* can be obtained on the web through:
www.agilent.com/find/psa

Then follow this selection process:

- Select “PSA series spectrum analyzers”.
- Select any PSA model number.
- Select “manuals”.
- Select “PSA series spectrum analyzers specifications guide”.
- Download specifications guide.

Frequency specifications

Frequency range

E4443A	(DC coupled)	3 Hz to 6.7 GHz
	(AC coupled)	10 MHz to 6.7 GHz
E4445A	(DC coupled)	3 Hz to 13.2 GHz
	(AC coupled)	10 MHz to 13.2 GHz
E4440A	(DC coupled)	3 Hz to 26.5 GHz
	(AC coupled)	10 MHz to 26.5 GHz
E4446A	(DC coupled)	3 Hz to 44 GHz
E4448A	(DC coupled)	3 Hz to 50 GHz

Band	**Harmonic mixing mode (N)**	
0	1–	3 Hz to 3 GHz
1	1–	2.85 GHz to 6.6 GHz
2	2–	6.2 GHz to 13.2 GHz
3	4–	12.8 GHz to 19.2 GHz
4	4–	18.7 GHz to 26.8 GHz
5	4+	26.4 GHz to 31.15 GHz
6	8–	31.0 GHz to 50.0 GHz

Frequency reference

Accuracy	± [(time since last adjustment x aging rate) + temperature stability + calibration accuracy]
Aging rate	± 1 x 10^{-7} / year
Temperature stability	
20°C to 30°C	± 1 x 10^{-8}
0°C to 55°C	± 5 x 10^{-8}
Calibration accuracy	± 7 x 10^{-8}

Example frequency reference accuracy 1 year after last adjustment:
= ±(1 x 1 x 10^{-7} + 1 x 10^{-8} + 7 x 10^{-8})
= ±1.8 x 10^{-7}

Frequency readout accuracy *(start, stop, center, marker)*

± (marker frequency x frequency reference accuracy + 0.25% x span + 5% x RBW + 2 Hz + 0.5 x horizontal resolution*)
*Horizontal resolution is span/(sweep points – 1)

Marker frequency counter

Accuracy	± (marker frequency x frequency reference accuracy + 0.100 Hz)
Delta counter accuracy	± (delta frequency x frequency reference accuracy + 0.141 Hz)
Counter resolution	0.001 Hz

Frequency span *(FFT and swept mode)*

Range	0 Hz (zero span), 10 Hz to maximum frequency of model
Resolution	2 Hz
Accuracy	± [0.2% x span + span / (sweep points – 1)]

Sweep time and triggering

Range:	
Span = 0 Hz	1 µs to 6000 s
Span ≥ 10 Hz	1 ms to 2000 s
Accuracy	
Span ≥ 10 Hz, sweep	±0.01% nominal
Span ≥ 10 Hz, FFT	±40% nominal
Span = 0 Hz	±0.01% nominal
Trigger	Free run, line, video, RF burst, external front, external rear
Trigger delay	
Span = 0 Hz, or FFT	–150 ms to +500 ms
Span ≥ 10 Hz, swept	1 µs to 500 ms
Resolution	0.1 µs

Sweep (trace) point range

Span = 0 Hz	2 to 8192
Span ≥ 10 Hz	101 to 8192

Gated FFT

Maximum span	10 MHz
Delay range	–150 to +500 ms
Delay resolution	100 ns or 4 digits whichever is more
Gate duration	1.83/RBW ±2% nominal

Resolution bandwidth (RBW)

Range (–3.01 dB bandwidth)	1 Hz to 3 MHz (10% steps), 4, 5, 6, 8 MHz
Bandwidth accuracy (power):	
RBW range	
1 Hz to 51 kHz	±0.5% (±0.022 dB)
56 kHz to 75 kHz	±1.0% (±0.044 dB)
82 kHz to 330 kHz	±0.5% (±0.022 dB)
360 kHz to 1.2 MHz (< 3 GHz CF)	±1.0% (±0.044 dB)
1.3 MHz to 2.0 MHz (< 3 GHz CF)	±0.07 dB nominal
2.2 MHz to 6.0 MHz (< 3 GHz CF)	±0.02 dB nominal
Bandwidth accuracy (–3.01 dB):	
RBW range	
8 MHz (< 3 GHz CF)	±15% nominal
Selectivity (–60 dB/–3 dB)	4.1:1 nominal

Information bandwidths

Maximum FFT width	10 MHz
I/Q waveform digital output bandwidth (Option E444xA-B7J)	10 MHz
321.4 MHz IF output:	
–1 dB bandwidth	20 to 30 MHz nominal
–3 dB bandwidth	30 to 60 MHz nominal
70 MHz IF output (Option E444xA-H70):	
–1 dB bandwidth	20 to 30 MHz nominal
–3 dB bandwidth	30 to 60 MHz nominal

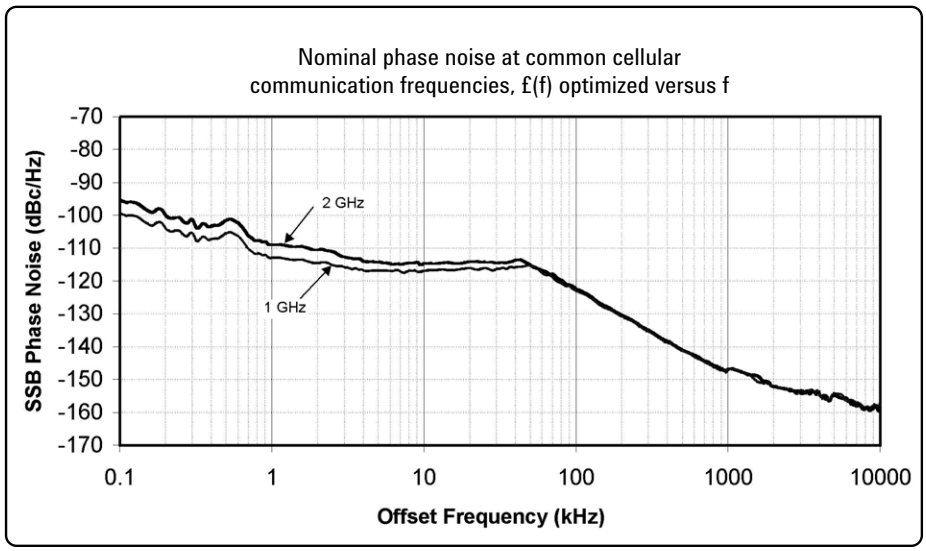

Figure 1. Nominal phase noise at common cellular frequencies

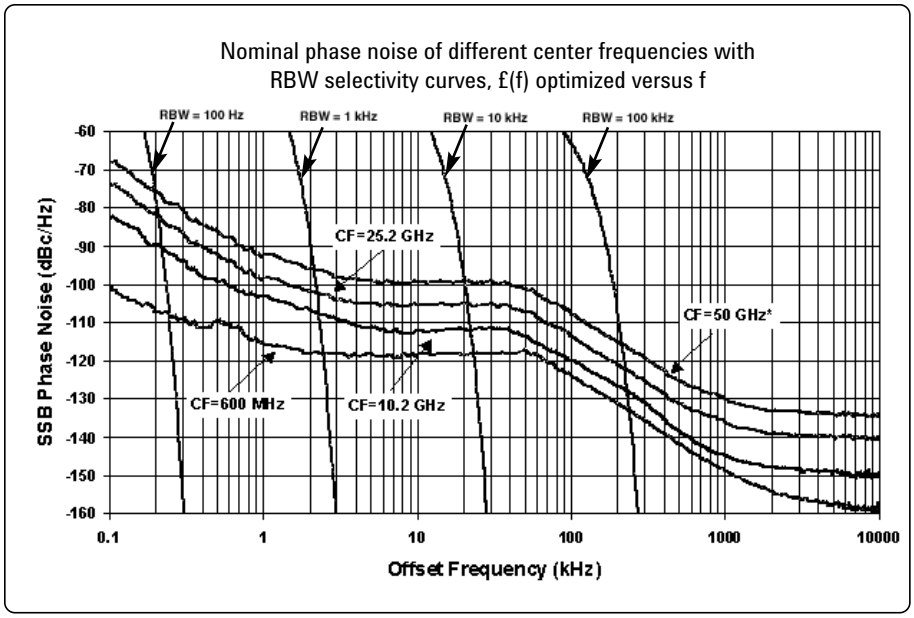

Figure 2. Nominal phase noise at various center frequencies

Video bandwidth (VBW)

Range	1 Hz to 3 MHz (10% steps), 4, 5, 6, 8 MHz and wide open
Accuracy	± 6% nominal

Stability

Noise sidebands (20°C to 30°C, CF = 1 GHz)

Offset	Specification	Typical
100 Hz	–91 dBc/Hz	–97 dBc/Hz
1 kHz	–103 dBc/Hz	–107 dBc/Hz
10 kHz	–114 dBc/Hz	–117 dBc/Hz
30 kHz	–114 dBc/Hz	–117 dBc/Hz
100 kHz	–120 dBc/Hz	–123 dBc/Hz
1 MHz	–144 dBc/Hz	–146 dBc/Hz
		–148 dBc/Hz nominal
6 MHz	–151 dBc/Hz	–152 dBc/Hz
		–156 dBc/Hz nominal
10 MHz	–151 dBc/Hz	–152 dBc/Hz
		–157.5 dBc/Hz nominal

Residual FM: < (1 Hz X N) p-p in 1 s

See frequency range for N (harmonic number)

Amplitude specifications

Amplitude range

Measurement range	Displayed average noise level (DANL) to maximum safe input level
Input attenuator range	0 to 70 dB in 2 dB steps

Maximum safe input level

Average total power	+30 dBm (1 W)
Preamp (Option E444xA-1DS)	+25 dBm
Peak pulse power	
< 10 µs pulse width, < 1% duty cycle and input attenuation ≥ 30 dB	+50 dBm (100 W)
DC volts:	
DC coupled	< ±0.2 Vdc
AC coupled (E4443A, E4445A, E4440A only)	±100 Vdc

1 dB gain compression (two-tone)

	Total power at input mixer	
10 MHz to 200 MHz	0 dBm	+3 dBm nominal
200 MHz to 3 GHz	+3 dBm	+7 dBm nominal
3 GHz to 6.6 GHz	+3 dBm	+4 dBm nominal
6.6 GHz to 26.5 GHz	–2 dBm	0 dBm nominal
26.5 GHz to 50 GHz		0 dBm nominal
Preamp on (Option E444xA-1DS)		
10 MHz to 200 MHz		–30 dBm nominal
200 MHz to 3 GHz		–25 dBm nominal

Typical gain compression (two-tone)

	Mixer level	Compression
10 MHz to 200 MHz	0 dBm	< 0.5 dB
200 MHz to 6.6 GHz	+3 dBm	< 0.5 dB
6.6 GHz to 26.5 GHz	–2 dBm	< 0.4 dB

Displayed Average Noise Level (DANL)

(Input terminated, sample or average detector, averaging type = Log, 20 to 30°C)

	Zero span and swept normalized to 1 Hz RBW and 0 dB attenuation	Zero span and swept normalized to 1 Hz RBW and 0 dB attenuation (typical)	FFT only actual 1 Hz RBW 0 dB attenuation
E4443A/E4445A/E4440A			
3 Hz to 1 kHz	—	–110 dBm nominal	—
1 kHz to 10 kHz	—	–130 dBm nominal	—
10 kHz to 100 kHz	–135 dBm	–142 dBm	–135 dBm
100 kHz to 1 MHz	–145 dBm	–149 dBm	–145 dBm
1 MHz to 10 MHz	–150 dBm	–153 dBm	–150 dBm
10 MHz to 1.2 GHz	–155 dBm	–156 dBm	–154 dBm
1.2 GHz to 2.5 GHz	–154 dBm	–155 dBm	–153 dBm
2.5 GHz to 3.0 GHz	–153 dBm	–154 dBm	–152 dBm
3 GHz to 6.6 GHz	–152 dBm	–153 dBm	–151 dBm
6.6 GHz to 13.2 GHz	–150 dBm	–152 dBm	–149 dBm
13.2 GHz to 20 GHz	–147 dBm	–149 dBm	–146 dBm
20 GHz to 26.5 GHz	–143 dBm	–145 dBm	–143 dBm
Preamp ON (Option E4443/5/0A-1DS)			
100 kHz to 200 kHz	–161 dBm	–164 dBm	–163 dBm nominal
200 kHz to 500 kHz	–164 dBm	–167 dBm	–167 dBm nominal
500 kHz to 10 MHz	–166 dBm	–168 dBm	–168 dBm nominal
10 MHz to 1.1 GHz	–169 dBm	–170 dBm	–170 dBm nominal
1.1 GHz to 2.5 GHz	–168 dBm	–169 dBm	–169 dBm nominal
2.5 GHz to 3.0 GHz	–166 dBm	–167 dBm	–167 dBm nominal
E4446A/E4448A			
3 Hz to 1 kHz	—	–110 dBm nominal	—
1 kHz to 10 kHz	—	–130 dBm nominal	—
10 kHz to 100 kHz	–140 dBm	–143 dBm	–140 dBm
100 kHz to 1 MHz	–145 dBm	–150 dBm	–145 dBm
1 MHz to 10 MHz	–150 dBm	–155 dBm	–150 dBm
10 MHz to 1.2 GHz	–154 dBm	–155 dBm	–153 dBm
1.2 GHz to 2.2 GHz	–153 dBm	–154 dBm	–152 dBm
2.2 GHz to 3 GHz	–152 dBm	–153 dBm	–151 dBm
3 GHz to 6.6 GHz	–151 dBm	–152 dBm	–150 dBm
6.6 GHz to 13.2 GHz	–146 dBm	–149 dBm	–146 dBm
13.2 GHz to 20 GHz	–145 dBm	–147 dBm	–144 dBm
20 GHz to 22.5 GHz	–143 dBm	–146 dBm	–143 dBm
22.5 GHz to 26.8 GHz	–140 dBm	–144 dBm	–140 dBm
26.8 GHz to 31.15 GHz	–142 dBm	–145 dBm	–141 dBm
31.15 GHz to 36 GHz	–134 dBm	–136 dBm	–133 dBm
36 GHz to 38 GHz	–129 dBm	–132 dBm	–129 dBm
38 GHz to 44 GHz	–131 dBm	–134 dBm	–131 dBm
44 GHz to 49 GHz	–128 dBm	–131 dBm	–127 dBm
49 GHz to 50 GHz	–127 dBm	–130 dBm	–126 dBm
Preamp ON (Option E4446/8A-1DS)			
100 kHz to 200 kHz	–160 dBm	–164 dBm	–160 dBm nominal
200 kHz to 500 kHz	–163 dBm	–167 dBm	–163 dBm nominal
500 kHz to 10 MHz	–164 dBm	–168 dBm	–164 dBm nominal
1 MHz to 10 MHz	–167 dBm	–169 dBm	–167 dBm nominal
10 MHz to 1.2 GHz	–167 dBm	–169 dBm	–167 dBm nominal
1.2 GHz to 2.2 GHz	–166 dBm	–168 dBm	–166 dBm nominal
2.2 GHz to 3.0 GHz	–164 dBm	–166 dBm	–164 dBm nominal

Display range

Log scale	0.1 to 1 dB/division in 0.1 dB steps 1 to 20 dB/division in 1 dB steps (10 display divisions)
Linear scale	10 divisions
Scale units	dBm, dBmV, dBuV, V, and W

Frequency response

(10 dB input attenuation, 20 to 30°C, preselector centering applied)

E4443A/E4445A/E4440A

3 Hz to 3 GHz	±0.38 dB	(±0.1 dB typical)
3 GHz to 6.6 GHz	±1.5 dB	(±0.5 dB typical)
6.6 GHz to 22 GHz	±2.0 dB	(±1.0 dB typical)
22 GHz to 26.5 GHz	±2.5 dB	(±1.0 dB typical)

E4446A/E4448A

3 Hz to 3 GHz	±0.38 dB	(±0.1 dB typical)
3 GHz to 6.6 GHz	±1.5 dB	(±0.7 dB typical)
6.6 GHz to 22 GHz	±2.0 dB	(±1.0 dB typical)
22 GHz to 26.8 GHz	±2.5 dB	(±1.0 dB typical)
26.4 GHz to 31.15 GHz	±1.75 dB	(±1.0 dB typical)
31.15 GHz to 50 GHz	±3.0 dB	(±2.0 dB typical)

Frequency response at attenuation ≠ 10 dB

10 MHz to 3 GHz	±0.80 dB nominal

Preamp on (Option E444xA-1DS), (for all models)

100 kHz to 3 GHz	±0.7 dB	< (±0.2 dB typical)

Input attenuation switching uncertainty

(Attenuator setting ≥ 2 dB)

At 50 MHz	±0.2 dB
3 Hz to 3 GHz	±0.3 dB nominal
3 GHz to 13.2 GHz	±0.5 dB nominal
13.2 GHz to 26.5 GHz	±0.7 dB nominal
26.5 GHz to 50 GHz	±1.0 dB nominal

Absolute amplitude accuracy

(10 dB attenuation, 20 to 30°C, 10 Hz ≤ RBW ≤ 1 MHz, input signal –10 to –50 dBm, all settings auto-coupled except Auto Swp Time = Accy, any reference level, any scale)

At 50 MHz	±0.24 dB (±0.06 dB typical)
At all frequencies	± (0.24 dB + frequency response) ± (0.06 dB+ frequency response) typical
3 Hz to 3 GHz (95% confidence)	±0.24 dB
Preamp on (Option E444xA-1DS)	± (0.36 dB + frequency response) ± (0.09 dB+ frequency response) typical

Input voltage standing wave ratio (VSWR)

(≥ 8 dB input attenuation)

50 MHz to 3 GHz	< 1.2:1 nominal
3 GHz to 18 GHz	< 1.6:1 nominal
18 GHz to 26.5 GHz	< 1.9:1 nominal
26.5 GHz to 50 GHz	< 1.57:1 nominal
Preamp on (50 MHz to 3 GHz) (≥ 10 dB attenuation)	< 1.2:1 nominal

Resolution bandwidth switching uncertainty

(referenced to 30 kHz RBW)

1 Hz to 1 MHz RBW	±0.03 dB
1.1 MHz to 3 MHz RBW	±0.05 dB
4, 5, 6, 8 MHz RBW	±1.00 dB

Reference level

Range:	
Log scale	-170 dBm to +30 dBm in 0.01 dB steps
Linear scale	707 pV to 7.07 V in 0.1% steps
Accuracy	0 dB

Display scale switching uncertainty

Switching between linear and log	0 dB
Log scale/div switching	0 dB

Display scale fidelity

≤ –20 dBm input mixer level	±0.07 dB total
–20 dBm < mixer level ≤ –10 dBm	±0.13 dB total

Spurious response *(mixer level = –40 dBm)*

General spurious:

f < 10 MHz from carrier	< (–73 + 20 log N) dBc
f ≥ 10 MHz from carier	< (–80 + 20 log N) dBc < (–90 + 20 log N) dBc typical

See frequency range for N

Second harmonic distortion (SHI)

E4443A, E4445A, E4440A	Distortion (dBc)	SHI (dBm)
10 MHz to 400 MHz (–40 dBm mixer level)	< –82	+42
400 MHz to 1.25 GHz (–40 dBm mixer level)	< –92	+52
1.25 GHz to 1.5 GHz (–40 dBm mixer level)	< –82	+42
1.5 GHz to 2.0 GHz (–10 dBm mixer level)	< –90	+80
2.0 GHz to 13.25 GHz (–10 dBm mixer level)	< –100	+90

E4446A, E4448A	Distortion (dBc)	SHI (dBm)
10 MHz to 400 MHz (–40 dBm mixer level)	< –82	+42
400 MHz to 1.25 GHz (–40 dBm mixer level)	< –91	+51
1.25 GHz to 1.5 GHz (–40 dBm mixer level)	< –81	+41
1.5 GHz to 2.0 GHz (–10 dBm mixer level)	< –90	+80
2.0 GHz to 3.25 GHz (–10 dBm mixer level)	< –94	+84
3.25 GHz to 13.25 GHz (–10 dBm mixer level)	< –96	+86
13.25 GHz to 25 GHz (–10 dBm mixer level)	< –100 nominal	+90 nominal
Preamp on (Option E444xA-1DS), (for all models) (input preamp level = –45 dBm)		
10 MHz to 1.5 GHz	< –60 nominal	+15 nominal

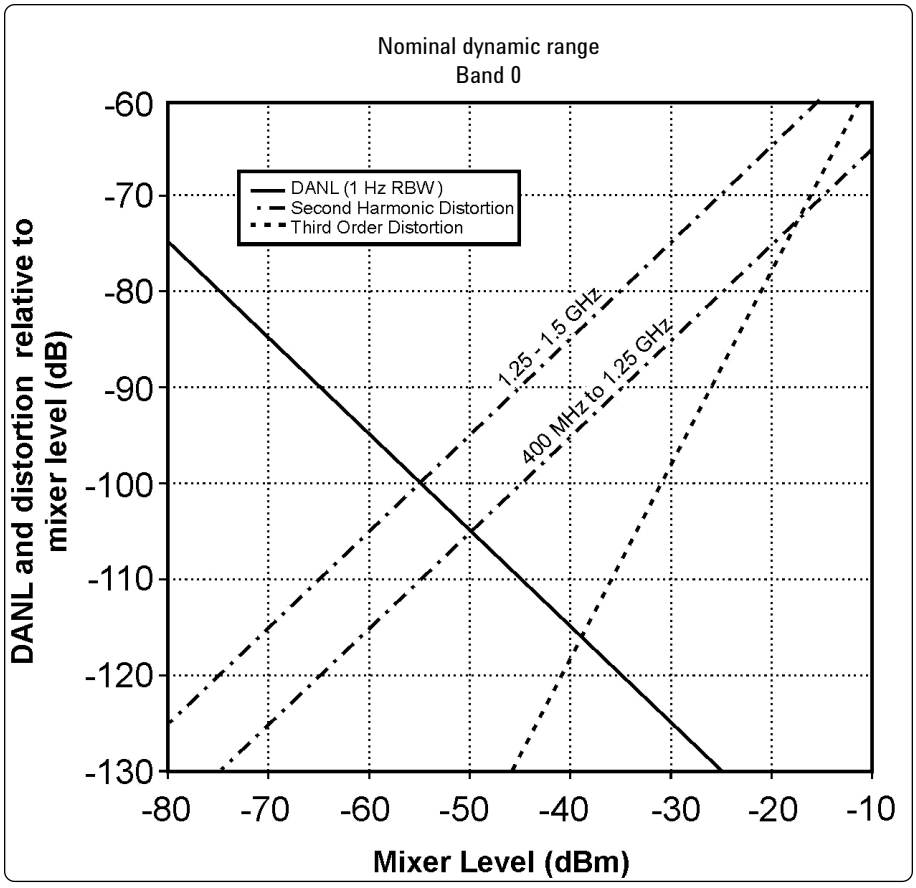

Figure 3. Nominal dynamic range - Band 0, for second and third order distortion, E4443A, E4445A, and E4440A - 3 Hz to 3 GHz

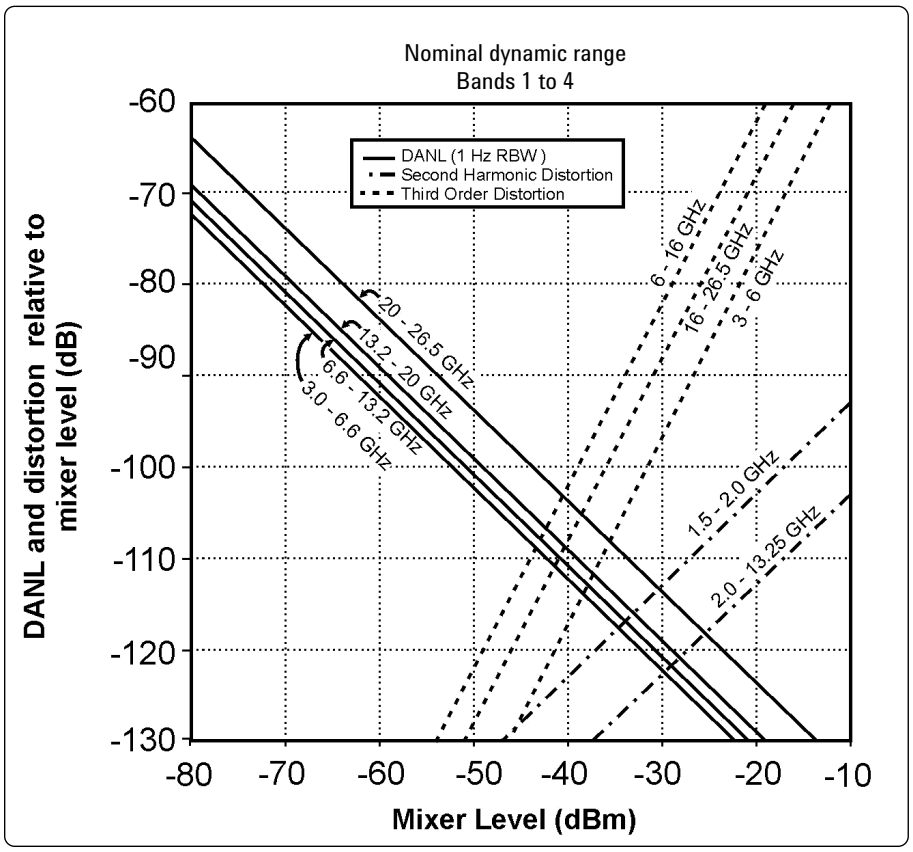

Figure 4. Nominal dynamic range – Bands 1 to 4, second and third order distortion, E4443A, E4445A, E4440A - 3 GHz to 26.5 GHz

Third-order intermodulation distortion (TOI)

(two –30 dBm tones at input mixer with tone separation > 15 kHz, 20 to 30°C)

E4443A/E4445A/E4440A

	Distortion (dBc)	TOI (dBm)
10 MHz to 100 MHz	< –88	+14 (+17 typical)
100 MHz to 400 MHz	< –90	+15 (+18 typical)
400 MHz to 1.7 GHz	< –92	+16 (+19 typical)
1.7 GHz to 3.0 GHz	< –94	+17 (+19 typical)
3.0 GHz to 6.0 GHz	< –90	+15 (+18 typical)
6.0 GHz to 16 GHz	< –76	+8 (+11 typical)
16 GHz to 26.5 GHz	< –84	+12 (+14 typical)

E4446A/E4448A

	Distortion (dBc)	TOI (dBm)
10 MHz to 100 MHz	< –90	+15 (+20 typical)
100 MHz to 400 MHz	< –92	+16 (+21 typical)
400 MHz to 1.7 GHz	< –94	+17 (+20 typical)
1.7 GHz to 3.0 GHz	< –96	+18 (+21 typical)
3.0 GHz to 6.0 GHz	< –92	+16 (+21 typical)
6.0 GHz to 16 GHz	< –84	+12 (+15 typical)
16.0 GHz to 26.5 GHz	< –84	+12 (+16 typical)
26.5 GHz to 50 GHz	< –85 nominal	+12.5 nominal

Preamp on (Option E444xA-1DS), ***(for all models, two –45 dBm tones at preamp input)***

10 MHz to 500 MHz	< –60 nominal	–15 nominal
500 MHz to 3 GHz	< –64 nominal	–13 nominal

Residual responses

Input terminated and 0 dB attenuation

200 kHz to 6.6 GHz	< –100 dBm
6.6 GHz to 26.8 GHz	< –100 dBm nominal
26.8 GHz to 50 GHz	< –90 dBm nominal

Trace detectors

Normal, peak, sample, negative peak, log power average, RMS average, and voltage average

Option E444xA-1DS, preamplifier

Frequency range	100 kHz to 3 GHz
Gain	28 dB nominal
Noise figure	7 dB nominal

Measurement speed *(sweep points = 601)*

Local measurement and display update rate	≥ 50/s nominal
Remote measurement and display update rate	≥ 22/s nominal

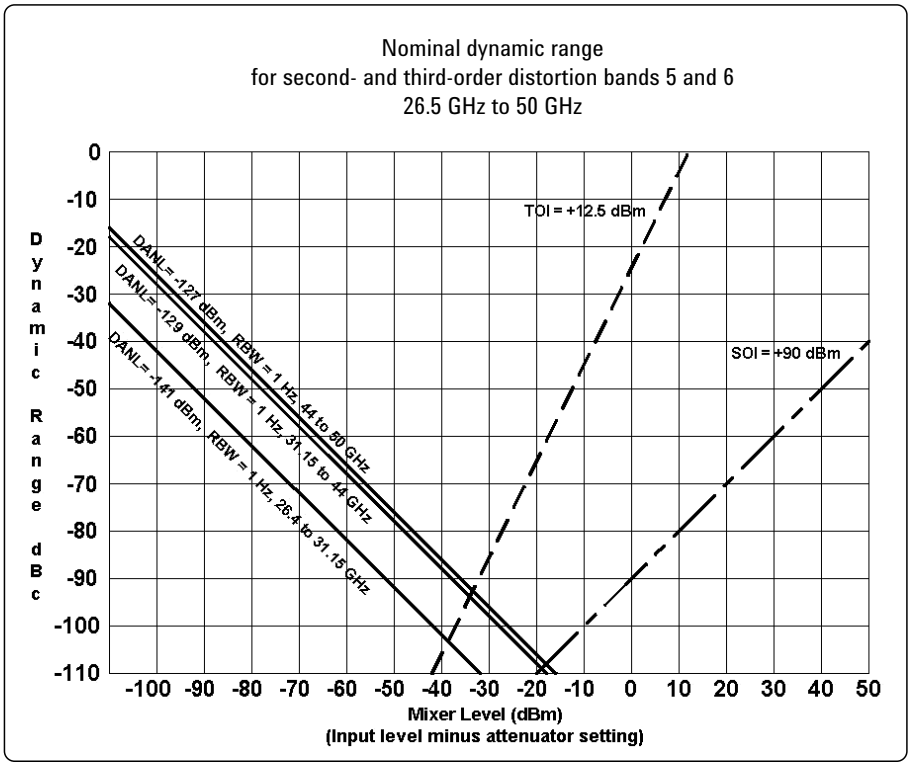

Figure 5. Nominal dynamic range – Bands 5 to 6, E4446A and E4448A - 26.4 GHz to 50 GHz

Power suite measurement specifications

Channel power

Amplitude accuracy, W-CDMA or IS95
(20 to 30°C, mixer level < –20 dBm) ±0.68 dB (±0.21 dB typical)

Occupied bandwidth

Frequency accuracy ± [span/(sweep points - 1)] nominal

Adjacent channel power

Accuracy, W-CDMA (ACLR) (at specific mixer levels and ACLR ranges):

	Adjacent	**Alternate**
MS	±0.12 dB	±0.17 dB
BTS	±0.22 dB	±0.22 dB
Dynamic range (typical):		
w/o noise correction	–74.5 dB	–82 dB
w/noise correction	–81 dB	–88 dB

Offset channel pairs measured 1 to 6

Multi-carrier power and ACP

ACPR dynamic range, W-CDMA (two carriers, RRC weighted, 3.84 MHz noise bandwidth):
- 5 MHz offset –70 dB nominal
- 10 MHz offset –75 dB nominal

ACPR accuracy (two carriers, 5 MHz offset, –48 dBc ACPR) ±0.38 dB nominal
Multiple number of carriers measured Up to 12

Power statistics CCDF

Histogram resolution 0.1 dB

Harmonic distortion

Maximum harmonic number 10^{th}
Results Fundamental power (dBm), relative harmonics power (dBc), total harmonic distortion in %

Intermod (TOI)

Measure the third-order products and intercepts from two tones

Burst power

Methods Power above threshold, power within burst width
Results Single burst output power, average output power, maximum power, minimum power within burst, burst width

Spurious emission

cdma2000 or W-CDMA *(1980 MHz region, 1.2 MHz RBW)*
Table driven spurious signals; search across regions.
Relative dynamic range 80.6 dB (82.4 dB typical)
Absolute sensitivity –89.7 dBm (–91.7 dBm typical)

Spectrum emission mask (SEM)

cdma2000 (750 kHz offset):
- Relative dynamic range (30 kHz RBW) 85.3 dB (88.3 dB typical)
- Absolute sensitivity –105.7 dBm (–107 dBm typical)
- Relative accuracy ±0.09 dB

3GPP W-CDMA (2.515 MHz offset):
- Relative dynamic range (30 kHz RBW) 87.3 dB (89.5 dB typical)
- Absolute sensitivity –105.7 dBm (–107.7 dBm typical)
- Relative accuracy ±0.1 dB

General specifications

Temperature range

Operating 0°C to +55°C
Storage –40°C to +75°C

EMI compatibility

- Conducted interference is in compliance with CISPR Pub 11/1990 Group 1 Class A
- Radiated emission is in compliance with CISPR Pub 11/1990 Group 1 Class B

Audio noise

ISO 7779 LNPE < 5.0 BELS at 25°C

Military specification

Type tested to environmental specifications MIL-PRF-28800F Class 4

Power requirements

Voltage and frequency:
- 100 to 132 Vrms, 47 to 66 Hz/360 to 440 Hz
- 195 to 250 Vrms, 47 to 66 Hz

Power consumption:
- On < 260 watts base (< 450 watts, fully loaded)
- Standby < 20 watts

Weight *(without options)*

E4443A, E4445A, E4440A

Net	23 kg (50 lbs) nominal
Shipping	33 kg (73 lbs) nominal

E4446A, E4448A

Net	24 kg (53 lbs) nominal
Shipping	34 kg (76 lbs) nominal

Dimensions

Height	177 mm (7.0 in)
Width	426 mm (16.8 in)
Length	483 mm (19 in)

Warranty

The E4440A, E4443A, E4445A, E4446A and E4448A are supplied with a three-year warranty.

Calibration cycle

The recommended calibration cycle is one year. Calibration services are available through Agilent service centers.

Input and outputs

Front panel

RF input

Connector:	
E4443A/E4445A	Type-N female, 50 Ω
E4440A	Type-N female, 50 Ω
Option E4440A-BAB	APC 3.5 male
E4446A/E4448A	2.4 mm male, 50 Ω

Probe power

Voltage/current (nominal)	+15 Vdc, ±7 % at 150 mA max –12.6 Vdc, ±10 % at 150 mA max GND

Headphone Reserved for future applications

Ext trigger input

Connector	BNC female
Impedance	10 kΩ nominal
Trigger level	5 V TTL nominal

Rear panel

10 MHz OUT (switched)

Connector	BNC female, 50 Ω
Output amplitude	≥ 0 dBm nominal
Frequency accuracy	10 MHz ± (10 MHz x frequency reference accuracy)

Ext Ref In

Connector	BNC female, 50 Ω
Input amplitude range	–5 to +10 dBm nominal
Frequency	1 to 30 MHz nominal
Frequency lock range	$\pm 5 \times 10^{-6}$ of specified external reference input frequency

Trigger in

Connector	BNC female
External trigger input:	
Impedance	> 10 kΩ nominal
Trigger level	5 V TTL nominal

Keyboard

Connector	6-pin mini-DIN (PS2) (Reserved for future applications)

Trigger 1 and Trigger 2 outputs

Connector	BNC female
Trigger 1 output:	HSWP (high = sweeping)
Impedance	50 Ω nominal
Level	5 V TTL
Trigger 2 output	Reserved for future applications

Monitor output

Connector	VGA compatible, 15-pin mini D-SUB
Format	VGA (31.5 kHz horizontal, 60 Hz vertical sync rates, non-interlaced) Analog RGB
Resolution	640 X 480

Remote programming

GPIB interface:	
Connector	IEEE-488 bus connector
GPIB codes	SH1, AH1, T6, SR1, RL1, PP0, DC1, C1, C2, C3, and C28, DT1, L4, C0
Serial interface connector	9-pin D-SUB male (factory use only)
LAN TCP/IP interface	RJ45 Ethertwist

Parallel printer interface connector

25-pin D-SUB female

321.4 MHz IF output

Connector	SMA female, 50 Ω nominal
Frequency	321.4 MHz nominal
Conversion gain	+2 to +4 dB nominal

SCSI interface

Connector	Mini D 50, female (factory use only)

Ordering information

PSA series spectrum analyzer

E4443A	3 Hz to 6.7 GHz
E4445A	3 Hz to 13.2 GHz
E4440A	3 Hz to 26.5 GHz
E4446A	3 Hz to 44 GHz
E4448A	3 Hz to 50 GHz

Options

To add options to a product, use the following ordering scheme:

Model	E444xA (x = 0, 3, 5, 6 or 8)
Example options	E4440A-B7J
	E4448A-1DS

Digital demodulation hardware

E444xA-B7J	Digital demodulation hardware (required for digital demodulation measurement personalities)

Digital demodulation measurements

E444xA-BAF	W-CDMA measurement personality
E444xA-202	GSM w/ EDGE measurement personality
E444xA-B78	cdma2000 measurement personality
E444xA-204	1xEV-DO measurement personality
E444xA-BAC	cdmaOne measurement personality
E444xA-BAE	NADC, PCD measurement personality

Phase noise measurement

E444xA-226	Phase noise measurement personality

Amplifiers

E444xA-1DS	100 kHz to 3 GHz built-in preamplifier

Inputs and outputs

E4440A-BAB	Replaces type "N" input connector with APC 3.5 connector

Connectivity software

E444xA-230	BenchLink Web Remote Control Software

Code compatibility

E444xA-266	HP 8566B/8568B code compatibility measurement personality

Accessories

E444xA-1CM	Rack mount kit
E444xA-1CN	Front handle kit
E444xA-1CP	Rack mount with handles
E444xA-1CR	Rack slide kit
E444xA-045	Millimeter wave accessory kit

Documentation

E444xA-0B1	Extra manual set including CD ROM

Calibration documentation

E444xA-UK6	Commercial calibration certificate with test data

Warranty and service

For warranty and service of 5 years, please order 60 months of R-51B (quantity = 60). Standard warranty is 36 months.

R-51B	Return-to-Agilent warranty and service plan

Calibration[1]

For 3 years, order 36 months of the appropriate calibration plan shown below. For 5 years, specify 60 months.

R-50C-001	Standard calibration
R-50C-002	Standards compliant calibration
E444xA-OBW	Service manual and calibration software

[1] Options not available in all countries.

Product literature

PSA Series - The Next Generation, brochure, literature number 5980-1283E
PSA Series, data sheet, literature number 5980-1284E

Phase Noise Measurement Personality, product overview, literature number 5988-3698EN
W-CDMA Measurement Personality, product overview, literature number 5988-2388EN
GSM with EDGE Measurement Personality, product overview, literature number 5988-2389EN
cdma2000 Measurement Personality, product overview, literature number 5988-3694EN
1xEV-DO Measurement Personality, product overview, literature number 5988-4828EN
cdmaOne Measurement Personality, product overview, literature number 5988-3695EN
NADC/PDC Measurement Personality, product overview, literature number 5988-3697EN
PSA Series Spectrum Analyzers, Option H70, 70 MHz IF Output, product overview, literature number 5988-5261EN

Self-Guided Demonstration for Spectrum Analysis, product note, literature number 5988-0735EN
Self-Guided Demonstration for Phase Noise Measurements, product note, literature number 5988-3704EN
Self-Guided Demonstration for W-CDMA Measurements, product note, literature number 5988-3699EN
Self-Guided Demonstration for GSM and EDGE Measurements, product note, literature number 5988-3700EN
Self-Guided Demonstration for cdma2000 Measurements, product note, literature number 5988-3701EN
Self-Guided Demonstration for 1xEV-DO Measurements, product note, literature number 5988–6208EN
Self-Guided Demonstration for cdmaOne Measurements, product note, literature number 5988-3702EN
Self-Guided Demonstration for NADC and PDC Measurements, product note, literature number 5988-3703EN

PSA Series Demonstration CD, literature number 5988-2390EN
Optimizing Dynamic Range for Distortion Measurements, product note, literature number 5980-3079EN
PSA Series Amplitude Accuracy, product note, literature number 5980-3080EN
PSA Series Swept and FFT Analysis, product note, literature number 5980-3081EN
PSA Series Measurement Innovations and Benefits, product note, literature number 5980-3082EN
PSA Series Spectrum Analyzer Performance Guide Using 89601A Vector Signal Analysis Software, product note, literature number 5988-5015EN

Selecting the Right Signal Analyzer for Your Needs, selection guide, literature number 5968-3413E
8 Hints for Millimeter Wave Spectrum Measurements, application note, literature number 5988–5680EN
PSA Series Spectrum Analyzer Performance Guide Using 89601A Vector Signal Analysis Software, product note, literature number 5988-5015EN
89600 series + PSA, 802.11A and HiperLAN2 ODFM Measurements, product note, literature number 5988-4094EN
N4256A Amplifier Distortion Test Set, product overview, 5988-2925EN
BenchLink Web Remote Control Softeware, product overview, literature number 5988-2610EN
HP 8566B/68B Programming Code Compatibility for PSA and ESA-E Series Spectrum Analyzers, product overview, literature number 5988-5808EN
IntuiLink Software, Data Sheet, Literature Number 5980-3115EN

For more information on the PSA series, please visit:

www.agilent.com/find/psa

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