Agilent
ESA-L Series Spectrum Analyzers

Data Sheet

Available frequency ranges

E4411B	*9 kHz to 1.5 GHz*
E4403B	*9 kHz to 3.0 GHz*
E4408B	*9 kHz to 26.5 GHz*

As the lowest cost ESA option, these basic analyzers are ideal for cost conscious bench-top or manufacturing environments.

If you are looking for a portable solution, consider the new Agilent N9340B handheld RF spectrum analyzer.

www.agilent.com/find/N9340B

Do you love your ESA-L, but need a more modern, faster analyzer?

The N9000A CXA is the perfect low cost replacement for the ESA-L basic analyzer.

www.agilent.com/find/CXA

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The ESA-L Series spectrum analyzers are tested to ensure they will meet their warranted performance. Unless otherwise stated, all specifications are valid over 0 to 55 °C. Supplemental characteristics, shown in italics, are intended to provide additional information that is useful in using the instrument. These typical (expected) or nominal performance parameters are not warranted but represent performance that 80 percent of the units tested exhibit with 95 percent confidence at room temperature (20 to 30 °C).

This data sheet is intended as a quick reference to ESA-L spectrum analyzer specifications, and is by no means complete. Please refer to the ESA-L specification guide for full information and specifications, publication number: E4403-90036.

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ESA-L Express Analyzer Option BAS or BTG

Receive faster delivery and a favorable price when you order the ESA-L express analyzer Option BAS or BTG. This express analyzer is configured based on the most frequently ordered ESA-L configuration and most popular options. The express analyzer options simplify the ordering process while maintaining the flexibility of the ESA platform.

Choose your frequency range:

E4411B	9 kHz to 1.5 GHz
E4403B	9 kHz to 3.0 GHz
E4408B	9 kHz to 26.5 GHz

Choose your express option:

BAS	Includes IF/sweep port (A4J) and GPIB connection (A4H)
BTG	Includes BAS, plus tracking generator functionality

And receive the following advantages:

- 1.1 dB overall amplitude accuracy
- +7.5 dBm TOI
- 1 kHz minimum RBW
- 100 Hz minimum RBW with Option 1DN

The BAS or BTG express option can be combined with Option 1DN, narrow resolution bandwidth.

If you are looking for a portable solution, consider the new Agilent N9340B handheld RF spectrum analyzer.

www.agilent.com/find/N9340B

If your test needs require a modern, fast analyzer, look no further than the N9000A CXA.

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Frequency Specifications

Upgrading from the ESA-L to the X-Series lowest entry instrument, the N900A CXA signal analyzer, offers numerous benefits. A sampling of side by side specifications are shown here for easy comparison.

Frequency Range	ESA-L			CXA
	E4411B	E4403B	E4408B	N9000A
BAS/BTG configuration	9 kHz to 1.5 GHz	9 kHz to 3.0 GHz	9 kHz to 26.5 GHz	9 kHz to 3.0/7.5 GHz
Custom configuration	(75 Ω input option 1DP) 1 MHz to 1.5 GHz	NA	NA	NA

ESA-L Frequency Range	100 Hz - 3 GHz	2.85 - 6.7 GHz	6.2 - 13.2 GHz	12.8 - 19.2 GHz	18.7 - 26.5 GHz
Band	0	1	2	3	4
Harmonic (N[a]) mixing mode	1-	1-	2-	4-	4-

Frequency Range	ESA-L (BAS/BTG)	CXA
Frequency reference error	± [(aging rate x time since last adjustment) + settability + temperature stability]	± [(time since last adjustment × aging rate) + temperature stability + calibration accuracy[c]]
Frequency readout accuracy	(start, stop, center, marker) = ±(frequency indication x frequency reference error + SP[b] + 15% of RBW + 10 Hz + 1 Hz x N[a])	± (marker freq. × freq. ref. accy. + 0.25% × span + 5% × RBWa + 2 Hz + 0.5 × horizontal resolution[d])
Aging rate	$\pm 2 \times 10^{-6}$/year	$\pm 1 \times 10^{-6}$/year[e]
Tempurature stability	$\pm 5 \times 10^{-6}$/year	$\pm 2 \times 10^{-6}$/year
Settability	$\pm 5 \times 10^{-6}$/year	$\pm 2 \times 10^{-8}$/year
Span coefficient (SP) [b]	0.75% x span	–
External reference	10 MHz	–
Marker frequency counter[f]		
Accuracy	± (marker frequency x frequency reference error + counter resolution)	± (marker freq. × freq. Ref. Accy. + 0.100 Hz)
Counter resolution	selectable from 1 Hz to 100 kHz	0.001 Hz
Frequency span		
Range	0 Hz (zero span), 100 Hz to maximum frequency range of the analyzer	0 Hz (zero span), 10 Hz to maximum frequency range of the analyzer

a. N is the harmonic mixing mode. For negative mixing modes (as indicated by "-"), the desired first LO harmonic is higher than the tuned frequency by the first IF (3.9214 for the 9 kHz to 3 GHz band, and 321.4 MHz for all other bands.)

b. +5% of span + $\frac{\text{span}}{\text{sweep pts.} - 1}$. Sweep points fixed at 401 for basic analyzer.

c. Calibration accuracy depends on how accurately the frequency standard was adjusted to 10 MHz. If the adjustment procedure is followed, the calibration accuracy is given by the "Achievable Initial Calibration Accuracy specification."

d. Horizontal resolution is due to the marker reading out one of the trace points.

e. For periods of one year or more.

f. Not available in RBW < 1 kHz (Option 1DR).

Frequency Specifications *(continued)*

Sweep time and trigger		ESA-L (BAS/BTG)	CXA
Range	Span = 0 Hz Span > 100 Hz	4 ms - 4000 s 4 ms - 4000 s	1 µs to 6000 s 1 ms to 4000 s
Accuracy (span = 0 Hz)		±1%	±0.01% (nominal)
Trigger type		Free run, single, line, video, offset, delayed, external	Free run, line, video, external 1, RF burst, periodic timer
Sweep (trace) points			
Range	Zero and non-zero span	401	1 to 20001
Resolution bandwidths			
Sequence		1/3/10	Bandwidths 1 Hz to 3 MHz are spaced at 10 % spacing using the E24 series (24 per decade). Bandwidths above 3 MHz are 4, 5,6, and 8 MHz.
Range	–3 dB –6 dB	1 kHz - 5 MHz[a] 9 kHz, 120 kHz	1 Hz to 8 MHz
Ranage with option 1DR[b] (ESA-L only)	–3 dB –6 dB	Add 100 Hz, 300 Hz Add 200 Hz	
Accuracy			
1 - 300 Hz		±10%	±5% (nominal)
300 Hz - 1 kHz			±5% (nominal)
1 kHz - 1.3 MHz		±15%	±5% (nominal)
1.5 MHz - 3.0 MHz		±15%	±7% (nominal)
5 MHz		±30%	
4-8 MHz			±20% (nominal)
Selectivity (60 dB/3 dB)			
	100 to 300 Hz	< 5:1 digital, approximately Gaussian	4.1:1 (nominal)
	1 kHz to 5 MHz	< 15:1 synchronously tuned four poles, approximately Gaussian	4.1:1 (nominal)
Video bandwidth			
Sequence		1-3-10	Same as resolution bandwidth range plus wide-open VBW (labeled 50 MHz)
Range		30 Hz to 3 MHz	
Range with 1DR (ESA-L only)		Adds 1, 3, 10 Hz for RBWs less than 1 kHz	

a. For resolution bandwidths < 1 kHz or > 3 MHz, not compatible with the rms detector.

b. Only available for spans < 5 MHz.

Frequency Specifications *(continued)*

	ESA-L spectrum analyzers		CXA signal analyzers	
	E4411B	E4403B/08B	All CXA configurations	
Noise sidebands (Phase noise)	Noise sidebands offset from CW signal with 1 kHz RBW, 30 Hz VBW and sample detector. Specification and typical dBc/Hz applies to all frequencies < 6.7 GHz. [a,b]		CF = 1 GHz. Specifications are given with the internal precision frequency reference.	
Offset from CW signal	Italics indicate typical performance			
1 kHz			–90 dBc/Hz	–95 dBc/Hz (nominal)
≥ 10 kHz	–93, *–95* dBc/Hz	–90, *–94* dBc/Hz	–100 dBc/Hz	–103 dBc/Hz (typical)
≥ 20 kHz	–100, *–102* dBc/Hz	–100, *–105* dBc/Hz		
≥ 30 kHz	–104, *–106* dBc/Hz	–106, *–112* dBc/Hz		
≥ 100 kHz	–113, *–116* dBc/Hz	–118, *–122* dBc/Hz	–100 dBc/Hz	–103 dBc/Hz (nominal)
1 MHz			–117 dBc/Hz	–120 dBc/Hz (nominal)
10 MHz				–140 dBc/Hz (nominal)

	ESA-L spectrum analyzers	CXA signal analyzers
	All frequencies	All frequencies
	Residual FM (peak-to-peak)	
1 kHz RBW and 1 kHz VBW (measurement time)	≤ 150 Hz x N[c] (100 ms) ≤ 30 Hz x N[c] (20 ms), Option 1DR	≤ 20 Hz peak to peak (20 ms) nominal

a. Enhanced wide offset phase noise and ACPR dynamic range.

b. Option 1DR is required for phase noise measurements at frequency offsets of 10 kHz and less. Performance at 10 kHz offset without Option 1DR is -90 dBc/Hz.

c. N = LO Harmonic mixing number.

Amplitude Specifications

		ESA-L spectrum analyzer		CXA signal analzyer	
		E4411B	E4403/08B	All frequency ranges	
Amplitude range					
Measurement range		Displayed average noise level		Displayed anverage noise level (DANL) to +23 dBm	
Mechanical input attenuator range		0 - 60 dB	0 - 65 dB	Standard	0 to 50 dB in 10 dB steps
				Option FSA	0 to 50 dB in 2 dB steps
Maximum safe input level					
Average continuous power		+30 dBm (1 W)	+30 dBm (1 W)	+30 dBm (1 W)	
Peak pulse power[a]		+30 dBm (1 W)	+50 dBm (100 W)	< 10 us pulse width, < 1 % duty cycle +50 dBm (100 W) and input attenuation ≥ 30 dB	
DC voltage	AC coupled	100 Vdc +75 dBmV (0.4 W) Option 1DP	100 Vdc	±50 Vdc	
1 dB gain compression Total power at input mixer[b]		Two tone			
50 MHz to 6.7 GHz		0 dBm to 1.5 GHz	0 dBm	–3 dBm (Preamp off, to 7.5 GHz) –23 dBm (Preamp on, to 7.5 GHz, nominal)	+1 dBm (Preamp off, to 7.5 GHz, nominal)
6.7 GHz to 13.2 GHz			–3 dBm		
13.2 GHz to 26.5 GHz			–5 dBm		

a. < 10 µs pulse width, < 1% duty cycle.

b. Mixer power level (dBm) = Input power (dBm) minus input attenuation (dB).

c. Full attenuation range 0 to 84 dB is mechanical + electronic attenuation.

Amplitude Specifications *(continued)*

ESA-L spectrum analyzer				CXA signal analzyer		
	E4411B	E4403B	E4408B	All frequency ranges		
Displayed average noise level (dBm) (input terminated, 0 dB attenuation, sample detector) specification *Italics indicate typical performance*				Displayed average noise level (dBm) (input terminated, 0 dB attenuation, sample or average detector) normalized to 1 Hz RBW		
Condition	100 Hz RBW; 1 Hz VBW (Option 1DR);				Preamplifier OFF	Preamplifier ON
Frequency				Frequency		
1 - 10 MHz	–123, *–129* dBm	*–126* dBm	*–129* dBm	1 - 10 MHz a	< –129 dBm	–135 dBm
10 - 500 MHz	–127, *–131* dBm	–125, *–130* dBm	–124, *–129* dBm	10 - 50 MHz	–130 dBm	–145 dBm
500 MHz - 1 GHz	–125, *–130* dBm			50 MHz - 2 GHz	–142 dBm	–157 dBm
1 - 1.5 GHz	–121, *–128* dBm	–124, *–130* dBm	–123, *–130* dBm	2 - 3 GHz	–138 dBm	–153 dBm
1.5 - 2 GHz	N/A			3 - 5 GHz	–136 dBm	–151 dBm
2 - 3 GHz		–122, *–130* dBm	–120, *–128* dBm			
3 - 6 GHz		N/A		5 - 6 GHz	–131 dBm	–146 dBm
6 - 12 GHz			–118, *–127* dBm			
12 - 22 GHz			–115, *–124* dBm	6 - 7.5 GHz	–126 dBm	–141 dBm
22 - 26.5 GHz			–109, *–122* dBm			

a. DANL below 10 MHz is dominated by phase noise around the LO feedthrough signal.

Amplitude Specifications *(continued)*

	ESA-L spectrum analyzer, all frequency ranges	CXA signal analyzer, all frequency ranges
Display		
Display range	0.1, 0.2, 0.5 dB/division and 1 to 20 dB/division in 1 dB steps (10 display divisions)	
Log scale		
RBW ≥ 1 kHz RBW ≥ 300 Hz	Calibrated 0 to –85 dB from reference level Calibrated 0 to –120 dB[a] from reference level	Ten divisions displayed 0.1 to 1 dB/division in 0.1 dB steps 1 to 20 dB/division in 1 dB steps
Linear scale	10 divisions	
Scale units	dBm, dBmV, dBµV, dBµA, A, V, and W	dBm, dBmV, dBµV, dBµA, dBmA, A, V, and W
Trace detectors	Peak, negative peak, sample, rms[b], video averaging	Peak, negative peak, sample, normal, average[c]
Marker readout resolution		
Log scale 0 to –85 dB 0 to –120 dB (1DR)	0.04	.01 dB (average off) .001 dB (average on)
Linear scale	0.01% of reference level	< 1% of signal level (nominal)
Reference level		
Range	–149.9 dBm to maximum mixer level + attenuator setting	–170 to +30 dBm in 0.01 dB steps
Resolution Log scale	±0.1 dB	0 dB
Accuracy[d]	For reference level (dBm) – input attenuator setting (dB) + preamp gain (dB)	
–10 to > –60 dBm	±0.3 dB	
–60 to > –85 dBm	±0.5 dB	
–85 to > –90 dBm	±0.7 dB	
Display scale switching uncertainty (referenced to 1 kHz RBW at reference level)		
Linear to log switching	±0.15 dB at reference level	
Resolution bandwidth switching uncertainty (referenced to 1 kHz at reference level)		
100 Hz, 300 Hz RBW	±0.3 dB (1DR)	
1 kHz to 3 MHz RBW	±0.3 dB	
5 MHz RBW	±0.6 dB	

a. 0 to –70 dB range when span = 0 Hz, or when IF gain fixed.

b. Not available for RBW < 1 kHz or > 3 MHz.

c. Average detector works on RMS, voltage and logarithmic scales.

d. 50 Ω, accuracy (at a fixed frequency, a fixed attenuator, and referenced to –35 dBm.

Amplitude Specifications *(continued)*

	ESA-L spectrum analyzer, all frequency ranges	CXA signal analyzer, all frequency ranges	
	Input attenuator switching uncertainty (at 50 MHz)	Input attenuation switching uncertainty relative to 10 dB reference setting	
Attenuator setting 0 to 5 dB	±0.3 dB	Attenuation > 2 dB, preamp off	
10 dB	Reference	Frequency range	Typical numbers
		50 MHz	±0.2 dB
		100 MH to 3.0 GHz	±0.4 dB
15 to 60 dB	±(0.1 dB + 0.01 x attenuator setting)	3.0 to 7.5 GHz	±0.5 dB
		Attenuation = 0 dB, preamp off	
			±0.5 dB
Frequency response (10 dB input attenuation)			
Absolute[a] 9 kHz to 3 GHz	±0.5 dB	9 kHz to 100 kHz	±1.5 dB (nominal)
3 to 6.7 GHz	±1.5 dB	100 kHz to 10 MHz	±1.0 dB
6.7 to 13.2 GHz	±2 dB	10 MHz to 3.0 GHz	±1.0 dB
13.2 to 26.5 GHz		3.0 GHz to 7.5 GHz[e]	±1.5 dB
Absolute amplitude accuracy			
At reference settings[b]	±0.4 dB		
Overall amplitude accuracy[c]	±(0.6 dB + absolute frequency response)		
Preamplifier off		At reference setting, 50 MHz	±0.40 dB
		At all frequencies[f]	±(0.40 dB + frequency response)
		100 kHz to 3.0 GHz (95% confidence)	±0.50 dB
Preamplifier on[g]		At all frequencies	±(0.50 dB + frequency response)
Display scale fidelity[g]		Log-linear fidelity (relative to the reference condition of -25 dBm input through the 10 dB attenuation, or -35 dBm at the input mixer)	
Log max cumulative dB below reference level RBW ≥ 1 kHz 0 dB reference	±(0.3 dB + 0.01 x dB from reference level)		
> 0 to 70 dB			
RBW ≤ 300 Hz (Option 1DR) span > 0 Hz, auto range on 0 to 98 dB[d]	±(0.3 dB + 0.01 x dB from reference level)		
> 98 to 120 dB	±2.0 dB from reference level, characteristic		
Log incremental accuracy dB below reference level 0 to 80 dB[d]	±0.4 dB/4 dB		
Linear accuracy	±2% of reference level		
Input mixer level[h]		Linearity	
-80 dBm < ML < -10 dBm		±0.2 dB	

a. Frequency response values are referenced to the amplitude at 50 MHz (20 to 30 °C).
b. Settings are: reference level –25 dBm; (75 Ω reference level +28.75 dBmV); input attenuation 10 dB; center frequency 50 MHz; RBW 1 kHz; VBW 1 kHz; amplitude scale linear or log; span 2 kHz; frequency scale linear; sweep time coupled, sample detector, signal at reference level.
c. For reference level 0 to –50 dBm; input attenuation 10 dB; RBW 1 kHz; VBW 1 kHz; amplitude scale log, log range 0 to –50 dB from reference level; frequency scale linear; sweep time coupled; signal input 0 to –50 dBm; span ≤ 20 kHz (20 to 30 °C).
d. 0 to 30 dB for RBW = 200 Hz.
e. Specifications for frequencies > 3 GHz apply for sweep rates < 100 MHz/ms.
f. Absolute amplitude accuracy is the total of all amplitude mesurement errors, and applies over a subset of settings and conditions. See CXA specification guide for details.
g. See CXA specifications guide for details.
h. Mixer level = input level - input attenuator.

Amplitude Specifications *(continued)*

	Basic analyzer E4411B/03B/08B	CXA signal analyzers
Spurious responses		
Third order intermodulation distortion (TOI)[c]	For two –30 dBm signals at input mixer[a] and > 50 kHz separation	For two -20 dBm signals at input mixer with tone separation 100 kHz, 0 dB RF attenuation
100 MHz to 26.5 GHz	< –75 dBc, +7.5 dBm TOI	Distortion[d], TOI[e], TOI typical
10 to 400 MHz		–60 dBc, +10 dBm, +13 dBm
400 MHz to 3 GHz		–66 dBc, +13 dBm, +15 dBm
3 GHz to 7.5 GHz		–60 dBc, +10 dBm, +13 dBm
Preamplifier On		
3.0 GHz to 3. 6 GHz		–13 dBm (nominal)
Second harmonic distortion		See CXA Data Sheet or CXA Specification Guide for SHI details
2 to 750 MHz –40 dBm tone at input mixer[a]	< –75 dBc, +35 dBm SHI (E4411B)	
10 to 500 MHz –30 dBm tone at input mixer[a]	< –60 dBc, +30 dBm SHI	
500 MHz to 1.5 GHz –30 dBm tone at input mixer[a]	< –70 dBc, +40 dBm SHI	
1.5 to 2.0 GHz –10 dBm tone at input mixer[a]	< –80 dBc, +70 dBm SHI	
> 2 GHz –10 dBm tone at input mixer[a]	≤ –95 dBc, +85 dBm SHI	
Other input related spurious		
Inband > 30 kHz offset	< –65 dBc for –20 dBm tone at input mixer[a]	
Out of band responses	< –80 dBc for –10 dBm tone at input mixer[a]	
f > 600 MHz from carrier		–60 dBc for -30 dBm mixer level (typical)
Residual responses (Input terminated and 0 dB attenuation)		
50 Ω RF input impedance		
150 kHz to 1.5 GHz/6.7 GHz[b]	< –90 dBm	
75 Ω RF input impedance (Option 1DP only available on ESA-L custom configuration for the E4411B)		
1 MHz to 1.5 GHz	< –36 dBmV	
200 kHz to 7.5 GHz		-90 dBm

a. Mixer power level (dBm) = input power (dBm) - input attenuation (dB).

b. Up to 1.5 GHz for models E4411B/03B. Up to 6.7 GHz for model E4408B.

c. The nominal performance of the phase noise at tfrequencies above the frequency at which the specifications apply (1 GHz) depends on the band and the offset.

d. Distortion for two tones that are each at -20 dBm is computed from TOI.

e. TOI = third order intercept. The TOI is given by the mixer tone level (in dBm) minus (distortion/2) where distortion is the relative level of the distortion tones in dBc.

Tracking Generator Specifications

The CXA does not offer a tracking generator option at this time.

Tracking generator specifications (Options 1DN and 1DQ)	
Frequency range	
E4411B	
Option 1DN, (50 Ω)	9 kHz to 1.5 GHz
Option 1DQ, (75 Ω)	1 MHz to 1.5 GHz
RBW range	1 kHz to 5 MHz
Output power level range	
E4411B	
Option 1DN	0 to –70 dBm
Option 1DQ	+42.75 to –27.25 dBmV
Output vernier range	
E4411B	10 dB
Output attenuator range	
E4411B	0 to 60 dB, 10 dB steps
Output flatness	
E4411B	
Option 1DN, (50 W)	
9 kHz to 10 MHz	±2.0 dB
10 MHz to 1.5 GHz	±1.5 dB
Option 1DQ, (75 W)	
1 to 10 MHz	±2.5 dB
10 MHz to 1.5 GHz	±2.0 dB
Effective source match (characteristic)	
E4411B	< 2.5:1
Spurious output	
Harmonic spurs	
E4411B	
(0 dBm output)	
9 kHz to 20 MHz	< –20 dBc
20 MHz to 1.5 GHz	< –25 dBc
Non-Harmonic spurs	
E4411B	< –35 dBc
Dynamic range	Maximum output power – displayed average noise level
Output power sweep range	
E4411B	
Option 1DN	(–15 to 0 dBm) - (source attenuator setting)
Option 1DQ	(+27.75 to +42.75 dBmV) - (source attenuator setting)

General Specifications

	Basic analyzer			CXA signal analyzer
	E4411B	E4403B	E4408B	N9000A-503/507
Temperature range				
Operating	0 to +55 °C			5 to 50 °C
Storage	–40 to +75 °C			–40 to +65 °C
Disk drive	10 to +40 °C			NA
EMI compatibility				
	Conducted and radiated interference is in compliance with CISPR Pub. 11/1990 Group 1 Class A Conducted and radiated interference is in compliance with CISPR Pub. 11/1990 Group 1 Class B[a] (Option 060)			Complies with European EMC Directive 2004/108/EC
Audible noise sound pressure at 25 °C				
	< 40 dBa pressure and < 4.6 bels power (ISODP7779)			
Military specifications Power requirements	Type tested to the environmental specifications of MIL-PRF-28800F class 3			Test methods are aligned with IEC 60068-2 and levels are similar to MIL-PRF-28800F Class 3.
AC operation on (line |)	90 to 132 V rms, 47 to 440 Hz 195 to 250 V rms, 47 to 66 Hz Power consumption < 300 W			100 to 120 V, 50 to 60 Hz Power consumption < 200 W
Standby (line ⏻)	Power consumption < 5 W			Power consumption < 10 W
DC operation	12 to 20 Vdc, < 200 W power consumption			220 to 240 V, 50 to 60 Hz
Data storage (nominal)				
Internal[b]	200 traces or states/8.0 MB			40 GB (nominal)
External	3.5 in, 1.44 MB, MS-DOS			Supports USB 2.0 compatible memory devices
Memory usage (nominal)				
State	16 kB[c]			
State plus 401- point trace	20 kB[c]			
Measurement speed				
Local measurement rate	≥ 35/s	≥ 30/s	≥ 28/s	11 ms nominal
Remote measurement and GPIB transfer	≥ 30/s	≥ 30/s	≥ 30/s	4 ms nominal
RF center freq tuning time	≤ 90 ms	≤ 90 ms	≤ 90 ms	51 ms nominal
Display				
Display resolution[d]	640 x 480			1024x768 XGA

a. Meeting class A performance during DC operation.

b. For serial numbers < US414400 or MY41440000, 1 MB without Option B72, 8 Mb with Option B72.

c. 401 sweep points. The size of a state will increase depending on the installed application(s). General Specifications

d. The LCD display is manufactured using high precision technology. However, there may be up to six bright points (white, blue, red, or green in color) that constantly appear on the LCD screen. These points are normal in the manufacturing process and do not affect the measurement integrity of the product in any way.

General Specifications *(continued)*

Inputs/outputs			
Front panel	ESA basic analyzer	CXA signal analyzer	
Input RF out	50 Ω type N (f); 75 Ω BNC (f) (Option 1DP); 50 Ω APC 3.5 (m) (Option BAB)	50 Ω type N (f)	
Probe power	+15 Vdc, –12.6 Vdc at 150 mA max (characteristic)	+15 Vdc, ±7 % at 150 mA max (nominal) –12.6 Vdc, ±10 % at 150 mA max (nominal) GND	
External keyboard	6-pin mini-DIN, PC keyboards (for entering screen titles and file names)	Compatible with USB 2.0	
Headphone Power output	Front panel knob controls volume 0.2 W into 4 Ω (characteristic)		
AMPT REF out	50 Ω BNC (f) (nominal)		
IF INPUT (Option AYZ)	50 Ω SMA (f) (nominal)		
LO OUTPUT (Option AYZ)	50 Ω SMA (f) (nominal)		
Rear panel			
10 MHz REF OUT	50 Ω BNC (f), > 0 dBm (characteristic)	50 Ω BNC (f), nominal	
10 MHz REF IN	50 Ω BNC (f), –15 to +10 dBm (characteristic)	50 Ω BNC (f), nominal	
GATE TRIG/EXT TRIG IN	BNC (f), 5 V TTL		
GATE /HI SWP OUT	BNC (f), 5 V TTL		
VGA OUTPUT	VGA compatible monitor, 15-pin mini D-SUB, (31.5 kHz horizontal, 60 Hz vertical sync rates, non-interlaced analog RGB 640 x 480)		
IF, sweep and video ports (Option A4J or AYX)			
AUX IF OUT	BNC (f), 21.4 MHz, nominal –10 to –70 dBm (uncorrected)		
AUX VIDEO OUT	BNC (f), 0 to 1 V, characteristic (uncorrected)		
HI SWP IN	BNC (f), low stops sweep, (5 V TTL)		
HI SWP OUT	BNC (f), (5 V TTL)		
SWP OUT	BNC (f), 0 to +10 V ramp		
GPIB interface (Option A4H)	IEEE-488 bus connector	Standard	
Serial interface (Option 1AX)	RS-232, 9-pin D-SUB (m)		
Parallel interface			
(Option A4H or 1AX)	25-pin D-SUB (f) printer port only		
I/O connectivity software	IO libraries suite **(www.agilent.com/find/iosuite/data-sheet)**		
Dimensions and weight for the ESA family of analyzers.			
Width to outside of instrument handle	416 mm (16.4 in)	426 mm (16.8 in)	
Width to outside of the shipping cover	373 mm (14.7 in)		
Overall height	222 mm (8.75 in)	177 mm (7.0 in)	
Depth from front frame to rear frame	409 mm (16.1 in)	368 mm (14.5 in)	
Depth with instrument handle rotated horizontal	516 mm (20.3 in)		
	E4411B	For all CXA signal analyzer frequencies	
Instrument weight	13.2 kg (29.1 lbs)	Instrument weight	16 kg (35 lbs) nominal
Shipping weight	25.1 kg (55.4 lbs)	Shipping weight	28 kg (62 lbs) nominal
	E4403B		
Instrument weight	15.5 kg (34.2 lbs)		
Shipping weight	27.4 kg (60.4 lbs)		
	E4408B		
Instrument weight	17.1 kg (37.7 lbs)		
Shipping weight	31.9 kg (70.3 lbs)		

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Remove all doubt

Our repair and calibration services will get your equipment back to you, performing like new, when promised. You will get full value out of your Agilent equipment throughout its lifetime. Your equipment will be serviced by Agilent-trained technicians using the latest factory calibration procedures, automated repair diagnostics and genuine parts. You will always have the utmost confidence in your measurements. For information regarding self maintenance of this product, please contact your Agilent office.

Agilent offers a wide range of additional expert test and measurement services for your equipment, including initial start-up assistance, onsite education and training, as well as design, system integration, and project management.

For more information on repair and calibration services, go to:

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