

Agilent Technologies ESA Spectrum Analyzers Specifications Guide Change Sheet



Agilent Technologies

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This document contains changes to the Agilent ESA Spectrum Analyzers Specifications Guide E4401-90406

Description

This supplement documents changes to the Agilent ESA Spectrum Analyzers Specifications Guide. The changes are provided to you as “directly replaceable pages”.

Procedure

Replace the indicated pages in the following chapters:

- Replace Title Page and page 2.
- In Chapter 2, replace pages 63 and 64 with pages 63, 63-a, 63-b, and 64.
- In Chapter 3, replace pages 127 and 128 with pages 127, 127-a, 127-b, and 128.
- In Chapter 4, replace pages 191 and 192 with pages 191, 191-a, 191-b, and 192.
- In Chapter 5, replace pages 258 and 259 with pages 258, 258-a, 258-b, and 259.

Specifications Guide

Agilent Technologies ESA-E Series Spectrum Analyzers

This manual provides documentation for the following instruments:

E4401B (9 kHz - 1.5 GHz)

E4402B (9 kHz - 3.0 GHz)

E4404B (9 kHz - 6.7 GHz)

E4405B (9 kHz - 13.2 GHz)

E4407B (9 kHz - 26.5 GHz)



Agilent Technologies

Manufacturing Part Number: E4401-90406

Supersedes: E4401-90255

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The following safety symbols are used throughout this manual. Familiarize yourself with the symbols and their meaning before operating this instrument.

WARNING	<i>Warning</i> denotes a hazard. It calls attention to a procedure which, if not correctly performed or adhered to, could result in injury or loss of life. Do not proceed beyond a warning note until the indicated conditions are fully understood and met.
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WARNING	This is a Safety Class 1 Product (provided with a protective earthing ground incorporated in the power cord). The mains plug shall only be inserted in a socket outlet provided with a protected earth contact. Any interruption of the protective conductor inside or outside of the product is likely to make the product dangerous. Intentional interruption is prohibited.
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WARNING	If this product is not used as specified, the protection provided by the equipment could be impaired. This product must be used in a normal condition (in which all means for protection are intact) only.
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CAUTION	<i>Caution</i> denotes a hazard. It calls attention to a procedure that, if not correctly performed or adhered to, could result in damage to or destruction of the instrument. Do not proceed beyond a caution sign until the indicated conditions are fully understood and met.
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CAUTION	Always use the three-prong ac power cord supplied with this product. Failure to ensure adequate earth grounding by not using this cord may cause product damage.
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CAUTION	This instrument has autoranging line voltage input, be sure the supply voltage is within the specified range.
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	Specifications	Supplemental Information
<p><i>(Option B7D)</i> <i>For sweep times</i> $\frac{\text{sweep points} - 1}{40 \text{ MHz}}$ to $\frac{\text{sweep points} - 1}{100 \text{ kHz}}$</p> <p><i>For:</i> $\frac{\text{sweep points} - 1}{\text{sweep time}} < 40 \text{ MHz}$</p> <p>Log 0 to -85 dB from ref level</p> <p>Linear</p> <p><i>For:</i> $\frac{\text{sweep points} - 1}{\text{sweep time}} \geq 40 \text{ MHz}$</p> <p>Log 0 to -85 dB from ref level</p> <p>Linear</p>	<p>0.2 dB</p> <p>0.2% of Reference Level</p> <p>0.3 dB</p> <p>0.3% of Reference Level</p>	

	Specifications	Supplemental Information
<p>Frequency Response^a 10 dB attenuation 9 kHz to 3.0 GHz</p> <p>20 to 30 °C</p> <p>0 to 55 °C</p> <p>800 MHz to 1.0 GHz^b</p> <p>20 to 30 °C</p> <p>0 to 55 °C</p> <p>1.7 GHz to 2.0 GHz^b</p> <p>20 to 30 °C</p> <p>0 to 55 °C</p>	<p>±0.46 dB</p> <p>±0.76 dB</p> <p>±0.46 dB</p> <p>±0.76 dB</p> <p>±0.46 dB</p> <p>±0.76 dB</p>	<p>±0.12 dB, typical</p> <p>±0.04 dB, typical</p> <p>±0.04 dB, typical</p>

E4402B Specifications and Characteristics
Amplitude

	Specifications	Supplemental Information
<i>(Option UKB)</i>		
100 Hz to 3.0 GHz (dc coupled)		
20 to 30 °C	±0.5 dB	
0 to 55 °C	±1.0 dB	
30 Hz to 3.0 GHz (dc coupled)		
20 to 30 °C		±0.5 dB, characteristic
0 to 55 °C		±1.0 dB, characteristic

- a. Frequency response values are referenced to the amplitude at 50 MHz.
- b. This specification applies only to analyzers with serial numbers \geq US39441006.

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E4402B Specifications and Characteristics
Amplitude

	Specifications	Supplemental Information
<i>(Option UKB cont. from pg. 63.a)</i>		
100 kHz to 3.0 GHz (ac coupled)		
20 to 30 °C	±0.5 dB	
0 to 55 °C	±1.0 dB	
800 MHz to 1.0 GHz (ac coupled)		
20 to 30 °C	±0.5 dB	
0 to 55 °C	±1.0 dB	
1.7 GHz to 2.0 GHz (ac coupled)		
20 to 30 °C	±0.5 dB	
0 to 55 °C	±1.0 dB	
Preamp On (<i>Option 1DS</i>)		
0 dB attenuation		
1 MHz to 3.0 GHz		
20 to 30 °C	±1.5 dB	
0 to 55 °C	±2.0 dB	
800 MHz to 1.0 GHz		
20 to 30 °C	±1.5 dB	±0.22 dB, typical
0 to 55 °C	±2.0 dB	
1.7 GHz to 2.0 GHz		
20 to 30 °C	±1.5 dB	±0.16 dB, typical
0 to 55 °C	±2.0 dB	

	Specifications	Supplemental Information
Input Attenuation Switching Uncertainty at 50 MHz		
Attenuator Setting		
0 dB to 5 dB	±0.3 dB	
10 dB	Reference	

	Specifications	Supplemental Information
<p>(Option B7D)</p> <p>For sweep times</p> <p>$\frac{\text{sweep points} - 1}{40 \text{ MHz}}$</p> <p>$\frac{\text{sweep points} - 1}{100 \text{ kHz}}$</p> <p>For:</p> <p>$\frac{\text{sweep points} - 1}{\text{sweep time}} < 40 \text{ MHz}$</p> <p>Log 0 to -85 dB from ref level</p> <p>Linear</p> <p>For:</p> <p>$\frac{\text{sweep points} - 1}{\text{sweep time}} \geq 40 \text{ MHz}$</p> <p>Log 0 to -85 dB from ref level</p> <p>Linear</p>	<p>0.2 dB</p> <p>0.2% of Reference Level</p> <p>0.3 dB</p> <p>0.3% of Reference Level</p>	

	Specifications	Supplemental Information
<p>Frequency Response</p> <p>50 Ω, Absolute^a/Relative</p> <p>10 dB attenuation (dc coupled)</p> <p>9 kHz to 3.0 GHz</p> <p>20 to 30 °C</p> <p>0 to 55 °C</p> <p>(ac coupled)</p> <p>100 kHz to 3.0 GHz</p> <p>20 to 30 °C</p> <p>0 to 55 °C</p> <p>800 MHz to 1.0 GHz^b</p> <p>20 to 30 °C</p> <p>0 to 55 °C</p>	<p>$\pm 0.46 \text{ dB}$</p> <p>$\pm 0.76 \text{ dB}$</p> <p>$\pm 0.50 \text{ dB}$</p> <p>$\pm 1.0 \text{ dB}$</p> <p>$\pm 0.50 \text{ dB}$</p> <p>$\pm 1.0 \text{ dB}$</p>	<p>$\pm 0.14 \text{ dB}$, typical</p> <p>$\pm 0.10 \text{ dB}$, typical</p>

E4404B Specifications and Characteristics
Amplitude

	Specifications	Supplemental Information
1.7 GHz to 2.0 GHz ^b		
20 to 30 °C	±0.50 dB	±0.08 dB, typical
0 to 55 °C	±1.0 dB	
<i>(Option UKB)</i>		
100 Hz to 3.0 GHz (dc coupled)		
20 to 30 °C	±0.50 dB	

- a. Absolute frequency response values are referenced to the amplitude at 50 MHz.
- b. This specification applies only to analyzers with serial numbers ≥ US39440498.

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E4404B Specifications and Characteristics
Amplitude

	Specifications	Supplemental Information
<i>(Option UKB cont. from pg. 127-a)</i>		
0 to 55 °C	±1.00 dB	
30 Hz to 3.0 GHz (dc coupled)		
20 to 30 °C		±0.5 dB, characteristic
0 to 55 °C		±1.0 dB, characteristic
Absolute ^a /Relative, Preamp On <i>(Option IDS)</i>		
0 dB attenuation		
1 MHz to 3.0 GHz		
20 to 30 °C	±1.5 dB	
0 to 55 °C	±2.0 dB	
800 MHz to 1.0 GHz		
20 to 30 °C	±1.5 dB	±0.35 dB, typical
0 to 55 °C	±2.0 dB	
1.7 GHz to 2.0 GHz		
20 to 30 °C	±1.5 dB	±0.26 dB, typical
0 to 55 °C	±2.0 dB	
Preselector centered for frequency >3.0 GHz		
10 dB attenuation		
3.0 GHz to 6.7 GHz (ac or dc coupled)		
Absolute ^a		
20 to 30 °C	±1.5 dB	
0 to 55 °C	±2.5 dB	
Relative		
20 to 30 °C	±1.3 dB	
0 to 55 °C	±1.5 dB	

a. Absolute frequency response values are referenced to the amplitude at 50 MHz.

	Specifications	Supplemental Information
<p>Fast Sweep Times for Zero Span</p> <p><i>(Option AYZ)</i></p> <p>For sweep times $\frac{\text{sweep points} - 1}{20 \text{ MHz}}$ to $\frac{\text{sweep points} - 1}{100 \text{ kHz}}$</p> <p>Log 0 to -85 dB from ref level</p> <p>Linear</p> <p><i>(Option B7D)</i></p> <p>For sweep times $\frac{\text{sweep points} - 1}{40 \text{ MHz}}$ to $\frac{\text{sweep points} - 1}{100 \text{ kHz}}$</p> <p><i>For:</i> $\frac{\text{sweep points} - 1}{\text{sweep time}} < 40 \text{ MHz}$</p> <p>Log 0 to -85 dB from ref level</p> <p>Linear</p> <p><i>For:</i> $\frac{\text{sweep points} - 1}{\text{sweep time}} \geq 40 \text{ MHz}$</p> <p>Log 0 to -85 dB from ref level</p> <p>Linear</p>	<p>0.3 dB</p> <p>0.3% of Reference Level</p> <p>0.2 dB</p> <p>0.2% of Reference Level</p> <p>0.3 dB</p> <p>0.3% of Reference Level</p>	

	Specifications	Supplemental Information
<p>Frequency Response</p> <p>50 Ω, Absolute^a/Relative</p> <p>10 dB attenuation (dc coupled)</p> <p>9 kHz to 3.0 GHz</p>		

E4405B Specifications and Characteristics
Amplitude

	Specifications	Supplemental Information
20 to 30 °C	±0.46 dB	±0.14 dB, typical
0 to 55 °C	±0.76 dB	
(ac coupled)		
100 kHz to 3.0 GHz		
20 to 30 °C	±0.50 dB	
0 to 55 °C	±1.0 dB	

a. Absolute frequency response values are referenced to the amplitude at 50 MHz.

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E4405B Specifications and Characteristics
Amplitude

	Specifications	Supplemental Information
(Continued from page 191-a)		
800 MHz to 1.0 GHz ^a		
20 to 30 °C	±0.50 dB	±0.10 dB, typical
0 to 55 °C	±1.0 dB	
1.7 GHz to 2.0 GHz ^a		
20 to 30 °C	±0.50 dB	±0.08 dB, typical
0 to 55 °C	±1.0 dB	
<i>(Option UKB)</i>		
100 Hz to 3.0 GHz (dc coupled)		
20 to 30 °C	±0.50 dB	
0 to 55 °C	±1.00 dB	
30 Hz to 3.0 GHz (dc coupled)		
20 to 30 °C		±0.5 dB, characteristic
0 to 55 °C		±1.0 dB, characteristic
Absolute ^b /Relative, Preamp On <i>(Option IDS)</i>		
0 dB attenuation		
1 MHz to 3.0 GHz		
20 to 30 °C	±1.5 dB	
0 to 55 °C	±2.0 dB	
800 MHz to 1.0 GHz ^a		
20 to 30 °C	±1.5 dB	±0.35 dB, typical
0 to 55 °C	±2.0 dB	
1.7 GHz to 2.0 GHz ^a		
20 to 30 °C	±1.5 dB	±0.26 dB, typical
0 to 55 °C	±2.0 dB	

a. This specification applies only to analyzers with serial numbers \geq US39440327.

b. Absolute frequency response values are referenced to the amplitude at 50 MHz.

	Specifications	Supplemental Information
<p>Fast Sweep Times for Zero Span</p> <p><i>(Option AYX)</i></p> <p>For sweep times $\frac{\text{sweep points} - 1}{20 \text{ MHz}}$ to $\frac{\text{sweep points} - 1}{100 \text{ kHz}}$</p> <p>Log 0 to -85 dB from ref level</p> <p>Linear</p> <p><i>(Option B7D)</i></p> <p>For sweep times $\frac{\text{sweep points} - 1}{40 \text{ MHz}}$ to $\frac{\text{sweep points} - 1}{100 \text{ kHz}}$</p> <p><i>For:</i> $\frac{\text{sweep points} - 1}{\text{sweep time}} < 40 \text{ MHz}$</p> <p>Log 0 to -85 dB from ref level</p> <p>Linear</p> <p><i>For:</i> $\frac{\text{sweep points} - 1}{\text{sweep time}} \geq 40 \text{ MHz}$</p> <p>Log 0 to -85 dB from ref level</p> <p>Linear</p>	<p>0.3 dB</p> <p>0.3% of Reference Level</p> <p>0.2 dB</p> <p>0.2% of Reference Level</p> <p>0.3 dB</p> <p>0.3% of Reference Level</p>	

	Specifications	Supplemental Information
<p>Frequency Response</p> <p>Absolute^a/Relative</p> <p>10 dB attenuation</p> <p>9 kHz to 3.0 GHz</p> <p>20 to 30 °C</p>	<p>±0.46 dB</p>	<p>±0.14 dB, typical</p>

E4407B Specifications and Characteristics
Amplitude

	Specifications	Supplemental Information
0 to 55 °C 800 MHz to 1.0 GHz	±0.76 dB	±0.10 dB, typical
20 to 30 °C	±0.46 dB	
0 to 55 °C 1.7 GHz to 2.0 GHz	±0.76 dB	±0.08 dB, typical
20 to 30 °C	±0.46 dB	
0 to 55 °C	±0.76 dB	

a. Absolute frequency response values are referenced to the amplitude at 50 MHz.

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E4407B Specifications and Characteristics
Amplitude

	Specifications	Supplemental Information
<i>(Option UKB cont. from pg. 258-a)</i>		
(dc coupled)		
100 Hz to 3.0 GHz		
20 to 30 °C	±0.5 dB	
0 to 55 °C	±1.0 dB	
30 Hz to 3.0 GHz		
20 to 30 °C		±0.5 dB, characteristic
0 to 55 °C		±1.0 dB, characteristic
(ac coupled)		
10 MHz to 3.0 GHz		
20 to 30 °C	±0.5 dB	
0 to 55 °C	±1.0 dB	
800 MHz to 1.0 GHz		
20 to 30 °C	±0.5 dB	
0 to 55 °C	±1.0 dB	
1.7 GHz to 2.0 GHz		
20 to 30 °C	±0.5 dB	
0 to 55 °C	±1.0 dB	
Absolute ^a /Relative Preamp On		
<i>(Option IDS)</i>		
0 dB attenuation		
1 MHz to 3.0 GHz		
20 to 30 °C	±1.5 dB	±0.47 dB, typical
0 to 55 °C	±2.0 dB	
800 MHz to 1.0 GHz		
20 to 30 °C	±1.5 dB	±0.35 dB, typical
0 to 55 °C	±2.0 dB	
1.7 GHz to 2.0 GHz		
20 to 30 °C	±1.5 dB	±0.26 dB, typical
0 to 55 °C	±2.0 dB	