Specifications

The following are specifications used to test the Agilent 83485A/B plug-in module. Specifications are valid after a 1 hour warm-up period. See the *Agilent 54701A Active Probe Service Guide* for complete probe specifications.

Vertical specifications

Agilent 83485A Electrical Channel Vertical Specifications

Bandwidth (−3 dB) on electrical or optical channel	dc to 12.4 or 20 GHz, user selectable
dc Accuracy—single marker[1]	
12.4 GHz bandwidth	±0.4% of full scale ±2 mV ±1.5% (reading − channel offset) ± (2%/°C) (ΔT_{cal}[2]) (reading) − 0.4%/hr (ΔTime[3]) (reading)
20 GHz	±0.4% of full scale ±2 mV ±3% (reading − channel offset) ± (2%/°C) (ΔT_{cal}[2]) (reading) − 0.4%/hr (ΔTime[3]) (reading)
dc Difference—two marker accuracy on same channel[1]	
12.4 GHz	±0.8% of full scale ±1.5% of delta marker reading ± (2%/°C) (ΔT_{cal}[2]) (reading) − 0.4%/hr (ΔTime[3]) (reading)
20 GHz	±0.8% of full scale ±3% of delta marker reading ± (2%/°C) (ΔT_{cal}[2]) (reading) − 0.4%/hr (ΔTime[3]) (reading)

1 It is recommended that a user vertical calibration be performed after every 10 hours of continuous use or if the temperature has changed by greater than 2°C from the previous vertical calibration.

2 Where ΔT_{cal} represents the temperature change in Celsius from the last user vertical calibration. Note that the temperature term goes to zero upon execution of a vertical calibration.

3 Where ΔTime represents the time since the last user vertical calibration. The uncertainty due to time typically stabilizes after 24 hours. This term goes to zero upon execution of a vertical calibration.

Agilent 83485A Electrical Channel Vertical Specifications (continued)

Transition Time (10%–90%) characteristic, calculated from T=0.35/BW, electrical	
12.4 GHz	*28.2 ps*
20 GHz	*17.5 ps*
Maximum RMS Noise	
12.4 GHz	0.5 mV (0.25 mV typical)
20 GHz	1.0 mV (0.5 mV typical)
Scale Factor	full scale is eight divisions
Minimum	1 mV/div
Maximum	100 mV/div
dc Offset Range	±500 mV
Nominal Input Impedance	50 Ω
Connectors	3.5mm (m), channel and trigger
Input Reflection/Return Loss	≤5% for 30 ps rise time
Number of Channels	1
Dynamic Range/Maximum Specified Input Power	±400 mV relative to channel offset
Maximum Safe Input	±2V + peak ac (+16 dBm)

Agilent 83485A Optical Channel Vertical Specifications

Bandwidth (−3 dB) on electrical or optical channel	dc to 12.4 or 20 GHz (user selectable)
dc Accuracy—single marker[1]	
12.4 GHz, filtered[2]	±25 μW ±2% (reading − channel offset) ± (2%/°C) (ΔT_{cal}[3]) (reading) − 0.4%/hr (ΔTime[4]) (reading)
20 GHz[2]	±25 μW ±4% (reading − channel offset) ± (2%/°C) (ΔT_{cal}[3]) (reading) − 0.4%/hr (ΔTime[4]) (reading)
dc Difference—two marker accuracy on same channel[1]	
12.4 GHz, filtered[2]	±2% of delta reading ± (2%/°C) (ΔT_{cal}[3]) (reading) − 0.4%/hr (ΔTime[4]) (reading)
20 GHz[2]	±4% of delta reading ± (2%/°C) (ΔT_{cal}[3]) (reading) − 0.4%/hr (ΔTime[4]) (reading)
Transition Time (10%–90%) characteristic, calculated from T=0.48/BW, optical	
12.4 GHz	*40 ps*
20 GHz	*25 ps*
STM-16/OC-48 filter	*190 ps*
STM-4/OC-12 filter	*750 ps*
STM-1/OC-3 filter	*3 ns*
Maximum RMS Noise	
12.4 GHz, filtered	12 μW (8 μW typical)
20 GHz	25 μW (15 μW typical)
Scale Factor	full scale is eight divisions
Minimum	20 μW/div
Maximum	500 μW/div
dc Offset Range	+1 to −3 mW (referenced two divisions below center screen)
Connectors	User selected option, 9/125 μm single mode fiber
Input Reflection/Return Loss	>33 dB for HMS-10 interface connector

1 It is recommended that a user vertical calibration be performed after every 10 hours of continuous use or if the temperature has changed by greater than 2°C from the previous vertical calibration.

2 Referenced to average power meter.

3 Where ΔT_{cal} represents the temperature change in Celsius from the last user vertical calibration. Note that the temperature term goes to zero upon execution of a vertical calibration.

4 Where ΔTime represents the time since the last user vertical calibration. The uncertainty due to time typically stabilizes after 24 hours. This term goes to zero upon execution of a vertical calibration.

Agilent 83485A Optical Channel Vertical Specifications (continued)

Filtered Response	Measured response conforms to ITU-TS G.957 and GR-253-CORE for STM-16, OC-48 (Option 034) or STM-4, OC-12 (Option 032) or STM-1, OC-3 (Option 030)
Calibrated Wavelengths	1310 nm and 1550 nm
Average power Monitor	
Specified Operating Range	−30 dBm to +3 dBm (1 μW to 2 mW)
Factory Calibrated Accuracy (20° C–30° C)	±5% of reading ±100 nW ± connector uncertainty
User Calibrated Accuracy[1] <5° C temp change	±2% of reading ±100 nW ± power meter accuracy
Number of Channels	1
Dynamic Range/Maximum Specified Input Power	2 mW
Maximum Safe Input	10 mW peak
Wavelength Range	1200–1600 nm

1 A user calibration can be performed with average optical power levels from 100 to 2000 μW, however, the instrument optical accuracy specification is only vaild for average optical calibration powers form 500 to 2000 μW.

Agilent 83485B Electrical Channel Vertical Specifications

Bandwidth (−3 dB)	dc to 40 GHz, or dc to 18 GHz (user selectable)
dc Accuracy—single voltage marker[1]	
18 GHz	±0.4% of full scale ±2 mV ±1.5% (reading − channel offset) ± (2%/°C) (ΔT_{cal}[2]) (reading)
40 GHz	±0.4% of full scale ±2 mV ±3% (reading − channel offset) ± (2%/°C) (ΔT_{cal}) (reading)[2]
Transition Time (10% to 90%, calculated from T=0.35/bandwidth)	*≤9 ps (40 GHz BW)* *≤19.5 ps (18 GHz BW)*
Maximum RMS Noise	
18 GHz	≤0.5 mV (0.25 mV typical)
40 GHz	1.0 mV (0.5 mV typical)
Scale Factor (full scale is eight divisions)	
Minimum	1 mV/div
Maximum	100 mV/div
dc Offset Range	±500 mV
Inputs:	
Dynamic Range	±400 mV relative to channel offset
Maximum Safe Input Voltage	*16 dBm peak ac ±2V dc*
Nominal Impedance	50 Ω
Reflections	≤5% for 20 ps rise time
Connector	2.4mm (m)

1 It is recommended that a user vertical calibration be performed after every 10 hours of continuous use or if the temperature has changed by greater than 2°C from the previous vertical calibration.

2 Where ΔT_{cal} represents the temperature change in Celsius from the last user vertical calibration. Note that the temperature term goes to zero upon execution of a vertical calibration.

Agilent 83485B Optical Channel Vertical Specifications

Bandwidth (−3 dB)	*dc to 30 GHz*
dc Accuracy[1] (Optical channel referenced to average power meter)	±50 μW ±4% of (reading − channel offset) ± (2%/°C) (ΔT_{cal}[2]) (reading)
dc Difference[1] (two marker accuracy, same channel, referenced to average power monitor)	±4% of delta reading ± (2%/°C) (ΔT_{cal}[2]) (reading)
Transition Time (10% to 90%) characteristic, calculated from T=0.48/bandwidth, optical	*<16 ps*
Maximum RMS Noise	<30 μW (<15 μW typical)
Scale Factor (full scale is eight divisions)	
Minimum	20 μW/div
Maximum	500 μW/div
dc Offset Range	+1 mW to −3 mW, referenced to two divisions above bottom of screen
Connector Type	9/125 μm single mode, user selectable connector option
Input Return Loss	30 dB (HMS-10 connector)
Filtered Bandwidth	Fourth or fifth order Bessel-Thomson filter, 3 dB frequency 7.465 GHz
Calibrated Wavelengths	1310 nm and 1550 nm
Average Power Monitor	
Specified Operating Range	−27 dBm to +3 dBm (2 μW to 2 mW)
Factory Calibrated Accuracy (20°C to 30°C)	±5% of reading ±100 nW ± connector uncertainty
User Calibrated Accuracy (<5°C temp change)	±2% of reading ±100 nW ±power-meter uncertainty
Maximum Specified Input Power	*2 mW*
Maximum Safe Input	*10 mW peak*
Wavelength Range	*1000 to 1600 nm*

1 It is recommended that a user vertical calibration be performed after every 10 hours of continuous use or if the temperature has changed by greater than 2°C from the previous vertical calibration.

2 Where ΔT_{cal} represents the temperature change in Celsius from the last user vertical calibration. Note that the temperature term goes to zero upon execution of a vertical calibration.