

Optical/Electrical Module Specifications

Multi Mode and Single Mode	86101A	86102A	86102U
----------------------------	--------	--------	--------

OPTICAL CHANNEL SPECIFICATIONS

Optical Channel Unfiltered Bandwidth	2.85 GHz (3 GHz typical)	10 GHz	15 GHz
Wavelength Range	750–860 nm		
Calibrated Wavelengths	850 nm		
Sensitivity (smallest avg. power for mask test)	<i>-17 dBm</i>	<i>-13.5 dBm</i>	<i>-7.5 dBm</i>
Transition Time (10% to 90% calculated from TR = 0.48/BW optical)			
Unfiltered	<i><160 ps</i>	<i><48 ps</i>	<i><32 ps</i>
RMS Noise			
Characteristic	<i>1.5 μW</i>	<i>3.4 μW</i>	<i>14 μW</i>
Maximum	<i>2.5 μW</i>	<i>5.5 μW</i>	<i>20 μW</i>
Scale Factor (per division)			
Minimum	<i>5 μW</i>		<i>20 μW</i>
Maximum	<i>100 μW</i>		<i>500 μW</i>
CW Accuracy (single marker, referenced to average power monitor, <50 μW/division)	$\pm 6 \mu\text{W} \pm 0.4\%$ of full scale $\pm 3\%$ of (reading-channel offset)		$\pm 25 \mu\text{W} \pm 2\%$ of (reading-channel offset), 15 GHz
CW Difference (two markers, referenced to average power monitor, 50 μW/division)	$\pm 0.8\%$ of full scale $\pm 3\%$ of (reading-channel offset)		$\pm 2\%$ of (reading-channel offset), 15 GHz
CW Offset (referenced two divisions from screen bottom)	$+0.2 \text{ mW to } -0.6 \text{ mW}$		$+1 \text{ mW to } -3 \text{ mW}$
Average Power Monitor (specified operating range)	$-30 \text{ dBm to } -2.2 \text{ dBm}$	$-30 \text{ dBm to } -2.2 \text{ dBm}$	$-27 \text{ dBm to } +3 \text{ dBm}$
Factory Calibrated Accuracy	$\pm 5\% \pm 100 \text{ nW} \pm \text{connector uncertainty, } 20^\circ\text{C to } 30^\circ\text{C}$		
User Calibrated Accuracy	$\pm 2\% \pm 100 \text{ nW} \pm \text{power meter uncertainty, } <5^\circ\text{C change}$		
Maximum Input Power			
Maximum non-destruct average	$0.4 \text{ mW } (-4 \text{ dBm})$	$0.8 \text{ mW } (-1 \text{ dBm})$	$2 \text{ mW } (+3 \text{ dBm})$
Maximum non-destruct peak	$10 \text{ mW } (+10 \text{ dBm})$		
Fiber Input	62.5/125 μm, user selectable connector		
Input Return Loss (HMS-10 connector fully filled fiber)	20 dB		

ELECTRICAL CHANNEL SPECIFICATIONS

Electrical Channel Bandwidth	12.4 and 20 GHz
Transition Time (10% to 90%, calculated from TR = 0.35/BW)	28.2 ps, 12.4 GHz 17.5 ps, 20 GHz
RMS Noise	<i>0.25 mV, 12.4 GHz</i>
Characteristic	<i>0.5 mV, 20 GHz</i>
Maximum	0.5 mV, 12.4 GHz 1 mV, 20 GHz
Scale Factor	
Minimum	1 mV/division
Maximum	100 mV/division
dc Accuracy (single marker)	$\pm 0.4\%$ of full scale $\pm 2 \text{ mV} \pm 1.5\%$ of (reading-channel offset), 12.4 GHz $\pm 0.4\%$ of full scale $\pm 2 \text{ mV} \pm 3\%$ of (reading-channel offset), 20 GHz
dc Difference (two markers)	$\pm 0.8\%$ of full scale $\pm 1.5\%$ of delta, 12.4 GHz $\pm 0.8\%$ of full scale $\pm 3\%$ of delta, 20 GHz
dc Offset	$\pm 500 \text{ mV}$
Input Dynamic Range (relative to channel offset)	$\pm 400 \text{ mV}$
Maximum Input Signal	$\pm 2 \text{ V}$
Nominal Impedance	50 ohm
Reflections (for 30ps rise time)	5%
Electrical Input	3.5 mm (male)

Optical/Electrical Module Specifications

Multi Mode and Single Mode Optical/Electrical Modules	86103A	86103B	86105A	86105B
OPTICAL CHANNEL SPECIFICATIONS				
Optical Channel Unfiltered Bandwidth	2.85 GHz (3 GHz typical)	10 GHz	20 GHz	15 GHz
Wavelength Range	1000–1600 nm			
Calibrated Wavelengths	1310 nm/1550 nm			
Sensitivity (smallest avg. power for mask test)	-20 dBm	-15 dBm	-8 dBm	-12dBm
Transition Time (10% to 90% calculated from TR = 0.48/BW optical)	<160 ps	<48ps	<24 ps	<32ps
RMS Noise				
Characteristic	1 μ W	2.2 μ W	8 μ W, 12.4 GHz 15 μ W, 20 GHz	5 μ W, 10GHz 10 μ W, 15GHz
Maximum	1.5 μ W	3.7 μ W	12 μ W, 12.4 GHz 25 μ W, 20 GHz	8 μ W, 10 GHz 15 μ W, 15 GHz
Scale Factor (per division)				
Minimum	5 μ W		20 μ W	
Maximum	100 μ W		500 μ W	
CW Accuracy (single marker, referenced to average power monitor, <50 μ W/division)	$\pm 6 \mu$ W $\pm 0.4\%$ of full scale $\pm 3\%$ of (reading-channel offset)		$\pm 25 \mu$ W $\pm 2\%$ of (reading-channel offset), 12.4 GHz $\pm 25 \mu$ W $\pm 4\%$ of (reading-channel offset), 20 GHz	
CW Difference (two markers, referenced to average power monitor, 50 μ W/division)	$\pm 0.8\%$ of full scale $\pm 3\%$ of (reading-channel offset)		$\pm 2\%$ of (reading-channel offset), 12.4 GHz $\pm 4\%$ of (reading-channel offset), 20 GHz	
CW Offset (referenced two divisions from screen bottom)	+0.2 mW to -0.6 mW		+1 mW to -3 mW	
Average Power Monitor (specified operating range)	-30 dBm to 0 dBm		-30 dBm to +3 dBm	
Factory Calibrated Accuracy				
Single mode	$\pm 5\% \pm 100$ nW \pm connector uncertainty (20°C to 30°C)			
Multi mode	$\pm 10\% \pm 100$ nW \pm connector uncertainty (20°C to 30°C)		N/A	
User Calibrated Accuracy	$\pm 2\% \pm 100$ nW \pm power meter uncertainty, <5°C change			
Maximum Input Power				
Maximum non-destruct average	0.4 mW (-4 dBm)	0.8 mW (-1dBm)	2 mW (+3 dBm)	
Maximum non-destruct peak	10 mW (+10 dBm)			
Fiber Input	62.5/125 μ m, user selectable connector		9/125 μ m single-mode	
Input Return Loss (HMS-10 connector fully filled fiber)	20 dB		33 dB	

ELECTRICAL CHANNEL SPECIFICATIONS

Electrical Channel Bandwidth	12.4 and 20 GHz
Transition Time (10% to 90%, calculated from TR = 0.35/BW)	28.2 ps, 12.4 GHz 17.5 ps, 20 GHz
RMS Noise	
Characteristic	0.25 mV, 12.4 GHz 0.5 mV, 20 GHz
Maximum	0.5 mv, 12.4 GHz 1 mV, 20 GHz
Scale Factor	
Minimum	1 mV/division
Maximum	100 mV/division
dc Accuracy (single marker)	$\pm 0.4\%$ of full scale ± 2 mV $\pm 1.5\%$ of (reading-channel offset), 12.4 GHz $\pm 0.4\%$ of full scale ± 2 mV $\pm 3\%$ of (reading-channel offset), 20 GHz
dc Difference (two markers)	$\pm 0.8\%$ of full scale $\pm 1.5\%$ of delta, 12.4 GHz $\pm 0.8\%$ of full scale $\pm 3\%$ of delta, 20 GHz
dc Offset	± 500 mV
Input Dynamic Range (relative to channel offset)	± 400 mV
Maximum Input Signal	± 2 V
Nominal Impedance	50 ohm
Reflections (for 30ps rise time)	5%
Electrical Input	3.5 mm (male)

Module Specifications (continued)

High Bandwidth, Single Mode Optical/Electrical Modules	86106B	86109A	86109B	86116A ¹
OPTICAL CHANNEL SPECIFICATIONS				
Optical Channel Unfiltered Bandwidth	28 GHz	30 GHz	40 GHz ²	53 GHz
Wavelength Range	1000–1600 nm			
Calibrated Wavelengths	1310/1550 nm			
Sensitivity (smallest average power for mask test)	-7 dBm	N/A		
Transition Time (10% to 90%, calculated from TR = 0.48/BW optical)	18 ps	16 ps	12 ps (FWHM) ³	9.0 ps (FWHM) ³
RMS Noise				
Characteristic	10 μ W (Filtered) 18 μ W (Unfiltered)	15 μ W	15 μ W (30 GHz) 50 μ W (40 GHz)	60 μ W (50 GHz) 160 μ W (53 GHz)
Maximum	15 μ W (Filtered) 30 μ W (Unfiltered)	30 μ W	30 μ W (30 GHz) 70 μ W (40 GHz)	90 μ W (50 GHz) 260 μ W (53 GHz)
Scale Factor				
Minimum	20 μ W/division			200 μ W/division
Maximum	500 μ W/division		1.0 mW/division	2.5 mW/division
CW Accuracy (single marker, referenced to average power monitor, 50 μ W/division)	$\pm 50 \mu$ W $\pm 4\%$ of (reading-channel offset)			$\pm 150 \mu$ W $\pm 4\%$ of (reading-channel offset)
CW Difference (two markers, referenced to average power monitor, 50 μ W/division)	$\pm 4\%$ of delta			
CW Offset (referenced two divisions from screen bottom)	+1 mW to -3 mW		+6 mW to -2 mW	+5 mW to -15mW
Average Power Monitor (specified operating range)	-27 dBm to +3 dBm		-23 dBm to +9 dBm	
Factory Calibrated Accuracy	$\pm 5\% \pm 100$ nW \pm connector uncertainty, 20°C to 30°C			
User Calibrated Accuracy	$\pm 2\% \pm 100$ nW \pm power meter uncertainty, <5°C change			
Maximum Input Power				
Maximum non-destruct average	2 mW (+3 dBm)		10 mW (+10 dBm)	
Maximum non-destruct peak	10 mW (+10 dBm)		50 mW (+17 dBm)	
Fiber Input	9/125 μ m, user selectable connector			
Input Return Loss (HMS-10 connector fully filled fiber)	30 dB			

¹ 86116A requires the 86100A/B software revision A.3.0 or above.

² Specified with 8 point moving average in frequency response.

³ FWHM (Full Width Half Max) as measured from optical pulse with 700 fs FWHM, 5 MHz repetition rate and 10 mW peak power.

ELECTRICAL CHANNEL SPECIFICATIONS

Electrical Channel Bandwidth	18 and 40 GHz	26 and 50 GHz	43 and 63 GHz
Transition Time (10% to 90%, calculated from TR = 0.35/BW)	19.5 ps, 18 GHz 9 ps, 40 GHz	<13.2 ps, 26 GHz 7 ps, 50 GHz	8.1 ps (43 GHz) 5.6 ps (63 GHz)
RMS Noise			
Characteristic	0.25 mV, 18 GHz 0.5 mV, 40 GHz	0.25 mV, 26 GHz 0.60 mV, 50 GHz	0.6 mV (43 GHz) 1.7 mV (63 GHz)
Maximum	0.5m V, 18 GHz 1.0 mV, 40 GHz	0.50 mV, 26 GHz 1 mV, 50 GHz	0.9 mV, (43 GHz) 2.5 mV (63 GHz)
Scale Factor			
Minimum	1 mV/division		2 mV/division
Maximum	100 mV/division		100 mV/division
dc Accuracy (single marker)	$\pm 0.4\%$ of full scale ± 2 mV $\pm 1.5\%$ of (reading-channel offset), 18 GHz $\pm 0.4\%$ of full scale ± 2 mV $\pm 3\%$ of (reading-channel offset), 40 GHz	$\pm 0.4\%$ of full scale ± 2 mV $\pm 1.5\%$ of (reading-channel offset), 26 GHz $\pm 0.4\%$ of full scale ± 2 mV $\pm 2\%$ of (reading-channel offset), 50 GHz/65 GHz	$\pm 0.8\%$ of full scale ± 2 mV $\pm 1.5\%$ of (reading-channel offset), 43 GHz $\pm 2.5\%$ of full scale ± 2 mV $\pm 2\%$ of (reading-channel offset), 63 GHz
dc Difference (two markers)	$\pm 0.8\%$ of full scale $\pm 1.5\%$ of delta, 18 GHz $\pm 0.8\%$ of full scale $\pm 3\%$ of delta, 40 GHz	$\pm 0.8\%$ of full scale $\pm 1.5\%$ of delta, 26 GHz $\pm 0.8\%$ of full scale $\pm 2\%$ of delta, 50 GHz/65 GHz	
dc Offset	± 500 mV		
Input Dynamic Range (relative to channel offset)	± 400 mV		
Maximum Input Signal	± 2 V		
Nominal Impedance	50 ohm		
Reflections (for 20 ps rise time)	5%		
Electrical Input	2.4 mm (male)		1.85 mm (male)

Module Specifications (continued)

Dual Optical Modules ¹	86111A	86111U	86113A	86115B
OPTICAL CHANNEL SPECIFICATIONS				
Optical Channel Unfiltered Bandwidth	2.85 GHz	15 GHz	2.85 GHz	28 GHz
Wavelength Range	750-860 nm		1000-1600 nm	
Calibrated Wavelengths	850 nm		1310/1550 nm	
Sensitivity (smallest average power for mask test)	-17 dBm	-7.5 dBm	-20 dBm	-7 dBm
Transition Time (10% to 90%,calculated from TR = 0.48/BW optical)				
Unfiltered	<160 ps	<32ps	<160 ps	18 ps
RMS Noise				
Characteristic	1.5 μ W	14 μ W	1.5 μ W	10 μ W (Filtered) 18 μ W (Unfiltered)
Maximum	2.5 μ W	20 μ W	2.5 μ W	15 μ W (Filtered) 30 μ W (Unfiltered)
Scale Factor				
Minimum	5 μ W	20 μ W	5 μ W	20 μ W
Maximum	100 μ W	500 μ W	100 μ W	500 μ W
CW Accuracy (single marker, referenced to average power monitor, 50 μ W/division)	$\pm 6 \mu\text{W} \pm 0.4\%$ of full scale $\pm 3\%$ of (reading-channel offset)	$\pm 2\%$ of (reading-channel offset), 15 GHz	$\pm 6 \mu\text{W} \pm 0.4\%$ of full scale $\pm 3\%$ of (reading-channel offset)	$\pm 50 \mu\text{W} \pm 4\%$ of (reading-channel offset)
CW Difference (two markers, referenced to average power monitor, 50 μ W/division)	$\pm 0.8\%$ of full scale $\pm 3\%$ of (reading-channel offset)	$\pm 2\%$ of (reading-channel offset)15 GHz	$\pm 0.8\%$ of full scale $\pm 3\%$ of (reading-channel offset)	$\pm 4\%$ of delta
CW Offset (referenced two divisions from screen bottom)	+0.2 mW to -0.6 mW	+1 mW to -3 mW	+0.2 mW to -0.6 mW	+1 mW to -3 mW
Average Power Monitor (specified operating range)	-30 dBm to -2.2 dBm	-27 dBm to +3 dBm	-30 dBm to 0 dBm	-27 dBm to +3 dBm
Factory Calibrated Accuracy				
Single mode	$\pm 5\% \pm 100 \text{ nW} \pm \text{connector uncertainty, (20}^\circ\text{C to 30}^\circ\text{C)}$			
Multi mode	$\pm 10\% \pm 100 \text{ nW} \pm \text{connector uncertainty, (20}^\circ\text{C to 30}^\circ\text{C)}$			N/A
User Calibrated Accuracy	$\pm 2\% \pm 100 \text{ nW} \pm \text{power meter uncertainty, } < 5^\circ\text{C change}$			
Maximum Input Power				
Maximum non-destruct average	0.4 mW (-4 dBm)	2 mW (+3 dBm)	0.4 mW (-4 dBm)	2 mW (+3 dBm)
Maximum non-destruct peak	10 mW (+10 dBm)			
Fiber Input				
	62.5/125 μm , user selectable connector			9/125 μm , user selectable connector
Input Return Loss (HMS-10 connector fully filled fiber)				
	20dB			30 dB

¹ Requires the 86100A/B software revision 3.0 or above.

Module Specifications (continued)

Dual Electrical Channel Modules	86112A	83484A	54754A
Electrical Channel Bandwidth	12.4 and 20 GHz	26.5 and 50 GHz	12.4 and 18 GHz
Transition Time (10% to 90%, calculated from TR = 0.35/BW)	28.2 ps, 12.4 GHz; 17.5 ps, 20 GHz	13.2 ps, 26.5 GHz; 7 ps, 50 GHz	28.2 ps, 12.4 GHz; 19.4 ps, 18 GHz
RMS Noise			
Characteristic	0.25 mV, 12.4 GHz; 0.5 mV, 20 GHz	0.46 mV, 26.5 GHz; 0.92 mV, 50 GHz	0.25 mV, 12.4 GHz; 0.5 mV, 18 GHz
Maximum	0.5 mV, 12.4 GHz; 1 mV, 20 GHz	0.75 mV, 26.5 GHz 1.5 mV, 50 GHz	0.5 mV, 12.4 GHz; 1 mV, 18 GHz
Scale Factor			
Minimum	1 mV/division		
Maximum	100 mV/division		
dc Accuracy (single marker)	±0.4% of full scale ±2mV ±1.5% of (reading- channel offset), 12.4 GHz ±0.4% of full scale ±2 mV ±3% of (reading- channel offset), 20 GHz	±0.4% of full scale ±2 mV ±1.2% of (reading- channel offset), 26.5 GHz ±0.4% of full scale ±2 mV ±2% of (reading- channel offset), 50 GHz	±0.4% of full scale or marker reading (whichever is greater) ±2 mV ±1.2% of (reading-channel offset)
dc Difference (two markers)	±0.8% of full scale ±1.5% of delta, 12.4 GHz ±0.8% of full scale ±3% of delta, 20 GHz	±0.8% of full scale ±1.2% of delta, 26.5 GHz ±0.8% of full scale ±2% of delta, 50 GHz	±0.8% of full scale or delta marker reading (whichever is greater) ±2 mV ±1.2% of (reading- channel offset)
dc Offset	±500 mV	±500 mV	±500 mV
Input Dynamic Range (relative to channel offset)	±400 mV	±400 mV	±400 mV
Maximum Input Signal	±2 V	±2 V	±2 V
Nominal Impedance	50 ohm	50 ohm	50 ohm
Reflections (for 30 ps rise time)	5%	5%	5%
Electrical Input	3.5 mm (male)	2.4 mm (male)	3.5 mm (male)

TDR System	Oscilloscope/TDR Performance	Normalized Characteristics
Rise Time	40 ps nominal	Adjustable from larger of 10 ps or 0.08 x time/div Maximum: 5 x time/div
TDR Step Flatness	≤ ±1% after 1 ns from edge ≤ ±5%, -3% 1 ns from edge	≤ 0.1%
Low Level	0.00 V ± 2 mV	0.00 V ± 2 mV
High Level	±200 mV ± 2 mV	±200 mV ± 2 mV

Clock Recovery Single Mode, Multimode and Electrical Modules	83491A	83492A	83493A	83494A
Channel Type	Electrical	Multimode Optical	Single-Mode Optical	Single Mode Optical
Clock Recovery Phase Locked Loop Bandwidth				
Internal Path Triggering	50 to 70 kHz			90 kHz
External Output	4 MHz ± 10%			
Data Rates (Mb/s)	155, 622, 1063, 1250, 2125, 2488, 2500	155, 622, 1063, 1250, 2125, 2488, 2500	155, 622, 1250, 2488, 2500	155, 622, 2488, 9953
Tracking/Acquisition Range	±0.1%			155, 622, 2488: ±0.1%; 9953: ±0.03%
Internal Splitter Ratio	50/50	50/50	10/90	10/90
Output Jitter	<0.0125 UI RMS			155, 622, 2488: 0.02 UI RMS 9953 0.03 UI RMS
Input Power for Clock Recovery	-10 dBm to +3 dBm	750 to 860 nm, -10 to +3 dBm 1000 to 1600 nm, -13 to +3 dBm	-20 dBm to +3 dBm	-12 dBm to +3 dBm (155, 622, 2488 Mb/s) -8 dBm to +3 dBm (9953 Mb/s)
Input/Output Connectors	APC 3.5 mm, 50 ohm	FC/PC, 62.5/125 µm multimode, user selectable connector	FC/PC, 9 /125 µm single mode, user selectable connector	
Auxiliary Recovered Clock and Regenerated Data Outputs				
Input Return Loss	Type N with SMA adapters			
	DC-1250 MHz, 20 dB 1250-2500 MHz, 15 dB	20 dB	28 dB	28 dB
Input Insertion Loss	DC-1250 MHz, 7 dB 1250-2500 MHz, 15 dB	5 dB Maximum	1.5 dB Maximum	

Ordering Information

86100B	Infiniium DCA mainframe, wide bandwidth digital oscilloscope
86100B-001	12 GHz trigger bandwidth
86100B-AX4	Rack mount flange kit
86100B-AXE	Rack mount flange kit with handles
86100B-UK6	Commercial cal certificate with test data

Optical/Electrical Modules

86101A	3 GHz optical channel; multimode, amplified (750-860 nm) 20 GHz electrical channel
86101A-201	155, 622 Mb/s
86101A-202	1.063, 1.25 Gb/s

86102A	10 GHz optical channel; multimode, amplified (750-860 nm) 20 GHz electrical channel
86102A-201	2.125, 3.187 Gb/s
86102A-202	2.488, 3.125 Gb/s
86102A-203	2.72, 3.32 Gb/s

86102U	15 GHz optical channel; multimode, unamplified (750-860 nm) 20 GHz electrical channel
86102U-201	1.25, 2.488 Gb/s
86102U-202	2.488, 3.125 Gb/s
86102U-203	3.125, 10.3125 Gb/s

86103A	3 GHz optical channel; multimode, amplified (1000-1600 nm) 20 GHz electrical channel
86103A-201	155, 622 Mb/s
86103A-202	1.063, 1.25 Gb/s

86103B	10 GHz optical channel; multimode, amplified (1000-1600 nm) 20 GHz electrical channel
86103B-201	622 Mb/s, 2.488 Gb/s
86103B-202	1.063, 1.25 Gb/s
86103B-203	2.125, 2.488 Gb/s

86105A	20 GHz optical channel; single-mode, unamplified (1000-1600 nm) 20 GHz electrical channel
86105A-101	155 Mb/s
86105A-102	622 Mb/s
86105A-103	2.488 Gb/s
86105A-201	622 Mb/s, 2.488 Gb/s
86105A-202	2.488, 9.953 Gb/s

86105B	15 GHz optical channel; single-mode, unamplified (1000-1600 nm) 20 GHz electrical channel
86105B-101	9.953, 10.3125, 10.51875, 10.664, 10.709 Gb/s
86105B-102	155, 622 Mb/s 2.488, 2.666, 9.953, 10.3125, 10.51875, 10.664, 10.709 Gb/s
86105B-103	1.063, 1.250, 2.125, 2.488, 2.666, 9.953, 10.3125, 10.51875, 10.664, 10.709 Gb/s

86106B	28 GHz optical channel; single-mode, unamplified (1000-1600 nm) 40 GHz electrical channel
86106B-410	9.953, 10.3125, 10.664, 10.709 Gb/s

86109A	30 GHz optical channel; single-mode, unamplified (1000-1600 nm) 40 GHz electrical channel
---------------	--

86109B	40 GHz optical channel; single-mode, unamplified (1000-1600 nm) 50 GHz electrical channel
---------------	--

86116A	53 GHz optical channel; single-mode, unamplified (1000-1600 nm) 63 GHz electrical channel
---------------	--

Dual Optical Channel Modules

86111A	Dual 3 GHz optical channels; multimode, amplified (750-860 nm)
86111A-201	155, 622 Mb/s
86111A-202	1.063, 1.25 Gb/s

86111U	Dual 15 GHz optical channels; multimode, unamplified (750-860 nm)
86111U-201	1.25, 2.488 Gb/s
86111U-202	2.488, 3.125 Gb/s
86111U-203	3.125, 10.3125 Gb/s

86113A	Dual 3 GHz optical channels; multimode, amplified (1000-1600 nm)
86113A-201	155, 622 Mb/s
86113A-202	1.063, 1.25 Gb/s
86113A-301	155 Mb/s, 622 Mb/s, 2.488 Gb/s

86115B	Dual 28 GHz optical channels; single-mode, unamplified (1000-1600 nm)
86115B-101	9.953 Gb/s
86115B-410	9.953, 10.3125, 10.664, 10.709 Gb/s

Dual Electrical Channel Modules

86112A	Dual 20 GHz electrical channels
---------------	---------------------------------

83484A	Dual 50 GHz electrical channels
---------------	---------------------------------

86118A	Dual 70 GHz electrical remote sampling channels
---------------	---

TDR/TDT Modules

Included with each of these TDR modules is a TDR demo board, programmers guide, 2 50 Ω terminations, APC-3.5 (m), and one short, APC-3.5 (m).

54754A	Differential TDR module with dual 18 GHz TDR/electrical channels
---------------	--

Trigger Module

86107A	Precision timebase reference module
86107A-020	10 and 20 GHz clock input capability
86107A-040	10, 20 and 40 GHz clock input capability

Clock Recovery Modules

The following modules provide a recovered clock from the data signal for triggering at standard telecommunications and enterprise data rates:

83491A	Electrical signals. Data rates 155, 622, 1063, 1250, 2125, 2488, 2500 Mb/s
83492A	Multimode optical. Data rates 155, 622, 1063, 1250, 2125, 2488, 2500 Mb/s
83493A	Single-mode signals. Data rates 155, 622, 1250, 2488, 2500 Mb/s
83494A	Single-mode signals. Data rates 155, 622, 2488 Mb/s and 9.953 Gb/s
83494A-103	Single-mode signals. Data rates 155, 622, 2488 Mb/s and 10.3125 Gb/s
83494A-106	Single-mode signals. Data rates 155, 622, 2488, 2666 Mb/s and 10.664 Gb/s
83494A-107	Single-mode signals. Data rates 155, 622, 2488, 2666 Mb/s and 10.709 Gb/s

Warranty Options (for all products)

R1280A	Customer return repair service
R1282A	Customer return calibration service

Connector Options**(for All Optical Modules)**

81000 AI	Diamond HMS-10 connector
81000 FI	FC/PC connector adapter
81000 SI	DIN connector adapter
81000 VI	ST connector adapter
81000 KI	SC Connector Adapter

Accessories

10086A	ECL terminator
11667B	Power splitter, DC to 26.5 GHz, APC 3.5 mm
11667C	Power splitter, DC to 50 GHz, 2.4mm
11742A-K01	50 GHz DC blocking capacitor
11898A	1.5 meter remote extender module
54006A	6 GHz passive probe
54007A	3.5 mm RF accessory kit
54008B	24 ns delay line
54121-68701	RF accessories kit
54701A	2.5 GHz active probe
83430A	2.5 Gb/s lightwave transmitter
83433A	10 Gb/s lightwave transmitter
83434A	10 Gb/s lightwave receiver
83440B/C/D	Optical-to-electrical converters (6/20/32 GHz)
83446A	2.5 Gb/s lightwave receiver
8490D-020	2.4 mm 20dB attenuator
86101-60005	Filler panel
C3751-60201	Mouse
E2610-68700	Keyboard
N1020A	6 GHz TDR probe kit
N1025A	1 GHz active differential probe

Adapters for Electrical Modules***Need 1.85mm adapter and cable information***

11900B	2.4mm (f-f) adapter
11901B	2.4mm (f) to 3.5mm (f) adapter
11901C	2.4mm (m) to 3.5mm (f) adapter
54124-24101	2.4mm termination
5061-5311	3.5mm (f-f) adapter
1250-1158	SMA (f-f) adapter
1810-0118	3.5mm termination

Firmware and software

Firmware and software upgrades are available through the Web or your local sales office. www.agilent.com/comms/dcaupgrade