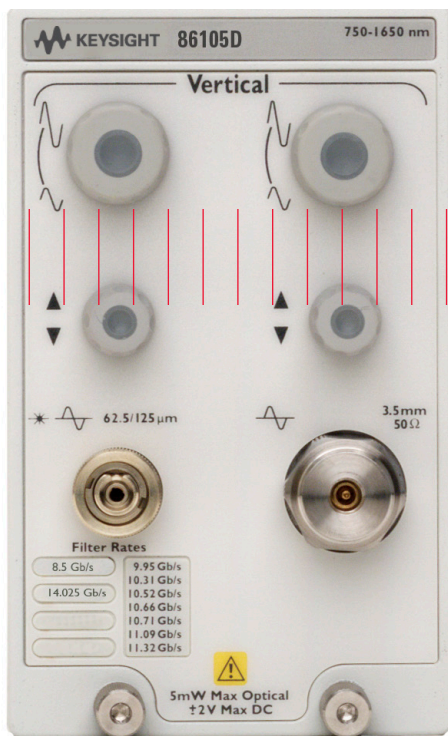


# Keysight Technologies

## 86105D Broad Wavelength Plug-in Module for High-Speed Optical Transceiver Test

### Configuration Guide



The 86105D is the ideal solution for waveform analysis of transceivers operating at 8.5 Gb/s (8X Fibre channel), 9.953 Gb/s (OC-192/STM-64), 10.3125 Gb/s (10 Gb Ethernet), 10.52 Gb/s (10X Fibre channel), all common 10 Gb/s FEC rates, and 14.025 Gb/s (16X Fibre channel) rates. The integrated optical receiver has an unfiltered bandwidth of 20 GHz. Option 281 provides an unfiltered bandwidth of 34 GHz and reference receivers for 25.78, 27.95 and 28.05 Gb/s and a general purpose 15 Gb/s filter (8 and 10 Gb/s rates are excluded). The well-designed magnitude and phase response provides high-fidelity waveforms and accurate analysis of high-speed laser designs. Switchable reference receiver capability is also available for eye-mask compliance testing at the rates mentioned above. The optical channel uses a broad wavelength photodetector operating from 750 to 1650 nm. The 62.5/125  $\mu\text{m}$  connector is compatible with both multimode and single-mode fibers. An electrical channel with 35 GHz bandwidth (50 GHz with option 281) can be used to characterize transceiver electrical signal performance.

## Comparing modules in the 86105 series

The 86105D provides superior value with its ability to accurately test a wide range of transceiver technologies from early research and development to high-volume manufacturing. Like the 86105C plug-in, the 86105D is compatible with short and long wavelength optical signals. (The 86105C provides reference receiver coverage at rates from 155 Mb/s to 11 Gb/s and is amplified, providing very high sensitivity.) The 86105D can be configured with an unamplified 20 GHz or 34 GHz (option 281) optical channel for very high-fidelity measurements in filtered or unfiltered modes.

For reduced cost option 100 eliminates the 16xFC (14 Gb/s) filter and option 200 provides only the 16xFC filter (no 8xFC or 10 Gb/s filters). If neither option is selected, 8xFC, 10G, and 16xFC filters are provided.

- 20 or 34 GHz optical channel
- Multimode and single-mode capability
- 750 to 1650 nm wavelength range
- 35 or 50 GHz electrical channel
- Compliance test solution for 8xFC, 10 Gb/s, and 16xFC rates or with option 281, 25.78 Gb/s 100 Gb Ethernet and 32xFC rates



## Configuring a complete test system

The 86105D is a plug-in module used with the 86100C/D<sup>1</sup> digital communications analyzer (DCA-J and DCA-X). The 86100C/D requires a timing reference (trigger) to acquire waveforms. This can be achieved with a synchronous clock or pattern trigger from a pattern generator or bit-error-ratio-tester (BERT) such as the N4903B. If the system being measured is not driven by a pattern generator and a synchronous timing signal is not available, the 83496B clock recovery module can be used to derive a trigger from the data being observed. The 83496B operates continuously (no gaps) from 50 Mb/s to 14.2 Gb/s<sup>2</sup>. The N1070A operates from 50 Mb/s to 32 Gb/s. For reduced jitter and increased mask margins at very high data rates, the 86107A precision timebase reduces the test system jitter level to as low as 100 fs.

1. Requires 86100C firmware revision 8.1. The 86105D is not compatible with the 86100A or B mainframes. For information regarding trade-in opportunities from A, B or C mainframes to D mainframes, contact your local Keysight representative
2. Requires 83496B option 200 or 201 and 86100C firmware revision 8.1. No modification of the 83496B hardware is required to extend its maximum operating range from 13.5 to 14.2 Gb/s

**Preliminary specifications:**

	<b>Optical channel</b>	<b>Electrical channel</b>
Bandwidth	20 GHz or 34 GHz (-3 dBo)	35 or 50 GHz (opt.281)
Wavelength range	750 to 1650 nm	
RMS noise	1310/1550 nm 8 and 10 G rates: 7 $\mu$ W (5 $\mu$ W) 16xFC: 12 $\mu$ W (8 $\mu$ W) 15 Gb/s (7 $\mu$ W) 25.78 Gb/s (13 $\mu$ W) 27.95 to 28.05 Gb/s (15 $\mu$ W)	250 $\mu$ V (25 GHz BW) 450 $\mu$ V (35 GHz BW) 600 $\mu$ V (50 GHz BW, opt. 281)
	850 nm 8 and 10 G rates: 12 $\mu$ W (10 $\mu$ W) 16xFC: 24 $\mu$ W (16 $\mu$ W) 15 Gb/s (9 $\mu$ W) 25.78 Gb/s (17 $\mu$ W) 27.95 to 28.05 Gb/s (18 $\mu$ W)	
Eye-mask sensitivity <sup>1</sup>	1310/1550 nm: 8 and 10 G rates, -12 dBm 16xFC, -9 dBm 15 Gb/s, -8 dBm 25.78 Gb/s, -8 dBm 27.95 to 28.05 Gb/s, -7 dBm	
	850 nm: 8 and 10 G rates, -9 dBm 16xFC, -6dBm 15 Gb/s, -9 dBm 25.78 Gb/s, -6 dBm 27.95 to 28.05 Gb/s, -5 dBm	

<sup>1</sup> Sensitivity parameter indicates the average power level where eye-mask 'hits' occur due to the oscilloscope noise. 10 dB extinction ratio assumed. Used for a relative comparison to other optical receivers

For more information on Keysight Technologies' products, applications or services, please contact your local Keysight office. The complete list is available at: [www.keysight.com/find/contactus](http://www.keysight.com/find/contactus)

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