

**Agilent**  
81495A Reference Receiver  
Technical Specifications



## 81495A Reference Receiver

Agilent's 81495A Reference Receiver is an O/E converter optimized for transceiver loop-back test according to IEEE 802.3ae, -LR, -LRM, -ER, -SR and FCx1, FCx2, FCx4, FCx8 and FCx10.

Offering a multimode fiber input, single-mode and multimode signals can be detected. Therefore the module covers the functionality of two modules in one, without extra cost.

The module is fully integrated into the industry standard Agilent Lightwave Measurement System LMS ( 816x A/B ) platform. Together with the huge range of modules for the LMS, any optical test application can be build within minutes. Remote control can be used to monitor the average optical power of the analyzed signal.

For the transceiver loop-back test the return signal of the transceiver is fed back to the BERT (Bit Error Ratio Tester). As the transceiver output is optical, the signal must first be converted to the electrical domain with the 81495A Reference Receiver.

The performance of this conversion has significant influence on the results of the loop-back test. The 81495A reference receiver works perfectly with the N4917A Optical Receiver Stress Test solution.

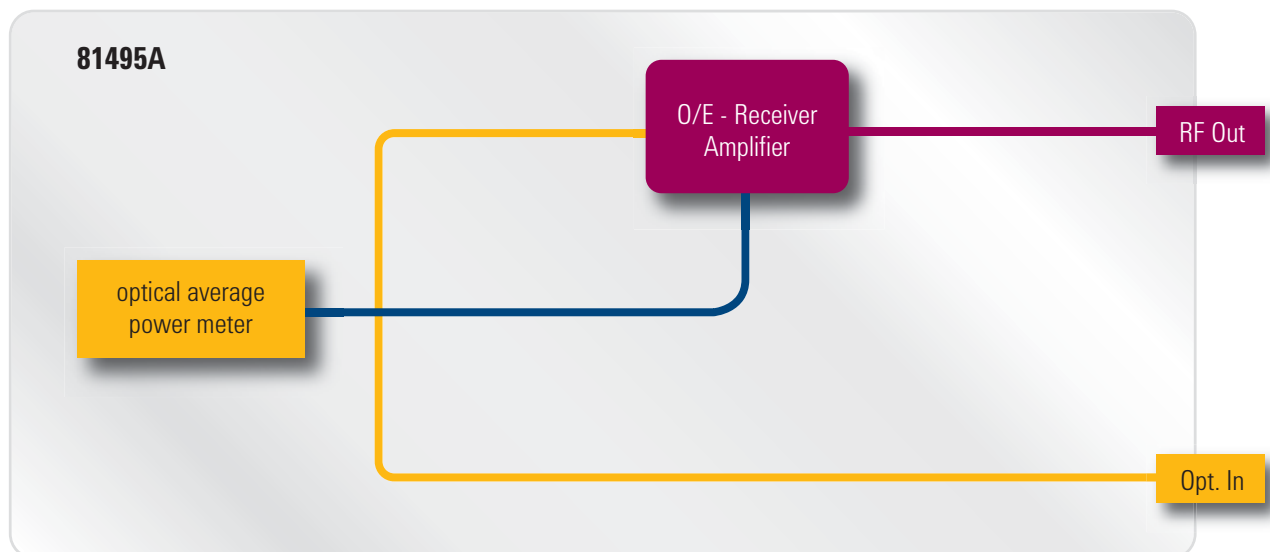
As additional feature the reference receiver provides an integrated optical average power meter. The capability of verifying the average optical power of the connected signal with the same receiver as the RF signal offers a fast and simple way to control the average signal power of the tested signal.

## Benefits

- Single-mode and multimode O/E in one device provides best cost efficiency.
- Clean eye for best loop-back performance in transceiver test.
- Low noise and low jitter to support reliable O/E conversion for optical stress test.
- Compliance to IEEE 802.3ae -LR, -LRM, -ER, -SR and up to 10 GFC in combination with the N4917A Optical Receiver Stress Test solution.
- Quick signal level verification and diagnosis with integrated average optical power meter.
- Linear conversion with internal amplifier extends the application as frontend O/E converter.
- Seamless integration in the industry standard Agilent LMS platform extends your optical workbench capabilities.

## Applications

- Loop-back test for compliance with IEEE 802.3ae optical transmitter stress test.
- Qualitative analysis of modulated signals with an electrical spectrum analyzer or oscilloscope
- Any scientific optical measurement setup that requires O/E conversion up to 9 GHz.



## Specifications

### Data Input (Optical in)

Operational data rate	622 Mb/s to 12.5 Gb/s	
Fiber type	Standard multi-mode 62.5 μm/ 125 μm	
Wavelength range	750 nm to 1650 nm	
Maximum safe input power	+8 dBm	
Maximum linear input power <sup>[f1]</sup>	-3 dBm	
Noise equivalent power (rms)	λ = 850 nm	< 3.0 μW (typical)
	λ = 1310 nm	< 1.5 μW (typical)
Optical-to-electrical conversion ratio <sup>[f2]</sup>	λ = 850 nm	> 250 V/W (typical)
	λ = 1310 nm	> 400 V/W (typical)
	λ = 1550 nm	> 350 V/W (typical)
Return loss	λ = 850 nm MM	> 14 dB (typical)
	λ = 1310 nm SM	> 27 dB (typical)

### Data Output (RF out)

Output impedance (nominal)	50 Ω
Opto-electrical modulation bandwidth <sup>[f3]</sup>	DC to 9.3 GHz (typical)
Rise and fall times ( 20 % to 80 %)	< 35 ps
Jitter <sup>[f4]</sup>	< 20 ps

### Optical average power meter (specifications valid at 850 nm, 1310 nm, 1550 nm)

Power range	-40 dBm to +5 dBm	
Total uncertainty (- 25 dBm to +2 dBm) <sup>[f5]</sup>	< ± 0.5 dB (typical)	
Linearity (- 25 dBm to +2 dBm) <sup>[f5]</sup>	< ± 0.05 dB (typical)	
Noise ( 2σ ) <sup>[f6]</sup>	λ = 850 nm	< 35 nW
	λ = 1310 nm, 1550 nm	< 20 nW
Averaging time (selectable)	100 μs to 10 s	

[f1] Compression < 1 dB

[f2] OMA ≤ 0.5 mW and average power ≤ 0.3 mW

[f3] -3dB decreases relative to 100 MHz

[f4] Jitter of input signal < 10 ps

[f5] NA ≤ 0.24; within 5 min after zeroing, at constant temperature ±1K,

For 850 nm and 1550 nm: up to 0 dBm

For 1550 nm: add 0.05 dB above -3dBm

[f6] 300 samples, averaging time 1 s, constant temperature ±1K

### General specifications

#### Optical connector interface

Agilent universal adapter straight ferrule

#### RF connector interface

2.4mm female

#### Module size (H x W x D)

75 mm x 32 mm x 335 mm (2.8" x 2.3" x 13.2")

#### Module weight

0.5 kg (1.1 lbs)

#### Warmup time

20 min

#### Operating temperature

+5° C to +40° C

#### Storage Temperature

- 40° C to +70° C

#### Humidity

15 % to 95 % relative humidity, non-condensing

#### 816xA/B Firmware revision

5.01 and higher

#### Recommended recalibration time

3 years

## Ordering Information

**81495A -085 Reference Receiver**

### Calibration and Warranty

R 1280  
Return-to-Agilent  
warranty and service plan

R-51B-001 - 3A  
3 month Return-to-Agilent  
warranty extended to 3 years

R-50C-011 - 3  
Agilent Calibration Up front  
Support Plan 3 year coverage

## Optical instruments online information

Optical test instruments  
[www.agilent.com/find/oct](http://www.agilent.com/find/oct)

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