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Keysight Technologies
81495A Reference Receiver

Data Sheet



KEYSIGHT TECHNOLOGIES

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81495A Reference Receiver

The Keysight Technologies, Inc. 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 Keysight 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.

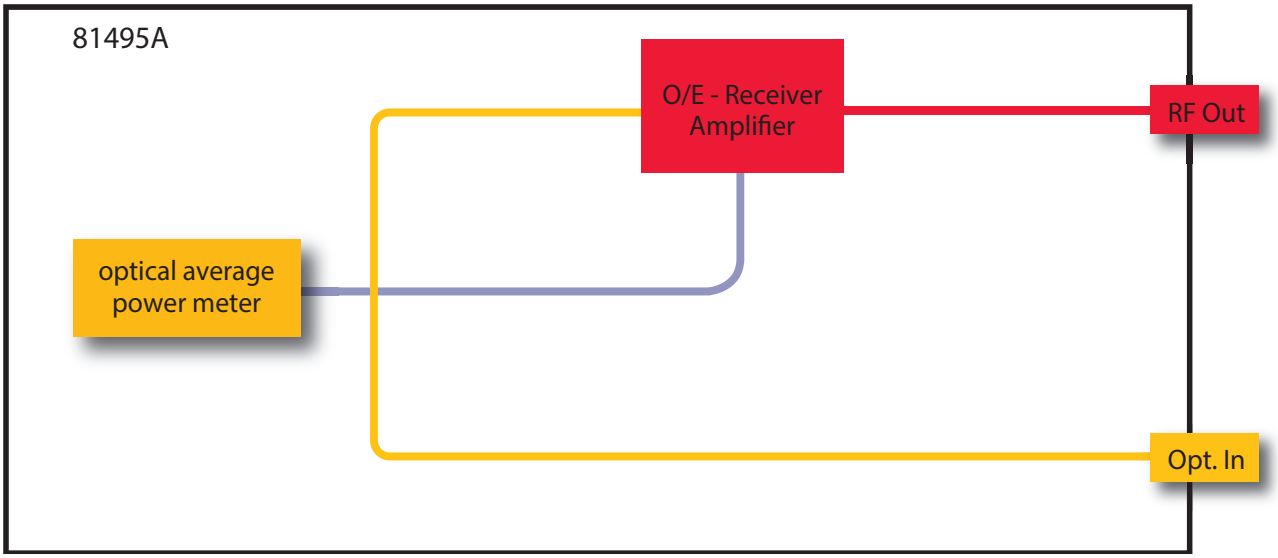
As additional feature the reference receiver provides an integrated optical average power meter. The capability of verifying the average optical power of the connected signal with the same receiver as the RF signal offers a fast and simple way to control the average signal power of the tested signal.

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 Keysight 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.



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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		2 mW
Maximum linear input power [f1]		–3 dBm
Noise equivalent power (rms)	λ = 850 nm λ = 1310 nm	< 3.0 µW (typical) < 1.5 µW (typical)
Optical-to-electrical conversion ratio [f2]	λ = 850 nm λ = 1310 nm λ = 1550 nm	> 250 V/W (typical) > 400 V/W (typical) > 350 V/W (typical)
Return loss	λ = 850 nm MM λ = 1310 nm SM	> 14 dB (typical) > 27 dB (typical)

Data Output (RF out)		
Output impedance (nominal)		50 Ω
Opto-electrical modulation bandwidth [f3]		DC to 9.3 GHz (typical)
Rise and fall times (20% to 80%)		< 35 ps
Jitter [f4]		< 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) [f5]		< ±0.5 dB (typical)
Linearity (–25 dBm to +2 dBm) [f5]		< ±0.05 dB (typical)
Noise (2σ) [f6]	λ = 850 nm λ = 1310 nm, 1550 nm	< 35 nW < 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] –3 dB decreases relative to 100 MHz
[f4] Jitter of input signal < 10 ps
[f5] NA ≤ 0.24; within 5 min after zeroing, at constant temperature ±1 °K,
For 850 nm and 1550 nm: up to 0 dBm
For 1550 nm: add 0.05 dB above –3 dBm
[f6] 300 samples, averaging time 1 s, constant temperature ±1K

General specifications

Optical connector interface
Keysight universal adapter straight ferrule

RF connector interface
2.4 mm 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

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Ordering Information

81495A-085 Reference Receiver

Calibration and Warranty

R 1280
Return-to-Keysight
warranty and service plan

R-51B-001 - 3A
3 month return-to-Keysight
warranty extended to 3 years

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

Optical instruments online information

Optical test instruments
www.keysight.com/find/oct

Lightwave Component Analyzers
www.keysight.com/find/lca

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