DATA SHEET

81492A Reference Transmitter

Keysight's 81492A Reference Transmitter is designed to offer excellent eye quality for NRZ and PAM4 signals at baud-rates up to 56Gbaud and can serve as universal single-mode E/O converter. In addition to the internal lasers at 1310 & 1550nm, an external optical input for usage with tunable laser sources is available. The integration in the LMS mainframe offers a variety of advanced features such as automated bias-point and power control, remote control via SCPI language and much more. The LMS mainframe platform also offers seamless integration into various performance and compliance test solutions like optical receiver stress test.

The separation of the signal source and the modulator is the only way to offer a zero-chirp modulation. This is essential for a clean and repeatable eye diagram when modulating with an appropriate clean external source to fulfill the requirements of the IEEE standard. Another advantage of this design compared to directly modulated transmitters is the wide extinction ratio range that can only be achieved with this design.

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Benefits

- Repeatable and reproducible measurements permit lower production test margins and improved specifications of the characterized devices.
- Reliable measurements ensure comparability of the test results.
- Support for full compliance to IEEE 802.3 stressed eye test in combination with Keysight's Optical Receiver Stress Test solutions.
- Wide extinction range offers highest test range coverage to ensure best quality of the tested devices under all target operating conditions.
- Rapid test reconfiguration with dual-wavelength to switch between 1310 nm and 1550 nm by remote control or manually without exchanging a module.
- Scalability with integration into industry-standard Keysight LMS platform extends your optical workbench capabilities.
- Fast signal calibration and optimization through integration with Keysight automation software

Application

- Reference transmitter for stressed eye compliance test according to IEEE 802.3.
- Creation of arbitrary optical modulation signals in combination with waveform generators.
- General transmission system test with special pulse patterns in combination with a pattern generator.

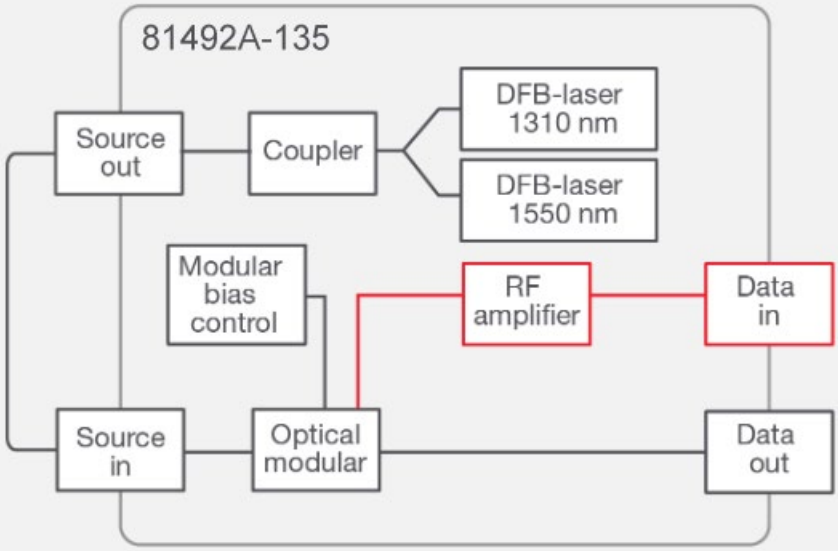

Figure 1: 1310 nm/1550 nm reference transmitter

Specifications

	Characteristic	81492A-135
Optical source output	Optical wavelength	L1: 1310 nm ± 10 nm L2: 1550 nm ± 10 nm
	Optical output power	> +13 dBm typical
	Attenuation range	6 dB
	Output power stability over 15 minutes	± 0.005 dB typical
	Optical interface type	APC Panda PMF 9 / 125 µm
Optical input	Wavelength range	1260 nm to 1360 nm 1480 nm to 1640 nm
	Optical input power range	+8 dBm to +16 dBm +10 dBm nom.
	Maximum safe input power	+18 dBm
	Loss at quadrature bias point	8 dB typical @ 1550 nm 10 dB typical @ 1310 nm
	Optical interface type	APC Panda PMF 9 / 125 µm
Data output	Optical interface type	APC SMF 28 9 / 125 µm
	Electro-optical modulation bandwidth 3 dB	> 26 GHz typical @ 1310 nm
	Electro-optical modulation bandwidth 6 dB	> 40 GHz typical @ 1310 nm

Specifications Continued

	Characteristic	81492A-135
Data output	TDEC 1)	< 1.5 dB typical, 1310 nm
	Jitter (peak-peak) 1)	< 6.5 ps typical
	Jitter (rms) 1)	< 400 fs typical
	Rise and fall time (20% to 80%) 3)	< 12 ps typical < 9 ps typical w. 59GHz scope BW [4)]
	ER 1)	> 6.0 dB > 7.9 dB typical
	Outer ER (PAM4) 2)	> 3.9 dB typical, 1310 nm > 3.0 dB typical, 1550 nm
	Outer OMA (PAM4) 2)	> 2.0 mW typical, 1310 nm > 2.9 mW typical, 1550 nm
	TDECQ (PAM4) 2)	< 2.4 dB typical, 1310 nm < 2.1 dB typical, 1550 nm

Measurements performed with M8045A pattern generator. Optical waveforms captured and analyzed using a N1092A and 86116C optical sampling scope.

1. M8045A settings: Signal rate 53.125 Gbaud, modulation type NRZ, output amplitude 250 mV, data pattern PRBS11,
2. N1092A settings: SIRC BW 39.84 GHz. De-emphasis optimized for eye width
   M8045A settings: Signal rate 53.125 Gbaud, modulation type PAM4, output amplitude 200 mV, data pattern SSPRQ,
   N1092A settings: SIRC BW 26.66 GHz. De-emphasis optimized with linear equalizer for eye opening
3. M8045A settings: Signal rate 56 Gbaud, modulation type NRZ, output amplitude 250 mV, data pattern Clock/16,
   N1092A settings: SIRC BW 39.84 GHz. De-emphasis optimized for eye width
4. M8045A settings: Signal rate 56 Gbaud, modulation type NRZ, output amplitude 250 mV, data pattern Clock/16,
   86116C settings: SIRC BW 59.7 GHz. De-emphasis optimized for eye width

General Specifications

RF connector interface	1.85 mm female
Module size (H x W x D)	75 mm x 64 mm x 335 mm (2.8” x 2.6” x 13.2”)
Module weight	1.0 kg (2.2 lbs)
Warmup time	60 min
Operating temperature	+5°C to +40°C
Storage temperature	−40°C to +70°C *
Humidity	5% to 95% relative humidity, non-condensing
816xA/B firmware revision	5.25 and higher
Recommended recalibration period	2 years

(*) recommended storage temperature range for 81491A-085 is +10°C to +40°C. If stored outside this range, the module must be conditioned at room temperature for at least 72 hours before use.

Ordering Information

Reference transmitter	
81492A-135 and 3x81000NI connector interface	1310 nm and 1550 nm

Learn more at: www.keysight.com

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

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