Agilent N7782A PER Analyzer and N7783A Thermal Cycling Unit

Key Benefits

- Accurate PER-measurement up to 50 dB
- Real-time display
- Easy-to-use: Reliable results independent of operator skill set
- Swept-wavelength and heating/stretching method available
- Measurement of the PER versus wavelength
- Fast/slow axis detection
- Instruments available for 850 nm up to 1640 nm
- Internal fixed wavelength sources at 850 nm/1310 nm/1550 nm available.

Introduction

Agilent's N7782A Series of polarization extinction ratio (PER) Analyzers has been designed for high speed and highly accurate testing of PER in PM fibers. The polarimetric measurement principle guarantees reliable measurements of PER values of up to 50 dB.

The real time measurement capability in combination with automation interfaces makes this unit ideally suited for integration in manufacturing systems, for example pig-tailing stations for laser diodes and planar wave guide components. Analog interfaces are provided for integration of the system in control loop applications.

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Applications

Laser diode PMF pig-tailing
Alignment of the PM fiber during the pig-tailing process is supported by real-time display of the PER and the optical power.

PMF splicing
In order to support the alignment during the splicing process of PM fibers the Agilent N7782A provides real time display of the optical power and of the angular misalignment of the two fibers.

PM component characterization
Measurement of the PER on PM components like fiber polarizers, PMF couplers, PMF splitters, etc.

Characterization of PMF cross-coupling
Polarization crosstalk in a PM fiber is measured and displayed as PER.

PM splice characterization
The angular misalignment of a PM splice can be measured in a non-destructive way. Even multiple splices in a chain can be characterized independently.

Using Agilent's tunable laser source 81600A Series in combination with the N7782A PER analyzer allows measuring the PER as a function of wavelength.

Agilent's software package includes drivers for most of the tunable laser sources commonly used in industry.

N7782A and N7783A Application Examples

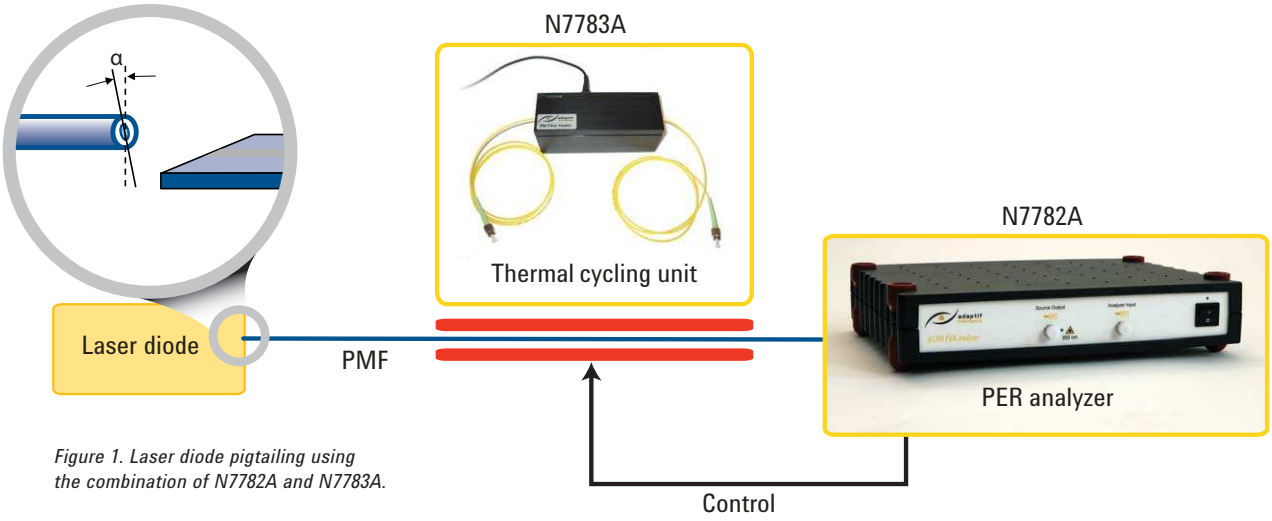

Figure 1. Laser diode pigtailing using the combination of N7782A and N7783A.

The heating / stretching method
The heating / stretching method provides accurate measurements of the PER at a single wavelength.
This method supports in particular well the measurement using narrow-band laser sources.
An optional internal laser source allows stand-alone operation of the system.

Agilent's thermal cycling unit, N7783A, is fully controlled by the N7782A PER analyzer and allows accurate and repeatable cycling of the temperature of the fiber under test. The PER measurement system consisting of the N7782A and the N7783A shows excellent accuracy and repeatability. Ease of use and automation interfaces, such as analog output ports for active alignment, make it particularly useful for production environments.

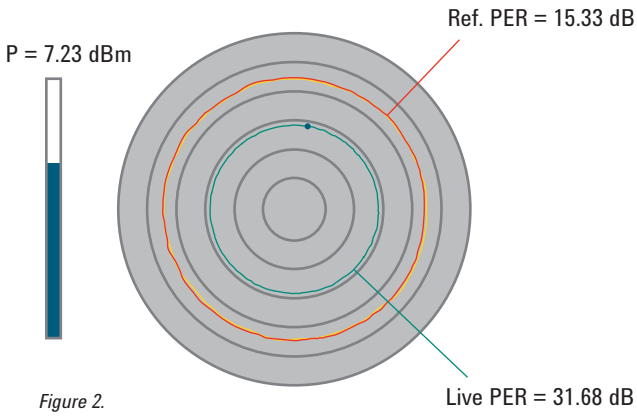

Figure 2.

Splice angle characterization

For characterizing an optical connection between two polarization maintaining fibers (PMFs), such as an optical splice, two thermal cycling units (N7783A) can be used. This eliminates the influence of input polarization or subsequent fibers at the output and isolates the angular misalignment of the connection located between the two thermal cycling units.

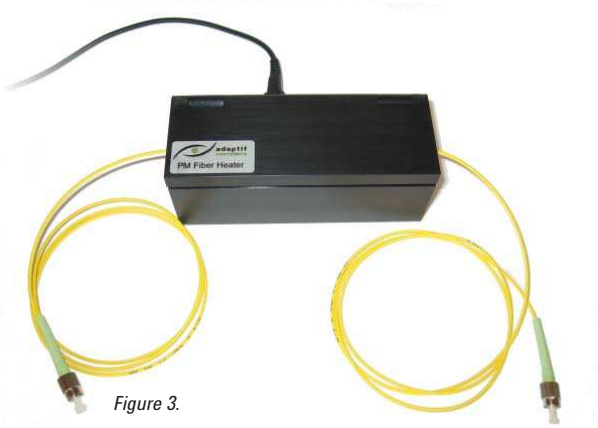

Figure 3.

Table 1. N7782A PER analyzer characteristics

	Benchtop						
Option	N7782A-100	N7782A -101	N7782A -200	N7782A -400	N7782A -401	N7782A -500	N7782A -501
Internal fixed wavelength source		850 nm			1,310 nm 1,550 nm		1,550 nm
Wavelength operating range	850 to 1,000 nm		950 to 1,100 nm	1,260 to 1,640 nm			
Factory calibrated range	850 nm		980 nm	1,270 to 1,375 nm 1,460 to 1,620 nm		1,460 to 1,620 nm	
PER range	0 to 50 dB						
Input power range	–35 ...10 dBm		–40 ... 10 dBm	–50 dBm ... +7 dBm			
Measurement update rate	> 10 Hz						
Displayed parameters	PER, power, angle						
Operating temperature	+5 °C ... +40 °C						
Interfaces	USB, GPIB, analog ports for measurement output (0 to 5 V)						
Power	100 – 240 VAC, < 36 W						
Dimensions (H x W x D)	70 mm x 330 mm x 270 mm (2.75“ x 12.0“ x 10.6“)						
PC Connectivity	A state of the art PC with GPIB/USB interface is required; it is not included						

Table 2. Agilent N7783A thermal cycling unit characteristics

Fiber jacket diameter	Up to 3 mm
Thermal cycling time	1 to 10 seconds (adjustable)
Thermal cycling range	0 °C to 60 °C
Power	100 to 240 VAC, < 36 W
Dimensions (H x W x D)	64 mm x 160 mm x 61 mm

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