OBR 4600: An Indispensable Development Tool for Silicon Photonics Research

More Than Just a Reflectometer
Tracks changes in polarization state, measures group delay.

Component Characterization with Unprecedented Visibility
See inside the component and evaluate each interface for RL, IL dispersion, and more.

Accelerate Design Iterations
A full range of measurements in a single scan. Up to 30 meters with 10 micron resolution in just 7 seconds.

Key Specifications
- 0.05 dB resolution and 0.10 dB accuracy
- 70 dB dynamic range
- Very low noise floor -130 dB
- Measures 30 m with 10 micron resolution in less than 7 seconds

Making Silicon Work at the Speed of Light

Optimize Fabrication Methods to Minimize Power Dissipation
Limiting total power dissipation is critical to minimize heating and signal degradation.

Identify the Location of Power Loss Inside the Chip
Characterize power loss across interfaces inside the chip with micron resolution.

Polarization Mode Dispersion
Quantify the impact to polarization caused by imperfections in physical dimensions and characteristics of the light paths.

One meter long spiral waveguide delay line manufactured on a Si/Si$_3$N$_4$/SiO$_2$ Chip

Spiral Delay Chip - Actual Size
Spiral Delay Chip - Schematic
OBR 4600 Connection

“Blumenthal and Bowers Optoelectronics Research Groups”

www.lunainc.com
301 1st Street, SW, Suite 200 | Roanoke, VA 24011

solutions@lunainc.com
540.769.8400
A Spiral Delay Line Fabricated on a Silicon Platform - An Analysis Using Luna’s OBR 4600

Total Distributed Loss Across 1 meter Silicon Photonics Spiral Delay Line

The high spatial resolution of the OBR 4600 is used to illuminate a reflective event near the entry point of the spiral delay line. The detail in the lower plot reveals that the broad reflective event at the beginning of the trace is in fact a series of 50 individual reflections in the space of 2.5 mm correlating to the input waveguide leg crossing the arms of the spiral path.

Using the same data set the average dispersion accumulated by traveling through the device can be determined by measuring the slope of the phase derivative. In this case, the average dispersion is equal to approximately 820 ps/nm.