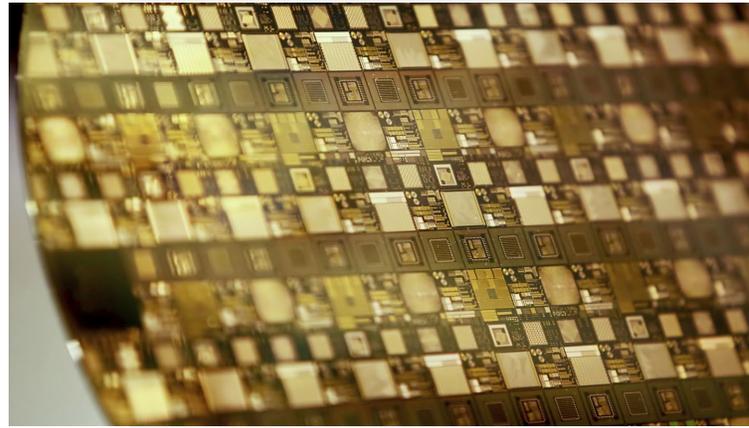




Silicon Photonics and PIC Testing



Fast and Complete Component Characterization

Luna's unique test systems, based on optical frequency-domain reflectometry (OFDR), deliver accuracy and speed for testing integrated components.

"See Inside" Components with Ultra-High Spatial Resolution

Luna's ultra-high resolution OBRs offer backscatter-level sensitivity for unprecedented distributed loss analysis of passive components.

Complete Component Characterization with a Single Scan

An OVA measures a passive component's linear transfer function (Jones Matrix) with a single scan, yielding all critical parameters in less time.

Higher Throughput for Manufacturing Test

Luna's 6400 Lightwave Analyzers combine high-speed transmission analysis with OBR reflectometry, making them ideal for manufacturing

Polarization Control and Stabilization

Luna's broad range of polarization control solutions deliver the performance and versatility for testing today's technologies.

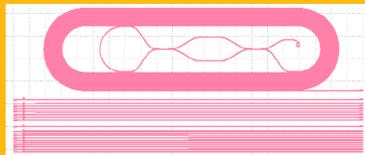
- All-fiber based polarization controller/scrambler/depolarizer
- High-speed LiNbO3 polarization control platform
- Versatile polarization synthesis and analysis

Applications

- Manufacturing test
- Quality control
- Diagnose production issues
- Characterize and analyze designs
- Validate models and improve simulations
- Passive optical components and modules - filters, PLCs, AWGs, MUX/DEMUX, splitters, gratings, WSS, ROADMs, etc.
- Polarization control
- Polarization impairment emulation for testing coherent receivers

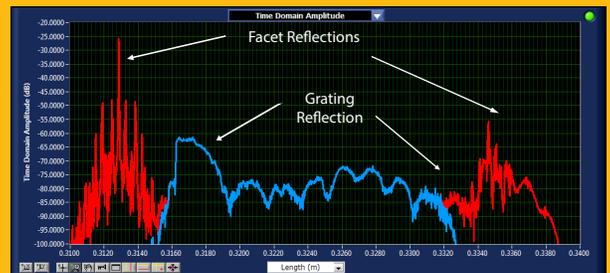
Example: Characterization of Planar Waveguides

Planar optical waveguides, a key building block of silicon photonic platforms, present several unique measurement challenges, including greater losses per unit length and high polarization dependency.

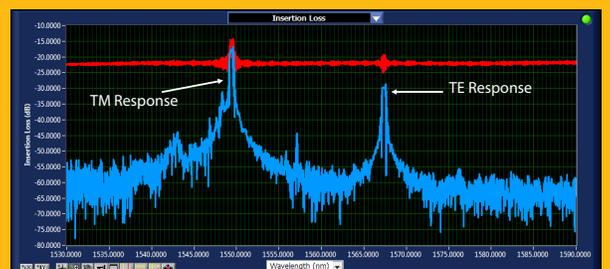


Luna's swept laser interferometric technology is able to scan the device and trace reflectivity along the length of the waveguide with sub-mm detail and fully characterize the optical path. For this example waveguide grating, scanned with an OBR 4600, the time domain trace allows easy identification of the facet and grating reflections.

Using the Luna analysis software, you can select only the grating reflection and easily observe the different TM and TE polarization effects in the spectral response. Otherwise, the overall spectral response (shown in red trace on bottom plot) is dominated by the large facet reflections.



The time domain response clearly shows the large facet reflections and grating reflection of the silicon photonic waveguide.



Spectral analysis of only the grating reflection (blue trace), selected via the time domain response, easily identifies the grating peaks. The overall response of the waveguide is shown by the red trace.



Component Test and Analysis Solutions

Advanced optical test products based on optical frequency domain reflectometry (OFDR) deliver industry leading dynamic range, resolution and speed.



Optical Vector Analyzer

OVA 5100

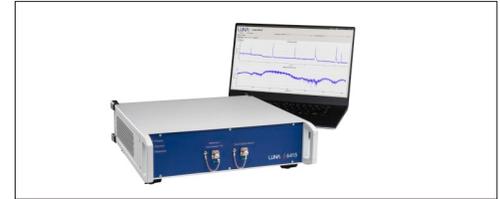
- Fast and complete characterization
 - With single scan, measure IL, RL, PDL, PMD, TE/TM states, phase, waveguide scatter and more
- Full polarization analysis



Optical Backscatter Reflectometer

OBR 4600

- Unprecedented visibility into details of PICs (10 μm resolution)
- Analyze distributed loss and scattering
- Measure skew with sub-ps resolution



Lightwave Component Analyzer

Luna 6400

- High speed analyzer for production test and quality control
- Reflectometer and transmission analyzer in single instrument

	OVA 5100 Optical Vector Analyzer	OBR4600 Optical Backscatter Reflectometer	Luna 6400 Component Analyzer	PDL-201 PDL Multimeter
Wavelength band	C & L, O	C & L, O, 1 μm	C	1260 - 1620 nm
Measurement mode	Transmission and Reflection (Time-Domain)	Reflection (Time-Domain)	Transmission and Reflection (Time-Domain)	Transmission
Insertion loss (IL), return loss (RL)	✓	✓	✓	✓ (IL)
Polarization (PDL, PMD)	✓	Track polarization states		✓ (PDL)
Phase measurements	✓	Group delay, Phase derivative		
Spectral domain analysis	✓	✓	✓	
Max spatial sampling resolution	20 μm	10 μm	20 μm	
High-speed scanning			✓	✓

Polarization Control and Stabilization

The industry's most comprehensive range of polarization control solutions provide your automated test systems with the flexibility and speed required for modern PIC testing.

Polarization Control Platform

- 7 polarization functions
- SOP Tracking for active polarization stabilization
- Acquirer function for quick toggling between TE/TM modes



Polarization Synthesizer

- Deterministic SOP generator with polarization monitoring capabilities
- Maintains any SOP at the output without any external feedback signals



Polarization Scrambler

- High-speed SOP depolarization for repeatable IL measurements
- All fiber-based lossless design with operation over 1260 nm-1650 nm
- < 5% DOP at 500 Hz detection bandwidth



Polarization Dependent Loss (PDL) Multimeter

- Measures PDL, insertion loss (IL) and optical power
- Wide wavelength range from 1260 to 1620 nm
- High-speed measurement: 30 ms

