

Swept Photonics Analyzer

SPA-110

Product Overview

Santec's Swept Photonics Analyzer, the SPA-110, is the next generation of OFDR based reflectometers from Santec. It is a versatile add-on module for Santec tunable lasers. When combined, this system is capable of analyzing even the most compact and complex optical components, providing detailed results for reflectance, transmission, and event location.

The system utilizes Optical Frequency Domain Reflectometry (OFDR) technology to examine the back reflection and transmission characteristics of fiber optic devices and components in the spatial domain. It generates a trace similar to that of an Optical Time Domain Reflectometer (OTDR) but with significantly higher resolution and precision.

The SPA-110, builds on its predecessor by improving the reflectance sensitivity and extending the scan range from 5m to 30m allowing for the addition of optical signal conditioning devices in the measurement setup. This improved sensitivity, increased range and the system's sampling resolution allow for a more comprehensive characterization of small devices like silicon photonic circuits, fiber optic components and compact fiber optic assemblies.

The SPA-110 is available in two configurations: O-band (1260 nm to 1350 nm) and CL-band (1480 nm to 1640 nm).



Features

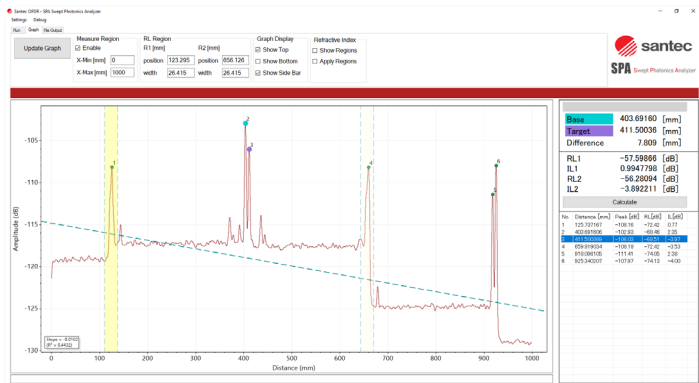
- Measure IL and RL on optical components
- Configurable based on Santec tunable laser
- Specify regions of interest to analyze events/feature of the optical device
- Define multiple refractive indexes for different areas of the trace
- Spectral analysis with 80 dB of dynamic range
- Spectral analysis of reflective events
- Low sensitivity for reflective events with virtually no dead zone
- Measure waveguide attenuation
- Up to 30m measurement range

Applications

- Analysis of silicon photonic waveguides
- Automated SiPh wafer alignment
- Optical component reflectance and analysis
- Wavelength dependent component characterization
- Fiber optic connector and cable assembly mating analysis
- High resolution reflectance analysis and length measurement (5 μ m)

Requirements

- Compatible Santec tunable lasers: TSL-570, TSL-710, and TSL-770

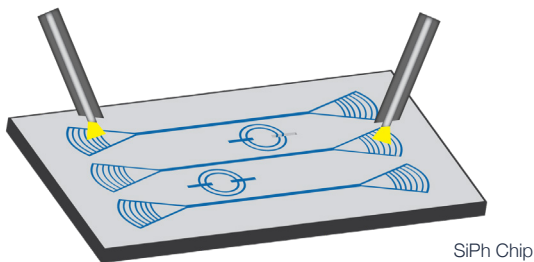
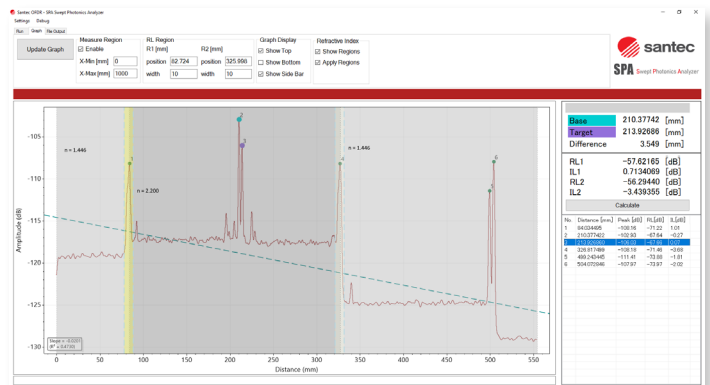


Define Areas of Interest

Select sections of the trace to automatically perform analysis of insertion loss and return loss with the region of interest.

Specify Multiple Refractive Indexes for a Trace

User can specify multiple indexes of refraction within a single trace when analyzing signals that may pass through different mediums, i.e. from fiber to air to silicon.



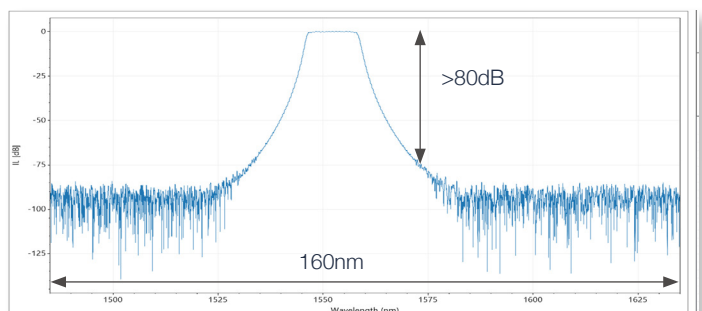
SiPh Chip

Ideal for PIC and Waveguide Analysis

With the highest resolution on the market, one can see details inside a PIC waveguide and analyze component loss, reflectance and waveguide attenuation.

Wavelength Dependent Loss Measurement

Measure transmission wavelength dependent loss across the full tunable laser range with over 80 dB of dynamic range with no gain switching. Single sweep and saves time.



SPA Optical / Electrical Specifications

Category	Parameter		Unit	Performance		Notes
Environmental Conditions	Operating Tem. Range		°C	15 to 35		
	Operating Humidity Range		%	< 80		non condensing
Common Characteristics	Wavelength Range (Maximum Tuning Width)		nm	1260 - 1350	1480 - 1640	Depends on the tunable laser range
				90	160	
	Sampling Resolution ^{*1,2}		μm	6	5	In fiber length
	Measurement Time (typ.)	Measurement Length: 5 m	sec	0.7	0.9	Resolution: 40 μm (O-band), 40 μm (CL-band)
			sec	2.6	4.4	Resolution: 6 μm (O-band), 5 μm (CL-band)
		Measurement Length: 30 m	sec	2	3.5	Resolution: 40 μm (O-band), 40 μm (CL-band)
			sec	9.9	17.2	Resolution: 6 μm (O-band), 5 μm (CL-band)
Reflection Mode	Maximum Measurement Length		m	30		In fiber length
	Repeatability (typ.) ^{*1,3}		μm	± 50	± 30	At 5 m fiber length
				± 300	± 180	At 30 m fiber length
	Dynamic Range	Return loss	dB	≥ 80		
		Insertion loss ^{*4}		≥ 20		
	Sensitivity		dB	-145		
	Total Range		dB	0 to -135		
Resolution		dB	0.1			
Transmission Mode	Maximum Measurement Length		m	60		In fiber length
	Repeatability (typ.) ^{*1,3}		μm	± 100	± 60	At 10 m fiber length
				± 600	± 360	At 60 m fiber length
	Dynamic Range	Insertion Loss	dB	≥ 80		
	Resolution		dB	0.1		
Interface	Measurement Port		-	1 or 2		2 ports are assigned input and output for IL measurement
	Fiber		-	PMF		
	Connector / Polish		-	FC/APC or SC/APC		
	Remote Control		-	USB		
Power Supply	Voltage		V	AC100 to 240		± 10%
	Max. Power Consumption		VA	100		
	Frequency		Hz	50/60		
Dimensions	Width x Depth x Height		mm	430 x 350 x 88		
	Weight		kg	11		

Notes:

^{*} All specifications are quoted after 1 hour warm-up period.

¹ These specifications are only guaranteed when measuring with PMF.

² 90 nm scan range for O-band, 160 nm scan range for CL-band.

³ Temperature < ±1°C/hr.

⁴ Two-way loss before backscatter reaches noise floor.



In the Box

SPA - Swept Photonics Analyzer

- SPA-110
- USB A to B
- Power Cord AC
- BNC Cable



Ordering Scheme & Instructions

1. Configure SPA Swept Photonics Analyzer

SPA-110--P--AP--AP--0

WAVELENGTH RANGE	
1	1260 - 1350nm
2	1480 - 1640nm

FIBER TYPE	
P	PMF (fixed)

INPUT CONNECTOR POLISH	
AP	APC (fixed)

OUTPUT CONNECTOR POLISH	
AP	APC (fixed)

OUTPUT PORT NUMBER	
1	1 port
2	2 port

INPUT CONNECTOR TYPE	
F	FC
S	SC

OUTPUT CONNECTOR TYPE	
F	FC
S	SC

* 1 port: Only reflection measurement mode is available.

2 port: Both reflection and transmission measurement modes are available

2. PMF Patch Cord

A PMF patch cord is required to connect the tunable laser to the SPA-110. Please define the ordering code for the PMF patch cord depending on the connector and polish type of the tunable laser output and the connector and polish type of the SPA-110 input.

PPC--P--AP

CONNECTOR A TYPE (To TSL)	
F	FC
S	SC

CONNECTOR A POLISH (To TSL)	
SP	SPC
AP	APC (angled PC)

CONNECTOR B TYPE (To SPA-110)	
F	FC
S	SC

CONNECTOR B POLISH (To SPA-110)	
AP	APC (angled PC)



Santec Japan Corporation
Tel: +81-568-79-3536

Santec Europe Ltd
Tel: +44-20-3176-1550

Santec USA Corporation
Tel: +1-800-726-8321

Santec (Shanghai) Corporation, Ltd
Tel: +86-21-58361261



EU Compliant



UK Compliant



RoHS Compliant

