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High Performance Tunable Laser
TSL-550

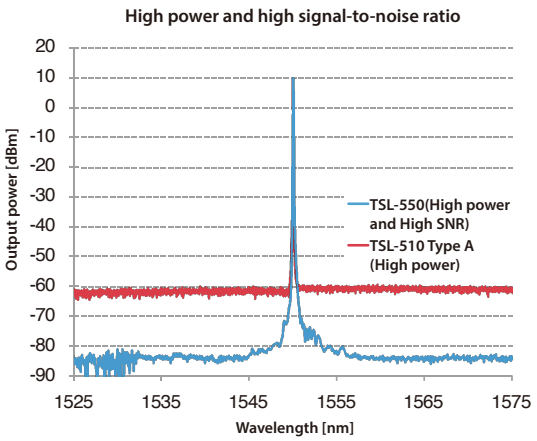
The TSL-550 is a high performance tunable laser with a wide tuning range and an output combining high power and high signal-to-noise ratio. The mod-hop-free tuning TSL-550 is equipped with features such as fine tuning and coherence control making it a must have tool for precision optical testing. Santec has used an innovative cavity design to lower the optical ASE noise, resulting in an extraordinarily high signal-to-noise ratio of over 90dB/0.1nm, while also maintaining a high output power of over +10dBm. GPIB and USB interfaces with the industry standard SCPI command set provide a convenient automated measurement solution.

The TSL-550 has two separate versions: Type A includes a wavelength meter with ±20pm wavelength accuracy and Type C, the high accuracy version, with an absolute wavelength accuracy of ±5pm.

The TSL-550 is ideal for next generation components testing driven by innovations in Dense Wavelength Division Multiplexing (DWDM), passives and Wavelength Selective Switches (WSS) that require characterization of multi-input, high extinction ratio devices. The TSL-550 is designed to improve production inspection throughput by doubling the scan repetition rate over conventional lasers. In addition, the TSL-550 is available for WDL and PDL measurement with the support of our power meter, MPM-210 and dedicated software.



Measurement Data



Features

- Wide tuning range: from 1260 to 1680 nm
- High output power: +10 dBm
- High signal-to-noise ratio: 90 dB/0.1 nm
- High wavelength accuracy:
  - Type A: ±20 pm
  - Type C: ±5 pm

Applications

- Optical component characterization
- Fiber optic transmission testing
- Photonic material characterization
- Interferometry
- Optical spectroscopy

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■ Optical Specifications

Wavelength range: 1260-1360nm and 1500-1630nm

Category	Parameter		Unit	Performance	
				TypeA	TypeC
Wavelength Characteristics	Wavelength Tuning Range		nm	1260-1360 / 1500-1630	
	Wavelength Setting Resolution		pm	0.1	
	Absolute Accuracy *1	Operating Temperature	pm	±20	±5
		25±1 ºC (typ.)	pm	±15	±2.5
	Repeatability *1		pm	±10	±2
	Stability (typ.) *2		pm	≤ ±5	≤ ±1
	Sweep Speed		nm/sec	1 to 100	
Optical power Characteristics	Output Power	Peak (typ.)	dBm	≥ 13	
		Full Tuning Range	dBm	≥ 10	
	Power Repeatability *1, *3		dB	±0.01	
	Power Stability *2, *3		dB	±0.01	
	Power Flatness vs. Wavelength *1, *3		dB	±0.2	
	Relative Intensity Noise (RIN) (typ.)*6		dB/Hz	-145 (1MHz to 3GHz)	
Spectrum	Linewidth (typ.)	Coherence Ctrl. Off	kHz	400	200
		Coherence Ctrl. On	MHz	40	
	SMSR (typ.)		dB	≥ 45	
	Signal to Total Source Spontaneous Emission Ratio*4		dB	≥ 70	
	Signal to Source Spontaneous Emission Ratio *5		dB/nm	≥ 80 (≥ 90 dB/0.1nm)	

* All specifications are quoted after 1 hour warm-up period. Specifications apply for wavelengths not equal to any water absorption line.
*1: At static condition or "Step" sweep mode. *2: For period of 1 hour. Within ± 0.5 ºC. *3: At “Auto” power mode.
*4: Ratio of signal power to total spontaneous emission power within ±15nm of the signal wavelength (typical value).
*5: Ratio of signal power to maximum spontaneous emission power in a 1nm band within a ±3nm band around the signal wavelength (typical value).
*6: At maximum output power.

Wavelength range: 1355-1485nm and 1480-1630nm

Category	Parameter		Unit	Performance	
				TypeA	TypeC
Wavelength Characteristics	Wavelength Tuning Range		nm	1355-1485 / 1480-1630	
	Wavelength Setting Resolution		pm	0.1	
	Absolute Accuracy *1	Operating Temperature	pm	±20	±5
		25±1 ºC (typ.)	pm	±15	±2.5
	Repeatability *1		pm	±10	±2
	Stability (typ.) *2		pm	≤ ±5	≤ ±1
	Sweep Speed		nm/sec	1 to 100	
Optical power Characteristics	Output Power	Peak (typ.)	dBm	≥ 13	
		≥ 10dBm Range	dBm	≥ 10 (1380-1485nm) @1355-1485nm model ≥ 10 (1500-1630nm) @1480-1630nm model	
		Full Tuning Range	dBm	≥ 7	
	Power Repeatability *1, *3		dB	±0.01	
	Power Stability *2, *3		dB	±0.01	
	Power Flatness vs. Wavelength *1, *3		dB	±0.2	
	Relative Intensity Noise (RIN) (typ.)*6		dB/Hz	-145 (1MHz to 3GHz)	
Spectrum	Linewidth (typ.)	Coherence Ctrl. Off	kHz	400	200
		Coherence Ctrl. On	MHz	40	
	SMSR (typ.)		dB	≥ 45	
	Signal to Total Source Spontaneous Emission Ratio*4		dB	≥ 70	
	Signal to Source Spontaneous Emission Ratio *5		dB/nm	≥ 80 (≥ 90 dB/0.1nm)	

* All specifications are quoted after 1 hour warm-up period. Specifications apply for wavelengths not equal to any water absorption line.
*1: At static condition or "Step" sweep mode. *2: For period of 1 hour. Within ± 0.5 ºC. *3: At “Auto” power mode.
*4: Ratio of signal power to total spontaneous emission power within ±15nm of the signal wavelength (typical value).
*5: Ratio of signal power to maximum spontaneous emission power in a 1nm band within a ±3nm band around the signal wavelength (typical value).
*6: At maximum output power.

■ Optical Specifications

Wavelength range: 1560-1680nm

Category	Parameter		Unit	Performance	
				TypeA	TypeC
Wavelength Characteristics	Wavelength Tuning Range		nm	1560-1680	
	Wavelength Setting Resolution		pm	0.1	
	Absolute Accuracy *1	Operating Temperature	pm	±20	±5
		25±1 ºC (typ.)	pm	±15	±2.5
	Repeatability *1		pm	±10	±2
	Stability (typ.) *2		pm	≤ ±5	≤ ±1
	Sweep Speed		nm/sec	1 to 100	
Optical power Characteristics	Output Power *7	Peak (typ.)	dBm	≥ 13	
		Full Tuning Range	dBm	≥ 10	
	Power Repeatability *1, *3		dB	±0.01	
	Power Stability *2, *3		dB	±0.01	
	Power Flatness vs. Wavelength *1, *3, *7		dB	±0.2	
	Relative Intensity Noise (RIN) (typ.) *6		dB/Hz	-145 (1MHz to 3GHz)	
Spectrum	Linewidth (typ.)	Coherence Ctrl. Off	kHz	400	200
		Coherence Ctrl. On	MHz	40	
	SMSR (typ.)		dB	≥ 45	
	Signal to Total Source Spontaneous Emission Ratio *4		dB	≥ 35	
	Signal to Source Spontaneous Emission Ratio *5		dB/nm	≥ 45 (≥ 55 dB/0.1nm)	

* All specifications are quoted after 1 hour warm-up period. Specifications apply for wavelengths not equal to any water absorption line.
*1: At static condition or "Step" sweep mode. *2: For period of 1 hour. Within ± 0.5 ºC. *3: At “Auto” power mode.
*4: Ratio of signal power to total spontaneous emission power within ±15nm of the signal wavelength (typical value).
*5: Ratio of signal power to maximum spontaneous emission power in a 1nm band within a ±3nm band around the signal wavelength (typical value).
*6: At maximum output power. *7: Warrant range is 1560 to 1650nm

■ General specifications

Interface	Optical Output Connector		-	FC or SC, SPC or APC
	Optical Fiber		-	SMF or PMF *1
	Communication		-	GP-IB (IEEE 488.2), USB, RS-232C
	Power Monitor		V	0 to 3
Modulation	LF Modulation		kHz	DC to 400 (Input level -2 to 0V, Modulation depth >50%/V (typ.))
	RF Modulation (option)		MHz	2 to 100 (Input level 5Vp-p, Modulation depth >10% (typ.))
Environmental Conditions and others	Operating	Temperature	ºC	15 to 35
		Humidity	%	< 80 (non-condensing)
	Power Supply		-	AC 100-240V±10%, 50/60Hz
	Power Consumption		VA	100
	Dimensions (W) x (D) x (H)		mm	210x440x110
	Weight		kg	6.5

*1: In case of PMF, polarization axis in alignment with connector key. Polarization extinction ratio is 17dB (typical value).

Model selection

Model Number	Wavelength Range
260360	1260 – 1360
355485	1355 – 1485
480630	1480 – 1630
500630	1500 – 1630
560680	1560 – 1680

Other wavelength range model is available on request. Please contact Santec Sales.

Laser safety information



This product is classified class 1M laser product according to IEC 60825-1 (2007).
This product complies with FDA performance standards for laser products except for deviations pursuant to Laser Notice No. 50 dated June 24, 2007.

Ordering Code

TSL-550-□-□□□□□□-□-□-□□-□□-□

- A: Type : **A-C.** See "Specifications" above.
- B: Wavelength: See "Model selection" above. (e.g. 500630: 1500-1630 nm)
- C: Fiber Type : **S** : SMF / **P** : PMF
- D: Connector Type : **F** : FC / **S** : SC
- E: Connector Polish : **SP** : SPC / **AP** : APC
- F: Modulation : **00** : LF / **RF** : LF+RF
- G: Power Monitor : **0** : None / **1** : Power Monitor (Standard)

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