

Tunable Laser Optical Sub-Assembly

TOSA TLDX15 Series



Key Features

- Up to 40 channels at 100 GHz spacing or up to 80 channels at 50GHz spacing
- C- or L-band
- Simple tuning algorithm
- 2.5 - 10 Gbps direct modulation
- Small package size

Applications

- WDM-PON
- Colorless ONU
- Intelligent optical interconnects
- DWDM sparing
- Dynamic wavelength provisioning
- Wavelength routing

Widely wavelength tunable semiconductor lasers are key components for next-generation optical networks. Conventional tunable lasers require complex fabrication processes such as non-uniform gratings and multiple epitaxial growths, and need multiple electrodes with complex control algorithms for wavelength tuning. As the dense wavelength division multiplexing (DWDM) technology extends towards access and data center networks, the cost reduction and operational simplicity have become more and more important.

Lightip has developed a simple and compact tunable laser based on patented proprietary technologies. It consists of a half-wave coupled V-cavity laser with only three electrodes: one for gain and direct modulation, one for channel selection corresponding to the ITU grid, and the third for fine tuning when needed. The laser structure does not involve any grating or epitaxial regrowth, and has a size of only about $500\mu\text{m} \times 300\mu\text{m}$. The advantages of compactness, fabrication simplicity and easy wavelength control offer cost-effective tunable laser solutions for many applications in metro and access networks, and beyond.

The TLDX155 series Transmitter Optical Sub-Assembly (TOSA) integrates a V-cavity edge-emitting tunable laser, a power monitoring photodiode, an isolator, and a TEC controller. The connector type can be chosen from LC, SC or fiber-pigtail with FC/PC or FC/APC connector. It can provide up to 40 channels at 100GHz spacing or 80 channels at 50GHz spacing in C- or L- band (other wavelength bands available on request). The size of the 9-pin TOSA is only a small fraction of that of the conventional butterfly package for tunable lasers.

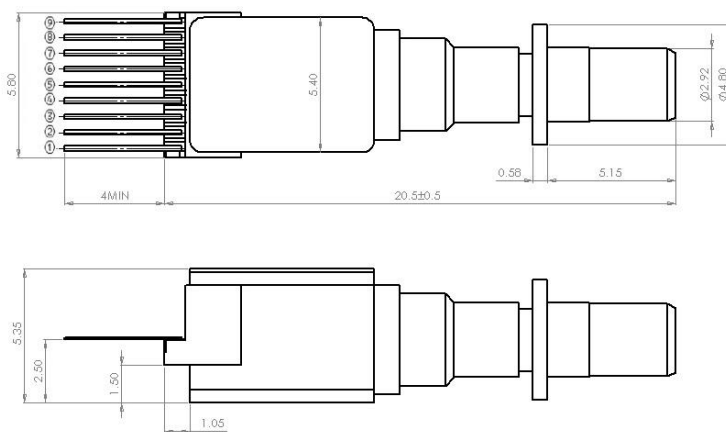
Specifications

Parameters	Min.	Typ.	Max.	Unit
Optical Output Power	0	3		dBm
LD Operating Temperature	10	35	65	°C
Ambient Operating Temperature	0	-	70	°C
Gain Forward Bias Current	25	30	100	mA
Channel Selector Current	20	-	140	mA
Fine Tuning Current	20	25	50	mA
LD Forward Bias Voltage	-	-	2.3	V
Modulation Data Rate	2.5 – 10			Gbps
Wavelength	C- or L-band (other wavelengths available on request)			
Channel Spacing	50 or 100			GHz
Number of Channels	16, 32, 40 @100GHz, or 32, 64, 80@50GHz			
Side Mode Suppression Ratio	35	38 - 40	-	dB
Optical Isolation	25	-	-	dB
Relative Intensity Noise	-	-	-135	dB/Hz
Power Monitor Current	20	-	500	μA
Power Monitor Dark Current	-	-	100	nA
TEC Current	-	0.7	1	A
TEC Voltage	-	2.2	3	V
Total Power Consumption (P _{LD} + P _{TEC})	-	2	3	W
Thermistor B constant	-	4050	-	K
Thermistor Resistance @25°C	9.5	10	10.5	kΩ

* Product specifications are subject to change without notice.

Dimensions

(in millimeters)



Pin Assignments

Pin	Symbol	Description
1	TEC+	TEC anode
2	TEC-	TEC cathode
3	GND	Ground
4	LD1	Gain bias and modulation signal
5	GND	Ground
6	PD-	Monitoring PD
7	LD2	Channel selector
8	LD3	Fine tuning
9	R _{Th}	Thermistor