

## Tunable Laser Bidirectional Optical Sub-Assembly BOSA TLBX15 Series



### Key Features

- **Up to 16 channels at 100 GHz spacing or up to 32 channels at 50GHz spacing**
- **C- or L-band**
- **Simple tuning algorithm**
- **2.5 Gbps direct modulation**
- **Bidirectional optical subassembly with LC connector or fiber pigtail**

### Applications

- **NGPON2**
- **WDM-PON**

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 access and data center networks, and beyond.

The TLBX15 series Bidirectional Optical Sub-Assembly (BOSA) is based on an 8-pin TO-CAN tunable laser, co-packaged with a PIN photodiode. The transmitter comprises a V-cavity edge-emitting tunable laser, a power monitoring photodiode, an isolator, and a TEC controller. Currently it can provide up to 16 channels at 100GHz spacing or 32 channels at 50GHz spacing in C- or L- band (other wavelength bands available on request), with a customer specified starting wavelength. The laser chip can be operated in semi-cooled condition at 40-60°C while the ambient operating temperature is between 0 and 70°C. A customized wavelength multiplexing filter is used for the bidirectional coupling to a single mode fiber, with an LC connector or fiber pigtail.

## Transmitter Specifications<sup>(1)</sup>

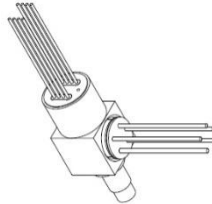
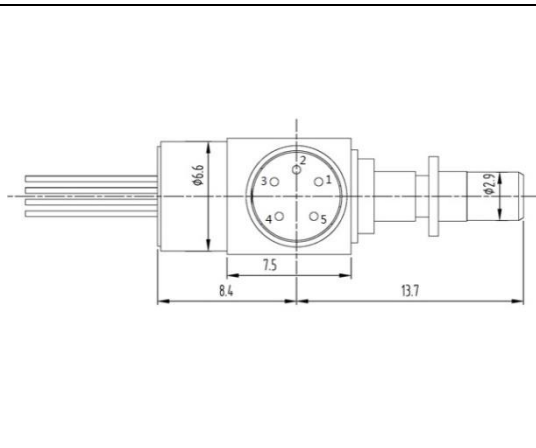
Note 1: See specifications of TLCX15 series TO-can based TOSA.

## Receiver Specifications<sup>(2)</sup>

Parameter	Sym	Test Conditions	Min.	Typ.	Max.	Unit
Power Supply	V <sub>cc</sub>		3.0	3.3	3.6	V
Supply Current	I <sub>cc</sub>	No Loads		31	36	mA
Single Ended Responsivity	R <sub>s</sub>	R <sub>load</sub> =50 Ohm, P>-23dBm, λ=1550nm	15		30	mV/μW
Differential Responsivity	R <sub>d</sub>	R <sub>load</sub> =100 Ohm, P>-23dBm, λ=1550nm	30		60	mV/μW
Small Signal Bandwidth	BW			1500		MHz
Low-Frequency Cut-off	LF			11		KHz
Saturation Power	P <sub>sat</sub>	P > -23 dBm, λ=1550 nm	0	3	6	dBm
Single-end Output Impedance	R <sub>o</sub>			50		Ohm
Rise/Fall Time (20%-80%)	T <sub>r</sub> /T <sub>f</sub>				150	ps
Sensitivity @25°C		λ=1550 nm, 25°C, @2.5 Gbps, PRBS23, ER=10 dB, BER=1×10 <sup>-10</sup>	29.5			dBm
Sensitivity@-40-85°C		λ=1550 nm, -40°C-85°C, @2.5 Gbps, PRBS23, ER=10 dB, BER=1×10 <sup>-10</sup>	29			dBm
Optical Isolation	ISO	λ=1530 nm – 1620 nm	-	45		dBm

Note 2: Typical Values are at +3.3V@25°C. Product specifications are subject to change without notice.

## Dimensions (in millimeters)



## Rx Pin Assignments<sup>(3)</sup>

Pin	Symbol	Description
1	GND	Ground
2	D+	Data P
3	I <sub>s</sub>	Source current
4	Vcc	DC power supply
5	D-	Data N

Note 3: See specifications of TLCX15 series TO-can based TOSA for Tx pin assignment.