

# Tunable Lasers

The Optoplex TL-MC040TA101 tunable laser is a high performance continuous wave (CW) tunable laser source for various test and measurement applications the C-band wavelength range covering from 1528nm (196.25 THz) to 1568nm (191.25 THz).

This tunable laser source is based on the OIF micro-iTLA standard. The laser and control electronics are pre-mounted on a dedicated circuit board for easy production installation. The tunable laser is featuring shuttered tuning, optical power control, off-grid tuning, adjustable grid spacing and narrow linewidth. A Labview software program and an RS232/USB cable are provided together with the tunable laser module. Users can plus and play with a computer (PC) to control the tunable laser very conveniently.

The TL-MC040TA101 tunable laser designed on a fully monolithic InP chip without moving parts, it is a low voltage electronically tuned device enabling channel switching with straightforward control electronics. The integrated semiconductor optical amplifier (SOA) provisions the optical power control and also acts as a shutter to allow dark tuning when reverse biased.

Laser tuning is implemented with thermal control. It can be tuned on grid or off-grid with a minimum tuning step of 0.1GHz. When operated in ON-Grid tuning, the tuning is shuttered. While in fine-tuning (+/-9GHz) mode, it is un-shuttered operation.

The TL-MC040TA101 tunable laser has a wavelength accuracy about 3.5pm max and a power stability of 0.02dB max (both measured in a period of 60 minutes).

With accurate wavelength and stable power output, the laser is ideal for many test and measurement applications, optical component and material characterization, and optical monitoring applications such as optical monitoring in optical thin film coating.



Figure 1, Photo of the Tunable Laser OEM Module, Model: TL-MC040TA101



REFERENCE IEC 60825-1 Ed2.0 (2007)



THIS PRODUCT COMPLIES WITH 21CFR 1040.10



Caution - use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

## Features:

- Full C-Band tunable laser source
- Narrow line-width,  $\leq 400\text{kHz}$
- High output power +15.5dBm nominal
- Variable output power range, 8.0dB
- Electronic shutter for dark tuning
- Gridless operation
- Wavelength stabilized for 0.1GHz
- Un-shuttered frequency fine tuning capability  $\pm 9\text{GHz}$
- Large SMSR,  $>40\text{dB}$
- Low RIN
- Low phase noise
- Low power dissipation, 4.5W
- Case operating temperature range  $-5^{\circ}\text{C}$  to  $+75^{\circ}\text{C}$
- Simple RS232 interface
- RS232/USB conversion cable available (optional)
- RoHS compliant 6/6
- Telcordia GR 468 Qualified
- Low-cost alternative solution in manufacturing line test and measurement
- Custom-software available for material and component characterization purpose upon request

## Applications:

- Coherent optical communication systems
- Low-Cost alternative laser source in manufacturing line test and measurement
- Optical characterization of materials and components
- Optical monitoring system (OMS) in optical thin film coating

## Operating Conditions

Parameter	Symbol	Unit	Conditions	Ratings			Notes
				Min	Typ.	Max	
Operating	$T_c$	$^{\circ}\text{C}$		0		+65	
Operating Humidity	-	%RH		5		85	
Storage	$T_{stg}$	$^{\circ}\text{C}$		-40		+85	
Storage Humidity	-	%RH		5		85	

## Mechanical Specifications

Parameter	Unit	Specifications	Notes
Dimensions (L x W x H)	mm	100 X 120 X 22	
Connector Type	-	FC/APC Standard	Specified by Customer

## Optical Performance Specifications

Parameter	Unit	Specification			Note
		Min	Typ.	Max	
Wavelength Range	nm	1528		1567	
Output Power	dBm	8		17	
Power Stability <sup>1</sup>	dB			±0.5	
Power Repeatability <sup>2</sup>	dB			±0.5	
Tuning Speed	sec	3		10	
SMSR (side mode suppression ratio)	dB	40			Measured over ±2.5nm range around the target frequency with 0.06nm RBW
Line width	kHz			400	
RIN (10MHz-1GHz) RIN (1-10GHz)	dB/Hz			-140 -145	
OSNR	dB	55			0.1nm optical bandwidth
PER	dB	20			
Back Reflection Tolerance	dB			27	
Shuttered Output Power	dBm			-35	

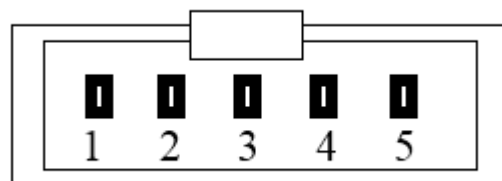
1. After 30 minute warm up, within 15 minutes at constant temperature.
2. After 30 minute warm up, within 1 hour at constant temperature.

## Electrical Performance Specifications

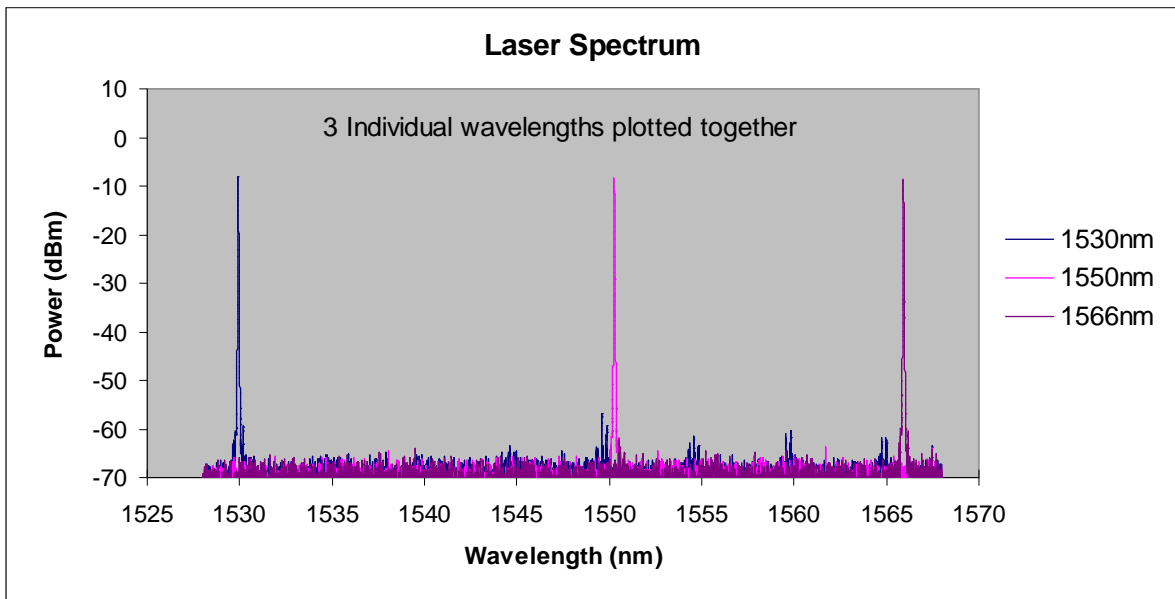
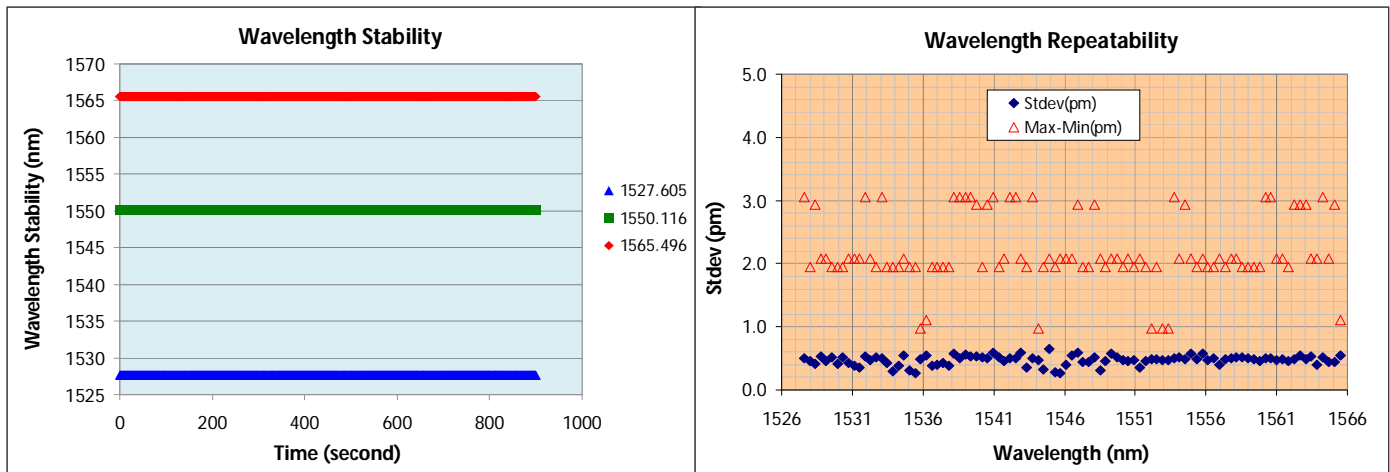
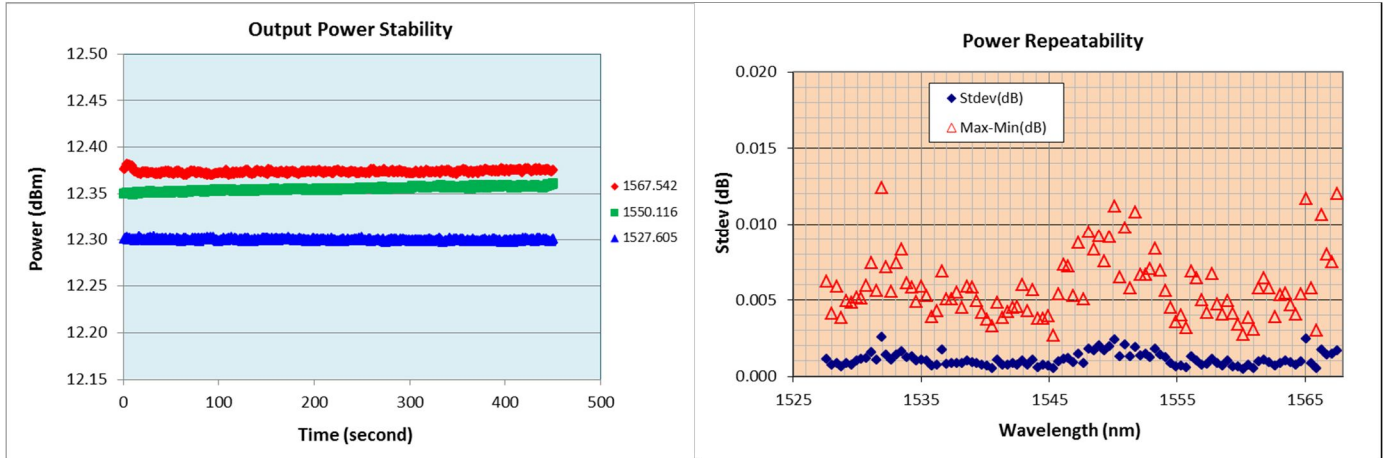
Parameter	Unit	Specification			Note
		Min	Typ.	Max	
Power Supply Voltage	V	4.5		5.0	
Power Consumption	W			6	
Cold Start Settle Time	s			10	
Warm Start Settle Time	s			0.1	
Transient Settle Time	μs		150	250	

## Full Function Pin Assignment

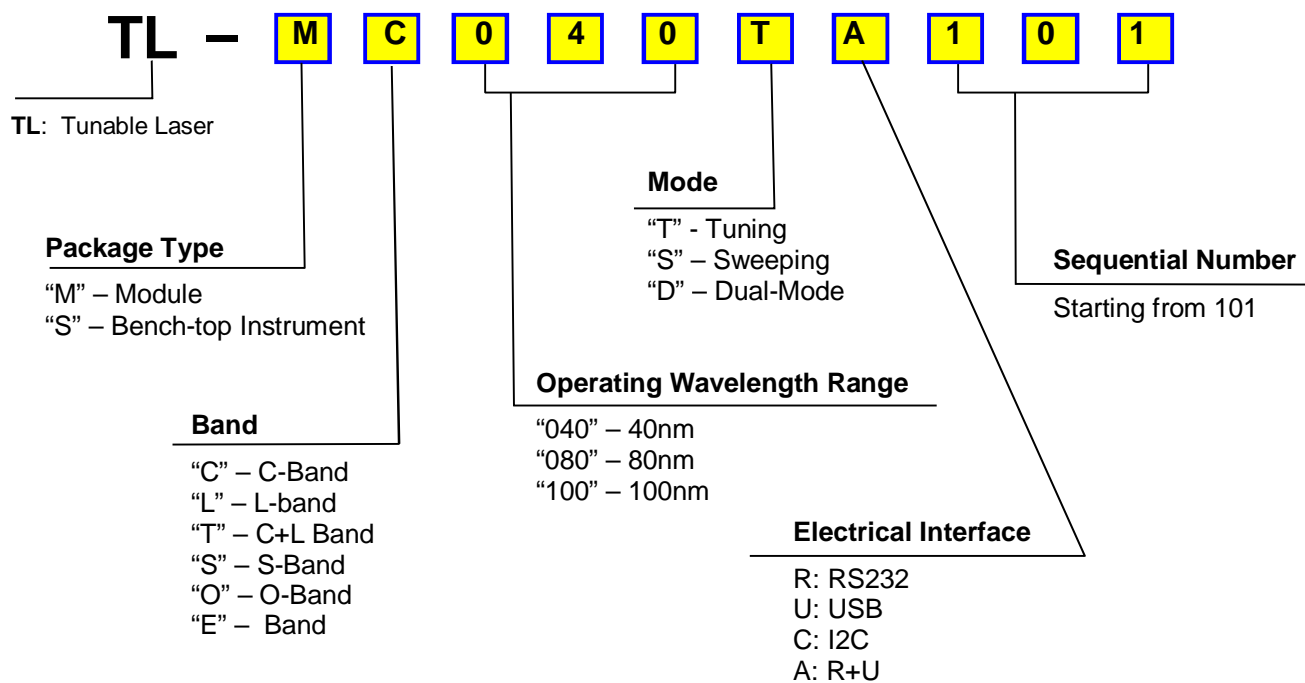
Pin Number	Pin Definition
1	/Reset
2	+5V VCC
3	Device Rx (LVTTTL)
4	Device Tx (LVTTTL)
5	Ground



# Appendix: Measured Performance



## Ordering Information



## Contact Information

### Headquarter

Optoplex Corporation  
48500 Kato Road  
Fremont, CA 94538  
USA  
Tel: (510) 490-9930  
Fax: (510) 490-9330  
[www.optoplex.com](http://www.optoplex.com)  
[info@optoplex.com](mailto:info@optoplex.com)

### Sales

[sales@optoplex.com](mailto:sales@optoplex.com)

### Technical Support

[support@optoplex.com](mailto:support@optoplex.com)