

NLL—NARROW LINEWIDTH LASER

The PureSpectrum™ - NLL is a compact, ultra low-noise distributed feedback (DFB) semiconductor laser module.



TeraXion's PureSpectrum™ Narrow Linewidth Laser is offered in a compact package suitable for integration in embedded designs / OEM instrumentation.

This fully integrated module uses state-of-the-art frequency noise control technology. It significantly reduces the optical linewidth of a DFB laser diode while preserving the benefits of the semiconductor diode.

The PureSpectrum™ NLL offers fast frequency tuning options for frequency-modulated continuous-wave (FMCW) sensing or other advanced sensing schemes.

Features

- Linewidth below 5 kHz
- Output power up to 70 mW
- Low phase noise
- High reliability
- Fast frequency modulation options

Applications

- Test and measurement
- Coherent OTDR
- Pipeline and bridge monitoring
- Perimeter detection in security applications
- LIDAR
- Quantum Key Distribution (QKD)

Available Configurations						Units
Wavelength Option ⁽¹⁾		1535 – 1565 (ITU grid)				nm
Output Power Option		30 or 70				mW
Fast Frequency Modulation Option		No Modulation	Option 1	Option 2	Option 3	
Fast Frequency Modulation Range		N/A	± 12	± 100	± 200	± MHz
Optical Parameters ⁽²⁾		No Fast Tuning	Option 1	Option 2	Option 3	Units
Linewidth ⁽³⁾		< 5		< 10	< 20	kHz
Max Frequency Noise	1 kHz – 100 kHz	< 5x10 ³		< 2x10 ⁴	< 5x10 ⁴	Hz ² /Hz
	100 kHz – 3 MHz	< 5x10 ⁵		< 5x10 ⁵	< 5x10 ⁵	
	3 MHz – 100 MHz	< 3x10 ⁵		< 3x10 ⁵	< 3x10 ⁵	
Frequency Stability		< 5x10 ⁻¹⁰ at 1 s, < 5x10 ⁻⁹ at 100 s		< 5x10 ⁻⁹ at 1 s, < 5x10 ⁻⁹ at 100 s		Allan Std. Dev.
Side Mode Suppression Ratio		> 30				dB
Polarization Extinction Ratio		> 17				dB
Relative Intensity Noise		< -130 (1 kHz - 10 kHz) < -140 (10 kHz - 1 MHz) < -150 (1 MHz - 1 GHz)				dBc/Hz
Output Type		CW				

Slow Frequency Tuning		Units	Fast Frequency Modulation (Option 1, 2 or 3)		Units
Frequency Tuning Method	Thermal Control Via Software Command		Modulation Method	Through External Modulation Input	
Frequency Tuning Range	± 10	GHz	Modulation Voltage Magnitude ⁽⁴⁾	-2 to +2	V
Frequency Tuning Resolution	5		Modulation Repetition Rate ⁽⁵⁾	Up to 0.5	
Slow Tuning Speed	0.5 (average)				MHz

Electrical Parameters		Units
Power Supply	+ 9 to + 36	VDC
Power Consumption ⁽⁶⁾	< 4.5	W

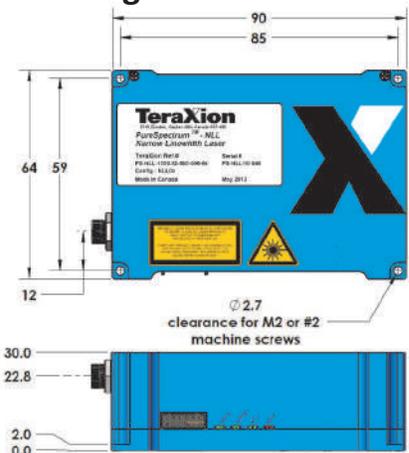
Mechanical Parameters		Units
Operating Temperature	- 5 to + 55	°C
Storage Temperature	- 40 to + 85	°C
Humidity Level	95, Non-Condensing	%
Dimensions (L x W x H)	90 x 64 x 30	mm
Fiber Type	PM Panda	
Optical Connector Type	FC / APC (Narrow Key), Key Aligned to Slow Axis	

Computer Interface	
Interface	RS-232
Connector	Hirose DF11-12DP-2DS
PC-Side Software ⁽⁷⁾	TeraXion's PureSpectrum™ Control and Monitoring Software
Power and Communication Module	TeraXion's 12 V PS-PU (Optional)

Typical specifications may vary depending upon user's requirements

- (1) In vacuum. Contact TeraXion for specific wavelength/channel.
- (2) At nominal wavelength
- (3) Linewidth is computed from the power spectral density of frequency noise (PSDFN) with 1 ms observation time. FWHM, Voigt profile.
- (4) Voltage must be fixed at 0V at turn-on and resets
- (5) Fast frequency modulation range is guaranteed up to specified repetition rate.
- (6) Typical at 25 °C for 70 mW output power
- (7) Windows compatible

Outline diagram



MKT-FTECH-PS-NLL 3.9

Laser safety information



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