

## Transmission Laser Modules

### KeyFeatures

2mW output power

Up to 3200 ps/nm dispersion performance

Low dispersion penalty

Optimized for direct modulation up to 2.7 Gbit/s

Wavelength selection according to ITU-T G.692 from 1529.55nm to 1569.59nm

25  $\Omega$  RF impedance matching and DC bias RF filtering

Industry - standard hermetic 14-pin butterfly package and low profile package (height 8.3mm)

InGaAsP Distributed FeedBack SLMQW (DFB) laser

### Applications

STM-16 ,OC-48 and DWDM Metropolitan Area Networks equipment

STM-16 ,OC-48 DWDM Transceiver and Transponder for Metropolitan and extended reach

Saturation Laser for WDM EDFA

Instrumentation

Digital CATV transmission

### For moreInfo

Please contact us at:

North America: **514.748.4848**  
**888.922.1044**

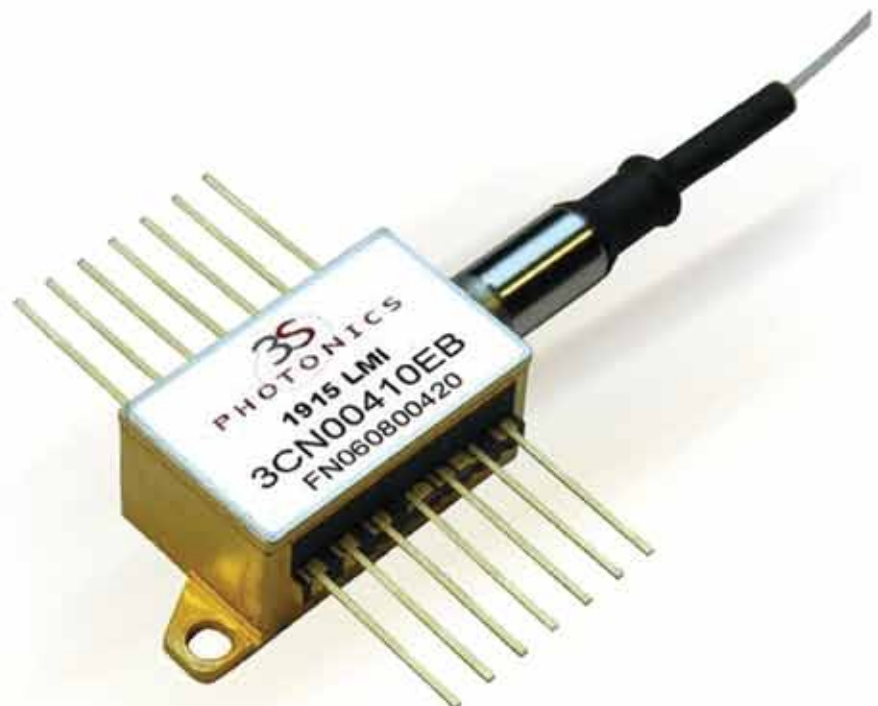
Europe & Asia: **+33 (0) 1 69 80 58 33**  
or via e-mail at **sales@3spgroup.com**

## 1915 LMI 2mW

### 1.55 $\mu$ m Laser Module - 2.5 Gb/s Direct Modulation - 2mW WDM & Single Channel application - up to 3200 ps/nm application

This laser module contains a 3SPGroup SLMQW DFB laser with 25  $\Omega$  impedance matching designed for use in Wavelength Division Multiplexed (WDM) systems, high power direct modulation operations up to 2.7 Gbit/s supporting application up to 3200 ps/nm.

The module incorporates a thermoelectric cooler, precision thermistor, and optical isolator for stable operation under all conditions.



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## OPTICAL CHARACTERISTICS

Unless otherwise stated: BOL @ Tcase= 25°C

Parameters	Symb	Conditions	Min	Typ.	Max	Units
Operating case temperature	Tc		-5		70	°C
Fiber-coupled peak power	Ppeak	@Twave	2			mW
Threshold current	Ith	@Twave	3		25	mA
Laser forward voltage	Vf	@Ppeak= 2 mW ; pin 11 & 3			2.5	V
Modulation current	If	@Ppeak= 2 mW ; pin 11 & 3, Note 1			45	mA
Extinction ratio	ER	Note 2	10			dB
Emission wavelength	λ	See table 3	1529.55		1564.68	nm
Δ (Emitted-Target Wavelength)	Δλ	@Twave, See Table 3 for Δ target	-0.1		+0.1	nm
Submount temperature	Twave		20		35	°C
Emitted I drift vs Twave	Δλ / Δ Twave	20°C ≤ Tsubmount ≤ 35°C		90		pm/°C
Emitted I drift vs Tcase	Δλ / Δ Tc	-5°C ≤ Tc ≤ 70°C			0.5	pm/°C
Tracking error	TE	@ Ppeak= 2 mW, Note 3			10	%
Side mode suppression	SMSR	@Twave ; Note 2	40		-	dB
Dispersion penalty	Δ S	Note 2 & 4			2	dB
Photodiode current	Im	V= -5 V, @Pmean=Ppeak/2, Note 4	30		300	µA
Photodiode dark current	Id	V= -5 V			0.1	µA
Serial resistance	RS	Ppeak=2mW; pin 11 & 12		25		Ω
Optical isolation	OI	-5°C ≤ Tc ≤ 70°C	30		-	dB
TEC current	It	@I(2mW), Twave= 20°C, Tc= 70°C	-		1.2	A
TEC voltage	Vt	@I(2mW), Twave= 20°C, Tc= 70°C	-		2.4	V
Thermistor resistance	RTH	Tsubmount= 25°C	9.7		10.3	kΩ
Thermistor β coefficient	β	Tsubmount= 25°C	3800		4000	K

**Note 1:** Modulation current :  $I_f = 2 * (I_{Pmean} - I_{th}) * [(1 - ER) / (1 + ER)]$  where  $P_{mean} = P_{peak}/2$

End Of Life criteria;  $\Delta I_f / I_f = 20\%$  or  $\Delta I_m / I_m = 20\%$

**Note 2 :** 2.488 Gb/s, Pmean, BER= 10-10, ER= 10±1%, NRZ line code, PRBS 223-1

**Note 3 :**  $TE = \text{Max} \{ | [P(70\text{C}) - P(25\text{C})] / P(25\text{C}) | ; | [P(-5\text{C}) - P(25\text{C})] / P(25\text{C}) | \}$

measurements @ -5 & 70°C are with If set at constant If (25 C)

**Note 4 :** Application depending : 3200 ps/nm or 1800 ps/nm dispersion assuming fiber with an average dispersion of 18 ps/nm.km @ 1550nm

**Twave:** Twave is the submount temperature at which the laser emission wavelength reaches the target wavelength with an accuracy of better than:  $\lambda \text{ target} \pm 0.1 \text{ nm}$ . This temperature is calculated during manufacturing according to:  $Twave = 25^\circ\text{C} + (1/C) * (\lambda \text{ target} - \lambda 25^\circ\text{C})$ , where C is the laser wavelength drift with temperature (in nm/°C).

**Emitted wavelength drift vs Tcase:** absolute value of maximum emitted wavelength deviation per unit of case temperature (°C) when Tcase varies from min to max operating conditions. Wavelength is stabilized through the thermal regulation of the laser chip based on the thermistor reading.

**IPmean:** laser bias current (mA) allowing to reach the mean optical output power (Pmean).

## Absolute Maximum Ratings

Exposing the device to stresses above those listed in absolute maximum rating could cause permanent damage. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

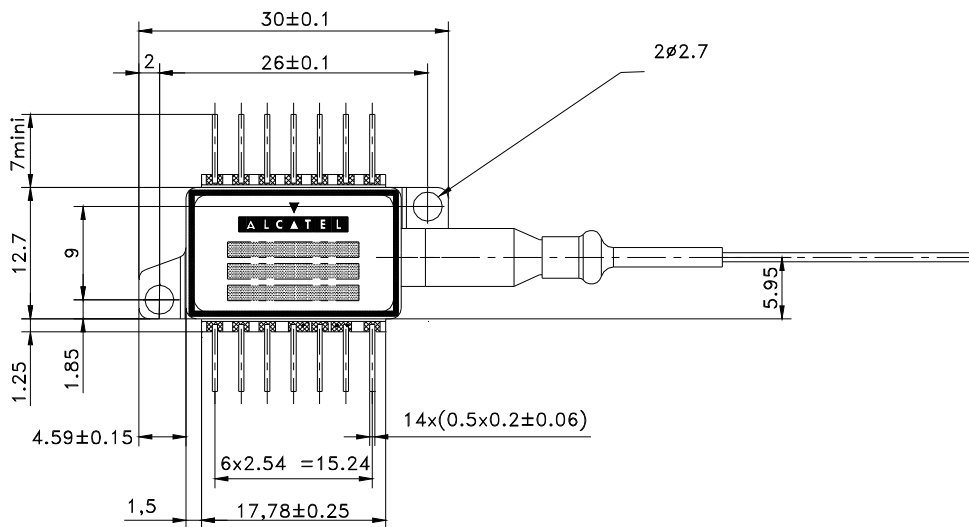
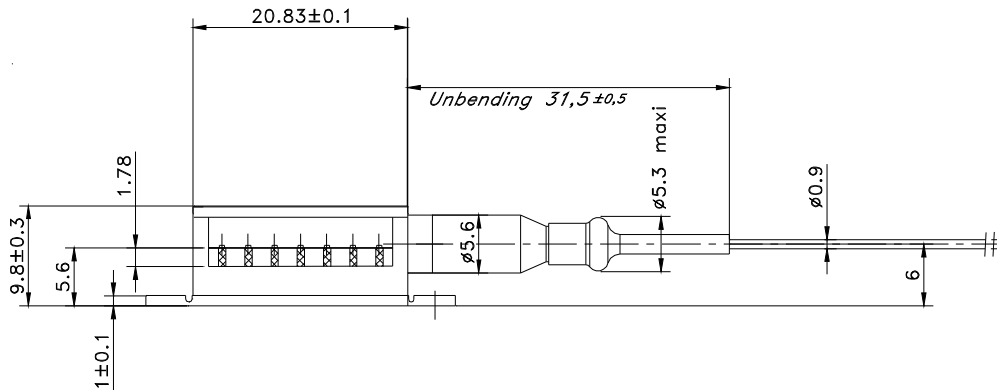
Parameters	Min	Max	Unit
Operating case temperature	-10	75	°C
Storage temperature	-40	85	°C
Laser forward current		150	mA
Laser reverse voltage		2	V
Photodiode forward current		1	mA
Photodiode reverse voltage		20	V
TEC voltage		2.8	V
TEC current		1.4	A
Lead soldering time (at 260°C)		10	s
Fiber bend radius	25		mm
Packing mounting screw torque		0.2	N.m

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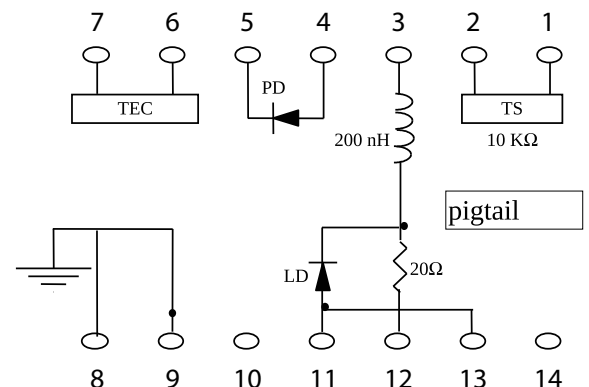
### Mechanical Details



Dimensions are in mm  
Fiber length 1600  $\pm$  100 mm  
(including optical connector)

### Pin Out

N°	Description	N°	Description
1	Thermistor	8	Case Ground
2	Thermistor	9	Case Ground
3	Laser DC bias (+)	10	Not Connected
4	Photodetector Anode (-)	11	RF common (+)
5	Photodetector Cathode (+)	12	Laser Modulation (-)
6	TEC (+)	13	RF common (+)
7	TEC (-)	14	Not Connected



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### Shipment **packing**

Each device is individually packed in an antistatic container and in such a manner as to prevent damage in transit. The packaging shall include the following information:

1. 3S Photonics logo
2. Product family name: 1915 LMI
3. Product code : 3CN code (see Ordering information section)
4. Serial number
5. Hazard warning label (ESD)
6. Laser Safety Class Label

### Laser Safety **Information**

Take appropriate precautions to prevent undue exposure to naked eye.

This product is classified Class 1M Laser Product according to IEC-60825-1: edition2.

All versions are Class IIIB laser products per 21 CFR 1040-10 Laser. Safety requirements under accession number 0120546-00.



### Device **marking**

Each device includes the following information as a minimum:

1. 3S Photonics
2. Product family name: 1915 LMI
3. Product code : 3CN code (see Ordering information section)
4. Serial number

### Deliverable **data**

The following data shall be supplied with each device:

1. L(I)/V(I) curves @ Tc/ Tsubmount= 25°C/Twave
2. It, Vt @ Tc/Tsubmount= 25°C/70°C, P= 10mW
3. Values of Twave and RTH @ Tsubmount= Twave
4. Values of If, Im, lth and external differential efficiency @ Tsubmount= Twave
5. Peak wavelength  $\lambda$  @ Tc= 25°C and Tsubmount= Twave under modulation
6. Dispersion penalty  $\Delta S$

For Single Channel application Twave= Tsubmount= 25°C

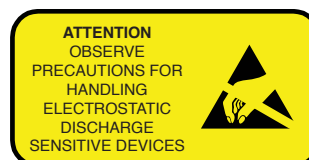
Product testing shall be carried out at a level that ensures conformity to the customer specification

### **Handling**

This product, in line with all similar devices, is sensitive to electrostatic discharge. Take precautions to prevent ESD; use wrist straps, grounded work surfaces and recognized anti-static techniques when handling the product. Handle the laser module by its package only, never hold it by leads or pigtail. For package mounting the following procedure should be carefully followed:

1. In order to achieve the ultimate thermal performance of the device, thermal paste can be usefully added on the support
2. Tighten screws up to 200mN/m - Do not exceed this mounting torque.
3. Assure that the leads are aligned and in contact with appropriate contact pads.

Care should be taken to avoid supply transient and over voltage. Over voltage above the maximum specified in absolute maximum rating section (table2) may cause permanent damage to the device.





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## ORDERING INFORMATION

Application	Fiber dispersion	Part number	Connector type
Single Channel	3200 ps/nm	3CN00753AA	FC/PC
WDM	3200 ps/nm	3CN00753##	FC/PC
Single Channel	3200 ps/nm	3CN00754AA	LC/PC
WDM	3200 ps/nm	3CN00754##	LC/PC
Single Channel	3200 ps/nm	3CN00757AA	SC/PC
WDM	3200 ps/nm	3CN00757##	SC/PC
Single Channel	1800 ps/nm	3CN00492AA	FC/PC
WDM	1800ps/nm	3CN00492##	FC/PC
Single Channel	1800 ps/nm	3CN00682AA	LC/PC
WDM	1800 ps/nm	3CN00682##	LC/PC
Single Channel	1800 ps/nm	3CN00786AA	SC/PC
WDM	1800 ps/nm	3CN00786##	SC/PC

## defines the wavelength according to the following Table 3.

Table 3

λ (nm)	THz	Code ##	λ (nm)	THz	Code ##	λ (nm)	THz	Code ##
1529,55	196,00	BP	1541,35	194,50	CV	1553,33	193,00	EB
1530,33	195,90	BR	1542,14	194,40	CX	1554,12	192,90	ED
1531,12	195,80	BT	1542,94	194,30	CZ	1554,94	192,80	EF
1531,90	195,70	BV	1543,73	194,20	DB	1555,75	192,70	EH
1532,68	195,60	BX	1544,53	194,10	DD	1556,55	192,60	EK
1533,47	195,50	BZ	1545,32	194,00	DF	1557,36	192,50	EM
1534,25	195,40	CB	1546,12	193,90	DH	1558,17	192,40	EP
1535,04	195,30	CD	1546,92	192,80	DK	1558,98	192,30	ER
1535,82	195,20	CF	1547,72	193,70	DM	1559,79	192,20	ET
1536,61	195,10	CH	1548,51	193,60	DP	1560,61	192,10	EV
1537,40	195,00	CK	1549,32	193,50	DR	1561,42	192,00	EX
1538,19	194,90	CM	1550,12	193,40	DT	1562,23	191,90	EZ
1538,98	194,80	CP	1550,92	193,30	DV	1563,05	191,80	FB
1539,77	194,70	CR	1551,72	193,20	DX	1563,86	191,70	FD
1540,56	194,60	CT	1552,52	193,10	DZ	1564,68	191,60	FF

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Please note: information in this document is typical and must be specifically confirmed in writing by your supplier before it becomes applicable to any order or contract. Information is subject to change without notice.  
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## ORDERING INFO

Please contact your Sales Manager. 3SPGroup can also develop custom products to meet a wide range of technical requirements.

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