

Transmission Laser Modules

KeyFeatures

7-pin Low Profile package with GPO connector RF input

High frequency RF connector package with 50Ω RF impedance

InGaAsP monolithically integrated DFB laser and modulator chip

Low drive voltage (≤ 2 Vpp)

RoHs Compliant

Applications

Metro SONET/SDH and D-WDM equipment

STM-64 (Long-Haul) and OC-192 (Intermediate-Reach) 300-pin MSA SFF Transponder

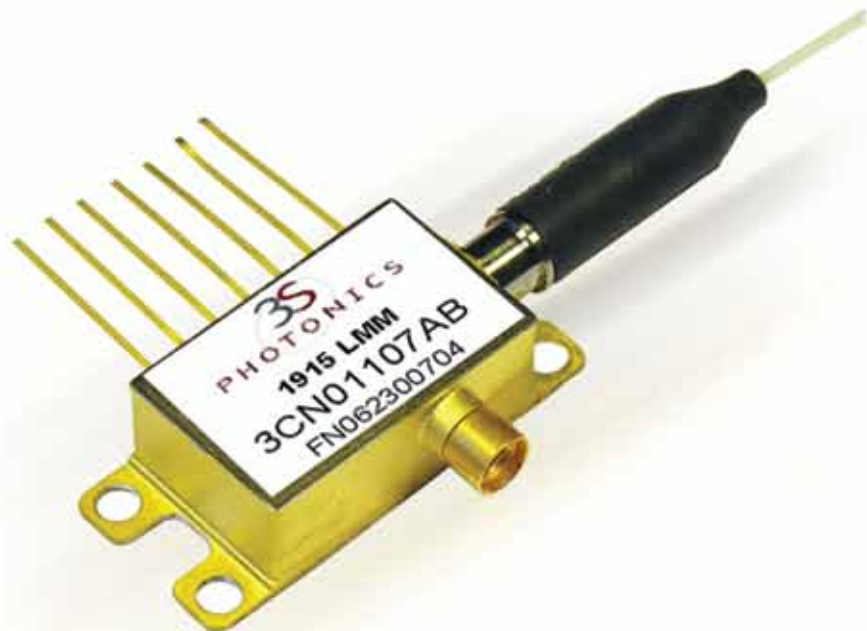
10 GbE 300-pin MSA Transponder

1915 LMM WDM LP

WDM - 800 ps/nm application - 10 Gbit/s digital Laser Module with integrated electro-absorption Modulator

The 1915 LMM contains a 3SPGroup DFB laser with monolithically integrated electro-absorption modulator (EA-ILM).

The modulation voltage is applied to the modulator section while the DFB laser operates CW. Without the complexity of LiNbO3 external modulators, the 1915 LMM is dedicated to STM64/OC-192 bit rate with reduced size and reduced cost. This device allows 10.7 Gbit/s data transmission with an extinction ratio higher than 10 dB and less than 2 V modulation voltage.



For moreInfo

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1915 LMM WDM LP

**WDM - 800 ps/nm
application - 10 Gbit/s digital
Laser Module with integrated
electro-absorption Modulator**



OPTICAL CHARACTERISTICS

Parameters	Symb	Conditions	Min	Max	Units
Operating case temperature	Tc		-5	75	°C
Threshold current	I _{th}	CW	5	35	mA
Operating current	I _f	CW	70	100	mA
Optical output power (EOL)	P _{ave}	I _f , V _{mod} , [1], [2]	-1	2	dBm
Tracking error	TE	measurement @ -5 & 75 °C are set @ constant I _f (25 C), See [3]	-0.5	+0.5	dB
Laser forward voltage	V _f	CW, I _f , V _{bias} = 0V		2	V
ON state voltage	V _{on}	See [1]	-1	0	V
Modulator bias voltage	V _{bias}	See [1]	-2		V
Modulator drive voltage	V _{mod}	See [1]		2	V
Dynamic extinction ratio	DER	I _f , [1], [2]	10		dB
Emission wavelength	λ		1528.77	1563.86	nm
Laser Chip temperature range For Tunability	T _{wave}	See [4]	25	40	°C
Side mode suppression	SMSR	See [1]	40		DB
Relative intensity noise	RIN	100 MHz to 9 GHz, @ P _{ave}		-130	dB/Hz
Cut off frequency	S ₂₁	- 3 dB, V _{bias} @ I _f	9		GHz
RF return loss	S ₁₁	DC to 7 GHz	10		DB
	S ₁₁	7 to 10 GHz		7	DB
Dispersion penalty	λ S	See [1], [2]		2	DB
Rise time / Fall time	Tr/Tf	See [1], 10%, 90%		45	ps
Monitor diode current	I _m	I _f , V = - 5 V	20	1500	μA
Monitor diode dark current	I _d	I _f , V = - 5 V		0.1	μA
Monitor diode capacitance	C _m	@ 1MHz, V = - 5 V		15	pF
TEC current	I _t	ΔT= 50°C, I _f +20% (EOL), V _{bias} = - 1V		1.3	A
TEC voltage	V _t	ΔT= 50°C, I _f +20% (EOL), V _{bias} = - 1V		2.5	V
Thermistor resistance	R _{TH}	T _{submount} = 25°C	9.5	10.5	kΩ
Thermistor β coefficient	β	T _{submount} = 25°C	3800	4000	K

Notes : All limits start of life T_{case} in the range [-5°C ; 75°C], T_{submount}= T_{wave} , monitor bias= - 5V, unless otherwise stated.

[1] BER= 10⁻¹⁰; 10.7 Gbit/s modulation; 231-1 PRBS;NZR line code.

[2] 1600 ps/nm dispersion assuming fiber with an average dispersion of 18 ps/nm/km @ 1550 nm.

[3] TE = Max { |(P(75°C)-P(25°C))/P(25°C)| ; |(P(-5°C)-P(25°C))/P(25°C)| }.

[4] For WDM applications T_{submount}= T_{wave}. T_{wave} is the chip temperature required to meet target wavelength (See table 3).

Absolute Maximum Ratings

Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

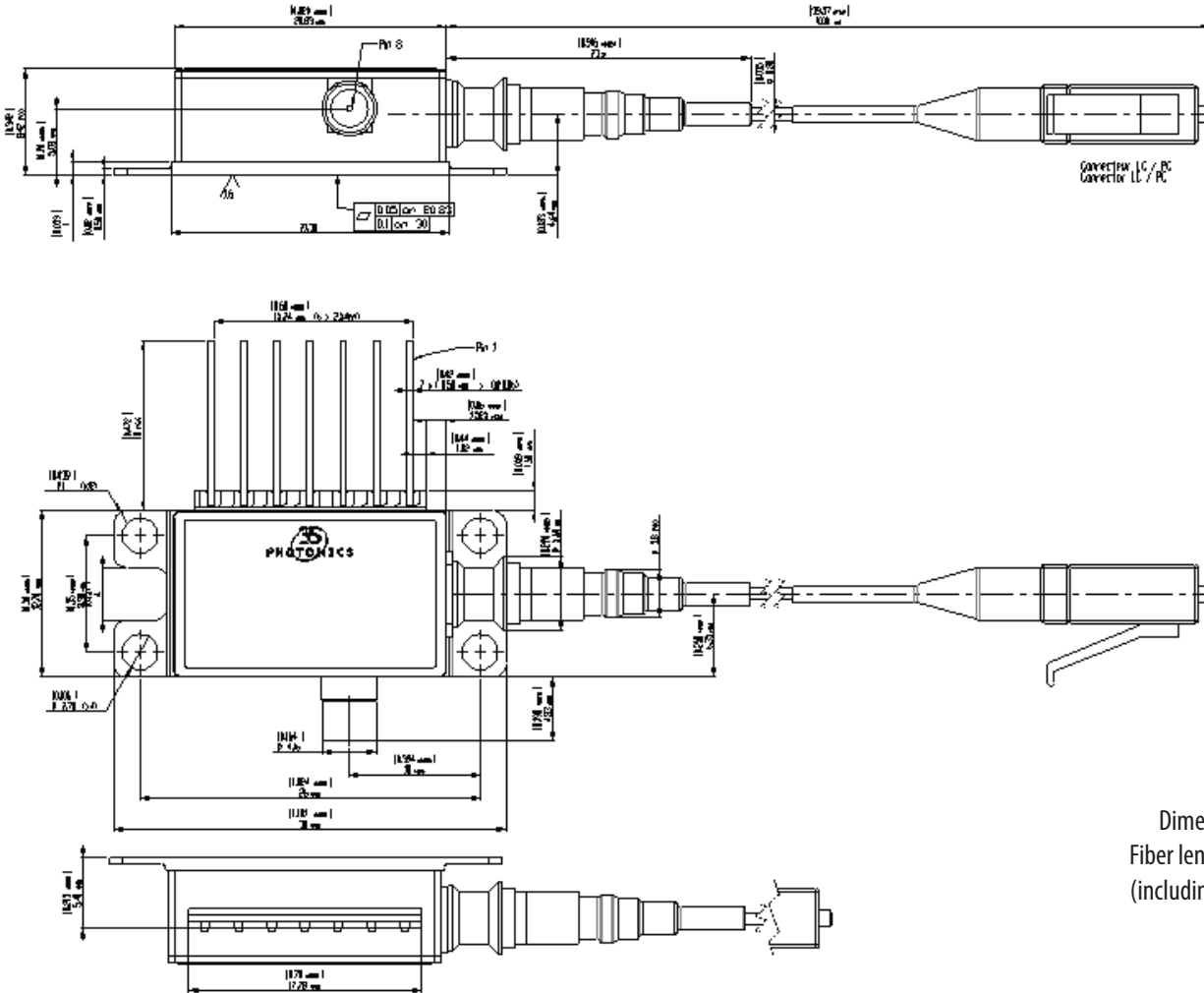
Parameters	Min	Max	Unit
Operating case temperature	-5	75	°C
Storage temperature	- 40	85	°C
CW optical output power		10	dBm
Laser forward current		150	mA
Laser reverse voltage		2	V
Modulator forward voltage		1	V
Modulator reverse voltage		5	V
Photodiode forward current		1	mA
Photodiode reverse voltage		20	V
TEC voltage		2.8	V
TEC current		1.4	A
ESD applied on PIN detector (pid 4&5, human body model)		100	V
ESD applied on other pins (humand body model)		2000	V
Lead soldering time (at 260°C)		10	s
Fiber bend radius	25		mm
Packing mounting screw torque		0.2	nm

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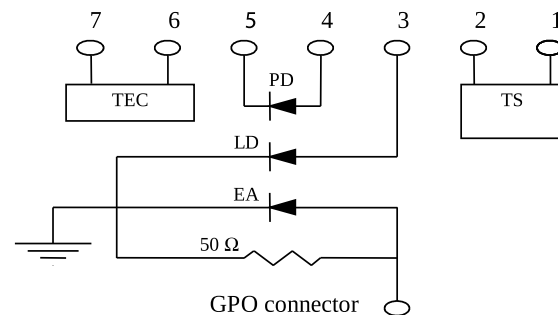


Mechanical Details



Pin Out

N°	Description
1	Thermistor
2	Thermistor
3	Laser DC bias (+)
4	Photodetector Anode (-)
5	Photodetector Cathode (+)
6	TEC (+)
7	TEC (-)



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Shipment **packing**

Each device is individually packed in an anti-static container and in such a manner as to prevent damage in transit.

The packing shall include the following information:

3S Photonics logo
Product family name : 1915 LMM
Product code : 3CN number (see Ordering information section)
Serial number
Hazard warning label (ESD)
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.



Qualification, Reliability and **Standards**

3SPGroup policy for all products is to carry out a complete qualification program. This qualification is based on manufacturers' qualification in agreement with Telcordia GR-468-Core (Generic Reliability Assurance Requirements for Optoelectronic Devices Used In Telecommunications Equipment - Central Office Level), MIL STD 883E (Test method and procedures for microelectronics) and following the standards ITU-T G652 and G-691. All products pass strict tests before shipping. Failure criteria are defined during the product qualification process.

Device **marking**

The device shall be legibly and permanently marked with the following information:

3S Photonics logo
Product family name: 1915 LMM
Product code : 3CN number (see Ordering information section)
Serial number

Deliverable **data**

The following data shall be supplied with each device:

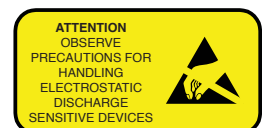
L(I) / V(I) / Im(I) curves Values for Vmod, Von (On-state voltage [0 data]), Vbias (bias voltage), S0 (received optical power without fiber), SMSR, ITH, It, Vt, I and Pave for If DER and dispersion penalty (DS)

Plot of SER vs Vmod over the range 0 V to -3 V @ If, Tc= 25 °C and Tsubmount= Twave

Handling

This product is sensitive to electrostatic discharge and should not be handled except at a static free workstation. Take precautions to prevent ESD; use wrist straps, grounded work surfaces and recognised anti-static techniques when handling the product. Handle the laser module by its package only, never hold it by its pigtail.

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



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ORDERING INFORMATION

Application	Part number	Electrical Connector	Optical Connector
WDM	3CN01107##	GPO type	LC/PC

defines the wavelength according to the Table 3.

Table 3

λ (nm)	THz	Code ##	λ (nm)	THz	Code ##
1528,77	196,10	BM	1546,92	193,80	DK
1529,55	196,00	BP	1547,72	193,70	DM
1530,33	195,90	BR	1548,51	193,60	DP
1531,12	195,80	BT	1549,32	193,50	DR
1531,90	195,70	BV	1550,12	193,40	DT
1532,68	195,60	BX	1550,92	193,30	DV
1533,47	195,50	BZ	1551,72	193,20	DX
1534,25	195,40	CB	1552,52	193,10	DZ
1535,04	195,30	CD	1553,33	193,00	EB
1535,82	195,20	CF	1554,12	192,90	ED
1536,61	195,10	CH	1554,94	192,80	EF
1537,40	195,00	CK	1555,75	192,70	EH
1538,19	194,90	CM	1556,55	192,60	EK
1538,98	194,80	CP	1557,36	192,50	EM
1539,77	194,70	CR	1558,17	192,40	EP
1540,56	194,60	CT	1558,98	192,30	ER
1541,35	194,50	CV	1559,79	192,20	ET
1542,14	194,40	CX	1560,61	192,10	EV
1542,94	194,30	CZ	1561,42	192,00	EX
1543,73	194,20	DB	1562,23	191,90	EZ
1544,53	194,10	DD	1563,05	191,80	FB
1545,32	194,00	DF	1563,86	191,70	FD
1546,12	193,90	DH			

All wavelengths referenced to vacuum, Twave for WDM applications.

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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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