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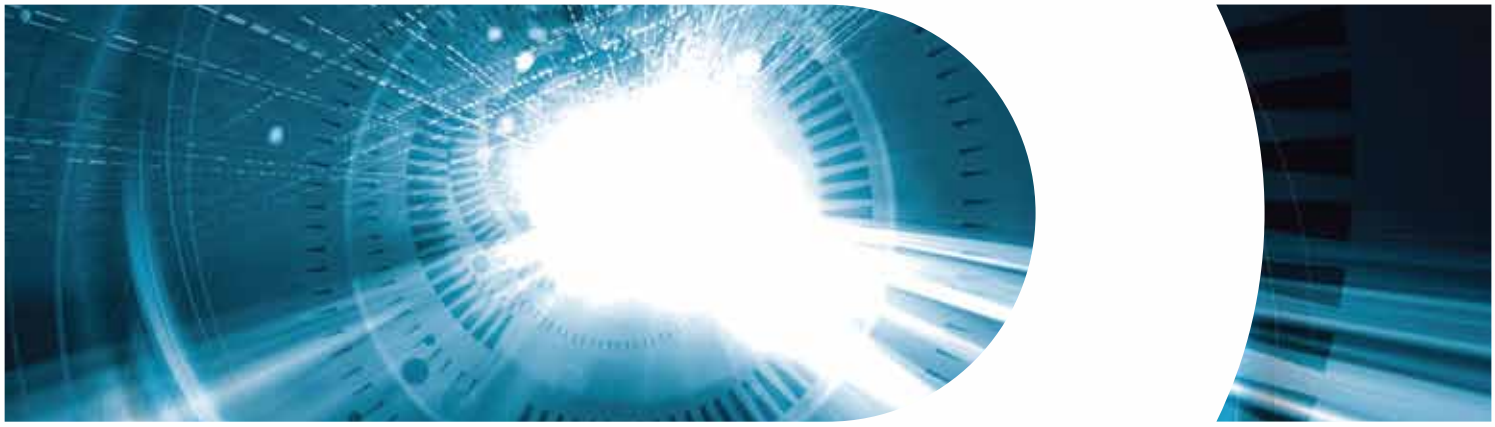


Transmission Laser Modules

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)
- High output power: [0;+4] dBm
- Very low dispersion penalty up to 90 km for 10.7 Gbit/s operation (up to 1600 ps/nm)
- RoHs Compliant

Applications

- Metro SONET/SDH and D-WDM equipment
- STM-64 (Long-Haul) and OC-192 (Long-Reach) 300-pin MSA SFF Transponder
- 10 GbE 300-pin MSA Transponder

For moreInfo

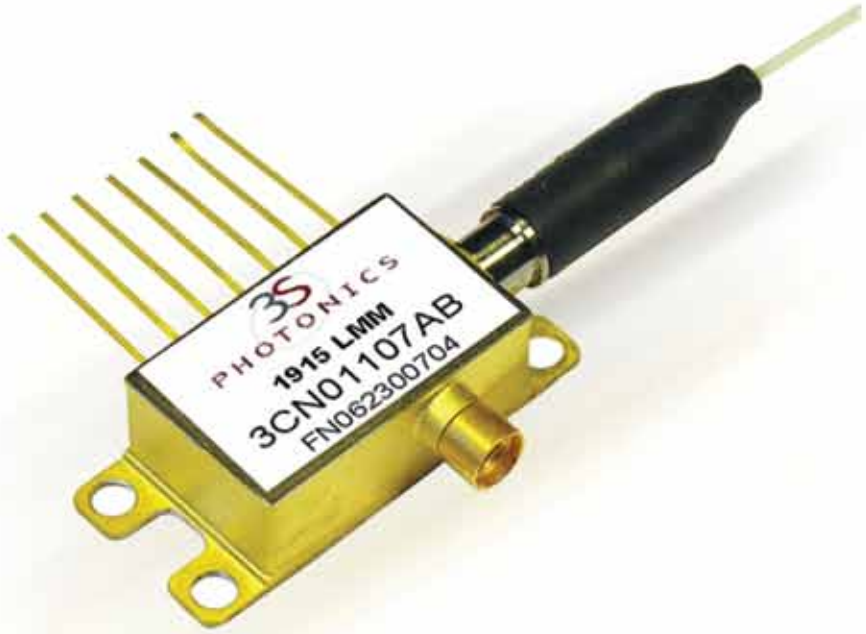
Please contact us at:
North America: **514.748.4848**
888.922.1044
Europe & Asia: **+33 (0) 1 69 80 58 33**
or via e-mail at **sales@3spgroup.com**

1915 LMM DWDM HP

WDM - 1600 ps/nm application - High optical output power 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.



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1915 LMM DWDM HP

WDM - 1600 ps/nm application - High optical output power 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	Ith	CW	5	35	mA
Operating current	If	CW	70	100	mA
Optical output power (EOL)	Pave	If, Vmod, [1], [2]	0	4	dBm
Tracking error	TE	measurement @ -5 & 75 °C are set @ constant IF (25 C), See [3]	-0.5	+0.5	dB
Laser forward voltage	Vf	CW, If, Vbias= 0V		2	V
ON state voltage	Von	See [1]	-1	0	V
Modulator bias voltage	Vbias	See [1]	- 2		V
Modulator drive voltage	Vmod	See [1]		2	V
Dynamic extinction ratio	DER	If, [1], [2]	10		dB
Emission wavelength	λ		1528.77	1569.59	nm
Laser Chip temperature range For Tunability	Twave	See [4]	20	30	°C
Side mode suppression	SMSR	See [1]	40		DB
Relative intensity noise	RIN	100 MHz to 9 GHz, @ Pave		-130	dB/Hz
Cut off frequency	S21	- 3 dB, Vbias @ If	9		GHz
RF return loss	S11	DC to 7 GHz	10		DB
	S11	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	Im	If, V = - 5 V	20	1500	µA
Monitor diode dark current	Id	If, V = - 5 V		0.1	µA
Monitor diode capacitance	Cm	@ 1MHz, V = -5 V		15	pF
TEC current	It	Δ T= 55°C, If+20% (EOL), Vbias= - 1V		1.3	A
TEC voltage	Vt	Δ T= 55°C, If+20% (EOL), Vbias= - 1V		2.5	V
Thermistor resistance	RTH	Tsubmount= 25°C	9.5	10.5	kΩ
Thermistor β coefficient	β	Tsubmount= 25°C	3800	4000	K

Notes : All limits start of life Tcase in the range [-5°C ; 75°C], Tsubmount= Twave , 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 Tsubmount= Twave. Twave 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.

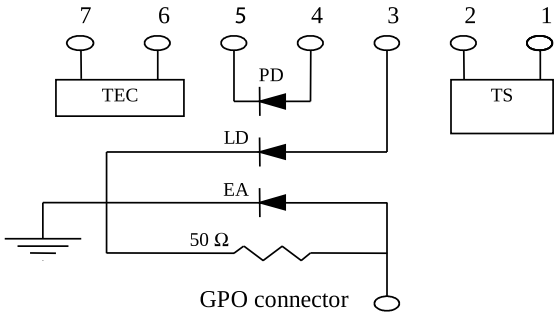
Parameters	Min	Max	Unit
Operating case temperature	-5	75	°C
Storage temperature	- 40	85	°C
CW optical output power		10	dBm
Laser forward current		150	mA
Laser reverse voltage		2	V
Modulator forward voltage		1	V
Modulator reverse voltage		5	V
Photodiode forward current		1	mA
Photodiode reverse voltage		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

1915 LMM DWDM HP

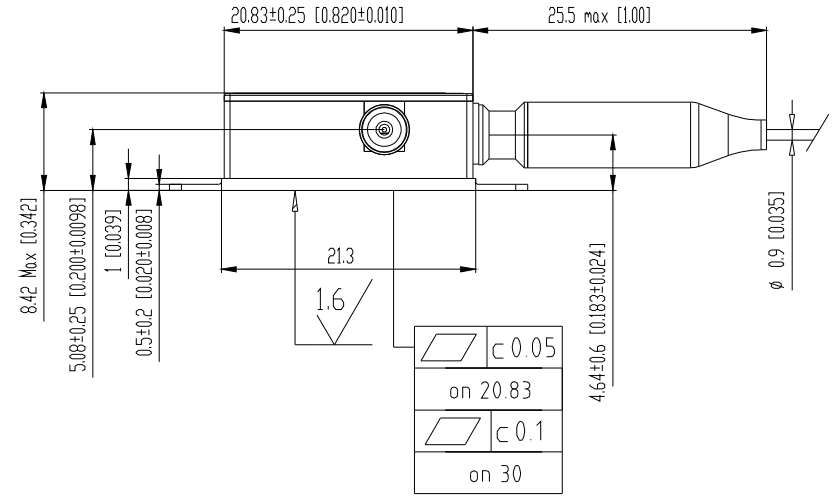
WDM - 1600 ps/nm application - High optical output power 10 Gbit/s digital Laser Module with integrated electro-absorption Modulator

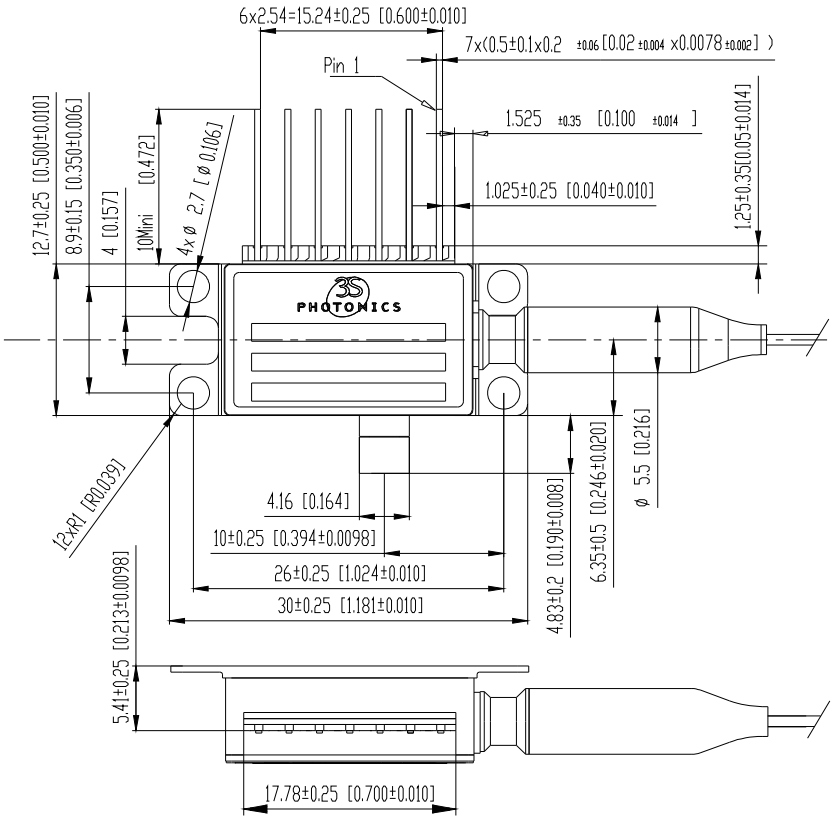
Pin **Out**

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



Mechanical **Details**





Dimensions are in mm
Fiber length 1600 ± 100 mm
(including optical connector)

1915 LMM DWDM HP

WDM - 1600 ps/nm application - High optical output power 10 Gbit/s digital Laser Module with integrated electro-absorption Modulator

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 Devtices 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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1915 LMM DWDM HP

WDM - 1600 ps/nm application - High optical output power 10 Gbit/s digital Laser Module with integrated electro-absorption Modulator

ORDERING **INFORMATION**

Application	Part number	Electrical Connector	Optical Connector
WDM	3CN01108##	GPO type	LC/PC

defines the wavelength according to the Table 3.

Table 3

λ (nm)	THz	Code ##	λ (nm)	THz	Code ##
1529,55	196,00	BP	1545,32	194,00	DF
1530,33	195,90	BR	1546,12	193,90	DH
1531,12	195,80	BT	1546,92	193,80	DK
1531,90	195,70	BV	1547,72	193,70	DM
1532,68	195,60	BX	1548,5	193,60	DP
1533,47	195,50	BZ	1549,32	193,50	DR
1534,25	195,40	CB	1550,12	193,40	DT
1535,04	195,30	CD	1550,92	193,30	DV
1535,82	195,20	CF	1551,72	193,20	DX
1536,61	195,10	CH	1552,52	193,10	DZ
1537,40	195,00	CK	1553,33	193,00	EB
1538,19	194,90	CM	1554,12	192,90	ED
1538,98	194,80	CP	1554,94	192,80	EF
1539,77	194,70	CR	1555,75	192,70	EH
1540,56	194,60	CT	1556,55	192,60	EK
1541,35	194,50	CV	1557,36	192,50	EM
1542,14	194,40	CX	1558,17	192,40	EP
1542,94	194,30	CZ	1558,98	192,30	ER
1543,73	194,20	DB	1559,79	192,20	ET
1544,53	194,10	DD	1560,61	192,10	EV

All wavelengths referenced to vacuum, Twave for WDM applications.

Revised March 2012

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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