

## Transmission Laser Modules

### KeyFeatures

InGaAsP monolithically integrated DFB laser and modulator in-house chip

Low drive voltage ( $\leq 2V_{pp}$ )

Very low dispersion penalty up to 50 km for 10.7Gbit/s operation (up to 800ps/nm)

XMD MSA compliant  
FPC for electrical connections

Low TEC power  $\leq 0.6W$

RoHs Compliant

### Applications

Metro and Regional Metro  
SONET /SDH line card size and  
cost optimization

STM-64 (Long-Haul) and  
OC-192 (Long-Reach) XFP & X2  
transceiver

### For moreInfo

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## 1925 LMM FPC LC 40Km 10 Gb/s Electro-Absorptive Integrated Laser Modulator Optical Sub-Assembly – XMD MSA 800 ps/nm TDM – LC receptacle & FPC Standard Case Temperature

This 1925 LMM contains a 3SPGroup DFB laser with monolithically integrated electro-absorption modulator.

The modulation voltage is applied to the modulator section while the DFB laser operates CW. Without the complexity of LiNbO3 external modulators, the 1925 LMM is dedicated to STM64 / OC-192 bit rate with reduced size and cost. This device allows 10 Gbit/s data transmission with an extinction ratio higher than 10dB and less than 2V modulation voltage.

The 1925 LMM is optimized for up to 10.7Gbit/s TDM transmission systems supporting dispersion up to 800 ps/nm.



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### OPTICAL CHARACTERISTICS

Parameters	Symb	Test conditions	Min	Max	Units
Operating case temperature	T <sub>c</sub>	Standard Case temperature	-5	75	°C
Laser Threshold current	I <sub>th</sub>	V <sub>BM</sub> =0V	5	35	mA
Laser operating current	I <sub>op</sub>	V <sub>BM</sub> =0V BOL	60	90	mA
Modulator bias voltage	V <sub>BM</sub>		-2	0	V
Modulator drive voltage	V <sub>pp</sub>	Note 1		2	V <sub>pp</sub>
Average optical output power	P <sub>AVG</sub>	I <sub>op</sub> , DER, λ <sub>c</sub> , notes 1, 2	-1	+2	dBm
Center wavelength range	λ <sub>c</sub>		1529	1561	nm
Dynamic Extinction Ratio	DER	I <sub>op</sub> , Note 1, 2	10		dB
Dispersion Penalty	ΔS	DER, Note 1, 2		2	dB
Side Mode Suppression Ratio	SMSR	Note 1	35		dB
Monitor Diode Current	I <sub>m</sub>	I <sub>op</sub> , V=-5V	100	1500	μA
Dark Current	I <sub>d</sub>			0.1	μA
TEC current	I <sub>t</sub>	P <sub>AVG</sub> min, V <sub>BM</sub> op, I <sub>op</sub> (EOL)=1.2*I <sub>op</sub> , ΔT=[30;35]°C		0.7	A
TEC voltage	V <sub>t</sub>			1.8	V
TEC power	W <sub>p</sub>	Standard Case Temperature, V <sub>BM</sub> op, I <sub>op</sub> (EOL)= 1.2*I <sub>op</sub> ΔT=[30;35]°C		0.6	W
Total power	W <sub>Tot</sub>	W <sub>TEC</sub> + W <sub>chip</sub> @ P <sub>AVG</sub> min, (V <sub>ON</sub> + V <sub>pp</sub> ) <sub>op</sub> , I <sub>op</sub> (EOL)= 1.2*I <sub>op</sub> ΔT=[30;35]°C		0.8	W
Tracking error	TE	@P <sub>peak</sub>	-0.5	+0.5	dB
Thermistor Resistance	R <sub>TH</sub>	T <sub>s</sub> =25°C	9.5	10.5	KΩ
Thermistor β Coefficient	β	T <sub>s</sub> =25°C	3800	4000	K

Note 1 : BER= 10<sup>-10</sup>, 10.7Gb/s, modulation, 231-1 PRBS, NRZ line code, driver OKI 4145KW

Note 2 : 800 ps/nm minimum dispersion assuming fibre with an average dispersion of 17ps/nm/km @ 1550nm

### Absolute Maximum Ratings

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

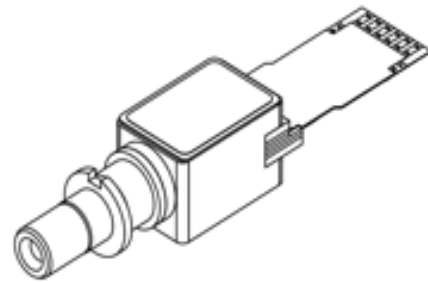
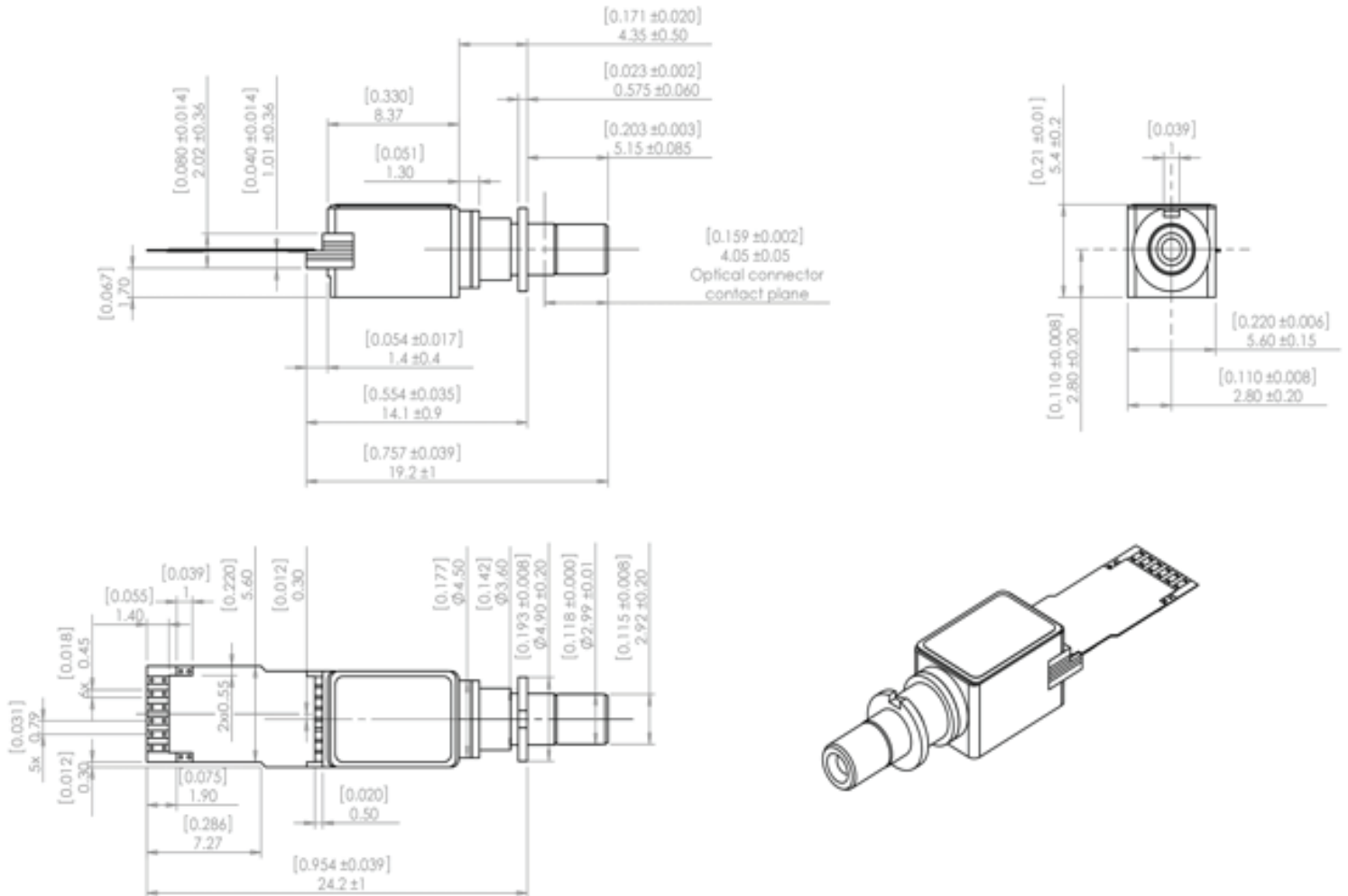
Parameters	Min	Max	Unit
Storage case temperature	-40	+85	°C
Laser Forward Current		150	mA
Laser Reverse Voltage		2	V
Laser Reverse Current		10	μA
Modulator Forward Voltage		1	V
Modulator Forward Current		100	mA
Modulator Reverse Voltage		5	V
Modulator Reverse Current		10	μA
Photodiode Forward Current		1	mA
Photodiode Reverse Voltage		20	V
TEC Voltage		2.6	V
TEC Current		1.4	A
Flex pad soldering Temperature (at 260°C)		10	s

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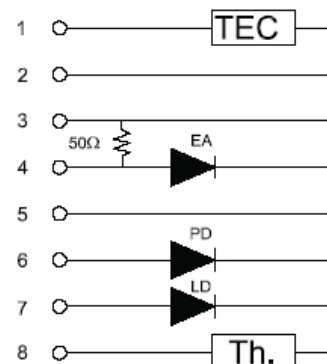


### Mechanical Details



### Pin Out

N°	Description
1	TE Cooler Cathode
2	TE Cooler Anode
3	Floating signal ground
4	Modulator Anode (bias-)
5	Floating signal ground
6	PD Anode (bias -)
7	LD Anode (bias -)
8	Thermistor



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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 : 1925 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.

### Deliverable **data**

The following data shall be supplied with each device for Single Channel (TDM) applications :

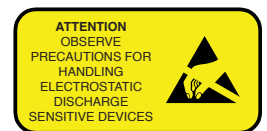
L(I) / V(I) / Im(I) curves  
Values for V<sub>mod</sub>, V<sub>on</sub> (On-state voltage [0 data]), V<sub>bias</sub> (bias voltage), DER, S<sub>0</sub> (received optical power without fiber), DS and P<sub>ave</sub> for I<sub>f</sub>  
DER and dispersion penalty (DS)  
Plot of SER vs V<sub>mod</sub> over the range 0 V to -3 V @ I<sub>f</sub>= 80 mA and T<sub>c</sub>= T<sub>submount</sub>= [40;45] °C

### 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 recognized 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	Output Power	Case Temperature
800 ps/nm - TDM	3CN01301AS	[-1, +2 dBm]	Standard

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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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