

**Multi-source Agreement (MSA) of  
40 Gbit/s Miniature Device (XLMD)**

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**XLMD01**

**Electrical & Optical Interfaces of  
Optical Transmitter Device**

**Rev. 1.0  
February 21, 2008**

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Description

This technical document has been created by the XLMD MSA committee. This document is offered to both users and suppliers of 40Gbit/s pigtail type optical device as a basis for a technical agreement. However, it is not a warranted document. Each optical device supplier will have its own datasheet. If the user wishes to find a warranted document they should consult the datasheet of the chosen optical device supplier.

The MSA committee reserves the rights at any time to add, amend or withdraw technical data contained in this document

### Revision History

Revision	Date	Purpose/ changes
1.0	February 21, 2008	First public issue

## 1 Scope

The XLMD MSA committee has created this technical document to specify the electrical and optical interfaces of optical transmitter device. The specifications were based on the investigation of cooled EMwL device with built-in driver IC and fiber pigtail.

## 2 Reference Documents

- [1] XLMD02  
"Physical Interface of Optical Transmitter Device Package"
- [2] FDA CDRH21CFR 1040.10  
"Performance standards for light-emitting products (Laser products.)"
- [3] FDA CDRH21CFR 1040.11  
"Performance standards for light-emitting products (Specific purpose laser products.)"
- [4] IEC 60825-1  
"Safety of laser products-Part 1: Equipment classification, requirements and user's guide"
- [5] IEC 60825-2  
"Safety of laser products-Part 2: Safety of optical fibre communication systems - Interpretation sheet 1"
- [6] IEC62007-1  
"Semiconductor optoelectronic devices for fibre optic system applications - Part 1: Essential ratings and characteristics"
- [7] IEC62007-2  
"Semiconductor optoelectronic devices for fibre optic system applications - Part 2: Measuring methods"
- [8] ITU-T G.959.1  
"Optical transport network physical layer interfaces"
- [9] ITU-T G.693  
"Optical interfaces for intra-office systems"
- [10] Telcordia GR-253-CORE  
"SONET Transport Systems: Common Generic Criteria"
- [11] Telcordia GR-468-CORE  
"Generic Reliability Assurance Requirements for Optoelectronic Devices Used In Telecommunications Equipment"

## 3 Abbreviations

EMwL	External modulator with laser diode
LD	Laser diode
PD	Photo diode

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TEC	Thermo-electric cooler
TDM	Time division multiplexing
WDM	Wavelength division multiplexing

## 4 Electrical Interface

**Table 1 Specifications of electrical and optical performances**

Item	Symbol	Condition	Min.	Typ.	Max.	Unit	Notes
Threshold current	I <sub>th</sub>	CW	—	—	50	mA	
LD operating current	I <sub>op</sub>				200	mA	
LD operating voltage	V <sub>op</sub>	CW	—	—	3.0	V	
Monitor current	I <sub>mon</sub>	CW	0.05	—	2	mA	
Capacitance (PD)		V <sub>rd</sub> = 5 V	—	—	20	pF	
Dark current (PD)		V <sub>rd</sub> = 5 V	—	—	0.1	μA	
TEC current	I <sub>tec</sub>		—	—	1.5	A	Note
TEC voltage	V <sub>tec</sub>		—	—	3.5	V	
TEC power consumption	P <sub>tec</sub>		—	—	4.0	W	
Thermistor resistance	R <sub>th</sub>	25degC	9.5	—	10.5	kΩ	
Thermistor B constant	B		3800	3900	4000	K	
Driver IC Supply Voltage	V		Defined by vendor				
Driver IC Supply Current	mA		Defined by vendor				

Note : For TDM application only. For further study for WDM.

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## 5 Optical Interface

The applicable optical interface shall be specified by each vendor considering the following.

ITU-T (G.959)	P1S1-3C2	P1S1-3C3	P1S1-3C5
Source Type	SLM	SLM	SLM
	P1L1-3A2	P1L1-3A3	P1L1-3A5
	SLM	SLM	SLM
	1L1-3C2FD	1L1-3C3FD	1L1-3C5FD
	SLM	SLM	SLM
	1L1-3C2F	1L1-3C3F	1L1-3C5F
	SLM	SLM	SLM

ITU-T (G.693)	VSR2000-3R2	VSR2000-3R3	VSR200-3R5
Optical Device	SLM	SLM	SLM
	VSR2000-3R2F	VSR2000-3R3F	VSR2000-3R5F
	SLM	SLM	SLM
	VSR2000-3L2F	VSR2000-3L3F	VSR2000-3L5F
	SLM	SLM	SLM
	VSR2000-3M2	VSR2000-3M3	VSR2000-3M5
	SLM	SLM	SLM
	VSR2000-3H2	VSR2000-3H3	VSR2000-3H5
	SLM	SLM	SLM

Telcordia (GR253-CORE)	SR-2	IR-2	IR-3
Optical Device	Indirect Modulation (IM)	IM	IM
	LR-2	LR-3	
	IM	IM	