Multi-source Agreement (MSA) of 10 Gbit/s Miniature Device (XMD)

XMD02

Electrical & Optical Interfaces of TOSA EMwL

Rev. 1.2
January 17, 2006

Description

This technical document has been created by the XMD MSA committee. This document is offered to both users and suppliers of 10Gbit/s compact optical sub-assembly (OSA) modules as a basis for a technical agreement. However, it is not a warranted document. Each OSA supplier will have its own datasheet. If the user wishes to find a warranted document they should consult the datasheet of the chosen OSA 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	September 1, 2004	First public issue
1.1	October 29, 2004	Addition of scope and reference document. Amend of electrical interface.
1.2	January 17, 2006	Addition of SC documents. Change document name to identify connector type.

1 Scope

The XMD MSA committee has created this technical document to specify the electrical and optical interfaces of cooled TOSA EMwL driven by external driver.

2 Reference Documents

[1] XMD04
"Physical Interface of LC TOSA Type 2 Package"

[2] XMD06
"Physical Interface of SC TOSA Type 2 Package"

[3] IEC62007-1
"Semiconductor optoelectronic devices for fibre optic system applications - Part 1: Essential ratings and characteristics"

[4] IEC62007-2
"Semiconductor optoelectronic devices for fibre optic system applications - Part 2: Measuring methods"

[5] IEEE 802.3ae
"IEEE Standard for Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications - Media Access Control (MAC) Parameters, Physical Layer, and Management Parameters for 10 Gb/s Operation"

[6] Telcordia GR-253-CORE
"SONET Transport Systems: Common Generic Criteria"

[7] ITU-T G.691
"Optical interfaces for single channel STM-64, STM-256 and other SDH systems with optical amplifiers"

[8] ITU-T G.693
"Optical interfaces for intra-office systems"

[9] ITU-T G709
"Network node interface for the Optical Transport Network (OTN)"

[10] ITU-T G.959.1
"Optical transport network physical layer interfaces"

[11] Telcordia GR-468-CORE
"Generic Reliability Assurance Requirements for Optoelectronic Devices Used In Telecommunications Equipment"

[12] IEC 60825-1
"Safety of laser products-Part 1: Equipment classification, requirements and user's guide"

[13] IEC 60825-2
"Safety of laser products-Part 2: Safety of optical fibre communication systems - Interpretation sheet 1"

[14] FDA CDRH21CFR 1040.10
"Performance standards for light-emitting products (Laser products.)"

[15] FDA CDRH21CFR 1040.11
"Performance standards for light-emitting products (Specific purpose laser products.)"

3 Abbreviations

EMwL	External modulator with laser
LD	Laser diode
OSA	Optical sub-assembly
PD	Photo diode
ROSA	Receiver optical sub-assembly
TEC	Thermo-electric cooler
TDM	Time division multiplexing
TOSA	Transmitter optical sub-assembly
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	Ith	CW	—	—	50	mA	
LD operating current	Iop				200	mA	
LD operating voltage	Vop	CW	—	—	3.0	V	
On-level modulation voltage	Vo		-1.0	—	0	V	Fig. 1
Modulator drive voltage	Vpp		—	—	2.3	V	Fig. 1
Input impedance	Zin		—	50	—	Ω	Fig. 2
Monitor current	Imon	CW	0.05	—	2	mA	
Capacitance (PD)		Vrd = 5 V	—	—	20	pF	
Dark current (PD)		Vrd = 5 V	—	—	0.1	μA	
TEC current	Itec		—	—	1	A	Note
TEC voltage	Vtec		—	—	2	V	
TEC power consumption	Ptec		—	—	1.3	W	
Thermistor resistance	Rth	25degC	9.5	—	10.5	kΩ	
Thermistor B constant	B		3800	3900	4000	K	

Note : For TDM application only. FFS for WDM.

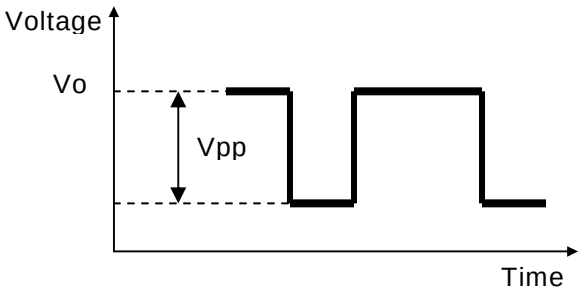

Fig.1 Definition of modulation voltage

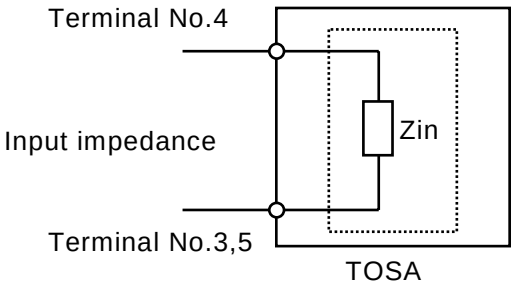

Fig.2 Definition of input impedance

4 Optical Interface

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

Ethernet (IEEE802.3)	10GBASE-EW/ER
Optical Device	-

Telcordia (GR-253-CORE)	SR-2	IR-1	IR-2	LR-1	LR-2(a and c)
Optical Device	EM	EM	EM	EM	EM

ITU-T (G.691)	S-64.1	S-64.2a	S-64.2b	L-64.2a	L-64.2c
Optical Device	-	SLM	SLM	SLM	SLM

ITU-T (G.691)	L-64.1	L-64.2	L-64.2r
Optical Device	SLM	SLM	SLM

ITU-T (G.693)	VSR600-2M2	VSR2000-2L2
Optical Device	SLM	SLM

ITU-T (G.959.1)	P1S1-2D1	P1S1-2D2a	P1S1-2D2b	P1L1-2D1	P1L1-2D2
Optical Device	-	SLM	SLM	SLM	SLM

ITU-T (G.959.1)	P1I1-2D2	P1I1-2D2r
Optical Device	SLM	SLM