

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

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**XMD03**

## **Physical Interface of LC TOSA Type 1 Package**

**Rev. 2.1  
January 17, 2006**

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### **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 users wish 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.

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**Revision History**

Revision	Date	Purpose/Changes
1.0	June 7, 2004	First public issue
2.0	September 30, 2004	Addition of Scope. Changes to unify the descriptions in TOSA Type1 and Type2 Package documents.
2.1	January 17, 2006	Changes document name to identify connector type Adds reference

## 1 Scope

The XMD MSA committee has created this technical document to specify the physical interface of LC TOSA type 1 package. The specifications were based on the investigation of TOSA to be mated with LC connector, mainly assuming a co-axial type as the type 1 package.

## 2 Reference Documents

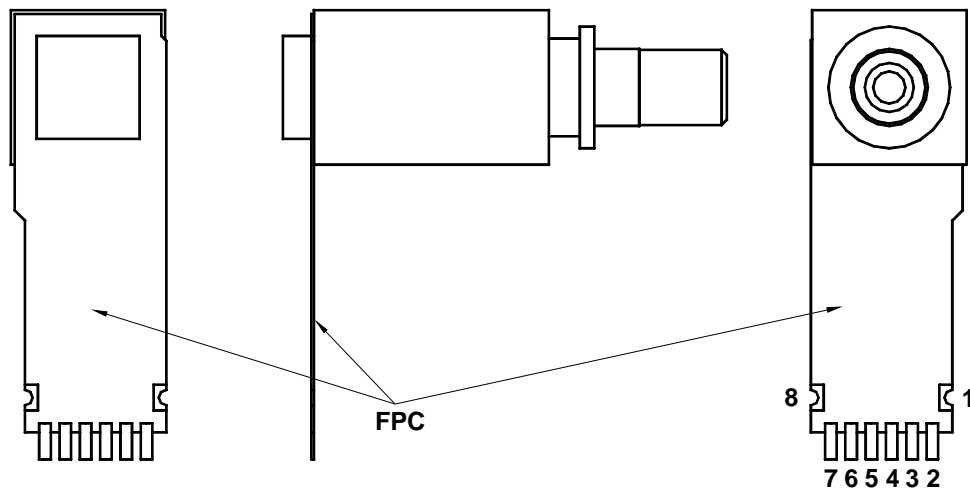
- [1] IEC 61754-20  
“Fibre optic connector interfaces – Part 20: Type LC connector family”
- [2] XMD01  
“Electrical & Optical Interfaces of TOSA DML”

## 3 Abbreviations

FPC	Flexible printed circuit
LD	Laser diode
OSA	Optical sub-assembly
PCB	Printed circuit board
PD	Photo diode
ROSA	Receiver optical sub-assembly
TOSA	Transmitter optical sub-assembly
XFP	10 gigabit small form factor pluggable

## 4 Electrical Interface

### 4.1 Numbering of electrical terminals



**Fig. 1 Electrical terminal numbering assignments**

Note 1: The FPC structure in this figure is prepared as an example only. The vendor should specify its FPC structure based on the mechanical interface in Session 5. The electrical terminal numbering assignments shall be defined by the pattern layout in Figure 3.

### 4.2 Electrical terminal assignment

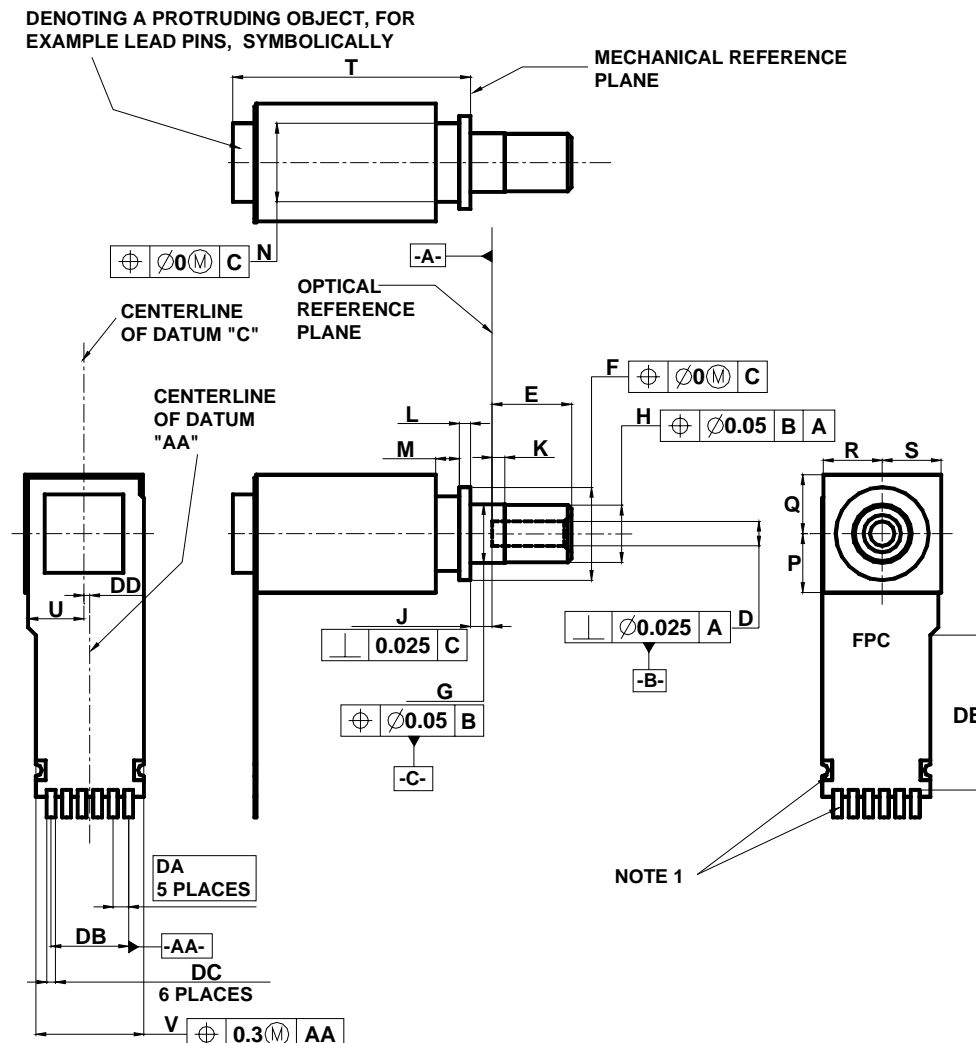
**Table 1 Terminal function definitions**

Terminal number	Option 1	Option 2
1	Signal Ground	Signal Ground
2	PD Cathode	PD Cathode
3	Signal Ground	Signal Ground
4	LD Cathode	LD Cathode
5	LD Anode	LD Anode
6	Signal Ground	Signal Ground
7	Thermistor	No User Connection
8	Signal Ground	Signal Ground

Note 1: Package potential shall be specified by each vendor.

## 5 Mechanical interface

## 5.1 Package outline



**Fig. 2 Package outline drawing**

Note 1: Denoting 8 soldering pads corresponding to the terminals described in Figure 1 and Table 1. Features and dimensions of the pads and the FPC end portion shape around the pads shall be specified by each vendor to comply with the recommended pattern layout described in Figure 3. The features of the pads and the FPC end portion shape described in this figure are prepared as examples only.

Note 2: The vendor should design the FPC by considering electrical crosstalk and mechanical stress.

**Table 2 Dimensions of the package outline**

Reference	Dimensions mm		Notes
	Minimum	Maximum	
D	-	-	Note 1
E	4.0	4.1	
F	4.7	5.1	Diameter
G	2.98	3.00	Diameter
H	-	2.97	Diameter
J	1.065	1.135	
K	0.55	0.70	
L	0.52	0.63	
M	1.0	-	
N	-	4.1	Diameter
P	-	3	Note 2
Q	-	3	Note 2
R	-	3	Note 2
S	-	3	Note 2
T	-	13.8	
U	-	3	
V	-	5.7	
DA	0.79		Basic dimension
DB	3.95		Reference dimension
DC	-	-	Note 3
DD	0.05	0.55	Note 4
DE	2.5	-	

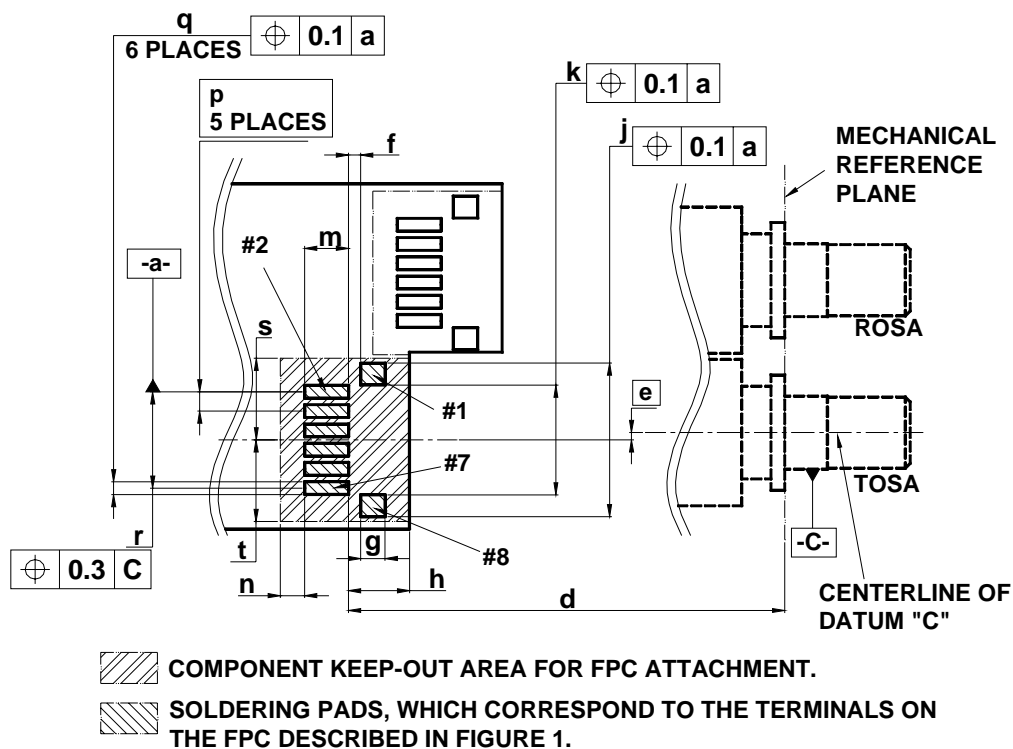
Note 1: Refer IEC 61754-20.

Note 2: P, Q, R and S only define the maximum dimension, thus do not specify the shape of the package.

Note 3: The dimension and the positional tolerance of "DC" shall be specified by each vendor considering the pattern layout described in Figure 3.

Note 4: Denoting the dimension from the centerline of the datum "C" to the centerline of the datum "AA".

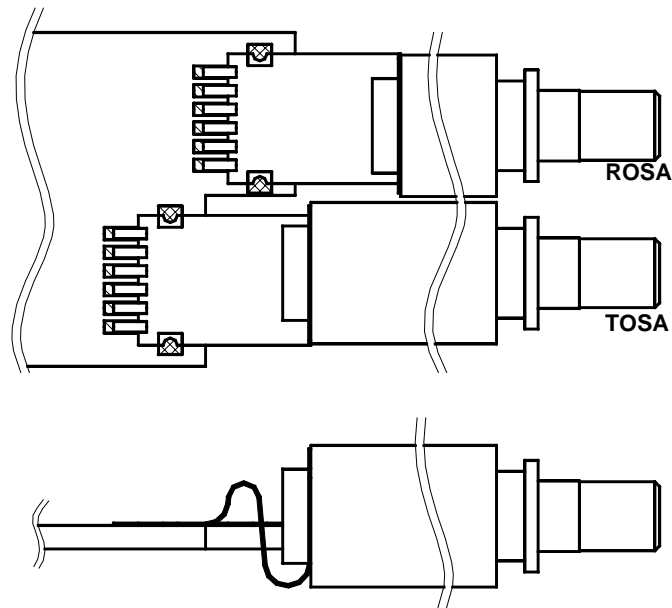
## 5.2 Recommended pattern layout



**Fig. 3 Recommended pattern layout for the PCB in a XFP transceiver**

Note 1: The datum "C" described here is the same one as described in Figure 2.

Note 2: #1, #2, #7 and #8 in this figure are denoting pad numbers corresponding to the terminal numbers described in Figure 1 and Table 1.



**Fig. 4 Recommended arrangement of the PCB, FPCs, TOSA and ROSA**

Note 1: The soldering pads for FPC attachment shall be prepared on the top side of the PCB as described here. The bending shape of the FPC shall be specified by each vendor. The FPC bending shape described here is prepared as an example only.



**Table 3 Dimensions of the recommended pattern layout for the PCB**

Reference	Dimensions mm		Notes
	Minimum	Maximum	
d	18.5	19.2	
e	0.3		Basic dimension, Note 1
f	0.50	0.55	
g	1.0	1.1	
h	-	2.5	
j	6.10	6.35	
k	4.45	4.55	
m	1.4	-	
n	1.0	-	
p	0.79		Basic dimension
q	0.45	0.50	
r	3.95		Reference dimension
s	3.35	-	Note 2
t	3.35	-	Note 2

Note 1: Denoting the offset between the datum “C” and the datum “a”.

Note 2: Denoting the dimension from the datum “a”.