

3Gb/s MSA CWDM 40km Single Transmitter SFP Transceiver Module

CWDM-SFP3GST-40



Application

- SMPTE 259M/292M/424M Compliant Electrical-to-Optical Interfaces
- HDTV/SDTV Fibre Channel Applications

Features

- CWDM Laser Diode Transmitter
- Up to 80 Km on 9/125µm SMF
- 3.3V Power Supply
- LC Duplex Optical Interface
- CML Differential Input
- Support Video Pathological Patterns for SD-SDI, HD-SDI and 3G-SDI
- Class 1 Laser International Safety Standard IEC 825 Compliant
- Operating Case Temperature Range (Standard: 0 to 70°C)

Description

FS's CWDM-SFP3GST-40 series of transmitter module is the perfect solution for high -speed communication networks. The transmitter module supports data rates up to 3Gbps. The module is fully compliant with Small Form-Factor Pluggable (SFP) Transceiver Multi-Source Agreement (MSA).

The transmitter module provides the system designer with Camera, Video, HDTV/SDTV Fibre Channel applications.

Product Specifications

I. Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Storage Temperature	Tst	-40	+85	°C
Relative Humidity	RH	5	95	%
Supply Voltage	Vcc	0	+3.6	V

II. Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit
Supply Voltage	Vcc	+3.1	+3.3	+3.5	V
Supply Current	Icc	-	-	200	mA
Operating Case Temperature	Top	0	-	+70	°C
Data Rate	B	270	-	3000	Mbps

III. Transmitter Optical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Note
Data rate	B	270	-	3000	Mbps	-
Output Center Wavelength	λ_c	Typ-7.5	1270~1610	Typ+7.5	dBm	-
Output Spectral Width (-20dB)	λ	-	-	1	dBm	-
Average Optical Output Power	Po	-5	-	5	nm	1,2
Extinction Ratio	ER	5	-	-	dB	1,2
Optic Output Eye: Compliant ITU-T G.957						1,2

Note1: The optical power is launched into 9/125μm SMF.

Note2: With a PRBS 2²³-1 test pattern@ 3000Mbps.

IV. Transmitter Electrical Characteristics

Parameter		Symbol	Min	Typical	Max	Unit
Supply Voltage		Vcc	+3.1	+3.3	+3.5	V
Supply Current		Icc	-	-	200	mA
Differential Input Voltage		Vin	400		2000	mVP-P
Input Differential Impedance		Zin	90	100	110	Ω
TX_DISABLE	Disable	VD	2.0	-	Vcc	V
	Enable	VEN	0	-	0.8	V
TX_Fault	Fault	VF	2.0	-	VCC	V
	Normal	VN	0		0.8	V

V. Digital Diagnostic Monitoring Characteristics

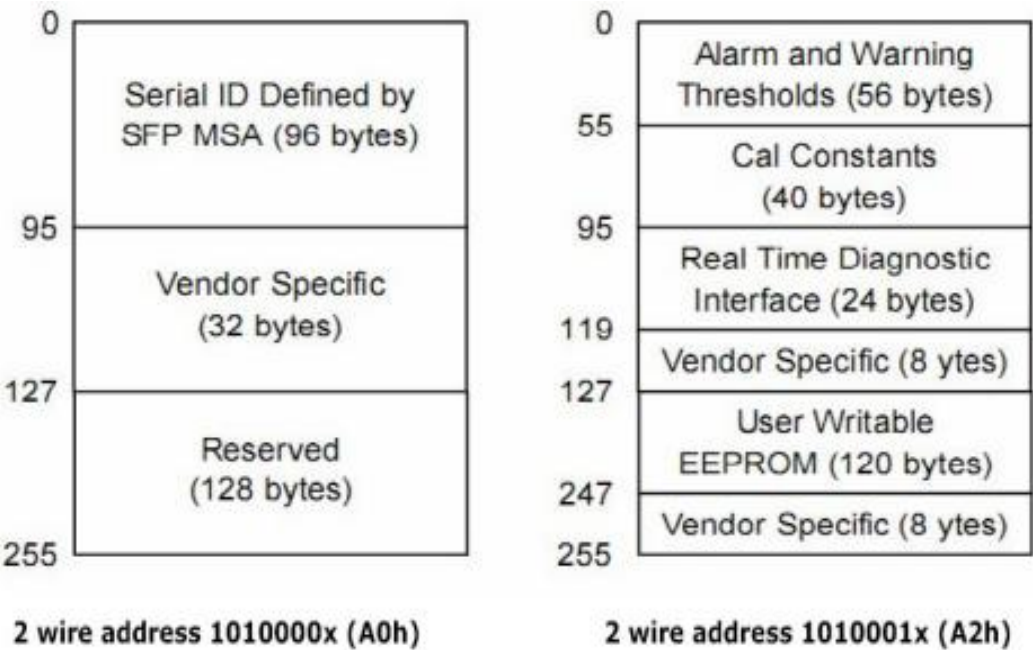
Parameter	Symbol	Range	Accuracy
Receiver Internal Temperature	T	Recommended Operation Condition	±3°C
Receiver Internal Supply Voltage	V _{CC}	Recommended Operation Condition	±3%
Laser Bias Current	I _B	I _B : 1- 100mA, Recommended Operation Condition	±10%
TX Output Power	P _o	P _o : min~max dBm, Recommended Operation Condition	±3dBm

VI. Information Functions

Serial ID provides access to identification information that describes the transceiver’s capabilities, standard interfaces, manufacturer, and other information.

SFP transceivers provide a unique enhanced digital diagnostic monitoring interface, which allows real- time access to device operating parameters such as transceiver temperature, laser bias current, transmitted optical power, and received optical power and transceiver supply voltage.

Defines a 256 byte memory map in E2 PROM that is accessible over a 2- wire serial interface at the 8 bit address 1010000X (A0h). The digital diagnostic monitoring interface makes use of the 8 bit address 1010001X (A2h), The interface is identical to, and is thus fully backward compatible with both the GBIC Specification and the SFP Multi Source Agreement. The complete interface is described in a “Digital Diagnostics Monitoring Interface for SFP Optical Transceivers” .



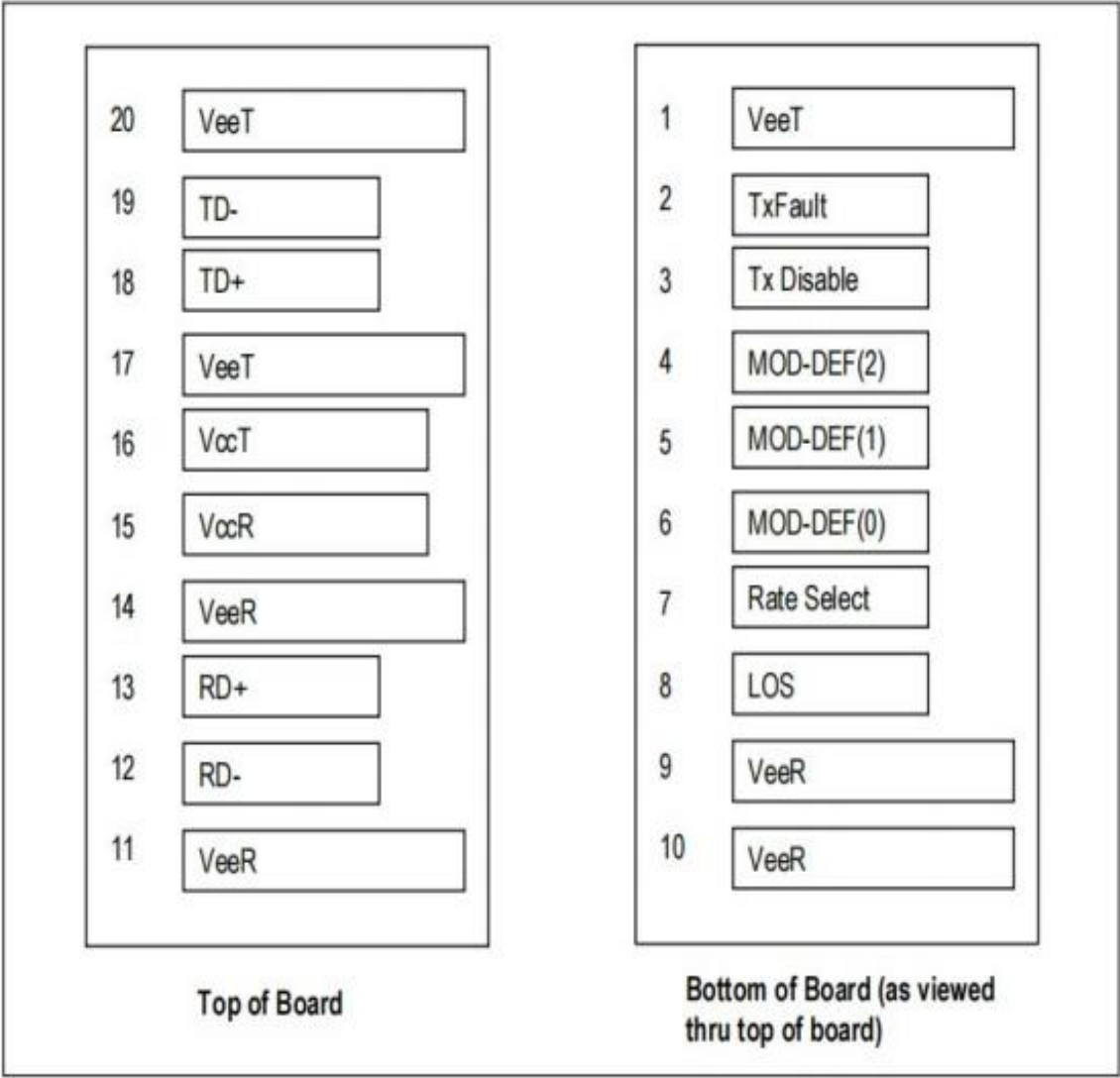
VII. Serial ID Memory Map: A0h

Data Address	Size (Byte)	Name of Field	Description
Base ID Fields			
0	1	Identifier	SFP
1	1	Ext. Identifier	SFP function is defined by serial ID only
2	1	Connector	LC Connector
3-10	8	Transceiver	Transceiver Codes
11	1	Encoding	NRZ
12	1	BR. Nominal	3000Mbps
13	1	Reserved	-
14	1	Length(9 um) km	Transceiver transmit distance
15	1	Length(9 um)100m	Transceiver transmit distance
16	1	Length(50µm)10m	Transceiver transmit distance
17	1	Length(62.5 um)10m	Transceiver transmit distance
18	1	Length (Copper)	Not compliant
19	1	Reserved	-
20-35	16	Vendor Name	SFP vendor name: FS
36	1	Reserved	-
37-39	3	Vendor OUI	-
40-55	16	Vendor PN	Part Number: CWDM-SFP3GST-40
56-59	4	Vendor rev	-
60-61	2	Wavelength	Transceiver wavelength
62	1	Reserved	-
63	1	CC_BASE	Check code for Base ID Fields
Extended ID Fields			
64-65	2	Options	TX_FAULT, TX_DISABLE and Loss of Signal implemented.
66	1	BR, max	-
67	1	BR, min	-
68-83	16	Vendor SN	Serial number
84-91	8	Date code	Manufactory date code
92	1	Diagnostic Monitoring Type	Digital diagnostic monitoring implemented, "internally calibrated" is implemented, RX measurement type is "Average Power" .

VII. Serial ID Memory Map: A0h

Data Address	Size (Byte)	Name of Field	Description
93	1	Enhanced Options	Optional Alarm/Warning flags implemented for all monitored quantities, Optional Soft RX_LOS monitoring implemented.
94	1	SFF-8472 Compliance	Includes functionality described in Rev 9.3 SFF-8472.
95	1	CC_EXT	Check sum for the extended ID Fields

VIII. Pin Definitions



IX. Connector Pin Assignment

Pin #	Pin Name	Plug Seq.	Description	Note
1	VeeT	1	Transmitter Ground	5
2	TX Fault	3	Transmitter Fault Indication	1
3	TX Disable	3	Transmitter Disable	2
4	MOD_DEF(2)	3	SDA Serial Data Signal	3
5	MOD_DEF(1)	3	SCL Serial Clock Signal	3
6	MOD_DEF(0)	3	Grounded to indicate that the module is present	3
7	Rate Select	3	Not in used	4
8	LOS	3	Not in used	4
9	VeeR	1	Receiver Ground	5
10	VeeR	1	Receiver Ground	5
11	VeeR	1	Receiver Ground	5
12	RD-	3	Not in used	4
13	RD+	3	Not in used	4
14	VeeR	1	Receiver Ground	5
15	VccR	2	Receiver Power	6
16	VccT	2	Transmitter Power	6
17	VeeT	1	Transmitter Ground	5
18	TD+	3	Transmit Data In	7
19	TD-	3	Inv. Transmit Data In	7
20	VeeT	1	Transmitter Ground	5

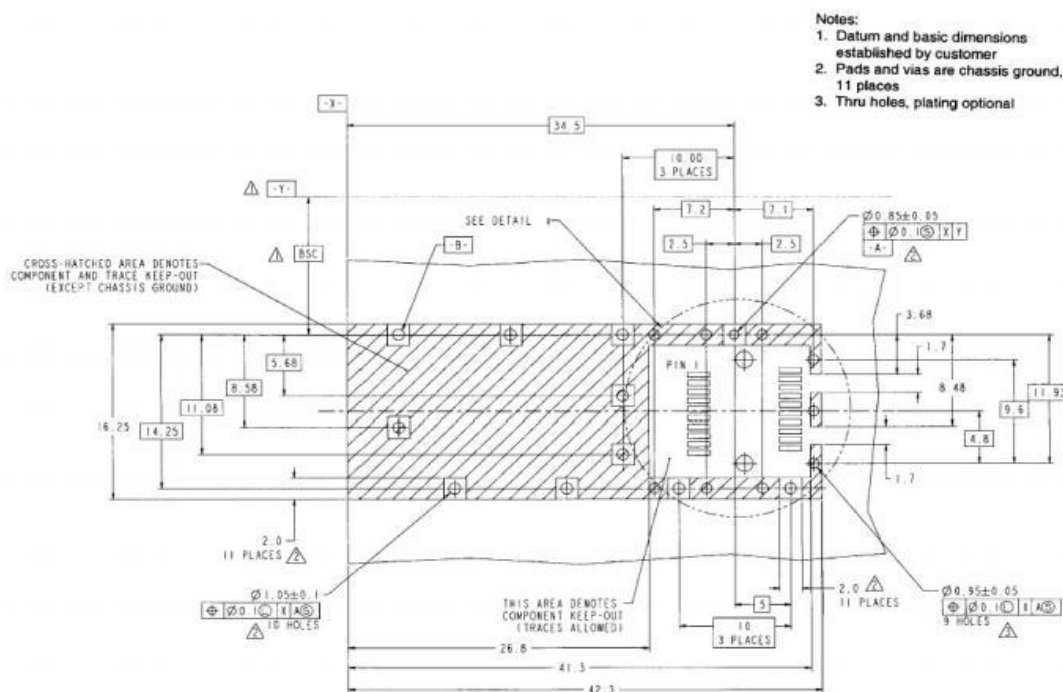
Note:

- TX_Fault is an open collector/drain output, which should be pulled up with a 4.7K Ω — 10K Ω resistor on the host board. Pull up voltage between 2.0V and VCCT, R+0.3V. When high, output indicates a laser fault of some kind. Low indicates normal operation. In the low state, the output will be pulled to < 0.8V.
- TX_Disable is an input that is used to shut down the transmitter optical output. Its states are:
 Low (0 – 0.8V): Transmitter on
 Low (>0.8, < 2.0V): Undefined
 High (2.0 – VCC): Transmitter Disabled
 Open: Transmitter Disabled
- Mod-Def 0, 1, 2. These are the module definition pins. They should be pulled up with a 4.7K Ω — 10K Ω resistor on the host board. The pull-up voltage shall be VCCT or VCCR.
 Mod-Def 0 is grounded by the module to indicate that the module is present.
 Mod-Def 1 is the clock line of two wire serial interface for serial ID.
 Mod-Def 2 is the data line of two wire serial interface for serial ID.
- Not in used.
- VeeR and VeeT may be internally connected within the SFP module.

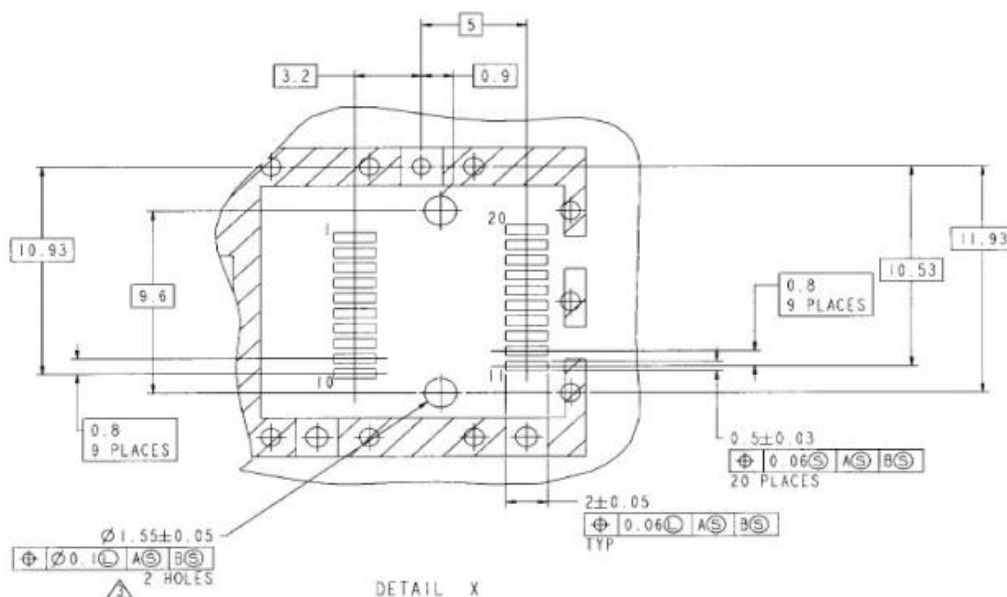
6. VCCR and VCCT are the receiver and transmitter power supplies. They are defined as 3.3V 5% at the SFP connector pin. Maximum supply current is 300 mA. Recommended host board power supply filtering is shown below. Inductors with DC resistance of less than 1ohm should be used in order to maintain the required voltage at the SFP input pin with 3.3V supply voltage. When the recommended supply filtering network is used, hot plugging of the SFP transceiver module will result in an inrush current of no more than 30 mA greater than the steady state value.

7. TD+/-: These are the differential transmitter inputs. They are AC-coupled, differential lines with 100 differential terminations inside the module. The AC coupling is done inside the module and is thus not required on the host board.

X. Host Board Layout

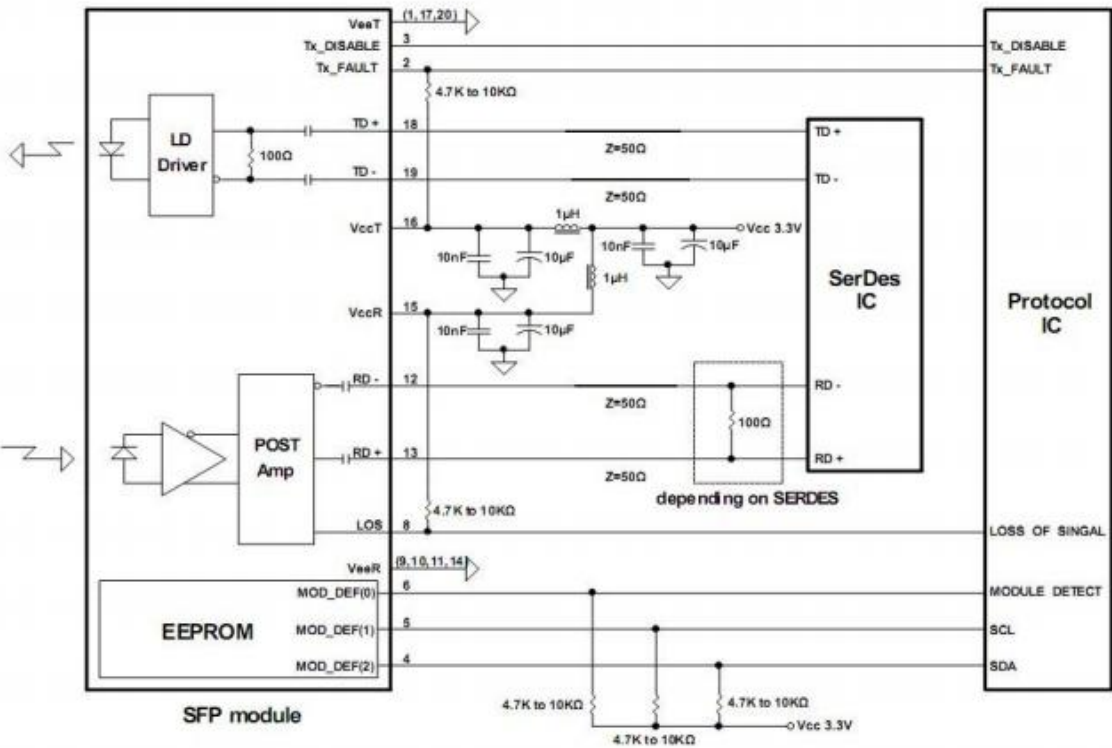


SFP Host Board Mechanical Layout



SFP Host Board Mechanical Layout (Cont.)

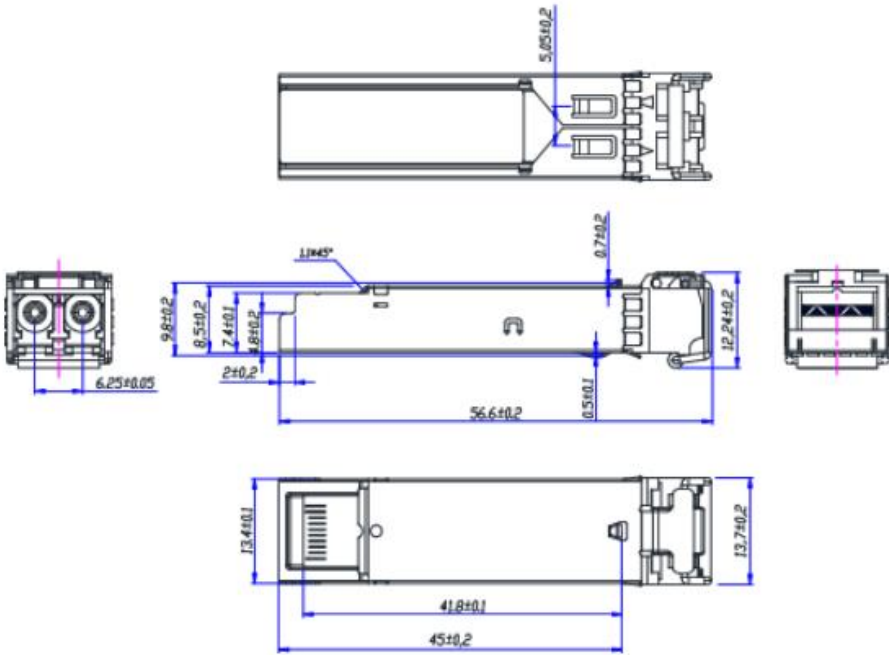
XI. Recommended Circuit Schematic



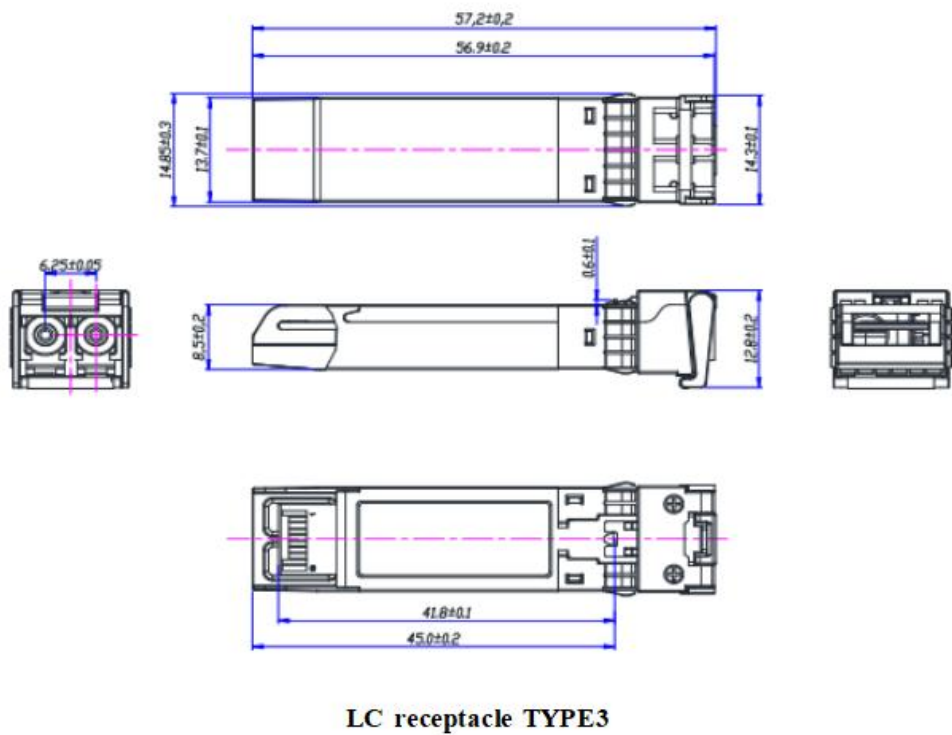
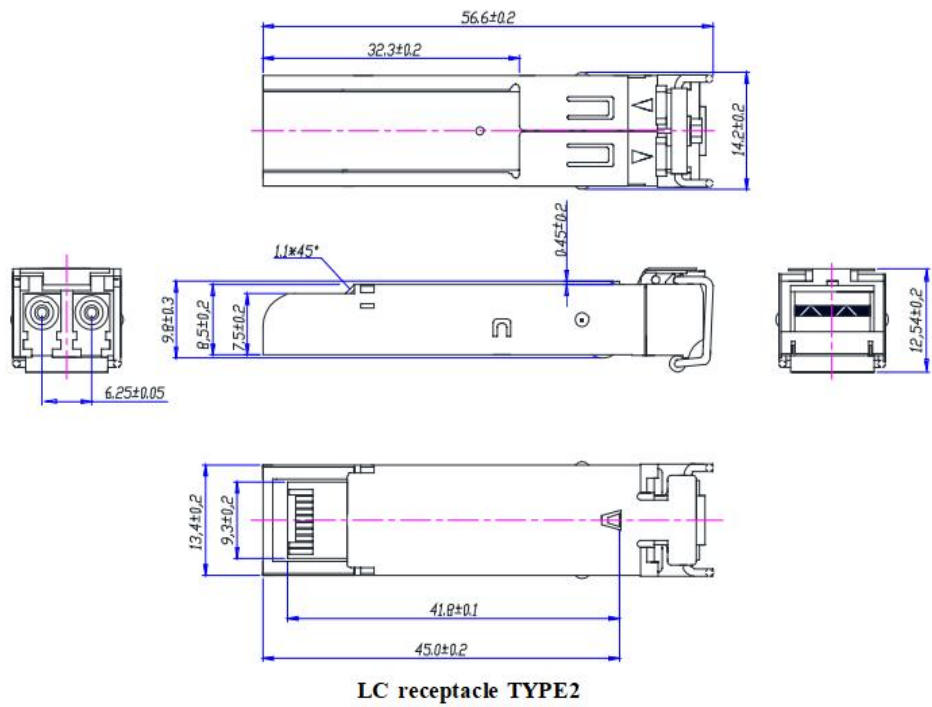
*Single receiver not used transmitter characteristics.

Recommended Circuit Schematic

XII. Module Outline Drawing (Units in mm)



LC receptacle TYPE1(common)



Note: Specifications subject to change without notice.

XIII. Ordering Information

Part Number	Product Description
CWDM-SFP3GST-10	3Gb/s MSA CWDM SFP 10km DOM LC SMF Single Transmitter Video Pathological Patterns Transceiver Module for SD/HD/3G-SDI
CWDM-SFP3GST-40	3Gb/s MSA CWDM SFP 40km DOM LC SMF Single Transmitter Video Pathological Patterns Transceiver Module for SD/HD/3G-SDI