

Features

- Data-Rate of 1.25Gbps operation
- 1310nm FP laser and PIN photodetector
- Compliant with SFP MSA and SFF-8472 with duplex LC receptacle
- Digital Diagnostic Monitoring: Internal Calibration or External Calibration
- Compliant with SONET OC-24-LR-1
- Single +3.3V power supply
- RoHS Compliant
- Operating case temperature:
 - Class C : 0°C ~70°C
 - Class I : -40°C ~85°C



Applications

- Gigabit Ethernet
- Fiber Channel
- Switch to Switch interface.
- Switched backplane applications.
- Router/Server Interface
- Other optical transmission systems

Description

The Small Form Factor Pluggable (SFP) transceivers are compatible with the SFP Multi-Source Agreement (MSA). They simultaneously comply with Gigabit Ethernet as specified in IEEE Std 802.3 and 1x Fiber Channel as defined in FC-P1-4 Rev.8.00.

Digital diagnostics functions are available via the 2-wire serial bus specified in the SFP MSA. The optical transceiver is RoHS compliant as described in Application Note AN-2038^{4,5}.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Units	Note
Storage Temperature	T_s	-40		85	°C	
Supply Voltage	V_{cc}	-0.5		4.5	V	
Operating Relative Humidity		5		85	%	

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Units	Note
Power Supply Voltage	V_{cc}	3.13	3.3	3.47	V	
Case Operating Temperature	T_{op}	0		70	°C	CMF
		-40		85	°C	IMF
Power Supply Current	I_{cc}			300	mA	
Data Rate			1.25		Gbps	

Digital Diagnostic Functions

Parameter	Symbol	Accuracy	Unit	Notes
Temperature Monitor Absolute Error	DMI_Temp	± 3	°C	Over operating Temp
Supply Voltage Monitor Absolute Error	DMI_VCC	± 0.1	V	Full operating range
RX Power Monitor Absolute Error	DMI_RX	± 3 dB	dB	1
Bias Current Monitor	DMI_Ibias	$\pm 10\%$	mA	
Laser Power Monitor Absolute Error	DMI_TX	± 3 dB	dB	1

Notes:

1. Due to measurement accuracy of different single mode fibers, there could be an additional +/-1 dB fluctuation, or a +/- 3 dB total accuracy.

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Units	Note
Transmitter						
Optical Center Wavelength	λ	1260	1310	1360	nm	
Output Optical Power	P_{TX}	-9		-3	dBm	1
Extinction Ratio	ER	9			dB	
Spectral Width (RMS)	$\Delta\lambda$			4	nm	
Optical Rise/Fall Time (20%-80%)	t_r/t_f			0.26	Ns	
Receiver						
Optical Center Wavelength	λ	1260		1580	nm	
Receiver Overload	P_{OL}	-3			dBm	2
Receiver Sensitivity	P_{SEN}			-23	dBm	2
LOS Assert	$LOSA$	-35			dBm	
LOS De-assert	$LOSD$			-24	dBm	
LOS Hysteresis	$LOSH$	1		4	dB	

Note:

1. The optical power is launched into SMF
2. Measured with a PRBS2⁷-1 test pattern @1250Mbps, $BER \leq 1 \times 10^{-12}$

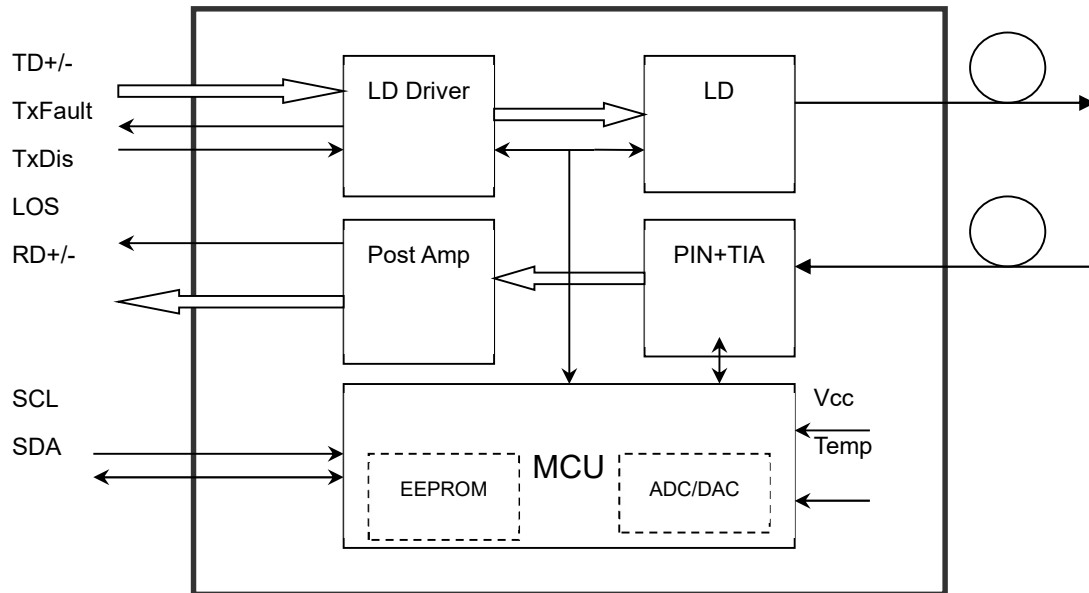
Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Units	Note
Transmitter						
Input Differential Impedance	Z_{IN}	90	100	110	Ω	
Single Ended Data Input Swing	V_{IN_pp}	400		1800	mV	1
Transmit Disable Voltage	V_D	2.0		V_{CC}	V	
Transmit Enable Voltage	V_{EN}	0		0.8	V	
Receiver						
Data Output Swing Differential	V_{OUT}	400		1800	mV	2
Data Output Rise/Fall Time (20%~80%)	tr/tf			300	ps	
LOS	<i>High</i>	2.0	-	V_{CC}	V	
	<i>Low</i>			0.8	V	

Note:

1. PECL input, internally AC-coupled and terminated.
2. Internally AC-coupled.

Block Diagram of Transceiver



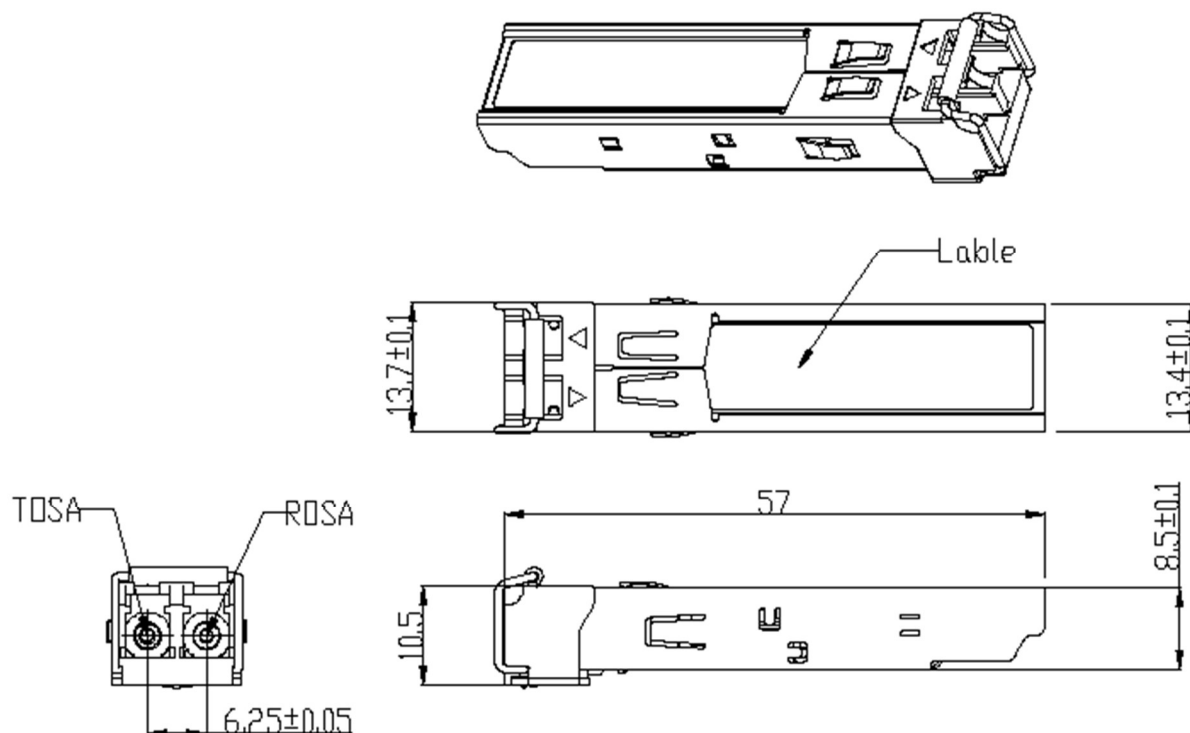
Pin Assignment

Pin	Symbol	Function/Description	Note
1	VEET	Transmitter ground (common with receiver ground)	1
2	TX_FAULT	Transmitter Fault. Not supported	
3	TX DISABLE	Transmitter Disable. Laser output disabled on high or open	2
4	MOD_DEF(2)	Module Definition 2. Data line for serial ID	3
5	MOD_DEF(1)	Module Definition 1. Clock line for serial ID	3
6	MOD_DEF(0)	Module Definition 0. Grounded within the module	3
7	Rate Select	No connection required	
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation	4
9	VEER	Receiver ground (common with transmitter ground)	1
10	VEER	Receiver ground (common with transmitter ground)	1
11	VEER	Receiver ground (common with transmitter ground)	1
12	RD-	Receiver Inverted DATA out. AC coupled	
13	RD+	Receiver Non-inverted DATA out. AC coupled	
14	VEER	Receiver ground (common with transmitter ground)	1
15	VCCR	Receiver power supply	
16	VCCT	Transmitter power supply	
17	VEET	Transmitter ground (common with receiver ground)	1
18	TD+	Transmitter Non-Inverted DATA in. AC coupled	
19	TD-	Transmitter Inverted DATA in. AC coupled	
20	VEET	Transmitter ground (common with receiver ground)	1

Notes:

1. Circuit ground is isolated from chassis ground.
2. Disabled: TDIS>2V or open Enabled: TDIS<0.8V
3. Should be pulled up with 4.7k~10k ohm on host board to a voltage between 2V and 3.6V
4. LOS is open collector output.

Dimensions



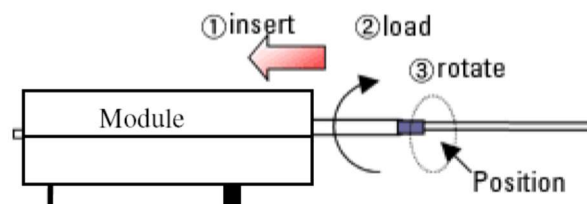
Optical Receptacle Cleaning Recommendations :

All fiber stubs inside the receptacle portions were cleaned before shipment. In the event of contamination of the optical ports, the recommended cleaning process is the use of forced nitrogen. If contamination is thought to have remained, the optical ports can be cleaned using a NTT international Cletop® stick type and HFE7100 cleaning fluid. Before the mating of patch-cord, the fiber end should be cleaned up by using Cletop® cleaning cassette.

Cleaning of patch-cord



Cleaning of fiber stub



1. Insert
Ensure that stick is held straight when inserting into sleeve.
2. Load
Apply sufficient pressure (approx 600-700g) to ensure ferrule a little depressed in sleeve.
3. Rotate
Rotate stick clockwise 4-5 times, while ensuring direct contact with ferrule end-face is maintained.

*Notice: Number of possible wipes:
Maintenance (repair) ~1 use / piece
Equipment construction: 4 uses / piece (max.)*

Note: The pictures were extracted from NTT-ME website. And the Cletop® is a trademark registered by NTT-ME

Ordering Information

<i>Model Number</i>	<i>Part Number</i>	<i>Wavelength</i>	<i>Temperature</i>
SFP-1.25G-LX-DM	OP6C-S10-13-CMF	1310nm	0 °C ~70 °C
SFP-1.25G-LX-DM-I	OP6C-S10-13-IMF	1310nm	-40 °C ~85 °C

Modification History

<i>Revision</i>	<i>Date</i>	<i>Description</i>
A1	Feb. 2013	Initial Release

Note: All information contained in this document is subject to change without notice.