Feature:

1. SFP+ package with LC connector
2. 1270nm/1330nm DFB-LD Transmitter
   A:1270TX/1330RX B:1330TX/1270RX
3. Distance up to 60km(10,20,40,60KM)
4. Power Dissipation < 1.5W
5. LVPECL compatible data input/output interface
6. Low EMI and excellent ESD protection
7. laser safety standard IEC-60825 compliant
8. Compatible with RoHS
9. Compliant with MSA SFP+ Specification SFF-8431
10. Compatible with SFF8472
11. Compliant with IEEE 802.3ae 10GBASE-LR/LW
12. Dispersion tolerance up to 40ps/nm over G.651

Application

- 10GBASE-LR at 10.31Gbps
- 10GBASE-LW at 9.95Gbps
- 0.6~10Gb/s CPRI/OBSAI
- Other Optical Link

Absolute Maximum Ratings

Parameter	Symbol		Min	Max	Unit
Storage Temperature	TS		-40	+85	℃
Operating Temperature	TOP	Commercial level	-20	+70	℃
		industrial level	-40	85	
Supply Voltage	VCC		-0.5	+3.6	V
Voltage on Any Pin	VIN		0	VCC	V
Soldering Temperature ,Time	-			260℃, 10 S	℃,S

Operation Environment

Parameter	Symbol		Min.	Typ	Max.	Unit
Ambient Temperature	TAMB	Commercial level	0	-	70	℃

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		industrial level	-40		85	
Power Supply Voltage	V_{CC}-V_{EE}		3.15	3.3	3.45	V
Power Dissipation					1	W
Data Rate	10GBASE-LR			10.3125		Gbps

Optical Characteristics

(Ambient Operating Temperature 0°C to +70°C, Vcc =3.3 V)

Parameter		Symbol	Min.	Typ.	Max.	Units
Transmitter Section						
Center Wavelength		λo	1260	1270	1280	nm
			1320	1330	1340	
RMS Spectral Width		Δλ	-	-	1	nm
Side Mode Suppression Ratio		SMSR	30			dB
Average Output Power	**10km**	Po	-5	-	0	dBm
	20km		-2		+3	
	40km		+1		+5	
	60km		+1		+6	
Extinction Ratio		Er	3.5	-	-	dB
Dispersion Penalty					2	dB
Input Differential Impedance		Zin	90	100	110	Ω
Relative Intensity Noise		$RIN_{12}OMA$			-128	dB/Hz
Total jitter		Tj			0.28	UI(p-p)
Receiver Section						
Center Wavelength		λo	1320	1330	1340	nm
			1260	1270	1280	
Receiver Sensitivity	**10km**	Rsen			-14	dBm
	20km				-14	
	40km				-15	
	60km APD				-20	
Receiver Overload	**0~40km**	Rov	0.5			dBm
	60KM		-6			

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Return Loss			12			dB
LOS Assert		LOS_A	-25			dBm
LOS Dessert		LOS_D			-15	dBm
LOS Hysteresis			0.5		4	dB
LOS	High		2.0		VCC+0.3	V
	Low		0		0.8	

Electrical Characteristics

(Ambient Operating Temperature 0°C to +70°C, Vcc =3.3 V)

Parameter		Symbol	Min.	Typ.	Max.	unit
Transmitter Section						
Input Differential Impendence		Zin	90	100	110	Ohm
Data Input Swing Differential		Vin	180		700	mV
TX Disable	Disable		2.0		Vcc	V
	Enable		0		0.8	V
TX Fault	Assert		2.0		Vcc	V
	Deassert		0		0.8	V
Receiver Section						
Output differential impendence		Zout		100		Ohm
Data output Swing Differential		Vout	300		800	mV
Rx_LOS	Assert		2.0		Vcc	V
	Deassert		0		0.8	V

Diagnostics

Parameter	Range	Accuracy	Unit	Calibration
Temperature	-5 ~ 75	±3	°C	Internal
Voltage	0 ~ VCC	0.1	V	Internal
Bias Current	0 ~ 12	0.3	mA	Internal
Tx Power	-8 ~ 1	±1	dBm	Internal
Rx Power	-18 ~ 0	±1	dBm	Internal

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EEPROM INFORMATION（A0）:

Addr	Field Size (Bytes)	Name of Field	HEX	Description
0	1	Identifier	03	SFP
1	1	Ext. Identifier	04	MOD4
2	1	Connector	07	LC
3-10	8	Transceiver	10 00 00 00 00 00 00 00	Transmitter Code
11	1	Encoding	06	64B66B
12	1	BR, nominal	67	10000M bps
13	1	Reserved	00	
14	1	Length (9um)-km	00	
15	1	Length (9um)	00	
16	1	Length (50um)	08	
17	1	Length (62.5um)	02	
18	1	Length (copper)	00	
19	1	Reserved	00	
20-35	16	Vendor name	48 44 56 20 20 20 20 20 20 20 20 20 20 20 20 20	HDV
36	1	Reserved	00	
37-39	3	Vendor OUI	00 00 00	
40-55	16	Vendor PN	xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx	ASC II
56-59	4	Vendor rev	31 2E 30 20	V1.0
60-61	2	Wavelength	05 1E	1310nm
62	1	Reserved	00	
63	1	CC BASE	XX	Check sum of byte 0~62
64-65	2	Options	00 1A	LOS, TX_DISABLE, TX_FAULT
66	1	BR, max	00	
67	1	BR, min	00	
68-83	16	Vendor SN	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	Unspecified
84-91	8	Vendor date code	XX XX XX 20	Year, Month, Day
92-94	3	Reserved	00	
95	1	CC_EXT	XX	Check sum of byte 64~94
96-255	160	Vendor specific		

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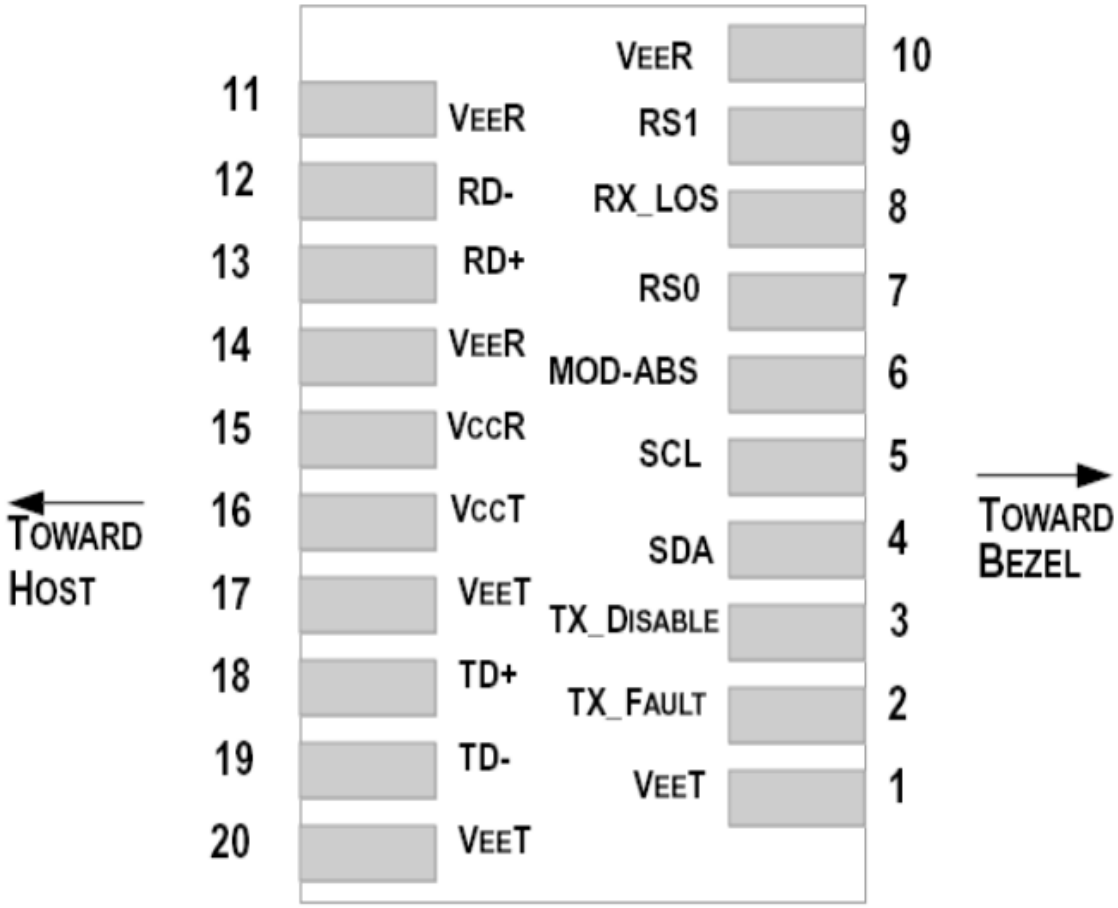
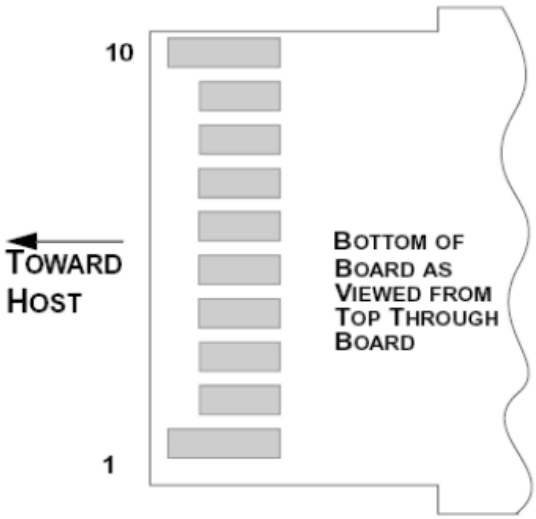
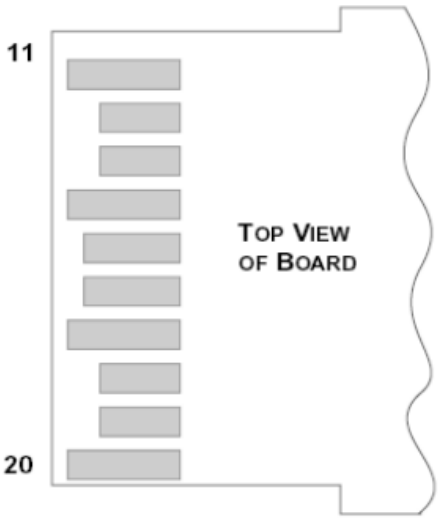
Pin Description:





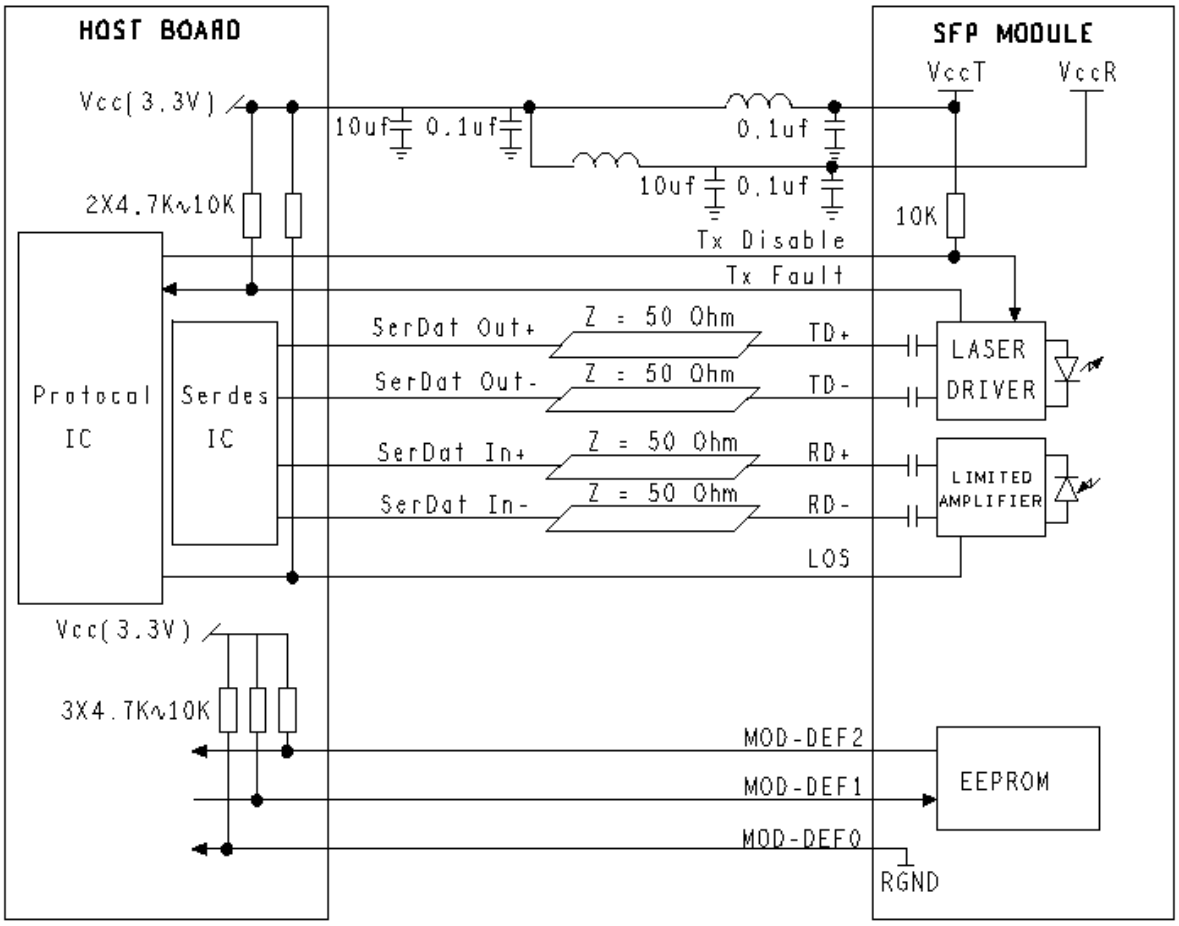


Pins	Name	Discription	NOTE
1	VeeT	Transmitter Ground	
2	Tx Fault	Transmitter Fault Indication	1
3	Tx Disable	Transmitter Disable	2
4	MOD DEF2	Module Definition 2	3
5	MOD DEF1	Module Definition 1	3
6	MOD DEF0	Module Definition 0	3
7	RS0	Not Connected	
8	LOS	Loss of Signal	4
9	RS1	Not Connected	
10	VeeR	Receiver Ground	
11	VeeR	Receiver Ground	
12	RD-	Inv. Received Data Output	5
13	RD+	IReceived Data Output	5
14	VeeR	Receiver Ground	
15	VccR	Receiver Power	
16	VccT	Transmitter Power	
17	VeeT	Transmitter Ground	
18	TD+	Transmit Data Input	6
19	TD-	Inv. Transmit Data Input	6
20	VeeT	Transmitter Ground	

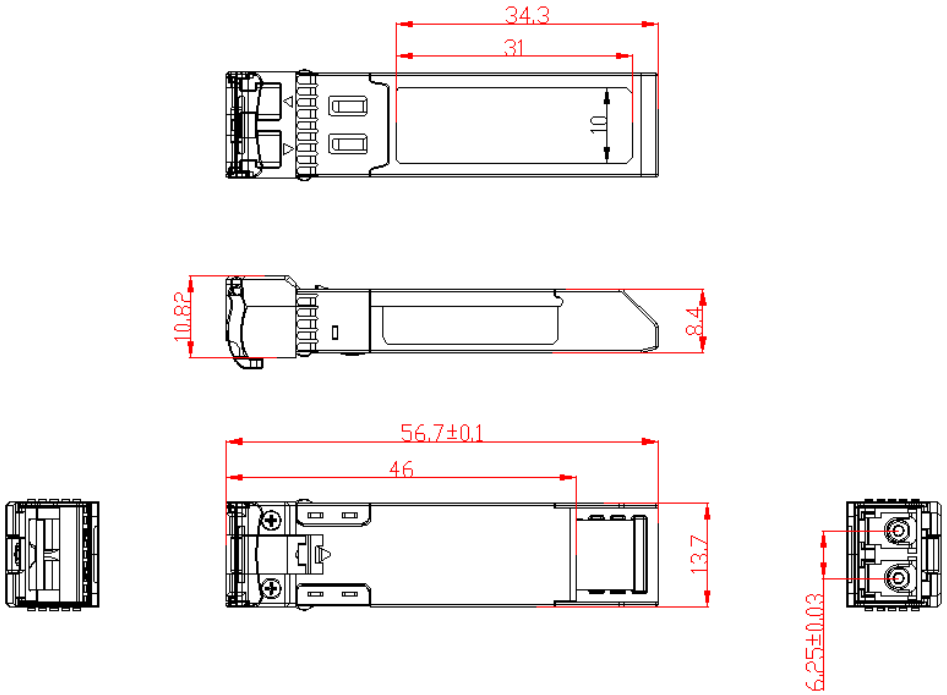
Notes:

1. TX Fault is an open collector output, which should be pulled up with a 4.7k~10kΩ resistor on the host board to a voltage between 2.0V and Vcc+0.3V. Logic 0 indicates normal operation; logic 1 indicates a laser fault of some kind. In the low state, the output will be pulled to less than 0.8V.
2. TX Disable is an input that is used to shut down the transmitter optical output. It is pulled up within the module with a 4.7k~10kΩ resistor. Its states are:
   Low (0~0.8V): Transmitter on
   (>0.8V, <2.0V): Undefined
   High (2.0~3.465V): Transmitter Disabled
   Open: Transmitter Disabled
3. MOD-DEF 0,1,2 are the module definition pins. They should be pulled up with a 4.7k~10kΩ 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
4. LOS is an open collector output, which should be pulled up with a 4.7k~10kΩ resistor on the host board to a voltage between 2.0V and Vcc+0.3V. Logic 0 indicates normal operation; logic 1 indicates loss of signal. In the low state, the output will be pulled to less than 0.8V.
5. These are the differential receiver output. They are internally AC-coupled 100Ω differential lines which should be terminated with 100Ω (differential) at the user SERDES.
6. These are the differential transmitter inputs. They are AC-coupled, differential lines with 100Ω differential termination inside the module.

Recommended Application Circuit



Outline drawing (mm):



Ordering information :

Part No.	Wavelength	Connector	Temp.	TX Power (dBm)	RX Sens (Max.) (dBm)	Distance
BSFP+-10G-L10A	1270TX/1330RX	LC	0~70℃	-5 to 0	-14	**10km**
BSFP+-10G-L10B	1330TX/1270RX	LC	0~70℃	-5 to 0	-14	**10km**
BSFP+-10G-L10A	1270TX/1330RX	LC	0~70℃	-2to 3	-14	**20km**
BSFP+-10G-L10B	1330TX/1270RX	LC	0~70℃	-2to 3	-14	**20km**
BSFP+-10G-L10A	1270TX/1330RX	LC	0~70℃	+1 to +5	-15	**40km**
BSFP+-10G-L10B	1330TX/1270RX	LC	0~70℃	+1 to +5	-15	**40km**
BSFP+-10G-L10A	1270TX/1330RX	LC	0~70℃	+1 to +6	-20	**60km**
BSFP+-10G-L10B	1330TX/1270RX	LC	0~70℃	+1 to +6	-20	**60km**

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