

**Alpha Bridge SFP
ASFP-10G-ER 1550 nm
Datasheet**



Features

- Supports from 9.83Gb/s to 11.3 Gb/s bit rates
- ☑ Compliant with IEEE 802.3ae 10GBASE-LR/LW
- ☑ Compliant with 10GFC
- ☑ Compliant with SFF-8431
- ☑ Hot-pluggable SFP+ footprint
- ☑ 1310nm DFB laser transmitter and PIN receiver
- ☑ Duplex LC connector
- ☑ Built-in digital diagnostic functions
- ☑ Up to 40km on SMF
- ☑ Single power supply 3.3V
- ☑ RoHS Compliant
- ☑ Class 1 laser product complies with EN 60825-1
- ☑ Operating temperature range: 0°C to 70°C



Applications

- ☑ 10GBASE-LR/LW Ethernet
- ☑ 10G Fibre Channel

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ	Max.	Units	Notes
Data Rate	DR	9.83	10.3125	11.3	Gb/s	1
Bit Error Rate	BER			10 ⁻¹²		
Operating Temperature	T _C	0		70	°C	2
Storage Temperature	T _{STO}	-40		85	°C	3
Supply Current	I _{CC}	--	250	270	mA	4
Input Voltage	V _{CC}	3.14	3.3	3.46	V	
Maximum Voltage	V _{MAX}	-0.5		4	V	4

Notes:

1. IEEE 802.3ae
2. Case temperature
3. Ambient temperature
4. For electrical power interface

Link Distances

Data Rate	Fiber Type	Distance Range (m)
9.83 –11.3 Gb/s	9/125umSMF	40

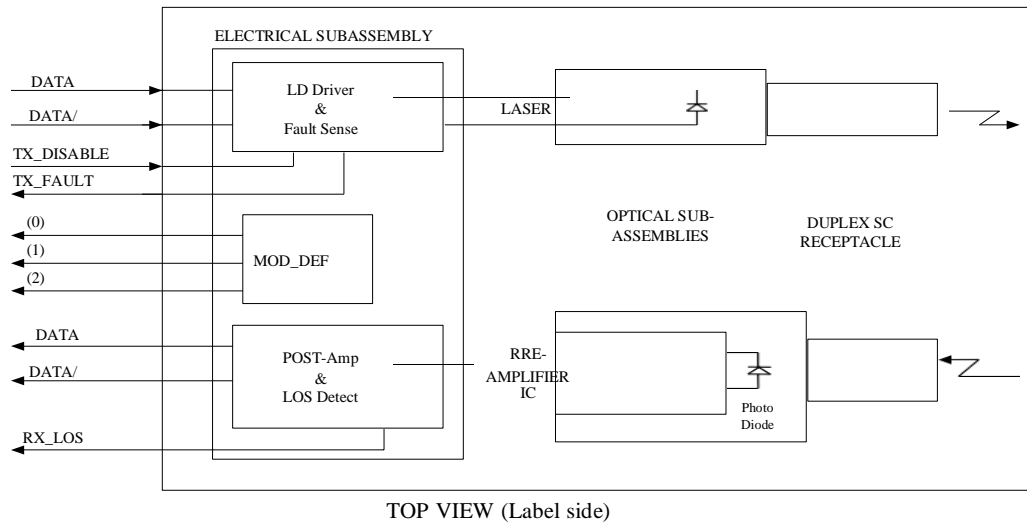
Transmitter Electro-optical Characteristics
 $V_{CC} = 3.1\text{ V to }3.5\text{ V, TC} = 0\text{ }^{\circ}\text{C to }70\text{ }^{\circ}\text{C}$

Parameter	Symbol	Min.	Typ.	Max.	Units	Note
Output Optical Power	P_{TX}	2	--	5	dBm	1
Optical Center Wavelength	λ_C	1290	1310	1330	nm	
Extinction Ratio	ER	3.5	5.5	--	dB	
Spectral Width (-20dB)	$\Delta\lambda$	--	--	0.6	Nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Relative Intensity Noise	R_{IN}		--	-128	dB/Hz	
Transmitter Dispersion Penalty	T_{DP}			3.2	dB	
Transmitter Jitter		According to IEEE 802.3ae requirement				
Launch Power of OFF Transmitter	T_{DP}			-30	dBm	1
Input differential impedance	R_{IN}		100	Compliant with IEEE802.z	Ω	
Differential data input swing	V_{IN_PP}	180	--	700	MV	
Transmit disable voltage	V_D	2	--	V_{CC}	V	
Transmit enable voltage	V_{EN}	V_{EN}		$VEE+0.8$	V	

Receiver Electro-optical Characteristics
 $V_{CC} = 3.1\text{ V to }3.5\text{ V, TC} = 0\text{ }^{\circ}\text{C to }70\text{ }^{\circ}\text{C}$

Parameter	Symbol	Min.	Typ.	Max.	Units	Notes
Optical Center Wavelength	λ_C	1260	---	1600	nm	
Receiver Overload	P_{OL}	0.5	---		dbm	
Receiver Sensitivity @10.3Gb/s	R_{X_SEN1}		---	-14.4	dBm	1
Receiver Reflectance	TRR_X		---	-12	dB	
LOS Assert	LOS_A	-30	---		dBm	
LOS De-Assert	LOS_D	--	---	-16	dBm	
LOS Hysteresis	LOS_H	0.5	---	--	dB	
Single ended data output swing	V_{OUT_PP}	300		850	MV	
Data output rise time/fall time (20%-80%)	t_r/t_f	28	---		Ps	
LOS Assert	LOS_A	2	---	V_{CC_HOST}	V	
LOS De-Assert	LOS_D	V_{EE}	---	$VEE+0.5$	V	

Block Diagram of Transceiver



Transmitter and Receiver Optical Sub-assembly Section

A 1310 nm InGaAsP laser and an InGaAs PIN photodiode integrate with an WDM filter to form a bi-directional single fiber optical subassembly (OSA). The laser of OSA is driven by a LD driver IC which converts differential input LVPECL logic signals into an analog laser driving current. And, The photodiode of OSA is connected to a circuit providing post-amplification quantization, and optical signal detection.

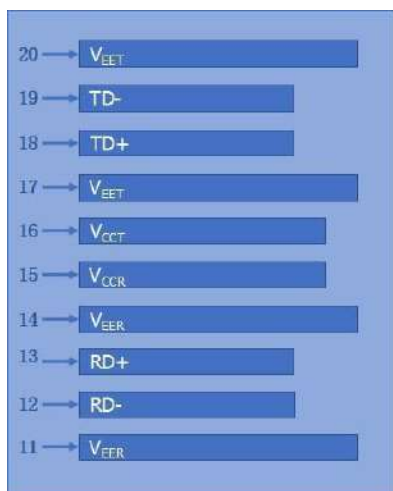
TX_DISABLE

The TX_DISABLE signal is high (TTL logic “1”) to turn off the laser output.

Receive Loss (RX_LOS)

The RX_LOS is high (logic “1”) when there is no incoming light from the companion transceiver. This signal is normally used by the system for the diagnostic purpose. The signal is operated in TTL level

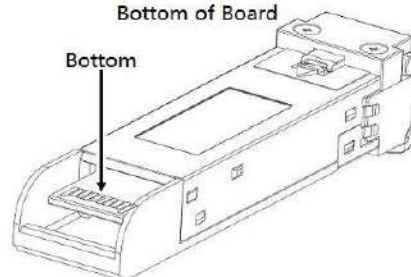
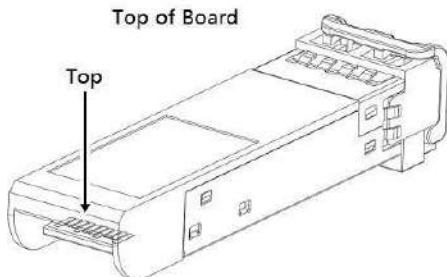
Pin Assignment



Top of Board



Bottom of Board



Pin Descriptions

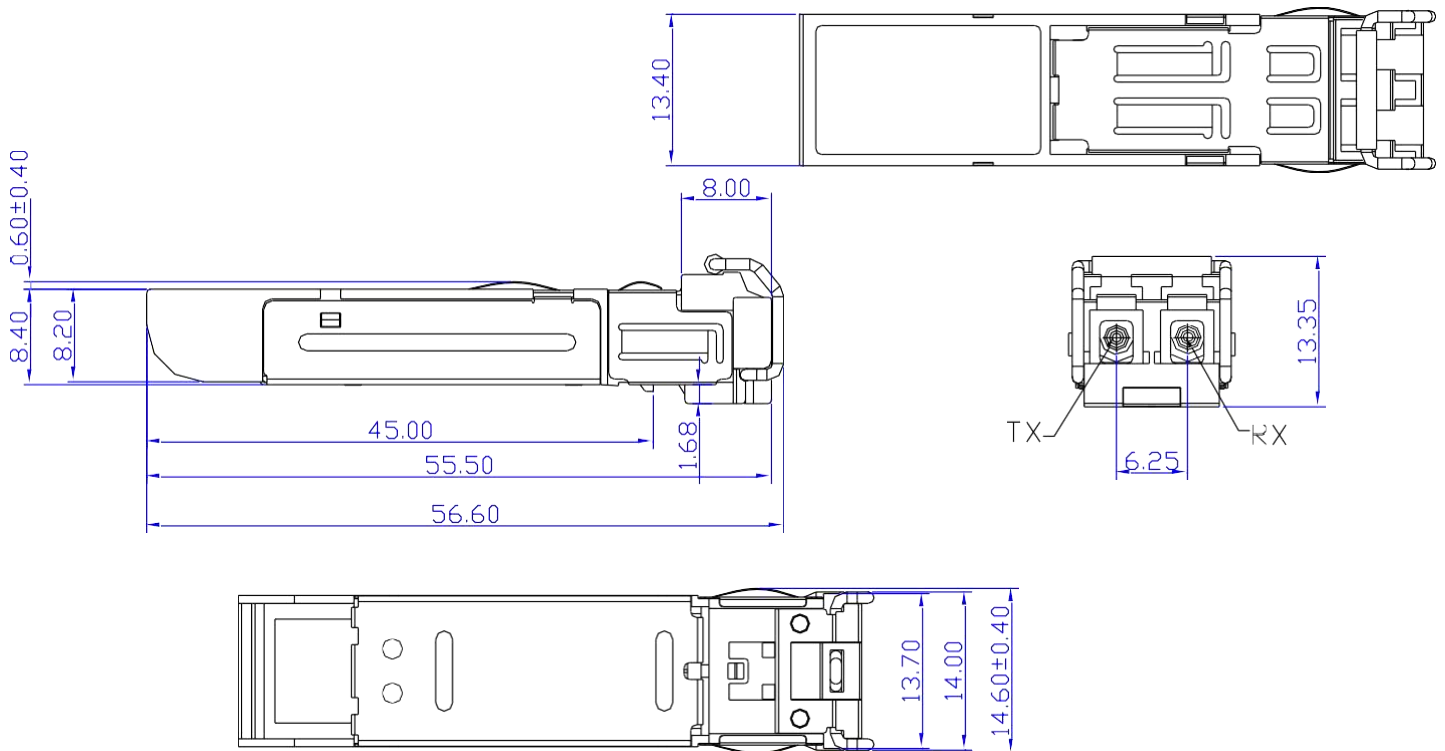
PIN	Single name	Description	NOTES
1	VEET	Transmitter ground (common with receiver ground)	1
2	TX_FAULT	Transmitter Fault	
3	TX_DISABLE	Transmitter Disable. Laser output disabled on high or open	2
4	SDA	Transmitter ground (common with receiver ground)	3
5	SCL	Transmitter ground (common with receiver ground)	3
6	MOD_ABS	Module Absent. Grounded within the module	3
7	RS0	No connection required	
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation	4
9	RS1	No connection required	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	Receiver ground (common with transmitter 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

- **Circuit ground is isolated from chassis ground**
- **Disabled: TDIS>2V or open, Enabled: TDIS.**
- **Should Be pulled up with 4.7k –10k ohm on host board to a voltage between 2V and 3.6V**
- **LOS is open collector output**

Dimensions



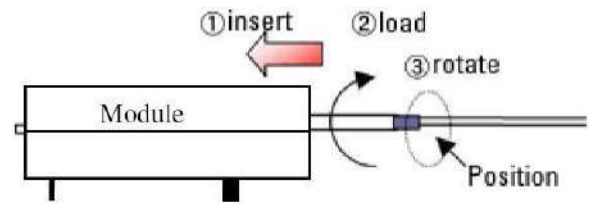
Optical Receptacle Cleaning Recommendations:

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

Model Number	Part Number	Voltage	Temperature
ASFP-10G-ER 1550 nm	OP6C-S40-13-CD	3.3V	0°C to 70 °C

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