



Features

- SFP Multi-Source Agreement compliant
- OC48/STM-16 application
- SFF-8472 diagnostic monitoring interface for optical transceivers
- Industry standard small form pluggable (SFP) package
- Simplex LC connector
- Differential LVPECL inputs and outputs
- Single power supply 3.3V
- TTL signal detect indicator
- Hot Pluggable
- Class 1 laser product complies with EN 60825-1
- RoHS Compliant

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Units	Note
Storage Temperature	T_S	-40	85	°C	
Supply Voltage	V_{CC}	-0.5	4.0	V	
Input Voltage	V_{IN}	-0.5	V_{CC}	V	

Recommended Operating Conditions

Parameter	Symbol	Min.	Max.	Units	Note
Case Operating Temperature	T_C	0	70	°C	OP6E-W20-B5-CM
		-40	85	°C	OP6E-W20-B5-IM
Supply Voltage	V_{CC}	3.1	3.5	V	
Supply Current	$I_{TX} + I_{RX}$	---	250	mA	

Diagnostics Monitoring

Parameter	Range	Accuracy	Unit	Calibration
Temperature	-40 to 95	± 3	$^{\circ}\text{C}$	External
Voltage	0 to VCC	± 0.1	V	
Bias Current	0 to 120	± 5	mA	
TX Power	-8 to +3	± 3 dB	dBm	
RX Power	-20 to 0	± 3 dB	dBm	

Transmitter Electro-optical Characteristics

Vcc = 3.1 V to 3.5 V, $T_c = 0^{\circ}\text{C}$ to 70°C (-40°C to 85°C)

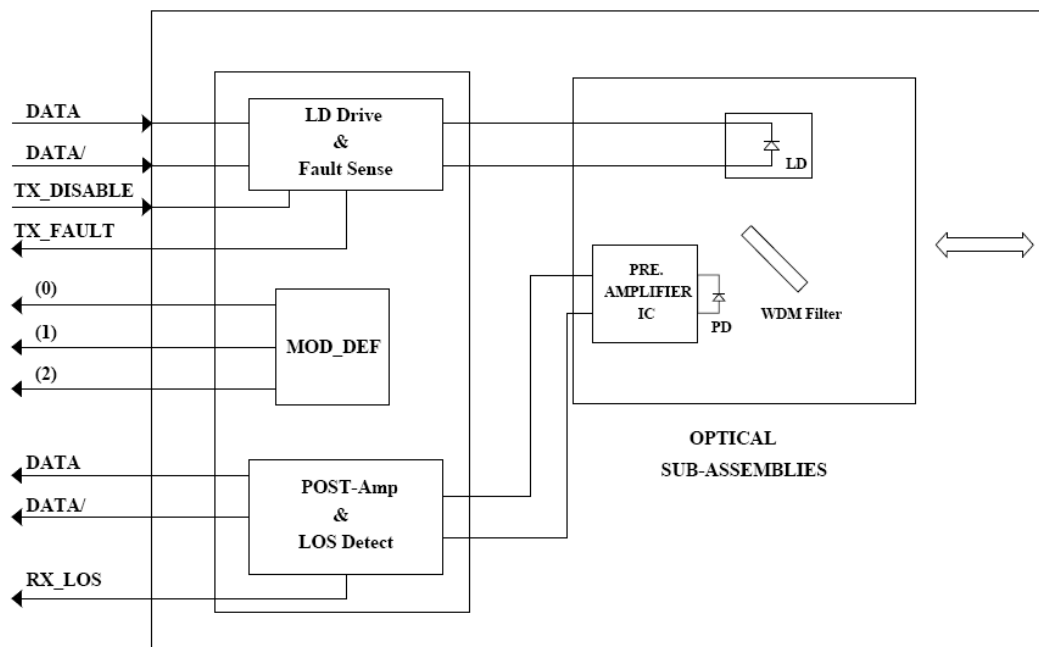
Parameter	Symbol	Min.	Typ.	Max.	Units	Note
Bit Rate	B	---	2488	---	Mbps	
Output Optical Power 9/125 μm fiber	P_{out}	-5	---	0	dBm	Average
Extinction Ratio	ER	6	---	---	dB	
Center Wavelength	λ_c	1530	1550	1570	nm	
Spectral Width (-20dB)	λ	---	---	1	nm	
Side Mode Suppression Ratio	$SMSR$	30			dB	
Output Eye	Compliant with Telcordia GR-253-CORE Issue 3 and ITU-T recommendation G957					
Max P_{out} TX-DISABLE Asserted	P_{OFF}	---	---	-45	dBm	
Differential Input Voltage	V_{DIFF}	0.4	---	2.0	V	

Receiver Electro-optical Characteristics

$V_{CC} = 3.1\text{ V to } 3.5\text{ V}$, $T_c = 0\text{ }^{\circ}\text{C to } 70\text{ }^{\circ}\text{C}$ ($-40\text{ }^{\circ}\text{C to } 85\text{ }^{\circ}\text{C}$)

Parameter	Symbol	Min.	Typ.	Max.	Units	Note
Bit Rate	B	---	2488	---	Mbps	
Optical Input Power-maximum	P_{IN}	0	---	---	dBm	BER < 10^{-10}
Optical Input Power-minimum (Sensitivity)	P_{IN}	---	---	-20	dBm	BER < 10^{-10}
Operating Center Wavelength	λ_C	1260	---	1360	nm	
Optical Return Loss	ORL	14	---	---	dB	$\lambda=1260\sim1360\text{nm}$
Loss of signal-Asserted	P_A	-35	---	---	dBm	
Loss of signal-Deasserted	P_D	---	---	-20	dBm	
Differential Output Voltage	V_{DIFF}	0.5	---	1.2	V	
Receiver Loss of Signal Output Voltage-Low	RX_LOS_L	0	---	0.5	V	
Receiver Loss of Signal Output Voltage-High	RX_LOS_H	2.4	---	V_{CC}	V	

Block Diagram of Transceiver



Transmitter and Receiver Optical Sub-assembly Section

A 1550 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

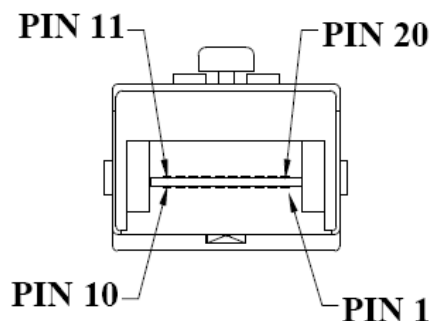
The TX_DISABLE signal is high (TTL logic "1") to turn off the laser output.

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

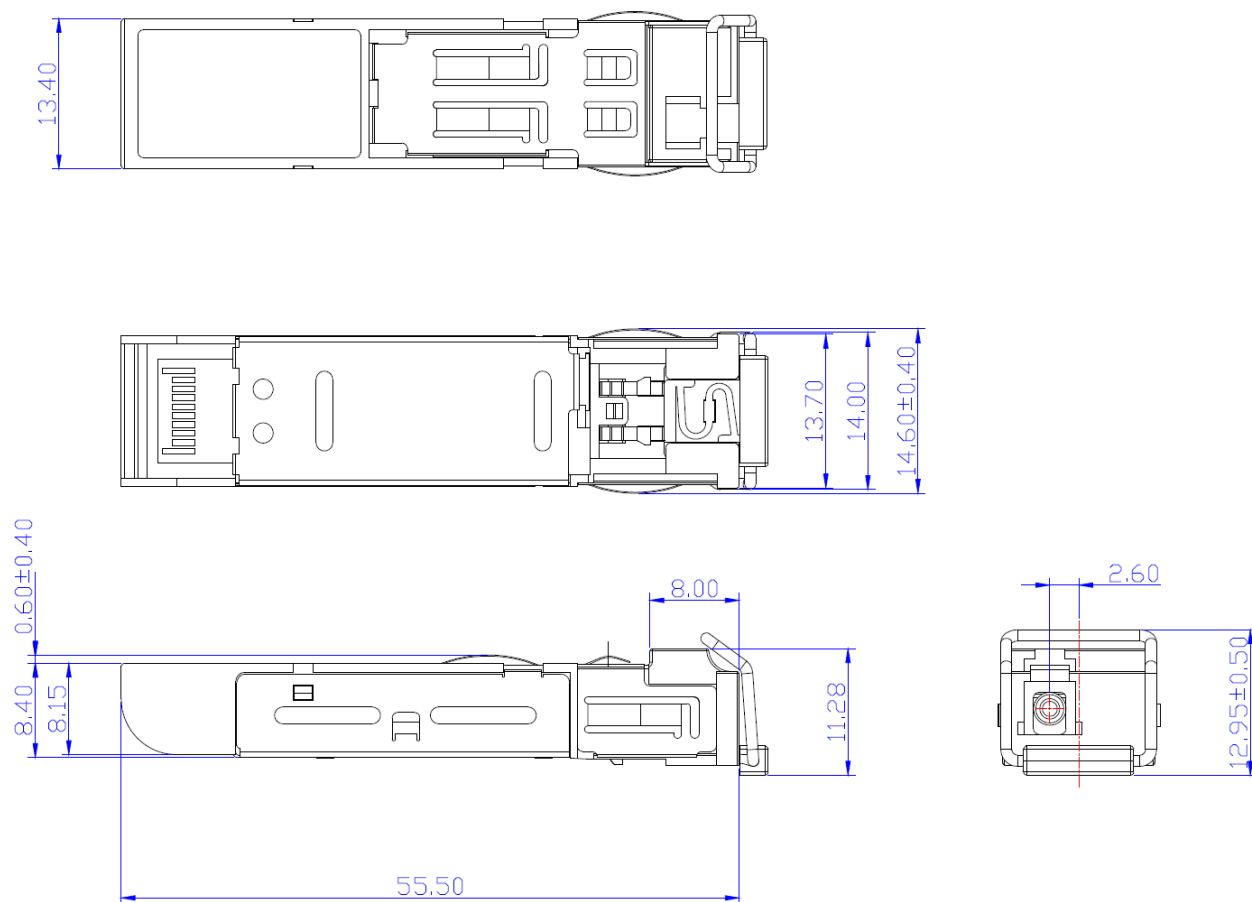
Pin-Out



Pin Descriptions

Pin	Signal Name	Description
1	T _{GND}	Transmitter Ground
2	TX_FAULT	Transmit Fault
3	TX_DISABLE	Transmit Disable
4	MOD_DEF(2)	SDA Serial Data Signal
5	MOD_DEF(1)	SCL Serial Clock Signal
6	MOD_DEF(0)	TTL Low
7	RATE SELECT	Open Circuit
8	RX_LOS	Receiver Loss of Signal, TTL High, Open collector
9	R _{GND}	Receiver Ground
10	R _{GND}	Receiver Ground
11	R _{GND}	Receiver Ground
12	RX-	Receive Data Bar, Differential PECL, ac coupled
13	RX+	Receive Data, Differential PECL, ac coupled
14	R _{GND}	Receiver Ground
15	V _{CCR}	Receiver Power Supply
16	V _{CCT}	Transmitter Power Supply
17	T _{GND}	Transmitter Ground
18	TX+	Transmit Data, Differential PCEL, ac coupled
19	TX-	Transmit Data Bar, Differential PCEL, ac coupled
20	T _{GND}	Transmitter Ground

Dimensions



DIMENSIONS ARE IN MILLIMETERS

ALL DIMENSIONS ARE ± 0.2 mm UNLESS OTHERWISE SPECIFIED

Ordering Information

OP	6	C	-	S	10	-	13	-	C	M
	↑	↑		↑	↑		↑		↑	↑
Product Code:	Data Rate:	Type:		Reach:	Wavelength:		Operating Temperature:		Additional Feature:	
5=GBIC;	A=155Mb/s;	S=Single-mode;		Normal:	Normal:		C=Commercial Purpose		M=Digital Optical Monitoring	
6=SFP-LC;	B=622Mb/s;	M=Multi-mode;		X1=Under 150m;	85=850nm;		(0~70℃);		(DOM)	
7=XFP;	C=1.25Gb/s;	W=BWDM;		X3=300m;	13=1310nm;		I= Industrial Purpose		(RX_LOS for Copper TX);	
8=XENPAK;	D=2.125Gb/s;	C=CWDM;		X5=550m;	15=1550nm;		(Extended Range)		F=with Fiber Stub;	
9=X2;	E=2.5Gb/s;	D=DWDM;		02=2km,	00=Copper T (RJ-45)				I=with Isolator;	
A=SFP+;	F=4.25Gb/s;	T=Copper-T (RJ-45)		10=10km;	CWDM:				S=Customized Style	
C=QSFP;	G=3.1Gb/s;	E=GEPON ONU;		70=70km;	27=1270nm;					
P=SFP-SC;	J=2.97G	F=GEPON OLT;		A0=100km;	47=1470nm;					
Q=SFP-MTRJ	P=6.144G;	G=GPON ONU;		C0=120km	61=1610nm					
	Q=7.37G;	H=GPON OLT			BWDM:					
	H=8.5Gb/s;				B3=Tx1310/Rx1550; B5=Tx1550/Rx1310;					
	K=10Gb/s;				B4=Tx1310/Rx1490; B9=Tx1490/Rx1310;					
	R=20Gb/s;				51=Tx1510/Rx1570; 57=Tx1570/Rx1510;					
	S=40Gb/s;				27=Tx1270/Rx1330; 33=Tx1330/Rx1270;					
	M=100Base-X SGMII;				B2=Tx1270/Rx1577; B7=Tx1577/Rx1270					
	N=100/1000Base-X SGMII;				T2=2TX1310nm; T3=TX1310nm;					
					T5=TX1550nm					
					DWDM:					
					17=Channel 17					
					34= Channel 34					

Model Number	Part Number	Reach	TX/RX	Input/Out	Signal Detect	Temperature	LD Type
SFP-2.5-BWDM-20-55-DM	OP6E-W20-B5-CM	20 km	1550/1310	AC/AC	LVTTL	0℃ to 70℃	1550 DFB
SFP-2.5-BWDM-20-55-IM	OP6E-W20-B5-IM	20 km	1550/1310	AC/AC	LVTTL	-40℃ to 85℃	1550 DFB

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