

1.25Gb/s SFP 1310nm 40km Transceiver

TS311AE-EN Product Specification

FEATURES

- Typical data rate 1.25Gbps
- 1310nm FP Laser and PIN photo detector
- Duplex LC receptacle
- Single +3.3V power supply
- Hot-pluggable
- International Class1 laser safety certified
- Operating temperature range: -20 ~ +85°C
- RoHS Compliant
- Support Digital Diagnostic Monitoring interface
- Max reach 40km over SMF

APPLICATIONS

- Point-to-Point networking
- SONET OC-24
- Other Optical Links

ORDERING INFORMATION

Part Number	Form Factor	Data Rate	Media	Distance (km)	Wavelength (nm)	Temperature (°C)
TS311AE-EN	SFP	1.25Gbps	SMF	40	1310	-20~85

ABSOLUTE MAXIMUM RATINGS

Exceeding the limits below may damage the transceiver permanently.

Parameter	Symbol	Min	Typ	Max	Unit.	Note
Storage Temperature	TSTG	-40	-	85	°C	
Operating Relative Humidity	RH	5	-	95	%	
Supply Voltage	VCC	-0.5	-	4	V	

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Min	Typ	Max	Unit.	Note
Operating Case Temperature	Tc	-20	-	85	°C	
Supply Voltage	VCC3	3.13	3.3	3.47	V	
Supply Current	ICC3	-	-	300	mA	+3.3V Supply
Data Rate	DR	-	1.25	-	Gbps	

ELECTRICAL and OPTICAL CHARACTERISTICS

Parameter	Symbol	Min	Typ	Max	Unit.	Note
Transmitter@1.25Gbps						
Tx Differential Input Amplitude	Vin p-p	200	-	2400	mV	
Input Differential Impedance	Zin	-	100	-	Ω	
Output Optical Power	PO	-5	-	0	dBm	
Extinction Ratio	ER	9	-	-	dB	
Center Wavelength Range	λc	1260	1310	1355	nm	
Spectrum Width(-20dB)	$\Delta \lambda$	-	-	1	nm	
Side Mode Suppression Ratio	SMSR	30	-	-	dB	
Optical Return Loss Tolerance	RL	12	-	-	dB	
Output Optical Eye	Compliant with G.957					
Tx Disable Voltage	VOH	2	-	VCC	V	LVTTTL
	VOL	0	-	0.8	V	LVTTTL
Optical Power at Tx Disable	Ptxdis	-	-	-45	dBm	
Receiver@1.25Gbps						
Rx Differential Output Amplitude	Vout p-p	300	-	800	mV	
Receiver Optical Wavelength	λc	1260	-	1355	nm	
Receiver Sensitivity	Sen	-	-	-24	dBm	Note 1
Receiver Overload	OL	-3	-	-	dBm	
LOS Voltage	Normal	2	-	Vcc+0.3	V	LVTTTL
	Fault	0	-	0.8	V	LVTTTL
LOS Assert Level	LOSA	-38	-	-	dBm	
LOS De-Assert Level	LOSD	-	-	-26	dBm	
LOS Hysteresis	LOSH	0.5		6	dB	

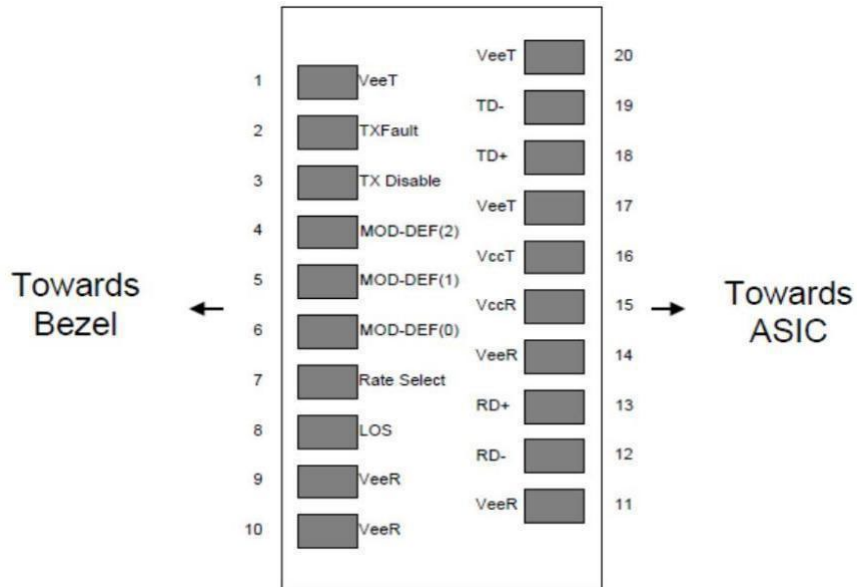
Notes:

1.Measured with 2⁷-1 NRZ Pattern. BER≤1E-12@1.25Gpbs, ER=9dB

Digital Diagnostic Functions

Parameter	Symbol	Min.	Max.	Unit	Repeatability	Notes
Temperature	DDMI_Temp	-3	3	°C	± 1°C	1LSB=1/256°C
Supply Voltage	DDMI_VCC	-3%	3%	V	± 1 %	1LSB=0.1mV
Bias Current	DDMI_Ibias	-10%	10%	mA	± 5 %	1LSB=2uA
TX Optical Power	DDMI_TX	-3	+3	dB	± 0.5 dB	1LSB=0.1uW
RX Optical Power	DDMI_RX	-3	+3	dB	± 1.5 dB	1LSB=0.1uW

PIN DIAGRAM



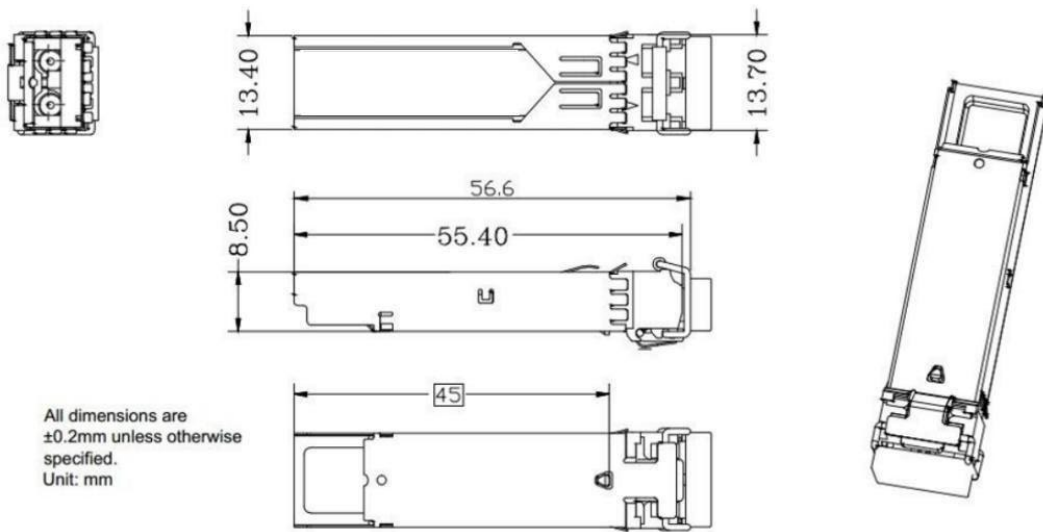
PIN DESCRIPTIONS

Pin	Symbol	Description	Notes
1	VeeT	Transmitter Ground (Common with Receiver Ground)	5
2	TX_Fault	Transmitter Fault, Low: normal; High: abnormal	1
3	TX_Disable	Transmitter Disable High: Transmitter off Low: Transmitter on	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.	
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)	5
10	VEER	Receiver Ground(Common with Transmitter Ground)	5
11	VEER	Receiver Ground(Common with Transmitter Ground)	5
12	RD-	Receiver Inverted DATA out. AC Coupled. CML-O	6
13	RD+	Receiver Non-inverted DATA out. AC Coupled. CML-O	6
14	VeeR	Receiver Ground	5
15	VccR	Receiver Power Supply	
16	VccT	Transmitter Power Supply	
17	VeeT	Transmitter Ground	5
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled. CML-I	7
19	TD-	Transmitter Inverted DATA in. AC Coupled. CML-I	7
20	VeeT	Transmitter Ground (Common with Receiver Ground)	5

Notes:

1. TX_Fault is an open collector/drain output, which should be pulled up with a 4.7K-10KΩ 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.
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 4.7-10 KΩ resistor.
3. SDA and SCL should be pulled up with a 4.7K- 10KΩ resistor on the host board.
4. LOS (Loss of Signal) is an open collector/drain output, which should be pulled up with a 4.7K - 10KΩ resistor. Pull up voltage between 2.0V and VccT/R+0.3V. When high, this output indicates the received optical power is below the worst-case receiver sensitivity (as defined by the standard in use). Low indicates normal operation. In the low state, the output will be pulled to <0.8V
5. The module signal ground contacts, VeeR and VeeT, should be isolated from the module case
6. RD-/+ : These are the differential receiver outputs. They are AC coupled 100Ω differential lines which should be terminated with 100Ω (differential) at the user SERDES. The AC coupling is done inside the module and is thus not required on the host board.
7. TD-/+ : These are the differential transmitter inputs. They are AC-coupled, differential lines with 100Ω differential termination inside the module. The AC coupling is done inside the module and is thus not required on the host board.

MECHANICAL SPECIFICATION



LABEL DIAGRAM



TS311AE-EN

SFP 1.25G Duplex 1310nm 40km LC

Class 1 Laser

MADE IN CHINA



X.XX.XX.XXX