Specification

Small Form Factor

Duplex LC Receptacle – SFF

Optical Transceivers

100BASE

155Mbit/s

Ordering Information

S F F – 8 5 1 3 – M 1 1 1 3 – 2 2 E - N

ForOE Model Name : TSP-F2AH1-D21

Model Name	Voltage	Device type	Interface	SD/LOS	Temperature	Distance
SFF-8513-M1113-22E-N	3.3V	VCSEL / PIN	DC / DC Coupling	LVPECL	-40°C ~+85°C	2km

Features

- **Small Form Factor MSA compliant**
- **155 Mbps SONET OC-3/STM-1 compliant**
- **850 nm VCSEL, InGaAs PIN 830 to 1600 nm**
- **LC duplex connector**
- **For multimode fiber application**
- **Meets Telcordia GR-468-CORE**
- **PECL signal detect**
- **Low power consumption**
- **Reach rated 2km**
- **Extended operating temp range (-40 to 85°C)**
- **No grounding clip**
- **Duplex dust cover included**
- **Class 1 Laser Product**

Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit
Storage Temperature	T_S	-50		90	°C
Power Supply Voltage	V_{CC}	-0.5		3.5	V
Soldering Temperature (10 seconds on leads only)				250	°C

Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit
Supply Voltage	V_{CC}	3.15	3.3	3.45	V
Operating Case temperature(Note 1)	Top	-40		85(Note2)	ºC
Power Supply Current	Icc		105	120	mA
Total Supply Current (TX disabled)	I_{CCDIS}			65	mA
Data Rate			155		Mbps

Note:

1. **Without air flow around the unit.**
2. **The Max. case temp. is 90 deg C measured at the center of the top metal cover.**

Transmitter Specifications (V_{CC}=3.15V~3.45V ; Top= -40°C ~ 85°C)

Parameter	Symbol	Min	Typ	Max	Unit
Optical Characteristics					
Optical Transmit Power	Po	-6.5		-4	dBm
Optical Center Wavelength	λ	830	850	860	nm
Output Spectrum Width (RMS)	σλ			1	nm
Extinction Ratio	ER	9			dB
Optical Rise / Fall Time (Note1)	T_r / T_f			2	ns
Total Jitter (p-p)	TJ_{PP}			0.5	ns
Electrical Characteristics					
TX Supply Current	I_T			45	mA
Data Input Voltage – Low	V_{IHS}	2.1		2.4	V
Data Input Voltage -- High	V_{ILS}	1.4		1.7	V
DC-Bias Disable Input Voltage -- Low	$V_{TDIS,L}$			0.8	V
DC-Bias Enable Input Voltage -- High	$V_{TDIS,H}$	2.0			V
TX Enable Time	T_{EN}			10	us
TX Disable Time	T_{DIS}			10	us

Note:

1. **Test method and condition defined in ITU G.957.**

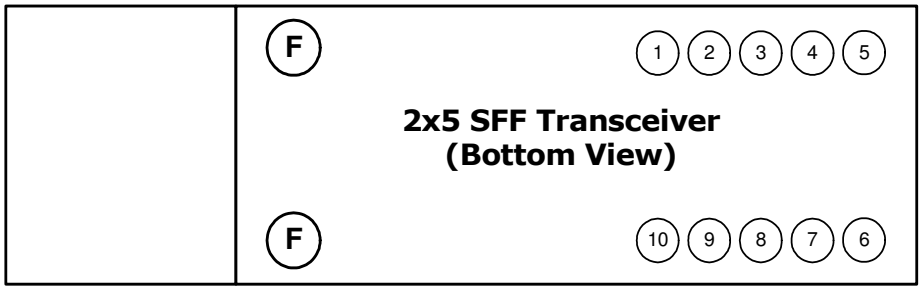
Receiver Specifications (V_{CC}=3.15V~3.45V ； Top= -40°C ~ 85°C)

Parameter	Symbol	Min	Typ	Max	Unit
Optical Characteristics					
Sensitivity (@ 1350 nm) (Note1)	P_{IN}			-32	dBm
Sensitivity (@ 850 nm) (Note1)	P_{IN}			-25	dBm
Maximum Input Power(Saturation) (PRBS=2^{23}-1 ； BER≦10^{-10})	P_{MAX}	-5			dBm
Operating Center Wavelength	λ_c	830		1600	nm
Signal Detect-Asserted (@ 1350 nm)	P_A			-34	dBm
Signal Detect-Deasserted (@ 1350 nm)	P_D	-45			dBm
Signal Detect-Asserted (@ 850 nm)	P_A			-26	dBm
Signal Detect-Deasserted (@ 850 nm)	P_D	-36			dBm
Signal Detect - Hysteresis	P_{HYS}	1		4	dB
Electrical Characteristics					
RX supply current (Note2)	I_R			65	mA
Data Output Voltage – Low	V_{OH}	2.1		2.4	V
Data Output Voltage – High	V_{OL}	1.5		1.8	V
Signal Detect Timing Asserted	P_A			100	us
Signal Detect Timing Deasserted	P_D			100	us

Note:

1. **Test method and condition defined in ITU G.957.**
2. **Does not include current drawn by elements connected to the SD pin.**

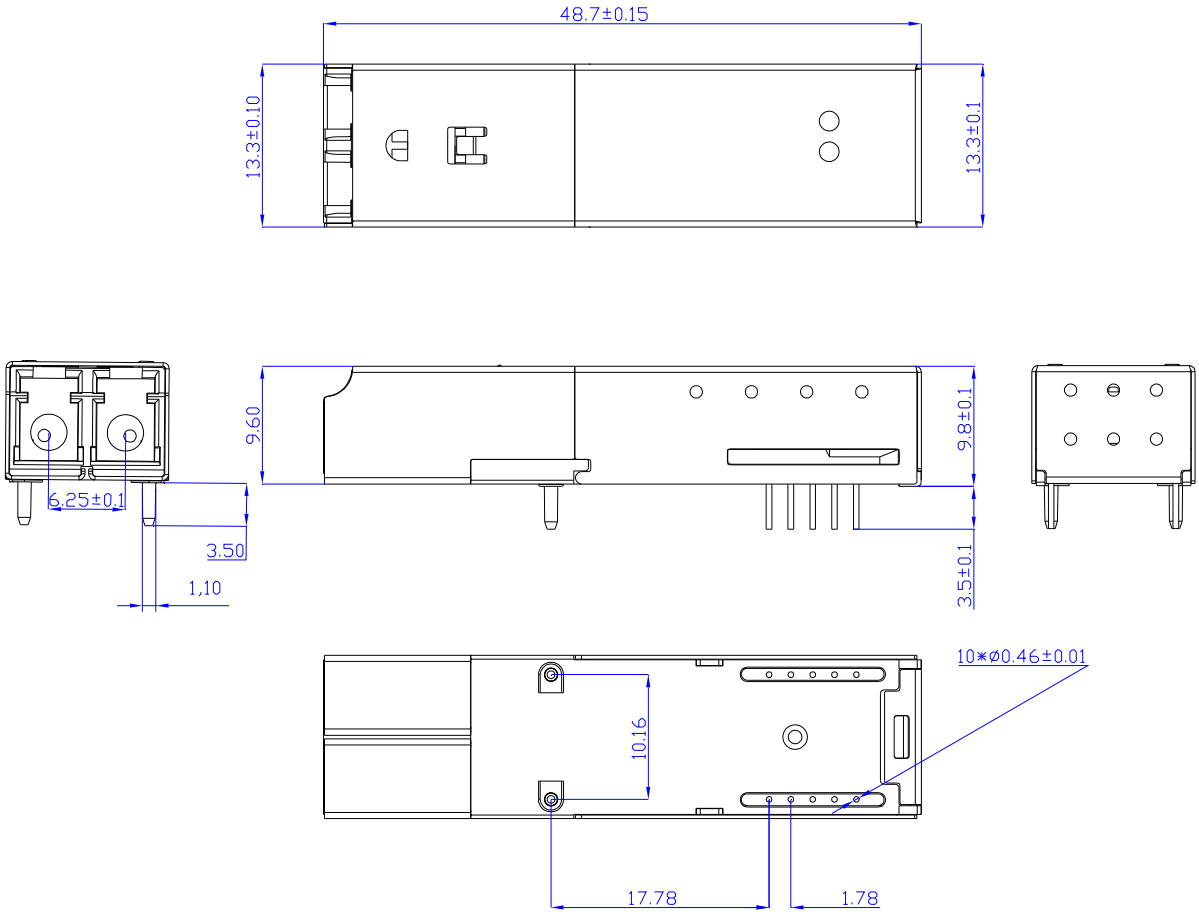
Pin Definition and Descriptions



PIN	Symbol	Description
1	VEER	Receiver Ground (Common with Transmitter Ground)
2	VCCR	Receiver Power Supply
3	SD	Signal Detect (Logic 1 indicates normal operation)
4	RD-	Receiver Inverted Data Output
5	RD+	Receiver Data Output
6	VCCT	Transmitter Power Supply
7	VEET	Transmitter Ground
8	DIS	Transmitter Disable
9	TD+	Transmitter Data Input
10	TD-	Transmitter Inverted Data Input

Mechanical Outlines

(Unit : mm)



ESD

Normal ESD precautions are required during the handling of this module. This transceiver is shipped in ESD protective packaging. It should be removed from the packaging and handled only in an ESD protected environment.

Contact Information

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