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)	Tc	-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 ; Tc= -40°C~85°C)

Parameter	Symbol	Min	Typ	Max	Unit
Optical Characteristics					
Optical Transmit Power	Po	-6.5		-4	dBm
Optical Center Wavelength	λ_C	830	850	860	nm
Output Spectrum Width (RMS)	$\Delta\lambda$			1	nm
Extinction Ratio	E_R	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:

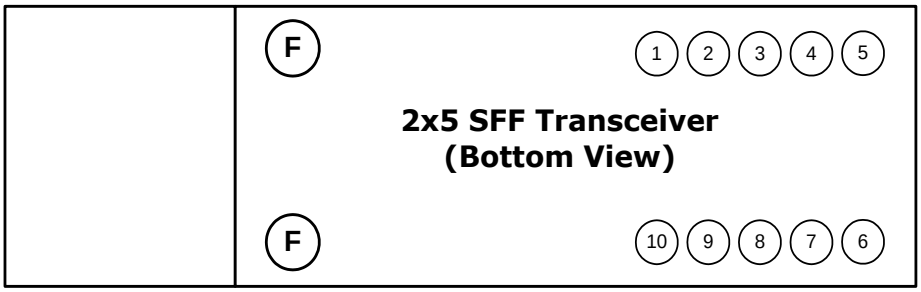
1. Test method and condition defined in ITU G.957.

Receiver Specifications (V_{CC}=3.15V~3.45V；Tc= -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)