TSSLS-DXXEE8 Optical Transceiver

25Gb/s SFP28 DWDM Single-mode Transceiver, with Diagnostic Monitoring
Duplex SFP28 DWDM 10km Transceiver

Features

- Up to 10km transmission on 9/125μm SMF
- Data rate from 24.33Gbps to 25.78Gbps
- Compliant with SFP+ MSA, SFF 8431
- Compliant with Digital Diagnostic SFF 8472
- 50GHz ITU, C-Band DWDM Cooled EML laser
- APD photodiode receiver
- Metal package for lower EMI
- Single 3.3V power supply
- Low power dissipation
- Full duplex LC connector
- Operating case temperature: Standard: 0°C~+70°C; Industrial: -40°C~+85°C
- RoHS6 compliant (lead free)

Applications

- 25G Ethernet
- CPRI option 10

Product Description

The TSSLS-DXXEE8 transceivers are Enhanced Small Form Factor Pluggable SFP28 transceivers designed for use in 25Gb/s links up to 10km of G.652 single mode fiber. They are compliant with SFF-8431, SFF-8432, SFF-8690, and support 25GbE and CPRI 10 over 15km fiber. Digital diagnostics functions are available via a 2-wire serial interface, as specified in SFF-8472.

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Absolute Maximum Ratings: (T_c=25°C)

These values represent the damage threshold of the module. Stress in excess of any of the individual Absolute Maximum Ratings can cause immediate catastrophic damage to the module even if all other parameters are within Recommended Operating Conditions.

Parameter	Symbol	Min.	Max.	Unit
Power Supply Voltage	VCC	-0.5	+3.6	V
Storage Temperature	Tc	-40	+85	°C
Relative Humidity	RH	0	85	%

Recommended Operating Environment:

Parameter	Symbol	Min	Typical	Max	Unit
Supply Voltage	VCC	3.15	3.3	3.45	V
Supply current	Icc	-	-	435	mA
Operating Case Temperature (Standard)	Tca	0	-	70	°C
Operating Case Temperature (Industrial)	Tca	-40	-	85	°C

Notes:

1. Supply current is shared between VCCTX and VCCRX.
2. In-rush is defined as current level above steady state current requirements.

Specification:

Electrical And Optical Characteristics:(Condition: Ta=Top)

Electrical

Parameter	Symbol	Min	Typical	Max	Unit
Transmitter Differential Input Voltage	+/-TX_DAT	190		700	mV p-p
Tx_Disable Input Voltage – Low	V_{IL}	0		0.8	V
Tx_Disable Input Voltage – High	V_{IH}	2.0		Vcc	V
Tx_Fault Output Voltage – Low	V_{OL}	0		0.8	V
Tx_Fault Output Voltage – High	V_{OH}	2.0		Vcc	V
Receiver Differential Output Voltage	+/-RX_DAT	350		850	mV p-p
Rx_LOS Output Voltage- Low	V_{OL}	0		0.8	V
Rx_LOS Output Voltage- High	V_{OH}	2.0		Vcc	V

Transmitter Specifications – Optical

Parameter	Symbol	Min	Typical	Max	Unit
Data Rate	B	-	2578	-	Mb/s

Centre Wavelength	λc	1530.92	1531.02	1531.12	nm
		1530.03	1530.13	1530.23	
		1529.45	1529.55	1529.65	
Average Output Power	Po	0	-	5	dBm
Extinction Ratio	EXT	6	-	-	dB
Center Wavelength Spacing		50			GHz
Wavelength Tolerance		-0.04		0.04	nm
Side-Mode Suppression Ratio	SMSR	30			dB
Optical power of OFF transmitter	Poff			-30	dBm
Output Optical Eye	{X1, X2, X3, Y1, Y2, Y3}= {0.31, 0.4, 0.45, 0.34, 0.38, 0.4} @25.78Gbps, PRBS 231-1				

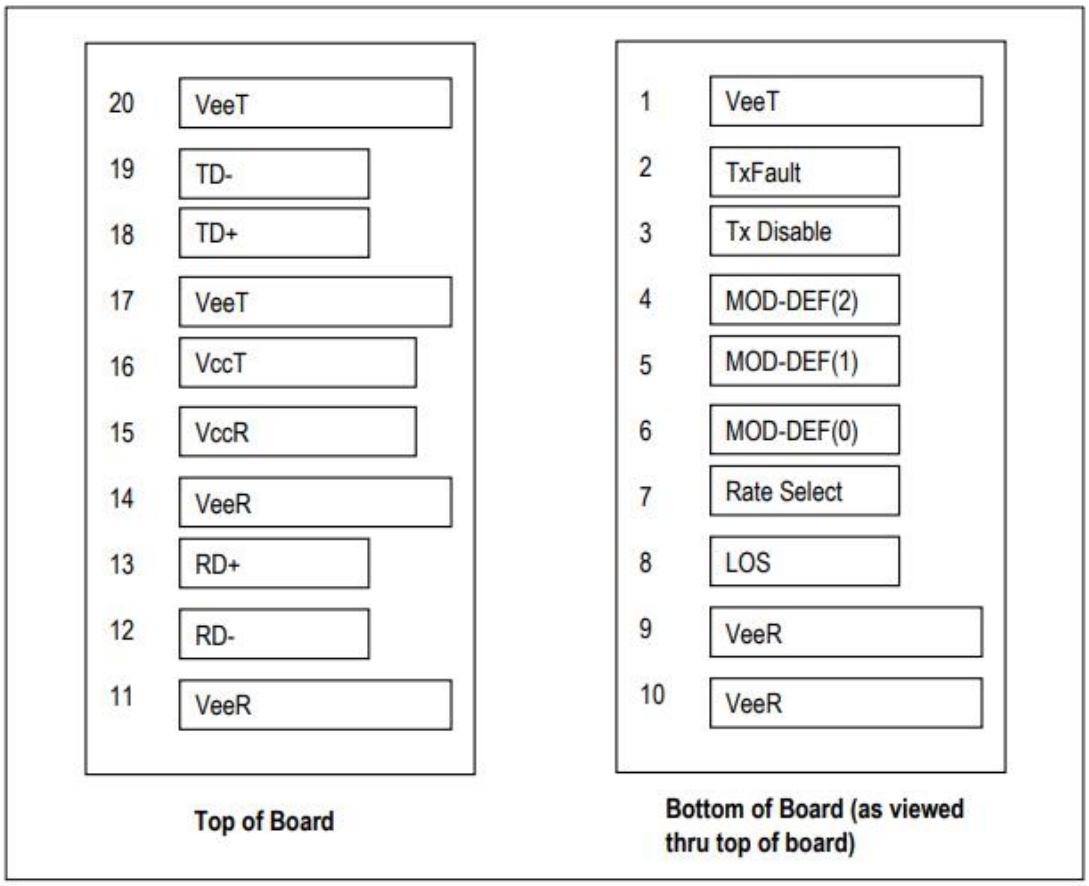
Receiver Specifications – Optical

Parameter	Symbol	Min	Typical	Max	Unit
Operating Wavelength	λc	1260	0	1620	nm
Avg. Receiver Sensitivity (EOL) @after 10km fiber transmission	P_{min}	-	-	-16	dBm
Receiver Overload	P_{MAX}	-6	-	-	dBm
LOS De-Asserted	Lda	-	-	-24	dBm
LOS Asserted	Lsa	-35	-	-	dBm
LOS Hysteresis	Lh	0.5	-	-	dB

Timing Characteristic:

Parameter	Symbol	Min.	Typical	Max.	Unit
TX_DISABLE Assert Time	t_off		3	10	usec
TX_DISABLE Negate Time	t_on		0.5	1	msec
Time to Initialize Include reset of TX_FAULT	t_int		30	300	msec
TX_FAULT from fault to assertion	t_fault		20	100	usec
TX_DISBEL time to start reset	t_reset	10			usec
Receiver Loss of Signal Assert Time (Off to On)	T_A,RX_LOS			100	usec
Receiver Loss of Signal Assert Time (On to Off)	T_d,RX_LOS			100	usec

SFP Transceiver Electrical Pad Layout:



Pin Definition

Pin	Symbol	Name/Description	Ref.
1	V_{EET}	Transmitter Ground(Common with Receiver Ground)	1
2	T_{FAULT}	Transmitter Fault .Not supported.	
3	T_{DIS}	Transmitter Disable. Laser output disabled on high or open	2
4	MOD_DEF(2)	Module Definition2.Data line for Serial ID.	3
5	MOD_DEF(1)	Module Definition1.Clock line for Serial ID.	3
6	MOD_DEF(0)	Module Definition0.Grounded with in the module	3
7	Rate Select	No connection required	3
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation	
9	V_{EER}	Receiver Ground(Common with Transmitter Ground)	4
10	V_{EER}	Receiver Ground(Common with Transmitter Ground)	1
11	V_{EER}	Receiver Ground(Common with Transmitter Ground)	1
12	RD-	Receiver Inverted DATA out. AC Coupled	
13	RD+	Receiver Non-inverted DAT out.AC Coupled	
14	V_{EER}	Receiver Ground(Common with Transmitter Ground)	1
15	V_{CCR}	Receiver Power Supply	

16	V_{CCT}	Transmitter Power Supply	
17	V_{EET}	Transmitter Ground(Common with Receiver Ground)	1
18	TD+	Transmitter Non-inverted DATA in.AC Coupled	
19	TD-	Transmitter Inverted DATA in. AC Coupled	
20	V_{EET}	Transmitter Ground(Common with Receiver Ground)	1

Notes:

[1] Circuit ground is internally isolated from chassis ground.

[2] Laser output disabled on TDIS >2.0V or open, enabled on TDIS <0.8V.

[3] Should be pulled up with 4.7k – 10kohms on host board to a voltage between 2.0V and 3.6V. MOD_DEF(0) pulls line low to indicate module is plugged in.

[4] LOS is open collector output. Should be pulled up with 4.7k – 10kohms on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

Ordering Information

Part Number	Product Description
TSSLS-DXXEE8C	25Gbps SFP28 DWDM 10Km 0°C ~ +70°C
TSSLS-DXXEE8T	25Gbps SFP28 DWDM 10Km -40°C ~ +85°C

DWDM Wavelength

XX	Frequency(THz)	Wavelength(nm)
60	196.0	1529.55
59	195.9	1530.13
58	195.8	1531.02

References

1. SFP28 MSA
2. Directive 2011/65/EU of the European Parliament and of the Council, "on the restriction of the use of certain hazardous substances in electrical and electronic equipment," July 1, 2011.

Important Notice

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