LXP-TUN-80D

SFP+ 10Gb/s Tunable DWDM Single-mode 80km DDM

PRODUCT FEATURES

- Supports 9.95 to 11.3Gb/s
- Support 80 km link distances
- 50GHz ITU-based channel spacing(C-Band) with a wavelength locker
- Monolithic MZM Tunable TOSA
- APD receiver with limiting amplifier
- Duplex LC connector
- Low power consumption: <2.5W
- Positive power supply lines: 3.3 V
- Operating case temperature range:

  Commercial: 0 to 70 deg C
- RoHS 6 compliant
- Compliant with SFF-8431 / SFF-8690

APPLICATIONS

- DWDM 10Gb/s SONET/SDH
- DWDM 10Gb/s Ethernet
- DWDM 10Gb/s SONET/SDH w/FEC

PRODUCT DESCRIPTION

The LXP-TUN-80D is a hot pluggable 3.3V Small-Form-Factor pluggable tunable SFP+ transceiver module for use in the 9.95Gb/s to 11.3Gb/s single mode high-speed communications equipment . It is designed expressly for high-speed communication applications that support SONET OC-192, SDH STM-64 over 80km of G.652 single mode fiber. Digital diagnostic functions are available via 2-wire serial interface, as specified in SFF-8431.

Ordering information

Part Number	Product Description
LXP-TUN-80D	10G SFP+ 80km Tunable transceiver, 50GHz Spacing, 96ch,RX APD,C-TEMP

Wavelength Guide Table

Channel	Wavelength (nm)	Frequency(THZ)	Channel	Wavelength (nm)	Frequency(THZ)
1	1567.13	191.30	51	1546.92	193.80
2	1566.72	191.35	52	1546.52	193.85
3	1566.31	191.40	53	1546.12	193.90
4	1565.90	191.45	54	1545.72	193.95
5	1565.50	191.50	55	1545.32	194.00
6	1565.09	191.55	56	1544.92	194.05
7	1564.68	191.60	57	1544.53	194.10
8	1564.27	191.65	58	1544.13	194.15
9	1563.86	191.70	59	1543.73	194.20
10	1563.45	191.75	60	1543.33	194.25
11	1563.05	191.80	61	1542.94	194.30
12	1562.64	191.85	62	1542.54	194.35
13	1562.23	191.90	63	1542.14	194.40
14	1561.83	191.95	64	1541.75	194.45
15	1561.42	192.00	65	1541.35	194.50
16	1561.01	192.05	66	1540.95	194.55
17	1560.61	192.10	67	1540.56	194.60
18	1560.20	192.15	68	1540.16	194.65
19	1559.79	192.20	69	1539.77	194.70
20	1559.39	192.25	70	1539.37	194.75
21	1558.98	192.30	71	1538.98	194.80
22	1558.58	192.35	72	1538.58	194.85
23	1558.17	192.40	73	1538.19	194.90
24	1557.77	192.45	74	1537.79	194.95
25	1557.36	192.50	75	1537.40	195.00
26	1556.96	192.55	76	1537.00	195.05
27	1556.55	192.60	77	1536.61	195.10
28	1556.15	192.65	78	1536.22	195.15

29	1555.75	192.70	79	1535.82	195.20
30	1555.34	192.75	80	1535.43	195.25
31	1554.94	192.80	81	1535.04	195.30
32	1554.54	192.85	82	1534.64	195.35
33	1554.13	192.90	83	1534.25	195.40
34	1553.73	192.95	84	1533.86	195.45
35	1553.33	193.00	85	1533.47	195.50
36	1552.93	193.05	86	1533.07	195.55
37	1552.52	193.10	87	1532.68	195.60
38	1552.12	193.15	88	1532.29	195.65
39	1551.72	193.20	89	1531.90	195.70
40	1551.32	193.25	90	1531.51	195.75
41	1550.92	193.30	91	1531.12	195.80
42	1550.52	193.35	92	1530.72	195.85
43	1550.12	193.40	93	1530.33	195.90
44	1549.72	193.45	94	1529.94	195.95
45	1549.32	193.50	95	1529.55	196.00
46	1548.91	193.55	96	1529.16	196.05
47	1548.51	193.60			
48	1548.11	193.65			
49	1547.72	193.70			
50	1547.32	193.75			

Notes:

1. LXP-TUN-80D module default channel is channel1(1567.13nm) for the first time power on.

2. The Module will remain last channel selected when power cycled.

I. Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Units
Storage Temperature	T_{stg}	-40	-	85	ºC
Relative Humidity - Storage	RH_O	5	-	95	%
Relative Humidity - Operating	RH_S	5	-	85	%
Power Supply	V_{CC}	-0.5	-	3.6	V

II. Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Units	Notes
Case Operating Temperature		0	25	70	ºC	Temperature Range = C
DC Supply Voltage	V_{CC}	3.14	-	3.46	V	

III. Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Units	Notes
Transmitter						
Differential Data input Swing	V_{IN}		-	900	mV	Refer to CEI-28G_VSR
Input Differential Impedance	Z_{in}	-	100	-	Ω	
Transmitter Disable Voltage	V_D	2.0	-	Vcc	V	
Transmitter Enable Voltage	V_{EN}	0	-	0.8	V	
Receiver						
Differential Data Output Swing	V_{ouT}	450	600	750	mV	
Output Differential Impedance	Z_{out}	-	100	-	Ω	
LOS Assert Voltage	V_{LOSA}	2.0	-	Vcc	V	
LOS De-assert Voltage	V_{LOSD}	0	-	0.8	V	

IV. Timing Characteristics

Parameter	Symbol	Min	Typ	Max	Units	Notes
Module Initialize time	Tinit	-	-	20	S	
Module Channel Switch time	TSel	-	-	200	ms	

V. Optical Characteristics

Parameter	Symbol	Min	Typ	Max	Units	Notes
Transmitter						
Average Output Power	P_{OUT}	-1		3	dBm	
Optical Wavelength	λ	As per ITU-T 694.1,50GHz Spacing 1529.16 to 1567.13			nm	191.30Ghz to 196.05GHz
Center Wavelength	λc_BOL	z-1.5	z	Z+1.5	GHz	
Center Wavelength	λc_EOL	z-2.5	z	Z+2.5	GHz	
Center Wavelength Spacing			50		GHz	
Side Mode Suppression Ratio	SMSR	30			dB	
Average Output Power (Laser Off)	P_{OFF}	-	-	-30	dBm	
Dispersion Penalty	DP			3	dB	
Extinction ratio	ER	8.2	-	-	dB	

Relative Intensity Noise	RIN	-	-	-130	dB/Hz	
Optical Return Loss Tolerance	ORLT	-	-	20	dB	
Receiver						
Center Wavelength		1260		1600	nm	
Received Sensitivity	PIN	-	-	-23	dBm	Note3
Optical Power Overload	POL	-7	-	-	dBm	
Receiver Reflectance	RFL	-	-	-27	dB	
Rx_LOS of Signal Assert	PA	-36	-	-	dBm	
Rx_LOS of Signal De-assert	PD	-	-	-25	dBm	
Rx_LOS of Signal Hysteresis	PHy	0.5	-	6	dB	

Notes:

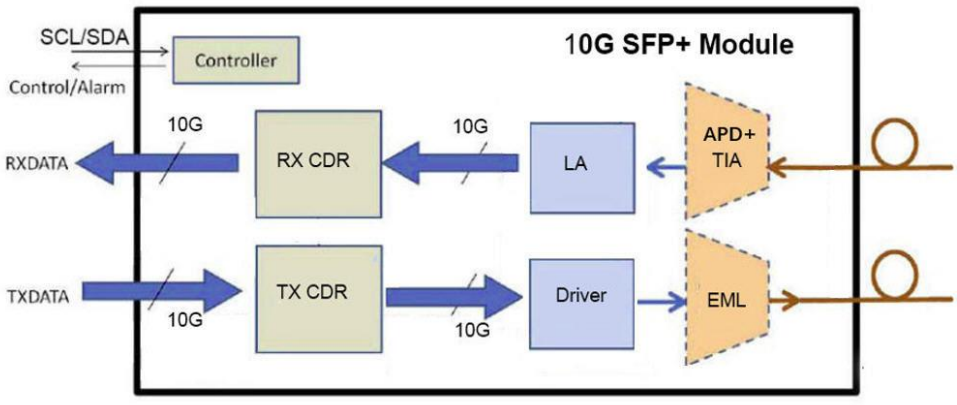
1. The optical power is launched into SMF
2. λ is wavelength of room temperature
3. Measured with RPBS 2^31-1 test pattern @10.3125Gb/s, ER=8.2dB，BER=1E-12

VI. Digital Diagnostic Monitor Accuracy

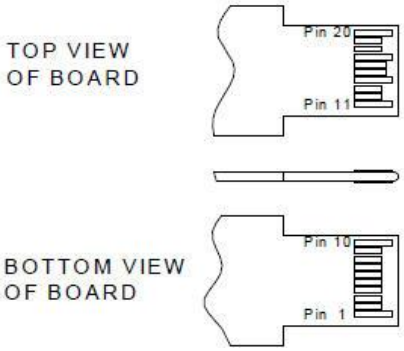
The following characteristics are defined over recommended operating condition

Parameter	Accuracy
Internally Temperature	±3℃
Internally Voltage	±3%
Measured TX Bias	±10%
Measured TX output power	±3dB
Measured RX output power	±3dB

VII. Block Diagram



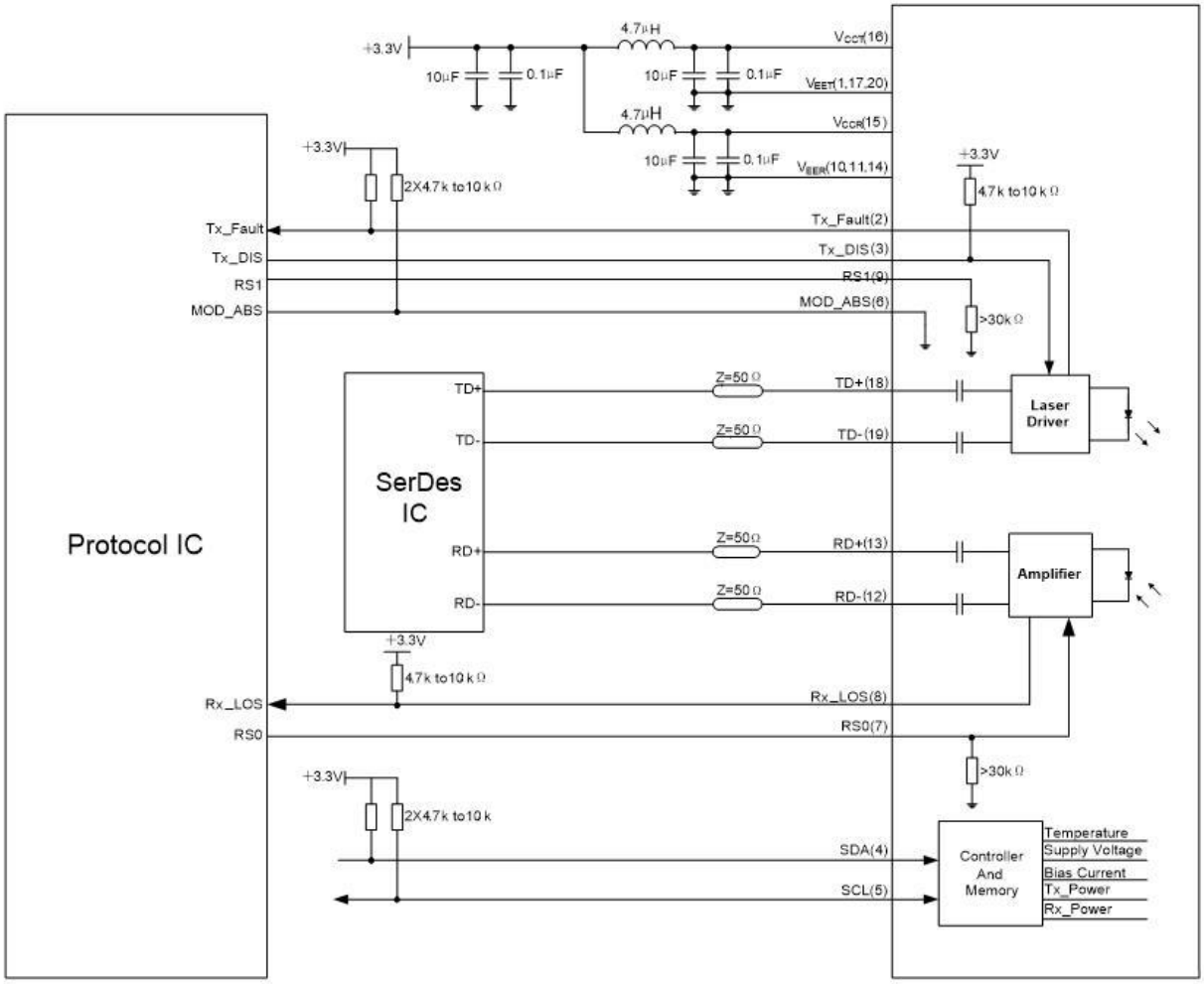
VIII.Pin Diagram



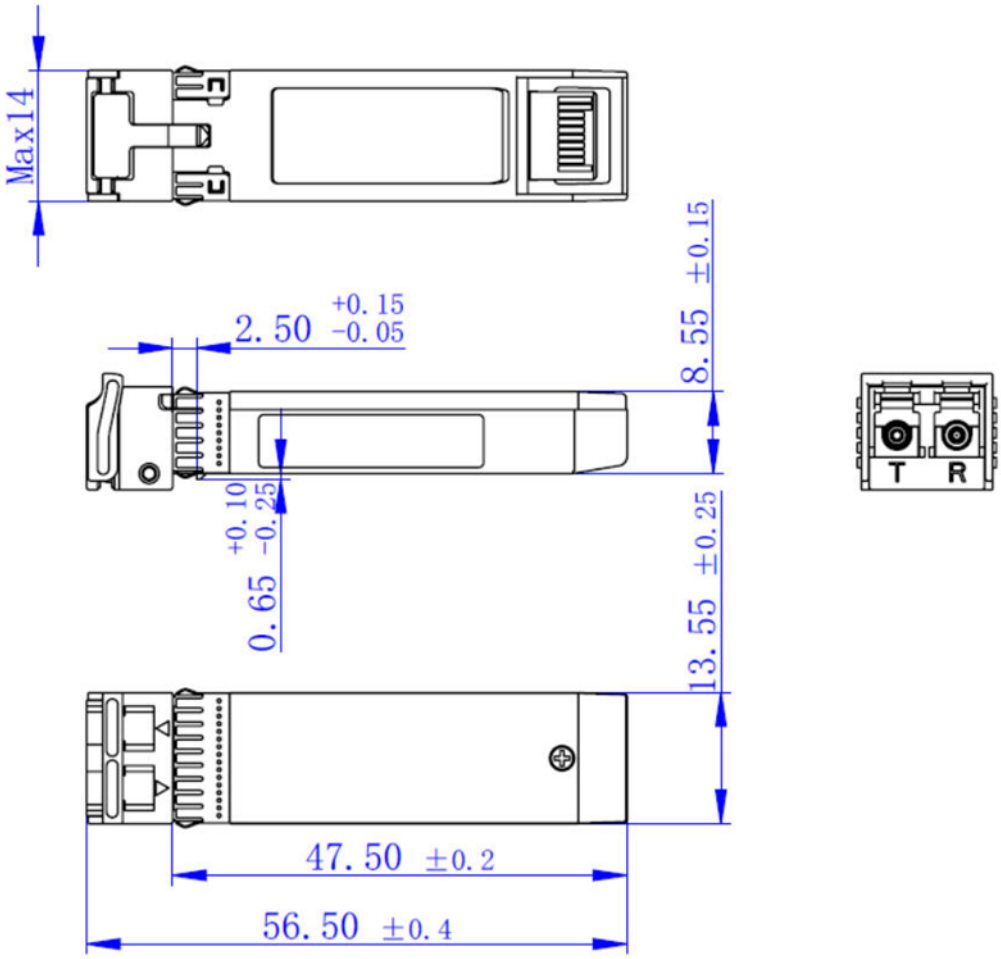
IX. Pin Descriptions

Pin	Symbol	Name/Description	NOTE.
1	Veet	Transmitter Ground (Common with Receiver Ground)	
2	TFault	Transmitter Fault.	
3	TDIS	Transmitter Disable. Laser output disabled on high or open.	
4	SDA	2-wire Serial Interface Data Line	
5	SCL	2-wire Serial Interface Clock Line	
6	MOD_ABS	Module Absent. Grounded within the module	
7	RS0	Rate Select 0	
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation.	
9	RS1	No connection required	
10	VEER	Receiver Ground (Common with Transmitter Ground)	
11	VEER	Receiver Ground (Common with Transmitter Ground)	
12	RD-	Receiver Inverted DATA out. AC Coupled	
13	RD+	Receiver Non-inverted DATA out. AC Coupled	
14	VEER	Receiver Ground (Common with Transmitter Ground)	
15	VCCR	Receiver Power Supply	
16	VCCT	Transmitter Power Supply	
17	VEET	Transmitter Ground (Common with Receiver Ground)	
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled.	
19	TD-	Transmitter Inverted DATA in. AC Coupled.	
20	VEET	Transmitter Ground (Common with Receiver Ground)	

X. Recommend Circuit Schematic



XI. Mechanical Specifications(Unit: mm)



Revision History

Version No.	Date	Description
1.0	June 24, 2021	Preliminary datasheet