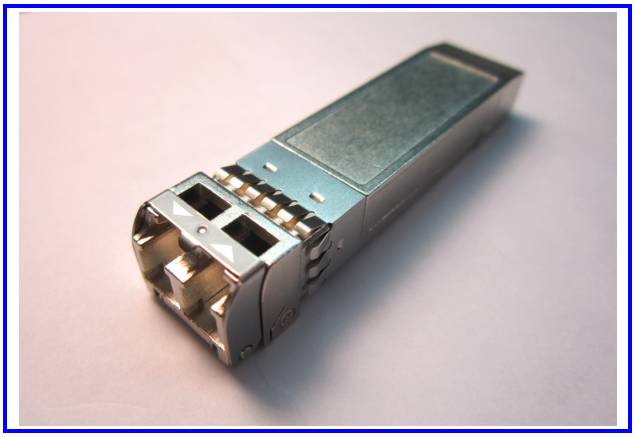
RoHS Compliant
DWDM Single-mode Transceiver
Small Form Pluggable (SFP+), with Diagnostic Monitoring
10G BASE-ZW/ZR Ethernet 10.3125Gbps/CPRI 9.8304Gbps



Features

- Compliant with SFF8472 diagnostic monitoring interface Duplex LC connector
- Single power supply 3.3V
- Hot Pluggable
- Up to 80km transmission on SMF
- 1550nm EML laser and APD receiver
- Class 1 laser product complies with EN 60825-1
- Support CPRI line bit rate option 7: 9830.4 Mbit/s

Ordering Information

TC:For C-Temp:0~70 °C

Channel	PART NUMBER	Frequency(THz)	Center Wavelength(nm)
17	LE48-H3U-TC-ND-17	191.7	1563.86
18	LE48-H3U-TC-ND-18	191.8	1563.05
19	LE48-H3U-TC-ND-19	191.9	1562.23
20	LE48-H3U-TC-ND-20	192.0	1561.42
21	LE48-H3U-TC-ND-21	192.1	1560.61
22	LE48-H3U-TC-ND-22	192.2	1559.79
23	LE48-H3U-TC-ND-23	192.3	1558.98
24	LE48-H3U-TC-ND-24	192.4	1558.17
25	LE48-H3U-TC-ND-25	192.5	1557.36
26	LE48-H3U-TC-ND-26	192.6	1556.55
27	LE48-H3U-TC-ND-27	192.7	1555.75
28	LE48-H3U-TC-ND-28	192.8	1554.94
29	LE48-H3U-TC-ND-29	192.9	1554.13
30	LE48-H3U-TC-ND-30	193.0	1553.33
31	LE48-H3U-TC-ND-31	193.1	1552.52
32	LE48-H3U-TC-ND-32	193.2	1551.72

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Channel	PART NUMBER	Frequency(THz)	Center Wavelength(nm)
33	LE48-H3U-TC-ND-33	193.3	1550.92
34	LE48-H3U-TC-ND-34	193.4	1550.12
35	LE48-H3U-TC-ND-35	193.5	1549.32
36	LE48-H3U-TC-ND-36	193.6	1548.51
37	LE48-H3U-TC-ND-37	193.7	1547.72
38	LE48-H3U-TC-ND-38	193.8	1546.92
39	LE48-H3U-TC-ND-39	193.9	1546.12
40	LE48-H3U-TC-ND-40	194.0	1545.32
41	LE48-H3U-TC-ND-41	194.1	1544.53
42	LE48-H3U-TC-ND-42	194.2	1543.73
43	LE48-H3U-TC-ND-43	194.3	1542.94
44	LE48-H3U-TC-ND-44	194.4	1542.14
45	LE48-H3U-TC-ND-45	194.5	1541.35
46	LE48-H3U-TC-ND-46	194.6	1540.56
47	LE48-H3U-TC-ND-47	194.7	1539.77
48	LE48-H3U-TC-ND-48	194.8	1538.98
49	LE48-H3U-TC-ND-49	194.9	1538.19
50	LE48-H3U-TC-ND-50	195.0	1537.40
51	LE48-H3U-TC-ND-51	195.1	1536.61
52	LE48-H3U-TC-ND-52	195.2	1535.82
53	LE48-H3U-TC-ND-53	195.3	1535.04
54	LE48-H3U-TC-ND-54	195.4	1534.25
55	LE48-H3U-TC-ND-55	195.5	1533.47
56	LE48-H3U-TC-ND-56	195.6	1532.68
57	LE48-H3U-TC-ND-57	195.7	1531.90
58	LE48-H3U-TC-ND-58	195.8	1531.12
59	LE48-H3U-TC-ND-59	195.9	1530.33
60	LE48-H3U-TC-ND-60	196.0	1529.55
61	LE48-H3U-TC-ND-61	196.1	1528.77

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TI:For I-Temp:-40~85 °C

Channel	PART NUMBER	Frequency(THz)	Center Wavelength(nm)
17	LE48-H3U-TI-ND-17	191.7	1563.86
18	LE48-H3U-TI-ND-18	191.8	1563.05
19	LE48-H3U-TI-ND-19	191.9	1562.23
20	LE48-H3U-TI-ND-20	192.0	1561.42
21	LE48-H3U-TI-ND-21	192.1	1560.61
22	LE48-H3U-TI-ND-22	192.2	1559.79
23	LE48-H3U-TI-ND-23	192.3	1558.98
24	LE48-H3U-TI-ND-24	192.4	1558.17
25	LE48-H3U-TI-ND-25	192.5	1557.36
26	LE48-H3U-TI-ND-26	192.6	1556.55
27	LE48-H3U-TI-ND-27	192.7	1555.75
28	LE48-H3U-TI-ND-28	192.8	1554.94
29	LE48-H3U-TI-ND-29	192.9	1554.13
30	LE48-H3U-TI-ND-30	193.0	1553.33
31	LE48-H3U-TI-ND-31	193.1	1552.52
32	LE48-H3U-TI-ND-32	193.2	1551.72
33	LE48-H3U-TI-ND-33	193.3	1550.92
34	LE48-H3U-TI-ND-34	193.4	1550.12
35	LE48-H3U-TI-ND-35	193.5	1549.32
36	LE48-H3U-TI-ND-36	193.6	1548.51
37	LE48-H3U-TI-ND-37	193.7	1547.72
38	LE48-H3U-TI-ND-38	193.8	1546.92
39	LE48-H3U-TI-ND-39	193.9	1546.12
40	LE48-H3U-TI-ND-40	194.0	1545.32
41	LE48-H3U-TI-ND-41	194.1	1544.53
42	LE48-H3U-TI-ND-42	194.2	1543.73
43	LE48-H3U-TI-ND-43	194.3	1542.94

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Channel	PART NUMBER	Frequency(THz)	Center Wavelength(nm)
44	LE48-H3U-TI-ND-44	194.4	1542.14
45	LE48-H3U-TI-ND-45	194.5	1541.35
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48	LE48-H3U-TI-ND-48	194.8	1538.98
49	LE48-H3U-TI-ND-49	194.9	1538.19
50	LE48-H3U-TI-ND-50	195.0	1537.40
51	LE48-H3U-TI-ND-51	195.1	1536.61
52	LE48-H3U-TI-ND-52	195.2	1535.82
53	LE48-H3U-TI-ND-53	195.3	1535.04
54	LE48-H3U-TI-ND-54	195.4	1534.25
55	LE48-H3U-TI-ND-55	195.5	1533.47
56	LE48-H3U-TI-ND-56	195.6	1532.68
57	LE48-H3U-TI-ND-57	195.7	1531.90
58	LE48-H3U-TI-ND-58	195.8	1531.12
59	LE48-H3U-TI-ND-59	195.9	1530.33
60	LE48-H3U-TI-ND-60	196.0	1529.55
61	LE48-H3U-TI-ND-61	196.1	1528.77

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Diagnostics

Parameter	Range	Accuracy	Unit	Calibration
Internal Transceiver Temperature	-40 to 85	± 3	°C	Internal
Internal Transceiver Voltage	3.14 to 3.46	± 0.1	V	
Bias Current	0 to 120	± 10%	mA	
TX Power	-1 to +3	± 3	dB	
RX average Power	-24 to -10	± 3	dB	

Absolute Maximum Ratings

PARAMETER	SYMBOL	MIN	MAX	UNITS	NOTE
Storage Temperature	T_S	–40	85	°C	
Operating Relative Humidity	*RH*	0	85	%	
Supply Voltage	*Vcc*	0	3.6	V	
Input Voltage	*Vin*	0	*Vcc*	V	

Recommended Operating Conditions

PARAMETER	SYMBOL	MIN	MAX	UNITS	NOTE
Case operating Temperature	T_C	0	70	°C	LE48-H3U-TC-ND-xx
		-40	85		LE48-H3U-TI-ND-xx
Supply Voltage	*Vcc*	3.14	3.46	V	
Supply Current	$I_{TX} + I_{RX}$		545	mA	LE48-H3U-TC-ND-xx
			645		LE48-H3U-TI-ND-xx
Power Consumption	*P*		1.8	W	LE48-H3U-TC-ND-xx
			2.1		LE48-H3U-TI-ND-xx

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Transmitter Electro-optical Characteristics

***Vcc* = 3.14 V to 3.46 V, Over Operating Case Temperature.**

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNITS	NOTE
Data Rate	*B*	9.95	10.3125	11.3	Gbps	
Output Optical Power	P_{out}	−1	---	+3.0	dBm	
Extinction Ratio	*ER*	8.2			dB	
Central Wavelength Spacing			100		G	
Central Wavelength-EOL		X-100	X	X+100	pm	X = specified center wavelength
Spectrum Width	$\Delta\lambda$			1	nm	
Side mode Suppression ratio	SSR_{min}	30			dB	
Transmitter and Dispersion Penalty	*TDP*			3	dB	
Relative Intensity Noise	*RIN*	---	---	−128	dB/Hz	
Optical Return Loss	*ORL*	21	---	---	dB	
Output Eye			Compliant with IEEE802.3ae			
Differential Input Impedance	Z_d		100		Ω	
Differential Input Voltage Swing	V_{DIFF}	300		1000	mVpp	
Transmit Fault Output-Low	TX_FAULT_L	0.0	---	0.5	V	
Transmit Fault Output-High	TX_FAULT_H	2.4	---	V_{CC}	V	
TX_DISABLE Assert Time	*t_off*	---	---	100	μs	
TX_DISABLE Negate Time	*t_on*	---	---	2	ms	
Tx_Fault assert for cooled module	*t_fault*	---	---	50	ms	
TX_DISABLE time to start reset	*t_reset*	10	---	---	μs	

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Receiver Electro-optical Characteristics

***Vcc* = 3.14 V to 3.46 V, Over Operating Case Temperature.**

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNITS	NOTE
Data Rate	B	9.95	10.3125	11.3	Gbps	
Operating Center Wavelength	λ_C	1530	---	1565	nm	
Optical Input Power-maximum	P_{IN}	-7	---	---	dBm	BER < 10^{-12}
Receiver Sensitivity@9.95~10.7Gbps	P_{IN}	---	---	–24	dBm	BER < 10^{-12}
Receiver Sensitivity with 80km fiber@9.95~10.7Gbps	PIN_{fiber}	---	---	–21	dBm	1,BER < 10^{-12}
Receiver Sensitivity@11.1~11.3Gbps	P_{IN}	---	---	–27	dBm	BER < 10^{-4}
Receiver Sensitivity with 80km fiber@11.1Gbps	PIN_{fiber}	---	---	–24	dBm	2, BER < 10^{-4}
Receiver Sensitivity with 80km fiber@11.3Gbps	PIN_{fiber}	---	---	–24	dBm	3, BER < 10^{-4}
Loss of Signal-Asserted	P_A	-38	---	---	dBm	
Loss of Signal-Deasserted	P_D	---	---	-25	dBm	
Differential Output Impedance	Z_d	---	100	---	Ω	
Differential Output Voltage	V_{DIFF}	300	---	800	mVpp	
Receiver Loss of Signal Output Voltage-Low	RX_LOS_L	0	---	0.5	V	
Receiver Loss of Signal Output Voltage-High	RX_LOS_H	2.4	---	V_{CC}	V	
Receiver Loss of Signal Assert Time (off to on)	t_{A,RX_LOS}	---	---	100	μs	
Receiver Loss of Signal Assert Time (on to off)	t_{D,RX_LOS}	---	---	100	μs	

Note1: Max chromatic dispersion tolerance over 80km of G.652 single mode fiber : 1450ps/nm

Note2: Max chromatic dispersion tolerance over 80km of G.652 single mode fiber : 1300ps/nm

Note3: Max chromatic dispersion tolerance over 80km of G.652 single mode fiber : 1100ps/nm

Timing Parameters

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNITS	NOTE
Time to initialize cooled module	*t_start_up*			10	s	

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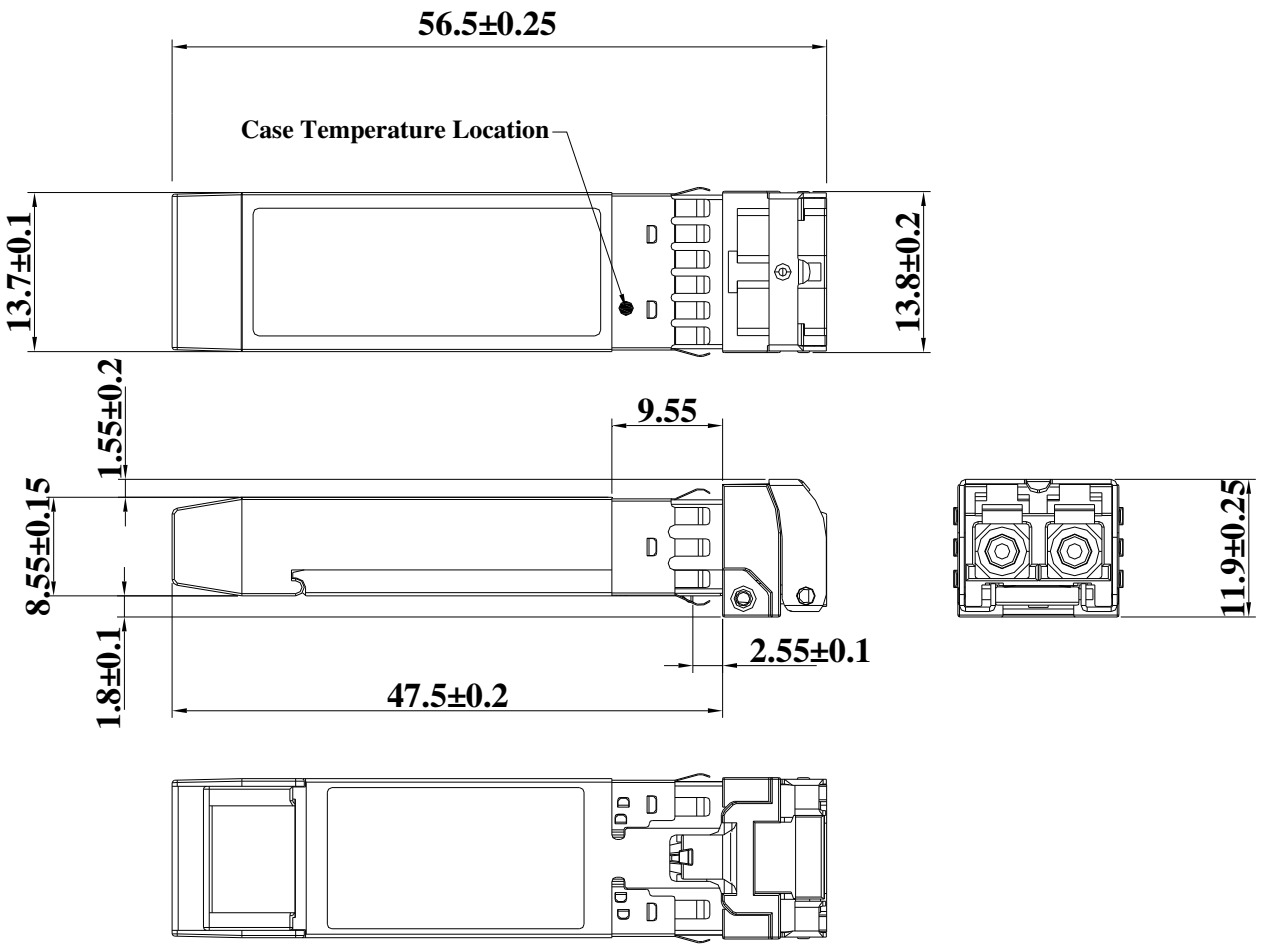
Dimensions



DIMENSIONS ARE IN MILLIMETERS

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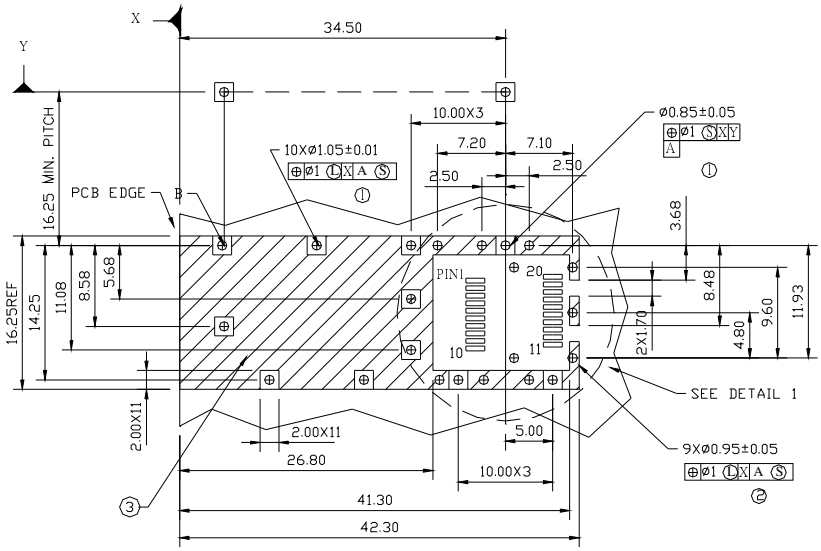
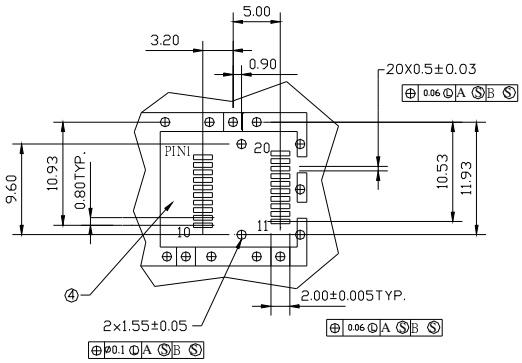
SFP host board mechanical layout





DETAIL 1

LEGEND

1.PADS AND VIAS ARE CHASSIS GROUND
2.THROUGH HOLES, PLATING OPTIONAL
3.HATCHED AREA DENOTES COMPONENT AND TRACE KEEPOUT(EXCEPT CHASSIS GROUND)
4.AREA DENOTES COMPONENT KEEPOUT (TRACES ALLOWED)

DIMENSIONS ARE IN MILLIMETERS

Unit: mm

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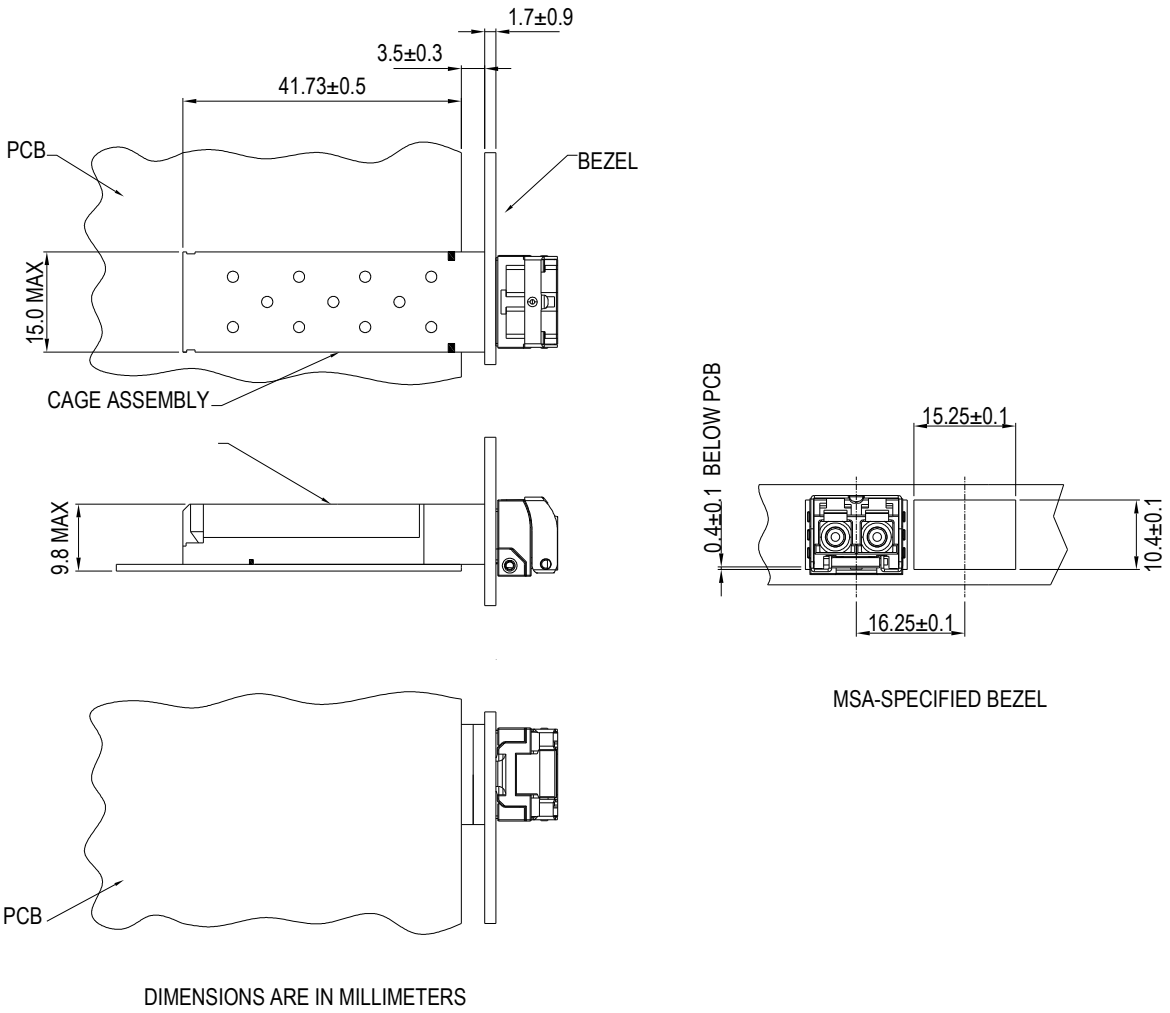
Assembly Drawing



Unit: mm

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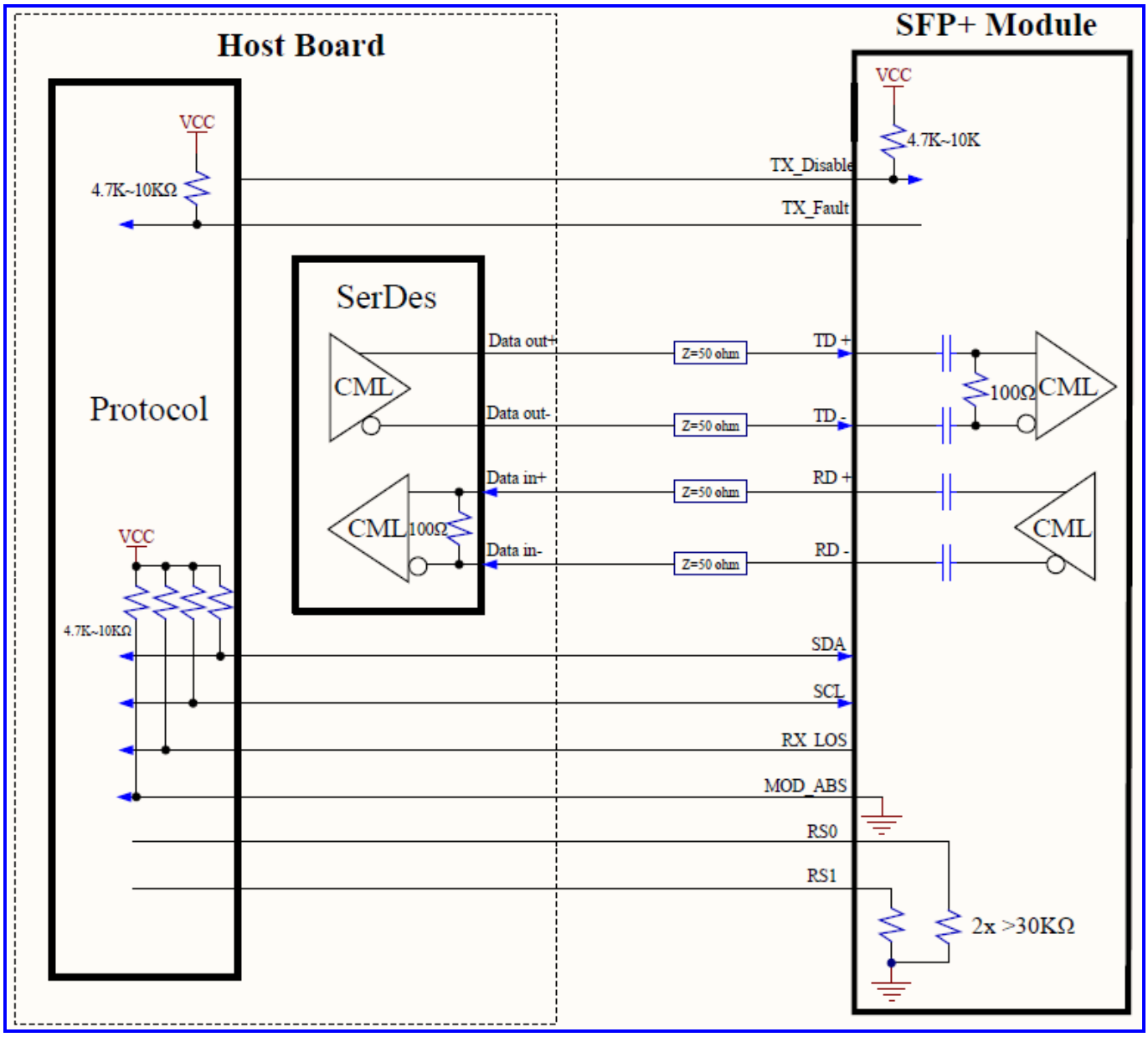
Recommended Interface Circuit



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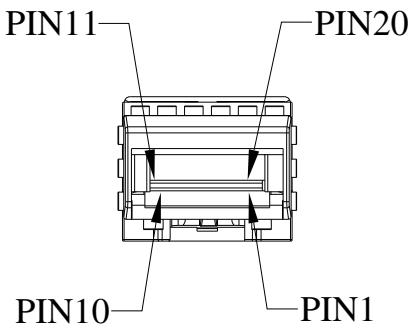
Pin Assignment

Pin-Out



Pin	Signal Name	Description
1	T_{GND}	Transmit Ground
2	*TX_FAULT*	Transmit Fault
3	*TX_DISABLE*	Transmit Disable
4	*MOD_DEF (2)*	SDA Serial Data Signal
5	*MOD_DEF (1)*	SCL Serial Clock Signal
6	*MOD_DEF (0)*	TTL Low
7	*RS0*	RX Rate Select, No function implemented
8	*RX_LOS*	Receiver Loss of Signal, TTL High, open collector
9	*RS1*	TX Rate Select, No function implemented
10	R_{GND}	Receiver Ground
11	R_{GND}	Receiver Ground
12	*RX–*	Receive Data out Bar, ac coupled
13	*RX+*	Receive Data out, ac coupled
14	R_{GND}	Receiver Ground
15	V_{CCR}	Receiver Power Supply
16	V_{CCT}	Transmitter Power Supply
17	T_{GND}	Transmitter Ground
18	*TX+*	Transmit Data in, ac coupled
19	*TX–*	Transmit Data in Bar, ac coupled
20	T_{GND}	Transmitter Ground

Note : All information contained in this document is subject to change without notice.

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