



RoHS Compliant
1550 nm Single-mode Transceiver
Small Form Pluggable (SFP+), with Diagnostic Monitoring
10G BASE-ZW/ZR Ethernet



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

PART NUMBER	VOLTAGE	TEMPERATURE	Distance
LE48-H3U-TC-N	3.3V	0°C to 70 °C	80km
LE48-H3U-TI-N	3.3V	-40°C to 85 °C	80km

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	0 to +4	± 3	dB	
RX average Power	-23 to -10	± 3	dB	



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Absolute Maximum Ratings

PARAMETER	SYMBOL	MIN	MAX	UNITS	NOTE
Storage Temperature	T_s	-40	85	°C	
Operating Relative Humidity	RH	0	85	%	
Supply Voltage	V_{cc}	0	3.6	V	
Input Voltage	V_{in}	0	V_{cc}	V	

Recommended Operating Conditions

PARAMETER	SYMBOL	MIN	MAX	UNITS	NOTE
Case operating Temperature	T_C	0	70	°C	LE48-H3U-TC-N
		-40	85		LE48-H3U-TI-N
Supply Voltage	V_{cc}	3.14	3.46	V	
Supply Current	$I_{TX} + I_{RX}$		545	mA	LE48-H3U-TC-N
			645		LE48-H3U-TI-N
Power Consumption @3.3V	P		1.8	W	LE48-H3U-TC-N
			2.1		LE48-H3U-TI-N



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Transmitter Electro-optical Characteristics

$V_{CC} = 3.14\text{ V to } 3.46\text{ V}$, $TC = 0^{\circ}\text{C to } 70^{\circ}\text{C}$, $TI = -40^{\circ}\text{C to } 85^{\circ}\text{C}$

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNITS	NOTE
Data Rate	B		10.3125		Gbps	
Output Optical Power	P_{out}	0	---	+4.0	dBm	
Extinction Ratio	ER	8.2			dB	
Center Wavelength	λ_C	1530	---	1565	nm	
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

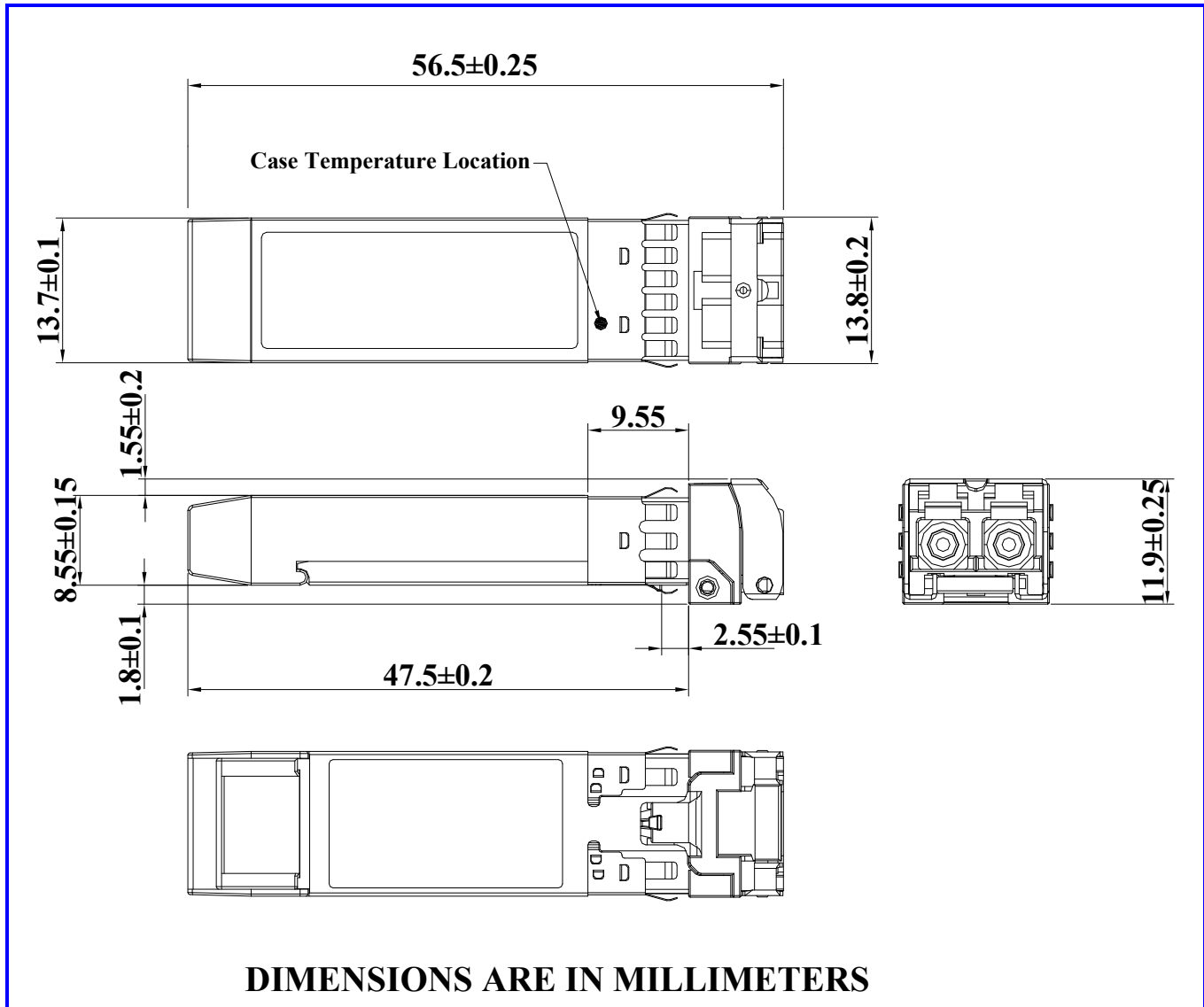
$V_{CC} = 3.14\text{ V to } 3.46\text{ V}$, $TC = 0^{\circ}\text{C to } 70^{\circ}\text{C}$, $TI = -40^{\circ}\text{C to } 85^{\circ}\text{C}$

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNITS	NOTE
	L					
Data Rate	B		10.3125		Gbps	
Operating Center Wavelength	λ_C	1530	---	1565	nm	
Optical Input Power-maximum	P_{IN}	-7	---	---	dBm	BER < 10^{-12}
Receiver Sensitivity@10.3125Gbps	P_{IN}	---	---	-23	dBm	BER < 10^{-12}
Receiver Sensitivity with 80km fiber@10.3125G	P_{IN_fiber}	---	---	-20	dBm	BER < 10^{-12}
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_LO S_L	0	---	0.5	V	
Receiver Loss of Signal Output Voltage-High	RX_LO S_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	

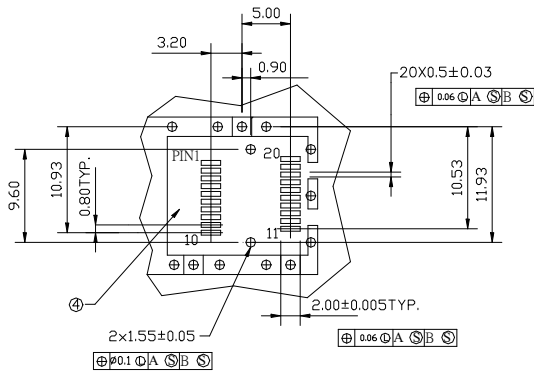
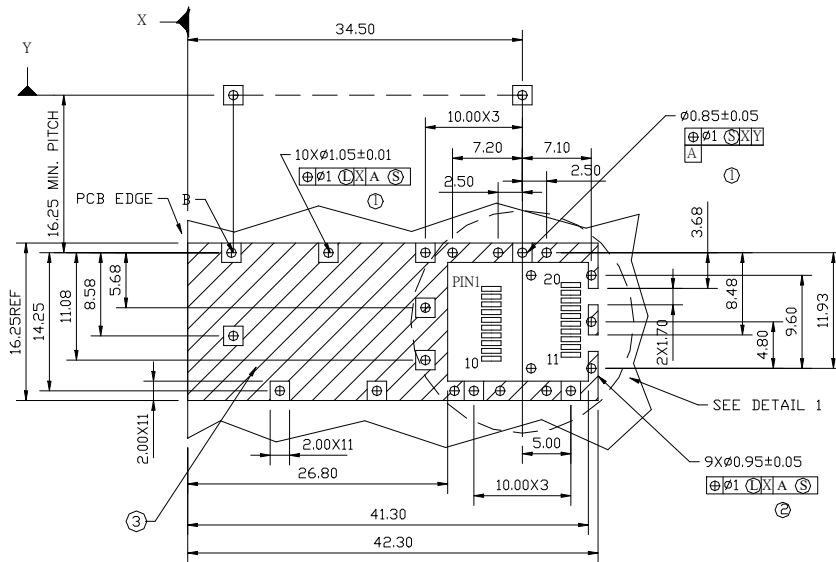
Timing Parameters

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNITS	NOTE
Time to initialize	t_{start_up}			10	s	

Dimensions



SFP host board mechanical layout



DETAIL 1

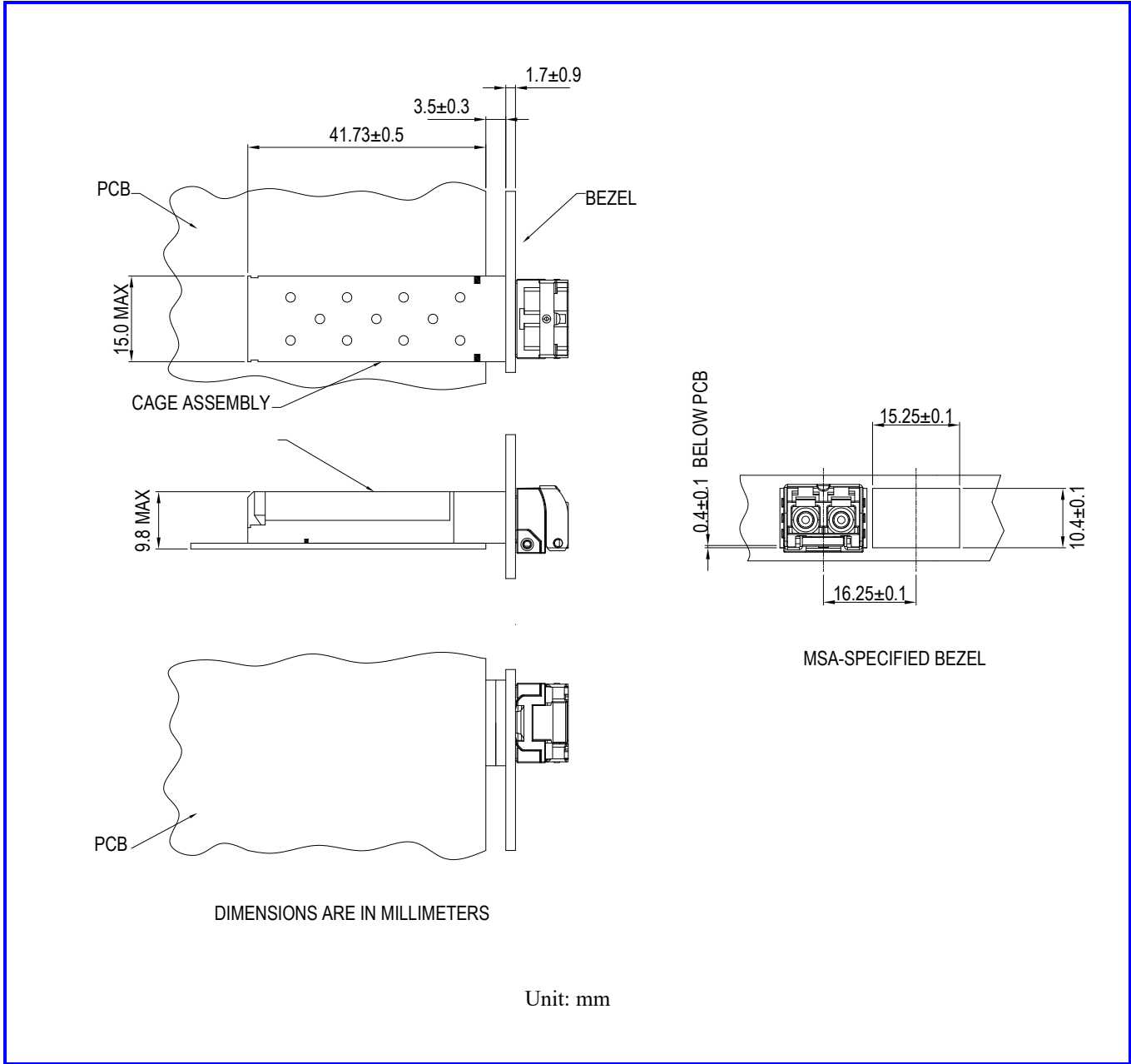
LEGEND

- 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)

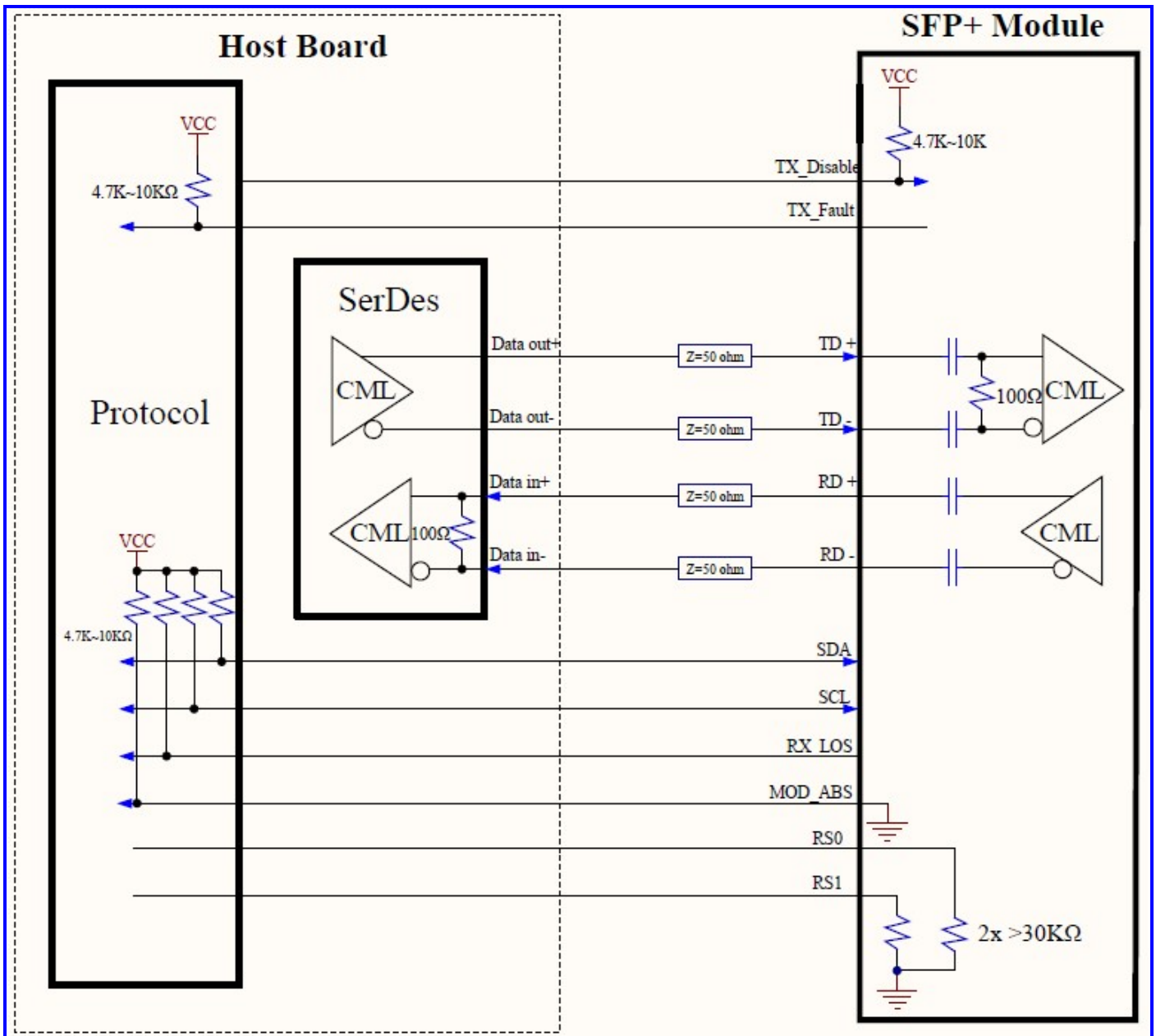
DIMENSIONS ARE IN MILLIMETERS

Unit: mm

Assembly Drawing

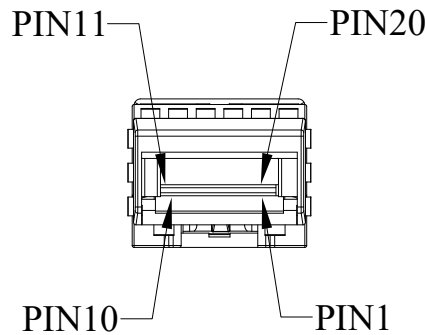


Recommended Interface Circuit



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.