



10GBASE-ZR/ZW 1550nm SMF 80km SFP+ Optical Transceiver with Duplex LC Connector

10GZRSFPx



DESCRIPTION

The 10GZRSFPx Enhanced Small Form Factor Pluggable SFP+ optical transceivers are RoHS compliant and designed for use in serial optical data communications application specified for a data rate of 10 Gb/s. The SFP+ transceiver module provides up to 80km transmission distance over single-mode fiber at nominal wavelength of 1550nm. They are compliant with SFF 8472 diagnostic monitoring interface, and EN60825-1, and supports CPRI line bit option 7:9830.4 Mbit/s.

FEATURES

- Compliant with SFF8472 diagnostic monitoring interface
- Duplex LC connector
- Hot pluggable SFP+ package
- Class 1 laser product compliant with EN 60825-1
- Support CPRI line bit rate option 7: 9830.4 Mbit/s
- Single power supply 3.3V
- Up to 80km transmission on SMF

APPLICATIONS

- 10GBASE-ZR/ZW

PRODUCT OVERVIEW

PART NUMBER	OPERATING TEMPERATURE
10GZRSFPC	0°C to 70°C
10GZRSFPI	-40°C to 85°C

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	

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	MIN	MAX	UNIT
Storage Temperature	T _S	-40	85	°C
Supply Voltage	V _{CC}	0	3.6	V
Input Voltage	V _{IN}	0	V _{CC}	V
Operating Relative Humidity	RH	0	85	%

RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	MIN	MAX	UNIT	NOTES
Case Operating Temperature	T _C	0	70	°C	10GZRSFPC
		-40	85		10GZRSFPI
Supply Voltage	V _{CC}	3.14	3.46	V	
Supply Current	I _{TX} + I _{RX}		545	mA	10GZRSFPC
			645		10GZRSFPI
Power Consumption @3.3V	P	-	1.8	W	10GZRSFPC
			2.1		10GZRSFPI

TRANSMITTER ELECTRO-OPTICAL CHARACTERISTICS (V_{CC} = 3.14V to 3.46V, T_C = 0°C to 70°C, -40°C to 85°C)

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT
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
Spectral Width (RMS)	Δλ	-	-	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 from fault to assertion	t _{fault}	-	-	50	ms
TX_DISABLE Time to start reset	t _{reset}	10	-	-	μs

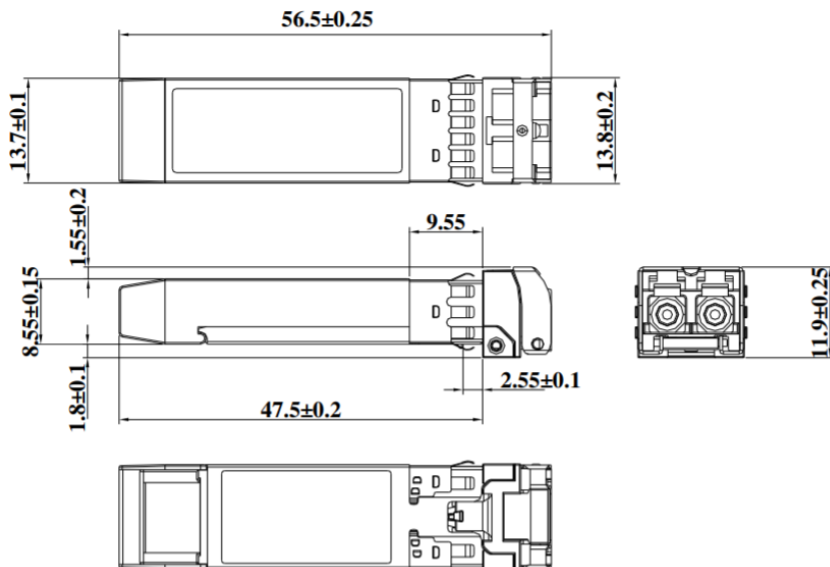
RECEIVER ELECTRO-OPTICAL CHARACTERISTICS ($V_{CC} = 3.14V$ to $3.46V$, $T_C = 0^{\circ}C$ to $70^{\circ}C$, $-40^{\circ}C$ to $85^{\circ}C$)

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT	NOTES
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@10.3125 Gbps	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_LOS _L	0	-	0.5	V	
Receiver Loss of Signal Output-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	

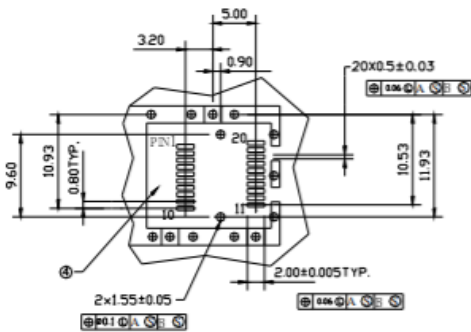
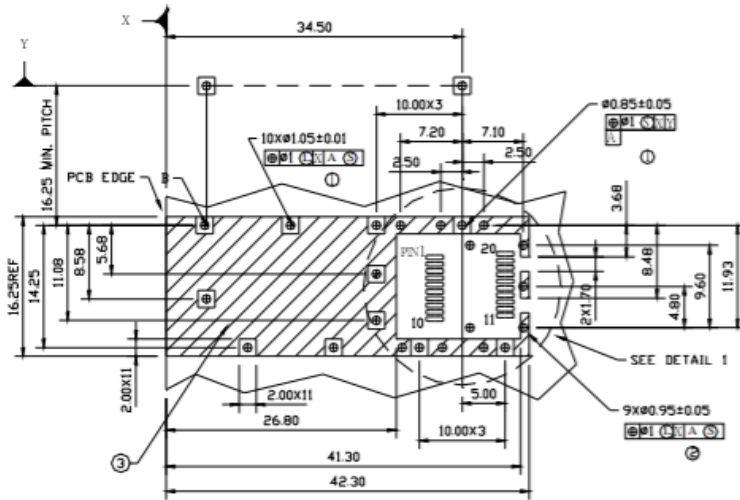
TIMING PARAMETERS

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT	NOTES
Time to Initialize	t_{start_up}			10	s	

DIMENSIONS (unit: mm)



SFP HOST BOARD MECHANICAL LAYOUT (unit: mm)

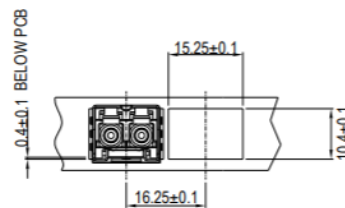
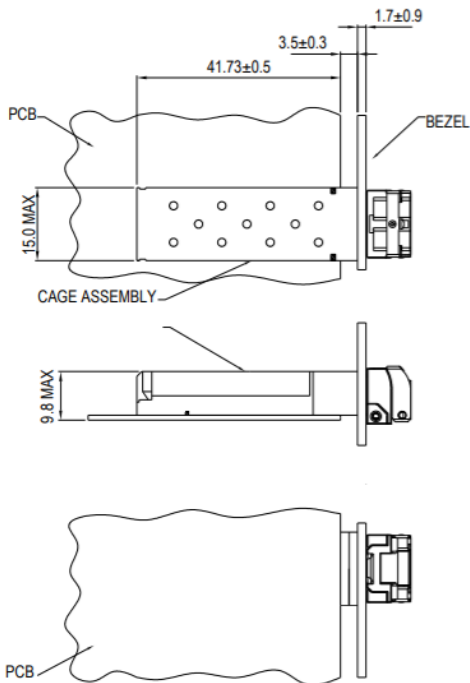


LEGEND

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)

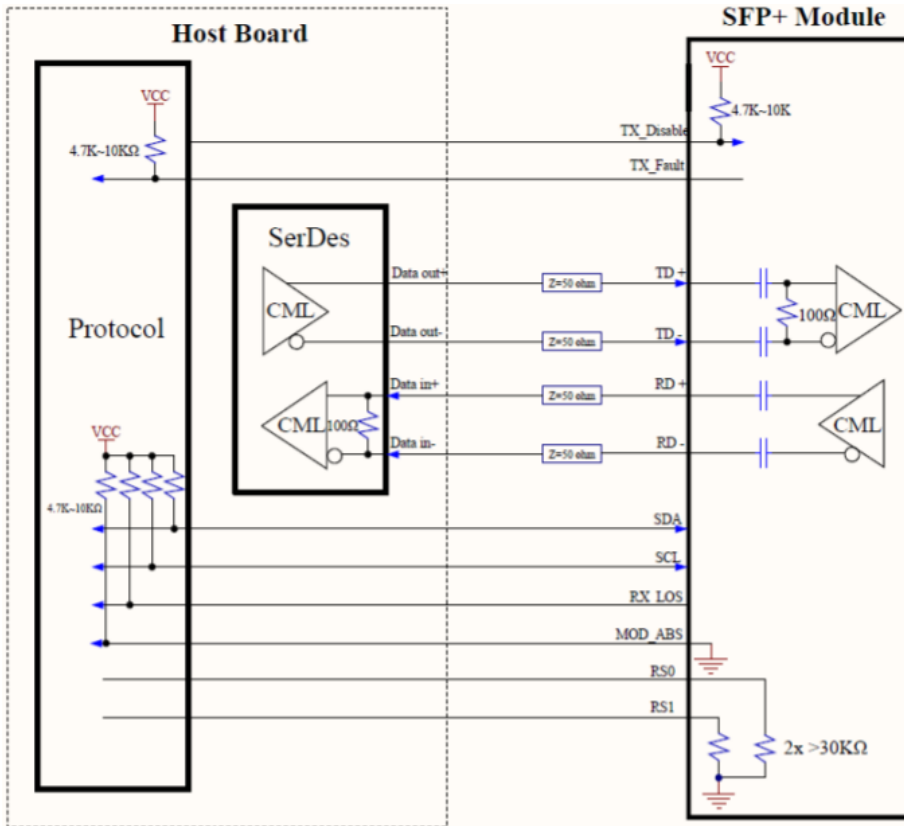
DIMENSIONS ARE IN MILLIMETERS

ASSEMBLY DRAWING

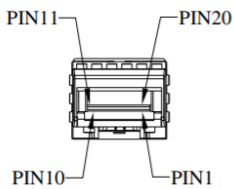


DIMENSIONS ARE IN MILLIMETERS

RECOMMENDED INTERFACE CIRCUIT



PIN ASSIGNMENT



PIN	SIGNAL NAME	DESCRIPTION	PIN	SIGNAL NAME	DESCRIPTION
1	T _{GND}	Transmit Ground	11	R _{GND}	Receiver Ground
2	TX_FAULT	Transmit Fault	12	RX-	Receive Data out Bar, ac coupled
3	TX_DISABLE	Transmit Disable	13	RX+	Receive Data out, ac coupled
4	MOD_DEF (2)	SDA Serial Data Signal	14	R _{GND}	Receiver Ground
5	MOD_DEF (1)	SCL Serial Clock Signal	15	V _{CCR}	Receiver Power Supply
6	MOD_DEF (0)	TTL Low	16	V _{CCT}	Transmitter Power Supply
7	RS0	RX Rate Select, no function implemented	17	T _{GND}	Transmitter Ground
8	RX_LOS	Receiver Loss of Signal, TTL High, open collector	18	TX+	Transmit Data in, ac coupled
9	RS1	TX Rate Select, no function implemented	19	TX-	Transmit Data in Bar, ac coupled
10	R _{GND}	Receiver Ground	20	T _{GND}	Transmitter Ground

ADDITIONAL NOTES

- Avoid eye or skin exposure to laser radiations.
- The device is sensitive to electro-static discharge (ESD). The device should be handled with ESD proof tools. To assemble the device on PCB, proper grounding is required to prevent ESD.
- Specifications are subject to change without notice.



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