



10GBASE-ER/EW 1550nm SMF 40km SFP+ Optical Transceiver with Duplex LC Connector

10GERSFPx



DESCRIPTION

The 10GERSFPx 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 40km transmission distance over single-mode fiber at nominal wavelength of 1550nm. They are compliant with SFF 8472 diagnostic monitoring interface, and EN60825-1, and support CPRI line bit rate 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 40km transmission on SMF

APPLICATIONS

- 10GBASE-ER/EW

PRODUCT OVERVIEW

PART NUMBER	OPERATING TEMPERATURE
10GERSFPC	0°C to 70°C
10GERSFPI	-40°C to 85°C

DIAGNOSTICS

PARAMETER	RANGE	ACCURACY	UNIT	CALIBRATION
Internal Transceiver Temperature	-40 to 95	±3	°C	Internal
Internal Transceiver Voltage	3.14 to 3.46	±0.1	V	
Bias Current	0 to 120	±10%	mA	
TX Power	-4.7 to +4.7	±3	dB	
RX Average Power	-1 to -16	±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	10GERSFPC
		-40	85		10GERSFPI
Supply Voltage	V _{CC}	3.14	3.46	V	
Supply Current	I _{TX} + I _{RX}		450	mA	
Power Consumption	P	-	1.5	W	

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 (Average)	P _{out}	-4.7	-	+4.0	dBm
Output Optical Power (OMA)	P _{out}	-1.7	-	-	dBm
Extinction Ratio	ER	6			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			2	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

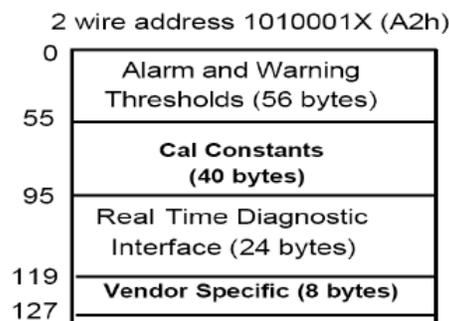
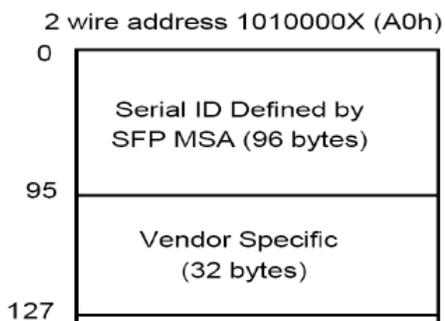
RECEIVER ELECTRO-OPTICAL CHARACTERISTICS (V_{CC} = 3.14V to 3.46V, T_C = 0°C to 70°C, -40°C to 85°C)

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT	NOTES
Data Rate	B		10.3125		Gbps	
Optical Input Power – maximum	P _{IN}	-1.0	-	-	dBm	BER<10 ⁻¹²
Receiver Sensitivity@10.3125 Gbps	P _{IN}	-	-	-15.8	dBm	BER<10 ⁻¹²
Receiver Sensitivity (OMA)	P _{IN}	-	-	-14.1	dBm	BER<10 ⁻¹²
Stressed Receiver Sensitivity (OMA)	P _{IN}	-	-	-11.3	dBm	BER<10 ⁻¹²
Operating Center Wavelength	λ _C	1530	-	1565	nm	
Loss of Signal-Asserted	P _A	-30	-	-	dBm	
Loss of Signal-Deasserted	P _D	-	-	-18	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	

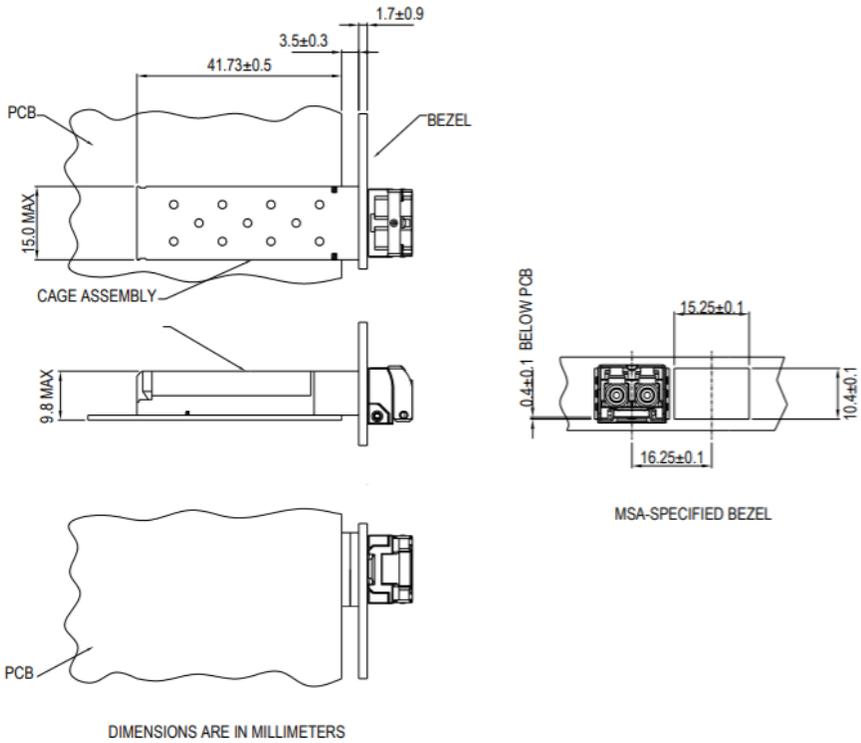
TIMING PARAMETERS

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT	NOTES
Time to Initialize	t_start_up			10	s	

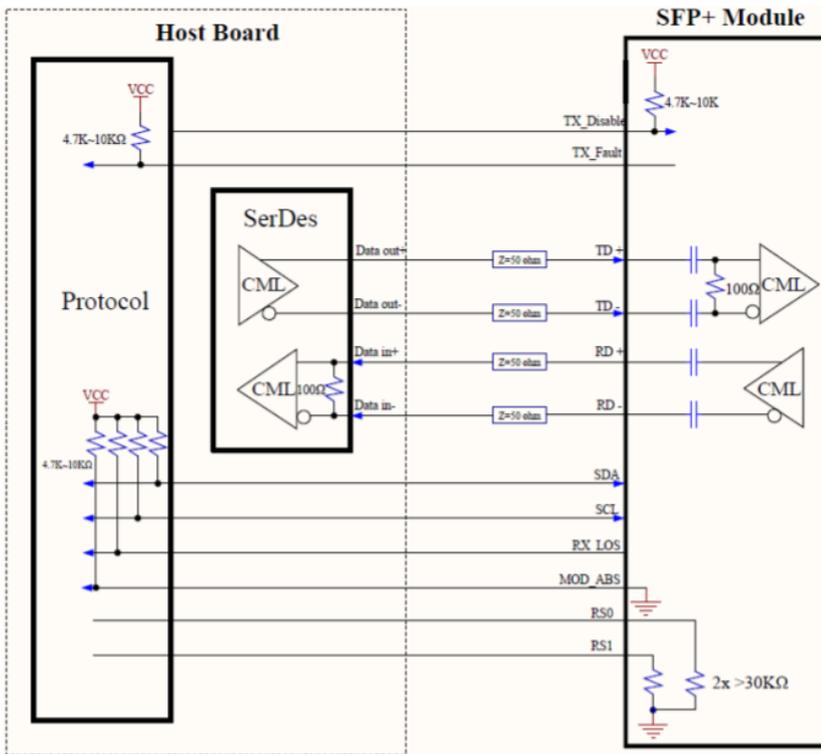
DIGITAL DIAGNOSTIC MEMORY MAP



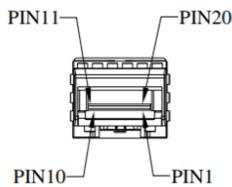
ASSEMBLY DRAWING



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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