10GBASE-ZR XENPAK Module SM SC 80km data range (1550nm) Cisco compatible



GBIC-, SFP-, XFP-, XENPAK-Transceiver

The tde Small Form Pluggable Optical Transceiver are easy installed for enterprise and telecom applications. The tde SFP modular line provides a fully compatible, highly reliable and volume accessible supply of quality transceiver products with excellent performance for design-in manufacturing and end-user enterprise applications.

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Technical Data

Features

- Up to 10GBd bi-directional data links
- Compliant with IEEE 802.3ae application
- Compliant with XENPAK MSA
- Temperature stabilized EML transmitter
- APD Photo-detector
- XAUI electrical interface: 4 lanes at 3.125GBd
- Hot Z-Pluggable
- SC Connectors
- Up to 80km on SMF
- Power Supply: 5V/3.3V/Adaptable Power Supply (APS: 1.2V)
- RoHS Compliance
- Operating temperature range: 0°C to 70°C

Applications

- 10GBd Ethernet

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Remarks
Storage Ambient Temperature	TS	-40	85	°C	
Supply Voltage (5V)	V5	0	6	V	
Supply Voltage (3.3V)	V3	0	4	V	
Supply Voltage (APS)	VAPS	0	1.5	V	
Optical Receiver Input	PIMAX		1.5	dBm	Average

General Specifications

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remarks
Data Rate	DR		10.3125		GBD	
Bit Error Rate	BER			10–12		
Total Power Consumption	P			4	W	
Supply Voltage (5V)	VCC5	4.75	5	5.25	V	Operating Environment
Supply Voltage (+3.3V)	VCC3	3.14	3.3	3.47	V	Operating Environment
Supply Voltage (APS)	VCCAPS	1.152	1.2	1.248	V	Operating Environment
Supply Current (5V)	ICC5			350	mA	
Supply Current (+3.3V)	ICC3			300	mA	
Supply Current (APS)	ICCAPS			1000	mA	

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Case Operating Temperature	TC	0		70	°C	

Link Distances

Parameter	Fiber Type	Distance Range (km)
10.3125GBd	9/125um SMF	80

Optical Characteristics - Transmitter

Parameter	Symbol	Min.	Max.	Unit	Remarks
Optical Wavelength	λ	1530	1570	nm	
Launch Power	POUT	-1	2	dBm	Average
Launch Power of OFF Transmitter	POUT_OFF		-30	dBm	Average
Side Mode Suppression Ratio	SMSR	30		dB	
Spectral Width (RMS)	Δλ		0.6	nm	
Optical Extinction Ratio	ER	8.2		dB	
Optical Return Loss Tolerance	ORLT		12	dB	
Relative Intensity Noise	RIN		-128	dB/Hz	
Transmitter Dispersion Penalty	TDP		2	dB	
Eye Mask Definition					According to IEEE 802.3ae

Optical Characteristics - Receiver

Parameter	Symbol	Min.	Max.	Unit	Remarks
Center Wavelength Range	λC	1260	1600	nm	
Optical Input Power	PIN	-16	-7	dBm	Average, Informative
Receiver Reflectance	TRRX		-27	dB	
Loss of Signal Assert Level	PLOS_A	-30			
Loss of Signal DeAssert Level	PLOS_D		-24		
Loss of Signal Hysteresis	PLOS_H	1			
Receiver electrical 3dB upper cutoff frequency	FR		12.3	Ghz	

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Electrical Characteristics - DC

	Parameter	Symbol	Min.	Typ.	Max.	Unit	Remarks
A. 1.2V COMS I/O DC Characteristics (PRTAD; LASI; RESET; TX_ON/ OFF)	External Pull-Up Resistor For Open Drain	RPU	10		22	kΩ	
	Output High Voltage	VOH	1			V	
	Output Low Voltage	VOL			0.15	V	
	Input High Voltage	VIH	0.84		1.2	V	
	Input Low Voltage	VIL			0.36	V	
	Input Pull-Down Current	IPD	20		120	uA	VIN=1.2V
B. XAUI I/O DC Charateristics (TXLANE[0..3]; RXLANE[0..3])	Differential Input Amplitude (pk–pk)	VIN_XAUI	200		2500	mV	AC Coupled
	Differential Output Amplitude (pk–pk)	VOUT_XAUI	800		1600	mV	AC Coupled
C. MDIO I/O DC Charateristics (MDIO; MDC)	Output Low Voltage	VOL			0.2	V	IOL=100uA
	Output Low Current	IOL			4	mA	
	Input High Voltage	VIH	0.84		1.2	V	
	Input Low Voltage	VIL			0.36	V	
	Pull-Up Supply Voltage	VPU	1.152	1.2	1.248	V	
	Input Capacitance	CIN			10	pF	
	Load Capacitance	CLOAD			470	pF	
	External Pull-Up Resistance	RPU	200			Ω	

Electrical Characteristics - AC

	Parameter	Symbol	Min.	Typ.	Max.	Unit	Remarks
A. XAUI Input AC Characteristics (TXLANE[0..3])	Baud Rate	BRXAUI_IN		3.125		GBd	
	Baud Rate Tolerance	BRTOL_XAUI	-100		100	ppm	
	Differential Input Impedance	ZIN_XAUI	80	100	120	Ω	

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	Differential Return Loss	RLIN	10			dB	100 MHz to 2.5 GHz
	Input Differential Skew	TIN_SKEW			75	ps	Crossing Point
	Jitter Amplitude Tolerance	JXAUI_TO			0.65	UIPP	IEEE 802.3ae
B. XAUI Output AC Charateristics (RXLANE[0..3])	Baud Rate	BRXAUI_OUT		3.125		GBd	
	Baud Rate Variation	BRXAUI_VAR	-100		100	ppm	
	XAUI Eye Mask (far-end)	TOUT_SKEW					According to IEEE 802.3ae
	Output Differential Skew				15	ps	
	Output Differential Impedance	ZOUT_XAUI	80	100	120	Ω	DC
	Differential Output Return Loss	RLOUT	10			dB	100 MHz to 2.5 GHz
	Total Jitter	TJXAUI			0.35	UI	Near-end No pre-equalization 1 UI=320 ps
	Deterministic Jitter	DJXAUI			0.17	UI	Near-end No pre-equalization 1 UI=320 ps
C. Power-On Reset Charateristics	Power-On Reset and TX_ONOFF Charateristics						According to XENPAK MSA Issue
D. MDIO I/O AC Charateristics (MDIO; MDC)	MDIO Data Hold Time	THOLD	10			ns	
	MDIO Data Setup Time	TSU	10			ns	
	Delay from MDC Rising Edge to MDIO Data Change	TDELAY			300	ns	
	MDC Clock Rate	fMAX			2.5	MHz	

Digital Diagnostic

Parameter	Symbol	Min.	Max.	Unit
Temperature Monitor	TMON	-5	+5	°C
Laser Bias Monitor	IMON	-10	10	%
TX Power Monitor	PTX	-3	+3	dBm
RX Power Monitor	PRX	-3	+3	dBm

Product variants & accessories

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Art.-No.	Description
TDE-XENPAK-10GB-ZR	10GBASE-ZR XENPAK Module SM SC 80km data range (1550nm) Cisco compatible

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