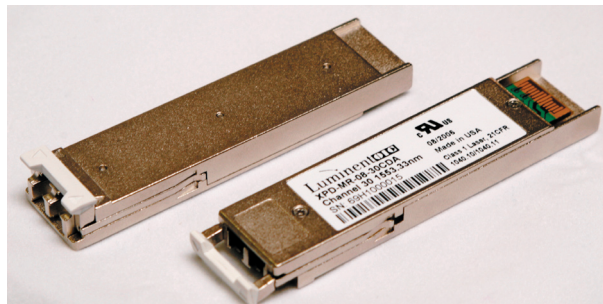


## XP-MR-04-CDA



## Features

- XFP MSA Rev 4.5 compliant
- 40km Reach
- Supports 9.95Gb/s, 10.31Gb/s, 10.52Gb/s, 10.7Gb/s, and 11.1Gb/s
- Cooled EML with isolator
- PIN Receiver
- Power dissipation <3.5W
- -5 to 70 C temperature range
- Digital Diagnostics
- XFI High Speed Electrical Interface
- RoHS Compliant
- Class 1 Laser, 21CFR 1040.10/1040.11
- EN 60825-1/A1:2002 Compliant
- Bail Latch Color: WHITE

## Absolute Maximum Rating

Parameter	Symbol	Min	Typical	Max	Unit
Maximum Supply Voltage (3.3V)	V <sub>cc3</sub>	-0.3	-	3.6	V
Maximum Supply Voltage (5.0V)	V <sub>cc5</sub>	-0.3	-	5.5	V
Maximum Supply Voltage (1.8V)	V <sub>cc2</sub>	-0.3	-	2	V
Storage Temperature	T <sub>st</sub>	-40	-	85	°C

## General Operations

Parameter	Symbol	Min	Typical	Max	Unit
Supply Voltage (1.8V)	V <sub>cc2</sub>	1.71	1.8	1.89	V
Supply Voltage (3.3V)	V <sub>cc3</sub>	3.14	3.3	3.47	V
Supply Voltage (5V)	V <sub>cc5</sub>	4.75	5	5.25	V
Total Current on any pin	I <sub>cc</sub>	-	-	500	mA
Inrush Current (1.8V)	I <sub>inrush2</sub>	-	-	1	A
Inrush Current (3.3V)	I <sub>inrush3</sub>	-	-	0.75	A
Inrush Current (5V)	I <sub>inrush5</sub>	-	-	0.5	A
Module current ramp rate		-	-	100	mA/μs
Power on 1.8V rail	P <sub>2rail</sub>	-	-	1.8	W
Power on 3.3V rail	P <sub>3rail</sub>	-	-	2.5	W
Power on 5V rail	P <sub>5rail</sub>	-	-	2.5	W
Module Total Power consumption	P <sub>t</sub>	-	-	3.5	W
Power Consumption-P_Down mode	P <sub>p_d</sub>	-	-	1.5	W
Power Supply Noise Rejection	PSNR	Compliant to Section 2.7.2 of XFP MSA			
Bit Rate	BR	9.95	-	11.1	Gb/s
Operating Temperature (case)	T <sub>op</sub>	-5	-	70	°C
Storage Temperature	T <sub>st</sub>	-40	-	85	°C

## XP-MR-04-CDA

## Transmitter Specifications (Optical)

Parameter	Symbol	Min	Typical	Max	Unit
Output Power	P <sub>O</sub>	-1	0.5	2	dBm
Average Launch Power Tx_Off	P <sub>off</sub>	-	-	-30	nm
Extinction Ratio	ER	8.2	-	-	dB
Eye Mask		ITU-T G.691, Telcordia GR-253-CORE, IEEE802.3 10GBASE-ZR Compliant			
Side Mode Suppression Ratio	SMSR	30	-	-	dB
Wavelength	$\lambda$	1530	-	1565	nm
Spectral Width	$\Delta\lambda_{20}$	-	-	1	nm
Jitter Generation (peak-to-peak)	J <sub>gen(pk-pk)</sub>	-	-	0.1	UI
Jitter Generation (RMS)	J <sub>gen(RMS)</sub>	-	-	0.01	UI
Dispersion Penalty at 800 ps/nm	DP	-	-	2	dB
Relative Intensity Noise	RIN	-	-	-130	dB/Hz
Reflectance Tolerance	ref <sub>T</sub>	-	-	-27	dB

## Transmitter Specifications (Electrical)

Parameter	Symbol	Min	Typical	Max	Unit
Input Differential Impedance	R <sub>in</sub>	-	100	-	$\Omega$
Differential Data Input Swing	V <sub>in,p-p</sub>	120	-	820	mV
TxDisable_Disable	V <sub>d</sub>	2	-	V <sub>cc3</sub>	V
TxDisable_Enable	V <sub>en</sub>	GND	-	GND + 0.8	V

## Receiver Specifications (Optical)

Parameter	Symbol	Min	Typical	Max	Unit
Sensitivity (9.95Gb/s) <sup>a</sup>	R <sub>X_sens995</sub>	-	-	-16	dBm
Sensitivity (10.7Gb/s) <sup>a</sup>	R <sub>X_sens1070</sub>	-	-	-15	dBm
Overload <sup>a</sup>	R <sub>X_OL</sub>	0	-	-	dBm
Wavelength <sup>b</sup>	$\lambda$	1528	-	1565	nm
Optical Return Loss	ORL	-	-	-27	dB
LOS Assert	-	-24	-	-	dBm
LOS De-assert	-	-	-	-16	dBm
LOS Hysteresis	-	0.5	-	-	dB

a) At 8.2dB ER, 1E-12 BER, 2<sup>31</sup>-1 PRBS, back to back

b) Operational over 1200 - 1625nm range

## Receiver Specifications (Electrical)

Parameter	Symbol	Min	Typical	Max	Unit
Reference Differential Output Impedance	Z <sub>d</sub>	-	100	-	$\Omega$
Differential Data Output Swing	V <sub>out,p-p</sub>	340	-	850	mV
Output Rise Time, 20-80%	t <sub>r</sub>	24	-	-	ps
Output Fall Time, 20-80%	t <sub>f</sub>	24	-	-	ps
LOS Fault	V <sub>LOS_fault</sub>	host_Vcc3 - 0.5	-	host_Vcc3	V
LOS Normal	V <sub>LOS_normal</sub>	GND	-	GND + 0.4	V

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## Reference Clock

Parameter	Symbol	Min	Typical	Max	Unit
Clock Differential Input Impedance	Z <sub>d</sub>	80	100	120	Ω
Differential Input Clock Amplitude (p-p)		640	-	1600	mV
Reference Clock Duty Cycle		40	-	60	%
Reference Clock Rise/Fall Time (20%-80%)	T <sub>r</sub> /T <sub>f</sub>	200	-	1250	ps
Reference Clock Frequency	f <sub>0</sub>	-	Baud/64	-	MHz

## Pin Out Definition

Pin	Logic	Symbol	Name/Description	Note
1		GND	Module Ground	1
2		VEE5	Optional -5.2V Power Supply (not used)	
3	LVTTTL-I	Mod_DeSel	Module De-select; When held low allows module to respond to 2-wire interface	
4	LVTTTL-O	Interrupt	Interrupt; Indicates presence of an important condition which can be read over the 2-wire serial interface	2
5	LVTTTL-I	TX_DIS	Transmitter Disable; Turns off transmitter laser output	
6		Vcc5	+5V Power Supply	
7		GND	Module Ground	1
8		Vcc3	+3.3V Power Supply	
9		Vcc3	+3.3V Power Supply	
10	LVTTTL-I/O	SCL	2-Wire Serial Interface Clock	2
11	LVTTTL-I/O	SDA	2-Wire Serial Interface Data Line	2
12	LVTTTL-O	Mod_Abs	Indicates Module is not present. Grounded in the Module	2
13	LVTTTL-O	Mod_NR	Module Not Ready; Indicating Module Operational Fault	2
14	LVTTTL-O	RX_LOS	Receiver Loss Of Signal Indicator	2
15		GND	Module Ground	1
16		GND	Module Ground	1
17	CML-O	RD-	Receiver Inverted Data Output	
18	CML-O	RD+	Receiver Non-Inverted Data Output	
19		GND	Module Ground	1
20		Vcc2	+1.8V Power Supply	
21	LVTTTL-I	P_Down/RST	Power Down; When high, requires the module to limit power consumption to 1.5W or below. 2-Wire serial interface must be functional in the low power mode. Reset; The falling edge initiates a complete reset of the module including the 2-wire serial interface, equivalent to a power cycle.	
22		Vcc2	+1.8V Power Supply	
23		GND	Module Ground	1
24	PECL-I	RefCLK+	Reference Clock Non-Inverted Input, AC coupled on the host board	
25	PECL-I	RefCLK-	Reference Clock Inverted Input, AC coupled on the host board	
26		GND	Module Ground	1
27		GND	Module Ground	1
28	CML-I	TD-	Transmitter Inverted Data Input	
29	CML-I	TD+	Transmitter Non-Inverted Data Input	
30		GND	Module Ground	1

## Notes:

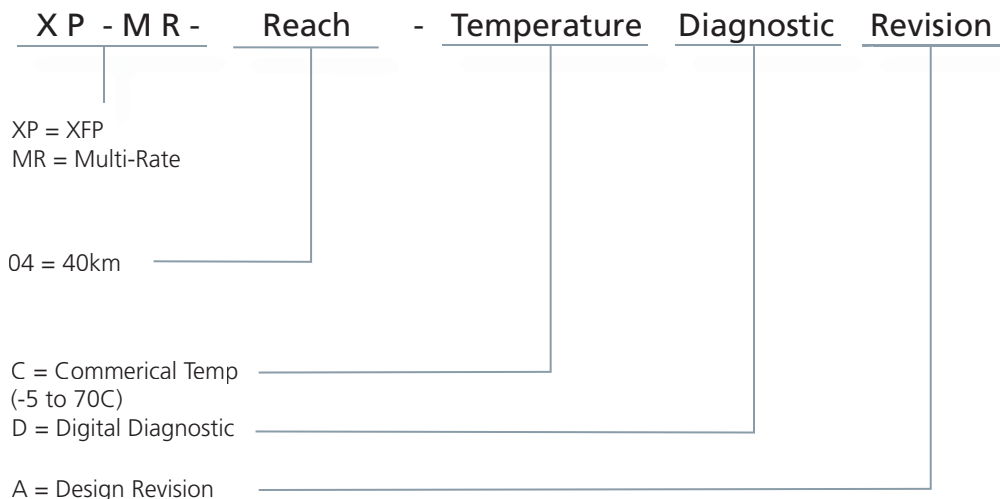
1. Module ground pins GND are isolated from the module case and chassis ground within the module.
2. Shall be pulled up with 4.7k-10kohms to a voltage between 3.15V and 3.45V on the host board.



XP-MR-04-CDA

Ordering Information

Part Numbering Definition:



Warnings

**Handling Precautions:** This device is susceptible to damage as a result of electrostatic discharge (ESD). A static free environment is highly recommended. Follow guidelines according to proper ESD procedures.

**Laser Safety:** Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure to direct or indirect radiation.

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