



Features

- Support 40GBASE-LR4 application
- Up to 10km transmission on SMF
- CWDM DFB laser and PIN receiver
- high speed I/O electrical interface
- MDIO interface with integrated Digital Diagnostic monitoring
- CFP MSA package with duplex LC connector
- Single +3.3V power supply
- Power consumption less than 7 W
- Operating case temperature: -5~+70°C
- RoHS compliant with lead free soldering

Absolute Maximum Ratings

Table 1 - Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Storage Temperature	T_S	-40	-	+85	°C	
Supply Voltage	V_{CC}	-0.5	-	+4.0	V	
Operating Relative Humidity	RH	-	-	+85	%	

Recommended Operating Conditions

Table 2 – Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Operating Case Temperature	T_C	-5	-	+70	°C	
Power Supply Voltage	V_{CC}	3.14	3.3	3.46	V	
Power Supply Current	I_{CC}	-	-	2	A	
Power Dissipation	P_D	-	-	7.0	W	
Aggregate Bit Rate	BR_{AVE}	39.81	-	44.58	Gbps	
Lane Bit Rate	BR_{LANE}	9.95	-	11.16	Gbps	
Transmission Distance	TD	2	-	10,000	m	1

Note 1: Measured with SMF.

Optical Characteristics

Table 3 – Optical Characteristics

Transmitter						
Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Center Wavelength Range Lane 0	λ_{C0}	1264.5	1271	1277.5	nm	
Center Wavelength Range Lane 1	λ_{C1}	1284.5	1291	1297.5	nm	
Center Wavelength Range Lane 2	λ_{C2}	1304.5	1311	1317.5	nm	
Center Wavelength Range Lane 3	λ_{C3}	1324.5	1331	1337.5	nm	
Total Launch Output Power	P_{TOT}	-	-	8.3	dBm	1
Average Launch Power per Lane	PTX_AVE_LANE	-	-	2.3	dBm	
Optical Modulation Amplitude per Lane	OMA	-4	-	-	dBm	1
Optical Modulation Amplitude–TDP per Lane	OMA_TDP	-4.8	-	-	dBm	
Average Output Power (Laser Off)	$P_{OUT-OFF}$	-	-	-30	dBm	1
Side Mode Suppression Ratio	SMSR	30	-	-	dB	
Extinction Ratio	ER	3.5	-	-	dB	2
Transmitter and Dispersion Penalty	TDP	-	-	2.3	dB	
Optical Return Loss Tolerance	ORLT	-	-	12	dB	
Optical Eye Mask	Compliant with IEEE 802.3ba-2010					2
Receiver						
Center Wavelength Range Lane 0	λ_{C0}	1264.5	1271	1277.5	nm	
Center Wavelength Range Lane 1	λ_{C1}	1284.5	1291	1297.5	nm	
Center Wavelength Range Lane 2	λ_{C2}	1304.5	1311	1317.5	nm	
Center Wavelength Range Lane 3	λ_{C3}	1324.5	1331	1337.5	nm	
Average Rx Power per Lane	PRX_AVE_LANE	-13.7		2.3	dBm	
Rx Sensitivity in OMA per Lane	$P_{IN-SENS_OMA_LANE}$	-	-	-11.5	dBm	3
Stress Rx Sensitivity in OMA per Lane	$P_{IN-SENS_STRESS_OMA_LANE}$	-	-	-9.9	dBm	3
Receiver Overload	P_{IN-OL}	2.3	-	-	dBm	3
Optical Return Loss	Ref	-	-	-26	dB	
LOS Assert per lane	LOS_A	-25	-	-	dBm	
LOS Hysteresis	LOS_H	0.5	-	2.0	dB	

Notes:

1. The optical power is launched into SMF.
2. Measured with a PRBS 2³¹-1 test pattern @10.3125Gbps.
3. Measured with a PRBS 2³¹-1 test pattern @10.3125Gbps, BER≤10⁻¹².

Electrical Characteristics

Table 4 – Electrical Characteristics

Transmitter							
Parameter	Symbol	Min.	Typical	Max.	Unit	Notes	
Differential Data Input Amplitude	$V_{IN,P-P}$	400	-	1000	mVpp		
Input Differential Impedance	Z_{IN}	80	100	120	Ω		
Tx_Fault	Normal Operation	V_{OL}	-0.3	-	0.4	V	
	Transmitter Fault	V_{OH}	2.4	-	V_{CC}	V	
Tx_Disable	Normal Operation	V_{IL}	-0.3	-	0.8	V	
	Laser Disable	V_{IH}	2.0	-	$V_{CC}+0.3$	V	
Receiver							
Differential Data Output Amplitude	$V_{OUT,P-P}$	200	-	1600	mVpp		
Output Differential Impedance	Z_O	80	100	120	Ω		
Output Rise/Fall Time, 10%~90%	T_R	30	-	-	ps		
Rx_LOS	Normal Operation	V_{OL}	-0.3	-	0.4	V	
	Lose Signal	V_{OH}	2.4	-	V_{CC}	V	

Pin Definitions

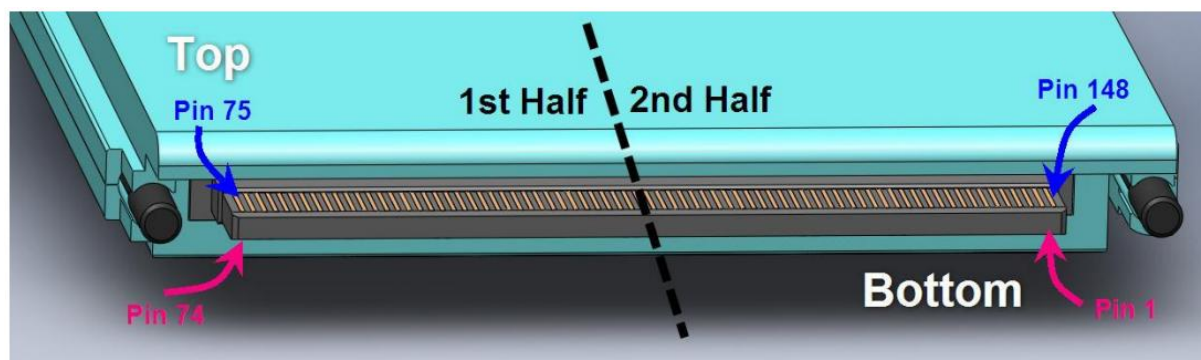

Figure 1, Pin View

Table 5–Pin Function Definitions

	Top Row (2nd Half)		Bottom Row (2nd Half)		Top Row (1st Half)		Bottom Row (1st Half)
148	GND	1	3.3V_GND	111	GND	38	MOD_ABS
147	REFCLKn	2	3.3V_GND	110	(S1_RX_MCLKn)	39	MOD_RSTn
146	REFCLKp	3	3.3V_GND	109	(S1_RX_MCLKp)	40	RX_LOS
145	GND	4	3.3V_GND	108	GND	41	GLB_ALRMn
144	(S1_REFCLKn)	5	3.3V_GND	107	N.C.	42	PRTADR4
143	(S1_REFCLKp)	6	3.3V	106	N.C.	43	PRTADR3
142	GND	7	3.3V	105	GND	44	PRTADR2
141	N.C.	8	3.3V	104	(S1_RX3n)	45	PRTADR1
140	N.C.	9	3.3V	103	(S1_RX3p)	46	PRTADR0
139	GND	10	3.3V	102	GND	47	MDIO
138	(S1_TX3n)	11	3.3V	101	(S1_RX2n)	48	MDC
137	(S1_TX3p)	12	3.3V	100	(S1_RX2p)	49	GND
136	GND	13	3.3V	99	GND	50	VND_IO_F
135	(S1_TX2n)	14	3.3V	98	(S1_RX1n)	51	VND_IO_G
134	(S1_TX2p)	15	3.3V	97	(S1_RX1p)	52	GND
133	GND	16	3.3V_GND	96	GND	53	VND_IO_H
132	(S1_TX1n)	17	3.3V_GND	95	(S1_RX0n)	54	VND_IO_J
131	(S1_TX1p)	18	3.3V_GND	94	(S1_RX0p)	55	3.3V_GND
130	GND	19	3.3V_GND	93	GND	56	3.3V_GND
129	(S1_TX0n)	20	3.3V_GND	92	N.C.	57	3.3V_GND
128	(S1_TX0p)	21	VND_IO_A	91	N.C.	58	3.3V_GND
127	GND	22	VND_IO_B	90	GND	59	3.3V_GND
126	N.C.	23	GND	89	RX3n	60	3.3V
125	N.C.	24	(TX_MCLKn)	88	RX3p	61	3.3V
124	GND	25	(TX_MCLKp)	87	GND	62	3.3V
123	TX3n	26	GND	86	RX2n	63	3.3V
122	TX3p	27	VND_IO_C	85	RX2p	64	3.3V
121	GND	28	VND_IO_D	84	GND	65	3.3V
120	TX2n	29	VND_IO_E	83	RX1n	66	3.3V
119	TX2p	30	PRG_CNTL1	82	RX1p	67	3.3V
118	GND	31	PRG_CNTL2	81	GND	68	3.3V
117	TX1n	32	PRG_CNTL3	80	RX0n	69	3.3V
116	TX1p	33	PRG_ALRM1	79	RX0p	70	3.3V_GND
115	GND	34	PRG_ALRM2	78	GND	71	3.3V_GND
114	TX0n	35	PRG_ALRM3	77	(RX_MCLKn)	72	3.3V_GND
113	TX0p	36	TX_DIS	76	(RX_MCLKp)	73	3.3V_GND
112	GND	37	MOD_LOPWR	75	GND	74	3.3V_GND

Mechanical Diagram

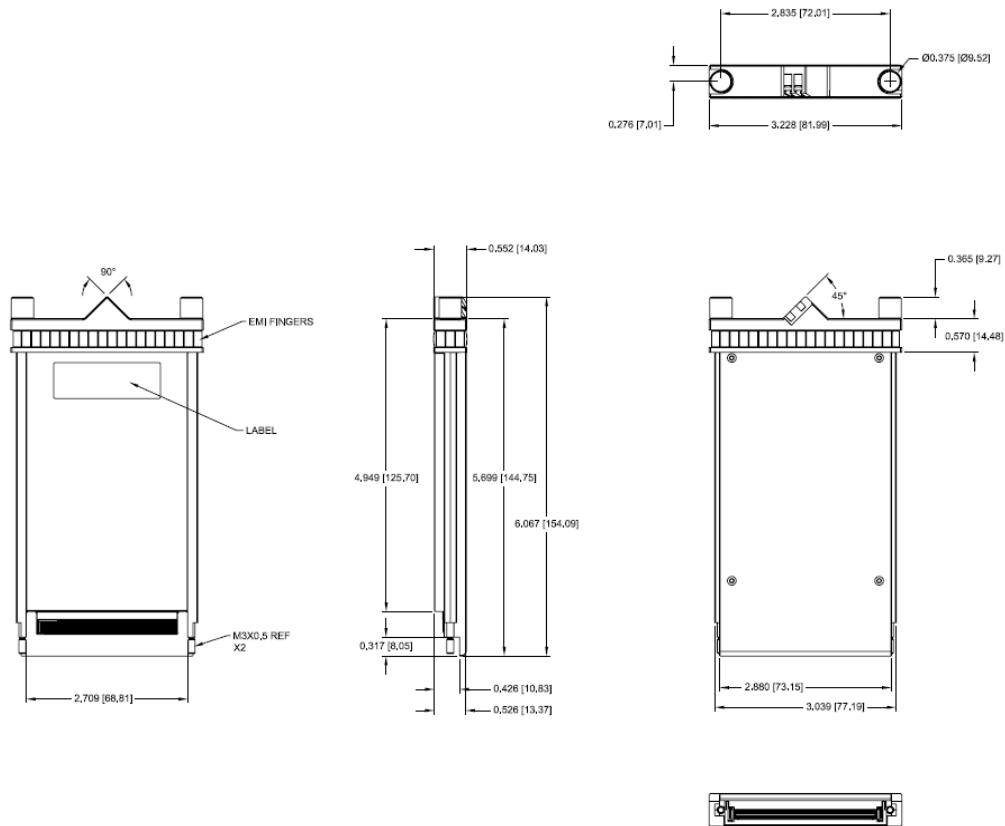


Figure 2, Mechanical Diagram of CFP

Order Information

Table 6 – Order Information

Part No.	Application	Data Rate	Laser Source	Fiber Type
CPC-44-MR-LR-CLFA	40GBASE-LR4	44.58G	CWDM DFB	SMF

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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