CPC-44-MR-LR-CLFA

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)	$P_{0UT-OFF}$	-	-	-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 2^{31}-1 test pattern @10.3125Gbps.
3. Measured with a PRBS 2^{31}-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

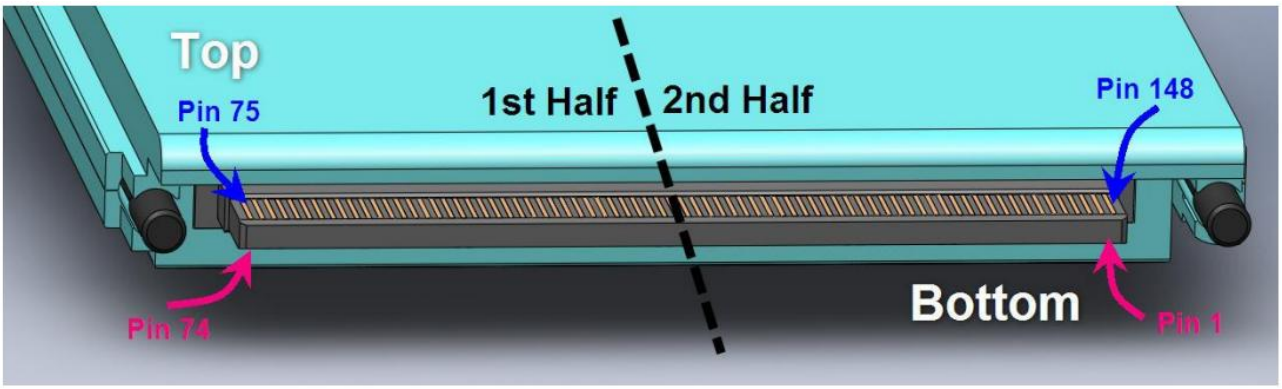

Figure 1, Pin View

Table 5–Pin Function Definitions

	Top Row (2nd Half)		Bottom Row (2nd Half)
148	GND	1	3.3V_GND
147	REFCLKn	2	3.3V_GND
146	REFCLKp	3	3.3V_GND
145	GND	4	3.3V_GND
144	*(S1_REFCLKn)*	5	3.3V_GND
143	*(S1_REFCLKp)*	6	3.3V
142	GND	7	3.3V
141	*N.C.*	8	3.3V
140	*N.C.*	9	3.3V
139	GND	10	3.3V
138	*(S1_TX3n)*	11	3.3V
137	*(S1_TX3p)*	12	3.3V
136	GND	13	3.3V
135	*(S1_TX2n)*	14	3.3V
134	*(S1_TX2p)*	15	3.3V
133	GND	16	3.3V_GND
132	*(S1_TX1n)*	17	3.3V_GND
131	*(S1_TX1p)*	18	3.3V_GND
130	GND	19	3.3V_GND
129	*(S1_TX0n)*	20	3.3V_GND
128	*(S1_TX0p)*	21	VND_IO_A
127	GND	22	VND_IO_B
126	*N.C.*	23	GND
125	*N.C.*	24	*(TX_MCLKn)*
124	GND	25	*(TX_MCLKp)*
123	TX3n	26	GND
122	TX3p	27	VND_IO_C
121	GND	28	VND_IO_D
120	TX2n	29	VND_IO_E
119	TX2p	30	PRG_CNTL1
118	GND	31	PRG_CNTL2
117	TX1n	32	PRG_CNTL3
116	TX1p	33	PRG_ALRM1
115	GND	34	PRG_ALRM2
114	TX0n	35	PRG_ALRM3
113	TX0p	36	TX_DIS
112	GND	37	MOD_LOPWR

	Top Row (1st Half)		Bottom Row (1st Half)
111	GND	38	MOD_ABS
110	*(S1_RX_MCLKn)*	39	MOD_RSTn
109	*(S1_RX_MCLKp)*	40	RX_LOS
108	GND	41	GLB_ALRMn
107	*N.C.*	42	PRTADR4
106	*N.C.*	43	PRTADR3
105	GND	44	PRTADR2
104	*(S1_RX3n)*	45	PRTADR1
103	*(S1_RX3p)*	46	PRTADR0
102	GND	47	MDIO
101	*(S1_RX2n)*	48	MDC
100	*(S1_RX2p)*	49	GND
99	GND	50	VND_IO_F
98	*(S1_RX1n)*	51	VND_IO_G
97	*(S1_RX1p)*	52	GND
96	GND	53	VND_IO_H
95	*(S1_RX0n)*	54	VND_IO_J
94	*(S1_RX0p)*	55	3.3V_GND
93	GND	56	3.3V_GND
92	*N.C.*	57	3.3V_GND
91	*N.C.*	58	3.3V_GND
90	GND	59	3.3V_GND
89	RX3n	60	3.3V
88	RX3p	61	3.3V
87	GND	62	3.3V
86	RX2n	63	3.3V
85	RX2p	64	3.3V
84	GND	65	3.3V
83	RX1n	66	3.3V
82	RX1p	67	3.3V
81	GND	68	3.3V
80	RX0n	69	3.3V
79	RX0p	70	3.3V_GND
78	GND	71	3.3V_GND
77	*(RX_MCLKn)*	72	3.3V_GND
76	*(RX_MCLKp)*	73	3.3V_GND
75	GND	74	3.3V_GND

Mechanical Diagram

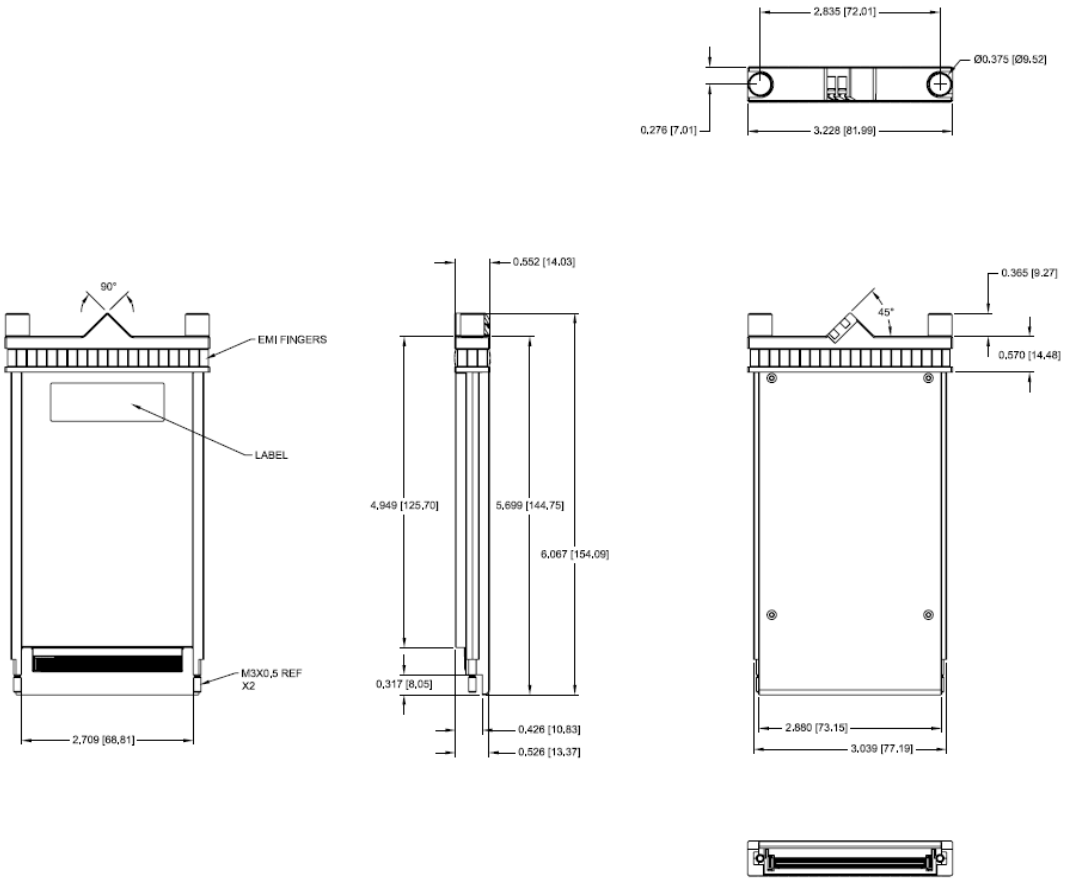

Figure 2, Mechanical Diagram of CFP

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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