

CXP 12x10Gbps Active Optical Cable

AOC-CXP-xxx

Features

- Compliant to InfiniBand Architecture Specification (release 1.3).
- Twelve independent Transmitters, and twelve independent Receivers, all operate at 10Gbps.
- Bi-directional operation, 12 × 10 Gbps per direction.
- Support transmission distance up to 100 meters.
- Backward-compatible with DDR (12 × 5Gbps) and SDR (12 × 2.5Gbps) rates.
- Enabled by 850nm VCSEL.
- Operating case temperature 0°C to 70°C .
- I2C communication bus.
- Hot pluggable.



Applications

- Infiniband QDR (12 x 10Gbps) InterConnect.
- Datacom and Telecom switch or route backplane connection.
- High performance computing InterConnect.

Description

The CXP Active Optical Cable (CXP AOC, Fig 1) is designed to support twelve bi-directional channels, parallel, high-speed for Infiniband quadruple data rate applications. The AOC supports 10Gbps per channel for distances from 2 to 100 meters using laser optimized advance high-performance multimode fiber (OM2+). The CXP form factor complies with the Infiniband Architecture Specifications.

Performance Specifications

Absolute Maximum Ratings

Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. These are absolute stress ratings only. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of the data sheet. Exposure to absolute maximum ratings for extended periods can adversely affect device reliability.

Table.1 Absolute maximum ratings

Parameter	Symbol	Min	Max	Unit	Remark
Storage Temperature	Ts	-20	+85	°C	For Plenum cable
Storage Relative Humidity	RH		85		
Supply Voltage	Vcc	-0.3	+3.6	V	
Supply Current	Icc	700	1500	mA	Depend on output amplitude level
ESD (HBM)		-2000	+2000	V	
Maximum Power Consumption	P(max)	2.2	5.1	W	Depend on output amplitude level
Transmitter single end Input Voltage	Vin p-p	75	800	mVpp	

Recommended Operating Conditions

Table.2 Recommended Operating Conditions

Parameter	Symbol	Min	Typ.	Max	Unit
Operating Temperature	Tc	0		+70	deg.C
Supply Voltage	Vcc	3.13	3.3	3.47	V
Power Supply Noise Tolerance				200	mVpp
Bit Rate pre lane	BR	-	10.3125	-	Gbps
Rate Tolerance		-100	-	+100	ppm

Electrical Interface

Table.3 Electrical Input Specification

Parameter	Min	Typ.	Max	Unit	Remark
Single ended input voltage tolerance	-0.3		4	V	
AC common mode input voltage tolerance			15	mVrms	
JD1 Deterministic Jitter			0.15	UI	
JT1 Total Jitter			0.30	UI	
DDPWS			0.07	UI	
Eye mask coordinate: X, Y1, Y2		0.15, 250, 600		UI mV,diff	Hit ratio=5x10-5

Table.4 Electrical Output Specification

Parameter	Min	Typ.	Max	Unit	Remark
Single ended input voltage tolerance	-0.3		4	V	
AC common mode input voltage tolerance			7.5	mVrms	
JD1 Deterministic Jitter			0.40	UI	only J2 was confirmed <0.42 UI
JT1 Total Jitter			0.72	UI	only J2 was confirmed <0.42 UI
Output transition time, 20% to 80	28		-	ps	
Eye mask coordinate: X, Y1, Y2		0.36, 100, 600		UI mV, diff	Hit ratio=5x10-5

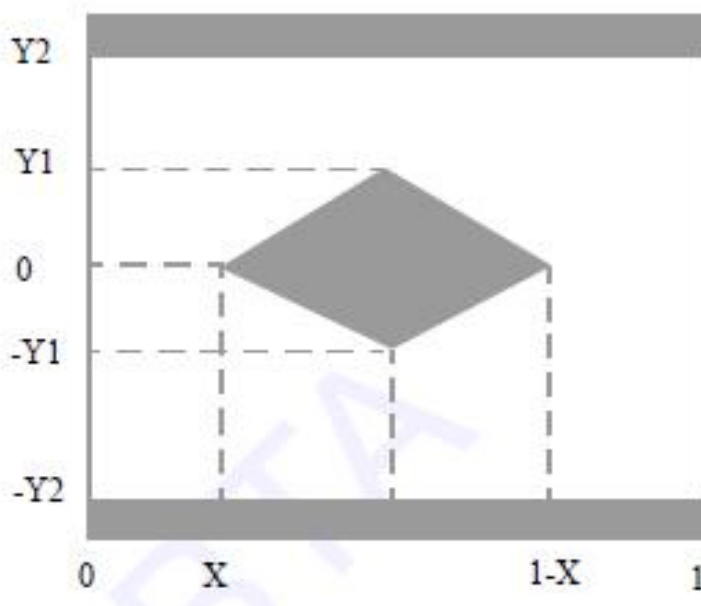
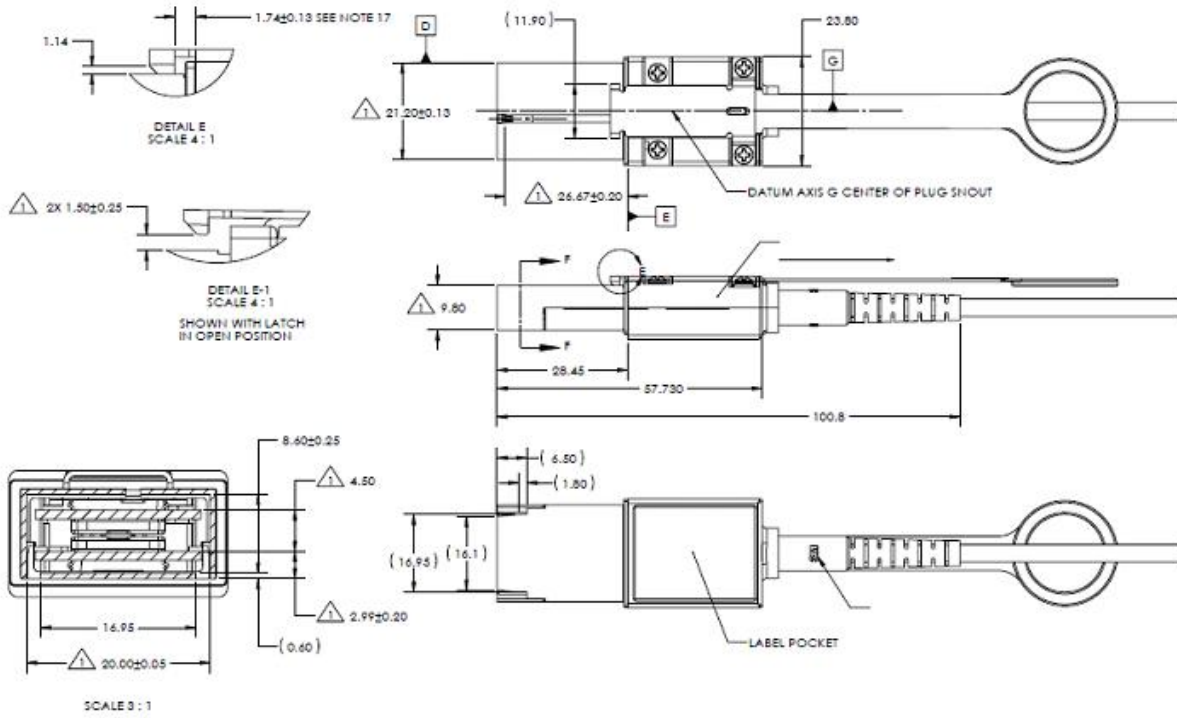


Fig 1. Eye mask for electrical signal

Table.5 Cable Specification

Parameter	Value	Remark
Type	OM2 Multimode Fiber , loose tube fiber	
Minimum Bend radius (mm)	30	
Cable diameter (mm)	3.8 0.15	
Cable length (m)	5, 10, 20, 30, 50,100	Custom-build cable length

Outline dimension



Note: all dimension in millimeters which are nominal and are subject to change.

Fig 2. CXP Mechanical dimension

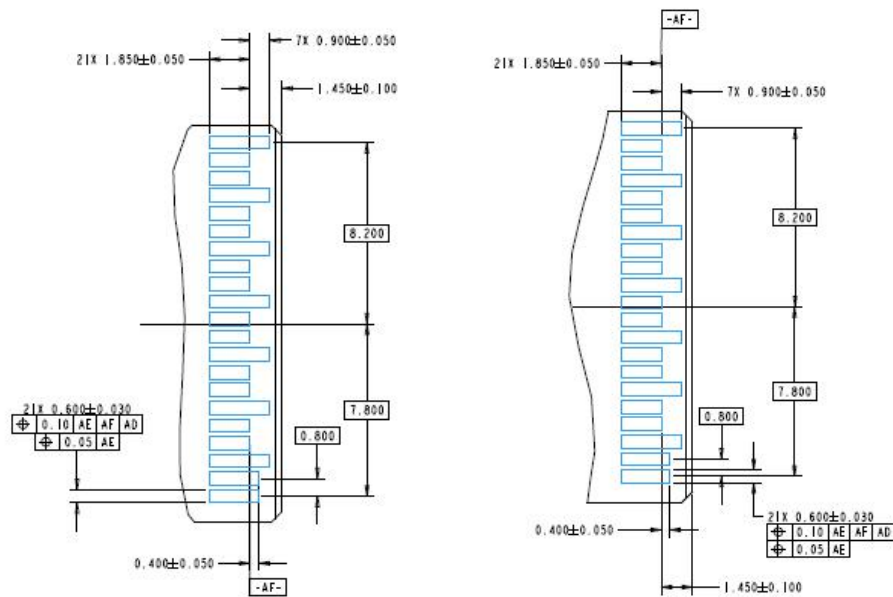


Fig 3. PCB Contacts (left: bottom PCB, right: top PCB)

RELIABILITY TESTS

10Gtek CXP AOC has completed and passes the following environmental reliability standards.

<ul style="list-style-type: none"> High Temperature Operating Life (GR-468-CORE) 	Tcase=+70°C, Vcc=3.3V.
<ul style="list-style-type: none"> Biased Damp Heat (MIL-STD-202 Method 103). 	Tcase=+70°C, RH=85%, Vcc=3.3Vs
<ul style="list-style-type: none"> Temperature Cycling (MIL-STD-883 Method 1010) 	Ta=0°C to 70°C
<ul style="list-style-type: none"> Biased Cyclic Moisture Resistance (MIL-STD-883 Method 1004) 	Ta=0°C to 70°C, biased (Vcc=3.3V), power on/off @ 30mins, 95%RH
<ul style="list-style-type: none"> Thermal Shock (MIL-STD-883 Method 1011.9) 	Ta=0°C to 70°C
<ul style="list-style-type: none"> Mechanical Shock (MIL-STD-883 Method 2002B) 	1500g, 0.5ms, 5shock/axis, 6axis
<ul style="list-style-type: none"> Mechanical Vibration (MIL-STD-883 Method 2007) 	20g, 20 to 2000Hz, 3axis, 4min/cycle, 4cycle/axis
<ul style="list-style-type: none"> ESD 	HBM – 2000V (JESD22-A114-B) Air Discharge -15kV air charge during operation (EN61000-4-2) ESD contact discharge - 8kV direct contact to the case (EN61000-4-2)
<ul style="list-style-type: none"> Durability (EIA-364-09C) 	Optical Mate/DeMate for 300 Insertions
<ul style="list-style-type: none"> Insertion Force (EIA/ECA-364-23D) 	Max insertion force: 40N. 50 insertion/withdraw cycles
<ul style="list-style-type: none"> Withdraw Force (EIA/ECA-364-23D) 	Max insertion force: 30N. 50 insertion/withdraw cycles
<ul style="list-style-type: none"> EMI 	RE (FCC part 15 class B) RS (IEC 61000 4-3)
<ul style="list-style-type: none"> Pull & Off-Axis test 	

Order Information

Part Number	Pigtail Length	Package style	Data Rate (Gb/s)	Temperature range
AOC-CXP-003	003:3m	CXP	120G	0~70°C
AOC-CXP-005	005:5m	CXP	120G	0~70°C
AOC-CXP-020	020:20m	CXP	120G	0~70°C
AOC-CXP-030	030:30m	CXP	120G	0~70°C
AOC-CXP-050	050:50m	CXP	120G	0~70°C
AOC-CXP-100	100:100m	CXP	120G	0~70°C

Revision History

Revision	Initiated	Approved	content	Release Date
Ver1.0	Jacky	Nicky	Released	Dec/2016
Ver1.1	HT.HUANG	Nicky	Released	Aug/2017

Further Information

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