



PARALIGHT Active Optical Cable Assemblies

PARALIGHT ACTIVE OPTICAL CABLE ASSEMBLIES FOR HIGH SPEED INTERCONNECTS

Product Facts

- 4 transmit and 4 receive channels at 5 Gb/s and 10 Gb/s per channel
- Industry standard (SFF-8470) electrical connector (aka InfiniBand 4X, IB 4X, CX4*, Fibre Channel) and QSFP Connector
- Internally terminated optics — no optical connector to clean
- Differential data I/O per InfiniBand version 1.2.1
- Asynchronous, internally AC coupled inputs and outputs
- Passively cooled design — low thermal resistance heat path from chip to connector shell
- Small diameter cable (3.0mm)
- Light weight
- Tight bend radius

* CX4 available in 5 Gb/s only.

Tyco Electronics' PARALIGHT active optical cable assemblies use state-of-the-art technology to provide cost effective high data throughput interconnects. The cables incorporate E/O and O/E conversion built into the connector shell to yield a dramatic improvement in PCB real estate utilization.

Using 850 nm VCSEL technology, the 5 Gb/s active cable assemblies will operate over a data rate of 2.5 to 5 Gb/s per lane with an aggregate data rate of 20 Gb/s in each direction. The 10 Gb/s active cable assemblies will operate over a data rate of 2.5 to 10 Gb/s per lane with an aggregate data rate of 40 Gb/s in each direction.

They are available in lengths up to 100 meters using 50 micron fiber. Longer lengths available upon request. The EOE circuitry is designed for use with 8B/10B encoded data streams, such as InfiniBand, Fibre Channel, and XAUI.

QSFP connector style supports connections for an I²C serial interface, which can be used to identify the product and performance capabilities.

Technical Document

Product Specification 108-2330

FOR MORE INFORMATION

Technical Support

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Fibre Channel is a trademark of the Fibre Channel Industry Association.

INFINIBAND is a trademark of the InfiniBand Trade Association.

XAUI is a trademark of the 10Gigabit Ethernet Alliance XAUI Interoperability Group.

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APPLICATIONS

- High Performance Computing Clusters
- Supercomputers
- High End Servers
- Mass Storage
- Metro Network Switch/Cross Connect
- High End Carrier Class Routers
- SDR, QDR and DDR InfiniBand Applications
- Other 2.5–10.0 Gb/s Applications
(e.g. 10 Gb Fibre Channel or 10 Gig Ethernet XAU1 on ports providing InfiniBand pinout 3.3 V power)

MECHANICAL/ENVIRONMENTAL

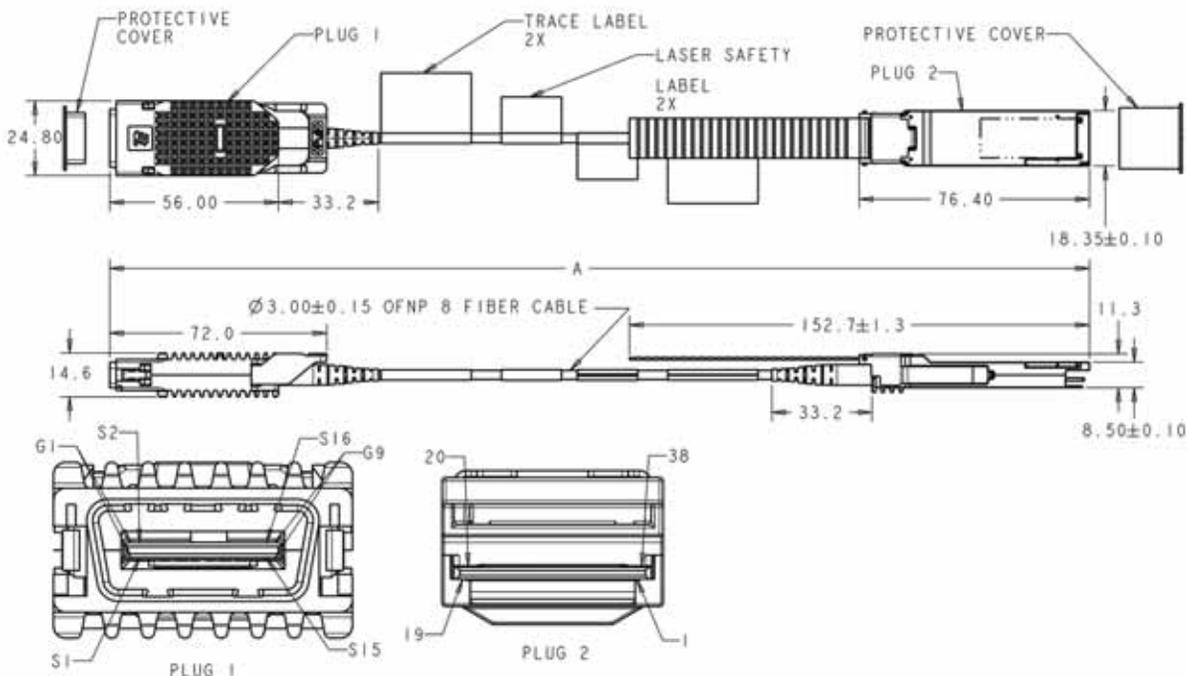
- Up to 100 meters — longer lengths available upon request
- 25 mm bend radius
- Operating Case Temperature 0°C to 70°C
- Storage Temperature -40°C to 85°C

MATERIALS

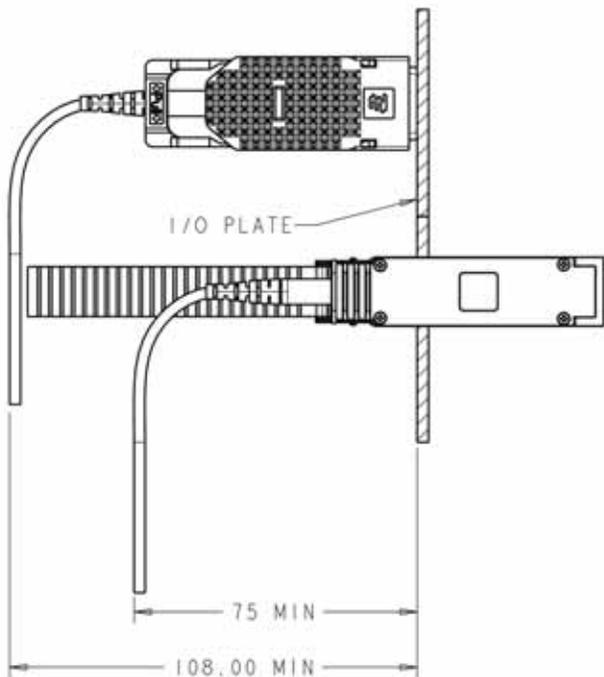
- OFNR/CSA-FT-6 (plenum) cable
- OFN-LS (LSZH rated) cable

PRODUCT DIMENSIONS

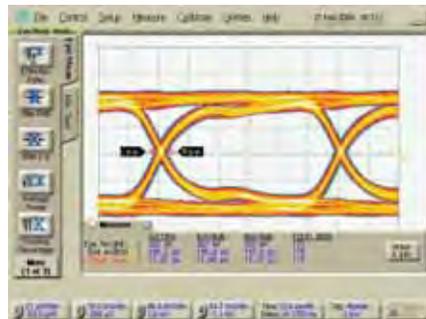
IB 4X to QSFP



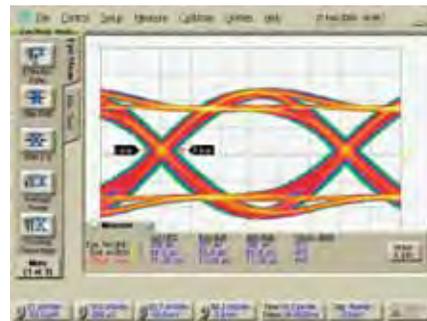
FRONT PANEL DOOR CLEARANCE



TYPICAL 5 Gb/s EYE DIAGRAM (PRBS2⁷-1 WITH CROSSTALK)



TYPICAL 10 Gb/s EYE DIAGRAM (PRBS2⁷-1 WITH CROSSTALK)



5 GB/S PART NUMBERS

Length (meters)	Cable Type	5 GB/S CX4*** Part Numbers	5 GB/S CX4 to QSFP Part Numbers	5 GB/S QSFP Part Numbers	10 GB/S QSFP Part Numbers
2	OFNP**	2064782-1	2064781-1	2064778-1	2064779-1
	LSZH*	2064815-1	2064814-1	2064812-1	2064813-1
3	OFNP**	2064782-2	2064781-2	2064778-2	2064779-2
	LSZH*	2064815-2	2064814-2	2064812-2	2064813-2
5	OFNP**	2064782-3	2064781-3	2064778-3	2064779-3
	LSZH*	2064815-3	2064814-3	2064812-3	2064813-3
10	OFNP**	2064782-4	2064781-4	2064778-4	2064779-4
	LSZH*	2064815-4	2064814-4	2064812-4	2064813-4
15	OFNP**	2064782-5	2064781-5	2064778-5	2064779-5
	LSZH*	2064815-5	2064814-5	2064812-5	2064813-5
20	OFNP**	2064782-6	2064781-6	2064778-6	2064779-6
	LSZH*	2064815-6	2064814-6	2064812-6	2064813-6
25	OFNP**	2064782-7	2064781-7	2064778-7	2064779-7
	LSZH*	2064815-7	2064814-7	2064812-7	2064813-7
30	OFNP**	2064782-8	2064781-8	2064778-8	2064779-8
	LSZH*	2064815-8	2064814-8	2064812-8	2064813-8
40	OFNP**	2064782-9	2064781-9	2064778-9	2064779-9
	LSZH*	2064815-9	2064814-9	2064812-9	2064813-9
50	OFNP**	1-2064782-0	1-2064781-0	1-2064778-0	1-2064779-0
	LSZH*	1-2064815-0	1-2064814-0	1-2064812-0	1-2064813-0
100	OFNP**	1-2064782-1	1-2064781-1	1-2064778-1	1-2064779-1
	LSZH*	1-2064815-1	1-2064814-1	1-2064812-1	1-2064813-1

*LSZH = Low Smoke Zero Halogen

**OFNP = Optical Fiber Nonconductive Plenum

***Also known as CX4 and SFF-8470

Note: Longer lengths available upon request.

Note: All part numbers are RoHS compliant.

5 GB/S SPECIFICATIONS

GENERAL SPECIFICATIONS

Symbol	Parameter	Min.	Typical	Max.	Unit	Notes
	Data Rate/Channel	2.5	—	5	Gb/s	1
Tc	Operating Case Temperature	0	—	70	°C	2
Vcc	Supply Voltage	3.13	3.3	3.47	V	
	Total Power Dissipation	—	1.3	1.5	W	3
	Fiber Core Diameter	—	50	—	μm	

1. Test pattern PRBS 2E7-1
2. Per End
3. Central office environment per GR-468-CORE

TRANSMITTER ELECTRICAL SPECIFICATIONS

Symbol	Parameter	Min.	Typical	Max.	Unit	Notes
	Input Common Mode	0	—	Vcc	V	1
V_diff_IN	Differential data swing	650	—	1600	mVpp	
Rin	Differential Input Impedance	80	100	120	Ω	

1. Internally AC coupled.

RECEIVER ELECTRICAL SPECIFICATIONS

Symbol	Parameter	Min.	Typical	Max.	Unit	Notes
	Output Common Mode	—	—	—	V	1
V_diff_OUT	Differential data swing	200	300	1200	mVpp	
Rout	Differential Output Impedance	—	100	—	Ω	
TJ	Total Jitter (p-p)	—	—	.42	UI	2
ΔT ch-ch	Skew	—	—	200	ps	

1. Internally AC Coupled.
2. Total jitter is specified at a BER of 10⁻¹² using PRBS 2⁷-1.

10 GB/S SPECIFICATIONS

GENERAL SPECIFICATIONS

Symbol	Parameter	Min.	Typical	Max.	Unit	Notes
	Data Rate/Channel	2.5	—	10.0	Gb/s	1
Tc	Operating Case Temperature	0	—	70	°C	2
Vcc	Supply Voltage	3.13	3.3	3.47	V	
	Total Power Dissipation	—	1.5	1.7	W	3
	Fiber Core Diameter	—	50	—	μm	

1. Test pattern PRBS 2E7-1
2. Per End
3. Central office environment per GR-468-CORE

TRANSMITTER ELECTRICAL SPECIFICATIONS

Symbol	Parameter	Min.	Typical	Max.	Unit	Notes
	Input Common Mode	0	—	Vcc	V	1
V_diff_IN	Differential data swing	500	—	1600	mVpp	
Rin	Differential Input Impedance	80	100	120	Ω	

1. Internally AC coupled.

RECEIVER ELECTRICAL SPECIFICATIONS

Symbol	Parameter	Min.	Typical	Max.	Unit	Notes
	Output Common Mode	—	—	—	V	1
V_diff_OUT	Differential data swing	200	300	1200	mVpp	
Rout	Differential Output Impedance	—	100	—	Ω	
TJ	Total Jitter (p-p)	—	—	.42	UI	2
ΔT ch-ch	Skew	—	—	200	ps	

1. Internally AC Coupled.
2. Total jitter is specified at a BER of 10⁻¹² using PRBS 2⁷-1.

MECHANICAL

Symbol	Parameter	Value	Unit	Notes
	Off Axis Load	22.2	N	
	Retention Load	89	N	
	Durability	250	cycles	

REGULATORY INFORMATION

Symbol	Parameter	Compliance
	Preliminary Eye Safety Classification ¹	1M
	Electrostatic Discharge (ESD), human body	JESD22-A114D, Class 1 (1000 volts), human body model.

Optical energy contained within cable.

CAUTION: Do not cut optical cable. Viewing the cut fiber ends, especially with certain optical instruments (for example, eye loupes, magnifiers, and microscopes) may pose an eye hazard.

This product is classified as a Class 1M Laser product in accordance with IEC 60825-1:1993+A1+A2 and complies with 21CFR 1040.10 and 1040.11 except for deviations pursuant to laser notice NO. 50, dated 24-Jun-2007

Note: The TUV Bauartmark does not apply to LSZH assemblies



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- Ability to browse RoHS Compliant Products in our on-line catalog
- Downloadable Technical Data Customer Information Presentation
- More detailed information regarding the definitions used above
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 Dimensions are in millimeters with inches (if shown) in brackets.
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