



PARALIGHT Active Optical Cable Assemblies

PARALIGHT ACTIVE OPTICAL CABLE ASSEMBLIES FOR HIGH SPEED INTERCONNECTS

Product Facts

- 4 transmit and 4 receive channels at up to 5 Gb/s per channel)
- 10 Gb/s available end of 2008
- Industry standard (SFF-8470) electrical connector (aka InfiniBand 4X, IB 4X, CX4, Fibre Channel)
- 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
- Low power consumption — under 1 watt per end
- Small diameter cable (2.9 mm)
- Light weight
- Tight bend radius

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.

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 VCSELS, it can be operated from 2.5 Gb/s to 5 Gb/s per channel with 10 Gb/s per channel available end of 2008. At 5 Gb/s this provides aggregate throughput of 20 Gb/s in each direction. At 10 Gb/s this provides aggregate throughput 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.

3.3 Volt power is supplied through a pin (G8) dedicated for this purpose as described in InfiniBand Specification Version 1.2.1. Pin G7 is the voltage sense pin and is tied internally to ground through a 5K ohm resistor.

**Technical Document
Product Specification**
108-2330

FOR MORE INFORMATION

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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
- DDR InfiniBand Applications (QDR available end of 2008)
- Other 2.5–5.0 Gb/s Applications
(e.g. 10 Gb Fibre Channel or 10 Gig Ethernet XAUI on ports providing InfiniBand pinout 3.3 V power)

ELECTRICAL/OPTICAL

- 20 Gb/s bidirectional —
40 Gb/s future offering (end of 2008)
- Compatible with SDR and DDR (InfiniBand) standards (QDR available end of 2008)
- Low power consumption — under 1 watt per end

MECHANICAL/ENVIRONMENTAL

- Up to 150 meters — longer lengths available upon request
- 25 mm bend radius
- Operating temperature 0°C to 60°C
- Storage Temperature -25°C to 70°C
- 4 channels each direction

MATERIALS

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

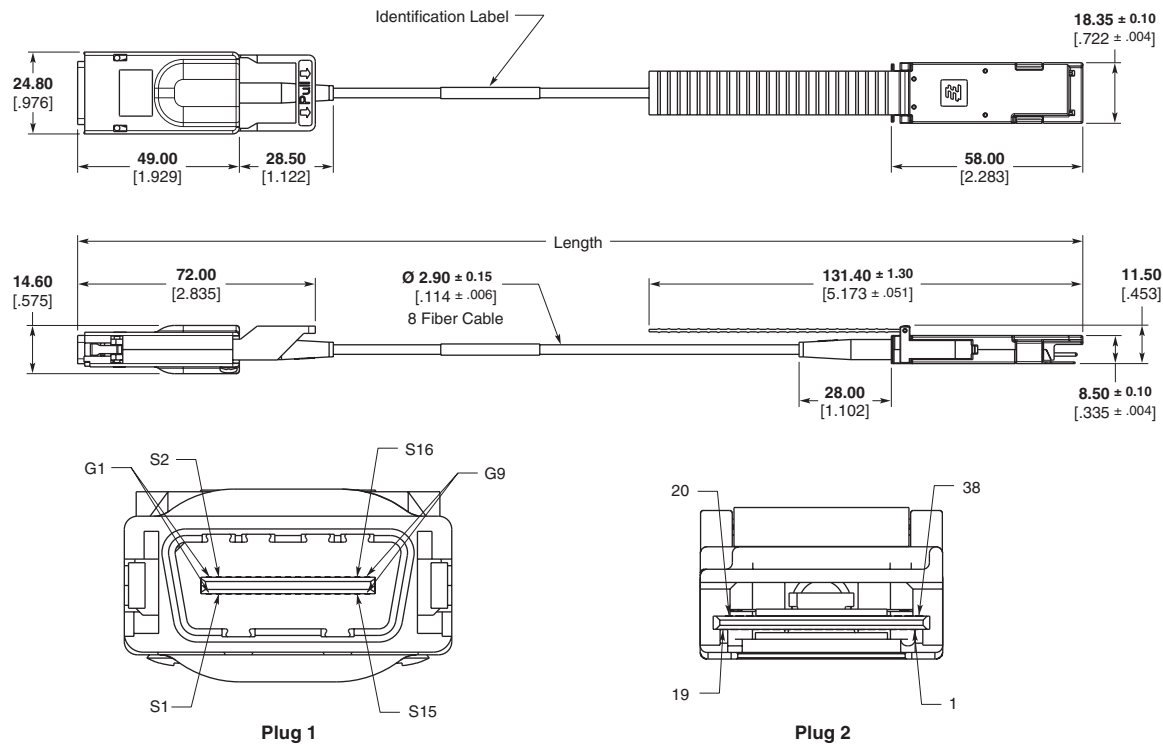
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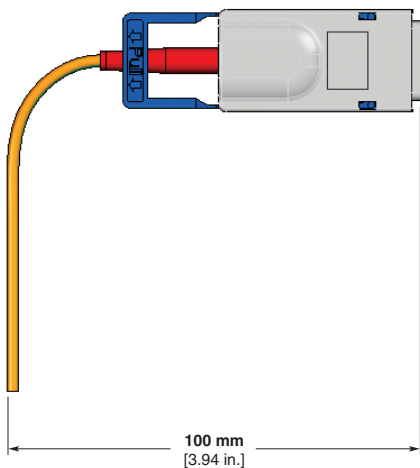
XAUI is a trademark of the 10Gigabit Ethernet Alliance XAUI Interoperability Group.

PRODUCT DIMENSIONS

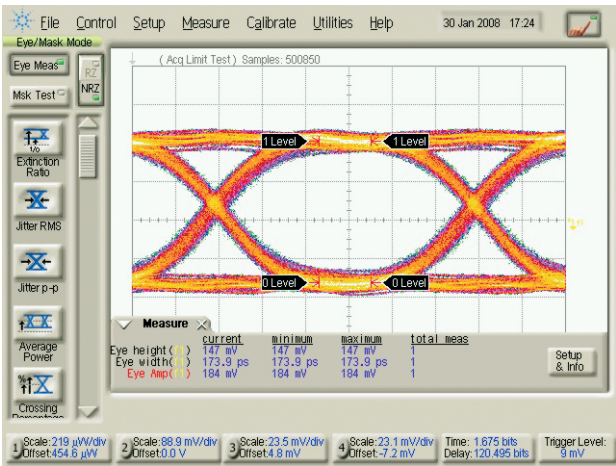
IB 4X to QSFP



FRONT PANEL DOOR CLEARANCE



TYPICAL 5 Gb/s EYE DIAGRAM (PRBS2^7-1 WITH CROSSTALK)



PART NUMBERS

Length (meters)	Cable Type	InfiniBand 4X*** Part Numbers	InfiniBand 4X to QSFP Part Numbers	QSFP to QSFP Part Numbers
2	OFNP**	1985427-9	1985554-9	1985861-9
	LSZH*	1984462-9	2064158-9	2064159-9
3	OFNP**	1985427-1	1985554-1	1985861-1
	LSZH*	1984462-1	2064158-1	2064159-1
5	OFNP**	1985427-2	1985554-2	1985861-2
	LSZH*	1984462-2	2064158-2	2064159-2
10	OFNP**	1985427-3	1985554-3	1985861-3
	LSZH*	1984462-3	2064158-3	2064159-3
15	OFNP**	1-1985427-0	1-1985554-0	1-1985861-0
	LSZH*	1-1984462-0	1-2064158-0	1-2064159-0
20	OFNP**	1985427-4	1985554-4	1985861-4
	LSZH*	1984462-4	2064158-4	2064159-4
30	OFNP**	1985427-5	1985554-5	1985861-5
	LSZH*	1984462-5	2064158-5	2064159-5
40	OFNP**	1985427-6	1985554-6	1985861-6
	LSZH*	1984462-6	2064158-6	2064159-6
50	OFNP**	1985427-7	1985554-7	1985861-7
	LSZH*	1984462-7	2064158-7	2064159-7
100	OFNP**	1985427-8	1985554-8	1985861-8
	LSZH*	1984462-8	2064158-8	2064159-8

*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.

GENERAL SPECIFICATIONS

Symbol	Parameter	Min.	Typical	Max.	Unit	Notes
	Data Rate/Channel	2.5	—	5	Gb/s	1
Tc	Operating Case Temperature	5	—	75	°C	
Vcc	Supply Voltage	3.13	3.3	3.47	V	
	Total Power Dissipation	—	0.8	1.0	W	2
	Fiber Core Diameter	—	50	—	μm	

1. Test pattern PRBS 2E7-1

2. Per End.

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	90	300	1600	mVpp	
Rout	Differential Output Impedance	—	100	—	Ω	
	Output Rise/Fall Time (20-80%)	—	—	120	ps	
TJ	Total Jitter (p-p)	—	—	.4	UI	2
ΔT ch-ch	Skew	—	—	100	ps	

1. Internally AC Coupled.

2. Total jitter is specified at a BER of 10⁻¹² using PRBS 2¹⁷-1.

ENGINEERING NOTES



ENGINEERING NOTES



MECHANICAL

Symbol	Parameter	Value	Unit	Notes
	Side load	75	N	
	Tensile Load	75	N	
	Durability	250	cycles	

REGULATORY INFORMATION

Symbol	Parameter	Compliance
	Preliminary Eye Safety Classification ¹	Not Applicable
	Electrostatic Discharge (ESD), human body	JESD22-A114D, Class 2 (2000 volts), human body model.

1. Optical energy contained with 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.

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NOTE: For purposes of this Document, included within the definition of RoHS Compliant are products that are clearly "Out of Scope" of the RoHS Directive such as hand tools and other non-electrical accessories.

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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
- So whatever your questions when it comes to RoHS, we have the answers at www.tycoelectronics.com/leadfree

RoHS
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Support
Center

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Dimensions are in millimeters with inches (if shown) in brackets.

For more information, contact your Tyco Electronics sales engineer, call 1-800-522-6752, or visit our website at: <http://www.tycoelectronics.com/fiberoptics>. Specifications subject to change.

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