Fiber Optic Products

RoHS Ready

Tyco Electronics

Our commitment. Your advantage.

Introduction

Tyco Electronics' Fiber Optics Business Unit is recognized as the world's preeminent supplier of fiber optic connectors and interconnection devices. We offer an extensive variety of optical connectors, cable assemblies, fiber management systems, and optoelectronic active and passive components — connectivity solutions. With unparalleled, world-class technologies and high quality products, Tyco Electronics demonstrates its commitment to satisfying all types of customers. Our sales service and support is available globally via an extensive network of Tyco Electronics sales engineers, field program managers, and applications engineers.

See inside back cover for Global Contacts and phone numbers.

Restriction on the use of Hazardous Substances (RoHS)

At Tyco Electronics, we're ready to support your RoHS requirements. We've assessed more than 1.5 million end items/components for RoHS compliance, and issued new part numbers where any change was required to eliminate the restricted materials. Part numbers in this catalog are identified as:

RoHS Compliant — Part numbers in this catalog are RoHS Compliant, unless marked otherwise. These products comply with European Union Directive 2002/95/EC as amended 1 January 2006 that restricts the use of lead, mercury, cadmium, hexavalent chromium, PBB, and PBDE in certain electrical and electronic products sold into the EU as of 1 July 2006.

NOTE: For purposes of this Catalog, 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.

Non-RoHS Compliant — These part numbers are identified with a "◆" symbol. These products do not comply with the material restrictions of the European Union Directive 2002/95/EC.

NOTE: Information regarding RoHS compliance is provided based on reasonable inquiry of our suppliers and represents our current actual knowledge based on the information provided by our suppliers. This information is subject to change. For latest compliance status, refer to our website referenced at right.

Getting the Information You Need

Our comprehensive on-line RoHS Customer Support Center provides a forum to answer your questions and support your RoHS needs. A RoHS FAQ (Frequently Asked Questions) is available with links to more detailed information. You can also submit RoHS questions and receive a response within 24 hours during a normal work week. The Support Center also provides:

- Cross-Reference from Non-compliant to Compliant Products
- 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've got the answers at www.tycoelectronics.com/leadfree

RoHS Customer Support Center

Catalog 1307895
Revised 11-07

www.tycoelectronics.com

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Mexico: 01-800-733-8926
C. America: 52-55-1106-0803

South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 31-73-624-6639

WHAT'S NEW IN THIS ISSUE

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Connectors, Adapters, Tooling and Accessories

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Expanded SECURE Connector Product Line Includes MPO and LC Interfaces

Ten variants in ten colors offered in two new interfaces

Tyco Electronics has expanded its SECURE connector product offering to include both MPO and LC interfaces. Through the use of ten different color/key variations, customers operating multiple networks in common areas can physically segregate their network throughout the system, from the backbone to the equipment panel.

Primary colors and keys are available in red, blue, yellow and green, with additional, secondary options for up to ten different color/keying configurations. Only connectors and adapters of the same color will intermate, and no standard product can plug into a secure adapter.

The LC SECURE product is compatible with both jacketed and buffered fiber. It is available in both LIGHTCRIMP PLUS and standard epoxy/polish styles for singlemode and multimode fibers. Each connector features a color-coded key that will only mate with like-colored adapters to minimize connection to the wrong networks. Standard colors include red, blue, green and yellow. An additional six colors are available as needed.

The MPO SECURE products are available in the same colors and are compatible with color-coded MPO SECURE cassettes. Standard MPO SECURE trunk cables are available in fiber counts to 72 fibers. MPO SECURE cassettes are available as twelve or twenty-four fiber assemblies. Cables and cassettes are available with 50 µm, Laser Optimized (10 Gig) and 62.5 µm multimode fiber.

The success of the MT-RJ SECURE product line has fostered growing interest in the SECURE product concept. The addition of the LC and MPO interfaces to the AMP NETCONNECT SECURE product portfolio will allow a wider adoption of the concept and allow more customers to take advantage of the benefits the system offers.

A complete line of connectivity, cable assemblies, and cables are available for MT-RJ SECURE, LC SECURE and MPO SECURE. See pages 9-13 for details.

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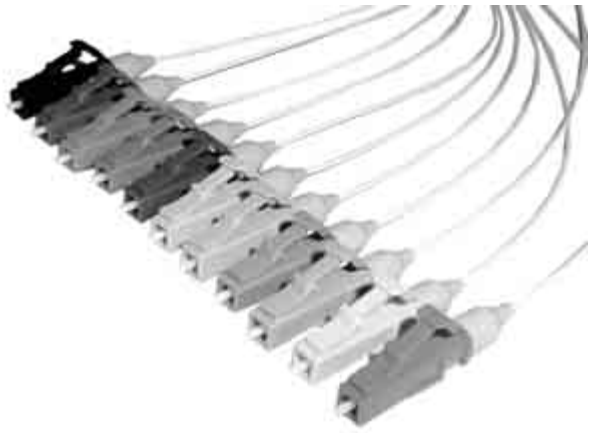
LC SECURE Product Offering

LIGHTCRIMP PLUS and Epoxy Style LC Product Facts

- LIGHTCRIMP PLUS— No Epoxy/No Polish
- Strip, Cleave and Crimp
- LC small form factor design is half the size of SC
- 10 exclusive connector variants
- Color coded plugs & adapters match MT-RJ & MPO SECURE offerings
- LIGHTCRIMP PLUS— Termination to 250 or 900 µm tight-buffered fiber, 1.6–2.0 mm jacketed fiber using standard tooling
- Epoxy Style—Termination to 250 or 900 µm tight-buffered fiber 1.6 – 2.0 mm jacketed fiber
- Epoxy Style—Suitable for use with heat-cured or anaerobic (quick cure) adhesives (See instruction sheet for recommended anaerobic adhesives)
- Product qualification to TIA/EIA 568-B.3
- Field installable duplex clip (black) for polarity correction if needed
- Plug nose features can provide up to 70 mutually exclusive keying combinations
- Distinct keyway geometry on plug nose & color coding assures identifiable key-type
- Extended lugs on plug side-walls prevent SECURE connectors from mating with non-secure adapters
- Molded internal geometry produces tamper resistant system
- Key placement allows SECURE plugs to interface with standard 1.25 mm test equipment, inspection microscopes and application tooling
- Termination kits — same as standard product



LIGHTCRIMP PLUS LC SECURE Kits

Color	Simplex 50/125 MM SECURE	Simplex 50/125 Laser Optimized (10 Gig) MM SECURE	Simplex 62.5/125 MM SECURE	Simplex SM SECURE	Notes
Red	1828853-1	1828854-1	1828855-1	1828856-1	Primary
Yellow	1828853-2	1828854-2	1828855-2	1828856-2	Primary
Green	1828853-3	1828854-3	1828855-3	1828856-3	Primary
Blue	1828853-4	1828854-4	1828855-4	1828856-4	Primary
Rose	1828853-5	1828854-5	1828855-5	1828856-5	
Aqua	1828853-6	1828854-6	1828855-6	1828856-6	
Brown	1828853-7	1828854-7	1828855-7	1828856-7	
Violet	1828853-8	1828854-8	1828855-8	1828856-8	
Orange	1828853-9	1828854-9	1828855-9	1828856-9	
Slate	1-1828853-0	1-1828854-0	1-1828855-0	1-1828856-0	

Highlighted Part Numbers are routinely stocked for shortest lead times.

Epoxy Style LC Kits

Color	Simplex Jumper Multimode	Simplex Buffer Multimode	Simplex Jumper Singlemode	Simplex Buffer Singlemode	Notes
Red	1828078-1	1828861-1	1828079-1	1828862-1	Primary
Yellow	1828078-2	1828861-2	1828079-2	1828862-2	Primary
Green	1828078-3	1828861-3	1828079-3	1828862-3	Primary
Blue	1828078-4	1828861-4	1828079-4	1828862-4	Primary
Rose	1828078-5	1828861-5	1828079-5	1828862-5	
Aqua	1828078-6	1828861-6	1828079-6	1828862-6	
Brown	1828078-7	1828861-7	1828079-7	1828862-7	
Violet	1828078-8	1828861-8	1828079-8	1828862-8	
Orange	1828078-9	1828861-9	1828079-9	1828862-9	
Slate	1-1828078-0	1-1828861-0	1-1828079-0	1-1828862-0	

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Duplex Clip:
Part Number 1754371-1

Note: All part numbers are RoHS compliant.

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LC SECURE Product Offering (Continued)

LC Duplex Adapters Product Facts

- **Flange mount, flangeless, and SL Series for use with AMP NETCONNECT SL panels**
- **High quality ceramic sleeves**
- **Suitable for singlemode and multimode**
- **Key and color compatible to Epoxy Style and LIGHTCRIMP PLUS Product**

LC Duplex Adapters

Color	SECURE Adapter Flanged	SECURE Adapter Flangeless	SECURE Adapter SL	Notes
Red	1828073-1	1828074-1	1828075-1	Primary
Yellow	1828073-2	1828074-2	1828075-2	Primary
Green	1828073-3	1828074-3	1828075-3	Primary
Blue	1828073-4	1828074-4	1828075-4	Primary
Rose	1828073-5	1828074-5	1828075-5	
Aqua	1828073-6	1828074-6	1828075-6	
Brown	1828073-7	1828074-7	1828075-7	
Violet	1828073-8	1828074-8	1828075-8	
Orange	1828073-9	1828074-9	1828075-9	
Slate	1-1828073-0	1-1828074-0	1-1828075-0	

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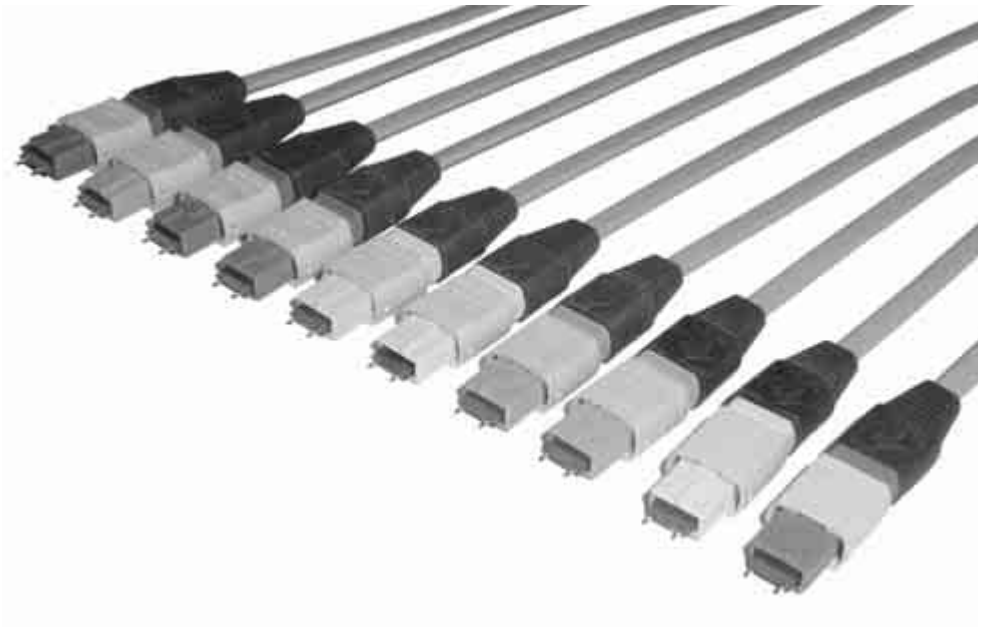
MPO SECURE Fiber Optic Products

MPO SECURE Trunk Cable Assemblies

Product Facts

- Feature color-coded, keyed designs to limit improper connections in segregated or SECURE networks
  - MPO SECURE plug only mates with same color MPO SECURE port
- Trunk cable fiber polarity is pair-flipped (AB/BA)
  - Trunk cables with straight-through polarity (AB/BA) are available
- Pulling socks protect MPO terminations during installation
- Twelve (12) fibers per MPO SECURE plug
- Additional counts and lengths are available
- Trunk cables come pre-tested and ready for immediate use
- MPO SECURE trunk cables are plenum cables
  - Plenum cables can be used in riser spaces
- For use with MPO SECURE Cassettes listed on page 12



Description	Fiber Type	SECURE Color/Keying	Part Number
12-Fiber	50/125 µm Multimode	Red	6754273-X
		Yellow	6754276-X
		Green	6754274-X
		Blue	6754275-X
	Laser Optimized (10 Gig) (850 nm LO 50/125 µm) Multimode	Red	6754420-X
		Yellow	6754421-X
		Green	6754422-X
		Blue	6754423-X
	62.5/125 µm Multimode	Red	6754269-X
		Yellow	6754272-X
		Green	6754270-X
		Blue	6754271-X
24-Fiber	50/125 µm Multimode	Red	6754281-X
		Yellow	6754284-X
		Green	6754282-X
		Blue	6754283-X
	Laser Optimized (10 Gig) (850 nm LO 50/125 µm) Multimode	Red	6754424-X
		Yellow	6754425-X
		Green	6754426-X
		Blue	6754427-X
	62.5/125 µm Multimode	Red	6754277-X
		Yellow	6754280-X
		Green	6754278-X
		Blue	6754279-X

X denotes length in feet: -1 = 10, -2 = 20, -3 = 30, -4 = 40, -5 = 50, -6 = 60, -7 = 70, -8 = 80, -9 = 90, 1- -0 = 100, 1- -1 = 110, 1- -2= 120, 1- -3 = 130, 1- -4 = 140, 1- -5 = 150, 1- -6 = 160, 1- -7 = 170, 1- -8 = 180, 1- -9 = 190, 2- -0 = 200, 2- -1 = 210, 2- -2 = 220, 2- -3 = 230, 2- -4 = 240, 2- -5 = 250, 2- -6 = 260, 2- -7 = 270, 2- -8 = 280, 2- -9 = 290, 3- -0 = 300

Note: All part numbers are RoHS compliant.

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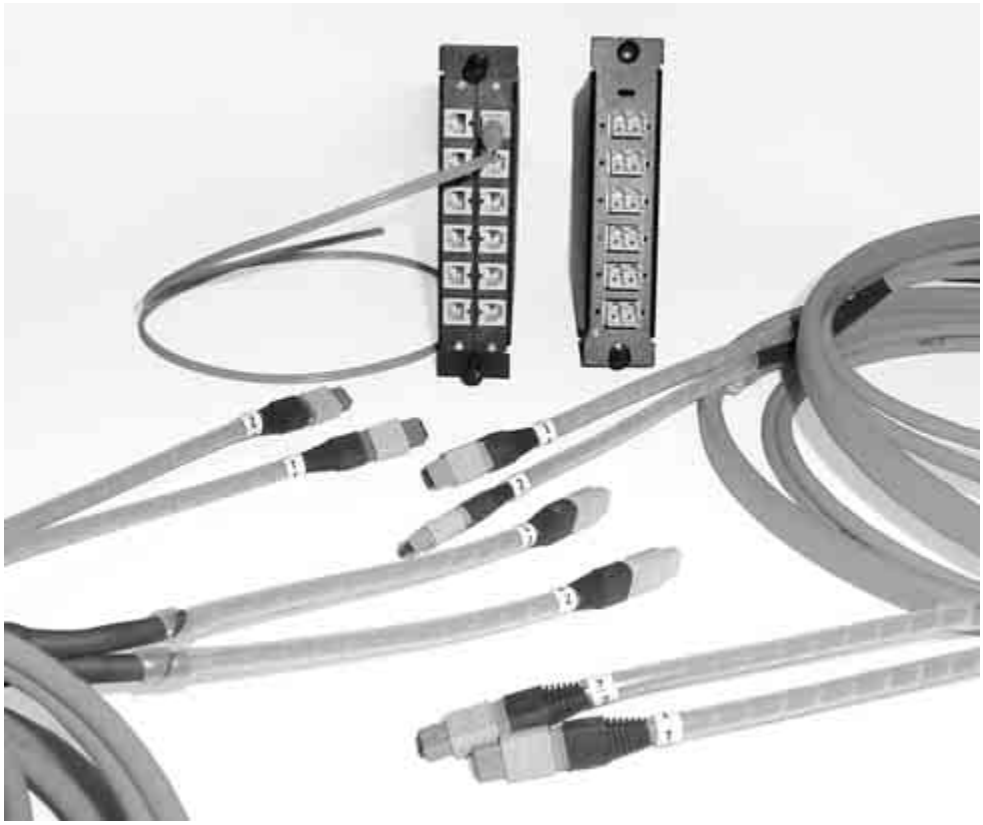
MPO SECURE Fiber Optic Products (Continued)

MPO SECURE Optical Fiber Cassettes

Product Facts

- Cassette fiber polarity is pair-flipped (AB/BA)
  - Cassettes with straight-through polarity (AB/AB) are available
- Cassettes have one MPO connection (12-Fiber) or two MPO connections (24-Fiber) on the back of each cassette
- Cassettes house MPO one or two 12-fiber break-out assemblies
- Cassettes have same footprint as Snap-in Adapter Plates
  - Mount in all AMP NETCONNECT enclosures that accept Snap-in Adapter Plates
- Cassettes come pre-tested and ready for immediate use
- MPO SECURE cassettes accept one or two MPO SECURE connectors and transition to the same color MT-RJ SECURE connectors
- MPO SECURE plug only mates with same color MPO SECURE port
- For use only with MPO SECURE Trunk Cable Assemblies on this page



Description	Fiber Count	Duplex Port Count	Part Number	
			MT-RJ	LC
50/125 µm Multimode	12	6	6754286-X	1918779-X
	24	12	6754288-X	1918780-X
62.5/125 µm Multimode	12	6	6754285-X	1918781-X
	24	12	6754287-X	1918782-X
Laser Optimized (10 Gig)	12	6	1918777-X	1918783-X
	24	12	1918778-X	1918784-X

X denotes color: -1 = Standard; -2 = Red; -3 = Green; -4 = Blue; -5 = Yellow; -6 = Orange; -7 = Brown; -8 = Violet; -9 = Rose; 1- -0 = Slate; 1- -1 = Aqua.

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MT-RJ SECURE Product Expansion — Now 10 Variants of the MT-RJ SECURE Products

In response to several customers, the MT-RJ SECURE product line has been expanded with an additional six color/key versions. In addition to the original four colors (blue, green, red and yellow), the six new colors (brown, rose, aqua, violet, slate and orange) now make for ten variations. In keeping with the MT-RJ SECURE products features, only plugs and jacks of the same color will mate, and none of the MT-RJ SECURE products will mate with the standard versions. A complete line of jacks, cable assemblies and colored cables are available. For more information see pages 73, 74 and 121.

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Rugged Fiber Optic Products

Product Facts

- **Expanded Beam**
  - **PRO BEAM Sr.Connectors**
  - **PRO BEAM Jr.Connectors**
  - **PRO BEAM Mini Connectors**
  - **Mini 38999**
  - **Mini ARINC**
  - **Mini GPRC**
- **LuxCis Optical Termini**
  - **One common terminus for GPRC, 38999, ARINC, Quadrax Cavity Reducers**
- **Sealed Circular LC ODVA Conforming Connector**

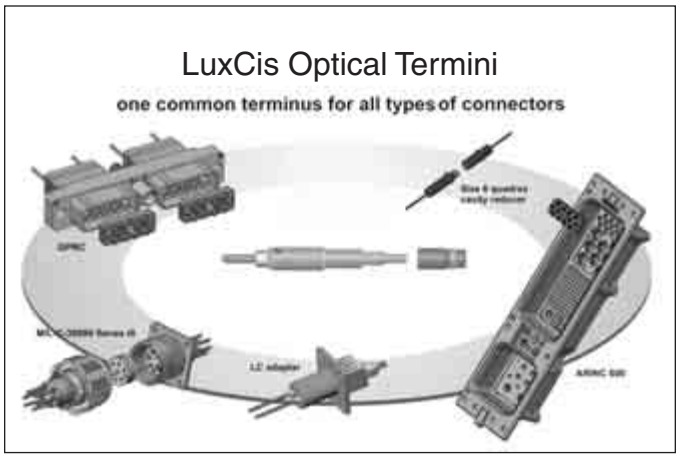
Expanded Beam Products

PRO BEAM Sr., Jr. & Mini Connectors

Tyco Electronics is proud to offer a full rugged fiberoptic product family.

With Tyco Electronics' Expanded Beam, LuxCis Optical Termini, and the Sealed Circular LC ODVA Conforming Connector, the end user is guaranteed a complete choice that meets their cost and optical performance needs in multiple industries.

For specific information, please contact your local Tyco Electronics Sales Representative.



LuxCis Optical Termini

LuxCis is a trademark of Radiall, S.A. Product is manufactured under license from Radiall, S.A.

ASSEMBLY CAPABILITIES
Tyco Electronics has extensive Rugged Optic Harness capabilities. Please consult your local Tyco Electronics Sales Representative for assistance.

Sealed Circular LC ODVA Conforming Connector

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Rugged Fiber Optic Products (Continued)

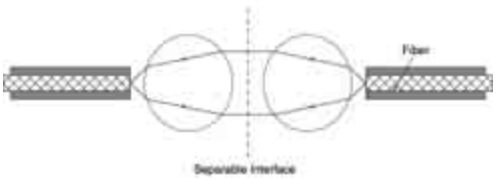
Expanded Beam Products

Product Facts

- PRO BEAM Sr., PRO BEAM Jr. and PRO BEAM Mini Connector field deployable interconnects
- ARINC 600 connectors, with inserts/holder blocks designed for Mini Expanded Beam — up to 128 channels on size 3 ARINC 600
- MIL-C-38999 Series III shell size 11 style circular connectors — Cable assemblies up to 4 fibers
- Unique Modular Design, for use with multimode and singlemode fiber
- Tactical cables, cable reels, backpacks
- Cable assembly and termination services
- Ball lens expands cross-sectional area of light over 200 times for multimode and over 2000 times for singlemode
- Rugged hermaphroditic construction (i.e., same insert mates to each other)
- Physically non-contacting mating conditions; no wear, installed fiber ferrule protected by ball lens

Expanded Beam Technology

From left to right: PRO BEAM Sr., PRO BEAM Jr. & Mini Expanded Beam inserts.



Expanded Beam Principle

Fiber Optic Interconnect/ Cable System using Expanded Beam technology, which physically expands and collimates the transmission signal into an optical beam over 14 times its original diameter (the cross sectional area of the light beam increases over 200 times for multimode optical signals). For singlemode signals, the collimated beam is over 45 times its original diameter (the cross-sectional area of the light beam increases over 2,000 times.). It is then refocused back down onto the core of the receiving fiber. This approach provides ease of alignment and low sensitivity to thermal changes and contamination. High strength, precision connector housings enhance a durable connection, optimizing low loss and repeatable performance. Suitable for aerospace, avionics, field-deployable communications, marine ship-to-shore applications, security systems, mobile diagnostic units, oil and gas exploration and other harsh environment applications demanding strength, durability and reliable performance in conditions of multiple coupling/ decouplings, blindmate situations, and high vibration.

Product Facts

- No wear on fiber optic interface; Very vibration resistant
- Easy to handle, easy to clean. Durable connection that is highly resistant to dirt/debris
- Singlemode or multimode
- Common 850/1300 Dual Wavelength, 1310, or 1550 nm wavelengths
- Easy alignment for low-loss, repeatable performance
- Consistent overall optical "link budget" assured
- Low sensitivity to thermal fluctuations and interface contamination
- Repeatable low-loss performance in harsh environments

ASSEMBLY CAPABILITIES
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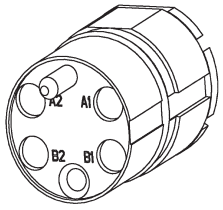
Expanded Beam Inserts



- PRO BEAM Sr. Insert — the original, larger format, Field Tactical, hermaphroditic Connector System
- PRO BEAM Jr. Insert — the second generation, reduced size, Field Tactical Connector System
- Mini Expanded Beam Insert for multi-channel small form factor — the smallest expanded beam multi-channel insert in the industry, a Tyco Electronics exclusive

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Rugged Fiber Optic Products (Continued)

PRO BEAM Jr. Connectors

Performance Specifications

Optical, Multimode Version

Insertion Loss, Typical — 0.7 dB @ 1300 nm*

Optical, Singlemode Version

Insertion Loss, Typical — 0.7 dB @ 1310 nm or 1500 nm*

Return Loss — > 34 dB @ 1310 nm or 1550 nm**

*When tested with reference quality launch/receive cable assemblies

**RL Tested Open Ended

Mechanical

Vibration, Sinusoidal — 10 - 500 Hz, 3 directions; 0.75 mm amplitude @ 10g acceleration

Bump — 4,000 Bumps, 6 directions @ 50g acceleration

Free Fall — 500 falls on concrete; Severity 1.2 m

Coupling Endurance — 3,000 couplings

Weight —
Plug — 123 grams, typical
D-Hole bulkhead — 102 grams, typical

Temperature

Operational Temperature — -40°C/+85°C

Storage Temperature — -55°C/+85°C

Temperature, Cyclic — -55°C/+85°C

Humidity (Damp Heat) —95% RH

Immersion

Water — 15 m depth (plug) - 15 m (Bulkhead)

Material and Finish

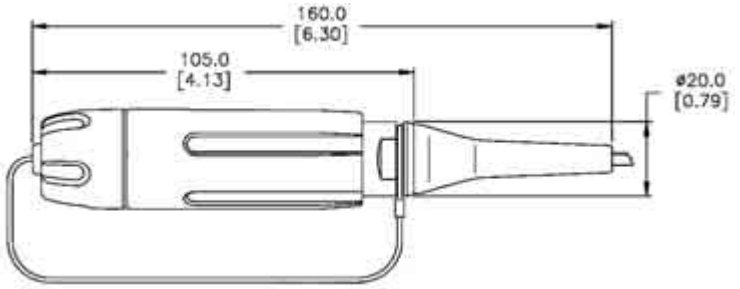
Shell Alloy — Aluminum; or nickel aluminum bronze (high saline environment)

Plating (For Aluminum Shells Only) — clear hard anodized; or green chromate conversion zinc (PRO BEAM Jr. Bulkheads only)

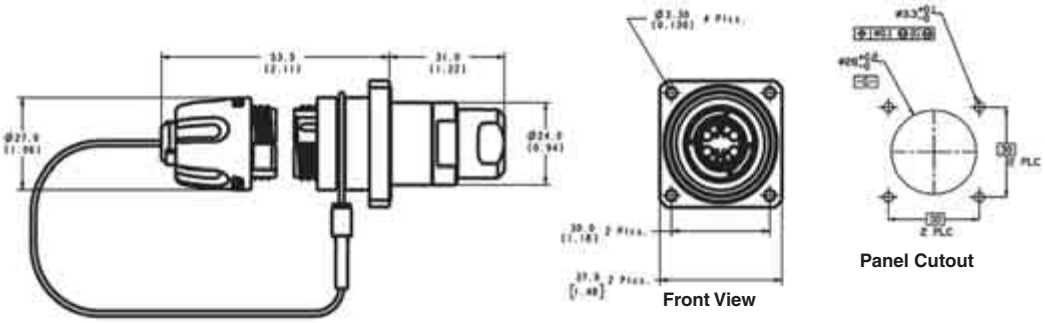
Bulkhead Connector Panel Thicknesses

PRO BEAM Jr. Bulkhead Connector D-Hole — 4 mm max.

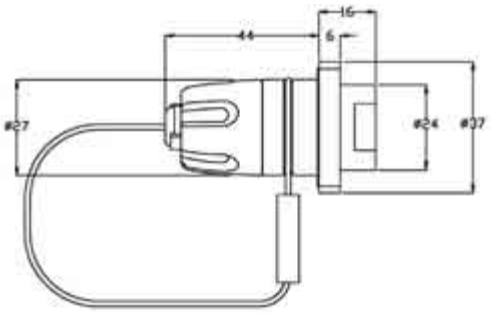
PRO BEAM Jr. Bulkhead Connector Square Flange — 6 mm max.



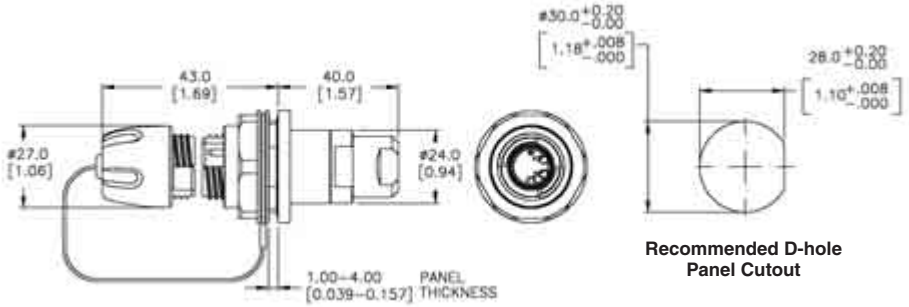
PRO BEAM Jr. Cable Connector, Plug



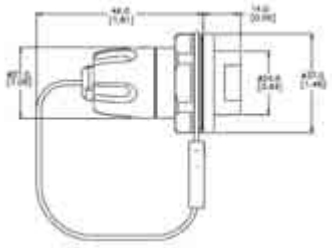
PRO BEAM Jr. Square Flange Mount Bulkhead



PRO BEAM Jr., Low Profile, Square Flange Mount Bulkhead



PRO BEAM Jr. D-Hole Bulkhead, Standard Cable Adapter



PRO BEAM Jr. Low Profile D-Hole Bulkhead

Catalog 1307895
Revised 11-07

www.tycoelectronics.com

Dimensions are in millimeters and inches unless otherwise specified. Values in brackets are standard equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

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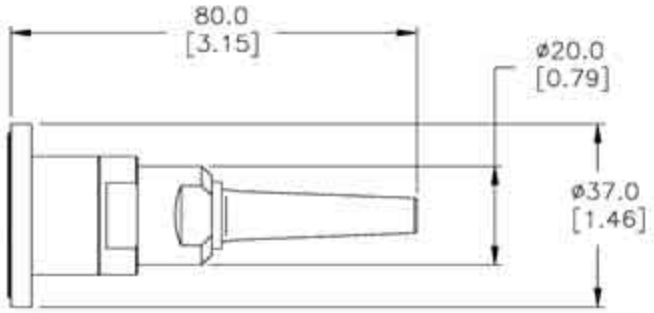
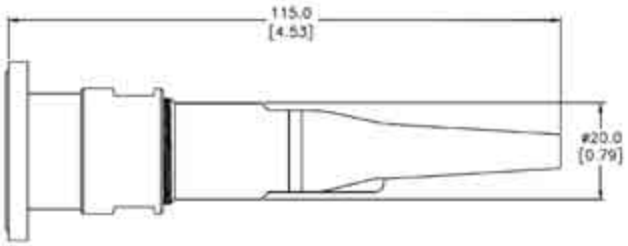
Rugged Fiber Optic Products (Continued)

PRO BEAM Jr. Connectors
(Continued)



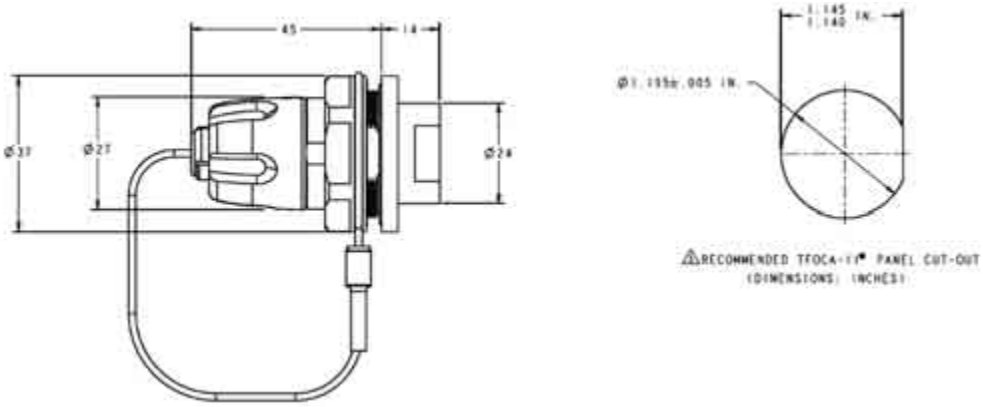
Standard Bulkhead Cable Adapter, with Boot



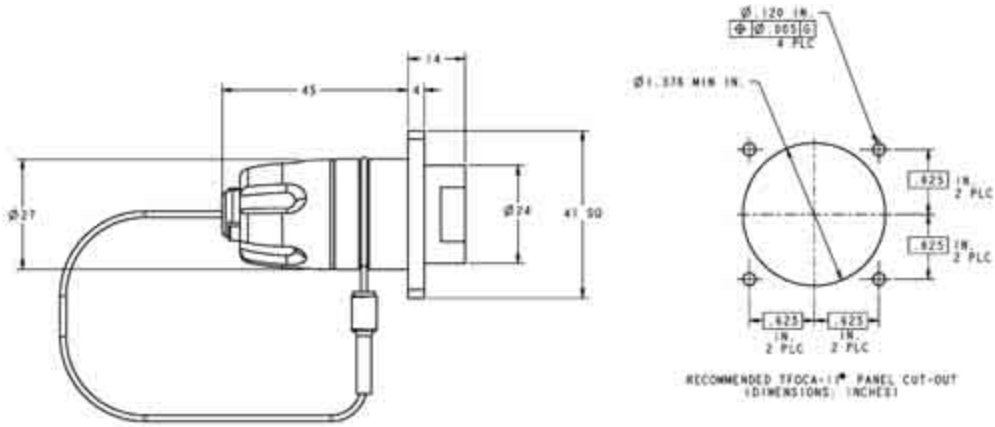
Environmentally Sealed Bulkhead Cable Adapter, with Boot

PRO BEAM Jr. Replacement Receptacles for TFOCA-II Panel Mount Connector Applications
(see page 18 for Part Numbers)

Panel Cutout Dimensions



PRO BEAM Jr. D-Hole Low Profile Buffered Fiber Bulkhead Replacement Connector for TFOCA-II Product



PRO BEAM Jr. Square Flange, Low Profile, Buffered Fiber Bulkhead Replacement for TFOCA-II Product

TFOCA-II is a trademark of Amphenol Fiber Systems International.

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UK: 31-73-624-6639

Rugged Fiber Optic Products (Continued)

PRO BEAM Jr. Connectors
(Continued)

Connector Assembly
1 Shell Kit
1 Insert Kit
1 Cable Adapter Kit*
X Ferrule Kits (X = No. of optical channels)

Part Numbers listed are Shell alloy = aluminum Plating = hard anodized. Consult Tyco Electronics for other plating/material options such as NiAlBz for Naval applications.

PRO BEAM Jr. Connector Shell Kits

Description	Part Number
PRO BEAM Jr. Plug w/EPDM rubber	1754436-1
PRO BEAM Jr. Plug w/Fluorosilicone rubber	1754436-2
PRO BEAM Jr. D-Hole Low Profile, Buffered Fiber Bulkhead	1693741-1
PRO BEAM Jr. D-Hole Standard Bulkhead	1754437-1
PRO BEAM Jr. D-Hole Sealed Bulkhead	1754438-1
PRO BEAM Jr. Square Flange Low Profile Buffered Fiber Bulkhead	1754439-1
PRO BEAM Jr. Square Flange Standard Bulkhead	1754440-1
PRO BEAM Jr. Square Flange Sealed Bulkhead	1754441-1

PRO BEAM Jr. Replacement Receptacles for TFOCA-II Panel Mount Connector Applications

Description	Part Number
PRO BEAM Jr. TFOCA-II Replacement D-Hole Low-Profile Buffered Fiber Bulkhead	1754445-1 ♦
PRO BEAM Jr. TFOCA-II Replacement D-Hole Sealed Bulkhead	1754446-1 ♦
PRO BEAM Jr. TFOCA-II Replacement Square Flange Low-Profile Buffered Fiber Bulkhead	1754447-1 ♦
PRO BEAM Jr. TFOCA-II Replacement Square Flange Sealed Bulkhead	1754448-1 ♦

PRO BEAM Jr. Insert Kits

Description	Part Number
2 x 850 / 1300 nm Multimode	1515743-1
2 x 1310 nm Singlemode	1515739-1
2 x 1550 nm Singlemode	1516040-1
4 x 850 / 1300 nm Multimode	1515747-1
4 x 1310 nm Singlemode	1515740-1
4 x 1550 nm Singlemode	1516041-1

ASSEMBLY CAPABILITIES
Tyco Electronics has extensive Rugged Optic Harness capabilities. Please consult your local Tyco Electronics Sales Representative for assistance.

Ferrule Kits

Fiber Hole Size	Mode	PRO BEAM Connector	Part Number
125 µm	SM	Jr.	1588908-2
126 µm	SM	Jr.	1588908-1
126 µm	MM	Jr.	1588700-1

PRO BEAM Jr. Connector Plug & Sealed Bulkhead Cable Adapter Kits

Cable Dia. (Max.)	Part Number
3.10 .122	1515814-1
3.60 .142	1515781-3
4.10 .161	1515848-2
4.60 .181	1516147-1
5.10 .201	1515834-2
5.65 .222	1515827-2
6.10 .240	1515859-3
6.70 .264	1588116-1
7.50 .295 (Breakout Cable Only)	1828168-1 (Plug)
7.50 .295	1754719-3 (Sealed Bulkhead)

PRO BEAM Jr. Connector Standard Bulkhead Cable Adapter Kits*

Cable Dia. (Max.)	Part Number
3.10 [.122]	1515791-2
3.60 [.142]	1515808-1
5.10 [.201]	1515835-2
5.65 [.222]	1515829-1
6.10 [.240]	1515796-2
4 x 3.00 [4 x .118]	1515749-1

*Standard Cable Adapter — Not applicable for Low Profile.

Note: Part Numbers are RoHS compliant except: ♦ Indicates non-RoHS compliant.

Technical Documents

Product Specification
108-2177 Design Objectives

Application Specification
114-13099

Instruction Sheets
408-8791 Grounding D-Hole Bulkhead
408-8797 Plug
408-8798 Standard D-Hole Bulkhead
408-8811 Sealed D-Hole Bulkhead
408-8834 Low Profile Square Flange Bulkhead
408-8840 Low Profile D-Hole Bulkhead
408-8841 Standard Square Flange Bulkhead

http://www.tycoelectronics.com/documents

Catalog 1307895
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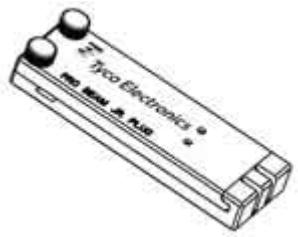
Rugged Fiber Optic Products (Continued)

PRO BEAM Jr. Connectors
(Continued)

Spare Parts & Tools



Curing Fixtures

Connector	Part Number
PRO BEAM Jr. Cable Plug (having cable with KEVLAR strength member fiber)	1693797-1
PRO BEAM Jr. Sealed D-Hole Bulkhead	
PRO BEAM Jr. Standard D-Hole and Square Flange Bulkhead	1693800-1
PRO BEAM Jr. Low Profile Buffered Fiber Bulkhead	1754122-1

Instruction Sheet 408-8857. Available at www.tycoelectronics.com

Cable Crimp Components

Description	Part Number
Crimp Sleeve (use with all PRO BEAM Jr. Connector Crimp Support sizes)	1515269-2
2.2 mm Crimp Support	1515567-1
3.1 mm Crimp Support	1515568-1
3.6 mm Crimp Support	1515569-1
3.8 mm Crimp Support	1515570-1
4.1 mm Crimp Support	2-1515270-0
4.6 mm Crimp Support	1516142-1
5.1 mm Crimp Support	1515571-1
5.65 mm Crimp Support	1515572-1
6.1 mm Crimp Support	1515573-1
6.5 mm Crimp Support	1515574-1
6.7 mm Crimp Support	1515575-1
Square Crimp Support for (4) 3 mm Cables	1515632-1

Ferrule Kits

Fiber Hole Size	Mode	PRO BEAM	Part Number
125 µm	SM	Jr.	1588908-2
126 µm	SM	Jr.	1588908-1
126 µm	MM	Jr.	1588700-1

Protective Caps

Description	PRO BEAM	Part Number
Standard cap, for D-Hole Bulkhead	Jr.	1515868-1
Standard cap, for Flange Mount Bulkhead	Jr.	1515787-2
Standard cap, for connector plug	Jr.	1515867-1

Technical Documents

Product Specifications

408-8857 Curing Fixtures for PRO BEAM Jr. and Sr. Connectors
408-8828 Cleaning Procedure for EB C/A's

Tooling Specifications

408-8795 Crimp Tool with Die Set for PRO BEAM Jr. and Sr. Connectors
408-10022 Die Assembly for Mini and Jr. Circular Crimps

http://www.tycoelectronics.com/documents

KEVLAR is a trademark of E. I. du Pont de Nemours and Company.

Note: All part numbers are RoHS compliant.

Catalog 1307895
Revised 11-07

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Rugged Fiber Optic Products (Continued)

PRO BEAM Mini Connectors

Tyco Electronics is pleased to announce the natural extension from our PRO BEAM Sr. and Jr. Connector product lines.

The PRO BEAM Mini Connector saves space and weight and is perfect for high density applications. The product offers the same durability as its larger counterparts.

PRO BEAM Sr., Jr. & Mini Connectors

PRO BEAM Mini Plug Connector

Connector Assembly
1 Shell Kit
1 Insert Kit
1 Cable Adapter Kit*
X Ferrule Kits (X = No. of optical channels)

*Not applicable for Low Profile

PRO BEAM Mini Connector Shell Kits

Type	Mount Style	Attribute Difference	Part Number (HA Aluminum)	Part Number (OD Aluminum)	Part Number (NiAlBronze)
Plug		EPDM Grip	1828698-1	N/A	1828698-2
Bulkhead	D-Hole	Low Profile - Buffered Fiber	1828699-1	1828699-2♦	1828699-3
		Low Profile - 1.8 Jacketed	1985140-1	1985140-2	1985140-3
	Square Flange	Sealed	1918185-1	*	1918185-2
		Low Profile - Buffered Fiber	1828826-1	*	*
		Neutrik Cutout-Drop-In	1918603-1	*	*

* Contact Tyco Electronics for availability.

PRO BEAM Mini Insert Kits

Description	Part Number
2 x 850 / 1300 nm Dual Multimode	1374759-4
2 x 1310 nm Singlemode	1588129-2
2 x 1550 nm Singlemode	1588128-2
4 x 850 / 1300 nm Dual Multimode	1374759-2
4 x 1310 nm Singlemode	1588129-3
4 x 1550 nm Singlemode	1588128-3

Ferrule Kits

Fiber Hole Size	Mode	PRO BEAM Connector	Part Number
125 µm	SM	Mini	1754700-1
126 µm	SM	Mini	1754700-2
126 µm	MM	Mini	1754699-1

ASSEMBLY CAPABILITIES
Tyco Electronics has extensive Rugged Optic Harness capabilities. Please consult your local Tyco Electronics Sales Representative for assistance.

PRO BEAM Mini Cable Adapter Kits For Plug

Cable Diameter	Part Number
5 mm	1828700-1
5.5 mm	1828700-2
6 mm	1828700-3

Note: Part Numbers are RoHS compliant except: ♦ Indicates non-RoHS compliant.

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Rugged Fiber Optic Products (Continued)

PRO BEAM Mini Connectors
(Continued)

Performance Specifications

Optical, Multimode Version

Insertion Loss, Typical —
0.7 dB @ 1300 nm*

Optical, Singlemode Version

Insertion Loss, Typical —
0.8 dB @ 1310 nm*

Return Loss — > 34 dB @ 1310 nm or 1550 nm**

*When tested with reference quality launch/receive cable assemblies

**RL Tested Open Ended

Mechanical

Vibration, Sinusoidal —
10 - 500 Hz, 3 directions;
0.75 mm amplitude @ 10g acceleration

Bump — 4,000 Bumps, 3 directions @ 40g acceleration

Free Fall — 500 falls on concrete; Severity 1.2 m

Coupling Endurance —
3,000 couplings

Weight —
Plug — 50 grams, typical
D-Hole bulkhead — 39 grams, typical

Temperature

Operational Temperature —
-40°C/+85°C

Storage Temperature —
-55°C/+85°C

Temperature, Cyclic —
-55°C/+85°C

Humidity (Damp Heat) —95% RH

Immersion

Water — 5 m depth (plug) - 2 m (Bulkhead)

Pressure

Low Pressure — 25 kPa @ -55°C

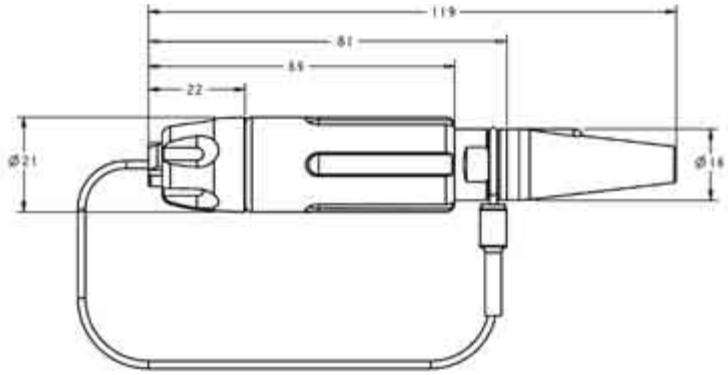
Material and Finish

Shell Alloy — Aluminum; or nickel aluminum bronze (high saline environment)

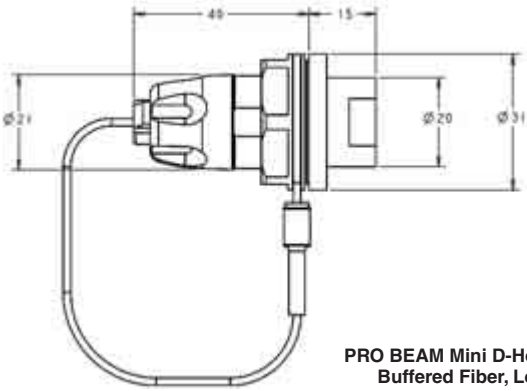
Plating (For Aluminum Shells Only) — clear hard anodized; or green chromate conversion zinc (PRO BEAM Jr. Bulkheads only)

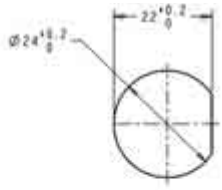
Technical Documents

408-10065 Plug
408-10067 Square Flange Bulkhead
408-10069 Low Profile D-Hole Bulkhead
408-10076 Sealed D-Hole Bulkhead
http://www.tycoelectronics.com/documents



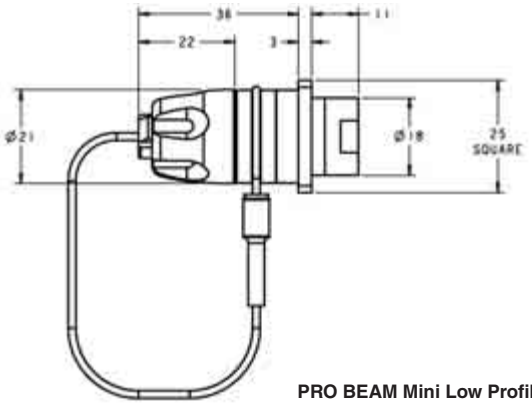
PRO BEAM Mini Cable Connector, Plug

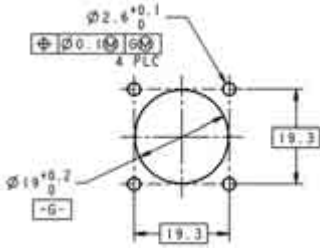




Recommended Panel Cutout

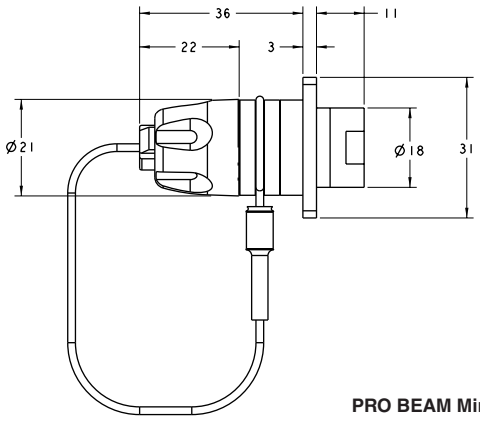
PRO BEAM Mini D-Hole Bulkhead, Buffered Fiber, Low Profile

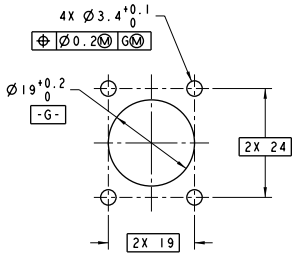




Recommended Panel Cutout

PRO BEAM Mini Low Profile, Square Flange Mount Bulkhead





Recommended Panel Cutout

PRO BEAM Mini Bulkhead with XLR Flange

Catalog 1307895
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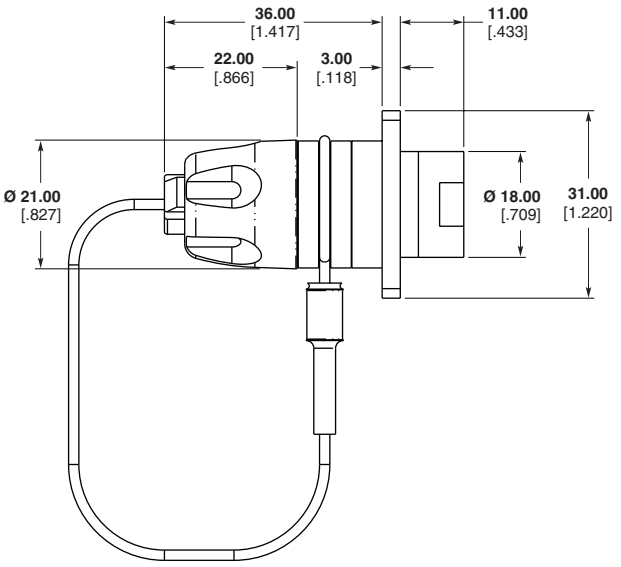
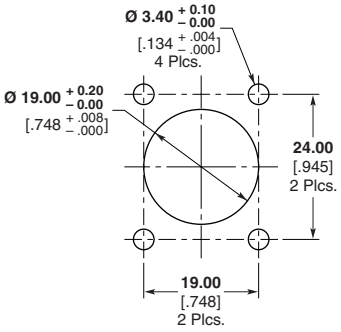
Rugged Fiber Optic Products (Continued)

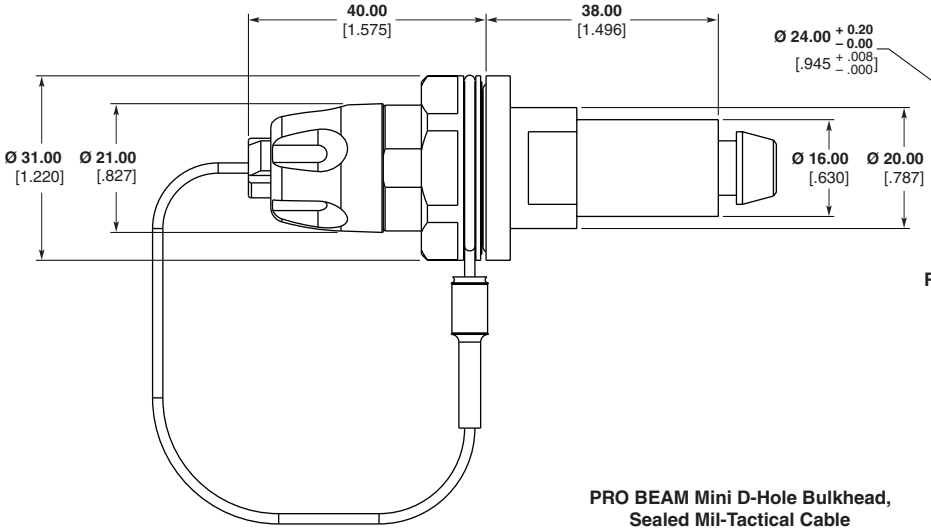
PRO BEAM Mini Connectors
(Continued)





Recommended Panel Cutout

**PRO BEAM Mini Low Profile,
Alternate Square Flange Mount Bulkhead**



Recommended Panel Cutout

**PRO BEAM Mini D-Hole Bulkhead,
Sealed Mil-Tactical Cable**

Catalog 1307895
Revised 11-07

www.tycoelectronics.com

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Rugged Fiber Optic Products (Continued)

PRO BEAM Sr. Connectors

Performance Specifications

Optical, Multimode Version

Insertion Loss, Typical —
0.7 dB @ 1300 nm*

Optical, Singlemode Version

Insertion Loss, Typical —
0.7 dB @ 1310 nm*

Return Loss — > 34 dB
@ 1310 nm or 1550 nm**

*When tested with reference quality launch/receive cable assemblies

**RL Tested Open Ended

Mechanical

Vibration, Sinusoidal —
10 - 500 Hz, 3 directions;
0.75 mm amplitude @ 10g acceleration

Bump — 4,000 Bumps, 6 directions, @ 50g acceleration

Free Fall — 500 falls on concrete; Severity 1.2 m

Coupling Endurance —
3,000 couplings

Weight —
Plug — 290 grams, typical
Chassis bulkhead — 150 grams, typical

Temperature

Operational Temperature —
-40°C/+85°C

Storage Temperature —
-55°C/+85°C

Temperature, Cyclic —
-55°C/+85°C

Humidity (Damp Heat) —95% RH

Immersion

Water — 5 m depth (plug),
2 m (Bulkhead)

Material and Finish

Shell Alloy — Aluminum; or nickel aluminum bronze (high saline environment)

Plating (For Aluminum Shells Only) — clear hard anodized

Bulkhead Connector Panel Thicknesses

PRO BEAM Sr. D-Hole Connector — 6.5 mm max.

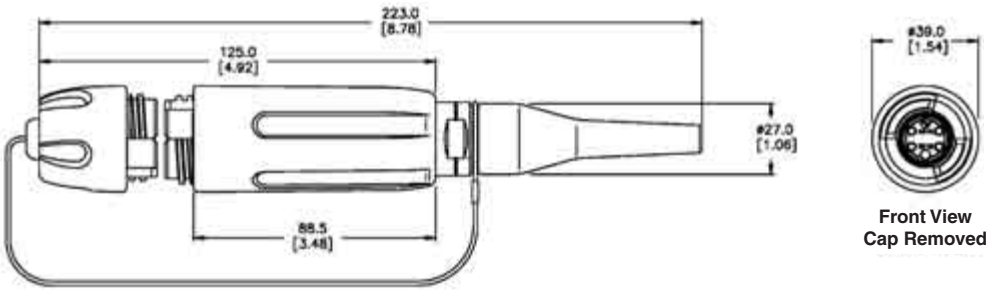
PRO BEAM Sr. Square Flange Connector — 8.5 mm max.

Technical Documents

Product Specifications
408-8799 Plug
408-8800 D-Hole Bulkhead
408-8877 Square Flange Bulkhead

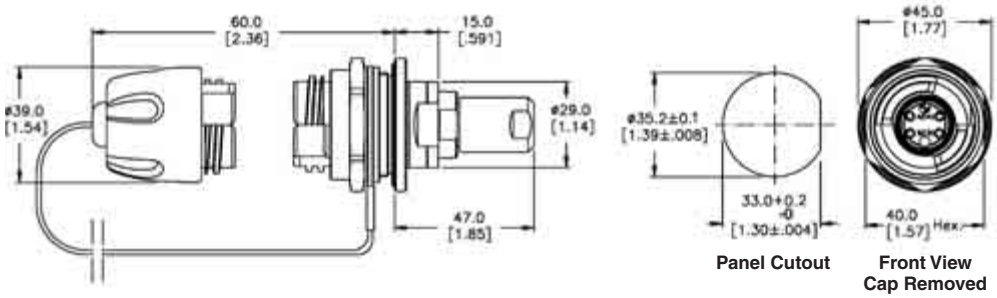
Application Specification
114-13122

http://www.tycoelectronics.com/documents



Front View
Cap Removed

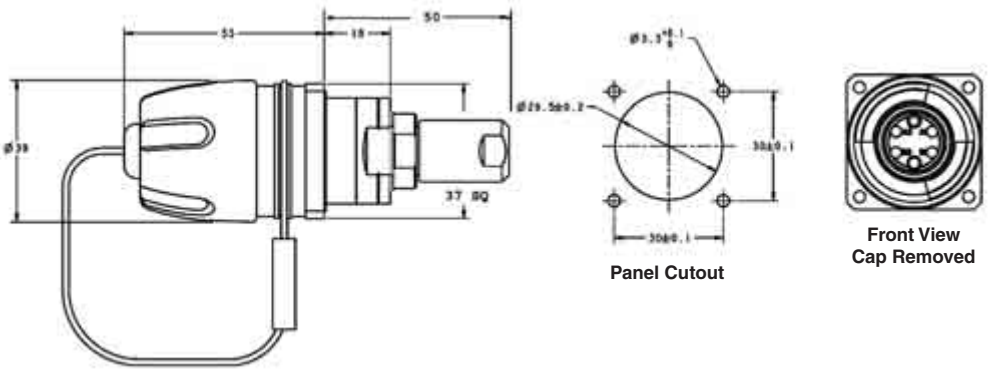
PRO BEAM Sr. Cable Connector, Plug



Panel Cutout

Front View
Cap Removed

PRO BEAM Sr. D-Hole Bulkhead with Standard Cable Adapter



Panel Cutout

Front View
Cap Removed

PRO BEAM Sr. Square Flange Mount Bulkhead with Standard Cable Adapter

Please contact your local Tyco Electronics Sales Representative for Part Numbers and availability.

Catalog 1307895
Revised 11-07

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UK: 31-73-624-6639

Rugged Fiber Optic Products (Continued)

PRO BEAM Sr. Connectors
(Continued)

Connector Assembly
1 Shell Kit
1 Insert Kit
1 Cable Adapter Kit*
X Ferrule Kits (X = No. of optical channels)

*Not applicable for Low Profile

Part numbers listed are Shell alloy = aluminum Plating = hard anodized. Consult Tyco Electronics for other plating/material options such as NiAlBz for Naval applications.

PRO BEAM Sr. Connector Shell Kits	Part Number
PRO BEAM Sr. Plug w/EPDM rubber	1754842-1
PRO BEAM Sr. D-Hole Standard Bulkhead	1754843-1
PRO BEAM Sr. Square Flange Standard Bulkhead	1754844-1

PRO BEAM Sr. Insert Kits	Part Number
2 x 850 / 1300 nm Multimode	1693001-1
2 x 1310 nm Singlemode	1515734-2
4 x 850 / 1300 nm Multimode	1693001-2
4 x 1310 nm Singlemode	1515735-1

Ferrule Kits

Fiber Hole Size	Mode	PRO BEAM Connector	Part Number
125 µm	SM	Sr.	1515941-1
126 µm	SM	Sr.	1515941-2
126 µm	MM	Sr.	1588801-1

ASSEMBLY CAPABILITIES
Tyco Electronics has extensive Rugged Optic Harness capabilities. Please consult your local Tyco Electronics Sales Representative for assistance.

PRO BEAM Sr. Connector Plug Adapter Kits

Cable Dia. (Max.)	Part Number
5.10 .201	1515940-1
5.65 .222	1515940-3
6.20 .244	1515940-5

PRO BEAM Sr. Connector Standard Bulkhead Cable Adapter Kits

Cable Dia. (Max.)	Style	Part Number
5.10 .201	Standard Cable Adapter	1515847-1
5.65 .222	Standard Cable Adapter	1515724-2
Buffered Fiber	Low Profile Adapter	1515299-2

Technical Documents

Product Specifications
408-8857 Curing Fixtures for PRO BEAM Jr. and Sr. Connectors
408-8828 Cleaning Procedure for EB C/A's

Tooling Specifications
408-8795 Crimp Tool with Die Set for PRO BEAM Jr. and Sr. Connectors
408-10022 Die Assembly for Mini and Jr. Circular Crimps

http://www.tycoelectronics.com/documents

Note: All part numbers are RoHS compliant.

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Rugged Fiber Optic Products (Continued)

Cable Assemblies and Accessories

Product Facts

- Ruggedized cable assemblies custom tailored for field use in harsh environments
- Heavy-duty light-weight cable reel organizes and protects connectors and cable for easy pay-out and safe storage
- Options for 500 meter reels include special backpack harnesses, a separate reel stand, or a combination reel and reel stand

Featured Cable Assemblies

TFOCA to PRO BEAM Jr. Plug Cable Assembly
1828536-1 ♦

LP D-Hole Bulkhead to 4 ST 62.5/125 on 1.8 mm cable
6828454-1 ♦

Plug to Plug (100 meters)
6754475-2

Typical Reels and Reel Stands for Field-Deployable Cable Assemblies

1918930-1

Tactical Reel/Drum Options

Cable Reels

Reel Capacity (Random Lay)				
Cable Diameter		Notes/Description	Flange Diameter	Part Number
5.0 mm	5.5 mm			
225 M	186 M	Reel & Reel Stand Combination Reel can be detached from stand without tools	310 mm	1918930-1
297 M	247 M	Reel*	310 mm	1754515-1
570 M	462 M	Reel*	370 mm	1754515-2
998 M	816 M	Reel*	460 mm	1754515-3
1271 M	1052 M	Reel*	510 mm	1754515-4

* See Accessories options below

PRO BEAM Jr. Kits

PRO BEAM Jr. Termination Kit 1828650-1

Cleaning Kit 1828335-2

ASSEMBLY CAPABILITIES
Tyco Electronics has extensive Rugged Optic Harness capabilities. Please consult your local Tyco Electronics Sales Representative for assistance.

Backpack with Reel

Reel with Stand "Static Frame"

Backpack Harness

Accessories

Description	Reel Diameter	Part Number
Backpack	370 mm Dia. Reel	1754516-1*
Backpack	460 mm Dia. Reel	1754516-2*
Backpack	510 mm Dia. Reel	1754516-3*
Static Frame	500 mm Dia. Max	1754517-1*
Static Frame	700 mm Dia. Max	1754517-2*

* Reel must be ordered separately.
Note: For lower cost alternative options. Please contact your local Tyco Electronics' Sales Representative or Tyco Electronics Product Information Center at 1-800-522-6752.
Note: Part Numbers are RoHS compliant except: ♦ Indicates non-RoHS compliant.

TFOCA-II is a trademark of Amphenol Fiber Systems International.

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Rugged Fiber Optic Products (Continued)

Tactical Field Splice Repair Kit Part Number 1985212-1

Materials List

Quantity	Description
4	Flexible Splice Housings
10	Mechanical Splices
1	Cleaver
1	Cable Stripper
2	Buffer Stripper (sizes): 126 micron, 200 micron
1	Utility Knife with 3 Spare Blades
1	KEVLAR Shears
1	6 inch Metal Ruler, (units in metric)
1	Illuminated Microscope with Batteries
40	Alcohol (at least 70%) Pads
1	Wipes, 5 x 8 inch, 280 count box
1	Plastic Frame Safety Glasses (ANSI approved lenses)
1	Tweezers
1	Roll Tape
1	Fine Tip Marking Pen
1	Set of Instructions (illustrated) — Waterproof
1	Portable Field Storage Case. This case shall be ruggedized and house all components necessary to repair broken cable. Dimensions of the case shall not exceed 7.5" H x 20" W x 14" — Black in color.

KEVLAR is a trademark of E. I. du Pont de Nemours and Company.

Note: All part numbers are RoHS compliant.

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Rugged Fiber Optic Products (Continued)

Optical Test Set for Fiber Optic Cables — Designed for harsh environments

Product Facts

- Especially designed to support the installation of optical links in the field
- Able to test both cable drums and entire links
- Powered by batteries with high autonomy
- Suitable for diagnostics and construction teams
- Easy to use, ergonomic, rugged design
- Suitable for cable length up to 10 km
- Supports up to 4 fibers per cable with various types of connectors

Diagnostic Features

Power Meter

The optical power from any source can easily be measured with the power meter function.

Optical Source

A continuous optical signal is generated and transmitted with selectable output power.

Drum Test / Cable Test

Test of an entire cable drum with automatic good/bad indication. The test of an entire cable is realized with a 2nd KPG-opt or a loop connector.

Test Frames (optional)

The KPG-opt can generate specific test frames as used in optical networks and LOS systems.

Optical Tester

Description	Part Number
850 nm 38999 III Size 11 Optical Test Kit	1918016-1
850/1300 nm PRO BEAM Jr. Optical Test Kit	1918016-2
1310 nm PRO BEAM Jr. Optical Test Kit	1985006-1

For additional wavelength testers, contact your local Tyco Electronics Sales Representative.

Protective Case
1918082-1

Note: All part numbers are RoHS compliant.

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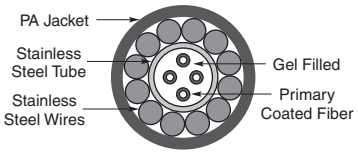
Rugged Fiber Optic Products (Continued)

ARMOR-LIGHT Tactical Field Deployable Fiber Optic Cable for Extreme Environments (Metallic for Rodent Proof)

4-Color Optical Fiber Cable Specification for Armored Cable for Ruggedized Applications

Construction:

- 4-color coded fibers
- Fiber types 50/125/250 µm, 62.5/125/250 µm and 9/125/250 µm
- Stainless steel gel filled tube
- Stainless steel wire
- Jacket — Nylon, black



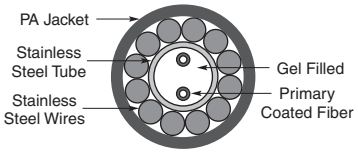
Fiber Type	Part Number	Outside Dia. (mm)	Weight kg/km	Max. Attenuation dB/km				Bandwidth MHz-km	
				850 nm	1300 nm	1310 nm	1550 nm	850 nm	1300 nm
62.5/125	1588957-1	3.8	24	3.5	1.0	X	X	160	500
50/125	1588957-2	3.8	24	2.7	0.9	X	X	400	1200
SM	1588957-4	3.8	24	X	X	0.40	0.25	X	X

Notes: 35 mm recommended bend radius.
3.1 kN breaking strength.

2-Color Optical Fiber Cable Specification for Armored Cable for Ruggedized Applications

Construction:

- 2-color coded fibers
- Fiber types 50/125/250 µm, 62.5/125/250 µm and 9/125/250 µm
- Stainless steel gel filled tube
- Stainless steel wire
- Jacket — Nylon, black



Fiber Type	Part Number	Outside Dia. (mm)	Weight kg/km	Max. Attenuation dB/km				Bandwidth MHz-km	
				850 nm	1300 nm	1310 nm	1550 nm	850 nm	1300 nm
62.5/125	1693808-1	3.8	24	3.5	1.0	X	X	160	500
50/125	1693808-2	3.8	24	2.7	0.9	X	X	400	1200
SM	1693808-4	3.8	24	X	X	0.40	0.25	X	X

Notes: 35 mm recommended bend radius.
3.1 kN breaking strength.

Note: All part numbers are RoHS compliant.

Non-Metallic Tactical Field Deployable Fiber Optic Cable

Product Facts

- All terrain field deployable cable, up to 4 fibers, singlemode or multimode
- Developed for deployment under the most demanding conditions
- Tight buffered fibers are protected by Aramid yarns and a tough ruggedized polyurethane sheath
- Tested in accordance with MIL-PRF-85045
- Flexible, water resistant, high crush resistant, and lightweight,
- Designs available to be resilient against radiation exposure

Technical Data

Mil-Standard Distribution Cable — 2 Fiber Singlemode

Attenuation — ≤ 0.5 dB/km @ 1310 nm / ≤ 0.5 dB/km @ 1550 nm
Diameter — 5.8 mm
Weight — 25 kg/km
Minimum Bending Radius — 29 mm
Crush Resistance — 2000 N/cm
Operating Temperature — -55° C to +85° C

Mil-Standard Distribution Cable — 4 Fiber Singlemode

Attenuation — ≤ 0.5 dB/km @ 1310 nm / ≤ 0.5 dB/km @ 1550 nm
Diameter — 5.8 mm
Weight — 27 kg/km
Minimum Bending Radius — 28 mm
Crush Resistance — 2000 N/cm
Operating Temperature — -55° C to +85° C

Mil-Standard Distribution Cable — 2 Fiber Multimode

Fiber Type — 50 µm/125 µm and 62.5/125
Attenuation — ≤ 3.5 dB/km @ 850 nm / ≤ 1.0 dB/km @ 1300 (62.5/125); ≤ 3.5 dB/km @ 850 nm / ≤ 1.5 dB/km @ 1300 (50/125)

Mil-Standard Distribution Cable — 4 Fiber Multimode

Fiber Type — 50 µm/125 µm and 62.5/125
Attenuation — ≤ 3.5 dB/km @ 850 nm / ≤ 1.0 dB/km @ 1300 (62.5/125); ≤ 3.5 dB/km @ 850 nm / ≤ 1.5 dB/km @ 1300 (80/125)

Other fibers (i.e. Polyimide, Silicon buffer, Carbon coated, radiation hardened, etc.) are available upon request.

Contact Tyco Electronics or your local Tyco Electronics Sales Representative for part numbers, pricing, and availability.

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Rugged Fiber Optic Products (Continued)

"Mini" Expanded Beam for Harsh Environments

Product Facts

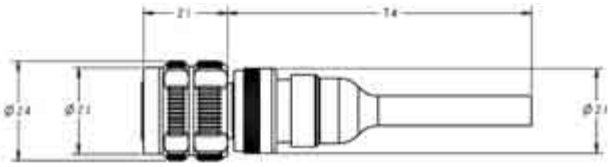
- **Available in shell size 11, housed on D38999 Series III style shells for harness applications**
- **Multiple options available for backshells. Consult your local Tyco Electronics Sales Representative**
- **Shell polarizations A through E available upon request**

Standard Material and Finish

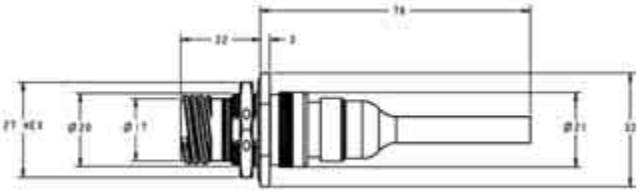
Shell Alloy — Aluminum
Plating — Nickel & green chromate

*Refer to customer drawing for dash number designation

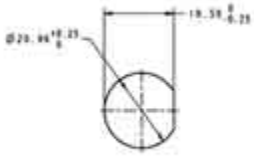
For part number details and plating options, contact your local Tyco Electronics Sales Representative.



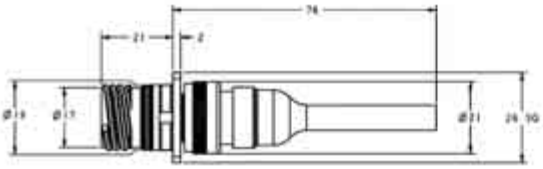
Plug Shell Kit

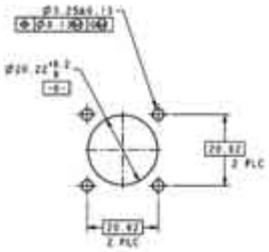


D-Hole Receptacle Shell Kit



Receptacle Panel Cut-Out (shell size 11) per MIL-DTL-38999K, figure 11

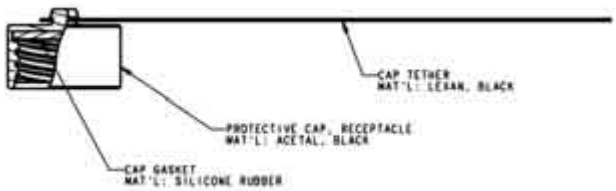




Square Flange Receptacle Shell Kit

ASSEMBLY CAPABILITIES
Tyco Electronics has extensive Rugged Optic Harness capabilities. Please consult your local Tyco Electronics Sales Representative for assistance.

38999 Plug Cap
1918024-1



38999 Receptacle Cap
1918025-1 = Jam Nut Receptacle
1918025-2 = Square Flange Receptacle

Note: All part numbers are RoHS compliant.

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Rugged Fiber Optic Products (Continued)

"Mini" Expanded Beam for Harsh Environments
(Continued)

	Mini EB 38999 Connector Shell Kits (N-Key)					
Use with:	**Ø1.8 mm Max Simplex Cable**		**MIL-Tactical Distribution Cable**		**Buffered Fiber Only**	
Finish:	**Electroless Ni Plate**	**OD Zn/Ni**	**Electroless Ni Plate**	**OD Zn/Ni**	**Electroless Ni Plate**	**OD Zn/Ni**
Plug:	6754518-1	1754518-7♦	6828045-1	1828045-7♦	1918883-1	1918883-7♦
Jam-Nut Receptacle:	6754519-1	1754519-7♦	6828046-1	1828046-7♦	1918884-1	1918884-7♦
Flange-Mount Receptacle:	6754520-1	1754520-7♦	6828047-1	1828047-7♦	1918885-1	1918885-7♦

PRO BEAM Mini Insert Kits

Description	Part Number
2 x 850 / 1300 nm Dual Multimode	1374759-4
2 x 1310 nm Singlemode	1588129-2
2 x 1550 nm Singlemode	1588128-2
4 x 850 / 1300 nm Dual Multimode	1374759-2
4 x 1310 nm Singlemode	1588129-3
4 x 1550 nm Singlemode	1588128-3

Ferrule Kits

Fiber Hole Size	Mode	PRO BEAM Connector	Part Number
125 µm	SM	Mini	1754700-1
126 µm	SM	Mini	1754700-2
126 µm	MM	Mini	1754699-1

Note: Part Numbers are RoHS compliant except: ♦ Indicates non-RoHS compliant.

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Rugged Fiber Optic Products (Continued)

Expanded Beam Avionics-Related Standards and Specifications for ARINC 600, 664, 763 and 801

ARINC 664 — Aircraft Data Network

Tyco Electronics' ARINC Connectors with Mini Expanded Beam inserts will meet/exceed all 100 Base-FX Ethernet LAN applications

ARINC 763 — Avionics Network Server System —

Tyco Electronics' ARINC 600 Connectors are designed to meet/exceed 100 Base-FX Ethernet LAN applications.

Network Server Unit (NSU) — can use ARINC 600 Size 1 connector with up to 8 Expanded Beam fiber optic channels (two Mini Expanded Beam inserts in cavity C)

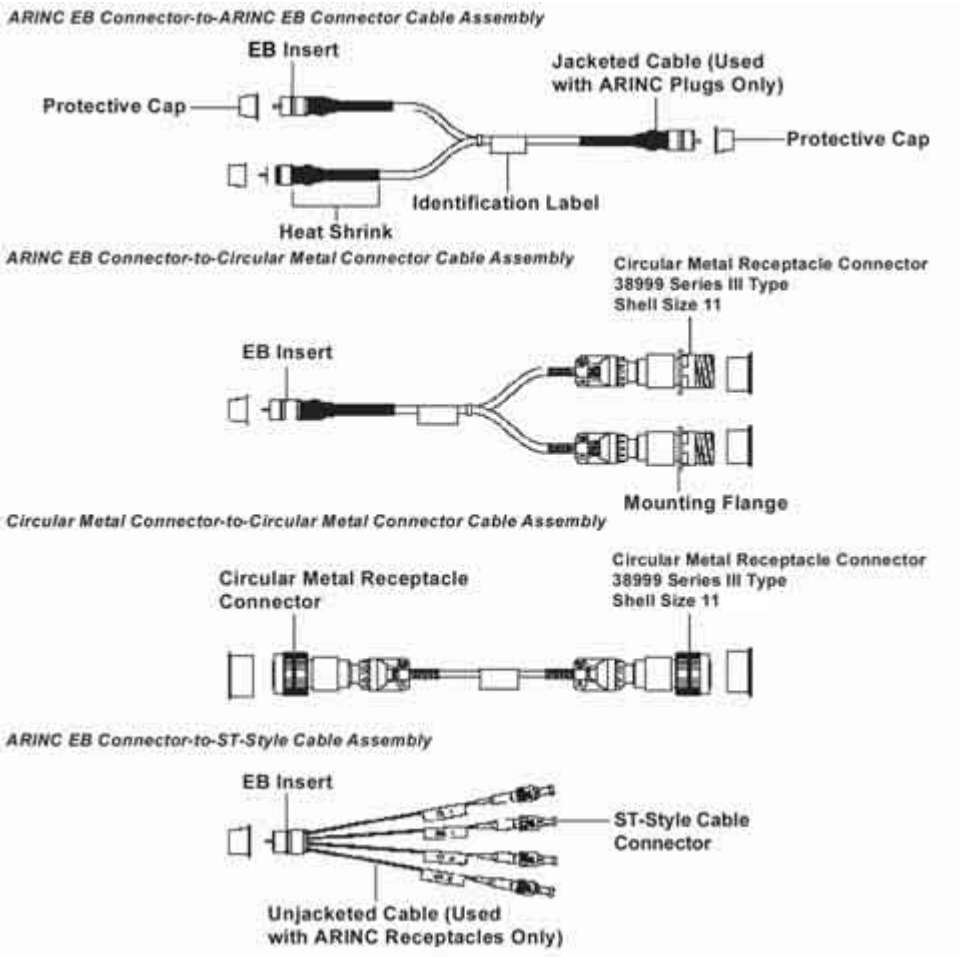
Server Interface Unit (SIU) — can use ARINC 600 Size 3 connector with up to 16 Expanded Beam fiber optic channels (four Mini Expanded Beam inserts in cavity F)

Integrated Network Server Unit (INSU) — can use ARINC 600 Size 3 connector with up to 16 Expanded Beam fiber optic channels (four Mini Expanded Beam inserts in cavity F)

ARINC 801 — Fiber Optics Working Group

Tyco Electronics provides a single reference point for Flight Level Optics that are multi-sourced.

Typical Assemblies for In-Flight Network Applications



Typical Assemblies

ASSEMBLY CAPABILITIES
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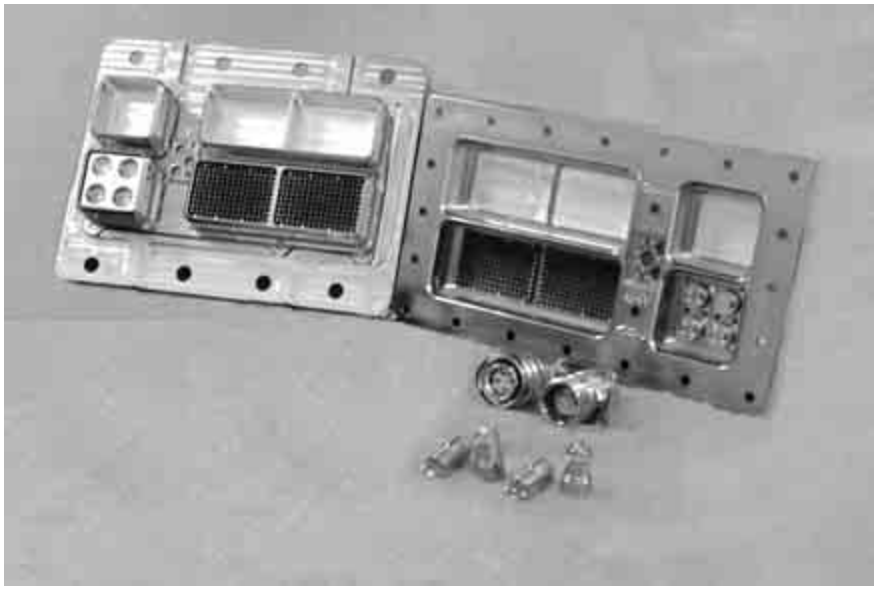
Rugged Fiber Optic Products (Continued)

ARINC 600 and 404

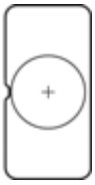


Product Facts

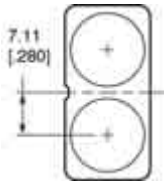
- For Mini Expanded Beam Inserts
- For use in 100 base-FX Ethernet LAN applications per ARINC 664 and ARINC 763
- Insert holders designed to ARINC 600, Supplement 13 or to specific customer needs for Mini Expanded Beam inserts
- Drop-In Insert Holders utilize Standard ARINC 600 Retainers
  - Hard Stop on Plug Side
  - Spring-Loaded Stop on Receptacle Side
  - Captive Hardware
- Facial Sealing — Optional
  - Bonded to Receptacle Block Mating Face
  - Raised Collar Seal around Optics Insert compresses against Chamfer on Plug Block Mating Face

ARINC 600 Insert Holders for Mini-Expanded Beam Contacts

Size 1
Power Cavities

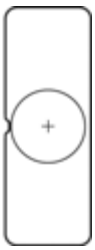


ARINC 600, 1 Position
1MP

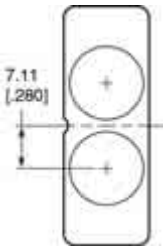


ARINC 600, 2 Position
2MP

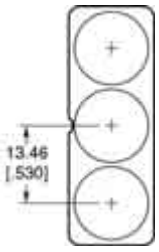
Size 1
Signal Cavities



ARINC 600, 1 Position
1MS



ARINC 600, 2 Position
2MS



ARINC 600, 3 Position
3MS

ASSEMBLY CAPABILITIES
Tyco Electronics has extensive Rugged Optic Harness capabilities. Please consult your local Tyco Electronics Sales Representative for assistance.

See next page (33) for Size 2 / 3 Power and Signal Cavities

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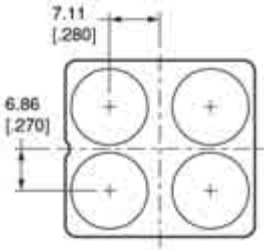
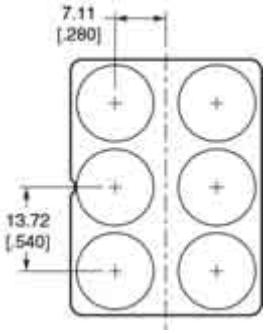
Rugged Fiber Optic Products (Continued)

Size 2 / 3
Power and Signal Cavities

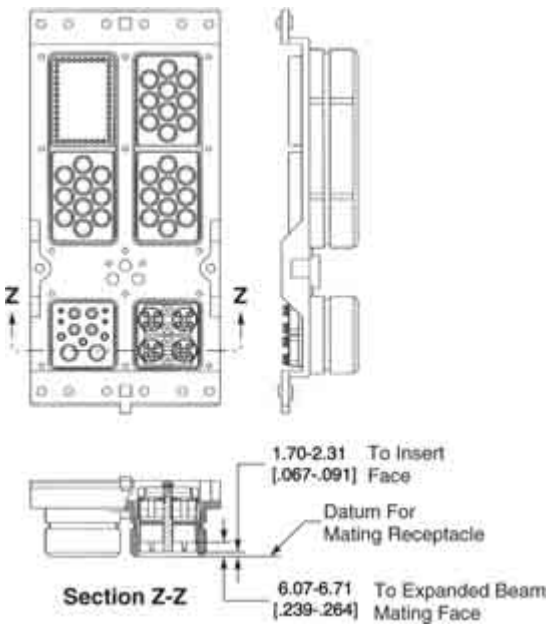


ARINC 600, 4 Position
4MP

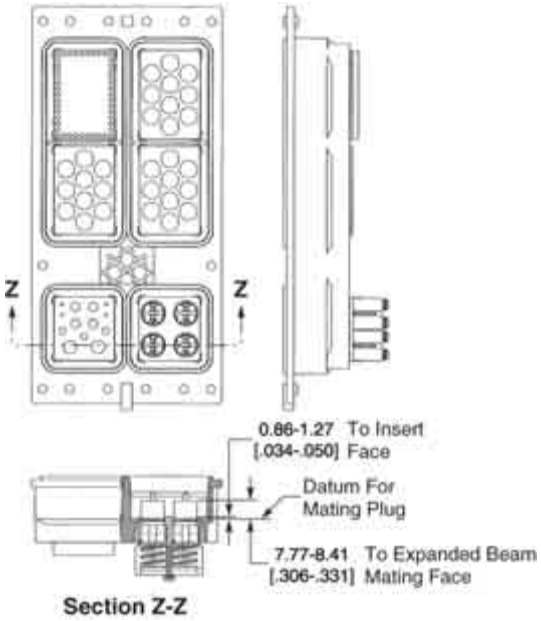


ARINC 600, 6 Position
6MS

ARINC 600 Insert Holders for Mini-Expanded Beam Contacts



Typical Layout for Plug



Typical Layout for Receptacle

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Rugged Fiber Optic Products (Continued)

F12 LuxCis Insert Assemblies

NEW

Product Facts

- **ARINC 801 approved**
- **Optical termini for use with GPR, ARINC 600, circular MIL-DTL-38999 connectors**
- **Industry Standard 1.25 mm ceramic ferrule**
- **Compatible with 1.5-2.2 mm tight jacket and loose tube cable construction:**
  - **MT - Tight jacket cable**
  - **ML – Loose tube cable**
- **Singlemode (SM) and Multimode (MM) versions**
- **LuxCis Optical Termini part numbers:**
  1828199-1 MM/ML Version
  1828200-1 MM/MT Version
  1918614-1 SM/ML Version
  1918616-1 SM/ML Version-APC
  1918615-1 SM/MT Version
  1918617-1 SM/MT Version-APC

Materials:

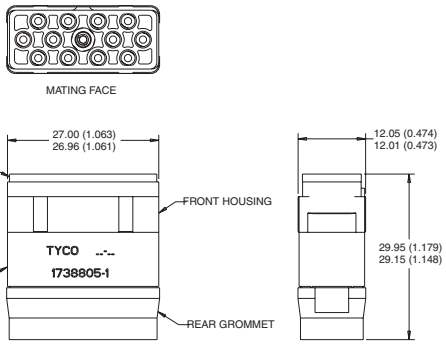
Housings – Nickel Plated Copper
Ferrule – Zirconia
Spring – Stainless Steel
Crimp Sleeve – Nickel Plated Copper
Protective Cover – Silicone

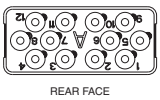
Optical Performance

Singlemode, 1310 nm/1550 nm (UPC)
Attenuation, Mean – 0.15dB
Return Loss - >50dB
Multimode, 850 nm.1310 nm
Attenuation, Mean – 0.10dB
Return Loss - >20dB

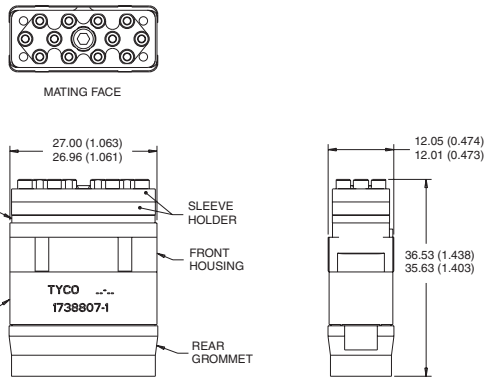
Assembly Capabilities

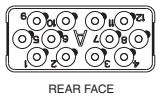
Tyco Electronics has extensive Rugged Optic Harness capabilities. Please consult your local Tyco Electronics Sales Representative for assistance.





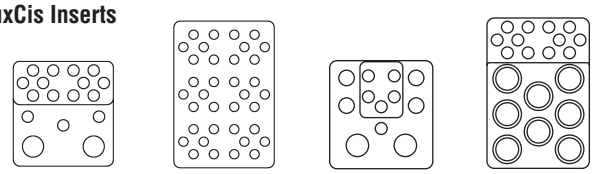
Insert Assembly, without Sleeve Holder, Environmental, F12
Key A 1738805-1
Key B 1738806-1





Insert Assembly, with Sleeve Holder, Environmental, F12, Key A GPRB
Key A 1738807-1
Key B 1738808-1

LuxCis Inserts



17F12Q2 **36F36** **12F5C2** **20F12Q8**

LuxCis Inserts and Cavity Reducers accept LuxCis Optical Termini.

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Note: All part numbers are RoHS compliant.

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Rugged Fiber Optic Products (Continued)

Comparative on Expanded Beam Inserts

Comparative on Expanded Beam Inserts' weight and Insertion Forces when applied to an ARINC housing

- ARINC 600 connector mated pair size 2 = 440 grams (without copper contacts)
- ARINC style Mini and Junior size Expanded Beam inserts = 5 pounds insertion force each when applied to the Rack and Panel ARINC Connector inserts
- Signal Cavity Optical Holder insert (i.e.: holds up to six mini inserts with four fiber ball lenses each or up to 24 fibers each insert set) = @ 30 grams
- Power Cavity Optical Holder insert (i.e.: holds up to four mini inserts with four fiber ball lenses each or up to 16 fibers each insert set) = @ 20 grams
- Insert mated pair PRO BEAM Jr. Connector insert set = @ 41.79 grams
- Insert mated pair PRO BEAM mini Connector insert set = @ 16.17 grams
- Fiber = single fiber ≤ 4 kg / km
- Fiber = four fiber jacketed with a support member ≤ 24 kg / km
- Static spring force per mated Expanded Beam insert pair = 5 lbs.

LuxCis Optical Termini Notes

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Sealed Circular LC ODVA Conforming Notes

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Rugged Fiber Optic Products (Continued)

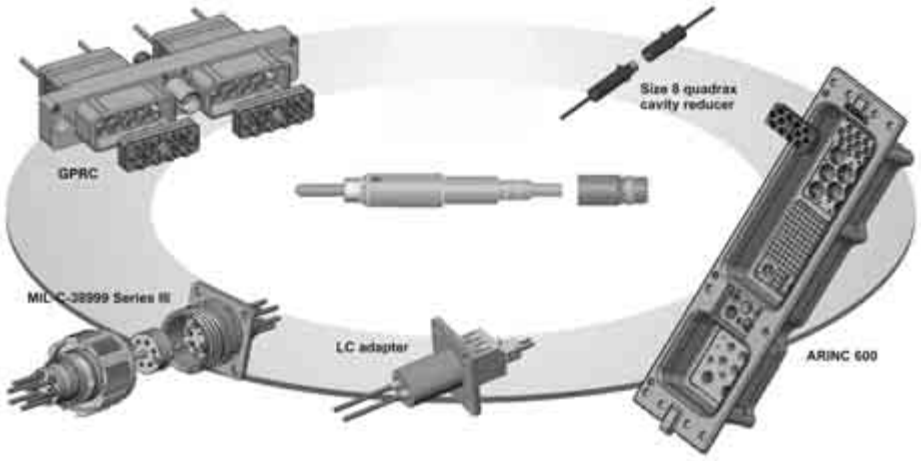
LuxCis Optical Termini

Product Facts

- **Optical termini for use with GPR, ARINC 600, circular MIL-DTL-38999 connectors.**
- **Industry Standard 1.25 mm ceramic ferrule**
- **Compatible with 1.5-2.2 mm Tight jacket and loose tube cable construction:**
  - **MT - Tight jacket cable**
  - **ML - Loose tube cable**
- **SM / MM versions**

LuxCis Optical Termini

one common terminus for all types of connectors



Materials

Housings — Nickel Plated Copper
Ferrule — Zirconia
Spring — Stainless Steel
Crimp Sleeve — Nickel Plated Copper
Protective Cover — Silicone

Optical Performance

Singlemode, 1310 nm/1550 nm (UPC):
Attenuation, Mean — 0.15dB
Return Loss — > 50dB
Multimode, 850 nm/1310 nm:
Attenuation, Mean — 0.10dB
Return Loss — > 20dB

Mechanical / Environmental Performance

Test Description	Standard	LuxCis Optical Termini in GPR A & B Connector	LuxCis Optical Termini in 38999 Connector	LuxCis Optical Termini in ARINC 600 Connector
Thermal Shock	SAE-AS-13441 met 1003.1	-55C /+100C	-55C /+100C	-55C /+100C
Temperature Life	TIA/EIA 455-20A	500h @ +100C	500h @ +100C	500h @ +100C
Vibration	TIA/EIA 455-11	8h/axis 3.8g²/Hz 43 G rms	8h/axis 3.8g²/Hz 43 G rms	8h/axis 0.2g²/Hz 16.4 G rms
Shock	TIA/EIA 455-14A	300 G - 3ms	300 G - 3ms	50G - 11ms
Mate/Unmate (GPR/ARINC 600)	SAE-AS-13441 met 2016	100 Cycles	N/A	100 Cycles
Mate/Unmate (38999)	TIA/EIA 455-21A	N/A	500 Cycles	N/A
Maint. Aging	SAE-AS-13441 met 2002-1	10 Cycles	10 Cycles	10 Cycles
Salt Spray	SAE-AS-13441 met 1001.1 cond C	96 hr	500 hr	48 hr
Cable Ret. (1.8 mm)	SAE-AS-13441 met 2009-1	68N	68N	68N
Humidity (GPR/38999)	TIA/EIA 455-5 met B7A	10 cycles / 24h 90% RH -25C/+65C	10 cycles / 24h 90% RH -25C/+65C	N/A
Humidity (ARINC 600)	TIA/EIA 455-5 met B	N/A	N/A	10 cycles / 24h 90% RH -25C/+65C
Altitude Imm.	TIA/EIA 455-15	10,000 ft (69.6kPa)	10,000 ft (69.6kPa)	10,000 ft (69.6kPa)

ASSEMBLY CAPABILITIES
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Rugged Fiber Optic Products (Continued)

LuxCis Optical Termini
(Continued)

There are three types of LuxCis Optical Termini available dependent upon cable structure.

Tyco Electronics has multiple connector types/families available for the LuxCis Optical Termini System.

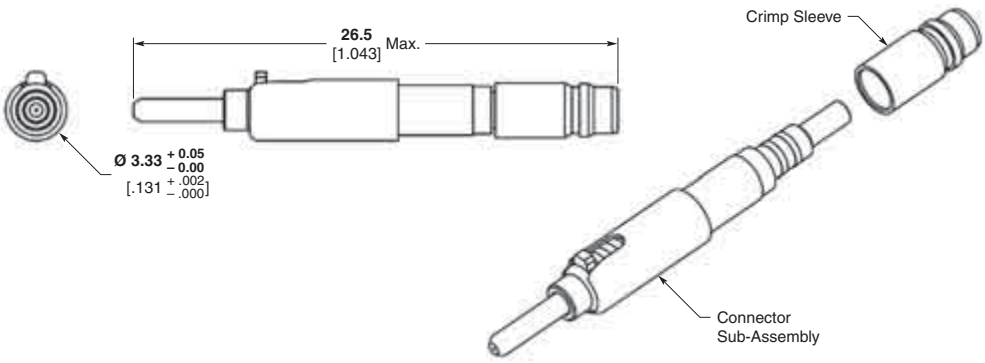
These are:

- **General Purpose Rectangular Connectors**
  - **F5 & F12 Inserts**
- **MIL-DTL-38999 connectors**
  - **13-04, 15-06, 21-16**
- **ARINC 600**
  - **F12 combinations and F36**
- **Quadrax Cavity Reducers**
- **Motherboard & Daughtercard Solutions**

Connector Options:

For part numbers, details, and / or additional connector types and arrangements, contact your local Tyco Electronics Sales Representative.

ASSEMBLY CAPABILITIES
Tyco Electronics has extensive Rugged Optic Harness capabilities. Please consult your local Tyco Electronics Sales Representative for assistance.



LuxCis Optical Termini Part Numbers

Cable Dia.	Cable Structure ML (loose & tight) MT (ultra tight)	S/M Fiber 125.3 µm PC/UPC	S/M Fiber 125.3 µm APC	M/M Fiber 128 µm PC
0.9mm Buffer	—	*	*	*
1.5 - 2.2 mm	ML	*	*	1828199-1
1.5 - 2.2 mm	MT	*	*	1828200-1

Consult your local Tyco Electronics Sales Representative for additional options.
* Contact Tyco Electronics for availability.

Accessories	Part Number
Dust Cap (bag of 10)	1828221-1

LuxCis Cavity Reducers

Size 8 Quadrax	Part Number	LuxCis Cavity Reducer
Pin Quadrax adapter for LuxCis Optical Termini in Quadrax FR type cavity	1757727-1	Quadrax cavity reducer (FR/FR) for receptacle shell
Pin Quadrax adapter for LuxCis Optical Termini in Quadrax RR type cavity	1757710-1	Quadrax cavity reducer (RR/RR) for receptacle shell
Socket Quadrax adapter for LuxCis Optical Termini in Quadrax RR type cavity	1757711-1	Quadrax cavity reducer (RR/RR) for plug shell

Cable Structure

	Loose Structure	Tight Structure	Ultra Tight Structure
Movement between fiber & 900 µm buffer	Yes	No	No
Movement between 900 µm & cable jacket	Yes	Yes	No

Adapters

Type	Version	Alignment Sleeve	Part Number	Dim.
LuxCis Optical Termini to LuxCis Optical Termini	Simplex Bulkhead Feedthrough Type	Ceramic Zirconia	1828996-1	Fig. 1
LuxCis Optical Termini to LuxCis Optical Termini	Simplex Straight	Ceramic Zirconia	1828997-1	Fig. 2
LuxCis Optical Termini to LC	Simplex LC Panel Cutout	Ceramic Zirconia	1828979-1	Fig. 3
LuxCis Optical Termini to LC	Duplex LC Panel Cutout	Ceramic Zirconia	1828980-1	Fig. 4
LuxCis Optical Termini to LC	Duplex MIL-DTL-38999 Panel Cutout	Ceramic Zirconia	1828995-1	Fig. 5

Tools

Description/Function	Part Number
Metal Extraction Tool (M81 969/1-03)	91066-3
Plastic Extraction Tool (M81 969/1403)	M81969/14-03
Daniels Right Angle Insertion Tool	DAK83-16*
Daniels Right Angle Removal Tool	DRK83-16*

* Contact Daniels Manufacturing

Note: All part numbers are RoHS compliant.

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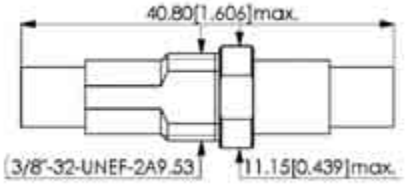
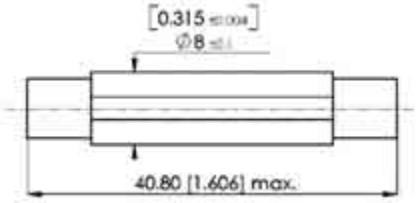
Rugged Fiber Optic Products (Continued)

NEW

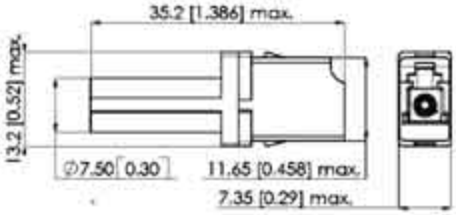
LuxCis Optical Termini Adapter Dimensions

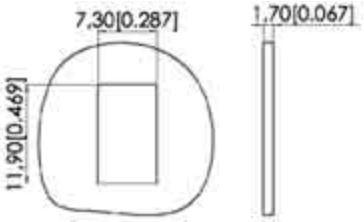


Terminus to Terminus Bulkhead Feedthrough

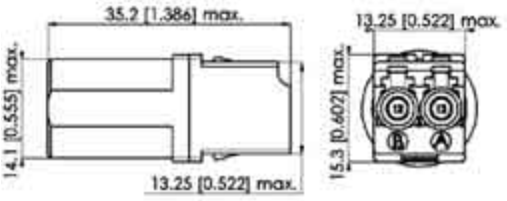


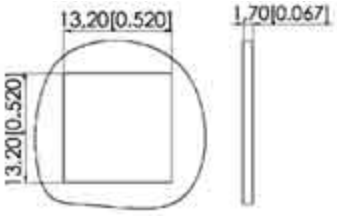
Terminus to Terminus Straight



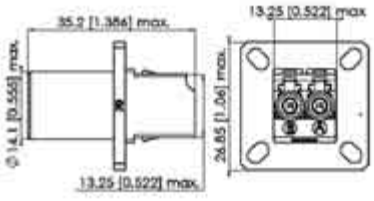


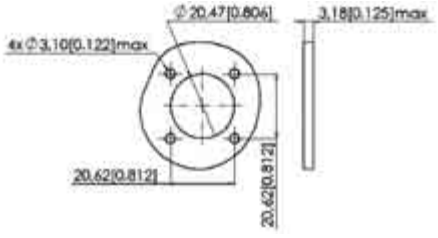
Terminus to LC Simplex





Terminus to LC Duplex, LC Panel





Terminus to LC Duplex, MIL-DTL-38999 Panel Cutout

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Rugged Fiber Optic Products (Continued)

NEW

LuxCis Optical Termini Termination Kit

Part Number 1828644-X

Most of the tools included in the Termination Kit are commonly used in the fiberoptic industry (strippers, cutting pliers and all accessories for fiber and cable preparation). The items in the table below are specially made for the LuxCis Optical Termini System. Their use is highly recommended to achieve mechanical and optical performances.

Qty -2	Qty -1	Description	Part Number	Item #
1	1	Label, Termination Kit	1918887-1	28
1	1	Insertion and Extraction Tool	91066-3	27
2	2	1.25 mm Swab	1828355-1	26
1	1	LC Polishing Bushing	1754074-1	25
1	1	Polishing Plate	501197-1	24
1	1	Polishing Pad	501523-1	23
10	10	0.3 µm Polishing Film	228433-5	22
5	5	Fine Diamond Polishing Film	503887-1	21
10	10	5 µm Polishing Film	228433-8	20
15	15	9 µm Polishing Film	1374484-1	19
1	1	Cleave Tool	504064-1	18
1	—	Curing Oven Block	1918510-1	17
1	—	Curing oven	502130-1	16
1	1	Resin injector tips	1918509-2	15
1	1	Resin injector	1918509-1	14
5	5	Epoxy, 353ND	504035-1	13
10	10	Alcohol Fiber Wipe	501857-2	12
1	1	Inner Ferrule Shaping Tool	1918511-1	11
1	1	Hexagonal key	19840-5	10
1	1	Fiber Stripping tool (125 µm)	1754708-1	9
1	1	Handtool	58532-1	8
1	1	Die-set, LuxCis Optical Termini	1828889-1	7
1	1	KEVLAR Shears	1278637-1	6
1	1	Cable Jacket Strip Tool	1278531-1	5
1	—	1.25 mm Microscope Adapter	1754765-1	4
1	—	200x Microscope	1754767-1	3
1	—	Carrying case, Weekender	1918881-1	2
—	1	Carrying case, Attache	1918834-1	1

The following tools are necessary for product termination but are not included in the kit:
Alcohol, canned air, and clean cloth.
Other accessories available include ruler, tweezers, cleaning tip, roller adhesive tape, moss cable support and permanent ink markers.

NEW

LuxCis Optical Termini Service Tool Kit (Inspection, testing & cleaning) Part Number 1828335-1

LuxCis Optical Termini Service Tool Kit (Cleaning only) Part Number 1828335-2

LuxCis Optical Termini Service Tool Kit (Testing only) Part Number 1828335-3

LuxCis Optical Termini Service Tool Kit (Hand Held Digital Probe Kit) Part Number 1828335-4

Tool Kit Contents

Item #	Comp Part Number	Description	-1	-2	-3	-4
1	1278540-1	Soft Carry Bag	1	—	—	—
2	1754767-1	200x Microscope	1	—	—	—
3	1754765-1	LC Microscope adapter	1	—	—	—
4	6374613-5	LC - SC 50/125 cable assembly	2	—	—	—
5	6374615-5	LC - SC 62.5/125 cable assembly	2	—	—	—
6	1918808-1	1.25 mm swab	2	2	—	—
7	1918810-1	OPTIPOP C Card Cleaner	2	5	—	—
8	1828349-1	Optical Loss Test Set	1	—	1	—
9	1828350-1	OLTS 1.25 mm detector cap	1	—	1	—
10	1828352-1	Visual Fault Locator	1	—	1	—
11	1828353-1	VFL 1.25 mm Adapter	1	—	1	—
12	1828465-1	Label, Service Kit	1	—	1	—
13	1918222-1	Inspection, Hand Held Digital Probe Kit	—	—	—	1
14	1918223-1	1.25 mm Adapter, Digital Probe	—	—	—	1

-1 inspection, cleaning & testing
-2 cleaning
-3 testing
-4 Hand Held Digital Probe Kit

Note: All part numbers are RoHS compliant.

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Rugged Fiber Optic Products (Continued)

Hand Held Visual Fault Locator (VFL)

Product Facts

- **650 nm (visible) Class 2 1.0 mW max Diode Laser**
- **Continuous and flashing (2-3 Hz pulsed) modes**
- **Rugged rubber shell and body design modeled after a popular military connector**
- **Lanyard attached dust cover**
- **Standard 2.5 mm adapter for SC, ST, and FC connectors**
- **Optional 1.25 mm adapter for LC and MU connectors.**
- **Unique design allows adapter to permanently reside on VFL so it is not misplaced allowing user to choose 1.25 mm or 2.5 mm**
- **Uses 1 "AA" style battery for >30 hours of continuous use**
- **Soft-sided belt case for convenience and storage**

The Tyco Electronics Hand Held Visual Fault Locator (VFL) is a rugged and affordable solution for identifying breaks and bending in optical fibers and cabling. Its powerful, red (650 nm) laser provides the ability to locate damaged, broken, or tightly bent fibers that cause undesirable attenuation in your system.

The jacket of the cable will glow red at the location of the fault. The FLASH button allows the user to toggle between continuous or pulsed mode. The compact, rugged, and balanced design is based upon a popular harsh environment fiber optic connector. The single "AA" style battery is good for >30 hours of continuous use and the soft-sided protective case with belt loop provides a convenient and protective means of storage.

Applications

Affordable VFL Solution for:

- Identifying breaks, bends, and other damage in optical fibers
- Tracing fiber paths
- Identifying termination errors
- Continuity testing

Product Dimensions

Length — 18.5 cm [7.283 in]
Width — 2.2 cm [0.866 in]
Thickness — 2.2 cm [0.866 in]
Weight (w/battery) — 150 g [0.33 lb]

Description	Part Number
Hand Held Visual Fault Locator	1828352-1
1.25 mm Adapter for Hand Held VFL	1828353-1
Includes Part Numbers 1828352-1 and 1828353-1	1828352-2

Combination LIGHTCRIMP PLUS SC/ST/LC Termination Kit Part Number 1985162-1

Note: All part numbers are RoHS compliant.

Catalog 1307895
Revised 11-07

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USA: 1-800-522-6752
Canada: 1-905-470-4425
Mexico: 01-800-733-8926
C. America: 52-55-1106-0803

South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 31-73-624-6639

Rugged Fiber Optic Products (Continued)

Sealed Circular LC ODVA Conforming Connector

Product Facts

- IP67 rated to ensure protection from dust and water immersion
- LC connector qualified to Telcordia GR-326 and TIA/EIA 568B.3
- Temperature range of –40°C to 85°C
- Bayonet-style mechanical lock
- Flame retardant materials per UL 94 V-0
- Dual mounting bulkhead design
- Singlemode and multimode fiber
- Can be used with cable types 9/125, 50/125 and 62.5/125
- LC to LC internal to the box Jumpers
- LC connector accepts tactical cable with 4.5 mm – 7.5 mm OD
- ODVA Conforming Plug to X interface on tactical with break out
- ODVA Conforming Plug to Plug on tactical cable
- Build to customer need

Applications

The LC ODVA Conforming Connector is ideal for:

- Harsh environments where chemicals, corrosive gases and liquids are commonplace
- Inside and outside industrial plant and equipment that interface with industrial Ethernet networks
- Remote interface applications such as towers and antennae as well as FTTX in PON and at the home applications
- Mobile routers and internet hardware

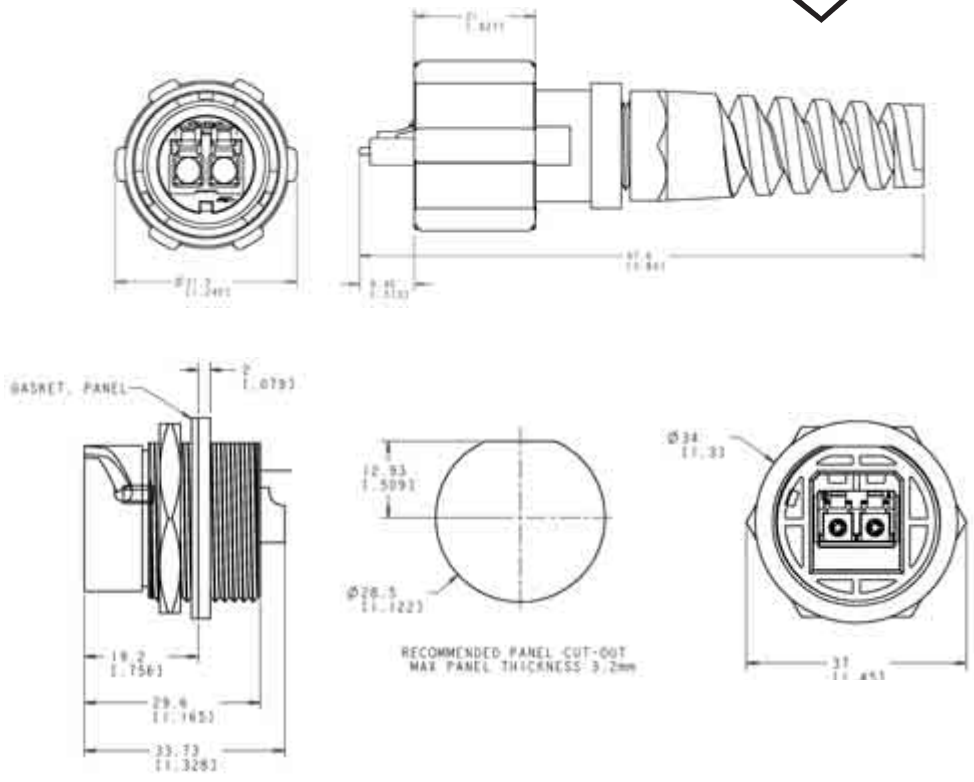
Plug Part Numbers:
1828618-1 (Multimode)
1828618-2 (Singlemode)

Receptacle Part Numbers:
1828619-1 (Multimode)
1828619-2 (Singlemode)

Plug & Receptacle Cap Part Numbers:

Plug Cap	1828740-1
Receptacle Cap	1918177-1

ASSEMBLY CAPABILITIES
Tyco Electronics has extensive Rugged Optic Harness capabilities. Please consult your local Tyco Electronics Sales Representative for assistance.



Standard Cable Assemblies

Part Number	Description
1828935-X	ODVA LC Interface, 62.5, 2 Fiber
1828936-X	ODVA LC Interface, Singlemode, 2 Fiber

Note: X = length in meters

Contact your local Tyco Electronics Sales Representative for information on upcoming product.

Note: All part numbers are RoHS compliant.

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Rugged Fiber Optic Products (Continued)

NEW

Coming Soon — Sealed Circular LC Shielded EMI Connector

EMI Shielded Receptacle Assembly

- **Components are thin film coated using a four-step SS/Cu/Cu/SS vacuum deposition process**
- **This coating results in an approximate 99% shielding effectiveness over uncoated assemblies**

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Rugged Fiber Optic Products (Continued)

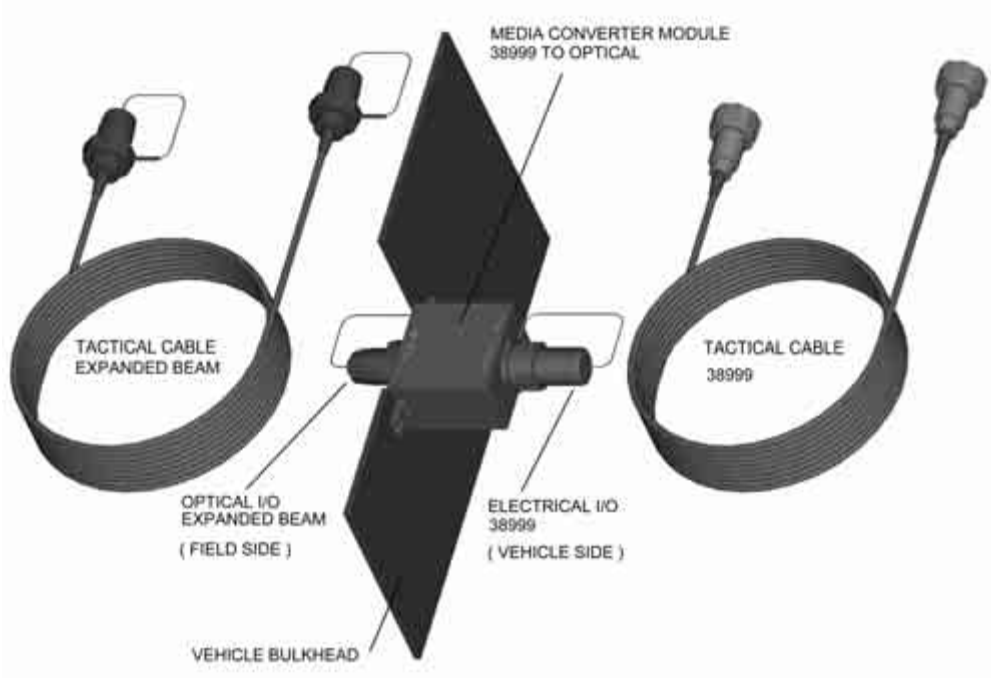
Rugged Media Converter & Ethernet Link Extender Solutions

Harsh Environment Optical Media Converter Assemblies allowing blind mate field applications over one, two, or four fibers

Tyco Electronics offers solutions for Harsh Environment applications of Ethernet Media Converters.

This page demonstrates Tyco Electronics' capabilities for Advanced Optical Modules. These include Fast, Gigabit, and Ethernet Link Extenders.

For additional Advanced Optical Modules, see Fiber Management & Packaged Solutions, Catalog 1307895, Section 3.



Contact your local Tyco Electronics Sales Representative with your specific design needs.

Design Objectives

Specifications	Results
Standard	IEEE802.3, IEEE802.3u Ethernet @ 10/100 Mb/s
Data Rates	10 and 100 Mb/s auto negotiation (option to force 10 Mb/s for legacy systems
Duplex Mode	Full or half-duplex auto-negotiation and N-Way support
Max. Forward Rate	14,880 packets per second (pps) @ 10 Mb/s, 148,800 pps @ 100 Mb/s
Fiber Connector	Multimode
Fiber Working Range	TBD
Optical Budget	TBD
Optical Wavelength	Multimode
Emissions	Complies with FCC Class A and CE Class A
Safety	UL, CE
Temperature Range	-40° - 85°C with humidity 10% to 90% non-condensing
Dimensions	Ø 2.0" (51 mm) X 7.7" (195 mm) from cap to cap Ø 2.0" (51 mm) X 6.6" (168 mm) X 7.6" (194 mm) for 90 assembly
Power Consumption	TBD
Power	5VDC
Qualification	Complies with MIL-STD-810D environmental requirements

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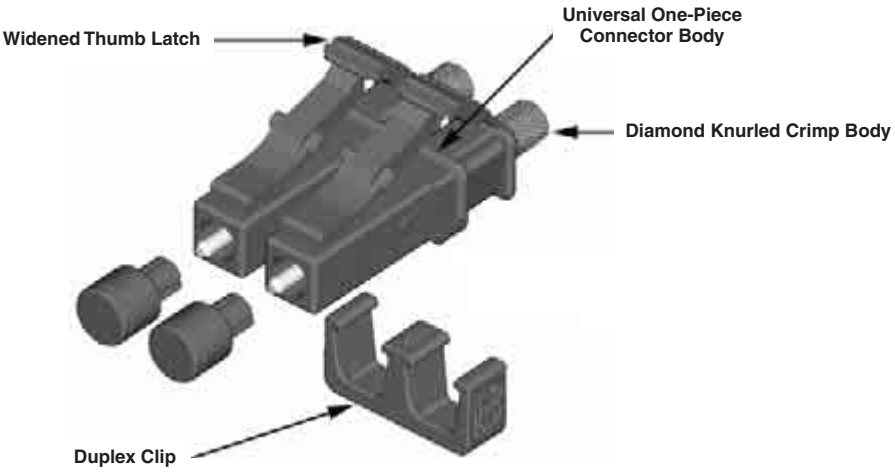
LC Connectors

One-Piece LC Connector

Product Facts

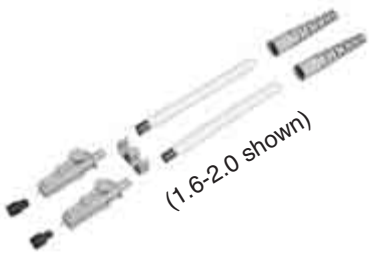
- Singlemode Telecordia GR-326 tested (Report #501-652)
- Multimode TIA/EIA 568-B.3 tested
- Singlemode and Multimode are compatible with both anaerobic adhesives and heat cure epoxy adhesives
- Universal Connector Body
  - Common body for simplex or duplex
  - Common body for jumper or buffer applications
  - Fewer parts to inventory
- Duplex Clip
  - Field installable
  - Makes simplex assemblies duplex
  - Correct polarity errors
  - Used for both jumpers and buffered fiber applications
- One-Piece Body
  - Improved rigidity
  - Improved side-load strength



- Color coded to comply with 568 C
  - Aqua for 50/125 laser optimized
  - Black for standard 50/125
  - Beige for 62.5/125
  - Blue for singlemode
- Widened Thumb Latch
  - Increased hit area
  - Increased bend strength
  - Ramped front latch for snag resistance
- Diamond Knurled Crimp Body
  - Increased tensile proof strength
  - Identical to Tyco Electronics' SC/FC design

Performance Characteristics

Insertion Loss — 0.2 dB Typical
Reflectance — -55 dB Typical
Operating Temperature — -40°C to +75°C
Durability — 500 Cycles



LC Connector Kits

Description	Fiber Type	Housing Color	Boot Color	Used with	Individual Pack Part Number	Bulk Pack Part Number
Simplex	Singlemode	Blue	Blue	900 µm Buffered	1918384-1	1918384-2
				1.6-2.0 mm Jacketed	1918266-1	1918266-2
				3.0 mm Jacketed	1918374-1	1918374-2
	Multimode	Beige	Aqua	900 µm Buffered	1918385-3	1918385-5
				1.6-2.0 mm Jacketed	1918267-3	1918267-5
				3.0 mm Jacketed	1918375-3	1918375-5
		Beige	Black	900 µm Buffered	1918385-4	1918385-6
				1.6-2.0 mm Jacketed	1918267-4	1918267-6
				3.0 mm Jacketed	1918375-4	1918375-6
		Beige	Beige	900 µm Buffered	1918385-1	1918385-2
				1.6-2.0 mm Jacketed	1918267-1	1918267-2
				3.0 mm Jacketed	1918375-1	1918375-2
Duplex	Singlemode	Blue	Blue	900 µm Buffered	1918387-1	1918387-2
				1.6-2.0 mm Jacketed	1918372-1	1918372-2
				3.0 mm Jacketed	1918376-1	1918376-2
	Multimode	Beige	Aqua	900 µm Buffered	1918388-3	1918388-5
				1.6-2.0 mm Jacketed	1918373-3	1918373-5
				3.0 mm Jacketed	1918377-3	1918377-5
		Beige	Black	900 µm Buffered	1918388-4	1918388-6
				1.6-2.0 mm Jacketed	1918373-4	1918373-6
				3.0 mm Jacketed	1918377-4	1918377-6
		Beige	Beige	900 µm Buffered	1918388-1	1918388-2
				1.6-2.0 mm Jacketed	1918373-1	1918373-2
				3.0 mm Jacketed	1918377-1	1918377-2
Duplex Clip	For use with Simplex Kits	Black	—	—	1754371-1	—

Note: All part numbers are RoHS compliant.

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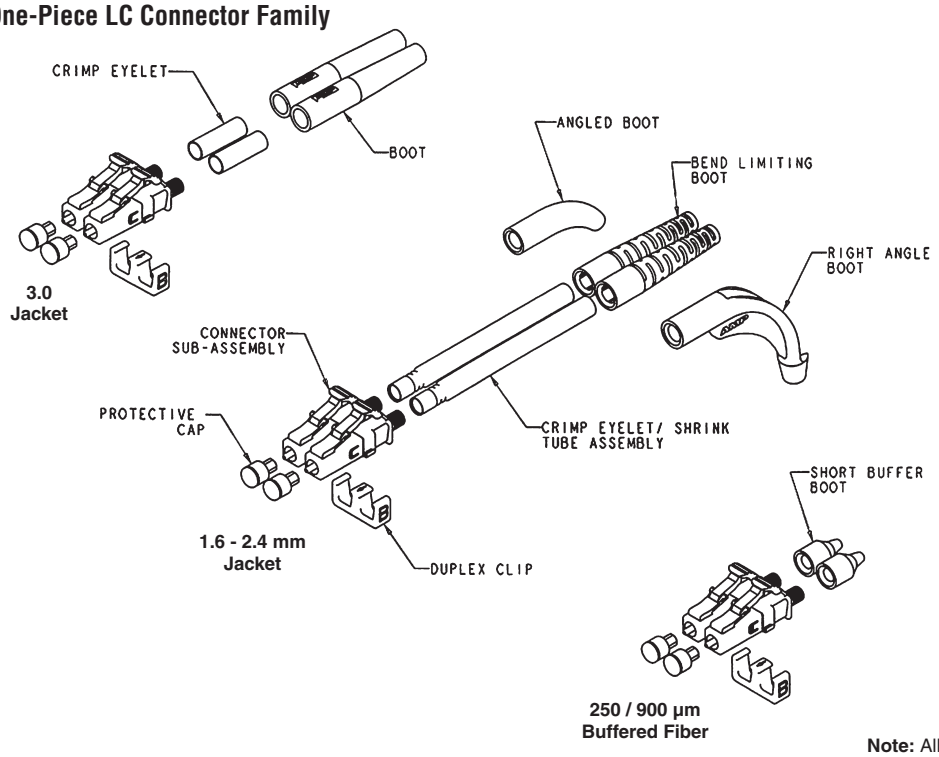
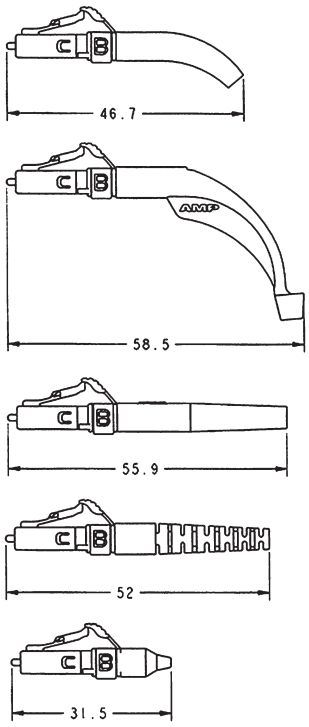
LC Connectors (Continued)

One-Piece LC Connector Family





Note: All of the above are also available in simplex.

LC Connector Component Selection Chart (bulk packaged)

Fiber Type	Simplex Connector Assembly & Dust Cap	Duplex Clip	Cable Size	Crimp Eyelet with Heat Shrink	Crimp Eyelet	Strain Relief Description	Strain Relief Part Number (see chart below)
Singlemode (blue hsg.)	1828456-1	1754371-1	1.6-2.0 mm	6374150-1	—	Straight/Bend Limiting	1588153-X
			1.6-2.0 mm	6374150-1	—	Angled	1374737-X
			1.6-2.0 mm	6374150-1	—	50 Degree Angle	6457543-X
			2.4 mm	6588189-1	—	Straight/Bend Limiting	1588153-X
			2.4 mm	6588189-1	—	Angled	1374737-X
			2.4 mm	6588189-1	—	50 Degree Angle	6457543-X
			3.0 mm	—	5504118-3	Straight	502716-X
			900 µm	—	—	900 µm Buffer, 10 mm	6588612-X
Multimode (beige hsg.)	1754625-1	1754371-1	1.6-2.0 mm	6374150-1	—	Straight/Bend Limiting	1588153-X
			1.6-2.0 mm	6374150-1	—	Angled	1374737-X
			1.6-2.0 mm	6374150-1	—	50 Degree Angle	6457543-X
			2.4 mm	6588189-1	—	Straight/Bend Limiting	1588153-X
			2.4 mm	6588189-1	—	Angled	1374737-X
			2.4 mm	6588189-1	—	50 Degree Angle	6457543-X
			3.0 mm	—	5504118-3	Straight	502716-X
			900 µm	—	—	900 µm Buffer, 10 mm	6588612-X

1374737-X

6457543-X

6588612-X

1588153-X

Crimp Tool Dieset only - 1588175-1
Crimp Tool with Dieset - 1588176-1
Instruction Sheet: 408-8675
http://www.tycoelectronics.com/documents

Termination Kit - 1754462-1
Upgrade Kit for Anaerobic terminations - 1754603-1

Strain Relief Color

Base Part Number	Beige	Blue	Black	Red	Aqua
1588153	-5	-2	-3	—	-8
1374737	-2	-1	-3	—	—
6457543	-1	-2	-4	—	—
502716	-3	-4	-1	-5	-11
6588612	-1	-2	-5	-4	-8

Note: All part numbers are RoHS compliant.

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LC Connectors (Continued)

Tight Jacketed LC Connectors

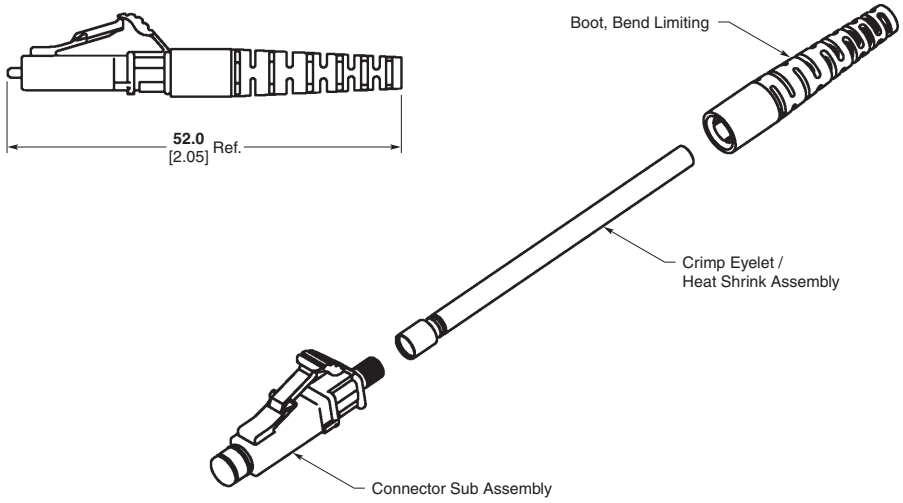
Product Facts

- Multimode or singlemode
- Simplex or duplex
- Tested using MIL-PRF-85045/16 2.0 mm cable
- LC Commercial Item Description (CID) interim approval by the Naval Surface Warfare Center, Dahlgren Division

Application

- In Flight Networks
- Shipboard Applications
- Aero Market

The tight jacketed LC Connectors are non pull-proof versions of the standard connectors that are designed for use with tight construction cable. Unlike standard connectors, this design allows the jacket and buffer to move together, reducing the chances of micro-bends and fiber breakage.



Fiber Type	Kit Part Number	Description
Singlemode (blue body & straight boot)	6828095-X	Simplex, 1.6–2.0 mm
	6828130-X	Duplex, 1.6–2.0 mm
	1918228-X	Simplex, 2.4 mm
Multimode (beige body & straight boot)	6828094-X	Simplex, 1.6–2.0 mm
	6828129-X	Duplex, 1.6–2.0 mm
	1918153-X	Simplex, 2.4 mm

Note: X = -1 for individual package, -2 for bulk package.
Instruction Sheet 408-10014. See http://www.tycoelectronics.com/documents.
Duplex Clip Available (Part Number 1754371-1).

Note: All part numbers are RoHS compliant.

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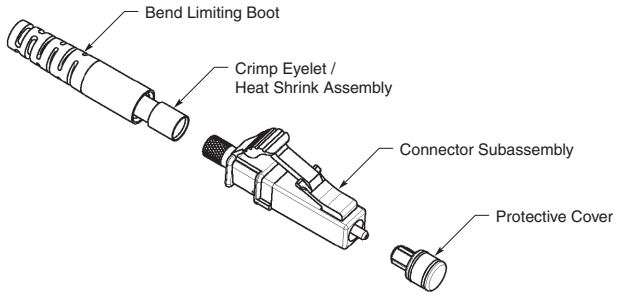
LC Connectors (Continued)

Short Boot LC Connector

Product Facts

- **Overall LC connector length 42.5 mm (compares to 52 mm standard product)**
- **Multimode or singlemode**
- **Simplex or duplex**
- **Anti-snag rear connector latch**
- **For 1.6 mm to 2.4 mm cable**
- **GR-326 Small Form-Factor Performance Requirements**

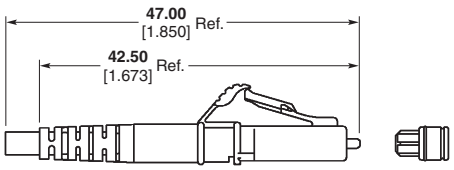
The short boot LC connector provides GR-326 level performance while reducing ferrule tip to boot length to 42.5 mm. The 20% reduction in length is ideal for installing in cabinets or other enclosed spaces, protecting against potential mechanical damage from closed cabinet doors.

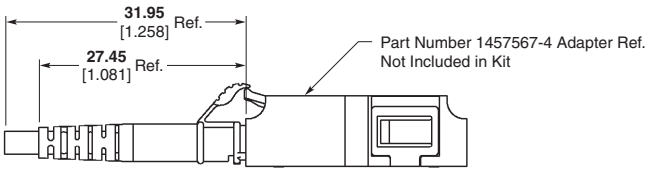


Fiber Type	Kit Part Number	Description
Singlemode (blue body & straight blue boot)	1918407-X	Simplex, 1.6-2.0 mm
	1918406-X	Duplex, 1.6-2.0 mm
Multimode (beige body & straight beige boot)	1918405-X	Simplex, 1.6-2.0 mm
	1918404-X	Duplex, 1.6-2.0 mm

Note: X = -1 for individual package, -2 for bulk package

The boot (1918403-X) is also sold separately, for use with any Tyco Electronics LC connector.





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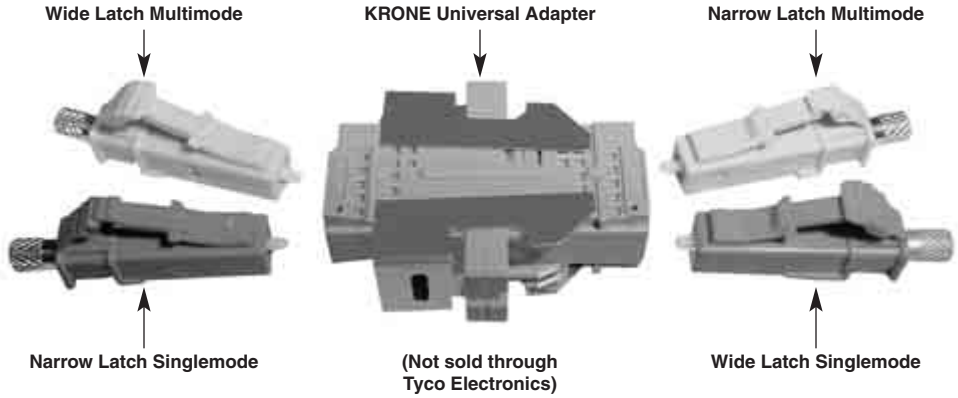
LC Connectors (Continued)



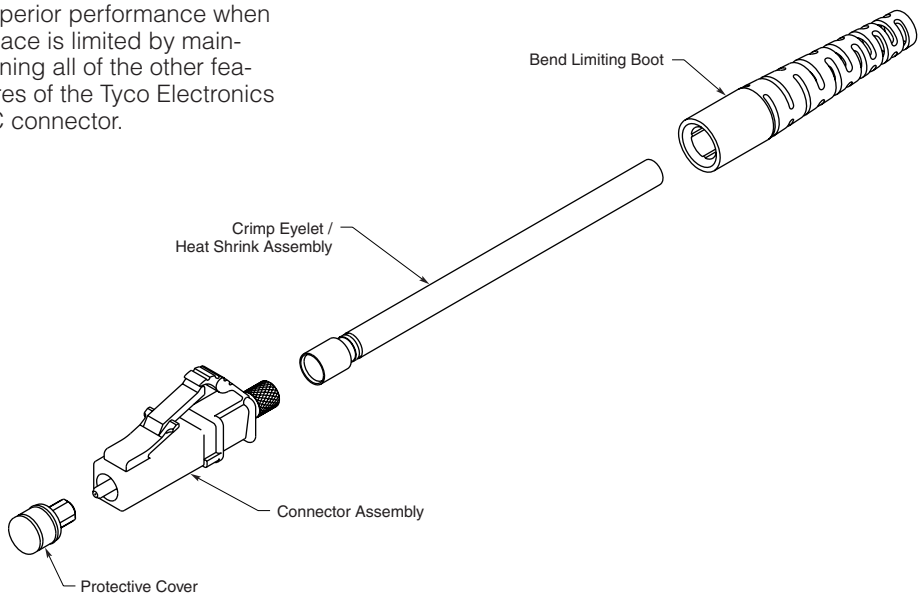
NEW

Narrow Latch LC Connector

Product Facts

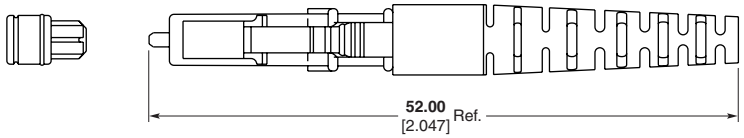
- One-piece housing
- Reduced thumb latch for tight interconnections
- Mates with Krone universal 1.25 mm adapter
- Multimode or singlemode
- Duplex through use of clip (Part Number 1754371-1)
- Anti-snag rear connector latch
- Subassembly can be used with 900 µm to 3.0 mm cable
- GR-326 Small Form Factor Performance

The reduced thumb latch on this connector provides superior performance when space is limited by maintaining all of the other features of the Tyco Electronics LC connector.



Fiber Type	Kit Part Number	Description
Singlemode (Blue Body & Straight Blue Boot)	1918538-X	Simplex, 1.6-2.0 mm
Multimode (Beige Body & Straight Beige Boot)	1918539-X	Simplex, 1.6-2.0 mm

Note: X = -1 for individual package, -2 for bulk package



KRONE is a trademark of KRONE Optical Systems, Inc.

Note: All part numbers are RoHS compliant.

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LC Connectors (Continued)

NEW

LC/SC Flexible Boot

Product Facts

- Compatible with any Tyco Electronics LC Connector
- Compatible with Tyco Electronics SC Part Numbers 6588714-3 and 6588715-5
- Controls cable radius in limited space environments
- For use with 1.6 to 2.4 mm multimode or singlemode cable
- Requires crimp eyelet with heat shrink (Part Number 6374150-X or 6588189-1)

Base Part Number	Beige	Blue	Black	Red
1918003	-5	-2	-3	—

NEW

LC/SC 900 µm GR-326 Style Boot

Product Facts

- Compatible with any Tyco Electronics LC Connector
- Compatible with Tyco Electronics SC parts 6588714-3 and 6588715-5
- Provides bend limiting support
- For use with 900 µm multimode or singlemode fiber

Base Part Number	Beige	Blue	Black	Green
1828184	-4	-1	-2	-3

Note: All part numbers are RoHS compliant.

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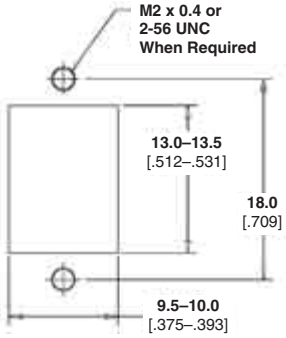
LC Adapters

LC Duplex Adapter for SC Cutout — Plastic

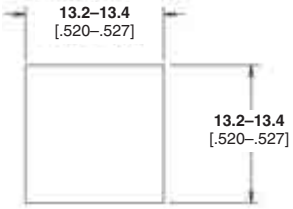
Alignment Sleeve Material	Description	Housing Color	Part Numbers
Metal	Flanged	Beige	6457567-8
		Black	2-6457567-1
		Aqua	2-6457567-0
		Blue	1-6457567-3
	Flangeless	Beige	6457567-7
		Black	1-6457567-9
		Aqua	1-6457567-8
Ceramic	Flanged	Beige	6457567-5
		Black	1-6457567-7
		Aqua	1-6457567-6
		Blue	6457567-4
		Green	6457567-6
	Flangeless	Beige	6457567-2
		Black	1-6457567-5
		Aqua	1-6457567-4
		Blue	6457567-1
		Green	6457567-3



Recommended Panel Cutout
Max. Panel Thk. 1.70 [.067]

LC Duplex Adapter for LC Cutout — Plastic

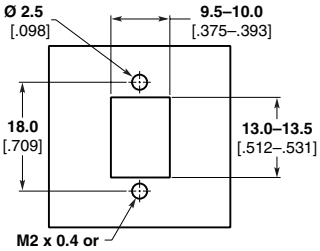
Alignment Sleeve Material	Description	Housing Color	Part Numbers
Metal	Duplex Sr-Jr	Beige	1985150-4
		Blue	1985150-3
	Duplex Sr-Sr	Beige	1985149-4
		Blue	1985149-3
Ceramic	Duplex Sr-Jr	Beige	1985150-2
		Blue	1985150-1
	Duplex Sr-Sr	Beige	1985149-2
		Blue	1985149-1



Recommended Panel Cutout
Panel Thk. 1.2/1.7 [.047/.067]

LC Adapter for SC Cutout — Metal

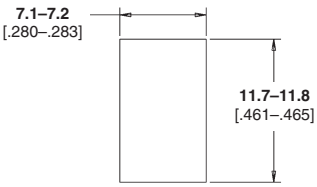
Alignment Sleeve Material	Description	Housing Color	Part Numbers
Ceramic	Flanged	Electroless Nickel	1754683-1
	Flangeless		1754682-1
	Flangeless w/ EMI Shielding		1754727-1



Recommended Panel Cutout
Panel Thk. 1.2/1.7 [.047/.067]

LC Simplex Adapter — Plastic

Alignment Sleeve Material	Description	Housing Color	Part Numbers
Ceramic	Simplex Adapter	Beige	1457062-2
		Blue	1457062-1

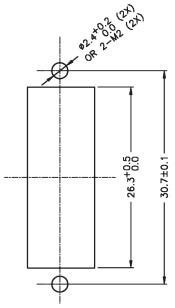


Recommended Panel Cutout
Panel Thk. 1.2/1.7 [.047/.067]

LC Quad Adapter — Plastic Flanged

Alignment Sleeve Material	Description	Housing Color	Part Numbers
Metal	Flanged	Beige	1695790-5
Ceramic	Flanged	Blue	1695790-4

Note: All part numbers are RoHS compliant.



Recommended Panel Cutout
Max. Panel Thk. 1.7 [.067]

Catalog 1307895
Revised 11-07

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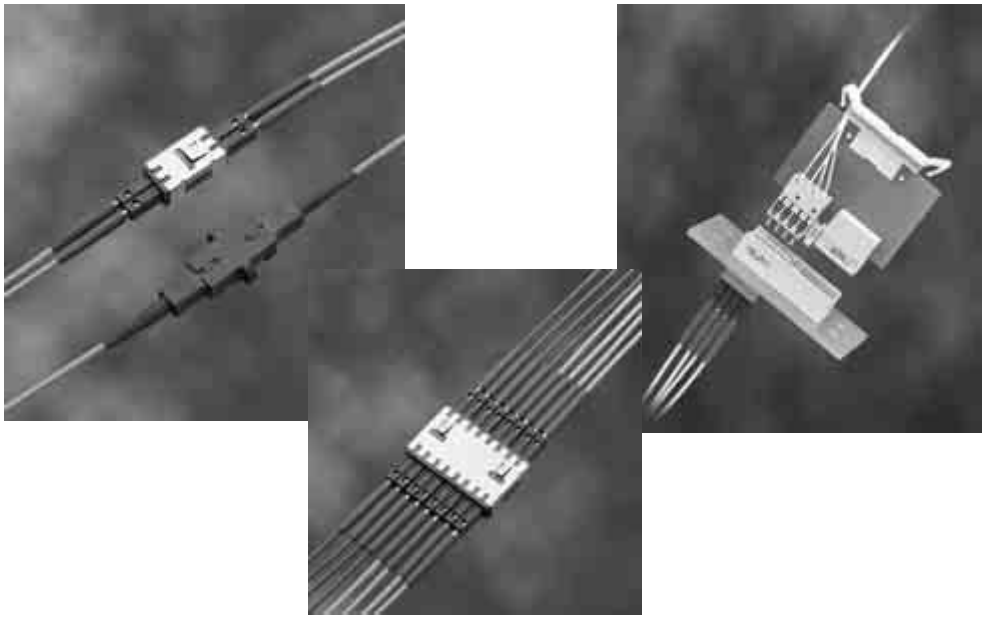
MU High Density Connectors

Product Facts

- **Singlemode and multimode product range**
- **For digital network applications PC end face available on both singlemode and multimode connectors**
- **For analog network applications, APC end face available on singlemode connectors (8°)**
- **Connector design uses 1.25 mm ceramic ferrule technology**
- **Polarized for precise insertion**
- **Factory terminated cable assemblies**
- **LSZH sheathed cable available**
- **High optical performance (low insertion, high return loss)**
- **High density (up to 8 lines per module)**

Performance Characteristics

Insertion Loss — 0.1 dB Typical
Reflectance — -55 dB Typical
Operating Temperature — -25°C to +75°C
Durability — 500 Cycles



Tyco Electronics' MU high density fiber optic interconnection system offers a solution for high performance telecommunications networking.

The system centers around the fully standardized MU connector, which is also sometimes known as the Mini SC. The MU connector is at least half the size of the standard SC connector. It can offer twice the port density but all the optical performance of traditional fiber optic connectors.

Featuring a similar latching mechanism to the SC connector, the MU is just as easy to connect and disconnect.

The MU system includes a complete range of multimode and singlemode pre-terminated cable assemblies; bulkhead adapters; backplane housings; system card housings; connector kits; termination tooling and customer polishing processes.

Key Applications

Front Panel I/O and High Density Patch Panels for Optical Transmission Equipment, Optical Distribution Frames and Optical Network Units.

- **Full range of simplex, duplex and 8 position bulkhead adapters**
- **Color coded adapters for ease of identification**
- **Tuneable versions available to achieve lower insertion losses**
- **"Push-pull" type latching mechanism**
- **Fully compliant with relevant IEC standards (IEC 60874-1, CECC 86 305 801)**
- **Exceeds ETSI performance requirements (ETSI Grade P)**

Back Panel I/O in Optical Transmission and Switching Equipment

- **8 position Type L optical modules available**
- **2.0 mm misalignment pickup tolerance during mating**
- **Zero force on backplane when fully mated**
- **Zero tensile load on daughter card when fully mated**
- **Constant mating force during 2.5 mm free float**
- **Fully compliant with IEC 60917 and IEC 61076-4-101**

Description	Part Number
FOKIT MU SM PC 0.9 125/1.0	1348982-1♦
FOKIT MU SM PC 0.9 126/1.0	1348982-2♦
FOKIT MU SM PC 125 µm, 2.0 mm	106875-1♦
FOKIT MU SM PC 126 µm, 2.0 mm	106875-2♦

Note: Part Numbers are RoHS compliant except: ♦ Indicates non-RoHS compliant.

MU Standards Compliance

Product range —
MU cable assembly
Applicable standards —
IEC 60874-1
CECC 86 305 801 (MU-APC)
I-ETS 300 671
IEC 61300

Product range —
Z-PACK 2 mm HM Product
Applicable standards —
IEC 60917
IEC 61076-4-101

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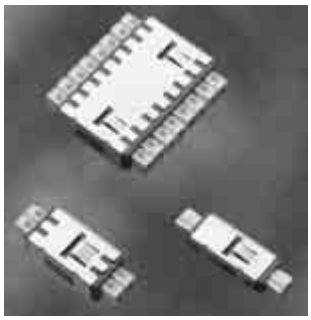
MU High Density Connectors (Continued)

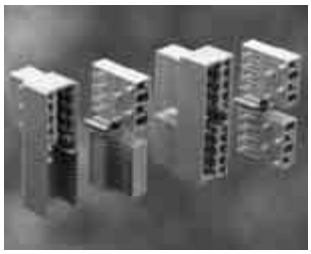


MU Bulkhead Adapter

The MU bulkhead adapter is designed to help save valuable panel space in high density applications. The adapter enables the interconnection of two MU connectors and features a 1.25 mm ceramic alignment sleeve to ensure precise fiber alignment and low insertion loss, both during and after the interconnection process.

The MU bulkhead adapter is available in PC and APC versions for both digital and analog network applications. It is also available in a choice of simplex, duplex and 8 position versions.

Description	Part Number
PC finish	
Simplex MU Adapter	233263-1 ♦
Duplex MU Adapter	233263-3 ♦
Duplex MU Adapter with SC cut-out	1348840-2
APC finish	
Duplex MU Adapter with SC cut-out	1348840-1



Z-PACK 2 mm HM[1] Type L and M Connector Housings

Z-PACK 2 mm HM connector housings offer a solution to the demand for discrete fiber lines, allowing single disconnects and routing on the backplane.

The 8 position Type L connector housing is fully optical and can accommodate up to 8 fiber lines. These connector housings are available in female configurations and are designed for use on the system card.

The hybrid Type M connector housing combines optical and electrical contacts in one housing, with 55 signal contact positions and 4 fiber optic lines. It allows easy migration from combined optical / electrical to full optical backplane inter-connections. Female Type M connector housings are suitable for use on the system card while male Type M connector housings are designed for back panel application.

Tyco Electronics also designs and manufactures a range of MT based fiber optic backplane connectors, LIGHTRAY MPX fiber optic backplane connectors. For further information, see Cable Assemblies & Backplane Interconnects Section 2, pages 137-151.

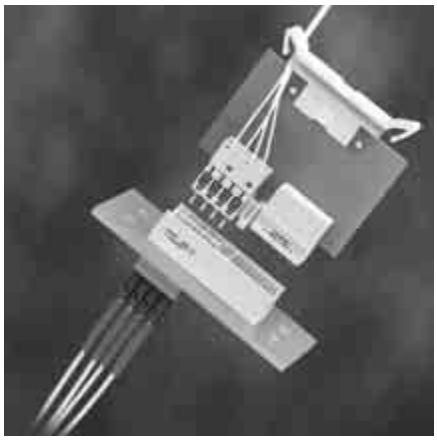
Description	Part Number
Type L	
Male	106743-1 ♦
Female	106744-1

[1]HM : Hard Metric

MU Backplanes

Product Facts

- **Complies to IEC 60917 and IEC 61076-4-101**
- **Constant mating force during 2.5 mm free float**
- **Zero tensile load on system card and backplane when fully mated**
- **Low insertion / extraction forces**
- **Scalable system allows easy implementation of future upgrades**
- **Low loss**
- **High return loss**
- **APC versions available**
- **Float in all directions (including x and y)**
- **Misalignment pick up tolerances 2.0 horizontal, 2.5 mm vertical, and 2 degrees angular**



Description	Part Number
2 Position	
Backplane Housing (includes mounting bracket)	1391160-1 ♦
Systemcard Housing	1391095-1
4 Position	
Backplane Housing (includes mounting bracket)	1391161-1 ♦
Systemcard Housing	1391094-1

Note: Future product extensions planned: 6 position and 8 position versions. Please contact your local Sales Engineer for additional information.

Note: Part Numbers are RoHS compliant except: ♦ Indicates non-RoHS compliant.

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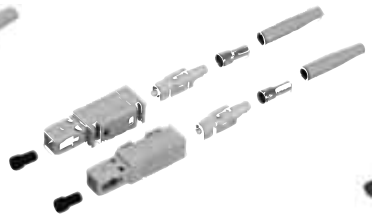
SC Connectors

Product Facts

- One-piece connector body:
  - Fastest assembly
  - Field installable
  - Anaerobic adhesive compatible
- Compliant with
  - JIS C-5973
  - Fibre Channel
  - TIA FOCIS-3
- Pre-radiused ceramic ferrules
- For 125 µm cladding diameter
- Instruction Sheet 408-8674 http://www.tycoelectronics.com/documents
- Color coded to comply with 568C
  - Aqua for 50/125 laser optimized
  - Black for standard 50/125
  - Beige for 62.5/125
  - Blue for singlemode

Simplex Connector



Duplex Connector

SC 1.6 mm to 2.0 mm Connector

Singlemode SC Connector Kits — Polymer Crimp Body

Description	Housing Color	Boot Color	Used With	Part Numbers		
				Individual Pack	Bulk Pack	Crimp Tool
Simplex	Blue	Blue	900 µm Buffered, 3.0 mm Jacketed	5504646-7	—	503911-1
			3.0 mm Jacketed	5504646-1	5504646-2	503911-1
			2.4 mm Jacketed	5504933-2	5504933-4	492026-1
			2.0 mm Jacketed	5503934-2	5503934-3	492026-1
			900 µm Buffer	5492123-1	5492123-2	N/A
Duplex	Blue	Blue	3.0 mm Jacketed	5504655-1	5504655-2	503911-1
			2.0 mm Jacketed	5504936-2	—	492026-1

GR-326 Style Singlemode SC Connector Kits — Metal Crimp Body

Description	Housing Color	Boot Color	Used With	Part Numbers		
				Individual Pack	Bulk Pack	Crimp Tool
Simplex	Blue	Blue	3.0 mm Jacketed	4-1918861-5	—	(1) 492131-1 (1) 58532-1
			2.4 mm Jacketed	6588714-5	6588714-6	1588176-1
			2.0 mm Jacketed	6588714-1	6588714-4	1588176-1
Duplex	Blue	Blue	2.4 mm Jacketed	6693776-5	6693776-6	1588176-1
			2.0 mm Jacketed	6693776-1	6693776-2	1588176-1

Multimode SC Connector Kits

Description	Housing Color	Boot Color	Used With	Part Numbers		
				Individual Pack	Bulk Pack	Crimp Tool
Simplex	Beige	Aqua	900 µm Buffered, 3.0 mm Jacketed	1-5503948-1	—	503911-1
			3.0 mm Jacketed	1-5503948-0	—	503911-1
			2.0 mm Jacketed	5504931-5	—	492026-1
			900 µm Buffer	5504932-5	—	N/A
	Beige	Black	900 µm Buffered, 3.0 mm Jacketed	1-5503948-2	—	503911-1
			3.0 mm Jacketed	1-5503948-3	5503948-8	503911-1
			2.0 mm Jacketed	5504931-6	5504931-3	492026-1
			900 µm Buffer	5504932-1	5504932-2	N/A
	Beige	Beige	900 µm Buffered, 3.0 mm Jacketed	5503948-5	—	503911-1
			3.0 mm Jacketed	5503948-1	5503948-2	503911-1
			2.4 mm Jacketed	5504930-1	5504930-2	492026-1
			2.0 mm Jacketed	5504931-1	—	492026-1
			900 µm Buffer	5504932-6	—	N/A
Duplex	Beige	Aqua	3.0 mm Jacketed	5504657-8	—	503911-1
			2.0 mm Jacketed	5504928-3	—	492026-1
	Beige	Black	3.0 mm Jacketed	5504657-9	—	503911-1
			2.0 mm Jacketed	5504928-4	—	492026-1
	Beige	Beige	3.0 mm Jacketed	5504657-1	5504657-2	503911-1
			2.4 mm Jacketed	5504927-1	5504927-2	492026-1
			2.0 mm Jacketed	5504928-1	—	492026-1

Performance Characteristics for Singlemode SC Connector Kits — Polymer Crimp Body

- **Insertion Loss** — <0.2 dB Typical
- **Return Loss** — <-55 dB Typical
- **Durability** — 200 Cycles

Performance Characteristics for GR-326 Style Product

- **Insertion Loss** — <0.2 dB Typical
- **Return Loss** — <-59 dB Typical
- **Durability** — 200 Cycles
- **Tested to GR-326 (Test Report 501-584)**
- **Tunable** — 6 positions

Performance Characteristics for Multimode SC Connector Kits

- **Insertion Loss** — <0.2 dB Typical
- **Durability** — 500 Cycles
- **TIA 586B Compliant**

Note: All part numbers are RoHS compliant.

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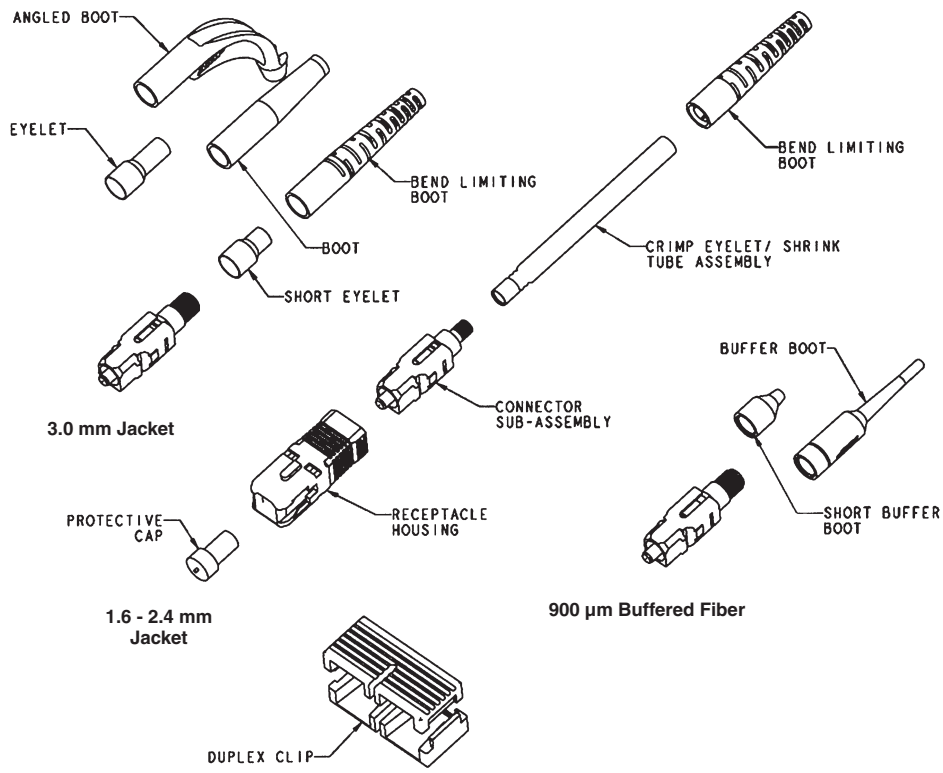
SC Connectors (Continued)

SC Connector Components



SC Duplex Clip (Black) Part Number 6348522-1

Use 2 pieces to duplex simplex housings

SC Connector Component Selection Chart (bulk packaged)

Fiber Type	Simplex Connector Sub-Assembly	Duplex Clip*	Cable Size	Crimp Eyelet w/ Heat Shrink	Crimp Eyelet	Strain Relief Part Number**
Singlemode - GR-326 Style	6457215-5	(2) 6348522-1	3.0 mm	—	504973-3	1588491-X
	6588714-3	(2) 6348522-1	2.4 mm	6588189-1	—	1588153-X
			1.6-2.0 mm	6374150-2	—	1588153-X
			900 µm	—	—	1828184-X
Singlemode - Polymer Crimp Body	5492123-7	(2) 6348522-1	3.0 mm	—	503970-3	5503971-X
			2.4 mm	—	503970-6	5503971-X
			2.0 mm	—	503970-9	5503971-X
			900 µm	—	—	6457493-X (long)
						6278309-X (short)
Multimode - Metal Crimp Body (Ceramic Ferrule)	6588715-5	(2) 6348522-1	2.4 mm	6588189-1	—	1588153-X
			1.6-2.0 mm	6374150-2	—	1588153-X
			900 µm	—	—	1828184-X
Multimode - Polymer Crimp Body (Ceramic Ferrule)	5503948-7	(2) 6348522-1	3.0 mm	—	503970-3	5503971-X
			2.4 mm	—	503970-6	5503971-X
			2.0 mm	—	503970-9	5503971-X
			900 µm	—	—	6457493-X (long)
						6278309-X (short)

* For Fibre Channel compliant assemblies, use one (1) piece each of Part Number 503487-Y and 503488-Y. (Dash refers to color — refer to customer drawing for details).

** Strain relief dash number indicates color - see page 55 for details.

Note: All part numbers are RoHS compliant.

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SC Connectors (Continued)

3.0 mm - GR-326 Style

SC Strain Reliefs — Jacketed Cable

Description	GR-326 Style	Part Number Color			
		Black	Red	Beige	Blue
3.0 mm	No	1-5503971-0	1-5503971-1	5503971-1	5503971-2
2.4 mm	No	1-5503971-2	1-5503971-3	5503971-3	5503971-4
2.0 mm	No	2-5503971-3	2-5503971-7	5503971-5	5503971-6
3.0 mm	Yes	—	—	—	1588491-2
1.6 mm - 2.4 mm	Yes	1588153-3	—	1588153-5	1588153-2

3.0 mm Angled

SC Strain Reliefs — Angled

Description		Part Number Color		
		Black	Beige	Blue
3.0 mm	Simplex	1278705-3	1278705-2	1278705-1
2.0 mm	Simplex	1374737-3	1374737-2	1374737-1
2.0 mm	45° Simplex	6457543-4	6457543-1	6457543-2

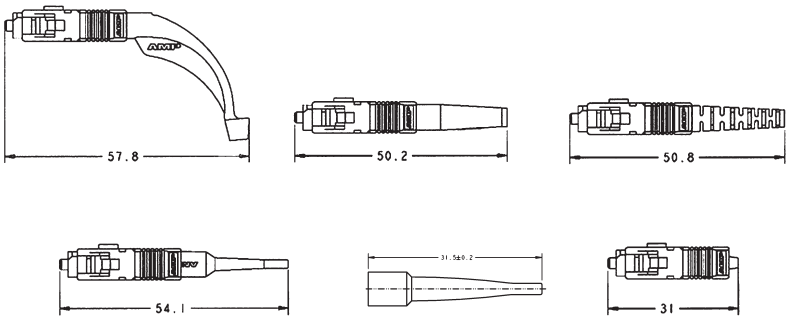
900 µm Short

900 µm

SC Strain Reliefs — 900 micron

Description	Part Number Color		
	Black	Beige	Blue
Long (33 mm) 900 µm	6457493-3	6457493-9	6457493-1
Short (10 mm) 900 µm	6278309-1	—	6278309-2
GR-326 Style 900 µm	1828184-2	1828184-4	1828184-1

GR-326 Style 900 µm



SC Low Loss Loopback Connector

Part Number 5503141-1

Product Facts

- 62.5/125 Multimode
- Use for Equipment Testing
- 0.6 dB Insertion Loss
- 0.5" Ferrule Centerline

Part Number 5503141-2

Product Facts

- 50/125 Multimode
- Use for Equipment Testing
- 0.8 dB Insertion Loss
- 0.5" Ferrule Centerline

Part Number 5504883-1

Product Facts

- Singlemode
- Use for Equipment Testing
- 1.5 dB Insertion Loss
- 0.5" Ferrule Centerline

Note: All part numbers are RoHS compliant.

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SC Connectors (Continued)

Tight Jacketed SC Connectors

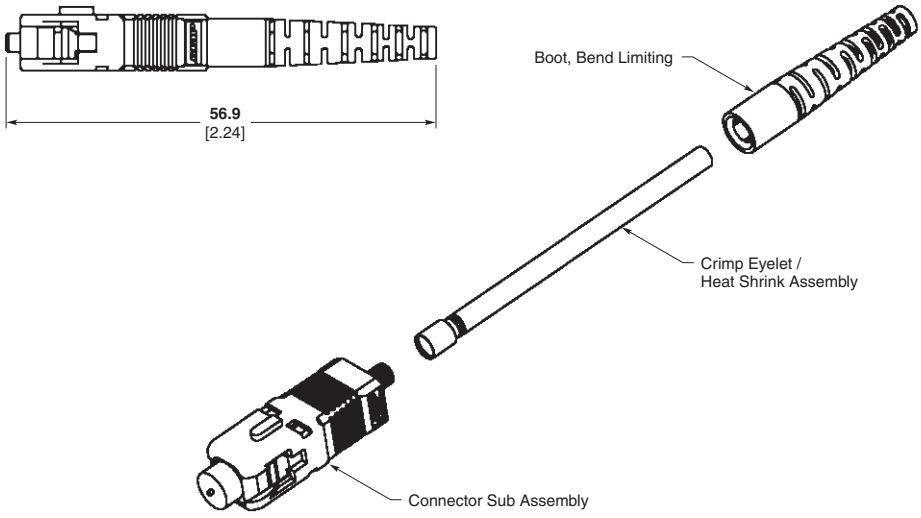
Product Facts

- **Multimode or singlemode**
- **Simplex or duplex**
- **Tested using MIL-PRF-85045/16 2.0 mm cable**
- **SC Commercial Item Description (CID) interim approval by Naval Surface Warfare Center, Dahlgren Division**

Application

- **In Flight Networks**
- **Shipboard Applications**
- **Aero Market**

The tight jacketed SC Connectors are non pull-proof versions of the standard connectors that are designed for use with tight construction cable. Unlike standard connectors, this design allows the jacket and buffer to move together, reducing the chances of micro-bends and fiber breakage.



Tight Jacketed SC Connector Kits

Fiber Type	Kit Part Number	Description
Singlemode (blue body & straight boot)	6828100-X	Simplex, 1.6–2.0 mm
	1828573-X	Duplex, 1.6–2.0 mm
	1918227-X	Simplex, 2.4 mm
Multimode (beige body & straight boot)	6828099-X	Simplex, 1.6–2.0 mm
	1828574-X	Duplex, 1.6–2.0 mm
	1918154-X	Simplex, 2.4 mm

Note: X = -1 for individual package, -2 for bulk package.
Instruction Sheet 408-10015. See http://www.tycoelectronics.com/documents.

Note: All part numbers are RoHS compliant.

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SC Connectors (Continued)

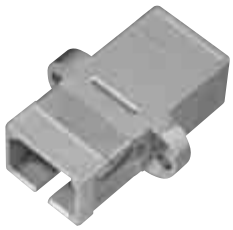
SC Adapters

Product Facts

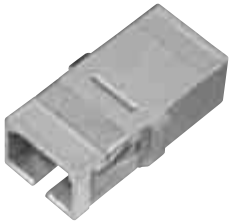
- Suitable for any SC connector
- Available with metal or ceramic alignment sleeves
- Choice of housing materials and colors
- Color coded to comply with 568C
  - Aqua for 50/125 laser optimized
  - Black for standard 50/125
  - Beige for 62.5/125
  - Blue for singlemode
- Duplex adapters accept two simplex connectors or one duplex connector
- Assortment of hybrid configurations available
- Mounting screws available Part Number 503663-1
- Slide-on cover available
- EMI gasketed parts available

SC Simplex Adapter - Plastic

Flangeless SC Simplex Adapter - Plastic



SC Simplex Adapter - Metal



Flangeless SC Simplex Adapter - Metal

SC Duplex Adapter - Plastic

Note: All part numbers are RoHS compliant.

SC Simplex Adapter - Plastic

Alignment Sleeve Material/Application	Housing Color	Part Numbers
Metal/MM only	Beige	5504614-1
	Black	5504614-3
	Aqua	5504614-4
Metal	Beige	5502632-9
	Black	5502632-7
	Aqua	2-5502632-3
	Blue	5502632-8
Ceramic	Beige	1-5502632-2
	Black	1-5502632-0
	Aqua	2-5502632-4
	Blue	1-5502632-1
Ceramic/APC	Green	1828028-2

Flangeless SC Simplex Adapter - Plastic

Alignment Sleeve Material	Housing Color	Part Numbers
Metal	Black	5504632-1
	Blue	5504632-3
Ceramic	Black	5504632-2
	Aqua	5504632-6
	Blue	5504632-4
	Green	5504632-5

SC Simplex Adapter - Metal

Alignment Sleeve Material	Housing Color	Part Numbers
Metal	Electroless Nickel	6278348-1
Ceramic	Electroless Nickel	6278348-3

Flangeless SC Simplex Adapter - Metal

Alignment Sleeve Material	Housing Color	Part Numbers
Metal	Electroless Nickel	6278348-5
Ceramic	Electroless Nickel	6278348-7

SC Duplex Adapter - Plastic

Alignment Sleeve Material/Application	Housing Color	Part Numbers
Metal/MM only	Beige	5504640-1
	Black	5504640-4
	Aqua	5504640-6
Metal	Beige	5502776-9
	Black	5502776-7
	Aqua	2-5502776-5
	Blue	5502776-8
Ceramic	Beige	1-5502776-2
	Black	1-5502776-0
	Aqua	2-5502776-6
	Blue	1-5502776-1
Ceramic/APC	Green	2-5502776-3

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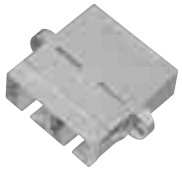
Japan: 81-44-844-8013
UK: 31-73-624-6639

SC Connectors (Continued)

SC Adapters (Continued)



SC Duplex Adapter

SC Duplex Adapter - Metal

Alignment Sleeve Material	Housing Color	Part Numbers
Metal	Electroless Nickel	6278049-1
Ceramic	Electroless Nickel	6278049-3

SC Duplex Metal Adapter w/ EMI Shielding

Shielded SC Duplex Adapter - Metal

Alignment Sleeve Material	Housing Color	Part Numbers
Metal	Electroless Nickel	6374223-1
Ceramic	Electroless Nickel	6374223-3

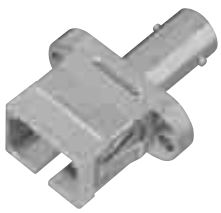
- **Designed to help prevent EMI leak**
- **Ideal for high-speed applications**

SC to ST Hybrid Adapters

SC to ST Simplex Adapter - Plastic

SC to ST Simplex Adapter - Plastic

Alignment Sleeve Material	Housing Color	Part Numbers
Metal	Beige	5502780-3
	Black	5502780-1
	Aqua	2-5502780-0
	Blue	5502780-2
Ceramic	Beige	5502780-6
	Black	5502780-4
	Aqua	2-5502780-1
	Blue	5502780-5



SC to ST Simplex Adapter - Metal

SC to ST Simplex Adapter - Metal

Alignment Sleeve Material	Housing Color	Part Numbers
Metal	Electroless Nickel	6278350-1
Ceramic	Electroless Nickel	6278350-3

Note: All part numbers are RoHS compliant.

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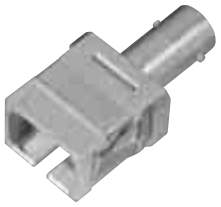
SC Connectors (Continued)

SC to ST Hybrid Adapters
(Continued)



Flangeless SC to ST Simplex Adapter - Metal

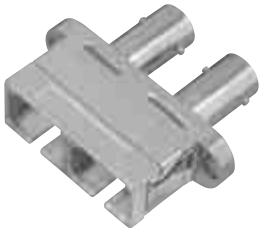
Flangeless SC to ST Simplex Adapter - Metal

Alignment Sleeve Material	Housing Color	Part Numbers
Metal	Electroless Nickel	6278350-5
Ceramic	Electroless Nickel	6278350-7

SC to ST Duplex Adapter - Plastic

SC to ST Duplex Adapter - Plastic

Alignment Sleeve Material	Housing Color	Part Numbers
Metal (MM Only)	Beige	5504663-4
	Black	5504663-6
	Aqua	5504663-5
Metal	Beige	5503137-3
	Black	5503137-1
	Aqua	2-5503137-1
	Blue	5503137-2
Ceramic	Beige	5503137-6
	Black	5503137-4
	Aqua	1-5503137-9
	Blue	5503137-5



SC to ST Duplex Adapter - Metal

SC to ST Duplex Adapter - Metal

Alignment Sleeve Material	Housing Color	Part Numbers
Metal	Electroless Nickel	6278051-1
Ceramic	Electroless Nickel	6278051-3

Slide-on Retractable Cover for SC Simplex or Duplex Applications

The Tyco Electronics slide-on retractable cover is used for simplex or duplex SC applications. These retractable doors slip onto the end of existing Tyco Electronics adapters and can be mounted after the adapter has already been installed.

1693539-1 — Blue Simplex SC

1693539-2 — Beige Simplex SC

1693539-3 — Green Simplex SC

1693540-1 — Blue Duplex SC

1693540-3 — Green Duplex SC

Note: All part numbers are RoHS compliant.

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ST Connectors — Epoxy Type

Product Facts

- **Epoxy type connector**
- **Pre-radiused ceramic ferrule**
- **Available in bulk packages**
- **Crimp tool Part Number 58433-4**

Singlemode Ceramic

Performance Characteristics

Insertion Loss — 0.3 dB typical
Back Reflection — <-40 dB typical
Durability — 200 cycles

Materials

Ferrule Material — Ceramic
Body Material — Nickel Plated Brass
Coupling Nut Material — Plated Die Cast

Ceramic

Singlemode ST Connector Kits — Ceramic Ferrule

Body	Coupling Nut	Boot Color	Used With	Individual Pack Part Number	Bulk Pack Part Number	IS Sheet
Nickel-plated Brass	Zinc	Yellow (900 µm)	900 µm and 250 µm Fibers	5503613-2	5503613-3	408-9645
	Zinc	Yellow (Bend-Limiting)	900 µm and 250 µm Fibers, 3.0 mm Cable	5502579-2	—	408-9645
	Zinc	Yellow (Short)	900 µm and 250 µm Fibers, 3.0 mm Cable	5502580-2	5502580-4	408-9645

Multimode Ceramic

Performance Characteristics

Insertion Loss — 0.3 dB typical
Durability — 500 cycles

Ceramic

Multimode ST Connector Kits — Ceramic Ferrule

Body	Coupling Nut	Boot Color	Used With	Individual Pack Part Number	Bulk Pack Part Number	IS Sheet
Polymer	Polymer	Black (Short)	3.0 mm Cable	—	503569-2	408-9971
		Black (Short)	900 µm Fiber, 3.0 mm Cable	503571-1	—	408-9971
		Black (Buffer)/ Black (Short)	900 µm and 250 µm Fibers, 2.4 mm & 3.0 mm Cable	5503571-3	—	408-9971
	Zinc	Black (Short)	3.0 mm Cable	503677-2	503677-1	408-9971
Nickel-plated Brass	Zinc	Black (Short)	3.0 mm Cable	—	5492458-2	408-9645
		Black (Buffer)/ Black (Short)	900 µm and 3.0 mm Cable	5492458-1	—	408-9645
		Black (Buffer)/ Black (Bend Limiting)	900 µm and 250 µm Fibers, 2.4 mm & 3.0 mm Cable	5501380-1	—	408-9645
		Black (Short)	2.4 mm & 3.0 mm Cable	1-5501380-6	2-5501380-0	408-9645
		Black (Right Angle)	900 µm and 250 µm Fibers, 2.4 mm & 3.0 mm Cable	5502674-1	—	408-9645

Note: All part numbers are RoHS compliant.

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ST Connectors — Epoxy Type (Continued)

Polymer Composite

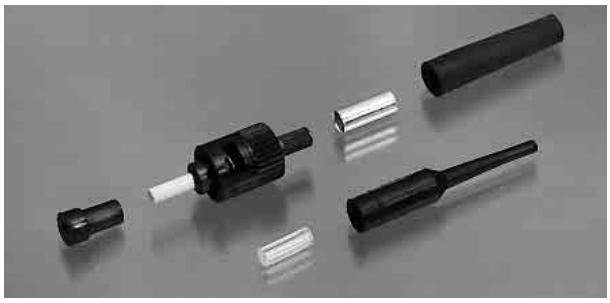
Multimode Polymer Composite

Performance Characteristics

Insertion Loss — 0.3 dB Typical
Durability — 500 Cycles
Crimp Tool — Part Number 58433-4
Instruction Sheet — 408-9971
http://www.tycoelectronics.com/documents

Materials

Ferrule — Composite Polymer
Body — Polymer
Coupling Nut — Polymer



Multimode ST Connector Kits — Polymer Ferrule

Body	Coupling Nut	Boot Color	Used With	Individual Pack Part Number	Bulk Pack Part Number
Polymer	Polymer	Black (Buffer)/ Black (Short)	900 µm and 250 µm Fibers, 3.0 mm Cable	5503415-1	—
		Black (Short)	3.0 mm Cable	—	503424-3

Stainless Steel

Multimode Stainless Steel

Performance Characteristics

Insertion Loss — 0.3 dB Typical
Operating Temp. Range — -30°C to +70°C
Durability — 500 cycles
Crimp Tool — Part Number 58551-1
Instruction Sheet — 408-4151
http://www.tycoelectronics.com/documents

Materials

Ferrule — Stainless Steel
Body — Nickel plated brass
Coupling Nut — Zinc

Multimode ST Connector Kits — Stainless Steel Ferrule

Body	Ferrule Designation	Boot Color	Used With	Part Number
Stainless Steel	125	Black (Bend Limiting)	3.0 mm Cable	5504008-3
		Black (Long)	4.3 mm Cable	5504008-4
	140	Black (Bend Limiting)	3.0 mm Cable	5504008-7
	231	Black (Bend Limiting)	3.0 mm Cable	1-5504008-4
	240	Black (Bend Limiting)	3.0 mm Cable	1-5504008-3
	280	Black (Short)	3.0 mm Cable	4-5504008-6

Note: All part numbers are RoHS compliant.

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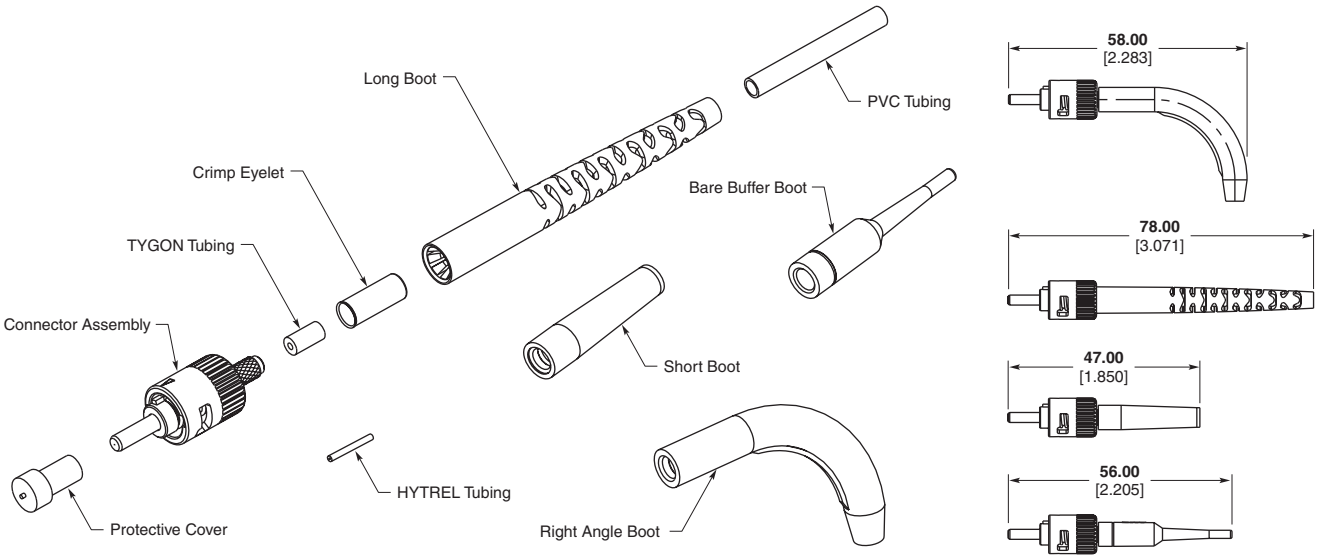
ST Connectors — Epoxy Type (Continued)



ST Connector Component Selection Chart (Bulk Packaged)

Fiber Type	Connector Sub-Assembly	Cable Size	Crimp Eyelet	Tubing	Strain Relief Part Number*
Singlemode - Ceramic Ferrule Metal Body, Metal Nut	5502578-2	1.6-2.0 mm	501971-3	5501275-2	503219-X
		2.4 mm	501971-3	5501275-1	502128-X
		2.4 mm	501971-3	5501275-1	501457-X
		3.0 mm	501971-3	—	502128-X
		3.0 mm	501971-3	—	501457-X
		900 µm	501971-3	502179-7	5503628-X
Multimode - Ceramic Ferrule Metal Body, Metal Nut	5492458-5	1.6-2.0 mm	501971-3	5501275-2	503219-X
		2.4 mm	501971-3	5501275-1	502128-X
		2.4 mm	501971-3	5501275-1	501457-X
		3.0 mm	501971-3	—	502128-X
		3.0 mm	501971-3	—	501457-X
		900 µm	501971-3	502179-7	5503628-X
Multimode - Ceramic Ferrule Metal Body, Polymer Nut	5501458-8	1.6-2.0 mm	501971-3	5501275-2	503219-X
		2.4 mm	501971-3	5501275-1	502128-X
		2.4 mm	501971-3	5501275-1	501457-X
		3.0 mm	501971-3	—	502128-X
		3.0 mm	501971-3	—	501457-X
		900 µm	501971-3	502179-7	5503628-X
Multimode - Ceramic Ferrule Polymer Body, Metal Nut	503676-5	1.6-2.0 mm	501971-3	5501275-2	503219-X
		2.4 mm	501971-3	5501275-1	502128-X
		2.4 mm	501971-3	5501275-1	501457-X
		3.0 mm	501971-3	—	502128-X
		3.0 mm	501971-3	—	501457-X
		900 µm	501971-3	502179-7	5503628-X
Multimode - Ceramic Ferrule Polymer Body, Polymer Nut	503676-4	1.6-2.0 mm	501971-3	5501275-2	503219-X
		2.4 mm	501971-3	5501275-1	502128-X
		2.4 mm	501971-3	5501275-1	501457-X
		3.0 mm	501971-3	—	502128-X
		3.0 mm	501971-3	—	501457-X
		900 µm	501971-3	502179-7	5503628-X

* Strain relief dash number indicates color - see chart on page 63 for details.

TYGON is a trademark of Saint-Gobain Performance Plastics Corporation.

HYTREL is a trademark of E.I. du Pont de Nemours and Company.

Note: All part numbers are RoHS compliant.

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ST Connectors — Epoxy Type (Continued)

Bend Limiting | Short | Right Angle | Buffer | Bend Limiting

Strain Relief Bulk packages (100 pcs./package)

Color	Bend Limiting	Short (3.0 mm)	Right Angle	Buffer	Short (2.0 mm)	Bend Limiting (2.0 mm)
Black	502128-1	501457-1	5502667-1	5503628-1	503219-1	233454-4
Blue	502128-7	501457-5	5502667-2	—	—	233454-2
Beige	—	501457-4	—	1-5503628-9	503219-4	233454-6

Product Facts

- Free-hanging or panel mount design

ST Coupling Receptacles

Alignment Sleeve Material	Packaging	Part Number
Polymer Composite Multimode	Single	501381-1
	Bulk (1000)	501381-2
Metal Multimode	Single	504021-1
	Bulk (50)	504021-2
Zirconia Ceramic Singlemode	Single	502750-1
	Bulk (50)	502750-2

ST Polymer Duplex Receptacle

Alignment Sleeve Material	Color	Part Number
Metal/MM Only	Beige	504662-2
Metal/MM Only	Lt. Almond	504662-1

ST Active Device Mounts — Multimode

Product Facts

- Designed to accept multimode TO-18, TO-46 and TO-52 active devices
- Nickel plated, die cast zinc
- Mount to PCB or through panel
- Includes positioning ring

Description	Packaging	Height	Part Number
Standard height	Single	.410	5501474-1
Low profile	Single	.280	5502585-2
Low profile	Single (100)	.314	5504022-2
Low profile	Bulk (50)	.314	5504022-3

Note: All part numbers are RoHS compliant.

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FC Connectors

Product Facts

- **One-piece connector body:**
  - **Fastest assembly**
- **Compliant with:**
  - **JIS C-5970**
- **Pre-radiused ferrule**

Instruction Sheet — 408-8674
http://www.tycoelectronics.com/documents

Singlemode FC Connector Kits - Polymer Crimp Body

Performance Characteristics

Insertion Loss — <0.2 dB Typical
Return Loss — <-59 dB Typical
Durability — 200 Cycles

Singlemode FC Connector Kits — Polymer Crimp Body

Boot Color	Used With	Individual Pack Part Number	Bulk Pack Part Number	Crimp Tool
Blue	3.0 mm Jacketed	5504649-1	5504649-8	503911-1
	2.4 mm Jacketed	5504914-2	—	492026-1
	2.0 mm Jacketed	5504915-2	—	492026-1
	900 µm Buffer	—	5492052-5	N/A

GR-326 Style FC Connector Kits - Metal Crimp Body Singlemode

Performance Characteristics

Insertion Loss — <0.2 dB Typical
Return Loss — <-59 dB Typical
Tested to GR-326
Tuning — 6 position

GR-326 Style Singlemode FC Connector Kits — Metal Crimp Body

Boot Color	Used With	Individual Pack Part Number	Bulk Pack Part Number	Crimp Tool
Blue	3.0 mm Jacketed	4-1918962-2	—	(1) 492131-1 (1) 58532-1
	2.4 mm Jacketed	6754264-5	6754264-6	1588176-1
	2.0 mm Jacketed	6754264-4	6754264-7	1588176-1
	900 µm Buffer	6754264-2	—	1588176-1

3.0 mm - GR-326 Style

3.0 mm Angled

900 µm Short

900 µm

GR-326 Style 900 µm

FC Strain Reliefs — Jacketed Cable

Description	GR-326 Style	Part Number Color			
		Black	Red	Beige	Blue
3.0 mm	No	1-5503971-0	1-5503971-1	5503971-1	5503971-2
2.4 mm	No	1-5503971-2	1-5503971-3	5503971-3	5503971-4
2.0 mm	No	2-5503971-3	2-5503971-7	5503971-5	5503971-6
3.0 mm	Yes	—	—	—	1588491-2
1.6 mm - 2.4 mm	Yes	1588153-3	—	1588153-5	1588153-2

FC Strain Reliefs — Angled

Description		Part Number Color		
		Black	Beige	Blue
3.0 mm	Simplex	1278705-3	1278705-2	1278705-1
2.0 mm	Simplex	1374737-3	1374737-2	1374737-1
2.0 mm	45° Simplex	6457543-4	6457543-1	6457543-2

FC Strain Reliefs — 900 micron

Description	Part Number Color		
	Black	Beige	Blue
Long (33 mm) 900 µm	6457493-3	6457493-9	6457493-1
Short (10 mm) 900 µm	6278309-1	—	6278309-2
GR-326 Style 900 µm	1828184-2	1828184-4	1828184-1

Note: All part numbers are RoHS compliant.

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UK: 31-73-624-6639

FC Connectors (Continued)

FC Connector Component Selection Chart (bulk packaged)

Fiber Type	Simplex Connector Sub-Assembly	Cable Size	Crimp Eyelet w/ Heat Shrink	Crimp Eyelet	Strain Relief Part Number*
Singlemode - GR-326 Style	6754264-8	1.6-2.0 mm	6374150-1	—	1588153-X
		2.4 mm	6588189-1	—	1588153-X
	6457216-5	3.0 mm	—	504973-3	1588491-X
Singlemode Polymer Crimp Body	5504649-9	2.4 mm	—	503970-6	5503971-X
		3.0 mm	—	503970-3	5503971-X
		900 µm	—	—	6457493-X (long) 6278309-X (short)
Multimode - Ceramic Ferrule	6374778-2	1.6-2.0 mm	6374150-1	—	1588153-X
		2.4 mm	6588189-1	—	1588153-X
	5504922-3	3.0 mm	—	503970-3	5503971-2
		900 µm	—	—	6457493-9 (long) 6278309-1 (short)

* Strain relief dash number indicates color - see page 64 for details.

FC Adapters

FC Square Flange Adapter

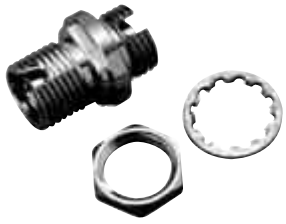
FC Simplex Square Flange Adapter - Metal

Alignment Sleeve Material	Panel Cut-out	Keyway Slot (Nom.)	Part Numbers
Metal	Square Flange	Std. 2.33 mm	5501506-2
Ceramic	Square Flange	Std. 2.33 mm	5501506-1

FC 8 mm/9 mm Dia. Round

FC Simplex 8 mm/9 mm Dia. Round (D-Hole) Adapter - Metal

Alignment Sleeve Material	Panel Cut-out	Keyway Slot (Nom.)	Part Numbers
Metal (Copper)	D-Hole	Std. 2.33 mm	5504407-1
Ceramic	D-Hole	Std. 2.33 mm	5504407-3
Ceramic/APC	D-Hole	2.05 mm Type R	5504407-8
Ceramic/APC	D-Hole	Prec. 2.02 mm	5504407-7



FC 8 mm Dia. Round (Double D)

FC Simplex 8 mm Dia. Round (Double D-Hole) Adapter - Metal

Alignment Sleeve Material	Panel Cut-out	Keyway Slot (Nom.)	Part Numbers
Metal	Double D-Hole	Std. 2.33 mm	5504013-1

Note: All part numbers are RoHS compliant.

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UK: 31-73-624-6639

FC Connectors (Continued)

Hybrid Adapters - SC/FC/ST

FC to ST Simplex Adapter - Metal

Hybrid FC to ST Simplex Adapter - Metal

Alignment Sleeve Material	Housing Color	Part Numbers
Metal	Electroless Nickel	5503640-1
Ceramic	Electroless Nickel	5503640-2

SC to FC Simplex Adapter - Plastic

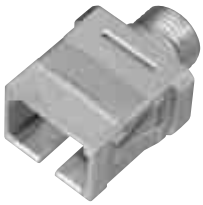
SC to FC Simplex Adapter - Plastic

Alignment Sleeve Material	Housing Color	Part Numbers
Metal	Black	5502871-1
Ceramic	Blue	5502871-4

SC to FC Simplex Adapter - Metal

SC to FC Simplex Adapter - Metal

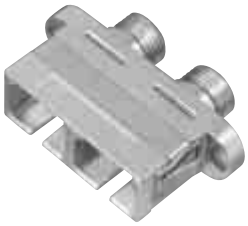
Alignment Sleeve Material	Housing Color	Part Numbers
Metal	Electroless Nickel	6278349-1
Ceramic	Electroless Nickel	6278349-3



Flangeless SC to FC Simplex Adapter - Metal

Flangeless Simplex Adapter - Metal

Alignment Sleeve Material	Housing Color	Part Numbers
Metal	Electroless Nickel	6278349-5
Ceramic	Electroless Nickel	6278349-7



SC to FC Duplex Adapter - Metal

SC to FC Duplex Adapter - Metal

Alignment Sleeve Material	Housing Color	Part Numbers
Metal	Electroless Nickel	6278050-1
Ceramic	Electroless Nickel	6278050-3

Note: All part numbers are RoHS compliant.

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Japan: 81-44-844-8013
UK: 31-73-624-6639

FSD Connector Components — Multimode

Product Facts

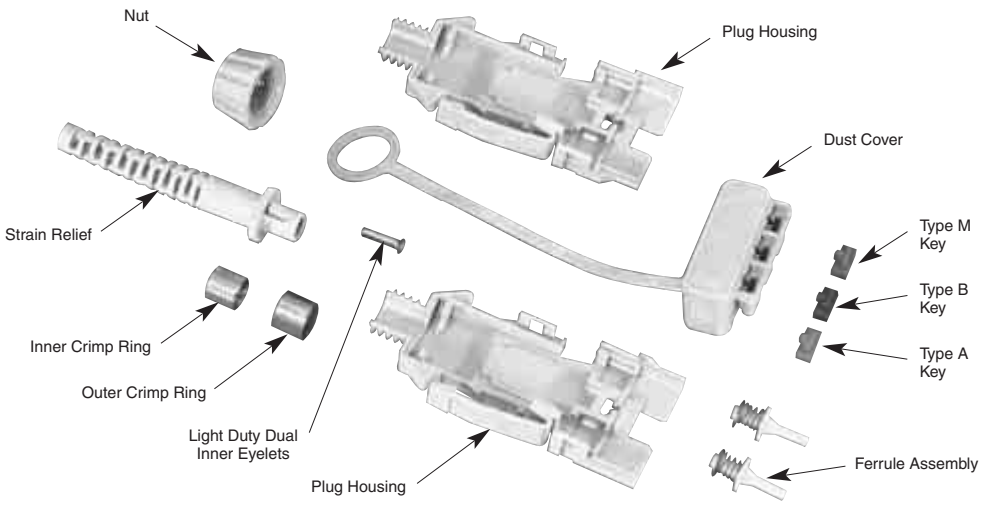
- **Meets specifications of FDDI PMD - ANSI X3.166**
- **Ceramic ferrules available**
- **Designed in polarization and user defined keying**

Performance Characteristics

Insertion Loss — 0.5 dB typical
Durability —
Ceramic Ferrules 500 cycles

Ceramic Instruction Sheet

408-9373
http://www.tycoelectronics.com/documents



FSD

Diameter (µm)	Part Number				
	Cable Type				Replacement Ferrules
	DUALAN Cable		Light Duty DUALAN Cable		
	Single Packed	Bulk Packed	Single Packed	Bulk Packed	
Ceramic Ferrules					
125	5501780-1	5501780-3*	5502015-1	5502015-3*	5501779-1

Termination Kit: 503746-6
* Bulk packed, 200 per package.
Assembly Fixtures: with Polishing Tool: 501795-1; without Polishing Tool: 502023-1

Field Keyable FSD Receptacles and Adapters

Multimode Receptacles

Description	Sleeve Material	
	Metal	Ceramic
FSD to FSD	502806-2	502806-4
FSD to ST	502808-2	502808-4

Note: All part numbers are RoHS compliant.

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UK: 31-73-624-6639

ESCON Connector Components

ESCON Connector Plug

Product Facts

- **Multimode**
- **IBM Approved**
- **Simple field assembly**

Performance Characteristics

Assembly Loss — 0.2 dB Typical
Durability — 200 cycles

Instruction Sheet

408-9808
http://www.tycoelectronics.com/documents

Description 125 µm	Part Number Black
DUALAN Cable	5492181-1
DUALAN Cable	5492181-2*

* Bulk packed, 50 per package
Termination Kit: 503746-6.

ESCON Receptacles

Product Facts

- **Multimode**

Description	Part Number Black
ESCON to ESCON	502825-2
ESCON to ST	502826-2

ESCON Assembly Fixture Kit

Used to hold ferrules during assembly, epoxy curing, and polishing. Allows simultaneous polishing of both ferrules.

Description	Part Number Black
Without Polishing Bushing	492236-2
Polishing Bushing	492269-1

ESCON is a trademark of IBM Corporation.

Note: All part numbers are RoHS compliant.

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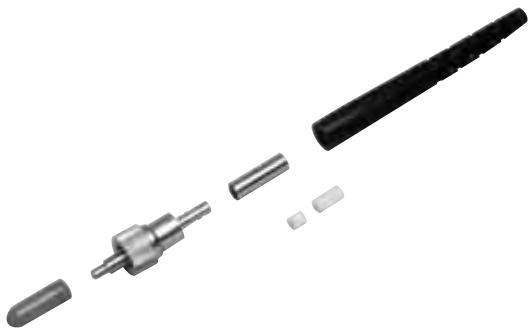
FSMA Products — Multimode

Product Facts

- **Industry compatible with 905 (FSMA-I) and 906 (FSMA-II) style connectors**
- **Terminates fiber sizes from 125 through 1000 microns in diameter**
- **Design parameters conform to NATO and IEC interface standards**



Performance Characteristics

Insertion Loss — 1.3 dB Typical
Temperature Range — -55°C to +105°C
Durability — 200 cycles

Documentation

Product Specification
108-45106
Instruction Sheet
408-9863
FSMA 905 & 906
Test Report
501-359
http://www.tycoelectronics.com/documents

FSMA Connectors

Ferrule Material	Connector Body Material	Fiber Diameter (µm)	Nominal Jacket O.D.		
			3.1 mm		4.3 mm
			905	906	905
Stainless Steel	Nickel-Plated Brass	125	5504566-1	5504014-1	5504567-1
		140	5504566-2	1-5504014-0	5504567-2
		231	5504566-7	—	—
		336	1-5504566-4	—	—
		720	—	—	3-5504567-9
		1000	3-5504566-0	—	—
		1050	3-5504566-1	—	2-5504567-9
		2050	—	—	3-5504567-3

Adapter Product Facts

- **Precision mating adapter for all FSMA connectors**
- **In-line splice or panel mount design**

Description	Part Number
FSMA Adapters	
Hex Flange, Stainless Steel	501049-1
Hex Flange, Stainless Steel, Counterbore, Sealed	501050-1
Fixed Flange, Nickel-Plated Brass	5504026-1
In-Line, Stainless Steel	504028-1
In-Line, Nickel-Plated Brass, Counterbore	5504030-1
In-Line, Stainless Steel, Counterbore, Short	504031-1

Active Device Mount Product Facts

- **Designed to house TO-18, TO-46, and TO-52 devices**
- **Constructed of nickel plated die cast zinc alloy or stainless steel**
- **Mounts to PC board or through panel**

Description	Part Number
FSMA Active Device Mounts	
PC Mount Receptacle, Die Cast	5502136-1
PC Mount Receptacle, Die Cast, Bulk Packaged	5502136-2
PC Mount Receptacle, Stainless Steel	501055-1

Note: All part numbers are RoHS compliant.

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MT-RJ Connectors

MT-RJ Plugs

Product Facts

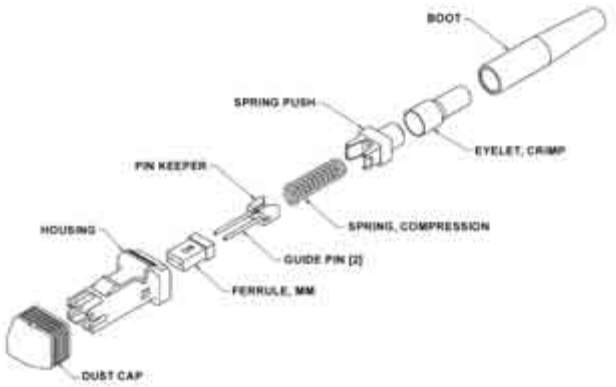
- Designed to meet TIA/EIA 568-B.3
- Each MT-RJ Connector houses two fibers
- Half the size of duplex SC and ST Connectors
- Options available include:
  - Multimode or singlemode
  - Mini DUALAN or Mini Zipcord cable
  - With or without guide pins
  - SECURE Connector Kits

Performance Characteristics

Insertion Loss — Typical (dB) 0.2 dB
Operating Temperature — -10°C to 60°C
Durability — 500 Cycles

Instruction Sheet

408-4540
http://www.tycoelectronics.com/documents



Standard MT-RJ Connectors

Fiber Type	Cable Type	Pins	Part Number
Singlemode	3.0 mm DUALAN	Without Guide Pins	6278399-1
	3.0 mm DUALAN	With Guide Pins	6278399-2
	1.8 mm Mini Zipcord	Without Guide Pins	6278751-1
	1.8 mm Mini Zipcord	With Guide Pins	6278751-2
Multimode	3.0 mm DUALAN	Without Guide Pins	6278398-1
	3.0 mm DUALAN	With Guide Pins	6278398-2
	1.8 mm Mini Zipcord	Without Guide Pins	6278750-1
	1.8 mm Mini Zipcord	With Guide Pins	6278750-2

SECURE MT-RJ Connectors

Fiber Type	Cable Type	Pins	Color	Part Number
Multimode	1.8 mm Mini Zipcord	Without Guide Pins	Red	1918356-1
			Yellow	1918356-2
			Green	1918356-3
			Blue	1918356-4
			Rose	1918356-5
			Aqua	1918356-6
			Brown	1918356-7
			Violet	1918356-8
			Orange	1918356-9
			Slate	1-1918356-0

MT-RJ to MT-RJ Adapter

Simplex Part Number:
1278017-1 (light almond)

Duplex Part Number:
6374906-1 (Almond)

MT-RJ to MT-RJ Simplex Adapter

MT-RJ to MT-RJ Duplex Adapter

Note: All part numbers are RoHS compliant.

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MT-RJ Connectors (Continued)

SL Series Outlets

Product Facts

- **Front-loading modules snap in and out for easy access**
- **Modular approach for flexibility**
- **"Invisible" icon holes stay hidden until used**
- **Individual jacks and inserts increase configuration and color-coding options**
- **MT-RJ SL Series housing accepts one MT-RJ Jack sold separately (See pages 119-122)**

MT-RJ SL Series Housing

Color	Part Number
Almond	1374416-1
Black	1374416-2
White	1374416-3
Gray	1374416-4
Orange	1374416-5
Blue	1374416-6
Red	1374416-7
Yellow	1374416-8
Green	1374416-9
Violet	1-1374416-0
Electrical Ivory	1-1374416-1
Rose	2-1374416-3
Aqua	2-1374416-4
Brown	2-1374416-5
Slate	2-1374416-6

MT-RJ Optical Patch Panel

Tyco Electronics' MT-RJ optical patch panels feature 24-port (48 fiber) capacity in a 1U high rack mounted enclosure and offer twice the fiber density of conventional patch panels. Features include pre-installed cable management, rugged cable entry strain relief, and a sliding, tilt-out drawer for easy termination of tight buffer or loose tube cable. Adjustable mounting brackets allow the user to mount the enclosure in forward, flush or recessed positions. The patch panel is supplied ready for MT-RJ jack installation.

Description	Part Number
1U Patch Panel with four, six-position MT-RJ interface housing Cable Management Rings (2 pieces), Cable Glands PG16, PG13.5, Dust Caps (24 pieces). (Jack modules not included)	1206704-4

MT-RJ Snap-In Adapter Plate

The MT-RJ snap-in adapter plate manages six MT-RJ Patch panel jacks (ordered separately, see page 73). The adapter plate is designed to fit into existing rack and wall mount enclosures with the benefit of industry standard labels and icons for port identification.

Description	Part Number
MT-RJ Snap-In Adapter Plates (Jack modules not included)	1278328-3

Note: All part numbers are RoHS compliant.

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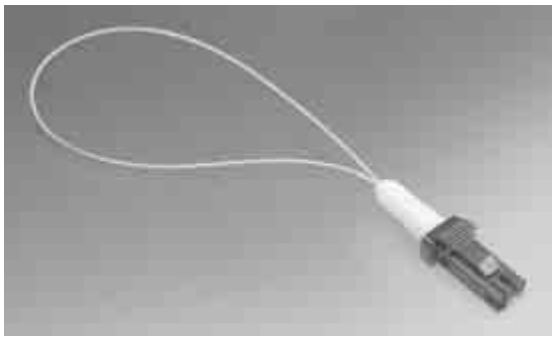
MT-RJ Connectors (Continued)

MT-RJ Loopbacks



Description	Part Number
MT-RJ to Singlemode Loopback	6278358-1
MT-RJ to Multimode Loopback, 50/125 µm	6278357-1
MT-RJ to Multimode Loopback, 62.5/125 µm	6278153-1

MT-RJ Cable Assemblies

See Cable Assemblies & Backplane Interconnects Section.

MT-RJ Bend Limiting Boots

Part Number 6374208-X

Product Facts

- **Compatible with all MT-RJ Jacks (see pages 119-122)**

Color	Part Number
Black	6374208-4
Beige	6374208-5

Note: All part numbers are RoHS compliant.

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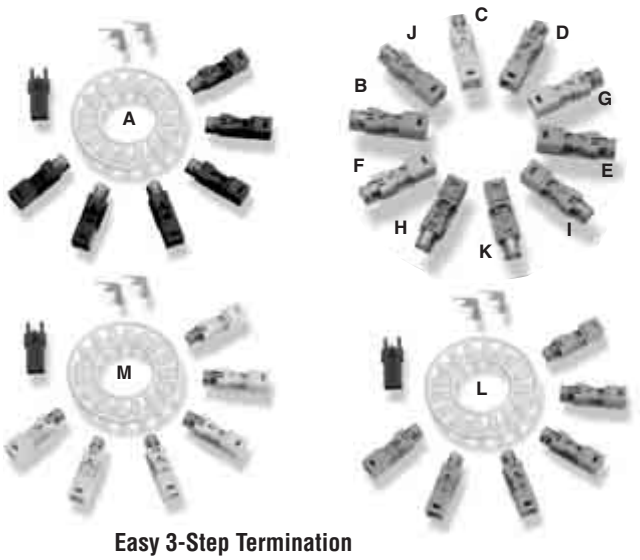
MT-RJ Patch Panel Jacks, No Epoxy, No Polish

Product Facts

- Patch panel jacks terminate either two 900 µm tight-buffered fibers or two 250 µm coated fibers (select appropriate part number):
  - No epoxy, no polishing, no crimping
  - Two (2) fibers in one ferrule
  - Re-terminatable – improves yield
  - Tunable
  - No bench tool required
- Each part number includes:
  - Six (6) patch panel jacks
  - Two (2) actuation tools
  - Fiber guide
  - Icon wheel
- Jack design eliminates need for MT-RJ Coupler
- Match fiber type of cable to fiber type of MT-RJ Jack
- Small form factor design is half the size of SC duplex
- Six (6) patch panel jacks fit in the MT-RJ Snap-in Adapter Plate (see page 72)
- SL Series Housings and bend-limiting boots sold separately (see pages 70, 72 and 78)
- MT-RJ Cable Assemblies on pages 121 and 122
- MT-RJ SECURE Jacks feature color-coded, keyed designs to limit improper connections in segregated or SECURE networks
- MT-RJ SECURE Plug only mates with same color MT-RJ SECURE Jack
- MT-RJ SECURE Cable Assemblies on pages 121 and 122
- Singlemode MT-RJ pigtail jacks on page 123



Easy 3-Step Termination

Strip | Cleave | Lock

Fiber Type		Jack Color	Figure	Part Number	
				250 µm Coated Fiber	900 µm Tight-buffered Fiber
50/125 µm Multimode	Standard	Black	A	6278303-1	6588880-1
	SECURE	RED	B	6278807-1	6588879-1
		YELLOW	C	6278807-2	6588879-2
		GREEN	D	6278807-3	6588879-3
		BLUE	E	6278807-4	6588879-4
		ROSE	F	6278807-5	6588879-5
		AQUA	G	6278807-6	6588879-6
		BROWN	H	6278807-7	6588879-7
		VIOLET	I	6278807-8	6588879-8
		ORANGE	J	6278807-9	6588879-9
		SLATE	K	1-6278807-0	1-6588879-0
Laser Optimized (10 Gig) (850 nm LO 50/125 µm) Multimode	Standard	Gray	L	6278303-4	6588880-3
	SECURE	RED	B	6693951-1	6693949-1
		YELLOW	C	6693951-2	6693949-2
		GREEN	D	6693951-3	6693949-3
		BLUE	E	6693951-4	6693949-4
		ROSE	F	6693951-5	6693949-5
		AQUA	G	6693951-6	6693949-6
		BROWN	H	6693951-7	6693949-7
		VIOLET	I	6693951-8	6693949-8
		ORANGE	J	6693951-9	6693949-9
		SLATE	K	1-6693951-0	1-6693949-0
62.5/125 µm Multimode	Standard	Beige	M	6278303-2	6588880-2
	SECURE	RED	B	6278808-1	6588878-1
		YELLOW	C	6278808-2	6588878-2
		GREEN	D	6278808-3	6588878-3
		BLUE	E	6278808-4	6588878-4
		ROSE	F	6278808-5	6588878-5
		AQUA	G	6278808-6	6588878-6
		BROWN	H	6278808-7	6588878-7
		VIOLET	I	6278808-8	6588878-8
		ORANGE	J	6278808-9	6588878-9
		SLATE	K	1-6278808-0	1-6588878-0

Note: Highlighted part numbers are routinely stocked for shortest lead times.

Note: All part numbers are RoHS compliant.

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MT-RJ Outlet Jacks, No Epoxy, No Polish

Product Facts

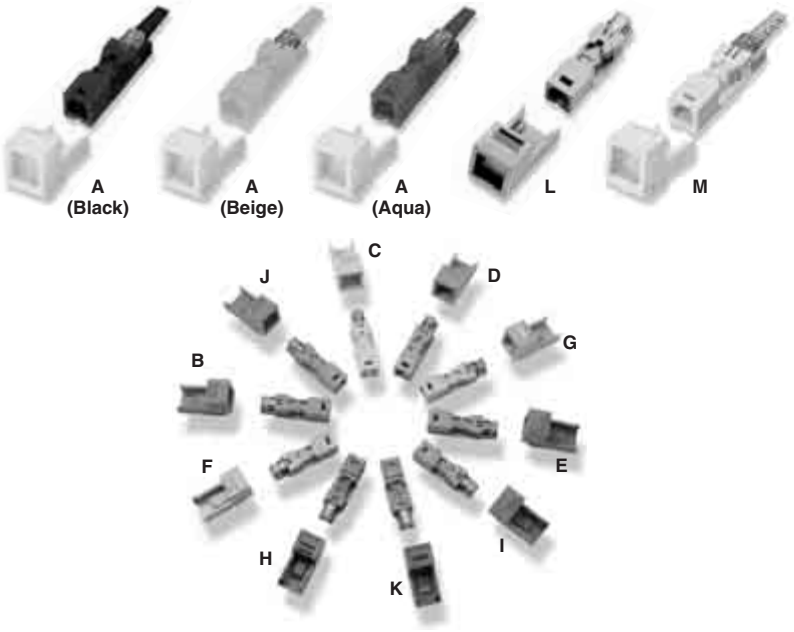
- Outlet jacks terminate two 900 µm tight-buffered fibers
  - No epoxy, no polishing, no crimping
  - Two fibers in one ferrule
  - Re-terminatable - improves yield
  - Tunable
  - No bench tool required
- Each part number includes:
  - One (1) outlet jack
  - Actuation tool
  - Bend-limiting boot
  - SL Series Housing
- Match fiber type of cable to fiber type of MT-RJ Jack
- Jack design eliminates need for MT-RJ Coupler
- Small form factor design is half the size of SC duplex
- SL Series Housing allows use in any faceplate or outlet that accepts SL Series Jacks
- MT-RJ Cable Assemblies on pages 121 and 122
- MT-RJ SECURE Jacks feature ten color-coded, keyed designs to limit improper connections in segregated or SECURE networks
  - MT-RJ SECURE plug only mates with same color MT-RJ SECURE Jack
- MT-RJ SECURE Cable Assemblies on page 121

Easy 3-Step Termination

Strip

Cleave

Lock



Fiber Type			Jack Color	Housing Color	Figure	Part Number
50/125 µm Multimode	Used with 900 µm Tight-buffered Fibers	Standard	Black	—	A	6278414-X
		SECURE	RED	RED	B	6278811-1
			YELLOW	YELLOW	C	6278811-2
			GREEN	GREEN	D	6278811-3
			BLUE	BLUE	E	6278811-4
			ROSE	ROSE	F	6278811-5
			AQUA	AQUA	G	6278811-6
			BROWN	BROWN	H	6278811-7
			VIOLET	VIOLET	I	6278811-8
			ORANGE	ORANGE	J	6278811-9
			SLATE	SLATE	K	1-6278811-0
Laser Optimized (10 Gig) (850 nm LO 50/125 µm) Multimode	Used with 900 µm Tight-buffered Fibers	Standard	Gray	—	L	1-6278414-2
		SECURE	RED	RED	B	6754252-1
			YELLOW	YELLOW	C	6754252-2
			GREEN	GREEN	D	6754252-3
			BLUE	BLUE	E	6754252-4
			ROSE	ROSE	F	6754252-5
			AQUA	AQUA	G	6754252-6
			BROWN	BROWN	H	6754252-7
			VIOLET	VIOLET	I	6754252-8
			ORANGE	ORANGE	J	6754252-9
			SLATE	SLATE	K	1-6754252-0
62.5/125 µm Multimode	Used with 900 µm Tight-buffered Fibers	Standard	Beige	—	M	6278415-X
		SECURE	RED	RED	B	6278810-1
			YELLOW	YELLOW	C	6278810-2
			GREEN	GREEN	D	6278810-3
			BLUE	BLUE	E	6278810-4
			ROSE	ROSE	F	6278810-5
			AQUA	AQUA	G	6278810-6
			BROWN	BROWN	H	6278810-7
			VIOLET	VIOLET	I	6278810-8
			ORANGE	ORANGE	J	6278810-9
			SLATE	SLATE	K	1-6278810-0

X denotes housing color: -1 = Almond, -2 = Black, -3 = White, -4 = Gray, -5 = Orange, -6 = Blue, -7 = Red, -8 = Yellow, -9 = Green, 1- - 0 = Violet, 1- -1 = Electrical Ivory

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Note: All part numbers are RoHS compliant.

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Japan: 81-44-844-8013
UK: 31-73-624-6639

LIGHTCRIMP PLUS No Epoxy, No Polish LC, SC and ST Connectors

Product Facts

- Multimode connector kits come with accessories needed to terminate to 250 µm fiber, 900 µm tight-buffered fiber, and 900 µm easy-strip
  - SC and ST kits also terminate 3 mm cables
- Singlemode connector kits terminate to 250 µm fiber, 900 µm tight-buffered fiber, 900 µm easy-strip and buffer tube splitter kits
- Easy installation:
  - No epoxy, no polishing
  - No bench tool required
  - Strip, cleave and crimp
- Easy identification:
  - Singlemode is blue
  - Laser Optimized (10 Gig) is aqua — 10 Gb/s applications
  - 62.5/125 µm is beige
  - 50/125 µm is black
- Match fiber type of cable to fiber type of LIGHTCRIMP PLUS
- Mates with standard couplers, adapters and adapter plates
- LC small form factor design is half the size of SC
- Tested to and meets TIA/EIA 568-B.3
- Termination tool kits on page 86

Performance Characteristics

Insertion Loss — Typical (dB)
0.2 dB Singlemode; 0.3 dB Multimode

Temperature Range —
-10°C to 60°C, tested to -40°C to 75°C

Durability — 500 cycles

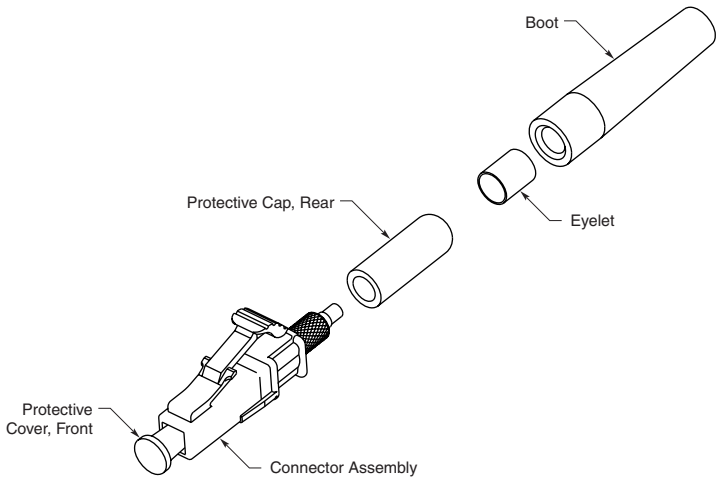

A


B


C


D


E G



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LIGHTCRIMP PLUS No Epoxy, No Polish LC, SC and ST Connectors (Continued)

Connector Type	Fiber Type	Housing Color	Boot Color	Used With	Figure	Part Number	IS Sheet
Simplex LC	Singlemode	Blue	Blue	900 µm & 250 µm Fibers	A	6754482-1	408-8925
	50/125 µm Multimode	Beige	Black	900 µm & 250 µm Fibers	B	6754483-2	408-8925
	Laser Optimized (10 Gig) (850 nm LO 50/125 µm) Multimode	Beige	Aqua	900 µm & 250 µm Fibers	–	6754483-4	408-8925
	62.5/125 µm Multimode	Beige	Beige	900 µm & 250 µm Fibers	B	6754483-1	408-8925
Simplex LC Jacketed	Singlemode Jacketed	Blue	Blue	1.6 - 2.0 mm Cable	F	1918626-1	408-8925
	62.5/125 µm Multimode Jacketed	Beige	Beige	1.6 - 2.0 mm Cable	F	1918627-1	408-8925
	50/125 µm Multimode Jacketed	Beige	Black	1.6 - 2.0 mm Cable	F	1918627-2	408-8925
	Laser Optimized (10 Gig) (850 nm LO 50/125 µm) Multimode Jacketed	Gray	Aqua	1.6 - 2.0 mm Cable	F	1918627-3	408-8925
Simplex SECURE LC	50/125 µm Multimode Jacketed	Various	Various	1.6 - 2.0 mm Cable	F	1828857-X[1]	408-8925
	Laser Optimized (10 Gig) (850 nm LO 50/125 µm) Multimode Jacketed	Various	Various	1.6 - 2.0 mm Cable	F	1828858-X[1]	408-8925
	62.5/125 µm Multimode Jacketed	Various	Various	1.6 - 2.0 mm Cable	F	1828859-X[1]	408-8925
	Singlemode Jacketed	Various	Various	1.6 - 2.0 mm Cable	F	1828860-X[1]	408-8925
Duplex LC	Singlemode	Blue	Blue	900 µm & 250 µm Fibers	–	6754484-1	408-8725
	50/125 µm Multimode	Beige	Black	900 µm & 250 µm Fibers	–	6754485-2	408-8725
	Laser Optimized (10 Gig) (850 nm LO 50/125 µm) Multimode	Beige	Aqua	900 µm & 250 µm Fibers	–	6754485-4	408-8725
	62.5/125 µm Multimode	Beige	Beige	900 µm & 250 µm Fibers	–	6754485-1	408-8725
Simplex SC	Singlemode*	Blue	Blue	900 µm & 250 µm Fibers	C	6693276-1	408-4471
	50/125 µm Multimode	Beige	Black	900 µm & 250 µm Fibers, 3 mm Cable	D	6278079-2	408-4471
	Laser Optimized (10 Gig) (850 nm LO 50/125 µm) Multimode	Beige	Aqua	900 µm & 250 µm Fibers, 3 mm Cable	–	6588291-2	408-4471
	62.5/125 µm Multimode	Beige	Beige	900 µm & 250 µm Fibers, 3 mm Cable	D	5492643-1	408-4471
Duplex SC	Singlemode	Blue	Blue	900 µm & 250 µm Fibers	–	6693278-1	408-8603
	50/125 µm Multimode	Beige	Black	900 µm & 250 µm Fibers, 3 mm Cable	–	6278080-2	408-8603
	Laser Optimized (10 Gig) (850 nm LO 50/125 µm) Multimode	Beige	Aqua	900 µm & 250 µm Fibers, 3 mm Cable	–	6588292-2	408-8603
	62.5/125 µm Multimode	Beige	Beige	900 µm & 250 µm Fibers, 3 mm Cable	–	6278009-1	408-8603
ST	50/125 µm Multimode	Metallic	Black	900 µm & 250 µm Fibers, 3 mm Cable	E	6278082-1	408-4457
	62.5/125 µm Multimode	Metallic	Beige	900 µm & 250 µm Fibers, 3 mm Cable	E	5492642-2	408-4457
Duplex LC Clip		Black	—	Package of 6 clips (for use with Simplex kits)	G	1754371-2	—
Duplex SC Clip (Use 2)		Black	—	2 pieces make one clip (for use with Simplex kits)	G	6348522-1	—

Note: Highlighted part numbers are routinely stocked for shortest lead times.

* Able to terminate up to 3 mm jacket.

[1] Dash denotes housing color: -1 Red, -2 Yellow, -3 Green, -4 Blue, -5 Rose, -6 Aqua, -7 Brown, -8 Violet, -9 Orange, 1- -0 Slate.

Note: All part numbers are RoHS compliant.

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LIGHTCRIMP No Epoxy, Polish SC and ST Connectors

Product Facts

- **No epoxy needed**
- **Easy installation: strip, crimp, cleave and polish**
- **Each connector kit comes with accessories needed to terminate to 250 µm fiber, 900 µm tight-buffered fiber, and 3 mm cables**
  - **Duplex part numbers contain two connectors**
- **Multimode connectors are suitable for use with 50/125 µm, Laser Optimized (10 Gig) (850 nm LO 50/125 µm) and 62.5/125 µm fibers**
- **Mates with standard couplers, adapters and adapter plates**
- **Meets TIA/EIA 568-B.3**

Performance Characteristics

Insertion Loss — 0.4 dB typical
Temperature Range — -40°C to 65°C
Durability — 500 cycles

Description			Figure	Part Number	IS Sheet
Simplex SC	Multimode	Ceramic Ferrule	A	5503692-1	408-4066
Duplex SC	Multimode	Ceramic Ferrule	—	5503693-1	408-4066
ST	Singlemode	Ceramic Ferrule	B	5504000-1	408-9860
	Multimode	Stainless Steel Ferrule	C	5504034-1	408-9860
		Ceramic Ferrule	B	5504001-1	408-9860
		Polymer	—	5492168-1	408-9860

Note: All part numbers are RoHS compliant.

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CORELINK Optical Fiber Splices

Product Facts

- Each CORELINK splice mates two 900 µm tight-buffered fibers or two 250 µm coated fibers
- Easy to install
- Reusable
- No bench tool required
- Splices sold in packs of 12
  - Includes 2 actuator keys
- Optional CORELINK installation tool shown below
- Designed to TIA/EIA 568-B.3

Replacement Keys

Performance Characteristics

Mean Splice Loss — < 0.3 dB
Mean Return Loss — -26 dB
Temperature Range — -0°C to 60°C

Description			Part Number
CORELINK Splice	Singlemode	Clear	503577-1
2 Replacement keys in key holder		—	503681-1

Note: Highlighted part number is routinely stocked for shortest lead times.

Instruction Sheet

408-4019
http://www.tycoelectronics.com/documents

CORELINK Splice Workstation

Part Number 503605-1

Product Facts

- Optional tool for installing CORELINK mechanical splices
- Convenient fiber and splice holder for easy installation
- Works with singlemode and multimode CORELINK mechanical splices

Instruction Sheet

408-4131
http://www.tycoelectronics.com/documents

Note: All part numbers are RoHS compliant.

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Optical Fiber Cables

Optical Fiber Cable Performance

Product Facts

- **AMP NETCONNECT Optical Fiber Cables are tested and designed to the most recent applicable industry standards for premise cabling, network and telecommunications applications, including:**
  - **IEEE 802.3**
    - **Ethernet**
    - **Fast Ethernet**
    - **Gigabit Ethernet**
    - **10 Gigabit Ethernet**
  - **FDDI**
  - **ATM**
  - **Fibre Channel**
  - **Token Ring**
  - **TIA/EIA-568**
  - **ISO 11801**
  - **ICEA-596**
  - **ICEA-640**
  - **ICEA-696**
  - **IEC 793-1**
  - **IEC 794-1**
  - **Telecordia GR-409-CORE**
  - **Telecordia GR-20-CORE**

AMP NETCONNECT Optical Fiber Cables

AMP NETCONNECT optical fiber cables contain the highest quality optical fiber and offer the best performance for LED-based, laser-based, and VCSEL-based (ex: Gigabit Ethernet and 10 Gigabit Ethernet) applications. AMP NETCONNECT multimode optical fibers offer performance guaranteed to go beyond the IEEE 802.3z distances for Gigabit Ethernet, and are guaranteed to support IEEE 802.3ae distances for Ten Gigabit Ethernet while still supporting slower protocols such as Fast Ethernet and FDDI.

The AMP NETCONNECT Laser Optimized 10 Gig Optical Fiber System is a high performance cabling system which has been designed to meet or exceed the requirements of the 10 Gigabit Ethernet application while still supporting all legacy LED and VCSEL applications. The system fulfills the specifications of IEEE 802.3ae for 10GBASE-SR (10 Gigabit Ethernet serial transmission on MMF at 850 nm) and complies to the OM-3 fiber type and link class definitions of the 2nd edition of ISO 11801. All AMP NETCONNECT Laser Optimized 10 Gig Optical Fiber System components have been designed and optimized to offer a complete, end-to-end system to support today's applications and provide an easy migration to higher data rates.

Fiber	Gigabit Ethernet @ 850 nm	Gigabit Ethernet @ 1300 nm	10 Gigabit Ethernet Serial @ 850 nm	10 Gigabit Ethernet WDM @ 1300 nm
Multimode 62.5/125 µm	300 m	550 m	33 m	300 m
Multimode 50/125 µm	600 m	600 m	82 m	300 m
Laser Optimized 10 Gig (850 nm Laser Optimized 50/125 µm) Multimode	1000 m	600 m	300 m	300 m

Optical Fiber Cable Specifications

	Singlemode (1300/1550 nm)	Laser Optimized 10 Gig (850 nm LO 50/125 µm) Multimode (850/1300 nm)	Multimode 50/125 µm (850/1300 nm)	Multimode 62.5/125 µm (850/1300 nm)
Indoor Cables				
Maximum Attenuation (dB/km)	0.7/0.7	3.5/1.5	3.5/1.5	3.5/1.5
OFL Bandwidth (MHz•km)	—/—	1500/500	500/500	200/500
Laser Bandwidth (MHz•km)	—/—	2000/—	—/—	—/—

Optical Fiber Cable Temperature Ranges

		Riser	Plenum
Interconnect (Tight Buffered) Cables	Storage	-40° C to +65° C (-40° F to +149° F)	-40° C to +65° C (-40° F to +149° F)
	Operating	-20° C to +50° C (-4° F to +122° F)	-20° C to +50° C (-4° F to +122° F)
	Installation	-20° C to +50° C (-4° F to +122° F)	-20° C to +50° C (-4° F to +122° F)
Indoor, Distribution (Tight Buffered) Cables	Storage	-40° C to +65° C (-40° F to +149° F)	-40° C to +65° C (-40° F to +149° F)
	Operating	-20° C to +50° C (-4° F to +122° F)	0° C to +50° C (32° F to +122° F)
	Installation	-20° C to +50° C (-4° F to +122° F)	0° C to +50° C (32° F to +122° F)

Note: Part Numbers are RoHS compliant except: ♦ Indicates non-RoHS compliant.

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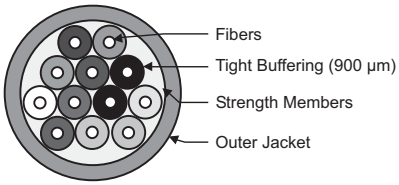
Optical Fiber Cables (Continued)

NEW

Distribution, 6-12 Fiber

Product Facts

- **Suitable for horizontal and in-building backbone cabling and for direct termination with epoxy/polish, LIGHTCRIMP, LIGHTCRIMP PLUS and MT-RJ jacks**
- **Suitable for inter-building cabling if buried in conduit, below the frost line**
- **Strippable 900 µm tight buffer coating allows for easy connectorization**
- **TIA color-coded fibers for easy identification**
- **UL and cUL listed OFNR (Riser) and OFNP(Plenum)**
- **Interlocking armor available**



Distribution Cables

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Fiber Count	Unit Count Unit (Fibers/Unit)	Fiber Type	UL/NEC Ratings	Part Number	Weight kg/km (lb/kft)	Diameter mm (in)	Tensile Load N (lbf)		Bending Radius mm (in)	
							Installation	Long Term	Installation	Long Term
6	1 (6)	Singlemode	Riser	1664036-6	22 (15)	4.8 (0.19)	667 (150)	167 (38)	96 (3.8)	48 (1.9)
			Plenum	1664037-6	24 (16)		445 (100)	111 (25)		
		Multimode 50/125 µm	Riser	2-1664038-1	22 (15)		667 (150)	167 (38)		
			Plenum	2-1664039-1	24 (16)		445 (100)	111 (25)		
		Laser Optimized 10 Gig Multimode 50/125 µm	Riser	8-1664038-9	22 (15)		667 (150)	167 (38)		
			Plenum	8-1664039-9	24 (16)		445 (100)	111 (25)		
		Multimode 62.5/125 µm	Riser	1-1664040-1	22 (15)		667 (150)	167 (38)		
			Plenum	1-1664041-1	24 (16)		445 (100)	111 (25)		
8	1 (8)	Singlemode	Riser	1664042-6	24 (16)	4.9 (0.19)	667 (150)	167 (38)	108 (4.2)	54 (2.1)
			Plenum	1664043-6	26 (18)		445 (100)	111 (25)		
		Multimode 50/125 µm	Riser	2-1664044-1	24 (16)		667 (150)	167 (38)		
			Plenum	2-1664045-1	26 (18)		445 (100)	111 (25)		
		Laser Optimized 10 Gig Multimode 50/125 µm	Riser	8-1664044-9	24 (16)		667 (150)	167 (38)		
			Plenum	8-1664045-9	26 (18)		445 (100)	111 (25)		
		Multimode 62.5/125 µm	Riser	1-1664046-1	24 (16)		667 (150)	167 (38)		
			Plenum	1-1664047-1	26 (18)		445 (100)	111 (25)		
12	1 (12)	Singlemode	Riser	1664048-6	36 (24)	6.2 (0.24)	667 (150)	167 (38)	124 (4.8)	62 (2.4)
			Plenum	1664049-6	46 (31)		445 (100)	111 (25)		
		Multimode 50/125 µm	Riser	2-1664050-1	36 (24)		667 (150)	167 (38)		
			Plenum	2-1664051-1	46 (31)		445 (100)	111 (25)		
		Laser Optimized 10 Gig Multimode 50/125 µm	Riser	8-1664050-9	36 (24)		667 (150)	167 (38)		
			Plenum	8-1664051-9	46 (31)		445 (100)	111 (25)		
		Multimode 62.5/125 µm	Riser	1-1664052-1	36 (24)		667 (150)	167 (38)		
			Plenum	1-1664053-1	46 (31)		445 (100)	111 (25)		

Notes: All of these cables are available with interlocking armor. Call for more information.
Highlighted part numbers are routinely stocked for shortest lead times.

Note: Part Numbers are RoHS compliant except: ♦ Indicates non-RoHS compliant.

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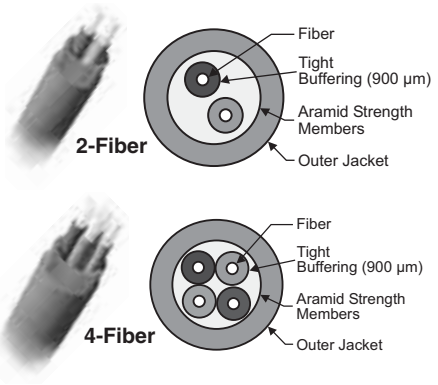
Optical Fiber Cables (Continued)

NEW

Horizontal, 2-4 Fiber

Product Facts

- **Suitable for direct termination with epoxy/polish, LIGHTCRIMP, LIGHTCRIMP PLUS and MT-RJ jacks**
- **Blue, green, red and yellow Dual and Quad multimode cables for MT-RJ SECURE Networks or network segregation**
- **Aramid yarn reinforcement**
- **UL and cUL listed OFNR (Riser) and OFNP(Plenum)**



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2-Fiber (Dual)

Fiber Count	Unit Count Unit (Fibers/Unit)	Fiber Type	UL/NEC Ratings	Jacket Color	Part Number	Weight kg/km (lb/kft)	Diameter mm (in)	Tensile Load N (lbf)		Bending Radius mm (in)	
								Installation	Long Term	Installation	Long Term
2	1(2)	Singlemode	Riser	Yellow	1664024-6	19 (13)	4.8 (0.19)	220 (50)	55 (12.5)	95 (3.8)	48 (1.9)
			Plenum	Yellow	1664025-6	23 (16)					
		Multimode 50/125 µm	Riser	Orange	2-1664026-1	19 (13)					
				Blue	2-1664026-0	19 (13)					
				Green	2-1664026-2	19 (13)					
				Red	2-1664026-4	19 (13)					
				Yellow	2-1664026-6	19 (13)					
			Plenum	Orange	2-1664027-1	23 (16)					
				Blue	2-1664027-0	23 (16)					
				Green	2-1664027-2	23 (16)					
				Red	2-1664027-4	23 (16)					
				Yellow	2-1664027-6	23 (16)					
		Laser Optimized 10 Gig Multimode 50/125 µm	Riser	Aqua	8-1664026-9	19 (13)					
			Plenum	Aqua	8-1664027-9	23 (16)					
		Multimode 62.5/125 µm	Riser	Orange	1-1664028-1	19 (13)					
				Blue	1-1664028-0	19 (13)					
				Green	1-1664028-2	19 (13)					
				Red	1-1664028-4	19 (13)					
				Yellow	1-1664028-6	19 (13)					
			Plenum	Orange	1-1664029-1	23 (16)					
				Blue	1-1664029-0	23 (16)					
				Green	1-1664029-2	23 (16)					
				Red	1-1664029-4	23 (16)					
				Yellow	1-1664029-6	23 (16)					

4-Fiber (Quad)

Fiber Count	Unit Count Unit (Fibers/Unit)	Fiber Type	UL/NEC Ratings	Jacket Color	Part Number	Weight kg/km (lb/kft)	Diameter mm (in)	Tensile Load N (lbf)		Bending Radius mm (in)	
								Installation	Long Term	Installation	Long Term
4	1(4)	Singlemode	Riser	Yellow	1664030-6	21 (14)	4.8 (0.19)	220 (50)	55 (12.5)	95 (3.8)	48 (1.9)
			Plenum	Yellow	1664031-6	25 (17)					
		Multimode 50/125 µm	Riser	Orange	2-1664032-1	21 (14)					
				Blue	2-1664032-0	21 (14)					
				Green	2-1664032-2	21 (14)					
				Red	2-1664032-4	21 (14)					
				Yellow	2-1664032-6	21 (14)					
			Plenum	Orange	2-1664033-1	25 (17)					
				Blue	2-1664033-0	25 (17)					
				Green	2-1664033-2	25 (17)					
				Red	2-1664033-4	25 (17)					
				Yellow	2-1664033-6	25 (17)					
		Laser Optimized 10 Gig Multimode 50/125 µm	Riser	Aqua	8-1664032-9	21 (14)					
			Plenum	Aqua	8-1664033-9	25 (17)					
		Multimode 62.5/125 µm	Riser	Orange	1-1664034-1	21 (14)					
				Blue	1-1664034-0	21 (14)					
				Green	1-1664034-2	21 (14)					
				Red	1-1664034-4	21 (14)					
				Yellow	1-1664034-6	21 (14)					
			Plenum	Orange	1-1664035-1	25 (17)					
				Blue	1-1664035-0	25 (17)					
				Green	1-1664035-2	25 (17)					
				Red	1-1664035-4	25 (17)					
				Yellow	1-1664035-6	25 (17)					

Note: Highlighted part numbers are routinely stocked for shortest lead times.

Note: Part Numbers are RoHS compliant except: ♦ Indicates non-RoHS compliant.

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Optical Fiber Cables (Continued)

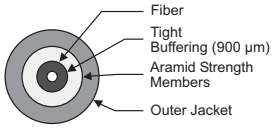
NEW

Interconnect, 1-2 Fiber

Product Facts

- Suitable for pigtails, patch cords and internal equipment connections
- Aramid yarn reinforcement
- UL and cUL listed OFNR (Riser) and OFNP(Plenum)

Simplex Cable



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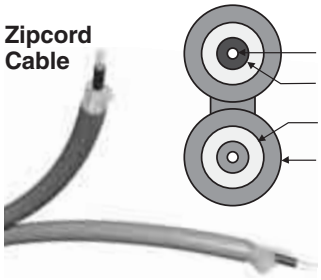
Zipcord Cable



Simplex (2.0 mm)

Fiber Count	Unit Count Unit (Fibers/Unit)	Fiber Type	UL/NEC Ratings	Part Number	Weight kg/km (lb/kft)	Diameter mm (in)	Tensile Load N (lbf)		Bending Radius mm (in)	
							Installation	Long Term	Installation	Long Term
1	1 (1)	Singlemode	Riser	1664006-6	5 (3)	2.0 (0.08)	220 (50)	55 (12.5)	40 (1.6)	20 (0.8)
			Plenum	1664007-6	6 (4)					
		Multimode 50/125 µm	Riser	2-1664008-1	5 (3)					
			Plenum	2-1664009-1	6 (4)					
		Laser Optimized 10 Gig Multimode 50/125 µm	Riser	8-1664008-9	5 (3)					
			Plenum	8-1664009-9	6 (4)					
		Multimode 62.5/125 µm	Riser	1-1664010-1	5 (3)					
			Plenum	1-1664011-1	6 (4)					

Simplex (2.9 mm)

1	1 (1)	Singlemode	Riser	1664000-6	8 (5)	2.9 (0.11)	220 (50)	55 (12.5)	58 (2.8)	29 (1.1)
			Plenum	1664001-6	9 (6)					
		Multimode 50/125 µm	Riser	2-1664002-1	8 (5)					
			Plenum	2-1664003-1	9 (6)					
		Laser Optimized 10 Gig Multimode 50/125 µm	Riser	8-1664002-9	8 (5)					
			Plenum	8-1664003-9	9 (6)					
		Multimode 62.5/125 µm	Riser	1-1664004-1	8 (5)					
			Plenum	1-1664005-1	9 (6)					

Zipcord (2.0 mm)

2	2 (1)	Singlemode	Riser	1664018-6	6 (4)	2.0 x 4.0 (0.08 x 0.16)	220 (50)	55 (12.5)	40 (2.2)	20 (0.8)
			Plenum	1664019-6	8 (5)					
		Multimode 50/125 µm	Riser	2-1664020-1	6 (4)					
			Plenum	2-1664021-1	8 (5)					
		Laser Optimized 10 Gig Multimode 50/125µm	Riser	8-1664020-9	6 (4)					
			Plenum	8-1664021-9	8 (5)					
		Multimode 62.5/125 µm	Riser	1-1664022-1	6 (4)					
			Plenum	1-1664023-1	8 (5)					

Zipcord (2.9 mm)

2	2 (1)	Singlemode	Riser	1664012-6	15 (10)	2.9 x 5.8 (0.11 x 0.22)	220 (50)	55 (12.5)	58 (2.2)	29 (1.1)
			Plenum	1664013-6	18 (12)					
		Multimode 50/125 µm	Riser	2-1664014-1	15 (10)					
			Plenum	2-1664015-1	18 (12)					
		Laser Optimized 10 Gig Multimode 50/125 µm	Riser	8-1664014-9	15 (10)					
			Plenum	8-1664015-9	18 (12)					
		Multimode 62.5/125 µm	Riser	1-1664016-1	15 (10)					
			Plenum	1-1664017-1	18 (12)					

Note: Highlighted part numbers are routinely stocked for shortest lead times.

Note: Part Numbers are RoHS compliant except: ♦ Indicates non-RoHS compliant.

Catalog 1307895
Revised 11-07

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Japan: 81-44-844-8013
UK: 31-73-624-6639

MPO Connectors

Product Facts

- Tested to Telecordia GR-1435
- Push Pull Latching
- 4, 8, 12, OR 24 fibers
- Color-coded housings differentiate singlemode and multimode:
  - Multimode - Beige
  - Singlemode - Green
- Manufactured to IEC Standards 61754-7 and TIA/EIA 604-5

Industry Standard

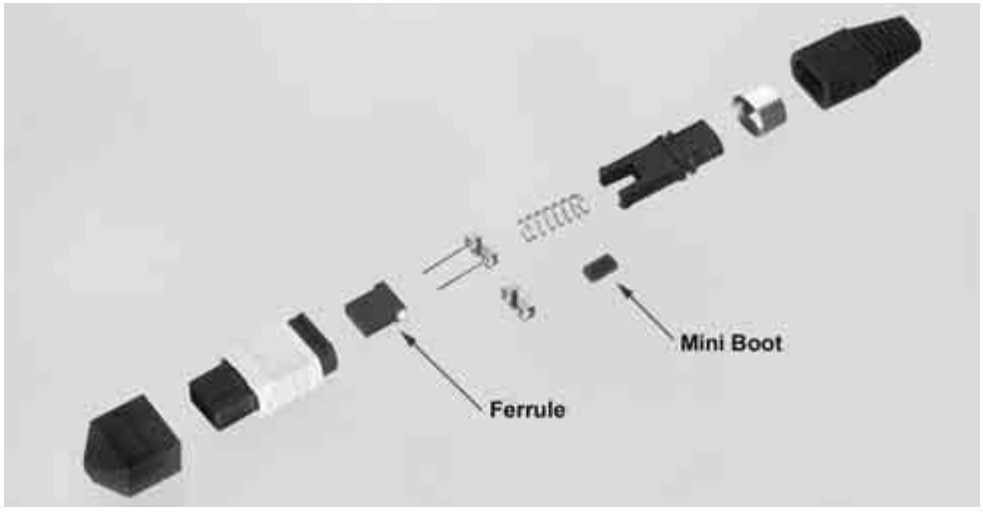
Performance Characteristics

Singlemode

Insertion Loss (Typ) — 0.25 dB
Insertion Loss (Max) — 0.75 dB
Return Loss — > 55 dB

Multimode

Insertion Loss (Typ) — 0.2 dB
Insertion Loss (Max) — 0.5 dB
Return Loss — > 20 dB



MPO Connector Kit Selection - Plug Kits

Fiber Type	Female (no pins)	Male (with pins)
Singlemode	6457981-1	6457981-2
Multimode	6457983-1	6457983-2

Note: Ferrules and Mini-Boots are sold separately. See chart below for proper part numbers.

MPO Ferrule Kit with Mini-Boot

Fiber Type	4 Position	8 Position	12 Position
Singlemode	5492221-1	5492221-2	5492221-3
Multimode	5503839-1	5503839-2	5503839-3

Crimping Tool with Dieset

1588698-1

MPO Adapters

Adapter Type	Single Pack	50 pc Bulk Pack
Adapter w/flange	1588172-1	1588172-5
Adapter w/flange and clip	1588172-2	1588172-6
Adapter w/o flange	1588172-3	1588172-7
Adapter w/o flange and w/clip	1588172-4	1588172-8

Note: All part numbers are RoHS compliant.

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Tooling

Powermeter Launch Lead Kits for Optical Testing and Certification

Today testing of fiber optic links is more sensitive than ever. AMP NETCONNECT test kits guarantee precise and replicable fiber testing. All kits contain connectors with controlled end faces and support testing with 3 jumper test method in accordance to ISO/IEC 14763-3.

Each kit contains:
- Test leads for simplex and duplex IL test
- Test leads for CPR tests
- Fiber coupling bushes
- Two mandrels (Multimode only)
- Cleaning aides
- Instruction manual
- Data sheet of end face geometry

Description	Part Number
50 µm, Multimode Launch Lead	Y-6695241-X
62.5 µm, Multimode Launch Lead	Y-6695243-X
9 µm, Singlemode Launch Lead	Y-6695245-X

Y- -X	Connector Type
-1	SC/PC to SC/PC
-2	SC/PC to ST/PC
-3	SC/PC to LC/PC
-4	SC/PC to FC/PC
-5	SC/PC to MT-RJ

Y- -X	Connector Type
-6	ST/PC to SC/PC
-7	ST/PC to ST/PC
-8	ST/PC to LC/PC
-9	ST/PC to FC/PC
1- -0	ST/PC to MT-RJ

Y- -X	Connector Type
1- -1	LC/PC to SC/PC
1- -2	LC/PC to ST/PC
1- -3	LC/PC to LC/PC
1- -4	LC/PC to FC/PC
1- -5	LC/PC to MT-RJ

Y- -X	Connector Type
1- -6	FC/PC to SC/PC
1- -7	FC/PC to ST/PC
1- -8	FC/PC to LC/PC
1- -9	FC/PC to FC/PC
2- -0	FC/PC to MT-RJ

Explanation: Connector 1 — to test equipment
Connector 2 — under test

OTDR Launch Lead Kits for Optical Testing and Certification

Each kit contains:
- Launch and tail lead
- Length 400 m Multimode and 500 m Singlemode
- Data sheet of end face geometry
- Coupling bushings
- Cleaning aides
- Instruction manual

Description	Part Number
50 µm, Multimode Launch Lead	Y-6695240-X
62.5 µm, Multimode Launch Lead	Y-6695242-X
9 µm, Singlemode Launch Lead	Y-6695244-X

Y- -X	Connector Type
-1	SC/PC to SC/PC
-2	SC/PC to ST/PC
-3	SC/PC to LC/PC
-4	SC/PC to FC/PC
-5	SC/PC to MT-RJ

Y- -X	Connector Type
-6	ST/PC to SC/PC
-7	ST/PC to ST/PC
-8	ST/PC to LC/PC
-9	ST/PC to FC/PC
1- -0	ST/PC to MT-RJ

Y- -X	Connector Type
1- -1	LC/PC to SC/PC
1- -2	LC/PC to ST/PC
1- -3	LC/PC to LC/PC
1- -4	LC/PC to FC/PC
1- -5	LC/PC to MT-RJ

Y- -X	Connector Type
1- -6	FC/PC to SC/PC
1- -7	FC/PC to ST/PC
1- -8	FC/PC to LC/PC
1- -9	FC/PC to FC/PC
2- -0	FC/PC to MT-RJ

Explanation: Connector 1 — to test equipment
Connector 2 — under test

Consumables for Power Meter and OTDR Launch Lead Kits

Description	Part Number
Cleaning Lens Book	434376-1
Compressed Air Bottle	1206860-1
Cleaning Stick 2.50 mm	1918807-1
Cleaning Stick 1.25 mm	1918808-1
Cleaning Stick MT-RJ	1391089-1

Note: Part Numbers are RoHS compliant except: ♦ Indicates non-RoHS compliant.

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Tooling (Continued)

Tool Kit Compatibility Chart

	Part Number	MT-RJ Jacks	MT-RJ SECURE Jacks	MT-RJ Plugs	LIGHTCRIMP PLUS			LIGHTCRIMP		Epoxy/Polish					
					LC	SC	ST	SC	ST	LC	SC	ST	FC	FSD	FSMA
Deluxe Premises Termination Tool Kit	1278949-2	X	X		X	X	X	X	X						
	1278949-3*	X	X		X	X	X	X	X						
MT-RJ Jack Tool Kit	1278346-1	X	X												
	1278346-2*	X	X												
LIGHTCRIMP PLUS No Epoxy/ No Polish Universal Tool Kit	1278118-4	X	X		X	X	X								
	1278118-5*	X	X		X	X	X								
MT-RJ Plug Termination Kit	1278745-1			X											
	1278745-2*			X											
LIGHTCRIMP PLUS No Epoxy/ No Polish LC Tool Kit	1754845-1				X										
	1754845-2*				X										
LIGHTCRIMP PLUS No Epoxy/ No Polish SC Tool Kit	1278022-1					X									
	1278022-2*					X									
LIGHTCRIMP PLUS No Epoxy/ No Polish ST Tool Kit	492697-1						X								
	492697-2*						X								
LIGHTCRIMP SC/ST No Epoxy/Polish Tool Kits	503957-1							X	X						
	503957-3							X	X						
	492543-1							X	X						
LIGHTCRIMP SC No Epoxy/ Polish Tool Kits	503706-1							X							
	503706-2							X							
LIGHTCRIMP ST No Epoxy/ Polish Tool Kits	503330-1								X						
	503330-3								X						
	492322-1								X						
Pro-installer Epoxy/ Polish Tool Kits	501258-7									X[1]	X	X	X	X	X
	501258-8									X[1]	X	X	X	X	X
	501258-9									X[1]	X	X	X	X	X
Epoxy/Polish SC/FC Tool Kit (no microscope, no curing oven)	503746-7									X[2]	X		X		
Epoxy/Polish ST Tool Kit (no microscope, no curing oven)	503746-1									X[2]		X			
Epoxy/Polish FSMA Tool Kit (no microscope, no curing oven)	503746-2									X[2]					X
Epoxy/Polish FSD Tool Kit (no microscope, no curing oven)	503746-6									X[2]				X	

[1] For LC terminations, also order Part Number 1754462-1.
[2] For LC terminations, also order Part Number 1754603-1.
*Includes Precision Cleaver and Microscope.

Epoxy/Polish Connector Consumables/Compatibility Chart

	Epoxies (Part Number)			Polishing Films (Part Number)					Consumable Package* Part Number
	EPO-TEK (504035-1	TRA-CON (501195-4)	HYSOL (502418-1)	9 µm (1374484-1)	5 µm (228433-8)	Diamond Film (503887-1)	0.3 µm (228433-5)	Final Polishing Film (502748-2)	
LC Singlemode	X	X	X	X	X	X	X	—	502306-4
LC Multimode	X	X	X	X	X	X	X	—	502306-4
SC Singlemode	X	X	X	—	X	—	X	X	502306-2
SC Multimode	X	X	X	—	X	—	X	X	502306-2
ST Singlemode	—	X	X	—	X	—	X	X	502306-2
ST Multimode	—	X	X	—	X	—	X	—	502306-1

*Epoxy & film for » 100 connectors.

Note: All part numbers are RoHS compliant.

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Tooling (Continued)

Deluxe Premises Termination Tool Kit

Part Number 1278949-2

Part Number 1278949-3 (Includes Precision Cleaver and Microscope)

Product Facts

- Includes all tools need for installing popular field-installable connectors
  - MT-RJ and MT-RJ SECURE Jacks
  - LIGHTCRIMP PLUS SC, LC and ST connectors
  - LIGHTCRIMP SC and ST connectors
- Convenient carrying case
- Includes consumables for LIGHTCRIMP connector terminations
  - For additional LIGHTCRIMP connector terminations, order additional polishing films 228433-9, 228433-8, 228433-7 and 228433-5 (page 93)
- Includes instructional CD-ROM video

MT-RJ Jack Termination Tool Kit

Part Number 1278346-1

Part Number 1278346-2 (Includes Precision Cleaver and Microscope)

Product Facts

- Includes all tools needed for installing MT-RJ and MT-RJ SECURE Jacks

MT-RJ Plug Termination Tool Kit

Part Number 1278745-1

Part Number 1278745-2 (Includes Precision Cleaver and Microscope)

Product Facts

- Includes all tools needed to terminate MT-RJ Plug in handy plastic case
- Contents: Cleave pen, Jacket/Buffer/Coating Stripper, KEVLAR Shears, Strip Template, Cable Clamps, Cure Fixtures, Crimp Tool, Die Sets, Epoxy Dispensers

LIGHTCRIMP PLUS Termination Tool Kits

Product Facts

- Includes all tools needed for installing the listed type LIGHTCRIMP PLUS no epoxy/no polish connectors, MT-RJ and MT-RJ SECURE Jacks
- LIGHTCRIMP PLUS Connector Termination Video CD-Rom also available separately, Part Number 1374503-1
- Convenient carrying case

Description	Part Number	
Universal LIGHTCRIMP PLUS No epoxy/No polish Tool Kit (SC, LC, ST and MT-RJ Jack)	1278118-4	1278118-5[1]
LIGHTCRIMP PLUS LC Connector Termination Tool Kit	1754845-1	1754845-2[1]
LIGHTCRIMP PLUS SC Connector Termination Tool Kit	1278022-1	1278022-2[1]
LIGHTCRIMP PLUS ST Connector Termination Tool Kit	492697-1	492697-2[1]

[1] Includes Precision Cleaver and Microscope.

Note: All part numbers are RoHS compliant.

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Tooling (Continued)

No Epoxy/No Polish Upgrade and Adaptive Termination Tool Kits

Product Facts

- **Upgrade Tool Kit supplements existing LIGHTCRIMP PLUS Tool Kits with tools needed to install LC connectors**
- **Adaptive Tool Kits supplements existing fiber optic tool kits with the tools needed to terminate**

LIGHTCRIMP PLUS connectors

- **Saves money on full tool kit by reusing tools from currently owned tool kits**

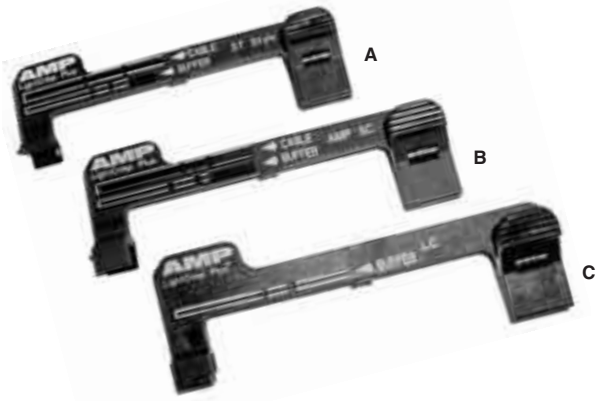
Description	Terminates	Includes	Cost Savings	Part Number
LC LIGHTCRIMP PLUS Upgrade Kit	LIGHTCRIMP PLUS LC	LC Die Set and Cable Holder	Low Cost Upgrade for Current Tool Kit	1754847-2
LC LIGHTCRIMP PLUS Adaptive Kit	LIGHTCRIMP PLUS LC	Crimp Tool, LC Die Set, LC Cable Holder, Cleave Tool and Instruction Sheet	Fiber and Cable Strippers in Current Tool Kit	1754846-1 1754846-2*
SC LIGHTCRIMP PLUS Adaptive Kit	LIGHTCRIMP PLUS SC	Crimp Tool, SC Die Set, SC Cable Holder, Cleave Tool and Instruction Sheet	Fiber and Cable Strippers in Current Tool Kit	1754737-1 1754737-2*
Combination LIGHTCRIMP PLUS Adaptive Kit	LIGHTCRIMP PLUS SC and ST	Crimp Tool, SC and ST Die Sets, SC and ST Cable Holders, Cleave Tool and Instruction Sheets	Fiber and Cable Strippers in Current Tool Kit	1754739-1 1754739-2*
ST LIGHTCRIMP PLUS Adaptive Kit	LIGHTCRIMP PLUS ST	Crimp Tool, ST Die Set, ST Cable Holder, Cleave Tool and Instruction Sheet	Fiber and Cable Strippers in Current Tool Kit	1754738-1 1754738-2*

*Includes microscope and precision cleaver

LIGHTCRIMP PLUS Cable Holders

Product Facts

- **Used in LIGHTCRIMP PLUS connector terminations (included in LIGHTCRIMP PLUS Tool Kits)**



Description	Figure	Part Number
ST	A	492703-1
SC	B	1278023-1
LC	C	1754138-1

Fiber Optic Cleave Tool Part Number 492674-1

Product Facts

- **Cleave fibers for LIGHTCRIMP PLUS connectors**
- **One is included in basic tool kits for MT-RJ Jacks and LIGHTCRIMP PLUS connectors (not the LC Upgrade Kit)**
- **Easy to use: clamp, score and bend**
- **Blade life-span is » 1000 cleaves**

Note: All part numbers are RoHS compliant.

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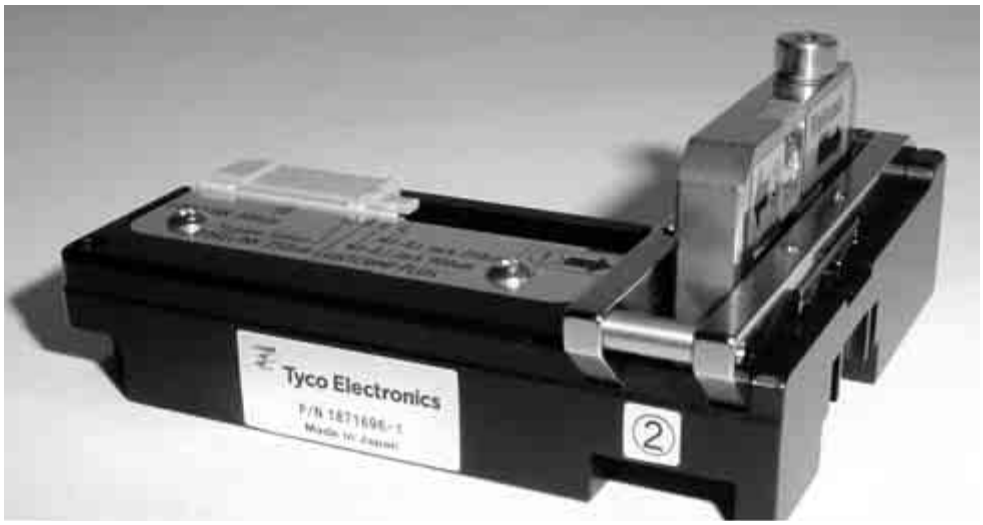
Tooling (Continued)



"New" Hand Held Precision Cleaver

Part Number 1871696-1 Hand Held Precision Cleaver

Part Number 1871696-2 Hand Held Precision Cleaver with Trash Can
(not a stocked item)

Product Facts

- **Operator independent = no craft sensitivity = consistent cleave every time**
- **Hand held operation**
- **10,000 cleave blade life**
- **4, 6, 8, 10, and 18 millimeter cleave lengths**
- **Product specific markings for LIGHTCRIMP PLUS and MT-RJ jack connectors, CORELINK splice, and fusion splicing**
- **Cleaved surface angle < 1.5°**
- **No lip, no fracture, and no roll-off**
- **Padded belt case for convenience and storage**
- **Neck lanyard included**

Tyco Electronics' hand held precision fiber cleaver provides precision quality cleaves with the feel and robustness of a full scale precision cleaver in a hand held size at an exceptionally competitive price. The 10,000 cleave blade life far exceeds that of any other hand held cleaver currently on the market. The detailed scale markings indicate proper cleave lengths for popular Tyco Electronics field installable fiber optic connectors and mechanical splices in addition to the standard numerical markings for other applications including fusion splicing. The included belt pouch and neck lanyard ensure that the cleaver is always within reach.

Applications

Affordable precision cleaving solution for:

- Field installable mechanical splice connectors
- Fusion splicing
- Mechanical splicing
- Bare fiber adapters

Product Dimensions

Length — 74 mm [2.913 in.]
Width — 65.5 mm [2.578 in.]
Thickness — 33.5 mm [1.318 in.]
Weight — 136 g [0.30 lb.]

Note: All part numbers are RoHS compliant.

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Tooling (Continued)

LIGHTCRIMP Termination Tool Kits

Product Facts

- Includes all tools needed for installing the listed type LIGHTCRIMP no epoxy/ polish connectors
- Convenient carrying case
- Includes consumables for installing 60 LIGHTCRIMP connectors
  - For additional LIGHTCRIMP terminations, order additional polishing films 228433-9, 228433-8, 228433-7 and 228433-5 (page 93)
- Note: photo is representative of kits — contents may vary by Part Number

Description		Microscope (if listed)	Part Number
LIGHTCRIMP SC	Termination Kit	—	503706-1
		Premium Microscope	503706-2
LIGHTCRIMP ST	Termination Kit	—	503330-1
		Premium Microscope	503330-3
	Mini Tool Kit	—	492322-1
LIGHTCRIMP SC and ST	Termination Kit	—	503957-1
		Premium Microscope	503957-2
	Mini Tool Kit	—	492543-1

LIGHTCRIMP Cleave Tool Part Number 503705-1

Product Facts

- Used in both SC and ST LIGHTCRIMP Connector terminations
- Included in the Deluxe and LIGHTCRIMP Tool Kits

Note: All part numbers are RoHS compliant.

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Japan: 81-44-844-8013
UK: 31-73-624-6639

Tooling (Continued)

Pro-Installer Epoxy/Polish Connector Termination Tool Kits

Product Facts

- Includes all tools necessary to install SC, ST, and FC Connectors
  - For LC terminations, also order Part Number 1754462-1
- Tool kits include:
  - Pro-Crimper II Hand Tool and crimping dies
  - Polishing bushings
  - Polishing film (also sold separately, page 93)
  - Cable and fiber strippers
  - Scissors
  - Scribe tool
- Includes polishing films to install 60 epoxy/polish connectors
  - Epoxy is sold separately (see page 92)
- Kits available with curing oven and microscope or without
- Convenient carrying case
- Photo is representative of kits — contents vary by Part Number

Professional Installer Kit

Description	Part Number
With 110 V Curing Oven and Microscope	501258-7
With 220 V Curing Oven and Microscope	501258-8
Without Curing Oven or Microscope	501258-9

Epoxy/Polish Connector Termination Tool Kits

Product Facts

- Includes all tools necessary to install the listed epoxy/polish connectors
  - For LC terminations, also order Part Number 1754603-1
- Tool kits include:
  - Pro-Crimper II Hand Tool and crimping dies
  - Polishing bushings
  - Polishing film (also sold separately, page 93)
  - Cable and fiber strippers
  - Scissors
  - Scribe tool
- Includes polishing films to install » 60 epoxy/polish connectors
  - Epoxy is sold separately (see page 92)
- Does not include curing oven or microscope
- Convenient carrying case

Description	Part Number
SC and FC	503746-7
ST	503746-1
FSMA	503746-2
FSD	503746-6

Note: All part numbers are RoHS compliant.

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UK: 31-73-624-6639

Tooling (Continued)

Cable Stripper
Part Number 1375317-1

Product Facts

- Cyclops Stripper ideal for stripping twisted pair (UTP and STP) and fiber optic cables up to 10.92 [0.43] diameter

Sapphire-Tipped Scribe Tool and Accessories

Product Facts

- Long-lasting sapphire blade
- Pen-type casing
- Used to install all Epoxy/ Polish Connectors
- Included in Epoxy/Polish Tool Kits

Description	Part Number
Sapphire-tipped Scribe Tool	504064-1
Replacement Blades	504290-1

Note: All part numbers are RoHS compliant.

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Tooling (Continued)

Epoxy/Polish LC Termination Accessories

Product Facts

- Supplement epoxy/polish tool kits on page 90 with these components to terminate LC Epoxy/Polish Connectors
- Different polishing films are required for LC polishing (see table on page 85 and films on page 93)

Description	Part Number
LC Polishing Puck — Metal	1754074-1
LC Cable Preparation Template	1588756-1
LC Hand Tool and Die Set	1588176-1
LC 1.25 mm Ferrule Microscope Adapter	1278997-1
LC Oven Block Assembly	1457628-1
LC Adaptive Kit — Anaerobic Epoxy Style	1754603-1
LC Adaptive Kit — Heat Cure	1754462-1

EPO-TEK 353ND Epoxy

Part Number 504035-1

Product Facts

- For use with SC and LC Connectors
- Pre-measured two-part packets for consistent results
- Long pot life once mixed
- Heat-cured epoxy
- Supplied in 4-gram packets
- Cures in 15 minutes at 115° C

TRA-CON Epoxies

Part Number 1918652-1

Product Facts

- For use with SC, LC, and ST Connectors
- Pre-measured two-part packets for consistent results
- Can be heat-cured or cured at ambient temperature
- Supplied in 2-gram packets
- Each packet terminates » 250 connectors
- 25 packets per pack
- Pot life = 30 minutes
- Cures in:
  - 24 hours @ 25° C
  - 2 hours @ 65° C
  - 10 minutes @ 110° C

HYSOL Epoxy-Tubes

Part Number 502418-1

Product Facts

- For use with SC, LC, ST, FSD, FC, and FSMA Connectors
- Two-part epoxy in two tubes
- Heat-cured epoxy
- Terminates » 400 connectors
- One set of two (2) tubes per part number
- Pot life = 30 minutes
- Cures in 30 minutes at 100° C

QC Quick Cure Adhesive

Product Facts

- One-part adhesive eliminates the hassle and mess of mixing
- Applies easily and cures in minutes without heat or UV light
- Works with standard multimode epoxy-style connectors without performance degradation
- Faster procedure for time-saving productivity and lower installed costs
- Not for use with singlemode terminations

Tube Size	Typical Connector Terminations Per Tube*	Part Number
3 grams	100	492508-1

*Your individual termination techniques will affect the number of terminations per tube.

Note: All part numbers are RoHS compliant.

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Tooling (Continued)

Epoxy Applicator Syringe Part Number 501473-3

Product Facts

- 3 cc capacity

Epoxy Curing Oven

Product Facts

- Reduces time required to cure epoxy
- Provides a uniform, controlled curing environment
- Used for all epoxy/polish connectors
- Comes equipped to cure up to four Duplex Connectors and 12 Simplex Connectors at once
  - Optional blocks reconfigure to 8 Duplex or 24 Simplex Connectors
- Variable temperature control (60°C to 125°C)
- Includes thermometer and cable support bracket
- Two voltage options
- Curing sleeves on page 98

Description	Part Number
110 VAC	502134-1
220 VAC	502134-2
Adapter Block for 8 Duplex Connectors	502222-1
Adapter Block for 24 Single Connectors	502129-1
Block Assembly for 1.6, 2.0 & 2.4 mm SC and FC (metal crimp body) and LC Connectors	1457528-1

Polishing Films

Product Facts

- Used to install LIGHTCRIMP and epoxy/polish connectors

Description	Part Number							
	FSMA	Multimode ST	Singlemode ST	FC	FSD/RSD	SC	LIGHTCRIMP XTC	LC
Hand Polishing Film:								
15 µm[4]	—	—	—	—	—	—	228433-9	—
9 mm	—	—	—	—	—	—	—	1374484-1[3]
5 µm[4]	228433-8	228433-8	228433-8	228433-8	228433-8	228433-8	228433-8	228433-8
1 µm[4]	228433-7	228433-7	—	—	228433-7	—	228433-7	—
Fine Diamond Film[1]	—	—	—	—	—	—	—	503887-1
0.3 µm[4]	228433-5	228433-5	228433-5	228433-5	228433-5	228433-5	228433-5	228433-5
Final Polish Film[1]	—	—	502748-2	502748-2	—	502748-2	—	—
Consumables Kit[2]	502306-1	502306-1	502306-2	502306-2	502306-1	502306-2	—	502306-4

[1] Pack of 5.
[2] Contains all consumable supplies for at least 100 connectors.
[3] Pack of 15.
[4] Pack of 100.

Note: All part numbers are RoHS compliant.

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Tooling (Continued)

Hand Held Visual Fault Locator (VFL)

Product Facts

- **650 nm (visible) Class 2 1.0 mW max Diode Laser**
- **Continuous and flashing (2-3 Hz pulsed) modes**
- **Rugged rubber shell and body design modeled after a popular military connector**
- **Lanyard attached dust cover**
- **Standard 2.5 mm adapter for SC, ST, and FC connectors**
- **Optional 1.25 mm adapter for LC and MU connectors.**
- **Unique design allows adapter to permanently reside on VFL so it is not misplaced allowing user to choose 1.25 mm or 2.5 mm**
- **Uses 1 "AA" style battery for >30 hours of continuous use**
- **Soft-sided belt case for convenience and storage**

The Tyco Electronics Hand Held Visual Fault Locator (VFL) is a rugged and affordable solution for identifying breaks and bending in optical fibers and cabling. Its powerful, red (650 nm) laser provides the ability to locate damaged, broken, or tightly bent fibers that cause undesirable attenuation in your system.

The jacket of the cable will glow red at the location of the fault. The FLASH button allows the user to toggle between continuous or pulsed mode. The compact, rugged, and balanced design is based upon a popular harsh environment fiber optic connector. The single "AA" style battery is good for >30 hours of continuous use and the soft-sided protective case with belt loop provides a convenient and protective means of storage.

Applications

Affordable VFL Solution for:

- Identifying breaks, bends, and other damage in optical fibers
- Tracing fiber paths
- Identifying termination errors
- Continuity testing

Product Dimensions

Length — 18.5 cm [7.283 in]
Width — 2.2 cm [0.866 in]
Thickness — 2.2 cm [0.866 in]
Weight (w/battery) — 150 g [0.33 lb]

Description	Part Number
Hand Held Visual Fault Locator	1828352-1
1.25 mm Adapter for Hand Held VFL	1828353-1
Includes Part Numbers 1828352-1 and 1828353-1	1828352-2

Note: All part numbers are RoHS compliant.

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Tooling (Continued)

Hand Held Microscope

Product Facts

- High quality glass optics
  - 200X magnification
- Optimal visual examination of terminated ends
  - 500um field of view
- Dual illumination
  - Coaxial for inspecting polish quality
  - Oblique for general conditions
- Pre-centered, threaded adapter mount provides easy focusing and changing of connectors
- Field and laboratory examination for multimode and singlemode fibers
- Portable
- Integral infrared filter for safety
  - Do NOT use any microscope to view active fiber signals
- Disposable, Type LR44 batteries
- Long-life LED (approximately 100,000 hours of operation)
- Each Kit includes:
  - 10-power objective microscope with an impact resistant ergonomic rubber shell and high quality glass optics
  - 20-power eyepiece
  - Padded carrying case with an integrated belt loop and internal adapter storage pocket
  - Neck lanyard with safety breakaway feature
  - Universal 2.5 mm ferrule adapter (for SC, ST and FC)
- Other adapters available are:
  - Universal 1.25 mm (adapts LC and MU)
  - MT-RJ
  - MPO
  - MPO APC
  - MPX
  - MPX APC

Tyco Electronics' hand held microscope incorporates high quality glass optics and dual illumination lighting for unsurpassed 200X magnification. With a 500 µm Field of View (FOV) and both coaxial and oblique illuminations, this microscope will meet the proposed TIA/IEC hand held microscope specification for a polish quality scope (coaxial) and general conditions scope (oblique) in one compact unit.

The built in IR-laser attenuation filter will provide protection from accidental exposure to active fibers, although intentional and prolonged viewing of active fibers is not recommended. The ergonomic, impact resistant shell provides a rugged feel, and the included padded belt case and neck lanyard ensure that the microscope is always within reach.

Applications

Affordable inspection device for:

- Polish inspection
- General conditions (debris) inspection
- Cleave quality inspection
- Verifying core size

Product Dimensions

Length — 186.9 mm [7.359 in.]
Width — 51.6 mm [2.030 in.]
Height — 31.5 mm [1.240 in.]
Weight — 317.5 g [0.70 lb.]

Description			Part Number
Hand Held Microscope			1754767-1
Adapters	1.25 mm Universal	LC and MU	1754765-1
	2.5 mm Universal	SC, ST and FC	1754766-1
	SC APC		1828833-1
	MT-RJ		1754768-1
	MPO		1828836-1
	MPO APC		1828837-1
	LIGHTRAY MPX Connectors		1828834-1
	LIGHTRAY MPX APC Connectors		1828835-1
	FSMA		1985040-1*

* Coupling adapter Part Number 1985041-1 required.

DANGER: Active fibers should never be viewed through a microscope.

Note: All part numbers are RoHS compliant.

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Tooling (Continued)

MTP/MPO IBC Cleaner Part Number 1918809-1

Product Facts

- **Cleans male or female MTP/MPO connectors**
- **Pre-washed cleaning cloth is lint and debris free**
- **Each cleaner is capable of more than 400 cleanings**
- **Can be used for bulkhead and unmated MTP/MPO cleaning**
- **Protective dust cover doubles as an adapter cap for cleaning unmated connectors**
- **FOCIS 5-Type MTP/MPO interface compliant**
- **Removes dust and oil contamination**
- **Ideal solution for cleaning parallel optics transceivers**

MTP is a trademark of US Conec Ltd.

The MTP/MPO IBC (In Bulkhead Cleaner) dry cloth cleaner offered by Tyco Electronics utilizes a densely woven micro-fiber cloth that cleans male (with pins) or female MTP/MPO connectors while in adapters, bulkheads, faceplates, or in unmated form with the unique adapter/dust cover. The unique cleaning cloth also reduces static charge making it one of the most advanced cleaning systems available for bulkhead optical connector cleaning.

Applications

For effective cleaning of:

- Male and female MTP/MPO connectors inside mating adapters
- Unmated male and female MTP/MPO connectors using included adapter
- Parallel optics transceivers
- Networking gear including switches and routers
- Factory or field connectors

Product Dimensions

Length — 184.2 mm [7.25 in.]
Width — 56.5 mm [2.22 in.]
Thickness — 22 mm [0.866 in.]
Adapter Length — 19.5 mm [0.759 in.]

OPTIPOP R Reel Cleaner

Product Facts

- **Static attraction is minimized**
- **Ultra clean micro-fiber cloth captures debris and other contamination**
- **Robust cloth does not fray or leave fibrous material behind**
- **Reduces the number of field and test issues caused by contaminated end faces**
- **High-end cost effective cleaning solution**

Reel Cleaner Refill (Six per Pack)
Part Number 1918806-1

OPTIPOP is a trademark of NTT Advanced Technology Corporation.

The OPTIPOP R dry cloth cassette cleaners offered by Tyco Electronics utilize a densely woven micro-fiber cloth that cleans fiber optic connector tips while reducing static charge. This makes them one of the most advanced cleaning systems available for optical connector cleaning.

Applications

A variety of reel cleaner configurations allow for use on the major optical connector types including FC, SC, ST, LC, MU, ODVA conforming, MT-RJ, and MPO.

Product Dimensions

Length — 127 mm [5.00 in.]
Width — 83 mm [3.26 in.]
Thickness — 48 mm [1.89 in.]
Weight — 150 g [0.33 lb.]

Description	Part Number
MPO w/pins reel cleaner	1918802-1
One slot reel cleaner; 1.25 mm, 2.5 mm, MT No Pins	1918803-1
MT-RJ plug w/pins reel cleaner	1918804-1
Two slot reel cleaner; 1.25 mm and 2.5 mm	1918805-1
Reel cleaner refill (six per pack)	1918806-1

Note: All part numbers are RoHS compliant.

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Tooling (Continued)

OPTIPOP C Card Cleaner

Product Facts

- **Static attraction is minimized**
- **Ultra clean micro-fiber cloth captures debris and other contamination**
- **Robust cloth does not fray or leave fibrous material behind**
- **Reduces the number of field and test issues caused by contaminated end faces**
- **Compact size**

Card Cleaner Refill (Ten per Pack)
Part Number 1918811-1

The compact OPTIPOP C dry cloth card cleaner offered by Tyco Electronics utilizes a densely woven micro-fiber cloth that cleans fiber optic connector tips while reducing static charge. This makes it one of the most advanced cleaning systems available for optical connector cleaning.

Applications

The card cleaner can be used on major optical connector types including FC, SC, ST, LC, MU, LC, ODVA, MT-RJ*, and MPO*.

*Without guide pins installed.

Product Dimensions

Length — 120 mm [4.72 in.]
Width — 57 mm [2.24 in.]
Thickness — 16 mm [0.63 in.]
Weight — 60 g [0.13 lb.]

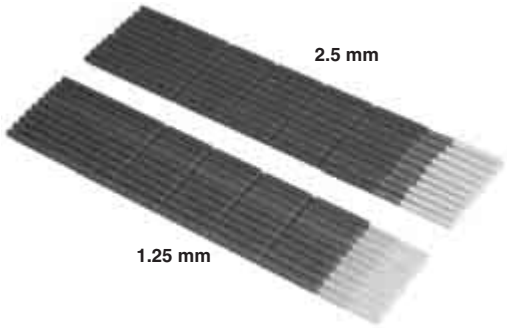
Description	Part Number
Fiber connector card cleaner	1918810-1
Card cleaner refill (ten per pack)	1918811-1

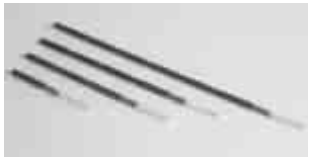
OPTIPOP is a trademark of
NTT Advanced Technology Corporation.

NEOCLEAN Stick Cleaner

Product Facts

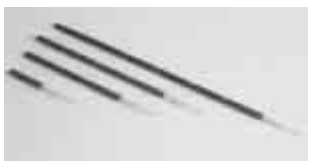
- **Perforated handle for customizing length and angle**
- **Ultra clean micro-fiber cloth captures debris and other contamination while minimizing static attraction**
- **Robust cloth does not fray or leave fibrous material behind**
- **Reduces the number of field and test issues caused by contaminated end faces**
- **Convenient packaging**





Product Dimensions

Part Number 1918807-1
2.5 mm Stick Cleaner
Overall Length — 151.2 mm [5.95 in.]
Tip Diameter — 1.25 mm [0.049 in.]
Handle Diameter — 2.65 mm [0.104 in.]
Tip Length — 12.6 mm [0.496 in.]



Part Number 1918808-1
1.25 mm Stick Cleaner
Overall Length — 151.2 mm [5.95 in.]
Tip Diameter — 2.5 mm [0.098 in.]
Handle Diameter — 2.65 mm [0.104 in.]
Tip Length — 20.0 mm [0.787 in.]

The NEOCLEAN dry cloth stick cleaners offered by Tyco Electronics utilize a densely woven micro-fiber cloth that cleans fiber optic connector tips while reducing static charge. This makes them one of the most advanced cleaning systems available for bulkhead optical connector cleaning.

Applications

The stick cleaners can be used on major single fiber optical connector types inside bulkhead adapters including FC, SC, ST, LC, MU, LC ODVA, and MT-RJ Jacks in addition to transceivers and lenses.

NEOCLEAN is a trademark of
NTT Advanced Technology Corporation.

Note: All part numbers are RoHS compliant.

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Tooling (Continued)

Hand Tools

PRO-CRIMPER III Hand Tool
Instruction Sheet 408-4020
http://www.tycoelectronics.com/documents

PRO-CRIMPER III Hand Tool

Connector	Cable Jacket Diameter (mm)	Part Number		
		Hand Tool w/ Die Set	Hand Tool Only	Die Set Only
FSMA	3.0	58551-1	58532-1	58552-1 (hex die)
ST Ceramic	3.0	58433-4	58532-1	58424-1
ST Stainless Steel	3.0	58433-4	58532-1	58424-1
ST Polymer Composite	3.0	58433-4	58532-1	58424-1
ST Ceramic Used with Loose Tube	3.8	—	58532-1	503890-1
ST Stainless Steel (504XXX series only)	3.0	58551-1	58532-1	58552-1
SC/FC (Polymer crimp body)	3.0	503911-1	58532-1	503910-1
	2.4 & 3.0	492026-1	58532-1	492025-1
SC, FC (Metal crimp body)	1.6-2.0, 2.4	1588176-1	58532-1	1588175-1
SC/FC (Metal crimp body)	3.0	—	58532-1	492131-1
FSD - Ceramic	DUALAN & LDD	58519-1	58532-1	58510-1
FSD - Polymer	DUALAN & LDD	58519-1	58532-1	58510-1
FSD/MC - Ceramic	DUALAN & LDD	58519-1	58532-1	58510-1
FSD Breakout Kit	DUALAN & Protection Kit	58519-1	58532-1	58510-1
LIGHTCRIMP Plus and LIGHTCRIMP ST	3.0	492623-1	58532-2	492622-1
LIGHTCRIMP Plus and LIGHTCRIMP SC	3.0	492782-1	58532-2	492783-1
LIGHTCRIMP Plus LC	1.6 – 2.0	1754137-1	58532-2	1754136-1
MT-RJ Plug	1.8	1278632-1	58532-1	1278627-1
LC	3.0, 2-4, 1.6-2.0	1588176-1	58532-1	1588175-1

Polishing Bushing, Curing Sleeves and Strip Card Kits

Connector	Cable Jacket Diameter (mm)	Part Number		
		Polishing Bushing	Curing Sleeves/Pieces	Strip Card Kit
FSMA	3.0	228025-1	502249-1 (12 pcs.)	501818-1
ST				
Ceramic, Stainless Steel	3.0	503337-1 (Metal) 503304-1 (Black Polymer)	502259-1 (12 pcs.)	501818-1
Polymer Composite	3.0	503304-2 (Beige Polymer)	502259-1 (12 pcs.)	501818-1
FC	3.0	504862-1	502862-2 (6 pcs.)	1754636-1
SC	3.0	502631-1 (Black Polymer)	502656-1 (1 pc.)	1754636-1
LC		1754074-1 (Metal) 1918196-1 (Black Polymer)	1457630-X[1] (12 pcs.)	1588756-1
FSD - Ceramic & Polymer	DUALAN & LDD	501795-1*	502023-1**	501818-1

* Curing Assembly Kit with polishing bushing.
** Curing Assembly Kit without polishing bushing.
[1] -1 LC 900 µm
-2 LC jacketed cable

Note: All part numbers are RoHS compliant.

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Table of Contents

Cable Assemblies & Backplane Interconnects

Cable Assemblies

Backplane Interconnects

LIGHTRAY OFX Optical Fiber Circuit

(See Fiber Management, Packages Solutions, Sub Systems, and Laser Process Section 3, pages 155, 156)

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Active Optical Cable Assemblies

NEW

InfiniBand 4x DDR Active Optical Cable Assemblies

Product Facts

- 4 transmit and 4 receive channels at up to 5 Gb/s per channel)
- Industry standard (SFF-8470) electrical connector (aka InfiniBand 4x, CX-4)
- 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
- <1 Watt power consumption
- Small diameter cable (2 mm)
- Light weight
- Tight bend radius

Tyco Electronics' active optical cables 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 850nm VCSELS, it can be operated from 2.5 Gb/s to 5 Gb/s per channel. At 5 Gb/s this provides aggregate full duplex throughput of 20 Gb/s. They are available in lengths up to 100 meters using 50 micron MM fiber[1]. The OEO 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

[1] Short lengths use standard multi-mode fiber, longer lengths use laser optimized (OM3) fiber

Applications

- High Performance Computing Clusters
- Supercomputers
- High end servers
- Mass storage
- Metro network switch/cross connect
- High end carrier class routers
- DDR InfiniBand
- 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 offered in future
- Compatible with InfiniBand SDR and DDR
- Power consumption per end 1 watt

Mechanical/Environmental

- Up to 200 meters
- 25 mm bend radius
- Operating temperature 0°C to 60°C
- Storage Temperature -25°C to 70°C
- 4 channels each direction
- FCC Class B

Materials

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

Standards

- InfiniBand SDR and DDR

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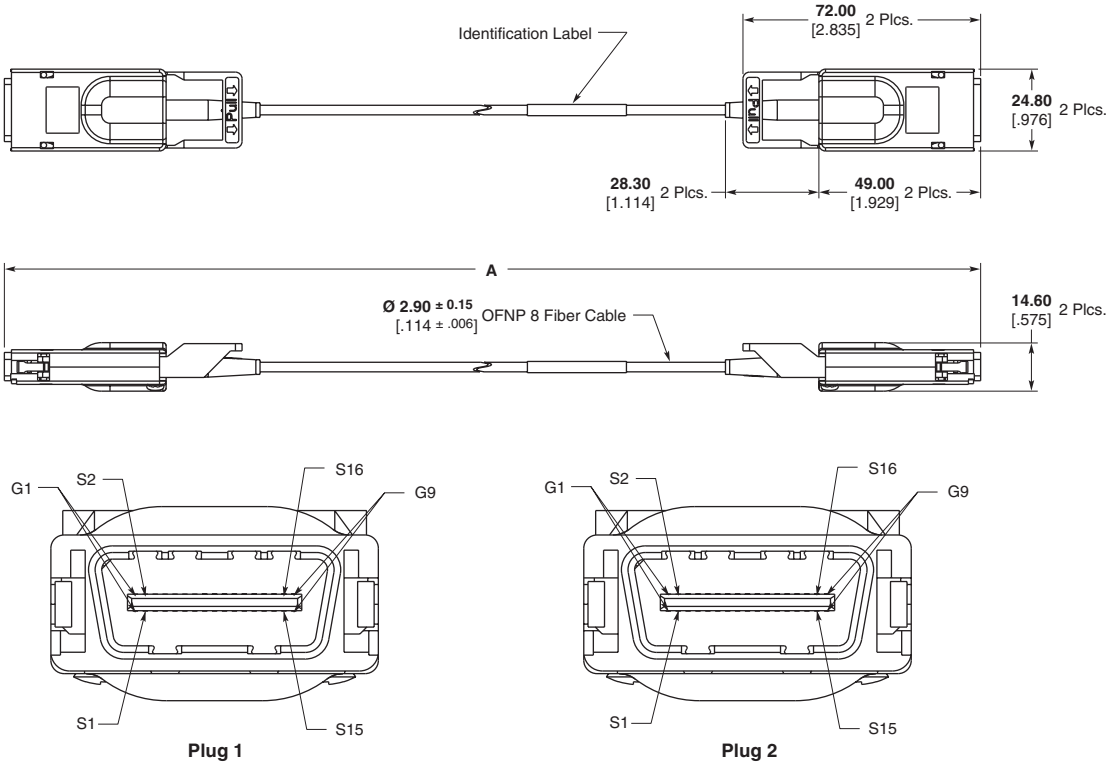
Japan: 81-44-844-8013
UK: 31-73-624-6639

Active Optical Cable Assemblies (Continued)



Part Number	Length (meters)	Style
1985427-1	3	Standard
1985427-2	5	
1985427-3	10	
1985427-4	20	
1985427-5	30	
1985427-6	40	
1985427-7	50	
1985427-8	100	
1984462-1	3	Low Smoke Zero Halogen (LSZH)
1984462-2	5	
1984462-3	10	
1984462-4	20	
1984462-5	30	
1984462-6	40	
1984462-7	50	
1984462-8	100	

Note: Longer lengths available upon request.

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LC Cable Assemblies

Product Facts

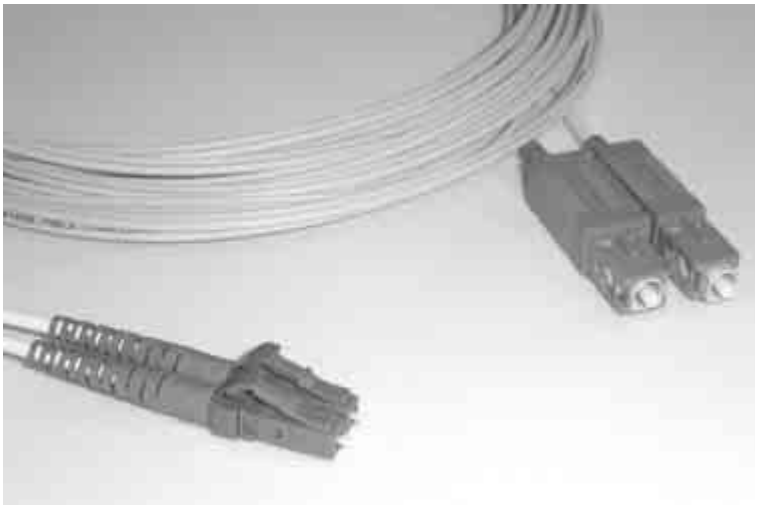
- For high performance applications/high density
- 125 µm Ceramic Ferrule Technology
- Small size — 1/2 size of standard SC and FC products
- Singlemode and multimode
- Tuned singlemode assemblies
- High performance small size cable
  - 900 µm buffered fiber assemblies
  - 2.0 mm cable assemblies
- Hybrid assemblies available with all standard connectors
- Hybrid SC's and FC's terminated to 2.0 mm cable and 900 µm buffered fiber
- Factory terminated/factory tested

LC Cable Assembly

Performance Characteristics

Insertion Loss —
Singlemode — .25 dB max.; < .1 dB typ.
Multimode — .1 dB typ.;
.1 dB typ. σ

Return Loss —
Singlemode — 55 dB; PC endface
Multimode — 20 dB



Hybrid LC-SC Cable Assembly

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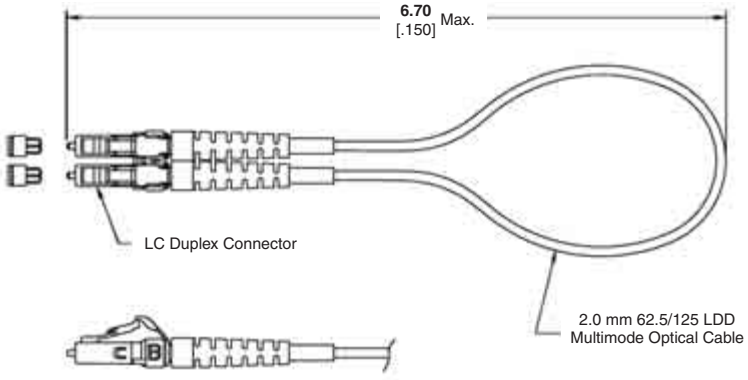
UK: 31-73-624-6639

LC Cable Assemblies (Continued)

Description		Cable Type	Part Numbers/Lengths (m)					
			1	2	3	4	5	10
Simplex								
Singlemode	LC to LC	900 micron	6374518-1	6374518-2	6374518-3	6374518-4	6374518-5	1-6374518-0
		2.0 mm Jacketed Riser	6374110-1	6374110-2	6374110-3	6374110-4	6374110-5	1-6374110-0
	LC to SC	900 micron	6374610-1	6374610-2	6374610-3	6374610-4	6374610-5	1-6374610-0
		2.0 mm Jacketed Riser	6374611-1	6374611-2	6374611-3	6374611-4	6374611-5	1-6374611-0
50/125 µm Multimode	LC to LC	2.0 mm Jacketed Riser	6374656-1	6374656-2	6374656-3	6374656-4	6374656-5	1-6374656-0
	LC to SC	2.0 mm Jacketed Riser	6374612-1	6374612-2	6374612-3	6374612-4	6374612-5	1-6374612-0
62.5/125 µm Multimode	LC to LC	900 micron	6374108-1	6374108-2	6374108-3	6374108-4	6374108-5	1-6374108-0
		2.0 mm Jacketed Riser	6374109-1	6374109-2	6374109-3	6374109-4	6374109-5	1-6374109-0
	LC to SC	2.0 mm Jacketed Riser	6374614-1	6374614-2	6374614-3	6374614-4	6374614-5	1-6374614-0
Duplex								
Singlemode	LC to LC	2.0 mm Jacketed Riser	6374657-1	6374657-2	6374657-3	6374657-4	6374657-5	6374657-6
	LC Duplex to SC Duplex	2.0 mm Jacketed Riser	6457072-1	6457072-2	6457072-3	6457072-4	6475072-5	1-6457072-0
	2 LC Simplex to 2 SC Simplex	2.0 mm Jacketed Riser	6374515-1	6374515-2	6374515-3	6374515-4	6374515-5	1-6374515-0
	LC to ST	2.0 mm Jacketed Riser	6457207-1	6457207-2	6457207-3	—	6457207-5	1-6457207-0
	LC to MT-RJ	1.8 mm Jacketed Riser	6374645-1	6374645-2	6374645-3	6374645-4	6374645-5	1-6374645-0
50/125 µm Multimode	LC to LC	2.0 mm Jacketed Riser	6374658-1	6374658-2	6374658-3	6374658-4	6374658-5	1-6374658-2
	LC to SC	2.0 mm Jacketed Riser	6374613-1	6374613-2	6374613-3	6374613-4	6374613-5	1-6374613-0
	LC to ST	2.0 mm Jacketed Riser	1906822-1	1906822-2	1906822-3	1906822-4	1906822-5	1-1906822-0
	LC to MT-RJ	1.8 mm Jacketed Riser	6374647-1	6374647-2	6374647-3	6374647-4	6374647-5	1-6374647-0
Laser Optimized (10 Gig) (850 nm 50/125 µm) Multimode	LC to LC	2.0 mm Aqua Jacketed Riser	6828317-1	6828317-2	6828317-3	6828317-4	6828317-5	1-6828317-0
	LC to SC	2.0 mm Aqua Jacketed Riser	6828318-1	6828318-2	6828318-3	—	6828318-5	1-6828318-0
		2.0 mm Orange Jacketed Riser	6754384-1	6754384-2	6754384-3	6754384-4	6754384-5	1-6754384-0
62.5/125 µm Multimode	LC to LC	2.0 mm Jacketed Riser	6374659-1	6374659-2	6374659-3	6374659-4	6374659-5	1-6374659-0
	LC to SC	2.0 mm Jacketed Riser	6374615-1	6374615-2	6374615-3	6374615-4	6374615-5	1-6374615-0
	LC to ST	2.0 mm Jacketed Riser	6457104-1	6457104-2	6457104-3	—	6457104-5	1-6457104-0
	LC to MT-RJ	1.8 mm Jacketed Riser	6374646-1	6374646-2	6374646-3	6374646-4	6374646-5	1-6374646-0

LC Loopbacks



Description		Part Number
LC Loopback	Singlemode	6457047-1
	Multimode 62.5/125 µm	6457048-1
	Multimode 50/125 µm	6457049-1

Note: All part numbers are RoHS compliant.

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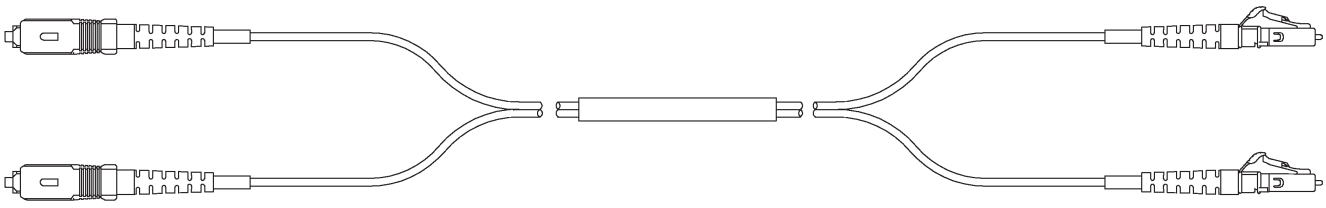
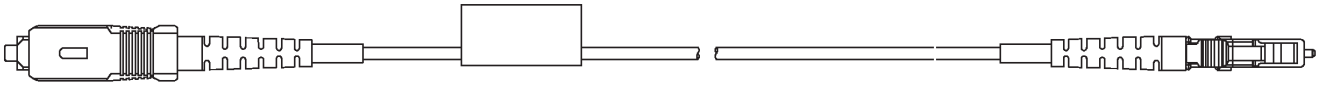
LC Cable Assemblies (Continued)

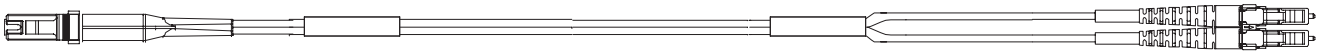
2.0 mm ZIPCORD, Singlemode
LC Simplex to SC Simplex



LC to Simplex SC
2.0 mm cable

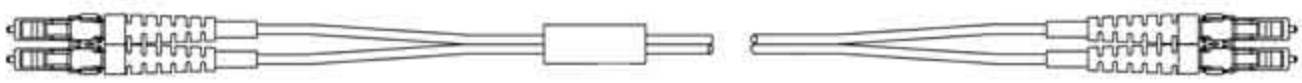


LC Duplex to MT-RJ



LC Simplex to SC
on 900 µm buffered fiber

LC Duplex to LC Duplex



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LC SECURE Cable Assemblies

Product Facts

- **LC SECURE Plugs mate with like-colored LC SECURE adapters only (see page 10)**
- **Ten exclusive connector variants**
- **Color coded assemblies match MT-RJ and MPO SECURE offerings (see pages 107 and 108)**
- **Distinct keyway geometry on plug nose and color coding assures identifiable key-type**
- **Black boots for 50/125 standard, beige for 62.5/125 multimode, blue for singlemode, and aqua for 50/125 Laser Optimized (10 Gig)**
- **Standard cable is 2 mm zipcord**
- **Standard jacket color is yellow for singlemode, orange for multimode, and aqua for Laser Optimized (10 Gig) multimode (850 nm 50/125 µm)**
- **Other configurations are available**

LC SECURE Color	Fiber Type	Part Numbers			
		MT-RJ	SC	LC	ST
Red	50/125 µm Multimode	1907114-X	1905992-X	1906012-X	1906002-X
	Laser Optimized (10 Gig) (850 nm 50/125 µm) Multimode	1907134-X	1906070-X	1906090-X	1905079-X
	62.5/125 µm Multimode	1907124-X	1828872-X	1906051-X	1906080-X
	Singlemode	1906904-X	1905089-X	1905109-X	1905099-X
Yellow	50/125 µm Multimode	1907116-X	1905994-X	1906014-X	1906004-X
	Laser Optimized (10 Gig) (850 nm 50/125 µm) Multimode	1907136-X	1906072-X	1906092-X	1906082-X
	62.5/125 µm Multimode	1907126-X	1828871-X	1906053-X	1906043-X
	Singlemode	1906906-X	1905091-X	1905111-X	1905101-X
Green	50/125 µm Multimode	1907117-X	1905995-X	1906015-X	1906005-X
	Laser Optimized (10 Gig) (850 nm 50/125 µm) Multimode	1907137-X	1906073-X	1906093-X	1906083-X
	62.5/125 µm Multimode	1907127-X	1828870-X	1906054-X	1906044-X
	Singlemode	1906907-X	1905092-X	1905112-X	1905102-X
Blue	50/125 µm Multimode	1907115-X	1905993-X	1906013-X	1906003-X
	Laser Optimized (10 Gig) (850 nm 50/125 µm) Multimode	1907135-X	1906071-X	1906091-X	1906081-X
	62.5/125 µm Multimode	1907125-X	1828875-X	1906052-X	1906042-X
	Singlemode	1906905-X	1905090-X	1905110-X	1905100-X
Orange	50/125 µm Multimode	1907118-X	1906996-X	1906016-X	1906006-X
	Laser Optimized (10 Gig) (850 nm 50/125 µm) Multimode	1907138-X	1906074-X	1906094-X	1906084-X
	62.5/125 µm Multimode	1907128-X	1906035-X	1906055-X	1906045-X
	Singlemode	1906908-X	1905093-X	1905113-X	1905103-X
Brown	50/125 µm Multimode	1907121-X	1906999-X	1906019-X	1906009-X
	Laser Optimized (10 Gig) (850 nm 50/125 µm) Multimode	1907141-X	1906077-X	1906097-X	1906087-X
	62.5/125 µm Multimode	1907131-X	1906038-X	1906058-X	1906048-X
	Singlemode	1906911-X	1905096-X	1905116-X	1905106-X
Slate	50/125 µm Multimode	1907123-X	1906001-X	1906021-X	1906011-X
	Laser Optimized (10 Gig) (850 nm 50/125 µm) Multimode	1907143-X	1906079-X	1906099-X	1906089-X
	62.5/125 µm Multimode	1907133-X	1828283-X	1906060-X	1906050-X
	Singlemode	1906913-X	1906040-X	1905118-X	1905108-X
Violet	50/125 µm Multimode	1907120-X	1905998-X	1906018-X	1906008-X
	Laser Optimized (10 Gig) (850 nm 50/125 µm) Multimode	1907140-X	1906076-X	1906096-X	1906086-X
	62.5/125 µm Multimode	1907130-X	1906037-X	1906057-X	1906047-X
	Singlemode	1906910-X	1905095-X	1905115-X	1905105-X
Rose	50/125 µm Multimode	1907119-X	1905997-X	1906017-X	1906007-X
	Laser Optimized (10 Gig) (850 nm 50/125 µm) Multimode	1907139-X	1906075-X	1906095-X	1906085-X
	62.5/125 µm Multimode	1907129-X	1906036-X	1906056-X	1906046-X
	Singlemode	1906909-X	1905094-X	1905114-X	1905104-X
Aqua	50/125 µm Multimode	1907122-X	1906000-X	1906020-X	1906010-X
	Laser Optimized (10 Gig) (850 nm 50/125 µm) Multimode	1907142-X	1906078-X	1906098-X	1906088-X
	62.5/125 µm Multimode	1907132-X	1906039-X	1906059-X	1906049-X
	Singlemode	1906912-X	1905097-X	1905117-X	1905107-X

Note: All part numbers are RoHS compliant.

Note: X denotes length in meters: -1 = 1, -2 = 2, -3 = 3, -5 = 5, 1- -0 = 10

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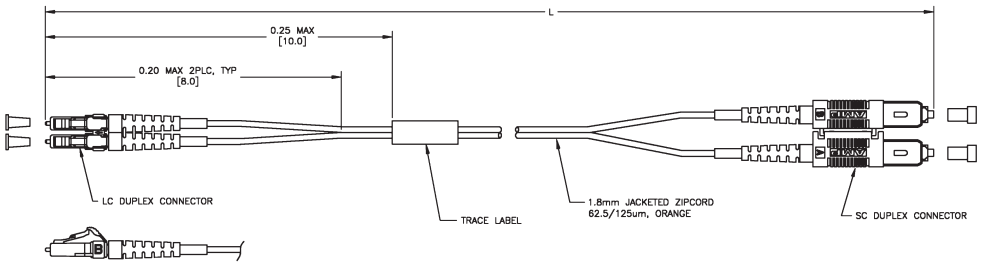
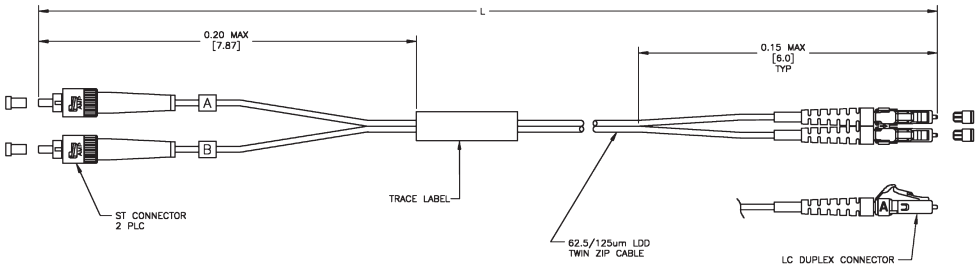
LC SECURE Cable Assemblies (Continued)

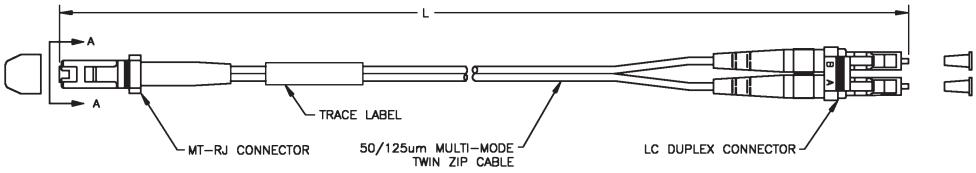
LC SECURE Duplex to SC Duplex



LC SECURE Duplex to Dual ST



LC SECURE Duplex to MT-RJ



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MT-RJ SECURE Cable Assemblies

Product Facts

- **MT-RJ SECURE plugs only mate with same-colored MT-RJ SECURE jacks**
- **MT-RJ SECURE Cable Assemblies have one MT-RJ SECURE plug on one end and a standard MT-RJ plug on the other end; other constructions are available (Contact your local Tyco Electronics sales representative for part numbers)**
- **Each assembly is a duplex (two-fiber) assembly**
- **Cable assemblies are riser-rated, other constructions are available (Contact your local Tyco Electronics sales representative for details)**
- **SC and LC connectors feature ceramic ferrules**
- **Jacket of cable assemblies comes in orange for multimode and yellow for singlemode, other color options are available**

MT-RJ SECURE Cable Assemblies and Patch Cord Part Numbers

MT-RJ SECURE Color	Fiber Type	Part Numbers			
		MT-RJ	SC	LC	ST
Red	50/125 µm Multimode	6278873-X	6278126-X	1907396-X	6278881-X
	Laser Optimized (10 Gig) (850 nm LO 50/125 µm) Multimode	6754406-X	6754410-X	1918667-X	1918701-X
	62.5/125 µm Multimode	6278890-X	6278894-X	6828104-X	6278898-X
	Singlemode	6918733-X	6918734-X	1918668-X	1918702-X
Yellow	50/125 µm Multimode	6278874-X	6278878-X	1918669-X	6278882-X
	Laser Optimized (10 Gig) (850 nm LO 50/125 µm) Multimode	6754407-X	6754411-X	1918670-X	1918703-X
	62.5/125 µm Multimode	6278891-X	6278895-X	6828923-X	6278899-X
	Singlemode	6918735-X	6918736-X	1918671-X	1918704-X
Green	50/125 µm Multimode	6278875-X	6278879-X	1907398-X	6278883-X
	Laser Optimized (10 Gig) (850 nm LO 50/125 µm) Multimode	6754408-X	6754412-X	1918672-X	1918705-X
	62.5/125 µm Multimode	6278892-X	6278896-X	1918673-X	6278900-X
	Singlemode	6918737-X	6918738-X	1918674-X	1918706-X
Blue	50/125 µm Multimode	6278876-X	6278880-X	1907394-X	6278884-X
	Laser Optimized (10 Gig) (850 nm LO 50/125 µm) Multimode	6754409-X	6754413-X	1918675-X	1918707-X
	62.5/125 µm Multimode	6278893-X	6278897-X	1907395-X	6278901-X
	Singlemode	6918739-X	6918740-X	1918676-X	1918708-X
Orange	50/125 µm Multimode	6828263-X	6828269-X	1918677-X	1918709-X
	Laser Optimized (10 Gig) (850 nm LO 50/125 µm) Multimode	6828251-X	6828257-X	1918678-X	1918710-X
	62.5/125 µm Multimode	6828275-X	6828281-X	1918679-X	1918711-X
	Singlemode	6828239-X	6828245-X	1918680-X	1918712-X
Brown	50/125 µm Multimode	6828264-X	6828270-X	1918681-X	1918713-X
	Laser Optimized (10 Gig) (850 nm LO 50/125 µm) Multimode	6828252-X	6828258-X	1918682-X	1918714-X
	62.5/125 µm Multimode	6828276-X	6828282-X	1918683-X	1918715-X
	Singlemode	6828240-X	6828246-X	1918684-X	1918716-X
Slate	50/125 µm Multimode	6828265-X	6828271-X	1918685-X	1918717-X
	Laser Optimized (10 Gig) (850 nm LO 50/125 µm) Multimode	6828253-X	6828259-X	1918686-X	1918718-X
	62.5/125 µm Multimode	6828277-X	6828283-X	1918687-X	1918719-X
	Singlemode	6828241-X	6828247-X	1918688-X	1918720-X
Violet	50/125 µm Multimode	6828266-X	6828272-X	1918689-X	1918721-X
	Laser Optimized (10 Gig) (850 nm LO 50/125 µm) Multimode	6828254-X	6828260-X	1918690-X	1918722-X
	62.5/125 µm Multimode	6828278-X	6828284-X	1918691-X	1918723-X
	Singlemode	6828242-X	6828248-X	1918692-X	1918724-X
Rose	50/125 µm Multimode	6828267-X	6828273-X	1918693-X	1918725-X
	Laser Optimized (10 Gig) (850 nm LO 50/125 µm) Multimode	6828255-X	6828261-X	1918694-X	1918726-X
	62.5/125 µm Multimode	6828279-X	6828285-X	1918695-X	1918727-X
	Singlemode	6828243-X	6828249-X	1918696-X	1918728-X
Aqua	50/125 µm Multimode	6828268-X	6828274-X	1918697-X	1918729-X
	Laser Optimized (10 Gig) (850 nm LO 50/125 µm) Multimode	6828256-X	6828262-X	1918698-X	1918730-X
	62.5/125 µm Multimode	6828280-X	6828286-X	1918699-X	1918731-X
	Singlemode	6828244-X	6828250-X	1918700-X	1918732-X

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Japan: 81-44-844-8013
UK: 31-73-624-6639

MPO SECURE Cable Assemblies

NEW

Product Facts

- For use with MT-RJ SECURE System MPO Cassettes on page 12 only
- Feature colored/keyed MPO connectors which only mate with like colored MPO couplers to limit access to secure networks
- 12-Fibers per MPO connector
- Pulling socks protect connectors during installation
- Available in 50 µm, Laser Optimized (10 Gig), and 62.5 µm Multimode as listed

MPO SECURE Trunk Cable Assemblies

MPO SECURE Color	Fiber Type	Part Numbers	
		12 Fiber	24 Fiber
Red	50/125 µm Multimode	6754273-X	6754281-X
	Laser Optimized (10 Gig) (850 nm LO 50/125 µm) Multimode	6754420-X	6754424-X
	62.5/125 µm Multimode	6754269-X	6754277-X
Yellow	50/125 µm Multimode	6754276-X	6754284-X
	Laser Optimized (10 Gig) (850 nm LO 50/125 µm) Multimode	6754421-X	6754425-X
	62.5/125 µm Multimode	6754272-X	6754280-X
Green	50/125 µm Multimode	6754274-X	6754282-X
	Laser Optimized (10 Gig) (850 nm LO 50/125 µm) Multimode	6754422-X	6754426-X
	62.5/125 µm Multimode	6754270-X	6754278-X
Blue	50/125 µm Multimode	6754275-X	6754283-X
	Laser Optimized (10 Gig) (850 nm LO 50/125 µm) Multimode	6754423-X	6754427-X
	62.5/125 µm Multimode	6754271-X	6754279-X
Rose	50/125 µm Multimode	1918741-X	1918759-X
	Laser Optimized (10 Gig) (850 nm LO 50/125 µm) Multimode	1918753-X	1918771-X
	62.5/125 µm Multimode	1918747-X	1918765-X
Aqua	50/125 µm Multimode	1918742-X	1918760-X
	Laser Optimized (10 Gig) (850 nm LO 50/125 µm) Multimode	1918754-X	1918772-X
	62.5/125 µm Multimode	1918748-X	1918766-X
Brown	50/125 µm Multimode	1918743-X	1918761-X
	Laser Optimized (10 Gig) (850 nm LO 50/125 µm) Multimode	1918755-X	1918773-X
	62.5/125 µm Multimode	1918749-X	1918767-X
Violet	50/125 µm Multimode	1918744-X	1918762-X
	Laser Optimized (10 Gig) (850 nm LO 50/125 µm) Multimode	1918756-X	1918774-X
	62.5/125 µm Multimode	1918750-X	1918768-X
Orange	50/125 µm Multimode	1918745-X	1918763-X
	Laser Optimized (10 Gig) (850 nm LO 50/125 µm) Multimode	1918758-X	1918775-X
	62.5/125 µm Multimode	1918751-X	1918769-X
Slate	50/125 µm Multimode	1918746-X	1918764-X
	Laser Optimized (10 Gig) (850 nm LO 50/125 µm) Multimode	1918759-X	1918776-X
	62.5/125 µm Multimode	1918752-X	1918770-X

Note: X denotes length in feet: -1 = 10, -2 = 20, -3 = 30, -4 = 40, -5 = 50, -6 = 60, -7 = 70, -8 = 80, -9 = 90, 1- -0 = 100, 1- -1 = 110, 1- -2 = 120, 1- -3 = 130, 1- -4 = 140, 1- -5 = 150, 1- -6 = 160, 1- -7 = 170, 1- -8 = 180, 1- -9 = 190, 2- -0 = 200, 2- -1 = 210, 2- -2 = 220, 2- -3 = 230, 2- -4 = 240, 2- -5 = 250, 2- -6 = 260, 2- -7 = 270, 2- -8 = 280, 2- -9 = 290, 3- -0 = 300.

Note: All part numbers are RoHS compliant.

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UK: 31-73-624-6639

MU High Density Cable Assemblies

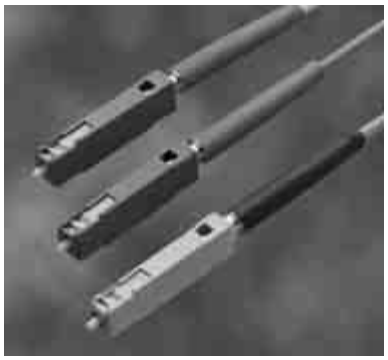
Product Facts

- Can be used with MU backplane connectors (Z-PACK 2 mm HM type L connector housings) for complete backplane or board to board solution
- 1.25 mm ferrule design
- Polarized to ensure precise insertion
- High density (up to 8 lines per module)
- "Push Pull" (SC style) latching mechanism
- Fully compliant with:
  - 1.25 mm ferrule design IEC60917 and IEC 61076-4-101
  - IEC 60874-1
  - CECC 86 305 801 (MU-APC)
  - JIS C-5970
  - I-ETS 300 671
  - IEC 61300

Performance Characteristics

Insertion Loss —
Singlemode: 0.3 dB Max
<0.1 dB Typical
Multimode: 0.1 dB Typical

Return Loss —
Singlemode: 55 dB - PC endface
Typical
>65 dB - APC endface
Multimode: 20 dB



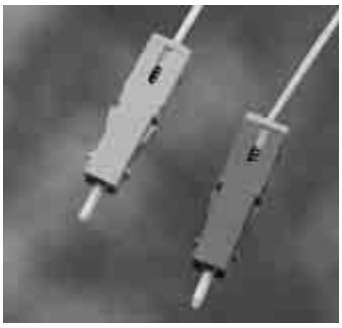
MU Cable Assemblies

Description	Part Numbers		
	1 Meter	2 Meters	3 Meters
LC to MU Board Plug Singlemode 900 µm	6457327-1	6457327-2	6457327-3
LC to MU 62.5/125 900 µm	6457328-1	—	—
MU to SC Singlemode 900 µm	6457329-1	6457329-2	6457329-3
MU to SC 62.5/125 900 µm	6457330-1	6457330-2	6457330-3
MU to MU Singlemode Buffered	6457482-1	6457482-2	6457482-3
MU to MU Singlemode 2 mm	6457523-1	6457523-2	6457523-3
MU to SC Singlemode 2.0 mm	6588145-1	6588145-2	—

Other lengths available upon request.

MU Boardplug Pigtails with Riser Cable

MU boardplug pigtails are designed for use with female Z-PACK 2 mm HM housings on the daughter-card. Available with 900 µm buffered fiber and in lengths of 1 meter as standard, custom lengths are available upon request.



Fiber Size (µm)	Endface	Cable Type	Length (meter)	Part Number
9/125	PC	900 µm pigtail	1	5106751-1

Note: All part numbers are RoHS compliant.

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SC & FC Singlemode Cable Assemblies

SC-SC Style Cable Assemblies

Product Facts

- **Compliant with:**
  - **JIS C-5973**
  - **ANSI X3T11 Fibre Channel**
  - **TIA 568**
- **Insertion Loss:**
  - **0.2 dB typical**
  - **0.5 dB maximum**

SC/APC Connectors

SC/UPC to SC/UPC Cable Assembly

Description	Min. Return Loss	Cable Diameter	Part Numbers Length (m) 1	3	5	10	15
Single-Fiber Jumpers							
Simplex SC/APC to SC/APC	65 dB	3.0 mm	5492188-1	5492188-3	5492188-5	1-5492188-0	1-5492188-5
	65 dB	2.0 mm	6828410-1	6828410-3	6828410-5	1-6828410-0	1-6828410-5
	65 dB	900 µm	5504678-1	5504678-3	5504678-4	5504678-5	—
Simplex SC/UPC to SC/UPC	55 dB	3.0 mm	5492015-1	5492015-3	5492015-4	5492015-5	5492015-6
	55 dB	2.0 mm	6828887-2	6828887-3	6828887-5	1-6828887-0	1-6828887-5
	55 dB	900 µm	5492276-1	5492276-3	5492276-5	1-5492276-0	—
Simplex SC/UPC to SC/APC	55/65 dB	3.0 mm	5492191-1	5492191-3	5492191-5	1-5492191-0	1-5492191-5
Single-Fiber Pigtails							
Simplex SC/APC	65 dB	3.0 mm	5492193-1	5492193-3	5492193-5	1-5492193-0	1-5492193-5
	65 dB	900 µm	1695588-1	1695588-3	1695588-5	1-1695588-0	1-1695588-5
Simplex SC/UPC	55 dB	3.0 mm	5492081-1	5492081-3	5492081-5	1-5492081-0	1-5492081-5
	55 dB	900 µm	5492065-1	5492065-3	5492065-5	1-5492065-0	1-5492065-5
Two-Fiber Jumpers — Zipcord							
Duplex SC/APC to Duplex SC/APC	55 dB	3.0 mm	1754490-1	1754490-3	1754490-5	1-1754490-0	1-1754490-5
Duplex SC/UPC to Duplex SC/UPC	55 dB	3.0 mm	5492019-1	5492019-3	5492019-4	5492019-5	5492019-6
(2) Simplex SC/UPC to (2) Simplex SC/UPC	55 dB	3.0 mm	1907362-1	1907362-3	1907362-5	1-1907362-0	1-1907362-5

All cable OFNR (Riser).

Note: All part numbers are RoHS compliant.

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SC & FC Singlemode Cable Assemblies (Continued)

FC-FC Style Cable Assemblies

Product Facts

- **Compliant with:**
  - **JIS C-5970**
  - **IEC 1754-13-1**
  - **TIA 504.4 (FOCIS-4)**
- **Insertion Loss:**
  - **0.2 dB typical**
  - **0.5 dB maximum**

FC/APC Connectors

FC/UPC to FC/UPC Cable Assembly

Description	Min. Return Loss	Cable Diameter	Part Numbers Length (m) 1	3	5	10	15
Single-Fiber Jumpers							
Simplex FC/APC to FC/APC	65 dB	3.0 mm	5492187-1	5492187-3	5492187-5	1-5492187-0	1-5492187-5
	65 dB	1.6 mm	6754068-1	6754068-3	6754068-5	—	—
	65 dB	900 µm	5503868-1	5503868-3	5503868-5	1-5503868-0	1-5503868-5
Simplex FC/UPC to FC/UPC	55 dB	3.0 mm	5492014-1	5492014-3	5492014-4	5492014-5	5492014-6
	55 dB	900 µm	5492230-1	5492230-3	5492230-5	1-5492230-0	1-5492230-5
Simplex FC/UPC to FC/APC	55/65 dB	3.0 mm	5492190-1	5492190-3	5492190-5	1-5492190-0	1-5492190-5
Single-Fiber Pigtails							
Simplex FC/APC	65 dB	3.0 mm	5492192-1	5492192-3	5492192-5	1-5492192-0	1-5492192-5
Simplex FC/UPC	55 dB	3.0 mm	5492194-1	5492194-3	5492194-5	1-5492194-0	1-5492194-5
	55 dB	2.0 mm	6278244-1	6278244-3	6278244-5	1-6278244-0	1-6278244-5
Two-Fiber Jumpers — Zipcord							
(2) Simplex FC/UPC to (2) Simplex FC/UPC	55 dB	3.0 mm	5492022-1	5492022-3	5492022-4	5492022-5	5492022-6

All cable OFNR (Riser).

Note: All part numbers are RoHS compliant.

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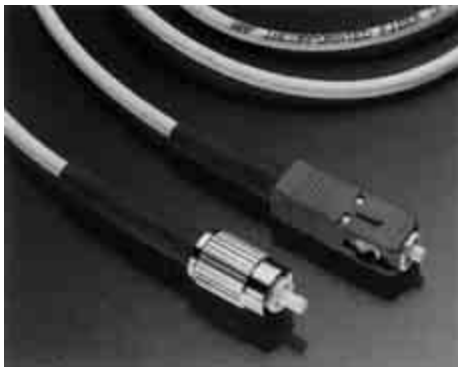
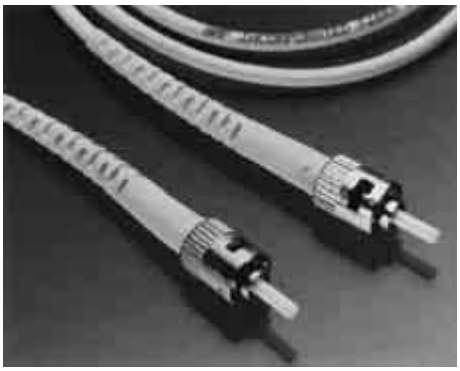
SC & FC Singlemode Cable Assemblies (Continued)

Hybrid FC/SC and Other Cable Assemblies



FC/UPC to SC/UPC Cable Assembly



ST/UPC Cable Assembly

Description	Min. Return Loss	Part Numbers Length (m)				
		1	3	5	10	15
Stocked Assemblies (FC/SC Hybrid)						
Simplex FC/APC to SC/APC	65 dB	5492189-1	5492189-3	5492189-5	1-5492189-0	1-5492189-5
Simplex FC/APC to SC/UPC	65/55 dB	6457165-1	6457165-3	6457165-5	1-6457165-0	1-6457165-5
Simplex FC/UPC to SC/UPC	55 dB	5492017-1	5492017-3	5492017-4	5492017-5	5492017-6
Other Simplex Assemblies						
Simplex SC/ST	55 dB	5492016-1	5492016-3	5492016-4	5492016-5	5492016-6
Simplex FC/ST	55 dB	5492018-1	5492018-3	5492018-4	5492018-5	5492018-6
Simplex ST/ST	55 dB	5502796-1	5502796-3	5502796-5	1-5502796-0	1-5502796-1
Other Duplex Assemblies						
SC Duplex/FC	55 dB	5492021-1	5492021-3	5492021-4	5492021-5	5492021-6
SC Duplex/ST Style	55 dB	5492020-1	5492020-3	5492020-4	5492020-5	5492020-6
ST/ST Style	55 dB	5503162-1	5503162-3	5503162-5	1-5503162-0	1-5503162-1

Insertion Loss: 0.5 dB Max., 0.2 dB Typical, when measured against a Reference Lead.
All cable 3 mm OFNR (Riser).

Note: All part numbers are RoHS compliant.

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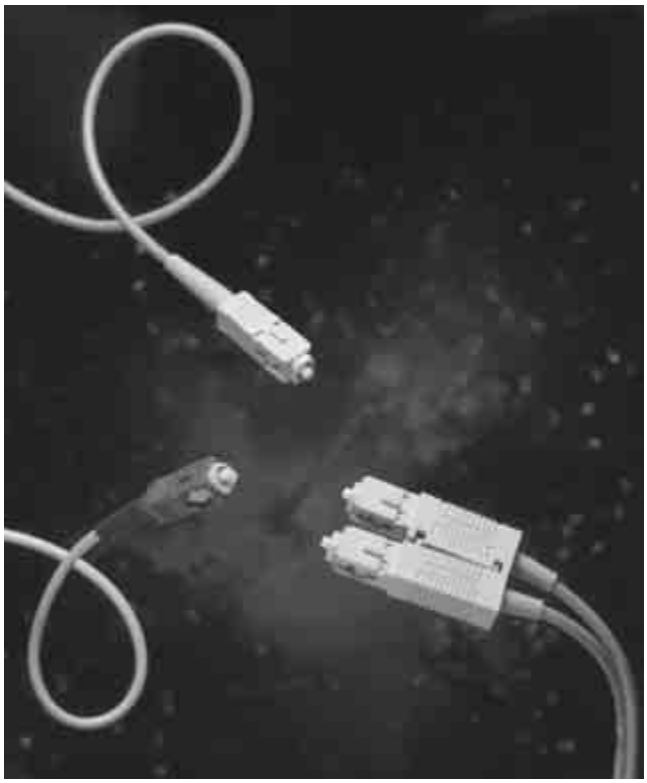
ST & SC Multimode Cable Assemblies

ST-Style

Description	Ferrule Type	Part Numbers Length (m)				
		1	2	3	5	10
ST-ST, Simplex, 62.5/125, Riser	Ceramic	6278789-1	6278789-2	6278789-3	6278789-4	6278789-7
ST-ST, Zipcord, 62.5/125, Riser	Ceramic	5503995-1	5503995-2	5503995-3	5503995-4	5503995-5
ST-ST, Zipcord, 62.5/125, Riser	Polymer	5503994-1	5503994-2	5503994-3	5503994-4	5503994-5
ST/ST, Zipcord, 50/125, Riser	Ceramic	6278207-1	6278207-2	6278207-3	6278207-5	1-6278207-0
ST/ST, Dual, 62.5/125, Plenum	Ceramic	5503959-1	5503959-2	5503959-3	5503959-5	1-5503959-0



SC-Style

Description	Ferrule Type	Part Numbers Length (m)				
		1	2	3	5	10
SC-SC, Simplex, 62.5/125, Riser	Ceramic	5504970-1	5504970-2	5504970-3	5504970-4	5504970-5
SC-SC, Simplex, 50/125, Riser	Ceramic	5504968-1	5504968-2	5504968-3	5504968-5	1-5504968-0
SC-SC, Simplex, Laser Optimized (10 Gig), Riser	Ceramic	1907499-1	1907499-2	1907499-3	1907499-5	1-1907499-0
SC-SC, Zipcord, 62.5/125, Riser	Ceramic	5492050-1	5492050-2	5492050-3	5492050-4	5492050-5
SC Dup-SC Dup, Zipcord, 62.5/125, Riser	Ceramic	5504971-1	5504971-2	5504971-3	5504971-4	5504971-5
SC Dup-SC Dup, Zipcord, 62.5/125, Riser	Polymer	5492249-1	5492249-2	5492249-3	5492249-5	1-5492249-0
SC-ST, Simplex, 62.5/125, Riser	Ceramic	5504972-1	5504972-2	5504972-3	5504972-4	5504972-5
SC Dup-ST, Zipcord, 62.5/125, Riser	Ceramic	5504958-1	5504958-2	5504958-3	5504958-4	5504958-5
SC Dup-ST, Zipcord, 62.5/125, Riser	Polymer	5492250-1	5492250-2	5492250-3	5492250-5	1-5492250-0

Note: All part numbers are RoHS compliant.

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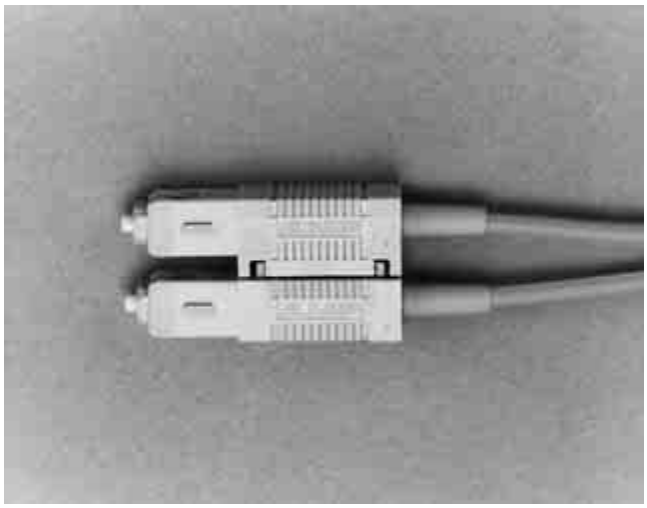
Fibre Channel Fiber Optic Assemblies

Product Facts

- Specified connector float assures intermateability with all Fibre Channel compliant devices
- Connector's minimal metal contact helps contain RFI/EMI
- Assemblies available with riser & plenum grade cable
- Custom cable assembly lengths available
- 50/125 µm multimode fiber
- 62.5/125 µm multimode fiber



Multimode	Ferrule Material	Fiber Size	Riser or Plenum	Part Numbers				
				Length (m)				
				1	2	3	5	10
SC Dup/SC Dup Zipcord	Ceramic	50/125	Plenum	6278016-1	6278016-2	6278016-3	6278016-5	1-6278016-0
SC Dup/SC Dup, Zipcord	Ceramic	62.5/125	Riser	6374040-1	6374040-2	6374040-3	6374040-5	1-6374040-0
SC Dup/SC Dup, Zipcord	Ceramic	62.5/125	Plenum	6374039-1	6374039-2	6374039-3	6374039-5	1-6374039-0
SC Dup-SC Dup, Zipcord	Ceramic	50/125	Riser	5504969-1	5504969-2	5504969-3	5504969-4	5504969-5
SC Dup-ST, Zipcord	Ceramic	62.5/125	Riser	6374038-1	6374038-2	6374038-3	6374038-5	1-6374038-0
SC Dup-ST, Zipcord	Ceramic	50/125	Riser	5492591-1	5492591-2	5492591-3	5492591-5	1-5492591-0

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Low Loss SC & FC Singlemode Cable Assemblies

Product Facts

- Full physical contact for all connected fibers
- Low back reflection
- One touch connection / disconnection (push-pull type connector)
- Compliant to IEC 61754-4
- Exceeds GR 326 requirements
- Available for all cable types: LSZH, Riser, & Plenum
- Suitable for all wavelengths: 1310, 1550 & 1625 nm

Applications

- Storage area equipment
- Original Equipment
- Premise installations — Local Area Networks
- Telecommunication Networks
- Multimedia Networks
- SECURE Networks

Tyco Electronics' Low Loss Connectors have an excellent performance of random attenuation <0.1 dB for both PC and APC connectors (GR326 has an objective of <0.2 dB random IL). This allows the system designer to have more interconnections without the need for additional investments in active devices. Line balancing is easier and line stability is easier to achieve.

These Ultra Low Loss Connectors are applicable in Long Haul, Metro and Fiber-to-the-Home applications, as well as DWDM, CDWM, and Analog Video Transmission.

In Long Haul Networks, more interconnections are possible without necessity for amplification. In Metro Ring applications, the connector allows Telecom vendors to remove the necessity for gain blocks or in-line amplifiers.

Use of the connector in Fiber-to-the-Home environments helps reduce cost, since patching instead of splicing will become more profitable and easier for installers to add subscribers.

Tyco Electronics' Low Loss product range is unique, as it is produced with proprietary processes. It eliminates concerns of attenuation measured against reference or random attenuation.

The connectors produced are of reference quality, since they are made with a standard Zirconia ferrule, which allows them to be used in Outside Plant and Operator Buildings specified in IEC Categories C (controlled), U (uncontrolled), and E (extreme).

Performance Characteristics

Typical IL in random connection (dB)* — < 0.08

Max IL in random connection (dB) 97% — 0.10

Max IL in random connection (dB) 100% — 0.15

* **Note:** The above values can only be achieved when low loss connectors are being used at both ends, in combination with a low loss adapter.

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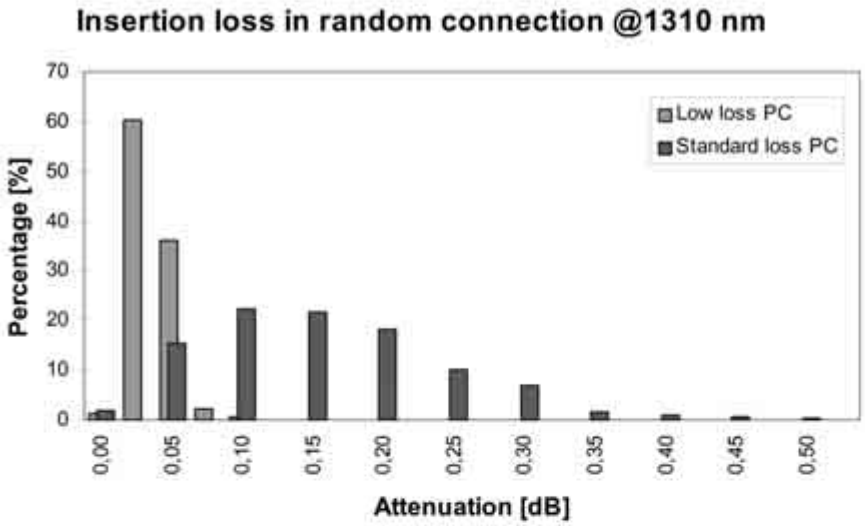
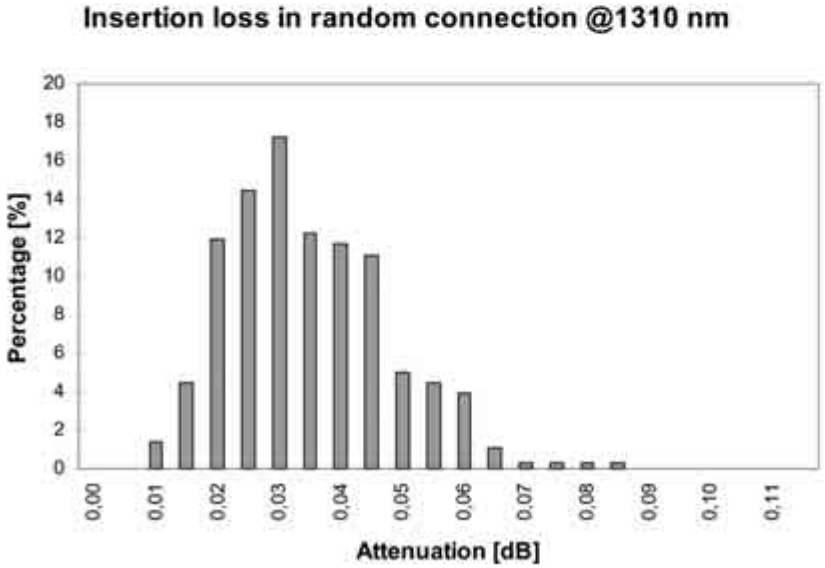
Low Loss SC & FC Singlemode Cable Assemblies (Continued)

Performance comparison of standard versus low loss connectors



Graph 1: Insertion loss spreading of standard and low loss connectors (macro scale).



Graph 2: Insertion loss in random connection @ 1310 nm of low loss connectors (micro scale).

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Dimensions are in millimeters and inches unless otherwise specified. Values in brackets are standard equivalents.

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USA: 1-800-522-6752
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C. America: 52-55-1106-0803

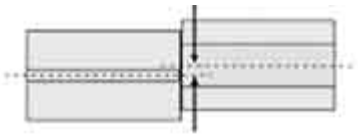
South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 31-73-624-6639

Mode Conditioning Cable Assemblies

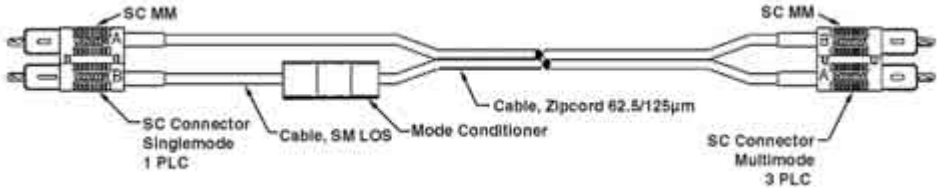
Mode Conditioning Patch Cords

Product Facts

- Allows use of singlemode gigabit ethernet equipment with multimode installed fiber
- Designed for Longwave (-LX) multimode applications for Gigabit Ethernet Compliant with IEEE-802.3z
- Masks Differential Mode Delay (DMD) signal degradation
- Functions the same as a standard patchcord



Singlemode Centerline Offset
From Multimode Centerline



Description	Part Number		
	2 Meters	3 Meters	5 Meters
LC - SC Mode Conditioning Patch Cords			
LC Duplex/SC Duplex, SM 62.5/125 µm	6536811-2	6536811-3	6536811-5
LC Duplex/ST Dual, SM 62.5/125 µm	1920476-2	1920476-3	1920476-5

Mode Conditioning Launch Leads with LSZH Cable

Note: See pages 118 & 119 for other LSZH Cable Assemblies

Description	Part Numbers	
	Length (m)	
	3	5.5
ST - ST Mode Conditioning Launch Lead with LSZH Cable		
ST/PC-ST/PC 50/125 µm	6348750-3	
ST/PC - ST/PC 62.5/125 µm	6348749-3	
ST Mode Conditioning Launch Lead Basic with LSZH Cable		
ST/PC Basic 50/125 µm		9-6536401-5
ST/PC Basic 62.5/125 µm		9-6536440-5

Description	Part Numbers							
	Length (m)							
	2	3	4	5	7	8	9	10
SC - SC Mode Conditioning Launch Lead with LSZH Cable								
SC - SC Duplex 50/125 µm	6206820-2	6206820-3	—	6208620-5	—	6206820-8	—	1-6206820-0
SC - SC Duplex 62.5/125 µm	6206821-2	6206821-3	6206821-4	6206821-5	6206821-7	6206821-8	6206821-9	1-6206821-0

Description	Part Numbers					
	Length (m)					
	2	3	5	7	8	10
SC - ST Mode Conditioning Launch Lead with LSZH Cable						
SC Duplex - ST 50/125 µm	6348269-2	6348269-3	6348269-5	6348269-7		
SC Duplex - ST 62.5/125 µm	6348271-2	6348271-3	6348271-5		6348271-8	1-6348271-0
SC - MT-RJ Mode Conditioning Launch Lead with LSZH Cable						
SC/PC - MT-RJ 50/125 µm		6536769-3				
SC/PC - MT-RJ 62.5/125 µm		6536770-3				
MT-RJ - ST Mode Conditioning Launch Lead with LSZH Cable						
MT-RJ - ST Duplex 50/125 µm		6536445-3	6536445-5			
MT-RJ - ST Duplex 62.5/125 µm		6536444-3	6536444-5			
MT-RJ - SC Mode Conditioning Launch Lead with LSZH Cable						
MT-RJ - SC Duplex 50/125 µm		6536447-3	6536447-5			
MT-RJ - SC Duplex 62.5/125 µm		6536446-3	6536446-5			

Note: All part numbers are RoHS compliant.

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Low Smoke, Zero Halogen (LSZH) Cable Assemblies

LC Cable Assemblies with LSZH Cable

Product Facts

- For high performance applications/high density
- 125 µm Ceramic Ferrule Technology
- Small size — half the size of standard SC & FC product
- Singlemode & multimode
- Tuned singlemode assemblies
- Hybrid assemblies available with all standard connectors
- Fully compliant with all relevant IEC, CENELEC and ETSI specifications

Performance Characteristics

Insertion Loss —
Singlemode: < 0.3 dB Against Reference
Multimode: < 0.1 dB Typical

Return Loss —
Singlemode: 55 dB - PC endface
Multimode: 20 dB

Note: See page 117 for Mode Conditioning LSZH Cable Assemblies

Description	Part Numbers				
	Length (m)				
	1	2	3	5	10
LC - LC Lead Assembly with LSZH Cable					
LC/PC - LC/PC Simplex Singlemode 0.9 mm tuned	6536330-1	6536330-2	6536330-3	6536330-5	1-6536330-0
LC/PC - LC/PC Simplex Singlemode 1.8 mm tuned	6536489-1	6536489-2	6536489-3	6536489-5	1-6536489-0
LC/PC - LC/PC Simplex Multimode 2.0 mm 50/125 µm	6536490-1	6536490-2	6536490-3	6536490-5	1-6536490-0
LC/PC - LC/PC Simplex Multimode 2.0 mm 62.5/125 µm	6536500-1	6536500-2	6536500-3	6536500-5	1-6536500-0
LC/PC - LC/PC Duplex Singlemode 1.8 mm tuned	6536501-1	6536501-2	6536501-3	6536501-5	1-6536501-0
LC/PC - LC/PC Duplex Multimode 1.8 mm 50/125 µm	6536502-1	6536502-2	6536502-3	6536502-5	1-6536502-0
LC/PC - LC/PC Duplex Multimode 1.8 mm 62.5/125 µm	6536503-1	6536503-2	6536503-3	6536503-5	1-6536503-0

Note: Custom lengths are available. Please contact your local Tyco Electronics Sales Representative.

SC Cable Assemblies with LSZH Cable

Product Facts

- 125 µm Ceramic Ferrule Technology
- Small size — half the size of standard SC & FC product
- Singlemode & multimode
- Tuned singlemode assemblies
- Hybrid assemblies available with all standard connectors
- Fully compliant with all relevant IEC, CENELEC and ETSI specifications

Performance Characteristics

Insertion Loss —
Singlemode: < 0.3 dB Against Reference
Multimode: < 0.1 dB Typical

Return Loss —
Singlemode: 55 dB - PC endface
Multimode: 20 dB

Note: See page 117 for Mode Conditioning LSZH Cable Assemblies

Description	Part Numbers				
	Length (m)				
	1	2	3	5	10
SC - SC Lead Assembly with LSZH Cable					
SC Duplex/SC Duplex (Ceramic Ferrule) 62.5/125 µm	5349578-1	5349578-2	5349578-3	5349578-5	1-5349578-0
SC/SC Simplex (Ceramic Ferrule) 62.5/125 µm	5349577-1	5349577-2	5349577-3	5349577-5	
SC Duplex/SC Duplex (Ceramic Ferrule) 50/125 µm	5349565-1	5349565-2	5349565-3	5349565-5	1-5349565-0
SC/SC Simplex (Ceramic Ferrule) 50/125 µm	5349564-1	5349564-2	5349564-3	5349564-5	1-5349564-0
SC Duplex/SC Duplex (Ceramic Ferrule) 50/125 µm OM3	6536464-1	6536464-2	6536464-3	6536464-5	1-6536464-0
SC Pigtail with LSZH Cable					
SC/PC Pigtail OM3 0.9 mm 50/125 µm DES		6536555-2			
SC/PC Pigtail OM3 0.9 mm 50/125 µm PP		6536561-2			

Note: Custom lengths are available. Please contact your local Tyco Electronics Sales Representative.

Note: All part numbers are RoHS compliant.

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Low Smoke, Zero Halogen (LSZH) Cable Assemblies (Continued)

ST Cable Assemblies with LSZH Cable

Description	Part Numbers Length (m)				
	1	2	3	5	10
ST - ST Lead Assembly with LSZH Cable					
ST-ST Simplex (Ceramic Ferrule) 62.5/125 µm	5349573-1	5349573-2	5349573-3	5349573-5	1-5349573-0
ST-ST Duplex (Ceramic Ferrule) 62.5/125 µm	5349574-1	5349574-2	5349574-3	5349573-5	1-5349574-0
ST-ST Simplex (Ceramic Ferrule) 50/125 µm	5349560-1	5349560-2	5349560-3	5349560-5	1-5349560-0
ST-ST Duplex (Ceramic Ferrule) 50/125 µm	5349561-1	5349561-2	5349561-3	5349561-5	1-5349561-0

Note: Custom lengths are available. Please contact your local Tyco Electronics Sales Representative.

Note: See page 117 for Mode Conditioning LSZH Cable Assemblies

MT-RJ Cable Assemblies with LSZH Cable

Description	Part Numbers Length (m)				
	1	2	3	5	10
MT-RJ to MT-RJ Lead Assembly with LSZH Cable					
MT-RJ to MT-RJ Singlemode	6206621-1	6206621-2	6206621-3	6206621-5	1-6206621-0
MT-RJ to MT-RJ Multimode 50/125 µm	6206617-1	6206617-2	6206617-3	6206617-5	1-6206617-0
MT-RJ to MT-RJ Multimode 62.5/125 µm	6206613-1	6206613-2	6206613-3	6206613-5	1-6206613-0
MT-RJ to MT-RJ Multimode 50/125 µm OM3	6536462-1	6536462-2	6536462-3	6536462-5	1-6536462-0
MT-RJ Pigtail with LSZH Cable					
MT-RJ Jack male Pigtail bare OM3			6536556-1		
MT-RJ Jack male Pigtail 50/125 µm			6348942-1		
MT-RJ Jack male Pigtail 62.5/125 µm			6348941-1		
MT-RJ Jack male Pigtail 9/125 µm Singlemode			6391366-1		

Note: Custom lengths are available. Please contact your local Tyco Electronics Sales Representative.

Hybrid Cable Assemblies with LSZH Cable

Description	Part Numbers Length (m)					
	1	2	3	5	10	15
LC - SC Lead Assembly with LSZH Cable						
LC/PC - SC/PC Simplex 0.9 mm tuned	6536504-1	6536504-2	6536504-3	6536504-5	1-6536504-0	
LC/PC - SC/PC Simplex 1.8 mm tuned	6536505-1	6536505-2	6536505-3	6536505-5	1-6536505-0	
LC/PC - SC/PC Simplex Multimode 2.0 mm 50/125 µm	6536506-1	6536506-2	6536506-3	6536506-5	1-6536506-0	
LC/PC - SC/PC Simplex Multimode 2.0 mm 62.5/125 µm	6536507-1	6536507-2	6536507-3	6536507-5	1-6536507-0	
LC/PC - SC/PC Duplex Singlemode 1.8 mm tuned	6536508-1	6536508-2	6536508-3	6536508-5	1-6536508-0	
LC/PC - SC/PC Duplex Multimode 1.8 mm 50/125 µm	6536509-1	6536509-2	6536509-3	6536509-5	1-6536509-0	
LC/PC - SC/PC Duplex Multimode 1.8 mm 62.5/125 µm	6536510-1	6536510-2	6536510-3	6536510-5	1-6536510-0	
LC - MT-RJ Lead Assembly with LSZH Cable						
LC/PC - MT-RJ Duplex Singlemode 1.8 mm tuned	6536511-1	6536511-2	6536511-3	6536511-5	1-6536511-0	
LC/PC - MT-RJ Duplex Multimode 1.8 mm 50/125 µm	6536512-1	6536512-2	6536512-3	6536512-5	1-6536512-0	
LC/PC - MT-RJ Duplex Multimode 1.8 mm 62.5/125 µm	6536513-1	6536513-2	6536513-3	6536513-5	1-6536513-0	
MT-RJ to SC Lead Assembly with LSZH Cable						
MT-RJ - SC Duplex Singlemode	6391153-1	6391153-2	6391153-3	6391153-5		
MT-RJ - SC Duplex Ceramic Ferrule Multimode 50/125 µm	6206619-1	6206619-2	6206619-3	6206619-5	1-6206619-0	
MT-RJ - SC Duplx Ceramic Ferrule Multimode 62.5/125 µm	6206615-1	6206615-2	6206615-3	6206615-5	1-6206615-0	
MT-RJ - SC Simplex Ceramic Ferrule Multimode 50/125 µm	6206618-1	6206618-2	6206618-3	6206618-5	1-6206618-0	
MT-RJ - SC Simplx Ceramic Ferrule Multimode 62.5/125 µm	6206614-1		6206614-3	6206614-5	1-6206614-0	
MT-RJ - SC Multimode 50/125 µm OM3	6536463-1	6536463-2	6536463-3	6536463-5	1-6536463-0	
MT-RJ to ST Lead Assembly with LSZH Cable						
MT-RJ - ST Singlemode 9/125 µm		6348093-2				1-6348093-5
MT-RJ - ST Ceramic Ferrule Multimode 50/125 µm	6206620-1	6206620-2	6206620-3	6206620-5	1-6206620-0	
MT-RJ - ST Ceramic Ferrule Multimode 62.5/125 µm	6206616-1	6206616-2	6206616-3	6206616-5	1-6206616-0	

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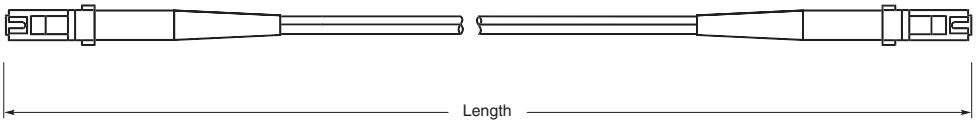
Optical Fiber Cable Assembly Information

Optical Fiber Cable Assembly Performance Details

Test Description		FOTP*	Requirement
Visual and Mechanical Inspection:	MT-RJ –	13	TIA/EIA-604-12
	SC –	13	TIA/EIA-604-3
	ST –	13	TIA/EIA-604-2
	LC –	13	TIA/EIA-604-10
Attenuation		34	≤ 0.75 dB
Return Loss		107	≤ -20 dB
Low Temperature (0° C for 4 days)		188	≤ 0.3 dB change
Temperature Life (55° C for 14 days)		7	≤ 0.3 dB change
Humidity (90 to 95% @ 40° C for 4 days)		5	≤ 0.3 dB change
Impact (8 drops from 1.8 m)		2	≤ 0.75 dB IL, < -20 dB RL
Durability (500 cycles)		21	≤ 0.75 dB IL, < -20 dB RL
Cable Retention (0° and 90°)		6	≤ 0.75 dB IL, < -20 dB RL
Flex (100 cycles)		1	≤ 0.75 dB IL, < -20 dB RL
Twist (10 cycles)		36	≤ 0.75 dB IL, < -20 dB RL

*FOTP = Fiber Optic Test Procedure

Optical Fiber Cable Assembly Length Reference



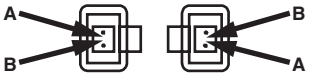
Meter to Foot and Inch Reference

Length in Meters	Length in Feet	Length in Inches
1	3.28	39.37
2	6.56	78.74
3	9.84	118.11
4	13.12	157.48
5	16.40	196.85
6	19.68	236.21
7	22.96	275.59
8	26.25	314.96
9	29.52	354.33
10	32.80	393.70
20	65.62	787.40
30	98.42	1181.10
40	131.23	1574.80
50	164.04	1968.50
60	196.85	2362.20
70	229.66	2755.90
80	262.47	3149.60
90	295.27	3543.30
100	328.08	3937.00
110	360.89	4330.69
120	393.70	4724.39
130	426.51	5118.09
140	459.32	5511.79
150	492.12	5905.49
160	524.93	6299.19
170	557.74	6692.89
180	590.55	7086.59
190	623.36	7480.29
200	656.17	7873.99

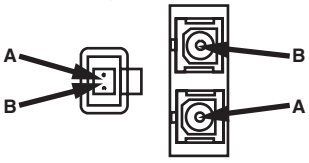
Fiber Polarity

Fiber Color	Left Connector	Right Connector
White	A	B
Blue	B	A

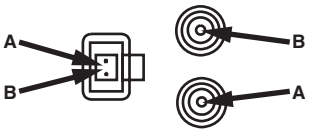
MT-RJ



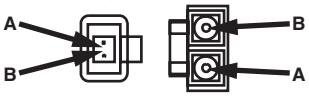
MT-RJ to Duplex SC



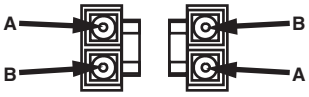
MT-RJ to Dual ST



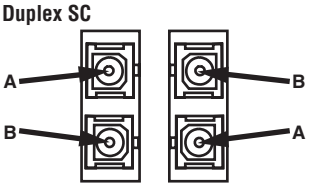
MT-RJ to Duplex LC



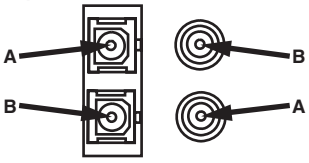
Duplex LC



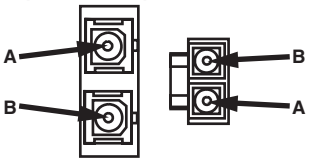
Duplex SC



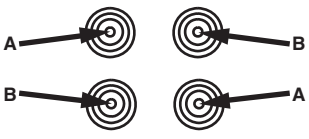
Duplex SC to Dual ST



Duplex SC to Duplex LC



Dual ST



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MT-RJ Cable Assemblies

Product Facts

- Each MT-RJ connector houses two fibers
- Cable assemblies are riser-rated

Connector End 1	Connector End 2	Fiber Type	UL/NEC Rating	Part Number
MT-RJ	MT-RJ	50/125 µm Multimode	OFNR	6278128-X
		Laser Optimized (10 Gig) (850 nm 50/125 µm) Multimode	OFNR	6588572-X
		62.5/125 µm Multimode	OFNR	6278032-X
		Singlemode	OFNR	6278033-X

X denotes length in meters: -1 = 1, -2 = 2, -3 = 3, -5 = 5, 1- -0 = 10

MT-RJ to SC Cable Assemblies

Product Facts

- Connects between equipment with different interfaces
- SC connectors feature ceramic ferrules
- Each MT-RJ Connector houses two fibers
- Cable assemblies are riser-rated

Connector End 1	Connector End 2	Fiber Type	UL/NEC Rating	Part Number
MT-RJ	Duplex SC	50/125 µm Multimode	OFNR	6278126-X
		Laser Optimized (10 Gig) (850 nm 50/125 µm) Multimode	OFNR	6693414-X
		62.5/125 µm Multimode	OFNR	6278028-X
		Singlemode	OFNR	6278031-X
	Simplex SC	50/125 µm Multimode	OFNR	6278127-X
		Laser Optimized (10 Gig) (850 nm 50/125 µm) Multimode	OFNR	6588573-X
		62.5/125 µm Multimode	OFNR	6278030-X

X denotes length in meters: -1 = 1, -2 = 2, -3 = 3, -5 = 5, 1- -0 = 10

Note: All part numbers are RoHS compliant.

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MT-RJ to ST Cable Assemblies

Product Facts

- Connects between equipment with different interfaces
- ST Connectors feature ceramic ferrules
- Each MT-RJ Connector houses two fibers
- Cable assemblies are riser-rated

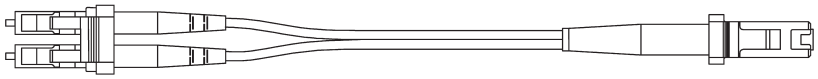
Connector End 1	Connector End 2	Fiber Type	UL/NEC Rating	Part Number
MT-RJ	Dual ST	50/125 µm Multimode	OFNR	6278199-X
		62.5/125 µm Multimode	OFNR	6278027-X
		Singlemode	OFNR	6278298-X

X denotes length in meters: -1 = 1, -2 = 2, -3 = 3, -5 = 5, 1- -0 = 10

MT-RJ to LC Cable Assemblies

Product Facts

- Connects between equipment with different interfaces
- One Duplex LC Connector and one MT-RJ Plug
- LC Connectors feature ceramic ferrules
- Cable Assemblies are riser-rated
- Each MT-RJ Connector houses two fibers



Connector End 1	Connector End 2	Fiber Type	UL/NEC Rating	Part Number
MT-RJ	LC Duplex	50/125 µm Multimode	OFNR	6374647-X
		Laser Optimized (10 Gig) (850 nm LO 50/125 µm) Multimode	OFNR	6588719-X
		62.5/125 µm Multimode	OFNR	6374646-X
		Singlemode	OFNR	6374645-X

X denotes length in meters: -1 = 1, -2 = 2, -3 = 3, -5 = 5, 1- -0 = 10

Note: All part numbers are RoHS compliant.

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MT-RJ Pigtail Jack (Single-Ended) Cable Assemblies

Product Facts

- Compatible with MT-RJ Jack Snap-in Adapter Plates
- Two 250 µm coated fiber in protective 900 µm tubing
- MT-RJ Jack Assemblies are compatible with fusion or mechanical splices
- Each MT-RJ Connector houses two fibers

Description	Fiber Type	Color	Part Number
MT-RJ Jack	50/125 µm Multimode	Black	6374018-X
	62.5/125 µm Multimode	Beige	6374019-X
	Singlemode	Blue	6374020-X
	Laser Optimized (10 Gig)	Aqua	1938008-X
MT-RJ SECURE Jack	Singlemode	Red	6588568-X
		Yellow	6588569-X
		Green	6588571-X
		Blue	6588570-X
		Orange	6828233-X
		Brown	6828234-X
		Slate	6828235-X
		Violet	6828236-X
		Rose	6828237-X
		Aqua	6828238-X

X denotes length in meters: -1 = 1, -2 = 2, -3 = 3

MT-RJ Pigtail Plug (Single-Ended) Cable Assemblies

Product Facts

- Compatible with MT-RJ Plug Snap-in Adapter Plates
- Two 250 µm coated fiber in protective 900 µm tubing
- MT-RJ Plug Assemblies are compatible with fusion or mechanical splices
- MT-RJ Plugs are pinned
- Each MT-RJ Connector houses two fibers

Description	Fiber Type	Part Number
MT-RJ Plug	50/125 µm Multimode	6588849-X
	62.5/125 µm Multimode	6693532-X
	Singlemode	6693533-X

X denotes length in meters: -1 = 1, -2 = 2, -3 = 3

Note: All part numbers are RoHS compliant.

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MT-RJ Cable Assembly Test Kits

MT-RJ Test Kit Components

Kit A

- 2 - MT-RJ (no pins) to SC/ST cable assemblies
- 1 - MT-RJ (pins) to SC/ST cable assembly
- 1 - MT-RJ to MT-RJ cable assembly
- 2 - Mandrels
- 1 - MT-RJ Adapter

Kit B

- 2 - MT-RJ to MT-RJ cable assemblies
- 2 - Mandrels

Kit C

- 2 - MT-RJ (no pins) to SC/ST cable assembly
- 1 - MT-RJ (pins) to SC/ST cable assembly
- 1 - MT-RJ to MT-RJ cable assembly
- 1 - MT-RJ Adapter

Kit D

- 2 - MT-RJ to MT-RJ cable assemblies

MT-RJ Test Kits

Description		Part Number	Components (see list)
MT-RJ to ST-Style Kit	Multimode 50/125 µm	1278861-2	Kit A
	Multimode 62.5/125 µm	1278862-2	Kit A
	Singlemode	1278863-2	Kit B
MT-RJ to ST-Style SECURE Kit	Multimode 50/125 µm	1278861-5	Kit A
	Multimode 62.5/125 µm	1278862-5	Kit A
	Singlemode	1278863-5	Kit B
MT-RJ to SC Kit	Multimode 50/125 µm	1278861-1	Kit A
	Multimode 62.5/125 µm	1278862-1	Kit A
	Singlemode	1278863-1	Kit B
MT-RJ to SC SECURE Kit	Multimode 50/125 µm	1278861-4	Kit A
	Multimode 62.5/125 µm	1278862-4	Kit A
	Singlemode	1278863-4	Kit B
MT-RJ to MT-RJ Kit	Multimode 50/125 µm	1278861-3	Kit C
	Multimode 62.5/125 µm	1278862-3	Kit C
	Singlemode	1278863-3	Kit D
MT-RJ to MT-RJ SECURE Kit	Multimode 50/125 µm	1278861-6	Kit C
	Multimode 62.5/125 µm	1278862-6	Kit C
	Singlemode	1278863-6	Kit D

MT-RJ Test Leads

MT-RJ Test Leads are divided into two primary categories:

- Launch Leads — made for use with standard test equipment
- OTDR Launch Leads — long lengths (100 meters) to deal with "dead zone" of OTDR equipment

Standard MT-RJ Launch Leads

Fiber Description	Part Number		
	MT-RJ — SC Simplex	MT-RJ — ST	MT-RJ — MT-RJ
No Pins, 62.5 Fiber	6435092-1	6435094-1	6435096-1
No Pins, 50/125 Fiber	6435092-2	6435094-2	6435096-2
No Pins, Singlemode	6435092-3	6435094-3	6435096-3
Pins, 62.5 Fiber	6435092-4	6435094-4	6435096-4
Pins, 50/125 Fiber	6435092-5	6435094-5	6435096-5
Pins, Singlemode	6435092-6	6435094-6	6435096-6

OTDR MT-RJ Launch Leads (100 meter length)

Part Number	Fiber Description
6588079-1	MT-RJ (No Pins) SC Simplex, 62.5/125 Fiber, 100 meters
6588080-1	MT-RJ (No Pins) SC Simplex, 50/125 Fiber, 100 meters

MT-RJ Loopbacks

Description		Part Number
MT-RJ Loopback	Multimode 50/125 µm	6278357-1
	Multimode 62.5/125 µm	6278153-1
	Singlemode	6278358-1

Note: All part numbers are RoHS compliant.

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MPO Cable Assemblies

MPO to MPO Trunk Cable Assemblies

Product Facts

- Quick connection of 12 fibers
- Pulling socks protect connectors during installation
- Available in
  - 62.5/125 µm
  - 50/125 µm
  - 50/125 µm laser optimized
  - Singlemode

Description		UL/NEC Ratings	Part Number
12 Fiber, Pair-Flipped (AB/BA)	50/125 µm Multimode	Riser (OFNR)/ Plenum (OFNP)	6435028-X
	Laser Optimized (10 Gig) (850 nm 50/125 µm) Multimode	Riser (OFNR)/ Plenum (OFNP)	6693087-X
	62.5/125 µm Multimode	Riser (OFNR)/ Plenum (OFNP)	6435024-X
	Singlemode	Riser (OFNR)/ Plenum (OFNP)	6435070-X
24 Fiber, Pair-Flipped (AB/BA)	50/125 µm Multimode	Riser (OFNR)/ Plenum (OFNP)	6435029-X
	Laser Optimized (10 Gig) (850 nm 50/125 µm) Multimode	Riser (OFNR)/ Plenum (OFNP)	6754687-X
	62.5/125 µm Multimode	Riser (OFNR)/ Plenum (OFNP)	6435025-X
	Singlemode	Riser (OFNR)/ Plenum (OFNP)	6754882-X
72-Fiber, Pair-Flipped (AB/BA)	50/125 µm Multimode	Plenum (OFNP)	6435031-X
		Riser (OFNR)	6435039-X
	62.5/125 µm Multimode	Plenum (OFNP)	6435027-X
		Riser (OFNR)	6435035-X

Note: X denotes length in feet: -1 = 10, -2 = 20, -3 = 30, -4 = 40, -5 = 50, -6 = 60, -7 = 70, -8 = 80, -9 = 90, 1- -0 = 100, 1- -1 = 110, 1- -2 = 120, 1- -3 = 130, 1- -4 = 140, 1- -5 = 150, 1- -6 = 160, 1- -7 = 170, 1- -8 = 180, 1- -9 = 190, 2- -0 = 200, 2- -1 = 210, 2- -2 = 220, 2- -3 = 230, 2- -4 = 240, 2- -5 = 250, 2- -6 = 260, 2- -7 = 270, 2- -8 = 280, 2- -9 = 290, 3- -0 = 300.

Other Standard MPO Cable Assemblies

Other Standard MPO Cable Assemblies

Part Number	Description
6588930-X	12-f MPO (f) - MPO (f), 50/125, jacketed ribbon, straight fiber path
6588688-X	12-f MPO (f) - MPO (f), 50/125, jacketed ribbon, reversed fiber path
6693182-X	12-f MPO (f) - MPO (f), 50/125, jacketed ribbon, reversed fiber path (For POP4 TxRx applications. Center 4 fibers not tested.)
6693088-X	12-f MPO (f) - MPO (f), SM, jacketed ribbon, straight fiber path
1588388-X	12-f MPO (f) - MPO (f), 62.5/125, jacketed ribbon, reversed fiber path
6457988-X	12-f MPO (f) - MPO (f), 62.5/125, jacketed ribbon, straight fiber path
6828375-X	12-f MPO (m) - MPO (m), 50/125, jacketed ribbon, straight fiber path
6828420-X	12-f MPO (m) - MPO (m), 50/125, jacketed ribbon, reversed fiber path

Note: X denotes length in feet: -1 = 10, -2 = 20, -3 = 30, -4 = 40, -5 = 50, -6 = 60, -7 = 70, -8 = 80, -9 = 90, 1- -0 = 100, 1- -1 = 110, 1- -2 = 120, 1- -3 = 130, 1- -4 = 140, 1- -5 = 150, 1- -6 = 160, 1- -7 = 170, 1- -8 = 180, 1- -9 = 190, 2- -0 = 200, 2- -1 = 210, 2- -2 = 220, 2- -3 = 230, 2- -4 = 240, 2- -5 = 250, 2- -6 = 260, 2- -7 = 270, 2- -8 = 280, 2- -9 = 290, 3- -0 = 300.

All part numbers are RoHS compliant.

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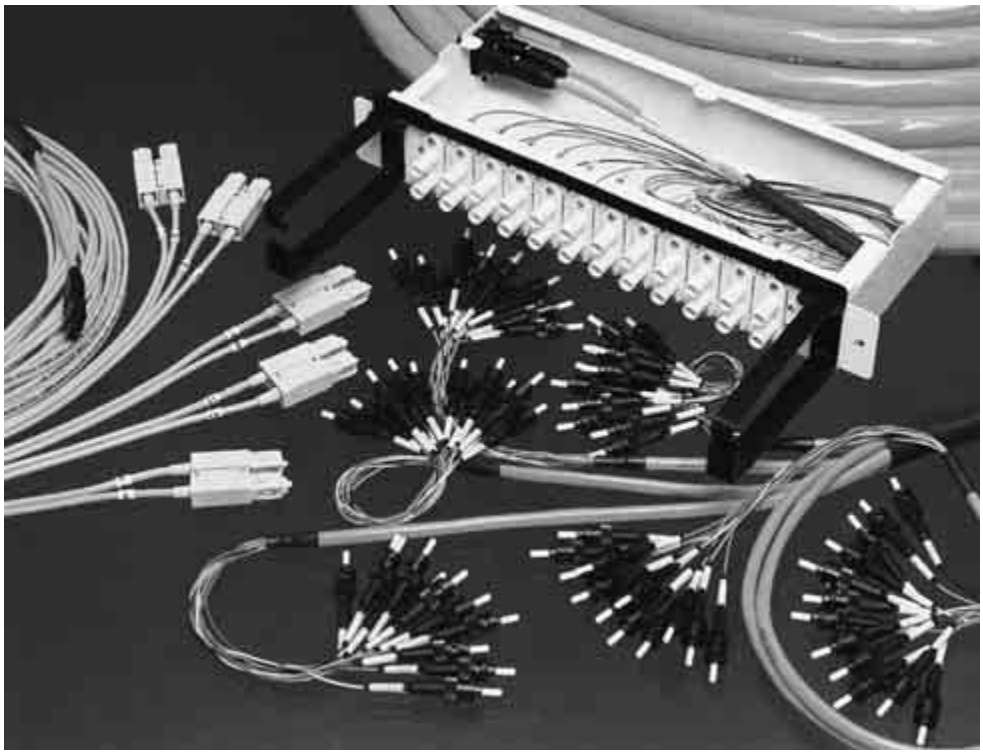
MPO Cable Assemblies (Continued)

MPO Cable Assemblies for Premise Networks



Description

- **A modular "plug-and-go" optical cabling system**

Applications

- **A high-performance option for AMP NETCONNECT zone cabling and cabling systems**

Product Facts

- **Uses proven NTT MT linear array technology in the MPO connector**
- **MPO packs up to 12 optical fibers into a single miniaturized connector about the same size as one SC type**
- **Cables are pre-terminated and tested**
- **Distribution hardware is pre-loaded**
- **Cable rating options:**
  - **Riser rated, UL-OFNR**
  - **Plenum rated, UL-OFNP (std.)**
  - **Low Smoke, Zero Halogen rated, LSZH**
- **Singlemode or Multimode**

Other Applications

- **Cabling System for Mainframes Catalog 889414**

Performance Characteristics

Insertion Loss —
Singlemode — 0.35 dB typical
Multimode — 0.50 dB typical

Return Loss —
Angled Singlemode — -50 dB typical
Flat Multimode — -40 dB typical

Durability —
After 500 matings ≤0.1 dB change

Temperature Range —
-40°C to +80°C

- **Produced under a Quality Management System certified to ISO 9001**

  A copy of the certificate is available upon request

Initially designed to replace thick copper parallel cables used under floors of computer rooms in large mainframe centers, Tyco Electronics' MPO Cabling System also makes perfect sense for campus and premise type Local Area Networks. It provides unparalleled ease and flexibility in cabling applications such as backbone and horizontal distribution to the desktop.

The MPO System uses the same simple concepts found in most structured networks following TIA/EIA 568A guidelines. The difference is that with MPO Systems the cables come pre-terminated and tested, with a pulling sock over each end. Just pull through the conduit, remove the netting, and plug it in — that's it.

MPO trunk cables run through the building vertically between floors, and horizontally through walls, ceilings, and under floors to distribution enclosures and consolidation points strategically located within the building. Mini-trunks and fanout assemblies connect the consolidation point to the workstation outlets. Jumper cables connect the outlet to the workstation, and are also used for cross-connecting in the telecommunications closet. Installation is easier and faster with cables selected specifically for each site.

MPO cabling is a high performance option for AMP NETCONNECT zone cabling, and complements the system as a furniture cabling solution. MPO cables can reside parallel to existing UTP without fear of crosstalk.

Mini-trunk feeder cables and fan-out cable assemblies are an ideal solution for the open office environment. Their small size allows easy storage in modular office panels and raceways. When it's time to move add or change the zone, the mini-trunks are simply unplugged from nearby zone enclosures and moved with the furniture. Data outage is contained to the zone under construction. After the zone is reconfigured, just plug the MPO connectors back in to the network, and your workstations are up and running.

There's no longer a need to bring in a network staff to shut down the entire system to re-terminate and test the cabling for moves, adds, and changes. Moves can usually be done by the end-user's facilities crew or someone with minimal network experience. At last, "modular" is living up to its promise. You can take an office apart, move it, and put it back together — quick and simple!

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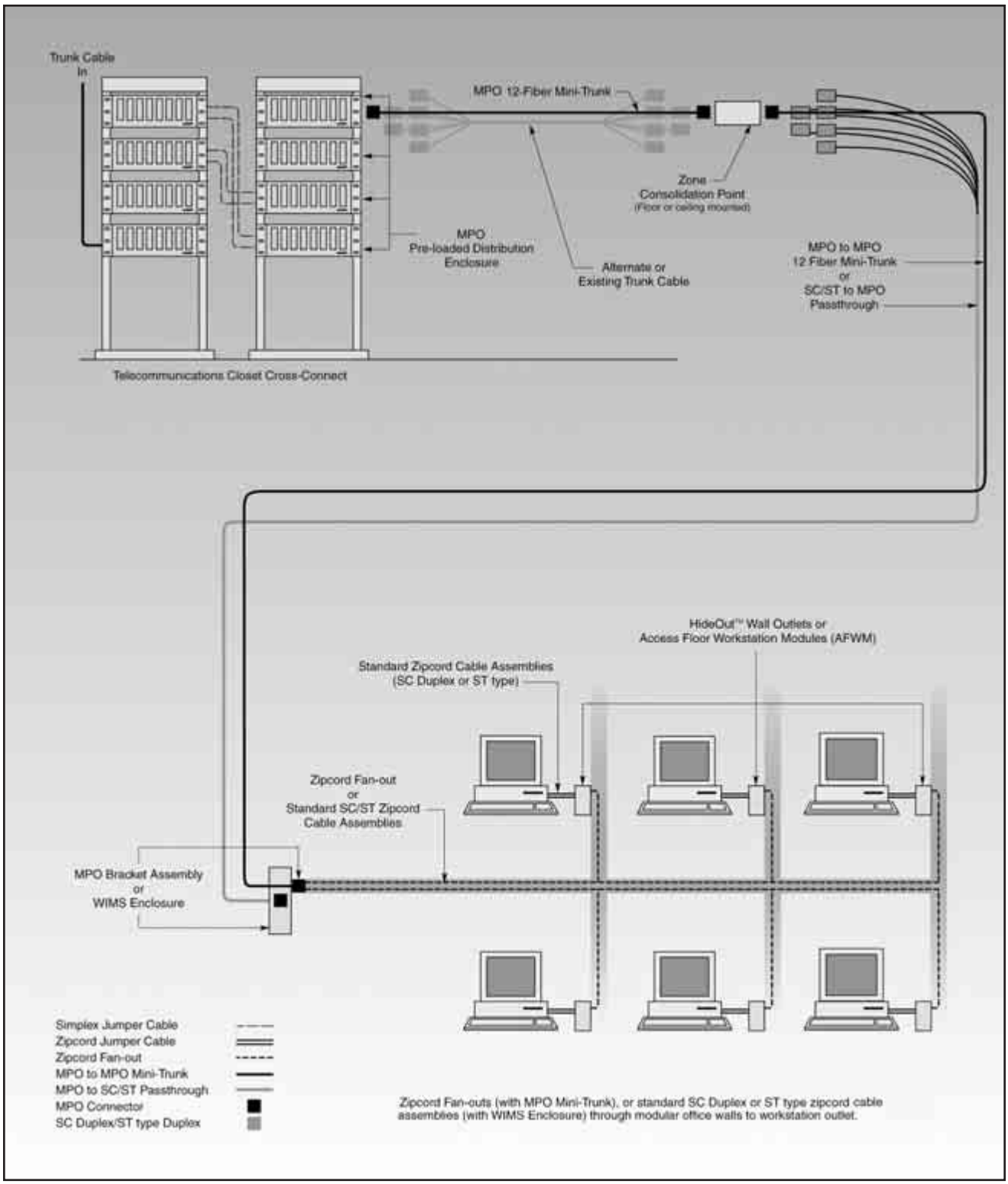
MPO Cable Assemblies (Continued)

MPO Cable Assemblies for Premise Networks (Continued)



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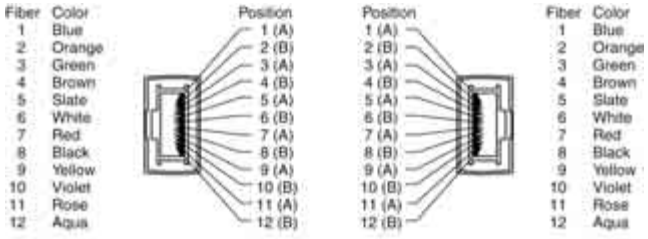
MPO Cable Assemblies (Continued)

MPO Cable Assemblies for Premise Networks (Continued)

Pairs Flipped Versus Straight Through Fiber Path Configuration

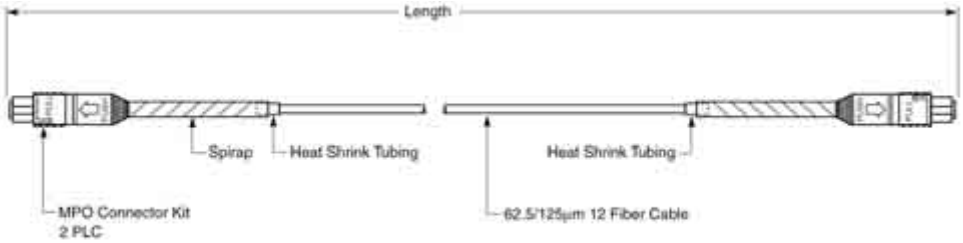
Unlike the mainframe application counterparts, Tyco Electronics' MPO trunks for Premise applications typically do not require "pair flipping".
Pair Flipping, or "AB/BA" transmit/receive configuration is a sequential channel cross-over scheme used for IBM Enterprise Systems Connectivity (ESCON) architecture. MPO premise trunk fiber pairs are configured as "AB/AB". For example — blue fiber (1) travels straight through the cable and exits on the opposite end in the same position (1), as illustrated (right). This fiber path configuration is known as "straight through".

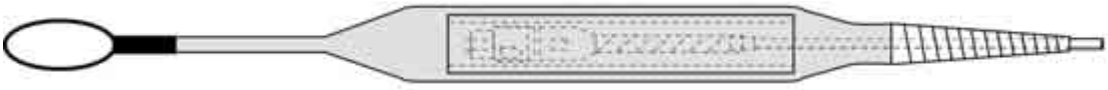


Straight Through Fiber Path Configuration

MPO to MPO Mini-Trunk Cable Assembly

4 pair (8 fiber), straight through 62.5/125 multimode





Pulling Sock (included on each end)

MPO to MPO Mini-Trunks

Trunk Length	Part Number (OFNP)
6 meter [19.7 feet]	1-5492105-9
8 meter [26.3 feet]	2-5492105-0
10 meter [32.8 feet]	5492105-2
15 meter [49.2 feet]	5492105-7
20 meter [65.6 feet]	5492105-3
23 meter [75.5 feet]	2-5492105-1
27 meter [88.6 feet]	2-5492105-2
30 meter [98.4 feet]	5492105-4
33 meter [108.3 feet]	2-5492105-3
38 meter [124.7 feet]	1-5492105-5
43 meter [141.1 feet]	2-5492105-4
46 meter [150.9 feet]	1-5492105-6
50 meter [164.1 feet]	5492105-8
53 meter [173.9 feet]	1-5492105-7
61 meter [200.1 feet]	1-5492105-3

Additional lengths available.
Custom lengths can be built to customer's specifications.

Note: All part numbers are RoHS compliant.

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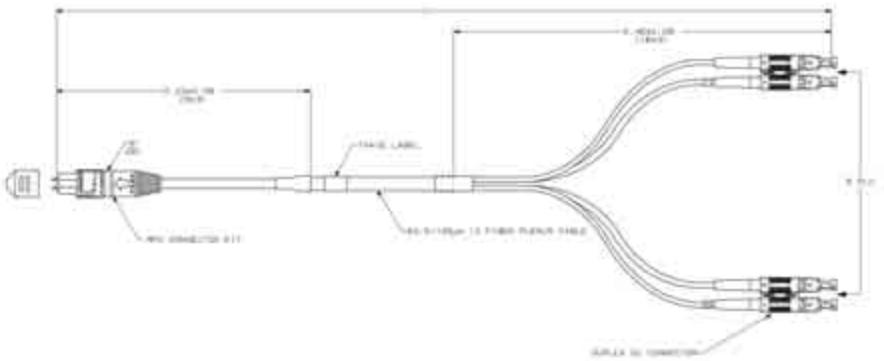
MPO Cable Assemblies (Continued)

MPO Cable Assemblies for Premise Networks (Continued)

MPO to SC Duplex PASS-THROUGH Fan-out

6 pair (12 fiber), straight through 62.5/125 multimode



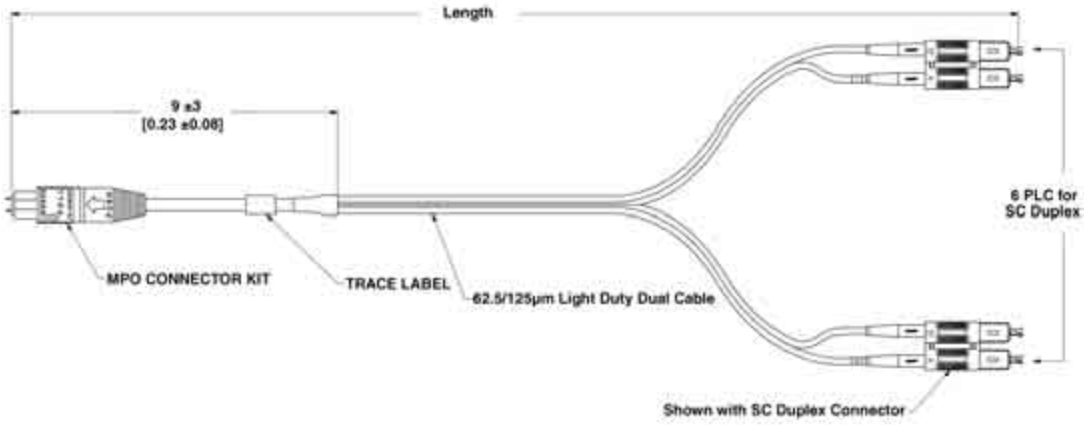
MPO to SC Duplex

Overall Length [L]	Part Number (OFNP)
6 meter [19.7 feet]	5492362-6
8 meter [26.3 feet]	5492362-8
10 meter [32.8 feet]	1-5492362-0
15 meter [49.2 feet]	1-5492362-5
20 meter [65.6 feet]	2-5492362-0

Additional lengths available.
Custom lengths can be built to customer's specifications.

MPO to SC Duplex Zipcord Fan-out

6 pair (12 fiber), straight through 62.5/125 multimode



MPO to SC Duplex

Overall Length [L]	Part Number
6 meter [19.7 feet]	5492363-6
8 meter [26.3 feet]	5492363-8
15 meter [49.2 feet]	1-5492363-5

Additional lengths available.
Custom lengths can be built to customer's specifications.

Note: All part numbers are RoHS compliant.

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MPO Cable Assemblies (Continued)

MPO Cable Assemblies for Mainframes

Description

- **A modular "plug-and-go" optical cabling system for mainframe information centers**

Application

- **Replaces copper bus-and-tag cables in parallel architecture, or streamlines IBM ESCON serial fiber optic technology**

Product Facts

- **Proven NTT MT linear array technology in the MPO connector**
- **MPO packs up to 12 optical fibers into a single miniaturized connector about the same size as one SC type**
- **ESCON Connectors are IBM Approved and 100% compatible**
  - **Direct attach harnesses**
  - **Jumper cables**
- **Cables are pre-terminated and tested**
- **Distribution hardware is pre-loaded**
- **Cable rating options:**
  - **Riser rated, UL-OFNR (std.)**
  - **Plenum rated, UL-OFNP**
  - **Low smoke, Zero Halogen rated, LSZH**
- **Singlemode or Multimode**

Other Applications

- **Cabling System for Premise Networks**
- **Produced under a Quality Management System certified to ISO 9001**

  A copy of the certificate is available upon request

IBM-APPROVED ESCON SUPPLIER

Tyco Electronics' MPO modular cabling system is structured to provide unparalleled ease and flexibility in the cabling of IBM Enterprise Systems Connection architecture (ESCON).

MPO provides every thing you need to cable your data center:

- assorted lengths of MPO connectorized 36 and 72-fiber trunks
- 8 or 12-fiber mini-trunks
- MPO to ESCON direct attach harnesses
- pre-loaded distribution enclosures
- MPO coupler bushing mounting brackets
- cable clamps
- ESCON jumper cables

Select what you need to connect your system and plug it in. Installation is faster and easier with cables selected specifically for the hardware layout in your data center.

MPO trunk cables deployed around the periphery or down the center of the computer room through under-floor conveyance systems provide plug-and-go connectivity to pre-loaded MPO distribution enclosures mounted in main and zone cabinets throughout the data center.

Multiple layers of MPO trunks and distribution hardware allow the data center to be divided into zones. Zoning further increases simplicity and flexibility of connections between equipment.

MPO mini-trunks, ESCON jumper cables and harnesses plugged into the distribution panels provide final connections to IBM Enterprise Systems processors, ESCON directors, and I/O devices.

Tyco Electronics' MPO System eliminates thick, inflexible point-to-point copper cables, or tangled bundles of ESCON jumpers running under computer room floors.

Once installed, the MPO System simplifies the hassles associated with migration. Because fiber transmissions are electrically silent, systems can be upgraded without planned outages. Re-configuring and rearranging equipment is six times faster, since only one connector is plugged in. It is also as simple as unplugging the trunk from the ESCON harness, leaving the harness to be removed with the equipment. Each MPO cable is removable and reusable.

The MPO System takes the superior performance of ESCON fiber optic technology one step further — by simplifying installation and migration, while opening up crowded space under computer room floors, improving air flow and breathing new life into data centers.

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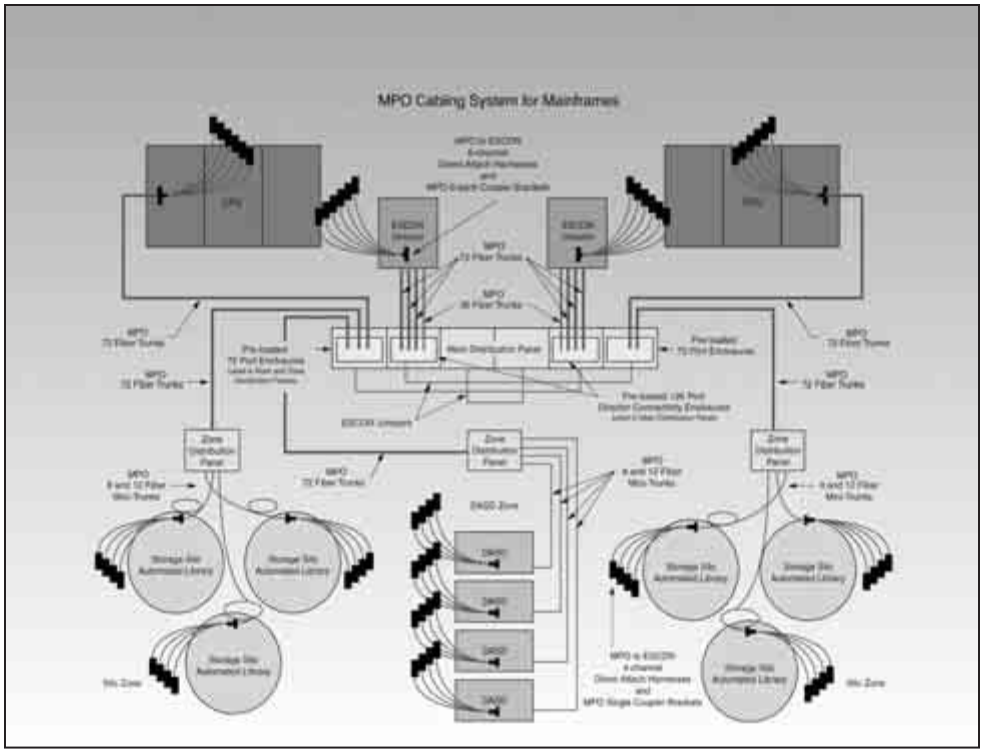
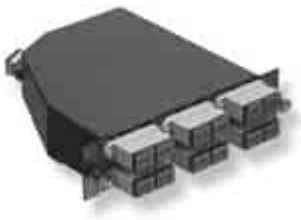
MPO Cable Assemblies (Continued)

MPO Cable Assemblies for Mainframes (Continued)

Product Facts

- Fiber wiring pattern is pair-flipped (AB/BA)
- Also available in straight-through (AB/AB) configuration
- Simple and flexible premise fiber cabling
- All cassettes have MPO trunk connections at rear
- Fits all AMP NETCONNECT Enclosures listed in this catalog that accept snap-in adapter plates
- Easy installation, moves, adds and changes





MPO Cassettes

Part Number	Description	Color	Fiber Count	Fiber Type	Config.
6435067-2	MPO-ST mod.assy.	Black	12	50	Crossed
6278418-2	MPO-ST mod.assy.	Black	12	62.5	Crossed
6754286-1	MPO-MT-RJ mod. assy.	Black	12	50	Crossed
6754288-1	MPO-MT-RJ mod. assy.	Black	24	50	Crossed
6754285-2	MPO-MT-RJ mod. assy.	Black	12	62.5	Crossed
6754287-1	MPO-MT-RJ mod. assy.	Black	24	62.5	Crossed
1938996-1	MPO-MT-RJ mod. assy.	Black	12	SM	Crossed
6828819-1	MPO-MT-RJ mod. assy.	Black	24	SM	Crossed
1918777-1	MPO-MT-RJ mod. assy.	Black	12	Laser Optimized (10 Gig)	Crossed
1918778-1	MPO-MT-RJ mod. assy.	Black	24	Laser Optimized (10 Gig)	Crossed
6435181-2	MPO-SC mod. assy.	Black	12	50	Crossed
6435180-2	MPO-SC mod. assy.	Black	12	62.5	Crossed

Part Number	Description	Color	Fiber Count	Fiber Type	Config.
6435069-2	MPO-SC mod. assy.	Black	12	SM	Crossed
6754333-2	MPO-SC mod. assy.	Black	12	Laser Optimized (10 Gig)	Crossed
1918779-1	MPO-LC mod. assy.	Black	12	50	Crossed
1918780-1	MPO-LC mod. assy.	Black	24	50	Flipped
1918781-1	MPO-LC mod. assy.	Black	12	62.5	Crossed
1918782-1	MPO-LC mod. assy.	Black	24	62.5	Flipped
1938056-1	MPO-LC mod. assy.	Black	12	SM	Crossed
1918786-1	MPO-LC mod. assy.	Black	24	SM	Flipped
1918783-1	MPO-LC mod. assy.	Black	12	Laser Optimized (10 Gig)	Crossed
1918784-1	MPO-LC mod. assy.	Black	24	Laser Optimized (10 Gig)	Flipped

Note: All part numbers are RoHS compliant.

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MPO Cable Assemblies (Continued)

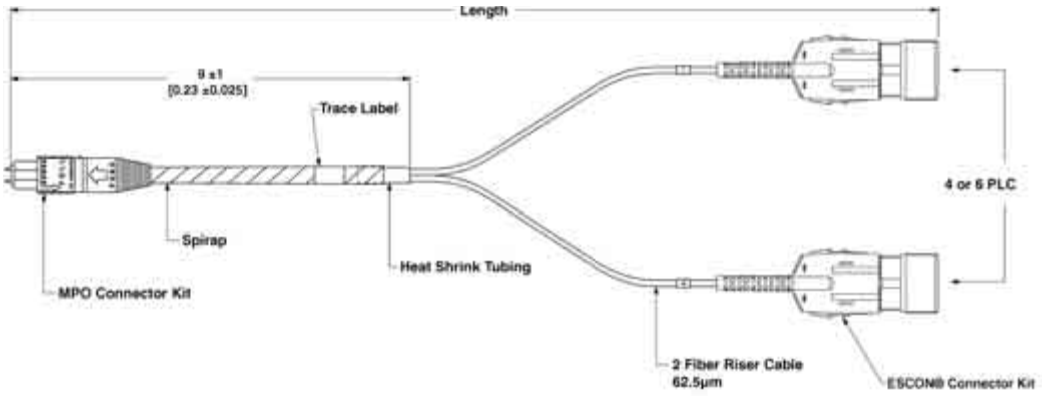
MPO Cable Assemblies for Mainframes (Continued)

MPO to ESCON Direct Attach Harness

4 channel (8 fiber), AB/AB straight through

6 channel (12 fiber), AB/AB straight through

62.5/125 multimode



Harness Length	6 Channel (12 fiber)
	Part Number
3 feet [0.9 meters]	6754335-1

Custom lengths can be built to customer's specifications.
Cable is Riser rated.

ESCON Cable Assemblies 62.5/125 µm Multimode

Cable Type	Length (meters)											
	1	2	3	4	5	7	13	22	31	46	61	122
Riser	5492231-1	5492231-2	5492231-3	5492231-4	5492231-5	5492231-7	1-5492231-3	2-5492231-2	3-5492231-1	4-5492231-6	6-5492231-1	9-5492231-9
Plenum	5492251-1	5492251-2	5492251-3	5492251-4	5492251-5	5492251-7	1-5492251-3	2-5492251-2	3-5492251-1	4-5492251-6	6-5492251-1	9-5492251-9
Low Smoke Zero Halogen	5492275-1	5492275-2	5492275-3	5492275-4	5492275-5	5492275-7	1-5492275-3	2-5492275-2	3-5492275-1	4-5492275-6	6-5492275-1	9-5492275-9

Connectors are black, cable is orange.
Cable construction is two fiber round.
Custom lengths are available.

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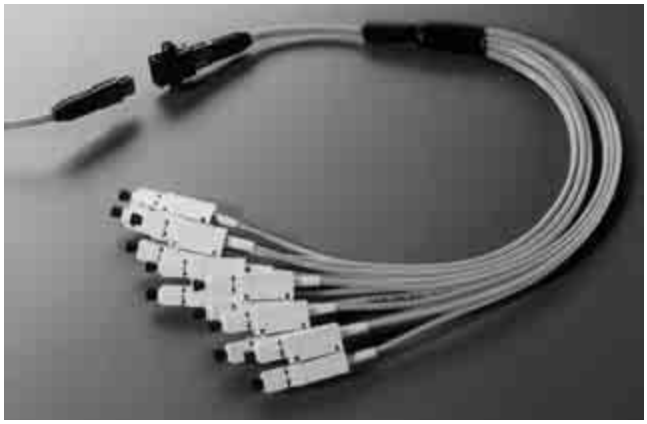
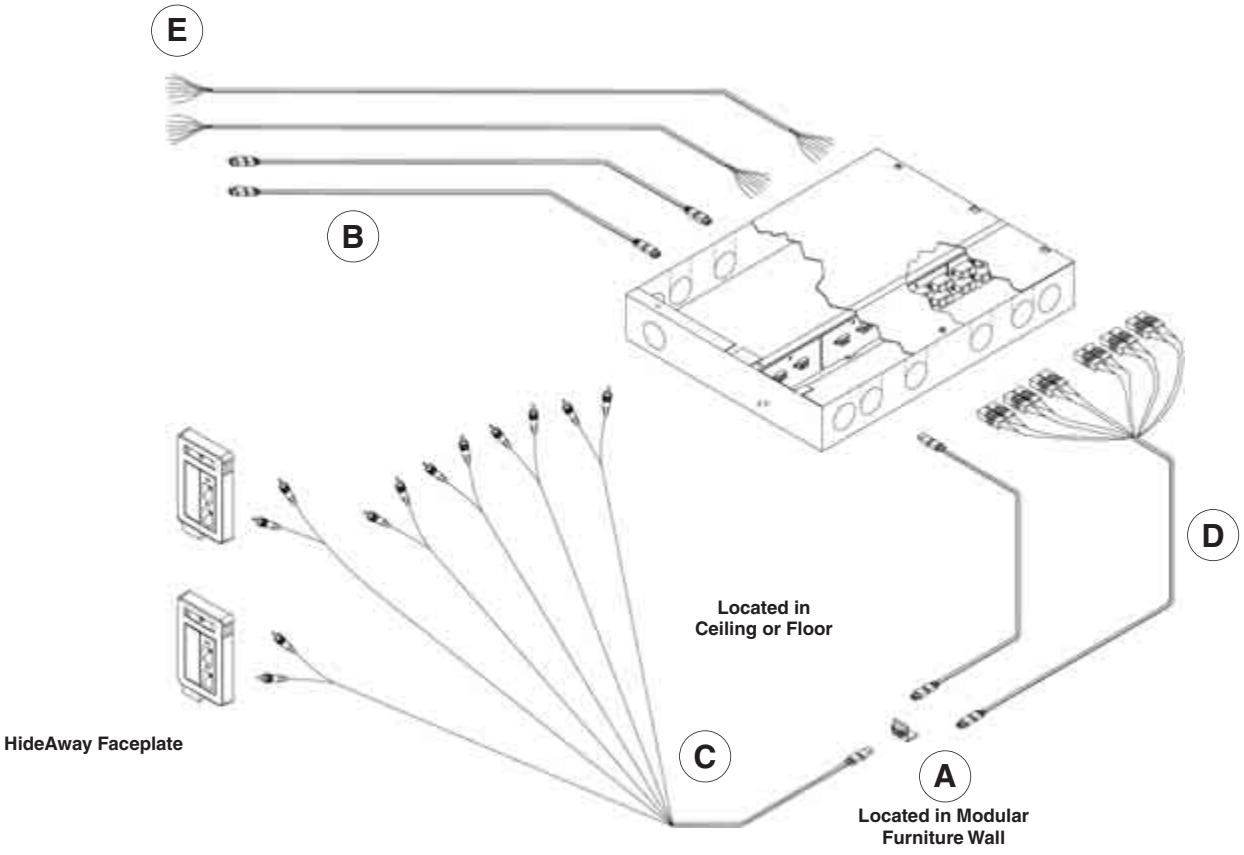
MPO Cable Assemblies (Continued)

MPO Cable Assemblies for Mainframes (Continued)

Tyco Electronics' MPO System delivers the full bandwidth of optical fiber while maintaining the flexibility for the open office with reusable assemblies.





Ordering Information:

	Part Number	Description
A	5504954-1	MPO Receptacle Mounting Bracket
B	5492105-X	MPO Cable Assembly, MPO/MPO straight through, 12 fiber, 62.5/125 mm
C	5492363-Y	MPO Cable Assembly, MPO/SC Duplex long fan-out, 12 fiber, 62.5/125 mm
D	5492362-Z	MPO Cable Assembly, MPO/SC Duplex short fan-out, 12 fiber, 62.5/125 mm

X denotes length in meters: -7 = 15, 1- -4 = 30, 1- -5 = 38, 1- -6 = 45, 2- -0 = 8, 2- -1 = 23
Y denotes length in meters: -6 = 6, -8 = 8, 1- -5 = 15
Z denotes length in meters: -6 = 6, -8 = 8, 1- -0 = 10, 1- -5 = 15, 2- -0 = 20

Note: All part numbers are RoHS compliant.

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High Density PARA-OPTIX Cable Assemblies

Product Facts

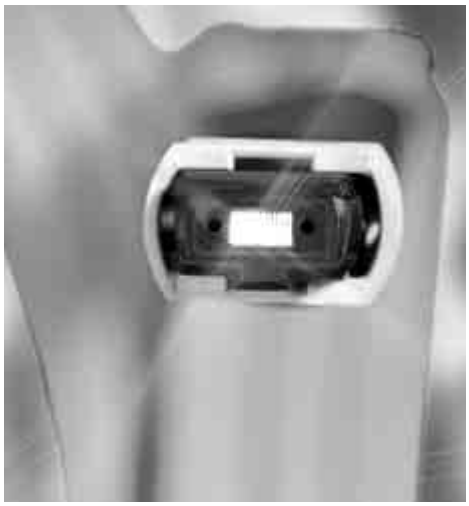
- Uses the latest generation MT-style ferrules
- Available in up to 72 fibers through a single MPO style connector
- Available in 12, 24, 32, 48, and 72 fiber
- Other fiber counts and lengths available
- Save time during installation — requires less connectors
- Reduced space requirements
- Can provide cost benefit on a per-fiber basis

Potential Applications

- Jumpers and trunk cables for Data Centers
- Optical backplanes
- SAN Very Short Reach applications

Please contact your local Sales Representative or Tyco Electronics for detailed performance characteristics and specifications.

Specifications are preliminary and subject to change.



Tyco Electronics' high density PARA-OPTIX cable assemblies use the latest in MT-ferrule technology to provide the maximum fiber density for parallel optical applications.

By terminating these ferrules in MPO style connectors, Tyco Electronics is able to take advantage of the industry standards and acceptance of the MPO connector family.

Tyco Electronics' PARA-OPTIX Cable Assemblies can support up to 72 fibers through a single connector, saving space on the board and time during installation.

Part Number	Description
6588930-X	12-fiber MPO-MPO, 50/125 Multimode
6588967-X	24-fiber MPO-MPO, 50/125 Multimode
6693070-X	32-fiber MPO-MPO, 50/125 Multimode
6693069-X	48-fiber MPO-MPO, 50-125 Multimode
1919166-X	72-fiber MPO-MPO, 50/125 Multimode
6693068-X	48-fiber MPO — (4), 12-fiber MPO, 50/125 bare ribbon
6693067-X	72-fiber MPO — (6), 12-fiber MPO, 50/125 bare ribbon

Note: "X" above denotes length. Check latest version of Tyco Electronics' customer drawing or contact your local sales representative for specific lengths available.

Note: All part numbers are RoHS compliant.

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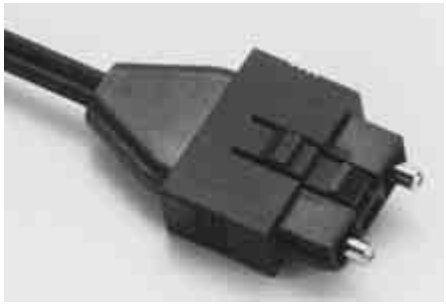
Plastic Fiber Cable Assemblies

F07 Duplex Plastic Fiber Cable Assemblies

Product Facts

- **Standard and custom lengths**
- **Conforms to JISC-5976**



Fiber Type	Length	Part Number
980/1000 µm Plastic Optical Fiber	1	5492155-1
	2	5492155-2
	3	5492155-3
	5	5492155-4
	10	5492155-5
	15	5492155-6
	20	5492155-7

Audio-DNP Plastic Fiber Cable Assemblies

Product Facts

- **Complies with EIAJ RC-5720 for digital audio equipment and Japan Industry STD F05**
- **Compatible with TDSLink**
- **Mates with receptacle configuration CNF50SR3 Type per EIAJ RC-5720**
- **Economical and highly reliable based on Tyco Electronics' high speed automatic assembly technologies**
- **Cable assemblies available with or without logo**
- **980/100 µm POF cable with UL VW-1 rating**

Applications

- **I/O and internal cabling of AV, OA, and FA equipment plus automotive internal networking**

Performance Characteristics

Operating Temperature — -30 C to +80 C

Max. Insertion Loss — 3.5 dB

Connector Mating Force — 4 Kg max.

Connector Unmating Force — 0.4 to 4 Kg

Cable Retaining Strength — 5 Kg min.

Length (mm)	Cable Assembly Part Number	
	Without Logo	With Logo
300	178671-3	173317-3
400	178671-4	173317-4
500	178671-5	173317-5
600	178671-6	173317-6
700	178671-7	173317-7
800	178671-8	173317-8
900	178671-9	173317-9
1000	1-178671-0	1-173317-0
1100	1-178671-1	1-173317-1
1200	1-178671-2	1-173317-2
1300	1-178671-3	1-173317-3
1400	1-178671-4	1-173317-4
1500	1-178671-5	1-173317-5
1600	1-178671-6	1-173317-6
1700	1-178671-7	1-173317-7
1800	1-178671-8	1-173317-8
1900	1-178671-9	1-173317-9
2000	2-178671-0	2-173317-0
2500	2-178671-1	—
3000	2-178671-2	—
3500	2-178671-3	—
4000	2-178671-4	—
4500	2-178671-5	—
5000	2-178671-6	—
5500	2-178671-7	—
6000	2-178671-8	—
10000	3-178671-6	—

Note: All part numbers are RoHS compliant.

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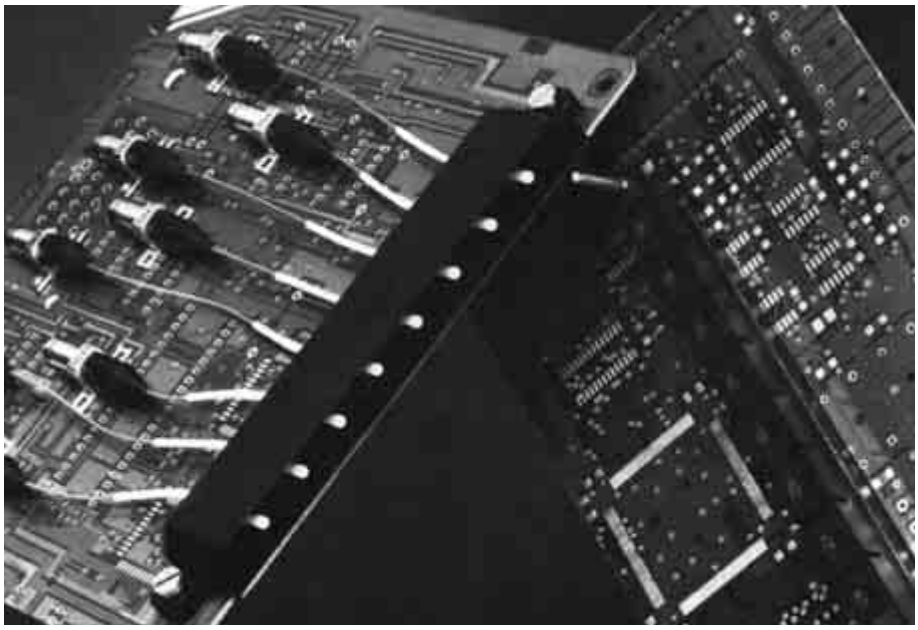
LIGHTPLANE Connector System

Product Facts

- **Optical interconnection of daughter cards to motherboard**
- **Bellcore compliant SC interface from motherboard**
- **2 to 8 positions**
- **Centerline spacing 12.5 mm (0.492 in.)**
- **Singlemode and multimode versions**
- **Daughtercard floats and alignment pins on mothercard assure mating**

Performance Characteristics

Insertion Loss — 0.5 dB typ.
Return Loss — 40 dB min.
Temperature Range — -40°C to +85°C
Durability — <0.5 dB after 200 cycles



The Tyco Electronics' LIGHTPLANE Connector is a multi-position fiber optic backplane connector that permits blind mating of singlemode or multimode optical fibers from a daughtercard to a system backplane or motherboard. Now you can simultaneously make both the optical and electronic interconnections when installing the daughtercard. The LIGHTPLANE connector contains up to 8 fiber positions utilizing the standard SC interface.

Use of off the shelf SC components minimizes per line costs. It also eliminates the need for separate optical jumpers from the daughtercards to the front or back of the cabinet, minimizing labor costs and possible fiber damage.

Designed for telecommunications and networking equipment, the LIGHTPLANE connector provides performance comparable to conventional SC interconnections: 0.5 dB typical insertion loss and 40 dB return loss. Shoulder screws on the daughtercard module provide the necessary float for precise alignment. Daughtercard termini are spring loaded to ensure optical contact between the backplane and daughtercard. The daughtercard connector acts like multiple SC connectors, providing fiber density and minimizing packaging all in one protective shell. The shell protects the optical contacts on all sides from accidental damage if the board is dropped or knocked against a hard surface.

Description	Size/No. of Positions	Part Number
Daughtercard Connector	8	503185-1
Motherboard Connector Ceramic Alignment Sleeves with Polarization Key	8	5503682-1
Description	**Type/Fiber Hole Dia. (µm)**	**Part Number**
Daughtercard Terminus for 900 µm buffered fiber	Singlemode/125	5503186-1
	Singlemode/126	5503186-2
	Singlemode/127	5503186-3
	Multimode/125	5503412-1
Pre-Assembled Cable Assembly Daughtercard Terminus on both ends-2 meters — Singlemode		5503683-1

Note: All part numbers are RoHS compliant.

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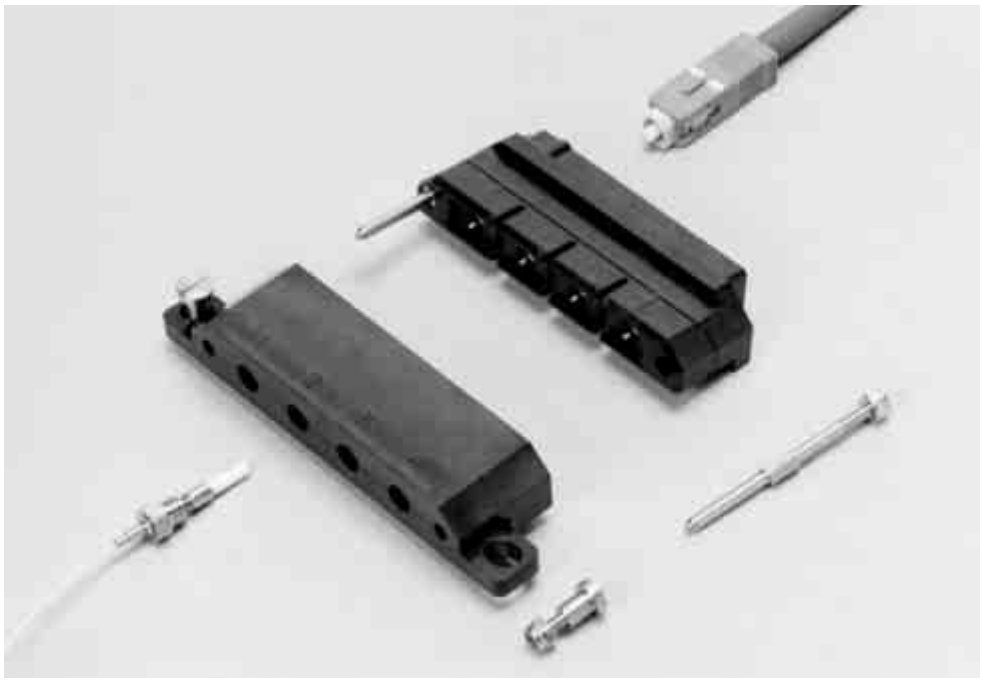
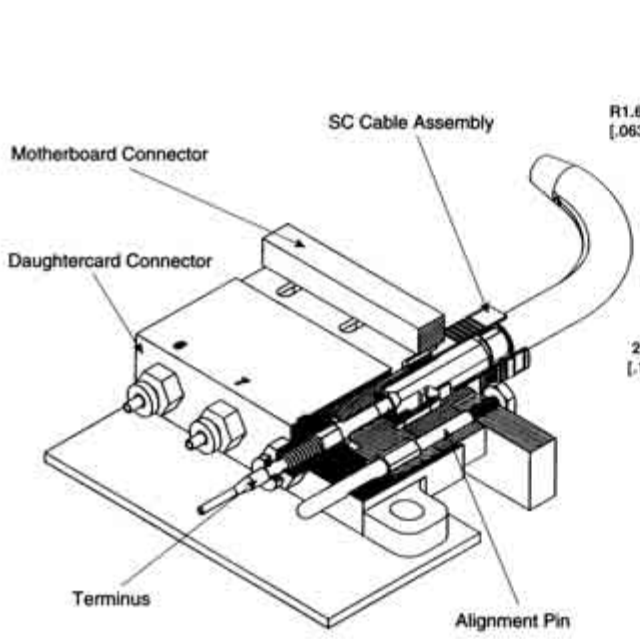
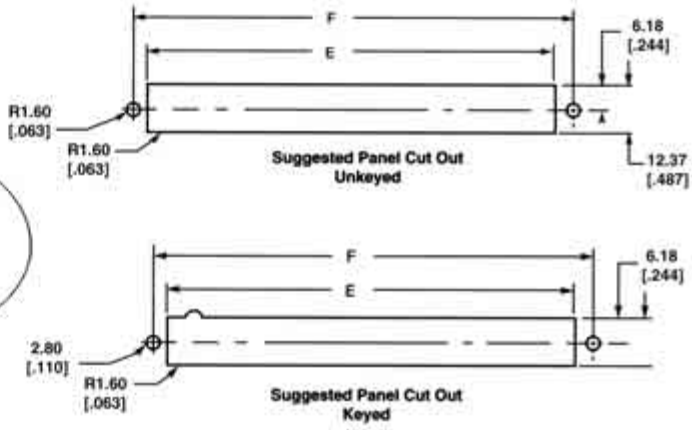
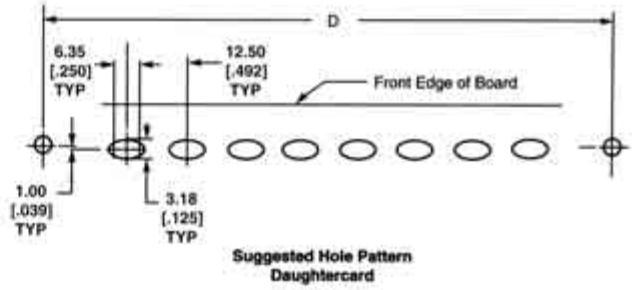
LIGHTPLANE Connector System (Continued)









LIGHTPLANE Connector System

No. of Positions	Dimension		
	D	E	F
1	38.00 [1.496]	12.88 [.507]	20.00 [.787]
2	50.50 [1.988]	25.38 [.999]	32.50 [1.280]
4	75.50 [2.972]	50.38 [1.984]	57.50 [2.264]
8	125.50 [4.941]	100.38 [3.952]	107.50 [4.232]

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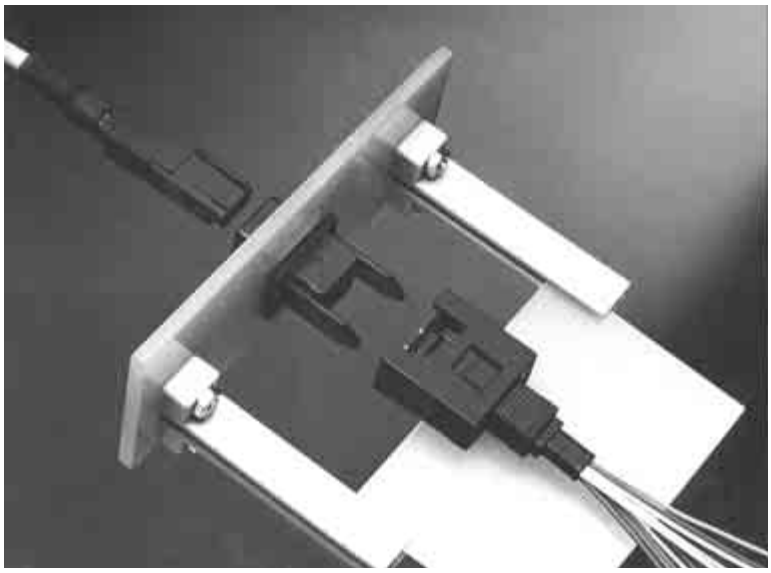
LIGHTRAY MPX System Interconnects

Product Facts

- **LIGHTRAY MPX Interconnects offer a blindmate backplane solution**
- **A complete fiber optic system which is ideal for applications requiring customized solutions**
- **Features very small, high density LIGHTRAY MPX connectors**
- **Based on industry proven MT interconnection technology**
- **Can use both multimode (62.5/125 µm or 50/125 µm) and singlemode (9 µm) fiber, and is designed to meet Bellcore GR 1435**
- **Saves valuable board space on the PCB, backplane and I/O**
- **Suitable for blind mate (free floating) and bulkhead applications. Offers flexible fiber routing and management**
- **2.5 mm of daughter card axial travel is provided**
- **Misalignment pick-up tolerance are:**
  ± 2.0 mm horizontal
  ± 2.5 mm vertical
  ± 2 degree angular



Tyco Electronics' LIGHTRAY MPX Interconnection System is designed for blind mate backplane and bulkhead dense fiber-to-fiber interconnect applications, including stand alone interconnections when used with bulkhead adapters.

The LIGHTRAY MPX Interconnection System offers maximum flexibility, making them ideal for customized requirements and solutions.

Based on the field-proven MT ferrule technology, the LIGHTRAY MPX Interconnection System features a miniature multi-fiber connector, which holds up to 24 fibers on 250 µm centers.

Tyco Electronics' LIGHTRAY MPX Interconnection System is multi-sourced and features fanout assemblies, mini trunk and trunk cable assemblies, pre-loaded enclosures, cable management systems, PC card connector housings and tooling, bulkhead adapters and transceiver modules and datalinks.

LIGHTRAY MPX Connector

Design Objectives

Parameter	Value		
	Multimode	Singlemode	Singlemode Low Loss
Insertion Loss, Mean (typical)	0.20 dB	0.25 dB	0.20 dB
Insertion Loss, Max.	0.50 dB	0.75 dB	0.30 dB / 0.5 dB*
Return Loss, Min.	20 dB	45 dB	45 dB
Durability,	0.3 dB CIT - 200 cycles		
Straight Pull 2.2N	0.3 dB change		
Vibration, 10 to 55 Hz	0.3 dB change		
Temperature, Storage	-40°C to +85°C		
Temperature Operating	-40°C to +85°C		
Thermal Aging, 14 Days @ +85°C	0.3 dB change		
Humidity,14 days 95% Rh @ +60°C	0.3 dB change		

* Low loss tested in-house to a maximum of 0.3 dB against a reference. 0.5 dB is maximum random mate loss.

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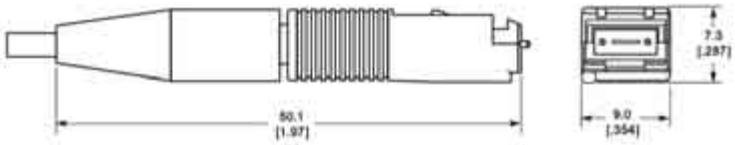
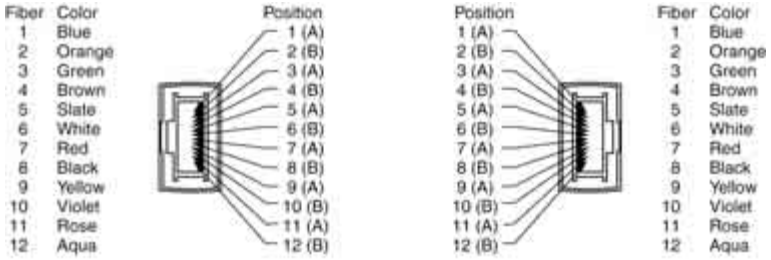
LIGHTRAY MPX System Interconnects (Continued)

LIGHTRAY MPX Connector



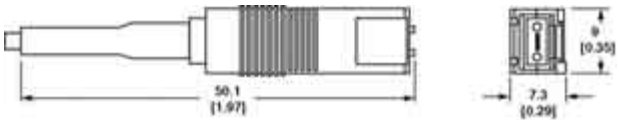
Straight Through Fiber Path Configuration



Straight Through Fiber Path Configuration

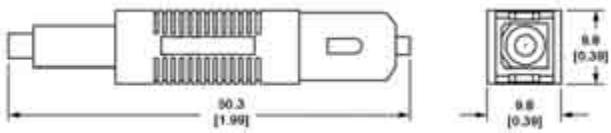
Unlike their mainframe application counterparts, LIGHTRAY MPX trunks for Premise applications typically do not require "pair flipping". Pair Flipping, or "AB/BA" transmit/receive configuration is a sequential channel cross-over scheme used for IBM Enterprise Systems Connectivity (ESCON) architecture. LIGHTRAY MPX premise-trunk fiber pairs are configured as "AB/AB". For example — blue fiber (1) travels straight the cable and exits on the opposite end in the same position (1), as illustrated below. This fiber path configuration is known as "straight through".

LIGHTRAY MPX Connector



LIGHTRAY MPX Connector accommodates up to 12 fibers in a form factor smaller than typical single-fiber connectors

SC Connector



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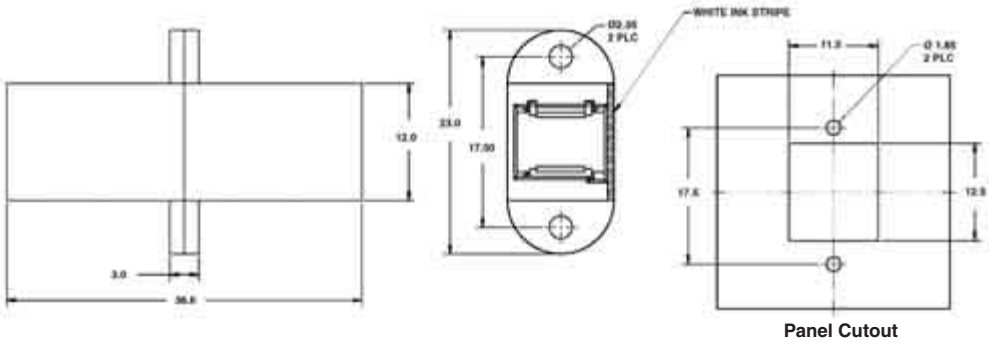
LIGHTRAY MPX System Interconnects (Continued)

Bulkhead Coupling Adapter

Part Number 492305-1



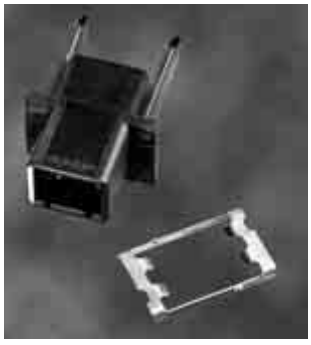
Panel Cutout

Product Facts

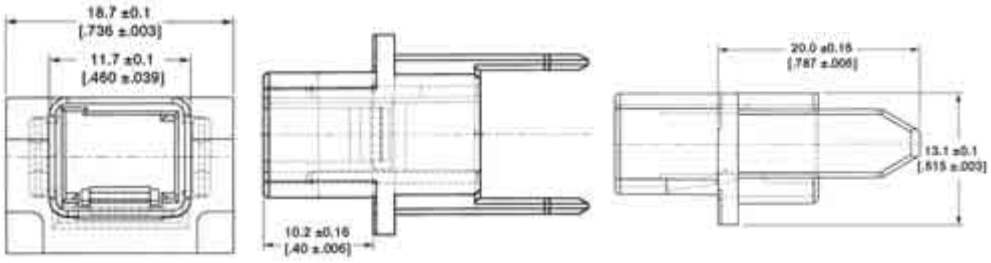
- Use two #2 screws for panel mounting
- LIGHTRAY MPX coupling adapter uses the same dust cover as the SC coupling adapter
- Can be mounted side-by-side for maximum port density

Backplane Housings and Adapters

Backplane Housing — Simplex



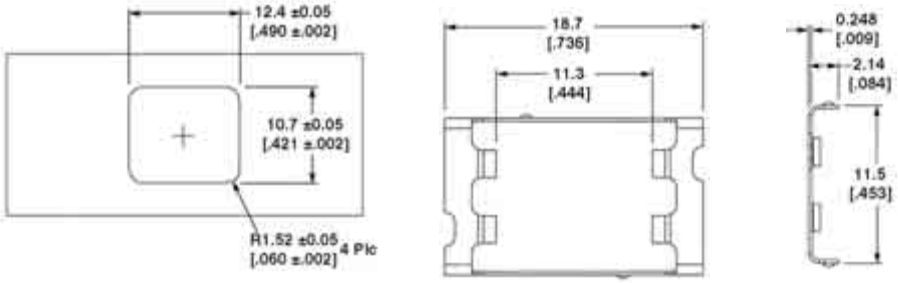
Part Number 492739-1



Product Facts

- All backplane mounting holes must be within 0.1 mm diameter true position of nominal from backplane daturns to assure proper mating
- Used to mate any LIGHTRAY MPX Connector from the backplane side
- Mates to 492234-1

Clip Part Number 492740-2



Backplane Cutout

Note: All part numbers are RoHS compliant.

Catalog 1307895
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UK: 31-73-624-6639

LIGHTRAY MPX System Interconnects (Continued)

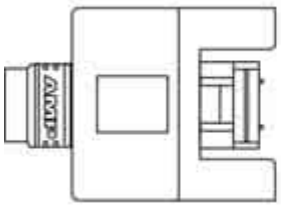
Backplane Housings and Adapters (Continued)

System Card Housing — Simplex

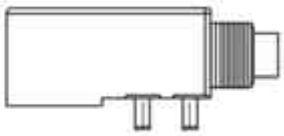
Product Facts

- Holds one standard or low loss LIGHTRAY MPX connector
- Simple press-fit mounting — no hardware needed
- Unique latching provides positive retention when card is unmated
- Space daughtercard mounting hole patterns no closer than 20.38 mm
- All daughtercard mounting holes must be within 0.1 mm diameter true position of nominal from daughtercard datum to assure proper mating
- Mates to 492739-1

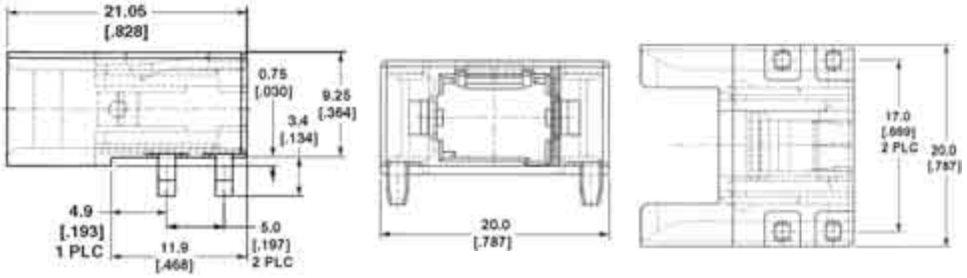
Part Number 492234-1



Top View



Side View



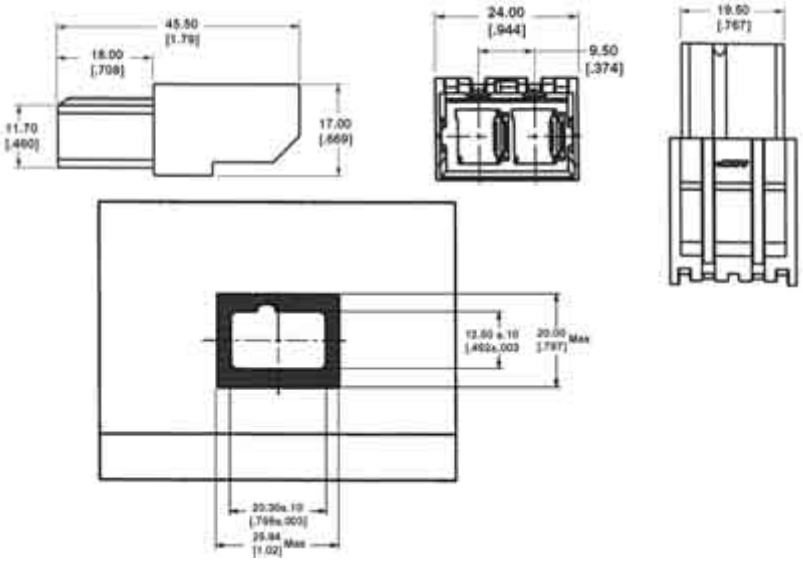
Daughtercard Housing Spacing

Backplane Housing — Duplex

Product Facts

- Holds two standard or low loss LIGHTRAY MPX connectors
- Optional self actuated laser safety shutter
- Up to 48 fibers simultaneously mated and managed
- Mates to part number 1374491-1
- Used with clip part number 1278530-2 (next page)

Part Number 1374490-1 and 6374493-1 (with safety shutter)



Panel Cutout

Note: All part numbers are RoHS compliant.

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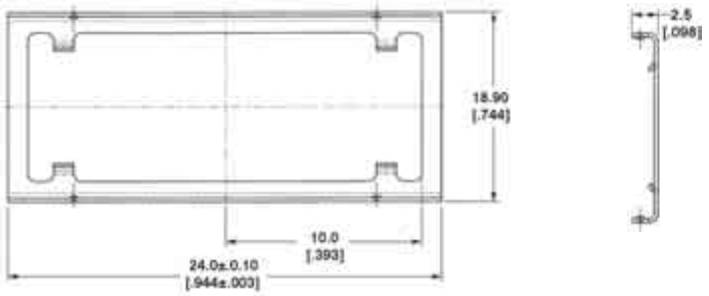
LIGHTRAY MPX System Interconnects (Continued)

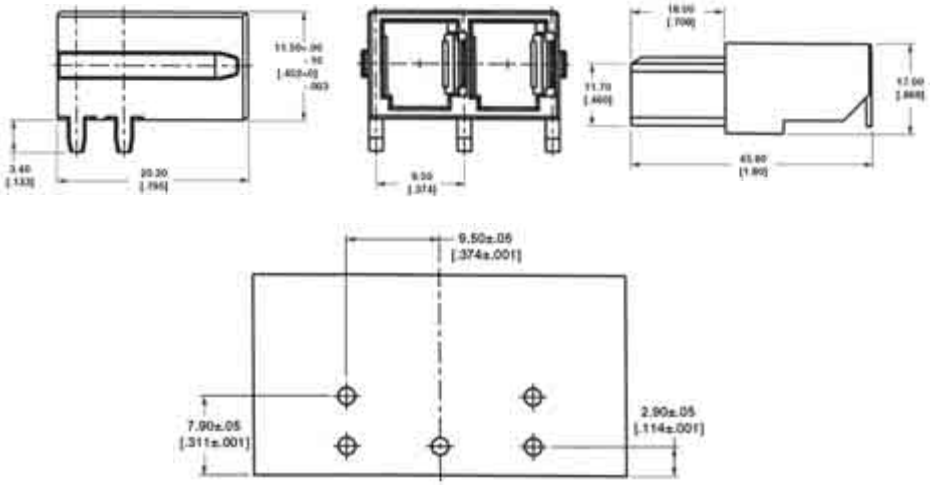
Backplane Housings and Adapters (Continued)

Clip Part Number 1278530-2, 1 x 2 Duplex



System Card Housing — Duplex

Part Number 1374491-1



Recommended Hole Pattern

Product Facts

- Holds two standard or low loss LIGHTRAY MPX connectors
- Up to 48 fibers simultaneously mated and managed
- Simple press-fit mounting, no hardware needed
- Unique latching provides positive retention when card is unmated
- Mates to part number 1374490-1

Note: All part numbers are RoHS compliant.

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LIGHTRAY MPX System Interconnects (Continued)

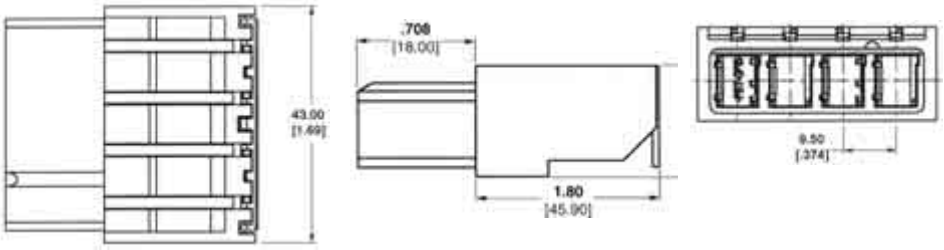
Backplane Housings and Adapters (Continued)

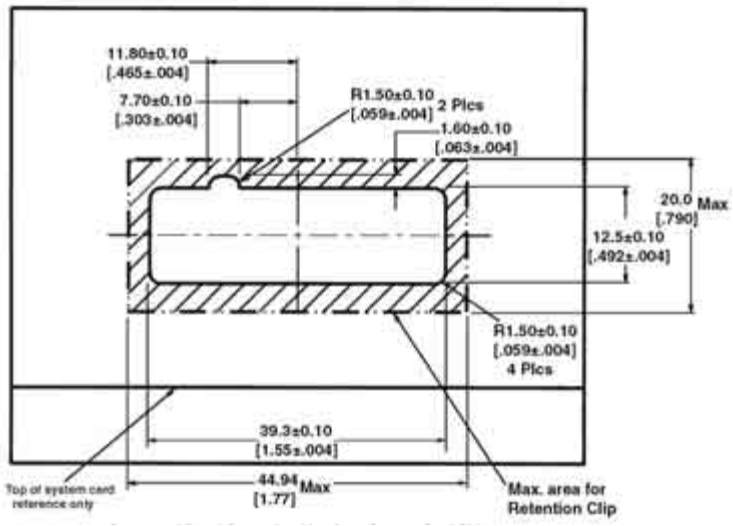
Backplane Housing — Quad

Product Facts

- Holds up to 4 standard or low loss LIGHTRAY MPX connectors
- Self actuated laser-safe shutter
- Up to 96 fibers simultaneously mated and managed
- Integral "tool safe" cable latching
- Mates to 1278391-1
- Used with clip 1278530-1

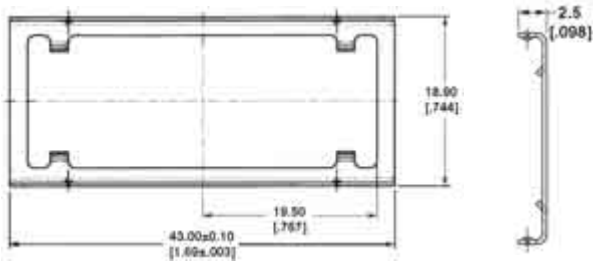
Part Number 6278529-1





Suggested Panel Cutout Looking from System Card Side

Clip Part Number 1278530-1, 1 x 4 Quad



Note: All part numbers are RoHS compliant.

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LIGHTRAY MPX System Interconnects (Continued)

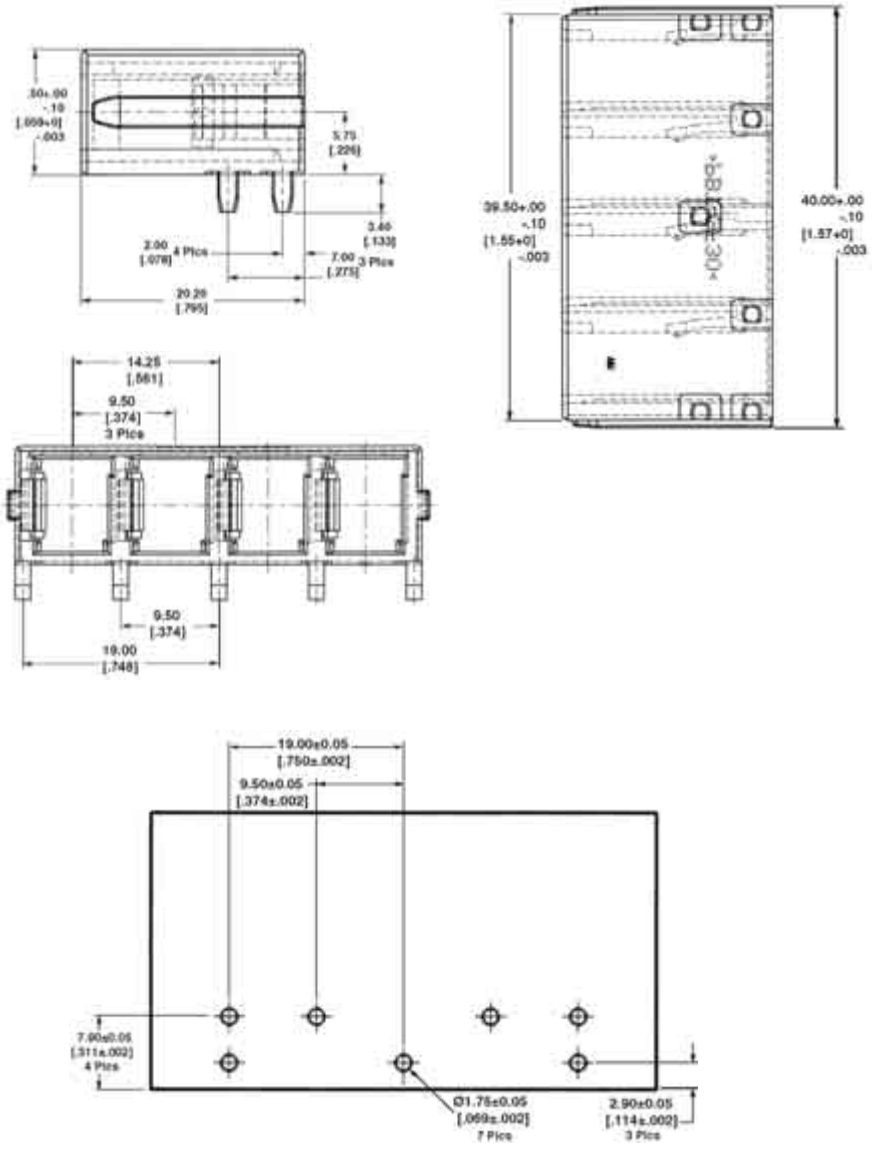
Backplane Housings and Adapters (Continued)

System Card Housing — Quad

Product Facts

- Holds 4 standard or low loss LIGHTRAY MPX connectors
- Up to 96 fibers simultaneously mated and managed
- Simple press-fit mounting — no hardware needed
- Unique latching provides positive retention when card is unmated
- Mates to 6278529-1

Part Number 1278391-1



Recommended Hole Pattern

Note: All part numbers are RoHS compliant.

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LIGHTRAY MPX System Interconnects (Continued)

Fanout Assemblies

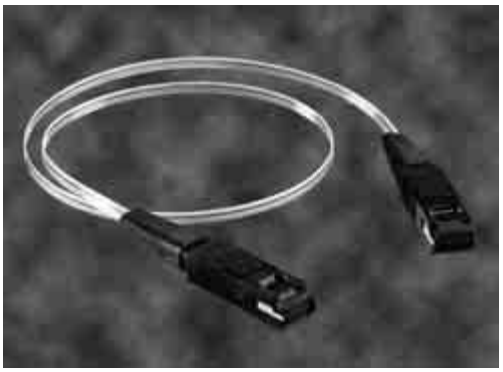
Product Facts

- Multimode 62.5/125 µm and 50/125 µm
- Singlemode 9 µm, 8° angle interface
- Color coded buffered fiber or LSZH (Low Smoke Zero Halogen) sheathed cable with breakout kit
- Male LIGHTRAY MPX connectors (with guide pins)
- 4, 8, 12, 16 and 24 fibers
- Custom lengths available
- Connector labeling to guide insertion
- SC, ST, FC or MT-RJ terminations available

Mini Trunk Assemblies

Product Facts

- Multimode 62.5/125 µm and 50/125 µm
- Singlemode 9 µm, 8° angle interface
- 250 µm bare ribbon and LSZH (Low Smoke Zero Halogen) sheathed ribbon cable available
- Female LIGHTRAY MPX connectors (without guide pins)
- 4, 8, 12, 16 and 24 fibers
- Custom lengths available
- Connector labeling to guide insertion



Trunk Assemblies

Product Facts

- Multimode 62.5/125 µm and 50/125 µm
- Singlemode 9 µm, 8° angle interface
- Available with female LIGHTRAY MPX connectors (without guide pins) and/or male LIGHTRAY MPX connectors (with guide pins)
- SC, ST, FC or MT-RJ terminations available for hybrid configurations
- 4, 8 and 12 position ribbon fiber sub-units
- LSZH (Low Smoke Zero Halogen) sheathed cable (round construction)

- Internal/external cable
- Custom lengths available

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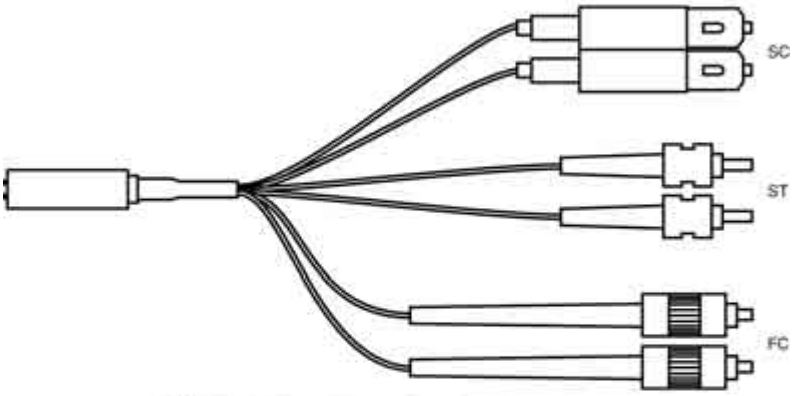
LIGHTRAY MPX System Interconnects (Continued)

System Card Assemblies

LIGHTRAY MPX to LIGHTRAY MPX Connector



LIGHTRAY MPX Connectors to Industry-Standard Connectors

LIGHTRAY MPX Connector Pigtail

Fanout Assembly Options

Product Facts

- **Multimode and singlemode**
- **Available with 900 µm buffered fiber, jacketed cable and ruggedized cable**
- **SC, ST, FC, MT-RJ, LC or other industry-standard connector terminations available**
- **Up to 24 fibers**
- **Custom lengths available**

Factory terminated assemblies are supplied custom built for each application. Assemblies are fully tested and can be offered with standard (multimode) or 8° angled (singlemode) end finishes to meet return loss needs.

The connectors accommodate various cable types, including ribbon and easy strip cable. The variety of configurations in cable assemblies makes it easy to transition from industry standard transceiver interfaces at one end and patch panels at the other. Factory terminated cables also speed system assembly, since the cables quickly and simply snap into place.

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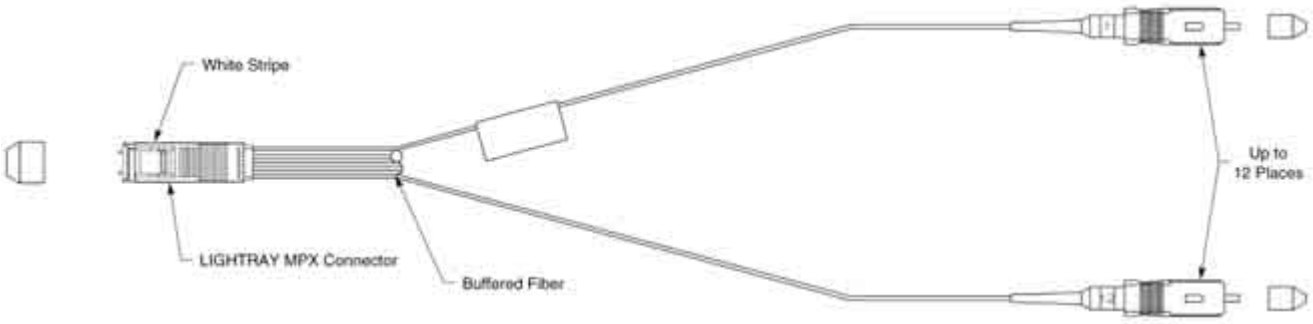
LIGHTRAY MPX System Interconnects (Continued)

System Card Assemblies
(Continued)

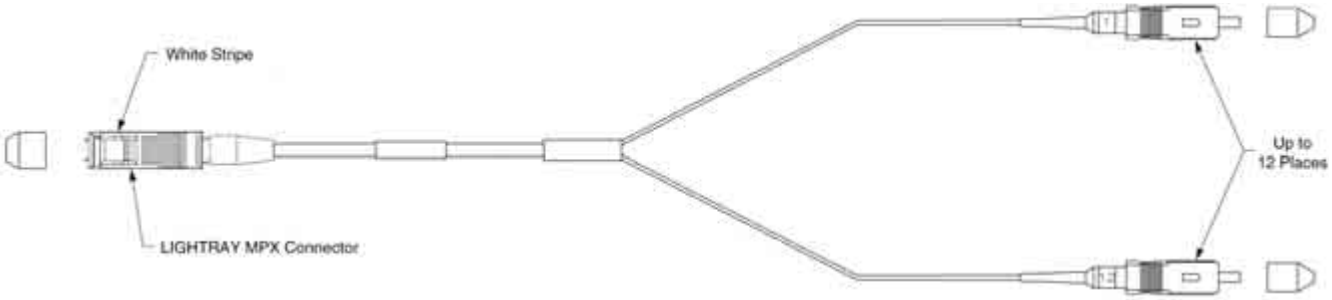
Optical Performance Characteristics

- **Mean insertion loss of 0.35 dB, with a maximum of 1.0 dB for both multimode and singlemode**
- **Minimum return loss 45 dB (8° APC interface for singlemode)**

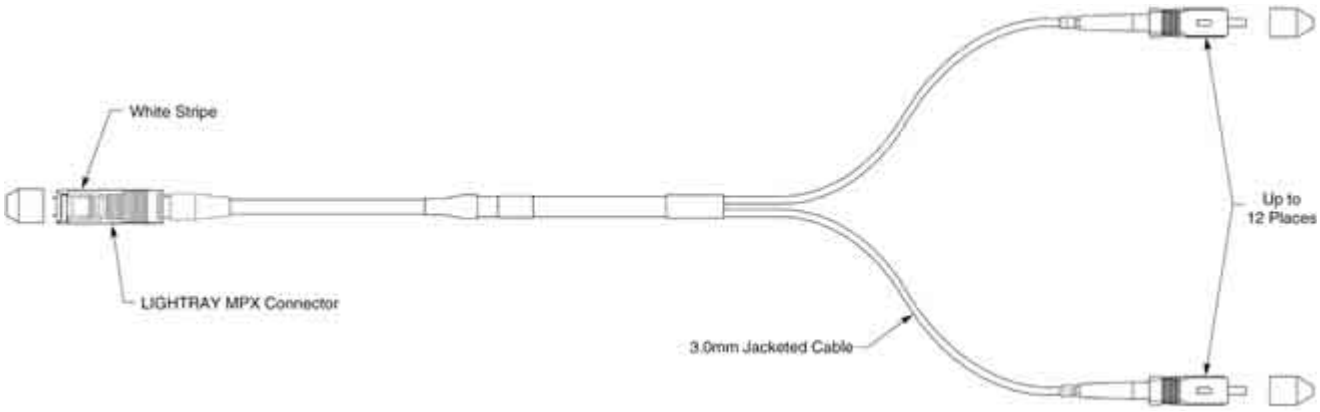
LIGHTRAY MPX Fanout Assembly — 900 µm Buffered Fiber



LIGHTRAY MPX Fanout Assembly — Jacketed Cable



LIGHTRAY MPX Fanout Assembly — Ruggedized Cable



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LIGHTRAY MPX System Interconnects (Continued)

Patch Cords

Cable Assembly Options

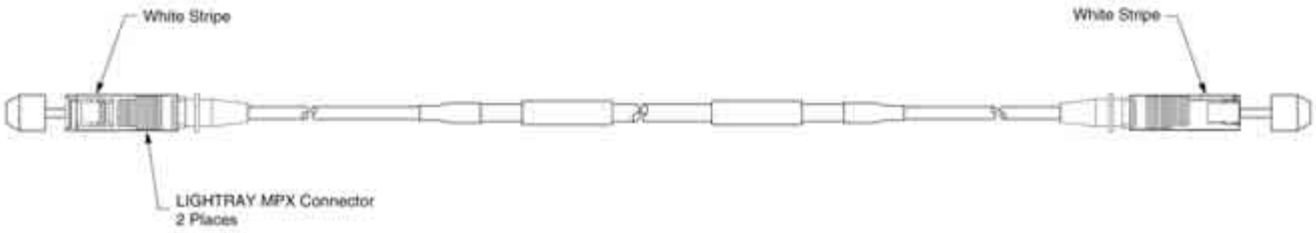
Product Facts

- **Multimode and singlemode**
- **Up to 24 fibers**
- **Ribbon cable, ruggedized or unruggedized cable construction**
- **Custom lengths available**

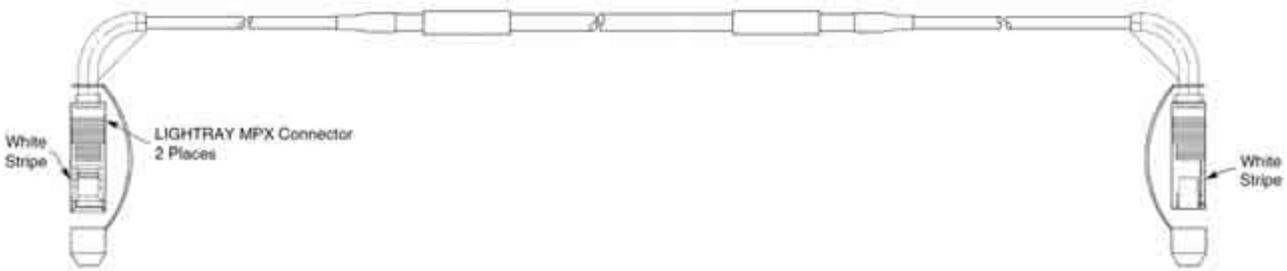
The LIGHTRAY MPX connector is pre-terminated onto fiber optic cable and pre-tested at the factory before being shipped. It can be used with either multimode or singlemode fiber and accepts a wide range of cable constructions, including ribbon fiber or "easy strip" fiber.

LIGHTRAY MPX to LIGHTRAY MPX Cable Assembly — Ribbon Fiber

LIGHTRAY MPX to LIGHTRAY MPX Cable Assembly — Jacketed Cable — Straight



LIGHTRAY MPX to LIGHTRAY MPX Cable Assembly — Jacketed Cable — Right Angle



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LIGHTRAY MPX System Interconnects (Continued)

LIGHTRAY MPX Cable Assemblies

Description	Part Number
Singlemode	
Standard Loss LIGHTRAY MPX Cable Assemblies	
4-fiber LIGHTRAY MPX (m) pigtail assy., 900 µm buffered fibers	6457078-X
8-fiber LIGHTRAY MPX (m) pigtail assy., bare ribbon	6374392-X
8-fiber LIGHTRAY MPX (f) pigtail assy., bare ribbon	6374539-X
8-fiber LIGHTRAY MPX (f) pigtail assy., 900 µm buffered fibers	6374537-X
8-fiber LIGHTRAY MPX (m) pigtail assy., 900 µm buffered fibers	6374538-X
8-fiber LIGHTRAY MPX (m) to LIGHTRAY MPX (m) assy., bare ribbon	6457394-X
8-fiber LIGHTRAY MPX (f) to LIGHTRAY MPX (f) assy., bare ribbon	6374600-X
8-fiber LIGHTRAY MPX (f) to LIGHTRAY MPX (f) assy., jacketed ribbon	6374887-X
12-fiber LIGHTRAY MPX (m) to LIGHTRAY MPX (m) assy., bare ribbon	6374743-X
12-fiber LIGHTRAY MPX (m) assy. to (12) SC, ruggedized	5492515-X
Low Loss LIGHTRAY MPX Cable Assemblies	
4-fiber LIGHTRAY MPX (m) to LIGHTRAY MPX (m) assy., bare ribbon	6457398-X
8-fiber LIGHTRAY MPX (m) pigtail assy., bare ribbon	6374448-X
8-fiber LIGHTRAY MPX (f) pigtail assy., bare ribbon	6374639-X
8-fiber LIGHTRAY MPX (m) pigtail assy., 900 µm buffered fibers	6457173-X
8-fiber LIGHTRAY MPX (f) pigtail assy., 900 µm buffered fibers	6457174-X
8-fiber LIGHTRAY MPX (m) to LIGHTRAY MPX (m) assy., bare ribbon	6374738-X

Note: All assemblies are custom built to customer's length specifications. Dash number indicates length. Please contact Tyco Electronics for proper dash number.

Note: All part numbers are RoHS compliant.

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LIGHTRAY MPX System Interconnects (Continued)

Dust Covers

Description		Part Number	
Simplex			
System Card	Board Side	1278201-1	
	Backplane Side	492578-1	
Backplane	Inside Cage	492575-1	(no insert)
		5492576-1	(with insert)
		503967-5	(removal tool)
	Back of Cage	5502871-1	
Duplex			
System Card	Board Side	5502871-1	
	Backplane Side	1374674-1	
Backplane	Inside Cage	6374671-1	
	Back of Rack	5502871-1	
Quad			
System Card	Board Side	5502871-1	
	Backplane Side	1374547-1	
Backplane	Inside Cage	6374548-1	
	Back of Rack	5502871-1	
Bulkhead		5502871-1	
Cable		492577-1	(without strap)
		492577-2	(with strap)

Cleaning Kit

Product Facts

- **2 re-useable cleaning kit assemblies**
- **2 LIGHTRAY MPX bulkhead adapters**
- **2 LIGHTRAY MPX backplane housings**
- **1 pack of 24 cleaning tool inserts (can be ordered separately)**

Description	Part Number
LIGHTRAY MPX Cleaning Kit	1278498-1
Cleaning Inserts (24/pack)	1457019-3

Connector Microscope Adapters

Product Facts

- **Designed specifically for the LIGHTRAY MPX Connector**
- **Fits in standard Tyco Electronics' microscope Part Number 1754767-1**
- **200 x power**

Description	Part Number*
Microscope Adapter	1828834-1
Microscope Adapter (angled)	1828835-1

* Coupling adapter Part Number 1985041-1 required.

Note: All part numbers are RoHS compliant.

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LIGHTRAY MPX System Interconnects (Continued)

Tooling and Accessories

Simplex Backplane Housing Tooling

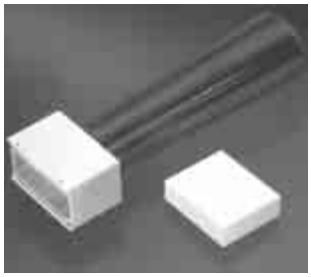
Part Number	Description
492356-3	System Card Mounting (Kit)
492356-2	Backplane Mounting (Kit)
492356-1	System Card & Backplane Mounting (Kits)
492493-1	Backplane Connector Side — Connector Support
1278315-1	Retention Clip Tool (Molded Plastic)
492578-1	Dust Cover — System Card Connector
5492576-1	Dust Cover — Backplane Connector Mating Connector Side (System Card Side)
503967-5	Dust Cover Removal Tool — Backplane (System Card Side)
5502871-1	Dust Cover — Backplane Connector Cable Side[1]
492740-2	Retention Clip

[1] Dust cover shown is flush mount. Same part with finger tabs is 1374678-1.

Duplex Backplane Housing Tooling

Part Number	Description
(Customer Supplied)[2]	System Card Seating Tool (Flat Rock on Housing)
(Customer Supplied)[2]	System Card Support Tool (Clearance for Attachment Posts)
1278944-2	Backplane Connector Side — Connector Support
1278945-4	Retention Clip Tool (with Handle)
1374674-1	Dust Cover — System Card Connector
6374671-1	Dust Cover — Backplane Connector Mating Connector Side (System Card Side)
503967-5	Dust Cover Removal Tool — Backplane (System Card Side)
5502871-1	Dust Cover — Backplane Connector Cable Side[1]
1278530-2	Retention Clip

[1] Dust cover shown is flush mount. Same part with finger tabs is 1374678-1.
[2] System card tooling is "customer supplied" — suggested detail is defined in application specifications (contact Tyco Electronics for availability).



Quad Backplane Housing Tooling

Part Number	Description
(Customer Supplied)[2]	System Card Seating Tool (Flat Rock on Housing)
(Customer Supplied)[2]	System Card Support Tool (Clearance for Attachment Posts)
1278944-1	Backplane Connector Side — Connector Support
1278945-2	Retention Clip Tool (with Handle)
1374547-1	Dust Cover — System Card Connector
6374548-1	Dust Cover — Backplane Connector Mating Connector Side (System Card Side)
503967-5	Dust Cover Removal Tool — Backplane (System Card Side)
5502871-1	Dust Cover — Backplane Connector Cable Side[1]
1278530-1	Retention Clip

[1] Dust cover shown is flush mount. Same part with finger tabs is 1374678-1.
[2] System card tooling is "customer supplied" — suggested detail is defined in application specifications (contact Tyco Electronics for availability).

Note: All part numbers are RoHS compliant.

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South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 31-73-624-6639

Engineering Notes

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Table of Contents

Fiber Management, Packaged Solutions, Sub Systems & Laser Process

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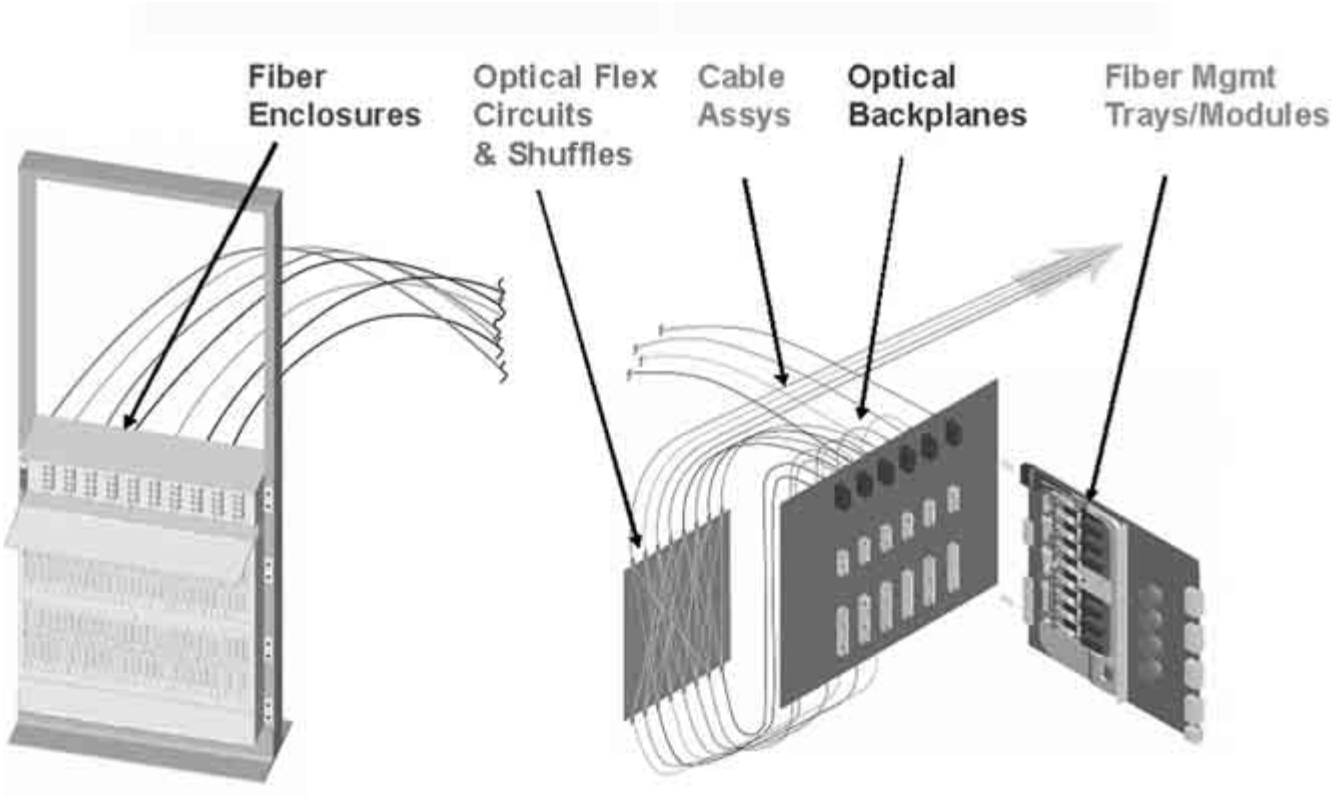
Fiber Management Systems



Tyco Electronics' Fiber Optics Business Unit is recognized globally as a leader in Fiber Optics Interconnects. We also offer a complete line of integrated Packaged Solutions to meet most complex design challenges. Working directly with us, our designers can offer solutions that help reduce your time to market, simplify your manufacturing, and work with you so that your design requirements are met. We offer complete solutions to a variety of fiber management challenges.

The products in this Fiber Management and Packaged Solutions section are custom designed products, specific to our customers' applications. Please contact your local Tyco Electronics' Sales Representative for design assistance.

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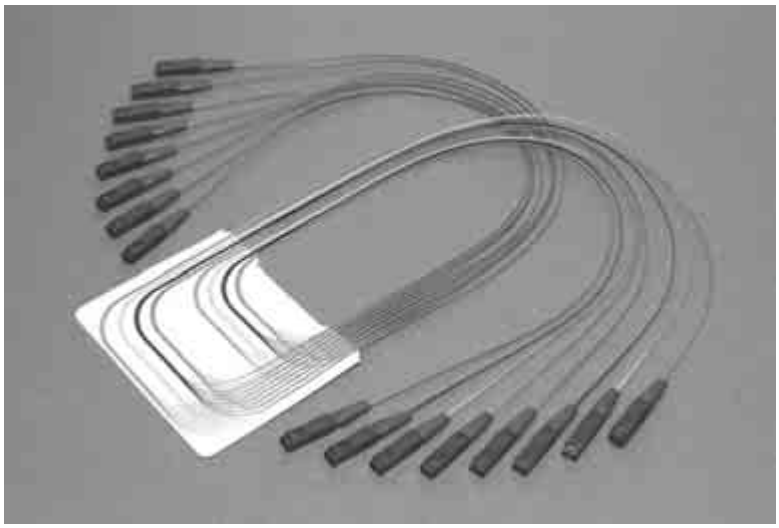
LIGHTRAY OFX Optical Fiber Circuit Assemblies

Product Facts

- **Singlemode and multimode product range**
- **Available in a range of symmetrical and asymmetrical designs**
- **Can be designed with a choice of protective film substrates (including V0 rated materials)**
- **Pre-terminated with LIGHTRAY MPX Connector or any other industry standard connector**
- **Operates over a broad temperature range**
- **Fiber optic equivalent of a copper circuit**
- **Allows fiber "crossovers" without performance penalty**
- **Very low insertion loss**
- **Flat or cylindrical design**

Benefits

- **Easy routing and management of thousands of fibers on a single substrate**
- **Fully optical cross connect**
- **Lightweight**
- **Saves valuable space**
- **Significantly contributes to skew compensation**
- **Easy to install**
- **Offers flexibility in systems design**



Tyco Electronics' LIGHTRAY OFX optical fiber circuit offers an innovative and flexible solution to precision fiber management in high fiber count applications.

Designed using the latest fiber optic technology, the LIGHTRAY OFX optical circuit consists of a number of optical fibers, which are encapsulated in thin protective film substrates. As well as saving valuable space in equipment and equipment racks, the LIGHTRAY OFX circuit also provides optimum optical performance.

Optical fiber "crossovers" allow the optical fibers to be routed in both regular and irregular designs. Fibers are routed on 250 µm center lines allowing LIGHTRAY MPX connectors to be terminated on the fiber tails.

Key Applications

High Fiber Count Applications in Optical Transmission and Switching Equipment, in Equipment Racks or on the Printed Circuit Board.

- **Provides a complete optical backplane, interconnecting multiple daughtercards**
- **Complex rack harnesses**
- **Simplified intra-rack fiber management and cabling**
- **Serves as a complete optical cross connect (64 x 64 or 128 x 128) in less than 500 x 500 mm of valuable space**
- **Can be used for the interconnection of optoelectronic devices on the printed circuit board**

Optical Performance (singlemode)

Maximum Insertion Loss* (connector loss) — <0.1 dB max; <0.05 dB typical

Polarization Depending Loss — <0.1 dB

Mechanical Characteristics

Vibration (per IEC 61300-2-1) — 10-55Hz

Fiber Retention (per IEC 61300-2-4) — 44 N max.

Environmental Characteristics

Operating Temperature — -40°C to + 85°C

Storage Temperature — -40°C to + 85°C

Humidity — 95%

* final loss depending on connector types

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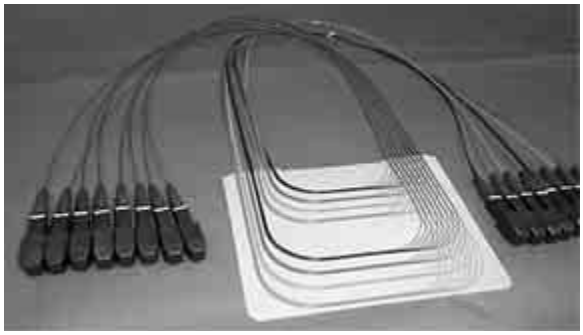
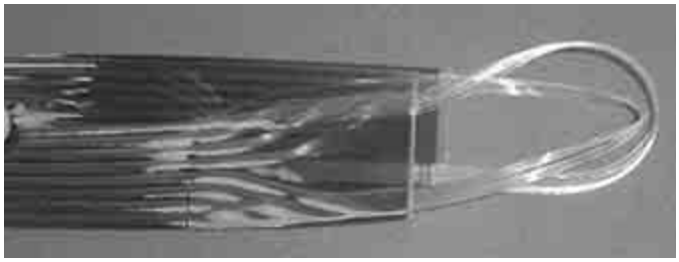
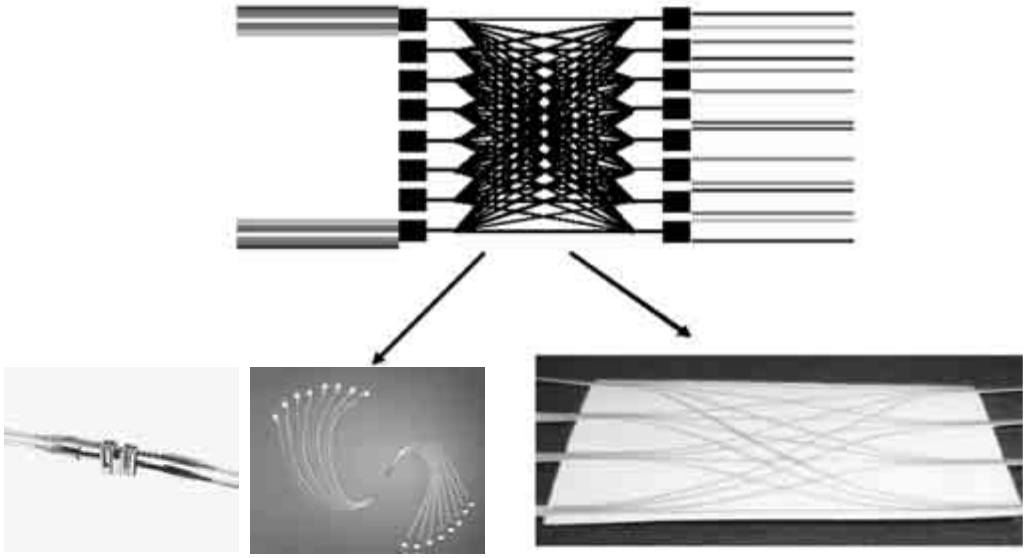
LIGHTRAY OFX Optical Fiber Circuit Assemblies (Continued)

Optical Flex Circuits & Shuffles





Optical Shuffle (Perfect)



Tyco Electronics' Optical Flex Circuits offer unique solutions that can greatly simplify fiber routing, just as the printed circuit board simplified electrical wiring. We offer a broad range of Optical Flex Circuit solutions, so that even the most complex routing challenges can be efficiently resolved:

- Standard ribbon or single fiber terminations
- Custom point-to-point routing done by Numerically Controlled (NC) machine
- Attachment to rigid carrier or copper backplane
- Low loss: < 0.05 typical
- Tube style "shuffles" for optimum density
- On board fiber management
- Stacked shuffles can be used as cross connects

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On Card Fiber Management

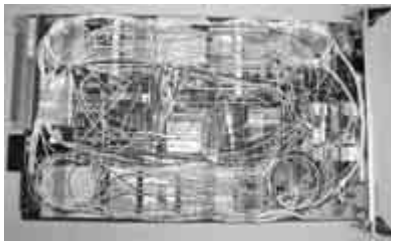
Product Facts

- Multimode or Singlemode
- Custom design
- 94-V0 rated materials

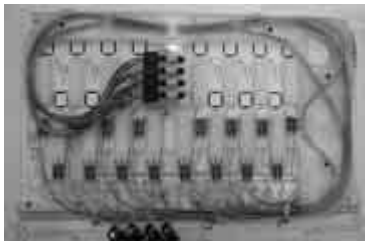
Benefits

- Easy management of on-board fibers
- Fiber protection and routing (allowing use of 250 micron fiber for added density)
- Pre-loaded and tested trays to facilitate manufacturing
- "Mezzanine" trays allow components to be mounted underneath the fiber tray — minimizing board real estate
- Splice management
- Maintaining minimum bend radius
- Eliminating long term performance degradation through "sag"
- Skew control

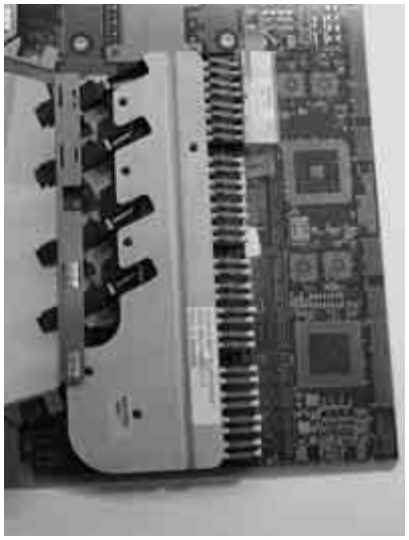
Before



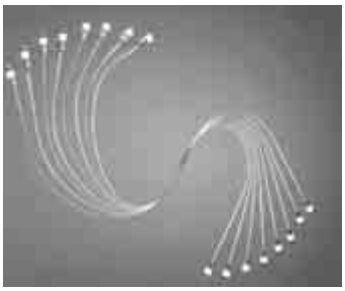
After



Thin modules designed to fit on your system card.



Plug and play — drop the module on your board and plug the connectors.



Non-planar circuits

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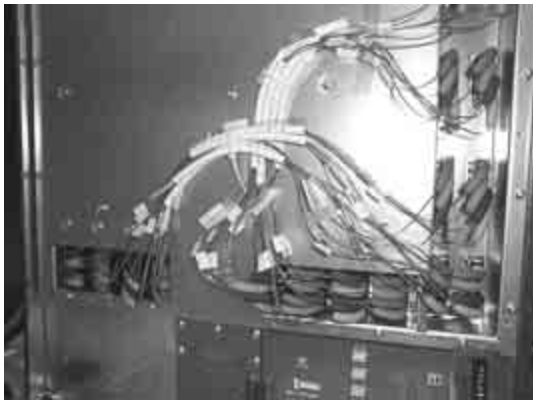
Optical Backplanes & Fiber Management Solutions

LIGHTRAY MPX Optical Backplane

Backside of Optical Backplane with Fiber Management

Fiber Management Solutions

Before



After

Customers' demands for scalability and adding optics functionality in the field can be satisfied with custom Optical Backplanes provided as complete modules by Tyco Electronics. Optical backplanes can be integrated with a variety of fiber management solutions to resolve most complex applications. Optical backplanes, using Tyco Electronics' LIGHTRAY MPX Interconnection System offers several significant benefits:

- Backplane connector float in all planes
- Proven and reliable MT technology
- Singlemode and multimode
- Up to 24 fibers per MT ferrule available
- High density: up to 96 fibers in 50 mm (using 24 fiber ferrule)
- Easily Upgradeable: start with all 12 fibers loaded in backplane cable and you can upgrade your system card from 4 to 8 to 12 fibers without changing the backplane cabling.
- Can be integrated with copper backplane, Optical Flex circuits, or specialized fiber management solutions

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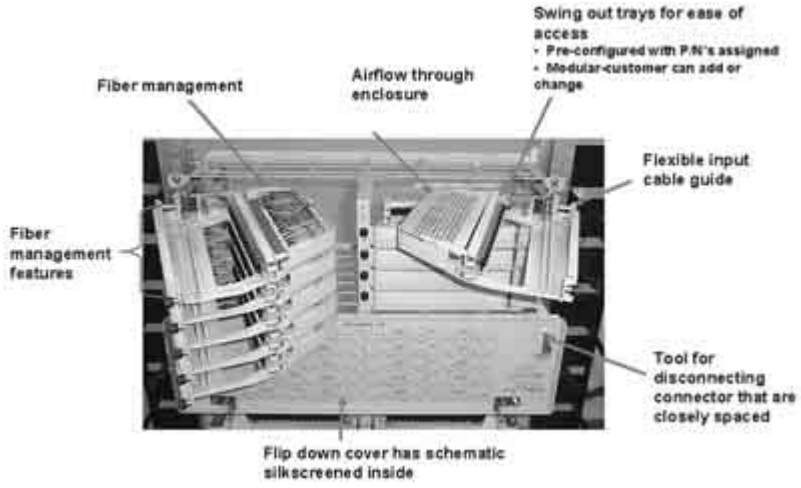
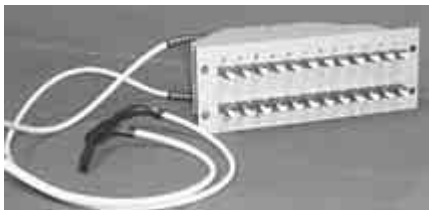
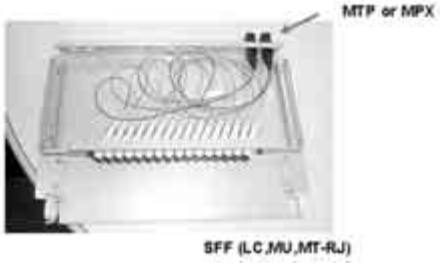
Enclosures and Customer Interface Panels







As customer interface panels and enclosures increase in fiber count and density, issues of fiber management, repairability, and scalability become increasingly complex. We offer complete solutions matched to the customers' individual program needs:

- High density, ease of access, flexibility
- Pre-loaded and tested cables
- Modular design approach for flexibility in I/O's needed, cable dress, and connector styles
- Accommodate airflow needs
- EMI Solutions

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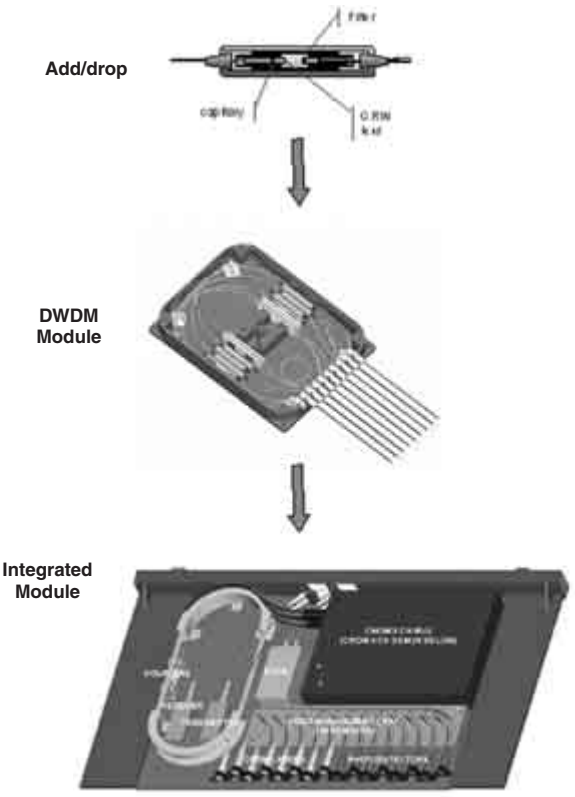
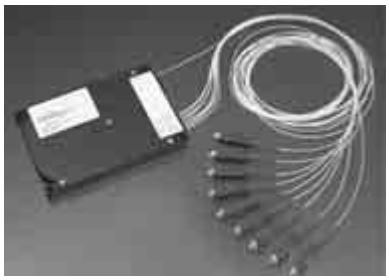
xWDM & Integrated Modules



Standard Modules



Custom Module

Tyco Electronics' offers standard and custom completed xWDM modules. Capabilities include:

- Work with increasingly tighter specifications and higher density requirements
- 100 & 200 Ghz, C, Passband, AWG's, etc.
- Modules 100% tested with SWS
  - Small increments and narrow spectral width for optical performance over the entire operating range
  - Tested for PDL as well as IL
- Offer expertise in packaging and testing of add-drops. Will also source newest technology outside
- Custom and high density packaging can be provided, standard cassettes also available
- Will integrate into higher value add modules.

See Attenuator, WDM's and Switches, Section 5, pages 185 & 186 for details on WDM products.

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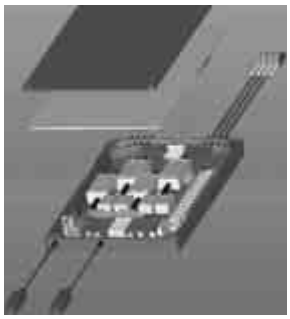
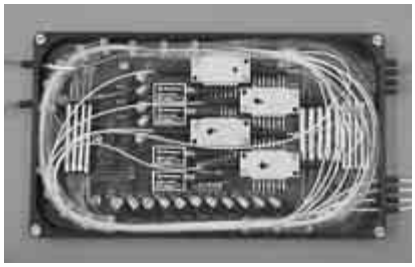
Advanced Optical Modules

Concept to Production



Concept

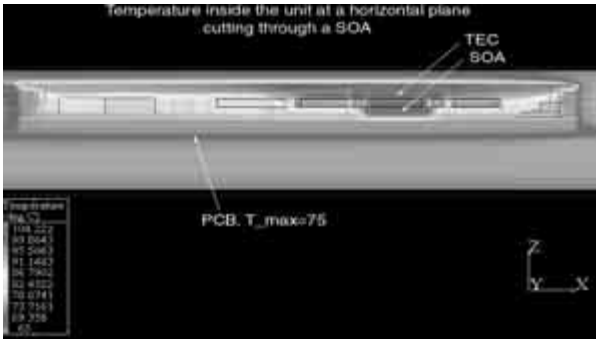


-to-

Production

Tyco Electronics offers fully designed optical modules for individual customer requirements. Modules can offer complete integration of passive, active, and electrical components. Solutions can incorporate:

- Amplifier technologies: EDFA, SOA, EDWA
- Protection circuitry
- Line balancing/equalization
- Amplification for transparent networks
- Fiber management, component placement/ profiles and impact on thermals
- Design for manufacturability
- Reliability



Design for Manufacturability

From complex optics to packaging designs for specialized customer needs including:

- Electrical and optical design
- Scale to manufacturing; optimize costs and benefits of discrete vs integrated solutions
- Custom packaging of standard devices and increase density
- Integrated E/O components
- Module layouts optimized to meet GR-63
- Standard modeling tools (Pro-E)
- Component layout to maintain bend radius compliance
- Design for repair-ability

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Advanced Optical Modules (Continued)

Turn-Key Solutions

Full turn-key packaging services offering customer print builds of electro-optic modules:

- Daughter card mezzanine modules
- Advanced fiber management solutions
- Channel and line cards
- Inventory management — customer, vendor

Advance Optical Module Qualification Capabilities

Tyco Electronics will qualify modules to various Industry Standards:

- GR326 singlemode connectors
- GR1435 MT connectors
- GR1380 splice integrity
- GR1209 branching components
- GR1221 reliability assurance
- GR63 environmental integrity for network systems
- Custom testing for module performance parameters

ATCA Splitter Cassette

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Rack Mountable C-Band EDFA

Rack Mountable C-band EDFA
(-48VDC, RS-232 interface)

Product Facts

- **High gain**
- **Low power consumption**
- **Low noise figure**
- **Integrated control electronics**
- **Input and output Isolation**
- **Rack mountable**
- **Alarms and monitoring capability**
- **RS-232 interface**
- **PC controllable software**
- **Fully customizable design**
- **CB certificate**
- **UL Recognized**
- **CSA Certified, File No. 237388**

237388

Applications

- **Long haul and metro applications**
- **Pre-amplifier, inline amplifier, or booster amplifier**
- **R&D laboratory environments with PC control software**
- **Single-channel amplification**
- **Narrow band amplification**

The Tyco Electronics Rack Mountable C-Band EDFA is a low-cost, compact, and flexible optical amplifier solution optimized for a variety of applications within your network systems or subsystems. The high gain profile and low noise figure enables its use as a pre, inline, or booster amplifier for metro and long haul applications. It is capable of signal gains up to 35 dB with a noise figure of less than 4.5 dB and total output power of up to +10 dBm for inline applications (+17 dBm for booster applications).

This heightened performance EDFA is available as a cooled inline amplifier with powerful integrated control electronics or a gain block with input and/or output monitoring capabilities to meet your needs. The control electronics design includes a built-in laser and TEC driver circuit with alarms and monitors. The RS-232 electrical interface module and software bundle is designed for control, ease of use, integration, and/or evaluation in your laboratory.

Tyco Electronics is customer driven and is capable of delivering low-cost, customized functionality for your application. Tyco Electronics can quickly optimize the EDFA design to meet your specific optical, electrical, mechanical and environmental requirements.

Product Specifications

Optical Parameters

Wavelength Range — 1530 nm min.; 1570 nm max.

Input Power Range* — -30 dBm min.; -10 dBm max.

Gain Range** — 25 dB typ.; 35 dB max.

Output Power (@ -10 dBm input power)*** — 10 dBm max.

Output Power Stability**** — 0.2 dB typ.

Polarization Dependent Gain — 0.3 dB max.

Polarization Mode Dispersion — 0.4 ps max.

Noise Figure — 4.5 dB typ.

Electrical Parameters

Pump Laser Diode Threshold Current — 35 mA max.

Pump Laser Diode Forward Current — 250 mA max.

Pump Laser Diode Reverse Voltage — 2 V max.

Monitor Photodiode Forward Current — 0.1 mA min; 3 mA max.

Monitor Photodiode Reverse Voltage — 20 V max.

EDFA Power Consumption @ 25 °C — 3.5 W max.

EDFA Power Consumption @ 70 °C — 10 W max.

Supply Voltage — -38 VDC min.; -48 VDC typ.; -60 VDC max.

Environmental Parameters

Operating Temperature Range — -5 °C min.; 70 °C max.

Storage Temperature Range — -40 °C min.; 85 °C max.

Operating Humidity — 5% RH min.; 95% RH max.

* Booster amplifier range is -10 to +3 dBm
** Typical gain range of 15 to 25 dB
*** Absolute maximum output power is +15 dBm
**** Across the operating temperature range of -5 °C – 70 °C

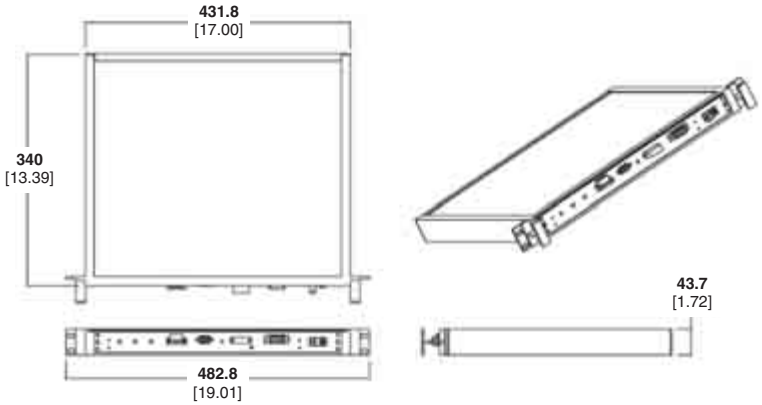

Figure 1: Mechanical Details of the Rack Mountable C-band EDFA

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Rack Mountable C-Band EDFA (Continued)

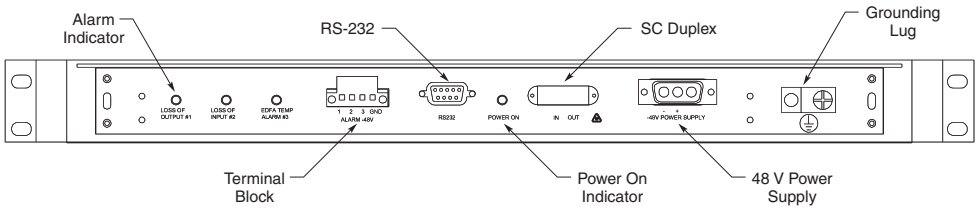

Figure 2: Front view of the Rack Mountable C-band EDFA

Alarm Indicators	Description
1	Loss of input power (- 20 dBm or below: red color)
2	Loss of output power (+ 5 dBm or lower: red color)
3	Temperature alarm (70 °C or higher: red color)
Terminal Block Position	**Description**
1	Loss of input power (- 20 dBm or below: - 48 VDC signal)
2	Loss of output power (+ 5 dBm or lower: - 48 VDC signal)
3	Temperature alarm (70 °C or higher: - 48 VDC signal)
4	GND

RS-232	Description
DB9 Connector	Serial communication
Power On Indicator	**Description**
Power ON	LED: green color
SC Duplex Adapter	**Description**
IN	Optical Input Power
OUT	Optical Output Power
48 V Power Supply Connector	**Description**
48 VDC	48 VDC Power Supply
Grounding Screw	Grounding Screw

EDFA Block Diagram — Options

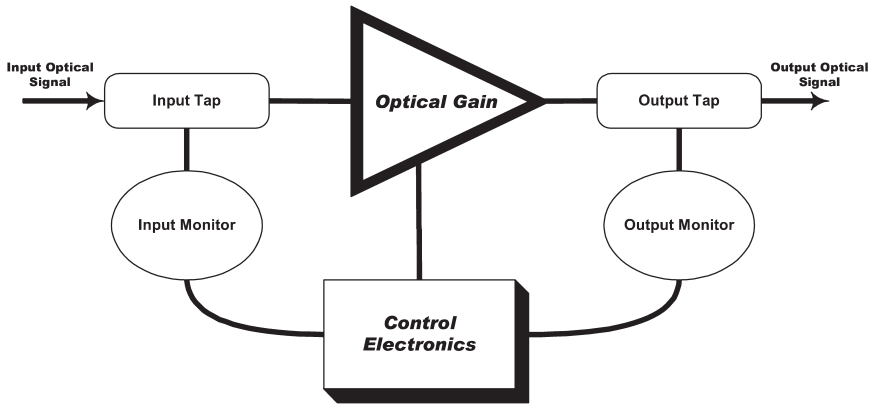

Figure 3: Block Diagram for Inline Amplifier Configuration

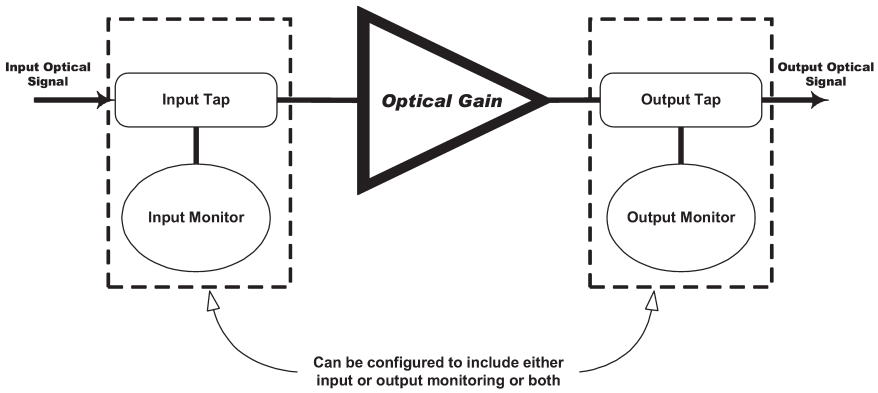

Figure 4: Block Diagram for Gain Block Configuration

Catalog 1307895
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South America: 55-11-2103-6000
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UK: 31-73-624-6639

Rack Mountable C-Band EDFA (Continued)

Control and Monitoring Software

Product Facts

- Software Laser ON / OFF alarm indicator
- Software alarm indicator for input power lower than - 20 dBm
- Software alarm indicator for output power lower than +5 dBm
- EDFA Laser Current Start-up Value
- EDFA Password Protection

Rack Mountable C-band EDFA with Control Electronics and Software for Monitoring and Control

Part Number 1919520-1 Module, EDFA with RS-232 Interface and -48 V Power Supply, 200 mW

Part Number 1919520-2 Module, EDFA with RS-232 Interface and -48 V Power Supply, 250 mW

For specific ordering information or for additional product detail, please contact your Tyco Electronics Sales Representative.

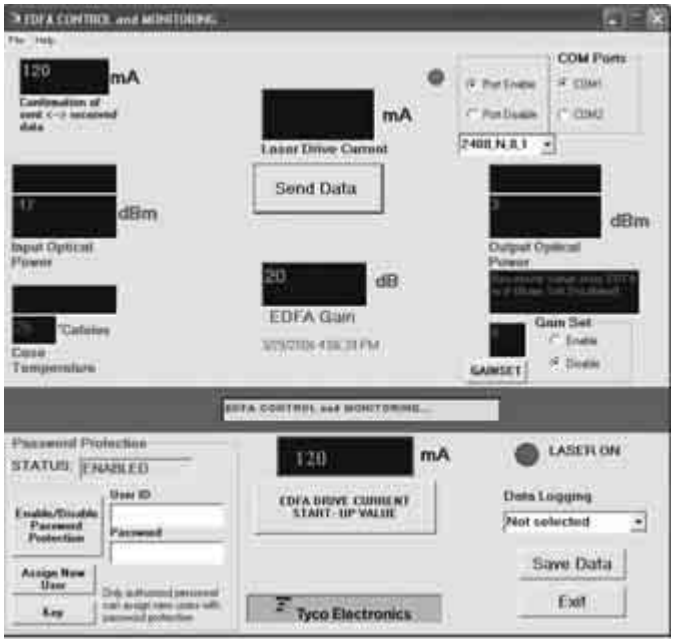

Figure 5: GUI of the EDFA Control and Monitoring Software Bundle

The Tyco Electronics Rack Mountable C-Band EDFA with an RS-232 control interface and software control package allows the flexibility to experiment with various module parameters through a PC. Parameters such as EDFA laser drive current input and output power levels, and EDFA gain are all dynamically configurable which allows the user to choose appropriate drive currents to achieve the desired output power.

The Tyco Electronics C-Band EDFA module with integrated control electronics and software is an all-in-one solution that offers all the above functionality within one GUI window via the RS-232 interface module to a PC.

Drive current information, input and output optical power, EDFA gain, and module temperature are all displayed continuously and updated dynamically. The data is calibrated to offer precise readings of the input and output power. Data can also be stored to a text file (*.txt) if desired in the following format:

"***"
"Date and Time: 6/2/2005 4:25:59 PM"
Laser Drive current = 120 mA
Optical Input Power = -17 dBm
Optical Output Power = 3 dBm
EDFA Gain = 20 dB
Case Temperature = 25 °C
"Laser Drive current (Start-up value) = 50 mA"
"***"

A convenient windows based help file (EDFA.HLP) is also included with the distributed software and contains all the information about the EDFA Software functionality and features.

Note: All part numbers are RoHS compliant.

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Single-Channel C-Band EDFA

Product Facts

- High gain
- Low power consumption
- Low noise figure
- Integrated control electronics
- Input & output isolation
- Compact size (90 x 70 x 12 mm)
- Alarms & monitoring capability (TTL logic)
- PC controllable software
- Fully customizable design
- Designed for compliance to GR-1312-CORE

Applications

- Long Haul & Metro
- Pre-amplifier, Inline amplifier, or Booster amplifier
- Narrow Band Amplification
- R&D Laboratory
- Environments with PC Control Software

Tyco Electronics' Single-Channel C-Band EDFA is a low-cost, compact, and flexible optical amplifier solution optimized for a variety of applications within your network systems or subsystems. The high gain profile and low noise figure enables its use as a Pre, Inline, or Booster amplifier for metro and long haul applications. It is capable of signal gains up to 35 dBm with a noise figure of less than 4.5 dB and total output power of up to +10 dBm for inline applications 9 +17 dBm for booster applications.

This heightened performance EDFA is available as a cooled inline amplifier with powerful integrated control electronics or a gain block with input and/or output monitoring capabilities to meet your needs. The control electronics design includes a built-in laser and TEC drive circuit with alarms and monitors. The optional RS-232 electrical interface module and included software bundle are designed for control, ease of use, and/or evaluation in your laboratory.

Tyco Electronics is customer driven and is capable of delivering low-cost, customized functionality for your application. Tyco Electronics can quickly optimize the EDFA design to meet your specific optical, electrical, mechanical and environmental requirements. (Rack mount options available)

Product Specifications

Optical Parameters	Min	Typical	Max	Unit
Wavelength Range	1530		1570	nm
Input Power Range*	-30		-10	dBm
Gain Range**		25	35	dB
Output power (@ -10 dBm input power)§			10	dBm
Output Power Stability §§		0.2		dB
Polarization Dependent Gain			0.3	dB
Polarization Mode Dispersion			0.4	ps
Noise Figure		4.5		dB

Electrical Parameters	Min	Typical	Max	Unit
Pump Laser Diode Threshold Current			35	mA
Pump Laser Diode Forward Current			250	mA
Pump Laser Diode Reverse Voltage			2	V
Monitor Photodiode Forward Current	0.1		3	mA
Monitor Photodiode Reverse Voltage			20	V
Power Consumption			3.5	W

Environmental Parameters	Min	Typical	Max	Unit
Operating Temperature Range	-5		70	°C
Storage Temperature Range	-40		85	°C
Operating Humidity	5		95	%RH

* Booster amplifier range is -10 to +3 dBm
** Typical gain range of 15 to 25 dBm
§ Absolute maximum output power is +17 dBm
§§ Across the operating temperature range of -5°C - 70°C

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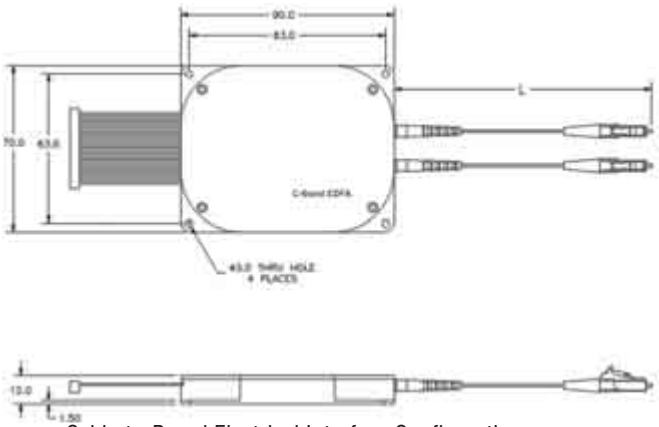
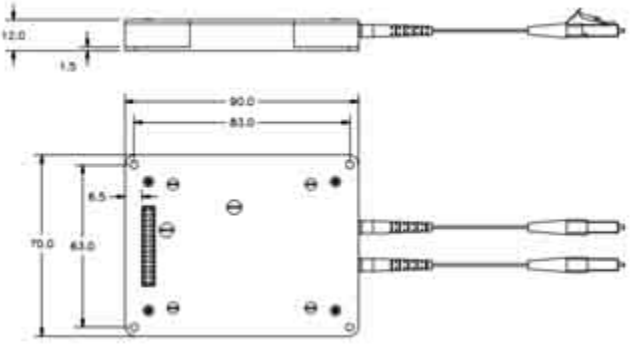
Single-Channel C-Band EDFA (Continued)

Mechanical Details



Cable-to-Board Electrical Interface Configuration



Embedded Electrical Interface Configuration

Pin	Description	Pin	Description	Pin	Description
1	5V	11	Pump Laser Bias Alarm	21	Reserved
2	5V	12	Reserved	22	Reserved
3	5V	13	Reserved	23	Set Gain
4	5V	14	Reserved	24	Reserved
5	Loss of Output Power Alarm	15	GND	25	TEC Disable
6	Loss of Input Power Alarm	16	Serial Input	26	Gain Set Acknowledge
7	Output Power Monitor	17	GND	27	Reserved
8	Input Power Monitor	18	GND	28	Reserved
9	Amplifier Disable	19	Amplifier and TEC disable	29	Serial Output
10	EDFA Module Temperature Alarm	20	GND	30	Reserved

EDFA Evaluation Kit - Controlling and Monitoring Software with PC Cable Interface:
1607030-1 ♦

EDFA C-Band Module

Part Number	Description
1607033-1 ♦	Embedded Elec. Interface, Gain Block, In and Out Monitor, Dual Isolation, LC, 0.5m fiber length, 2.0 mm fiber diameter
1607037-1 ♦	Embedded Elec. Interface, Controllable, In and Out Monitor, Dual Isolation, LC, 0.5m fiber length, 2.0 mm fiber diameter
1607035-1 ♦	Cable-to-Board, Gain Block, In and Out Monitor, Dual Isolation, LC, 0.5m fiber length, 2.0 mm fiber diameter
1607039-1 ♦	Cable-to-Board, Controllable, In and Out Monitor, Dual Isolation, LC, 0.5m fiber length, 2.0 mm fiber diameter
1607033-2 ♦	Embedded Elec. Interface, Gain Block, In and Out Monitor, Dual Isolation, SC, 0.5m fiber length, 2.0 mm fiber diameter
1607035-2 ♦	Embedded Elec. Interface, Controllable, In and Out Monitor, Dual Isolation, SC, 0.5m fiber length, 2.0 mm fiber diameter
1607039-2 ♦	Cable-to-Cable, Controllable, In and Out Monitor, Dual Isolation, SC, 0.5m fiber length, 2.0 mm fiber diameter

The Tyco Electronics C-Band EDFA can be bundled with an RS-232 control interface and software control package allowing the customer the flexibility to experiment with various module parameters through a PC. Parameters such as EDFA / laser drive currents, input and output power levels, and EDFA gain are all dynamically configurable and this allows the user to choose appropriate drive currents to achieve the desired output power.

The Tyco Electronics C-Band EDFA module with integrated control electronics and software is an all-in-one solution that offers all the above functionality within one GUI window via the RS-232 interface module to a PC. Drive current information, input and output optical power, EDFA gain, and module temperature are all displayed continuously and updated dynamically.

Data can be stored in a text file (* .txt) in the following format::

"Date and Time: 11/29/2002 4:25:59 PM"
Laser Drive current = 120 mA
Optical Input Power = -15 dBm
Optical Output Power = 10 dBm
EDFA Gain = 25 dB
Case Temperature = 25°C

Note: Part Numbers are RoHS compliant except: ♦ Indicates non-RoHS compliant.

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C-Band Gain Flattened EDFA

Product Facts

- **Gain Flatness over wide band**
- **Low power consumption**
- **Low noise figure**
- **Integrated control electronics**
- **Input & output isolation**
- **Compact size (90 x 70 x 12 mm)**
- **Alarms & monitoring capability (TTL logic)**
- **PC controllable software**
- **Fully customizable design**
- **Designed for compliance to GR-1312-CORE**

Applications

- **Long Haul & DWDM Metro**
- **Inline amplifier**
- **R&D Laboratory Environments with PC Control Software**
- **Single-Channel Amplification**
- **Narrow Band Amplification**

Tyco Electronics' C-Band Gain Flattened EDFA is a low-cost, compact, and flexible optical amplifier solution optimized for a variety of applications within your network systems or subsystems. The low cost, optimized gain flatness and high gain profile enables its use as an inline amplifier for DWDM metro and long haul applications. It is capable of signal gains up to 25 dB with a typical gain flatness of +/- 0.5 dB and total output power of up to +13 dBm.

This heightened performance EDFA is available as a cooled inline amplifier with powerful integrated control electronics or a gain block with input and/or output monitoring capabilities to meet your needs. The control electronics design includes a built-in laser and TEC drive circuit with alarms and monitors. The optional RS-232 electrical interface module and included software bundle are designed for control, ease of use, integration, and/or evaluation in your laboratory.

Tyco Electronics is customer driven and is capable of delivering low-cost, customized functionality for your application. Tyco Electronics can quickly optimize the EDFA design to meet your specific optical, electrical, mechanical and environmental requirements. (Rack mount options available.)

Product Specifications

Optical Parameters	Min	Typical	Max	Unit
Wavelength Range	1530		1563	nm
Input Power Range	-17		-3	dBm
Gain Range		20	25	dB
Output power @ -3 dBm input power			13	dBm
Gain Flatness		+/-0.5		dB
Gain Flatness (Maximum) Peak to Peak at Pin = -12 dBm			0.98	dB
Polarization Dependent Gain			0.3	dB
Polarization Mode Dispersion			0.4	ps
Optical Stability		0.2		dB
Noise Figure		4.5		dB

Electrical Parameters	Min	Typical	Max	Unit
Pump Laser Diode Threshold Current			35	mA
Pump Laser Diode Forward Current		190	220	mA
Pump Laser Diode Reverse Voltage			2	V
Monitor Photodiode Forward Current	0.1		3	mA
Monitor Photodiode Reverse Voltage			20	V
Power Consumption			3.5	W

Environmental Parameters	Min	Typical	Max	Unit
Operating Temperature Range	-5		70	°C
Storage Temperature Range	-40		85	°C
Operating Humidity	5		95	%RH

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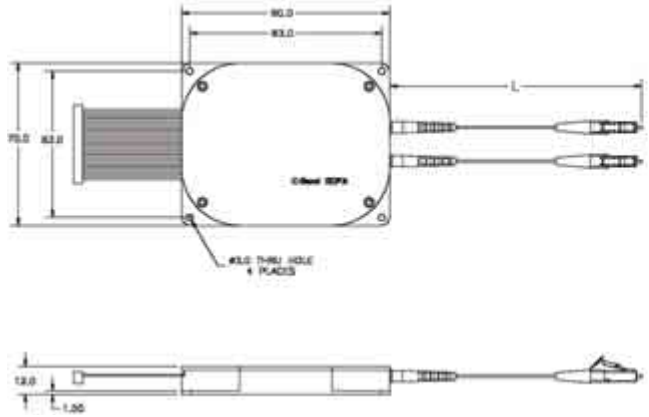
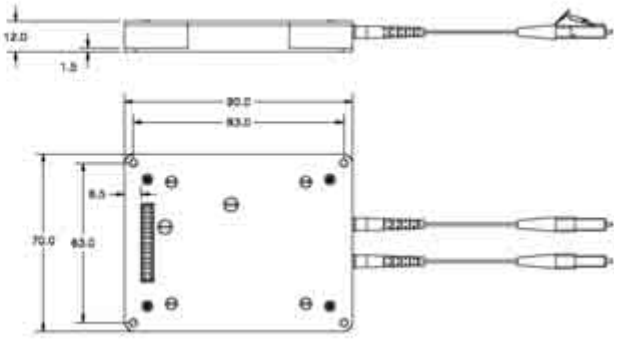
Japan: 81-44-844-8013
UK: 31-73-624-6639

C-Band Gain Flattened EDFA (Continued)

Mechanical Details



Cable-to-Board Electrical Interface Configuration



Embedded Electrical Interface Configuration

Pin	Description	Pin	Description	Pin	Description
1	5V	11	Pump Laser Bias Alarm	21	Reserved
2	5V	12	Reserved	22	Reserved
3	5V	13	Reserved	23	Set Gain
4	5V	14	Reserved	24	Reserved
5	Loss of Output Power Alarm	15	GND	25	TEC Disable
6	Loss of Input Power Alarm	16	Serial Input	26	Gain Set Acknowledge
7	Output Power Monitor	17	GND	27	Reserved
8	Input Power Monitor	18	GND	28	Reserved
9	Amplifier Disable	19	Amplifier and TEC disable	29	Serial Output
10	EDFA Module Temperature Alarm	20	GND	30	Reserved

EDFA Evaluation Kit - Controlling and Monitoring Software with PC Cable Interface:
1607030-1 ♦

C-Band Gain Flattened EDFA Module

Part Number	Description
1607300-1 ♦	Gain-Flattened EDFA, Cable-to-Board Elec. Interface, Controllable, LC, 2.0 mm fiber diam., 0.5m fiber length
1607300-2 ♦	Gain-Flattened EDFA, Cable-to-Board Elec. Interface, Controllable, SC, 2.0 mm fiber diam., 0.5m fiber length
1607334-1 ♦	Gain-Flattened EDFA, Embedded Elec. Interface, Controllable, LC, 2.0 mm fiber diam., 0.5m fiber length
1607334-2 ♦	Gain-Flattened EDFA, Embedded Elec. Interface, Controllable, SC, 2.0 mm fiber diam., 0.5m fiber length
1607335-1 ♦	Gain-Flattened EDFA, Cable-to-Board Elec. Interface, Gain Block, LC, 2.0 mm fiber diam., 0.5m fiber length
1607335-2 ♦	Gain-Flattened EDFA, Cable-to-Board Elec. Interface, Gain Block, SC, 2.0 mm fiber diam., 0.5m fiber length
1607336-1 ♦	Gain-Flattened EDFA, Embedded Elec. Interface, Gain Block, LC, 2.0 mm fiber diam., 0.5m fiber length
1607336-2 ♦	Gain-Flattened EDFA, Embedded Elec. Interface, Gain Block, SC, 2.0 mm fiber diam., 0.5m fiber length

The Tyco Electronics C-Band EDFA can be bundled with an RS-232 control interface and software control package allowing the customer the flexibility to experiment with various module parameters through a PC. Parameters such as EDFA / laser drive currents, input and output power levels, and EDFA gain are all dynamically configurable and this allows the user to choose appropriate drive currents to achieve the desired output power.

The Tyco Electronics C-Band EDFA module with integrated control electronics and software is an all-in-one solution that offers all the above functionality within one GUI window via the RS-232 interface module to a PC. Drive current information, input and output optical power, EDFA gain, and module temperature are all displayed continuously and updated dynamically.

Data can be stored in a text file (* .txt) in the following format::

"Date and Time: 11/29/2002 4:25:59 PM"
Laser Drive current = 120 mA
Optical Input Power = -15 dBm
Optical Output Power = 10 dBm
EDFA Gain = 25 dB
Case Temperature = 25°C

Note: Part Numbers are RoHS compliant except: ♦ Indicates non-RoHS compliant.

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1310 Amplifier Module

Product Facts

- High optical gain at 1310 nm
- Low power consumption
- High saturation output power
- Wide optical bandwidth
- Input & output isolation
- Data rate transparent
- Compact size
- Designed for compliance to GR-1312-CORE

Applications

- Metro and Access
- Applications
- Booster or Pre-Amplifier
- CATV
- CWDM

Tyco Electronics' 1310 Optical Amplifier is a low-cost, compact, and flexible optical amplifier solution optimized for a variety of applications within your network systems or subsystems. The high gain profile and low noise figure enables its use as a pre-amplifier or booster amplifier for metro and access applications. It is capable of signal gains up to 25 dB with a noise figure of less than 7 dB.

This heightened performance 1310 optical amplifier is available as a cooled pre-amplifier, with integrated control electronics allowing automatic and dynamic gain control or as a gain block with input and/or output monitoring capabilities. The integrated control electronics includes a build-in TEC and laser driver to allow the amplifier module to begin amplification the instant power is applied to the module to a pre-determined gain setting. The integrated control electronics will also maintain a pre-determined output power or gain setting regardless of input power stability.

Tyco Electronics is customer driven and is capable of delivering low-cost, customized functionality for your application. Tyco Electronics can quickly optimize the 1310 amplifier design to meet your specific optical, electrical, mechanical and environmental requirements. (Rack mount options available.)

Product Specifications

Optical Parameters	Min	Typical	Max	Unit
Wavelength Range	1280		1340	nm
3 dB Optical Bandwidth (booster)*	55			dBm
Fiber to Fiber Gain (booster)§	10			dB
Gain Ripple		0.5	0.8	dB
Saturation Output Power**	8	9		dBm
Polarization Dependent Gain		0.5	1.0	dB
Noise Figure		6	7	dB

Electrical Parameters	Min	Typical	Max	Unit
SOA Forward Current			250	mA
SOA Reverse Voltage			2.5	V
TEC Drive Current			1.5	A
TEC Drive Voltage			3.6	V
Power Consumption			2.5	W

Environmental Parameters	Min	Typical	Max	Unit
Operating Temperature Range	-5		70	°C
Storage Temperature Range	-40		85	°C
Operating Humidity	5		95	%RH

* For pre-amplifier the minimum optical bandwidth is 45 nm
§ For pre-amplifier the minimum fiber-to-fiber gain is +18 dB
** Output saturation power is defined as the power for which the gain is 3 dB compressed from its maximum value

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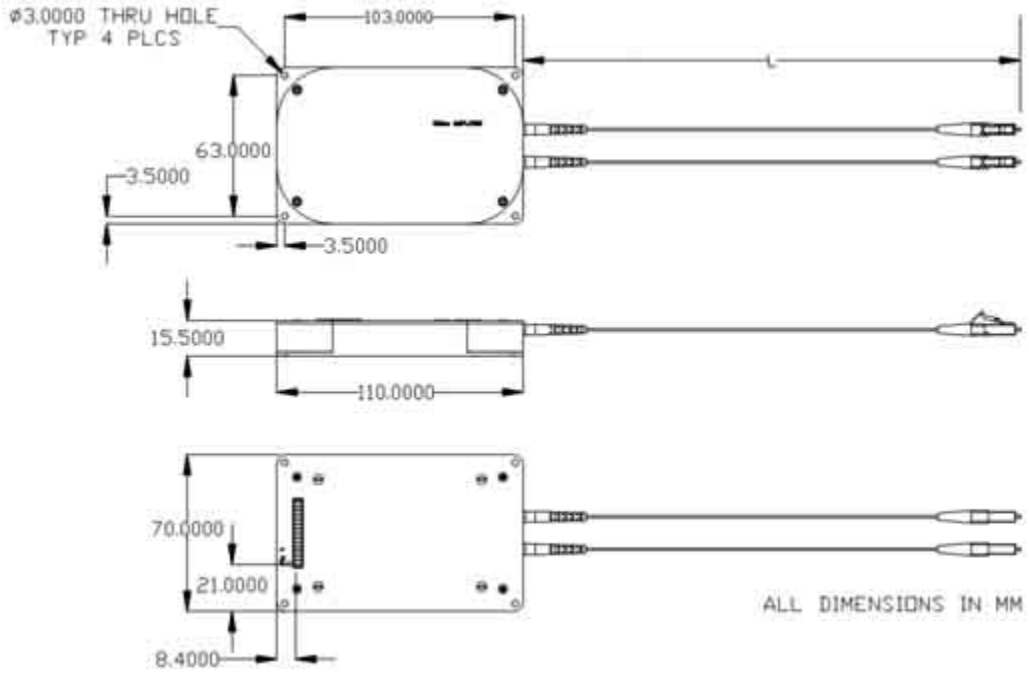
1310 Amplifier Module (Continued)

Mechanical Details



Embedded Electrical Interface Configuration

Pin	Description	Pin	Description	Pin	Description
1	Input Pin Diode Anode	11	Reserved	21	Reserved
2	Input Pin Diode Cathode	12	Reserved	22	SOA -
3	Reserved	13	TEC +	23	+ 5 V
4	Input Pin Diode Ground	14	TEC +	24	+ 5 V
5	Reserved	15	Reserved	25	Reserved
6	Output Pin Diode Anode	16	Reserved	26	Reserved
7	Reserved	17	TEC -	27	Reserved
8	Output Pin Diode Cathode	18	TEC -	28	Thermistor
9	Reserved	19	Reserved	29	Reserved
10	Output Pin Diode Ground	20	SOA +	30	Thermistor

1310 Amplifier Module

Part Number	Description
1607290-1♦	1310 Booster Amplifier, LC, 2.0 mm fiber diam., 0.5m fiber length
1607290-2♦	1310 Booster Amplifier, SC, 2.0 mm fiber diam., 0.5m fiber length
1607291-1♦	1310 Pre-Amplifier, LC, 2.0 mm fiber diam., 0.5m fiber length
1607291-2♦	1310 Pre-Amplifier, SC, 2.0 mm fiber diam., 0.5m fiber length
1607292-1♦	1310 Smart Amplifier, LC, 2.0 mm fiber diam., 0.5m fiber length
1607292-2♦	1310 Smart Amplifier, SC, 2.0 mm fiber diam., 0.5m fiber length

Note: Part Numbers are RoHS compliant except: ♦ Indicates non-RoHS compliant.

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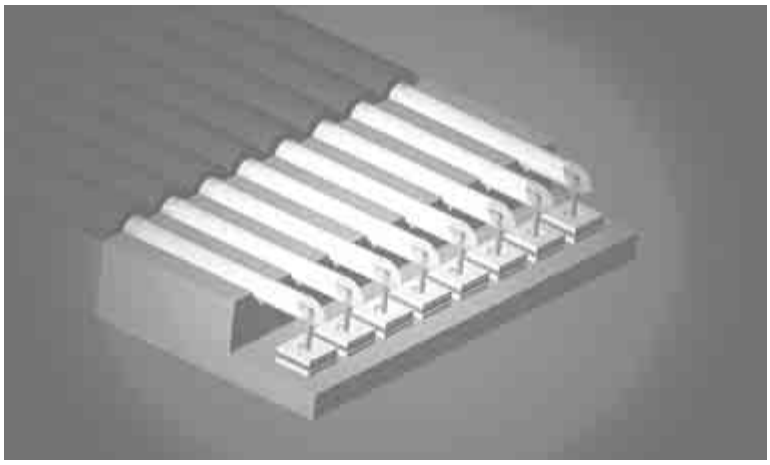
Laser Process for FIBERSHAPE Products

FIBERSHAPE Products by Laser Processing

Product Facts

- **Complete range of cleave angles**
- **Ultra high precision measured @ core region (< ±0.5 degrees)**
- **Capable of providing domed end finish**
- **Angle cleaving of ribbons (incl. sawtooth)**
- **Angled cleaves in 0, 8, 45 and other custom degrees**
- **Ultra precise length control of cleaved endface versus ref. plane**
- **Capable of cleaving close to fiber coating**
- **High volume industrial solution for the opto-electronic industry**



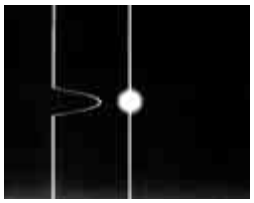
90 Degree VCSEL Array Interface

Tyco Electronics laser process, which uses the power of a laser beam to prepare fiber endfaces for termination in connector assemblies and optical devices, provides a state-of-the-art solution for opto electronic device pigtailing including:

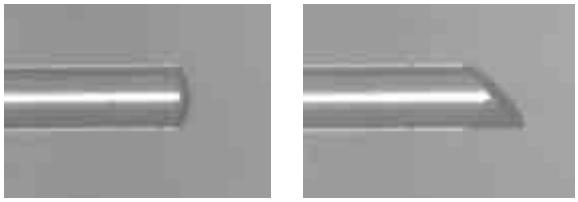
- Planar OEICs
- Array Devices
- Discrete Laser/LED/Receiver package
- Detachable pigtails

This ultra high precision process enables very compact designs and perpendicular fiber coupling.

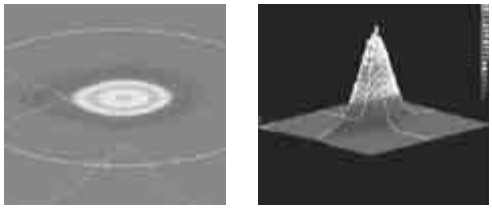
Please contact your local sales representative or Tyco Electronics for more in-depth product information.



Near Field Scan @ 1310 nm



Straight and Angled Cleave



Wedge Fiber Characteristics

Laser Processed Subassembly

Catalog 1307895
Revised 11-07

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Premises Wiring & Telecom Outside Plant Products

Catalog 1307895
Revised 11-07

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AMP NETCONNECT Premises Wiring Products

Premises Wiring Products

SECURE Optical Fiber Connectivity: LC SECURE, MPO SECURE, and MT-RJ SECURE Products
Section 1 and 2 - Pages 8-13, 105, 106, 108, and 121

No Epoxy, No Polish Terminations (SC, LC, MT-RJ and ST)
Section 1 and 2 - Pages 9, 13, 53-59, 73, 74, and 77

MPO High-Density Fiber Connectivity, Cables and Cassettes

AMPTRAC Connectivity Management System

Complete Product Line for Fiber Networking

25 Year System Warranty

The AMP NETCONNECT Business Unit of Tyco Electronics offers a total fiber optic solution including fiber optic cable, connectivity and hardware; as well as network management through the new AMPTRAC Connectivity Management System. Please contact AMP NETCONNECT for more information on product and system warranties.

Additionally, the AMP NETCONNECT Business Unit offers a complete line of copper networking products, including shielded and unshielded twisted pair cabling solutions, cables, connectivity, cable assemblies, patch panels and faceplates.

For more information on any Premises Wiring products or systems, visit www.ampnetconnect.com or contact customer service at 1-800-553-0938.

The AMP NETCONNECT full line catalog (#82164) is also available through customer services or from your local Tyco Electronics sales representative.

Catalog 1307895
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www.tycoelectronics.com

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Telecom Outside Plant Products

Telecom Outside Plant Products

The Telecom Outside Plant Business Unit of Tyco Electronics has been created from a family of companies with a long tradition of making quality components for telecommunications networks and providing innovative solutions for their evolving needs.

The FIST, FOSC, and FibrBoss families of modular fiber management products enhance the design, implementation, and maintenance of fiberoptic networks, from the central office/exchange to the customer's premises.

For more information on Telecom Outside Plant products or services, visit http://www.telecomosp.com or contact customer service at 1-888-557-8901.

A full line Telecom Outside Plant Catalog (#1654451) is also available through customer services or your local Tyco Electronics sales representative.

Catalog 1307895
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Engineering Notes

Catalog 1307895
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Attenuators, WDM's, and Switches

Catalog 1307895
Revised 11-07

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Attenuators

Singlemode Build Out Attenuators

Product Facts

- A range of fixed attenuation values. Standard values of 1 through 20 and 25 dB
- UPC and APC offer Excellent Return Loss
- LC, SC, FC, ST, and D4 styles
- Attenuation is wavelength independent and polarization insensitive
- Low PDL
- Low modal noise
- High reliability
- Very low reflectance
- Vibration resistant
- Dual Window and Broadband Bandpass
- End face geometry per GR-326
- Designed to comply with Telcordia GR-910

Applications

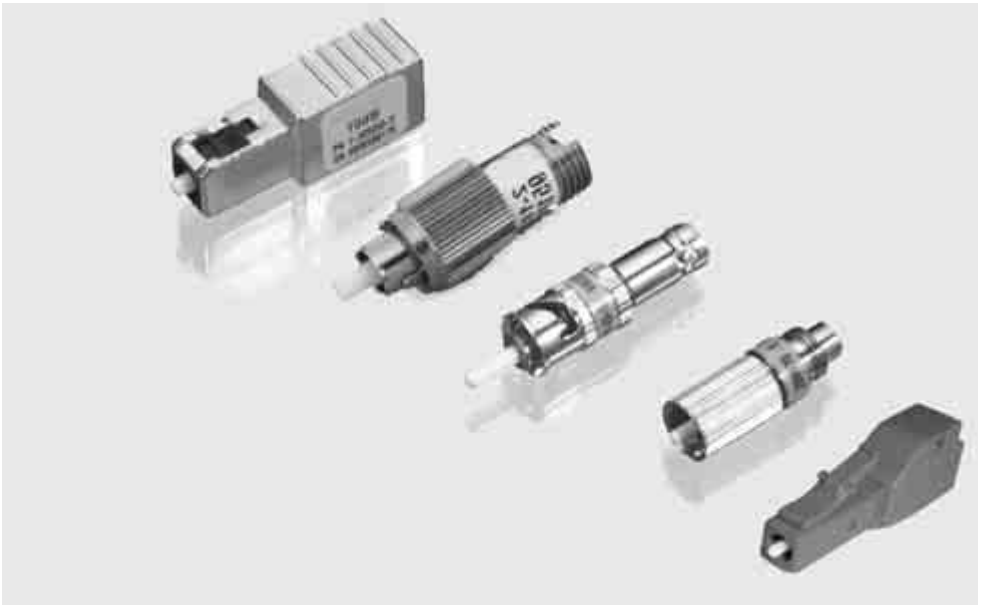
- Power leveling in DWDM transmission systems
- Test and Measurement
- Power attenuation at the receiver

Available Collateral

- Test reports qualifying product to Telcordia GR-910 (2004)
- Application Specification 114-1129
- Installation/Cleaning Instruction Sheet 408-8895
- Product Specification 108-2099

http://www.tycoelectronics.com/documents

- Customer Drawings



Tyco Electronics high performance Build Out Attenuators utilize a unique all-fiber construction to absorb the optical signal.

By employing a Tyco Electronics' technology, the design minimizes reflectance, attenuation tolerance, and PDL while maximizing reliability, environmental stability, and power handling. There are no filters, air gaps, or core mismatches.

Customizable Features

- Attenuation tolerance
- Attenuation values in 1 dB increments
- Labeling
- Kitting/Packaging
- Wavelength Dependent Loss
- Reflectance:
  - UPC to -55 dB max.
  - APC to -65 dB max.

Specifications

Attenuation Values —
1-20 dB and 25 dB (Fixed)

Reflectance —
≤ -55 and -65 dB for UPC and APC polish, respectively

Operating Temperature —
-40°C to +75°C

Vibration Resistance —
< 0.1 x attenuation

Catalog 1307895
Revised 11-07

www.tycoelectronics.com

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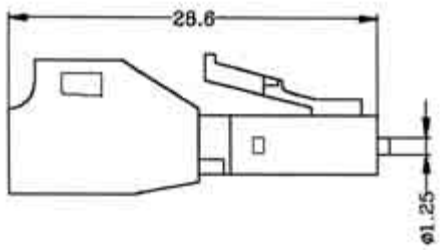
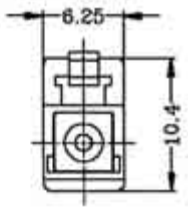
Attenuators (Continued)

Singlemode
LC Attenuators, Build Out Style, Fixed Value

LC/UPC





Note: Additional attenuation values available upon request.

Broadband Bandpass Attenuators Operating Wavelength 1260-1360 nm & 1430-1625 nm

Attenuation (dB)	Part Number
1	1693560-1
2	1693560-2
3	1693560-3
4	1693560-4
5	1693560-5
6	1693560-6
7	1693560-7
8	1693560-8
9	1693560-9
10	1-1693560-0
11	1-1693560-1
12	1-1693560-2
13	1-1693560-3
14	1-1693560-4
15	1-1693560-5
16	1-1693560-6
17	1-1693560-7
18	1-1693560-8
19	1-1693560-9
20	2-1693560-0
25	2-1693560-5

Note: Attenuation Tolerance, Ambient
≥ 5 dB: ± .10 x nominal attenuation value
< 5 dB: ± 0.50 dB
Reflectance ≤ -55 dB

Note: All part numbers are RoHS compliant.

Catalog 1307895
Revised 11-07

www.tycoelectronics.com

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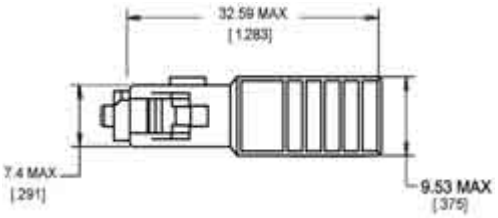
Attenuators (Continued)

Singlemode
SC Attenuators, Build Out
Style, Fixed Value

SC/UPC



Note: Additional attenuation values available upon request.

Dual Window Attenuators
Operating Wavelength
1310/1550 nm ±25 nm

Attenuation (dB)	Part Number
1	5209943-1
2	5209943-2
3	5209943-3
4	5209943-4
5	5209943-5
6	5209943-6
7	5209943-7
8	5209943-8
9	5209943-9
10	1-5209943-0
11	1-5209943-1
12	1-5209943-2
13	1-5209943-3
14	1-5209943-4
15	1-5209943-5
16	1-5209943-6
17	1-5209943-7
18	1-5209943-8
19	1-5209943-9
20	2-5209943-0
25	2-5209943-5

Note: Attenuation Tolerance, Ambient
≥ 5 dB: ± .10 x nominal attenuation value
< 5 dB: ± 0.50 dB
0 dB: 0.50 dB max
Reflectance ≤ -55 dB

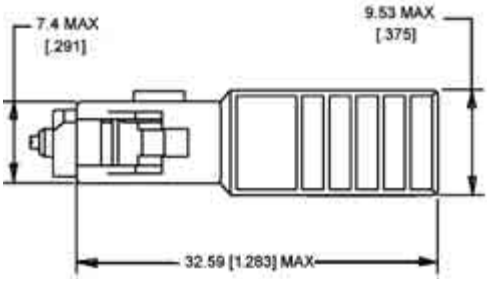
Broadband Bandpass Attenuators
Operating Wavelength
1260-1360 nm & 1430-1625 nm

Attenuation (dB)	Part Number
1	5209250-1
2	5209250-2
3	5209250-3
4	5209250-4
5	5209250-5
6	5209250-6
7	5209250-7
8	5209250-8
9	5209250-9
10	1-5209250-0
11	1-5209250-1
12	1-5209250-2
13	1-5209250-3
14	1-5209250-4
15	1-5209250-5
16	1-5209250-6
17	1-5209250-7
18	1-5209250-8
19	1-5209250-9
20	2-5209250-0
25	2-5209250-5

Note: Attenuation Tolerance, Ambient
≥ 5 dB: ± .10 x nominal attenuation value
< 5 dB: ± 0.50 dB
0 dB: 0.50 dB max.
Reflectance ≤ -55 dB

Singlemode
SC Attenuators, Build Out
Style Fixed Value

SC/APC 8°



Note: Additional attenuation values available upon request.

* 9° APC Available (Part Number 5417496-X)

Dual Window Attenuators
Operating Wavelength
1310/1550 nm ±25 nm

Attenuation (dB)	Part Number
1	5209597-1
2	5209597-2
3	5209597-3
4	5209597-4
5	5209597-5
6	5209597-6
7	5209597-7
8	5209597-8
9	5209597-9
10	1-5209597-0
11	1-5209597-1
12	1-5209597-2
13	1-5209597-3
14	1-5209597-4
15	1-5209597-5
16	1-5209597-6
17	1-5209597-7
18	1-5209597-8
20	2-5209597-0
25	2-5209597-5

Note: Attenuation Tolerance, Ambient
≥ 5 dB: ± .10 x nominal attenuation value
< 5 dB: ± 0.50 dB
Reflectance ≤ -60 dB

Broadband Bandpass Attenuators
Operating Wavelength
1260-1360 nm & 1430-1625 nm

Attenuation (dB)	Part Number
1	5417021-1
2	5417021-2
3	5417021-3
4	5417021-4
5	5417021-5
6	5417021-6
7	5417021-7
8	5417021-8
9	5417021-9
10	1-5417021-0
11	1-5417021-1
12	1-5417021-2
13	1-5417021-3
14	1-5417021-4
15	1-5417021-5
16	1-5417021-6
17	1-5417021-7
18	1-5417021-8
19	1-5417021-9
20	2-5417021-0
25	2-5417021-5

Note: Attenuation Tolerance, Ambient
≥ 5 dB: ± .10 x nominal attenuation value
< 5 dB: ± 0.50 dB
Reflectance ≤ -65 dB

Note: All part numbers are RoHS compliant.

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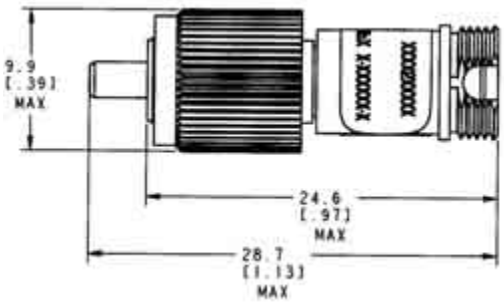
Attenuators (Continued)

Singlemode FC Attenuators, Build Out Style, Fixed Value

FC/UPC



Note: Additional attenuation values available upon request.

Dual Window Attenuators Operating Wavelength 1310/1550 nm ±25 nm

Attenuation (dB)	Part Number
1	5209948-1
2	5209948-2
3	5209948-3
4	5209948-4
5	5209948-5
6	5209948-6
7	5209948-7
8	5209948-8
9	5209948-9
10	1-5209948-0
11	1-5209948-1
12	1-5209948-2
13	1-5209948-3
14	1-5209948-4
15	1-5209948-5
16	1-5209948-6
17	1-5209948-7
18	1-5209948-8
19	1-5209948-9
20	2-5209948-0
25	2-5209948-5

Note: Attenuation Tolerance, Ambient
≥ 5 dB: ± .10 x nominal attenuation value
< 5 dB: ± 0.50 dB
Reflectance ≤ -55 dB

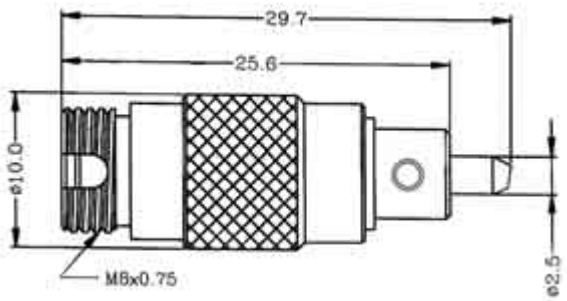
Broadband Bandpass Attenuators Operating Wavelength 1260-1360 nm & 1430-1625 nm

Attenuation (dB)	Part Number
1	5209285-1
2	5209285-2
3	5209285-3
4	5209285-4
5	5209285-5
6	5209285-6
7	5209285-7
8	5209285-8
9	5209285-9
10	1-5209285-0
11	1-5209285-1
12	1-5209285-2
13	1-5209285-3
14	1-5209285-4
15	1-5209285-5
16	1-5209285-6
17	1-5209285-7
18	1-5209285-8
19	1-5209285-9
20	2-5209285-0
25	2-5209285-5

Note: Attenuation Tolerance, Ambient
≥ 5 dB: ± .10 x nominal attenuation value
< 5 dB: ± 0.50 dB
0 dB: 0.50 dB max.
Reflectance ≤ -55 dB

Singlemode FC Attenuators, Build Out Style, Fixed Value

FC/APC (8°)



Note: Additional attenuation values available upon request.

Dual Window Attenuators Operating Wavelength 1310/1550 nm ±25 nm

Attenuation (dB)	Part Number
1	1754722-1
2	1754722-2
3	1754722-3
4	1754722-4
5	1754722-5
6	1754722-6
10	1-1754722-0
12	1-1754722-2
15	1-1754722-5
18	1-1754722-8
20	2-1754722-0
25	2-1754722-5

Note: Attenuation Tolerance, Ambient
≥ 5 dB: ± .10 x nominal attenuation value
< 5 dB: ± 0.50 dB
Reflectance ≤ -65 dB

Note: All part numbers are RoHS compliant.

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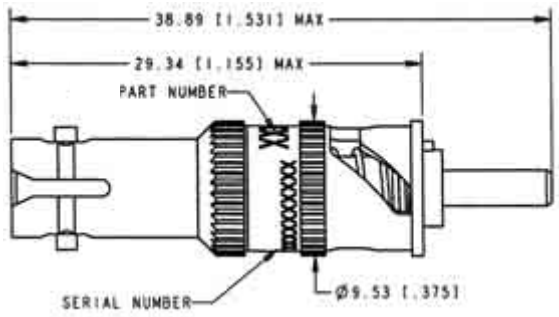
Attenuators (Continued)

Singlemode
ST Attenuators, Build Out
Style, Fixed Value

ST/UPC



Dual Window Attenuators
Operating Wavelength
1310/1550 nm ±25 nm

Attenuation (dB)	Part Number
1	5417549-1
2	5417549-2
3	5417549-3
4	5417549-4
5	5417549-5
6	5417549-6
7	5417549-7
8	5417549-8
9	5417549-9
10	1-5417549-0
11	1-5417549-1
12	1-5417549-2
13	1-5417549-3
14	1-5417549-4
15	1-5417549-5
16	1-5417549-6
17	1-5417549-7
18	1-5417549-8
19	1-5417549-9
20	2-5417549-0
25	2-5417549-5

Note: Attenuation Tolerance, Ambient
≥ 5 dB: ± .15 x nominal attenuation value
< 5 dB: ± 0.75 dB
Reflectance ≤ -55 dB

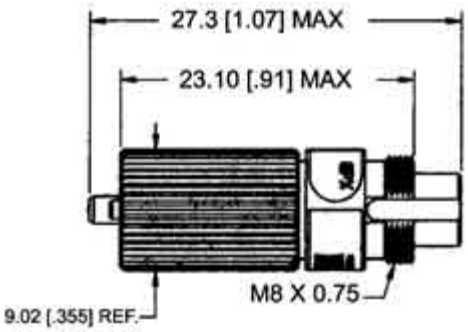
Broadband Bandpass Attenuators
Operating Wavelength
1260-1360 nm & 1430-1625 nm

Attenuation (dB)	Part Number
1	5417399-1
2	5417399-2
3	5417399-3
4	5417399-4
5	5417399-5
6	5417399-6
7	5417399-7
8	5417399-8
9	5417399-9
10	1-5417399-0
11	1-5417399-1
12	1-5417399-2
13	1-5417399-3
14	1-5417399-4
15	1-5417399-5
16	1-5417399-6
17	1-5417399-7
18	1-5417399-8
19	1-5417399-9
20	2-5417399-0
25	2-5417399-5

Note: Attenuation Tolerance, Ambient
≥ 5 dB: ± .10 x nominal attenuation value
< 5 dB: ± 0.50 dB
0 dB: 0.50 dB max.
Reflectance ≤ -55 dB

Singlemode
D4 Attenuators, Build Out
Style, Fixed Value

D4/PC



Note: Additional attenuation values available upon request.

Dual Window Attenuators
Operating Wavelength
1310/1550 nm ±25 nm

Attenuation (dB)	Part Number
5	5209570-5
10	1-5209570-0
15	1-5209570-5
20	2-5209570-0

Note: Attenuation Tolerance, Ambient
≥ 5 dB: ± .15 x nominal attenuation value
< 5 dB: ± 0.75 dB
Reflectance ≤ -45 dB

Note: All part numbers are RoHS compliant.

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Attenuators (Continued)

In Line Attenuators

Product Facts

- **A range of fixed attenuation values. Standard values of 1 through 20, and 25 dB**
- **UPC offers Excellent Return Loss**
- **Attenuation is wavelength independent and polarization insensitive**
- **Low PDL**
- **Low modal noise**
- **High reliability**
- **≤ -60 dB Reflectance (unconnectorized)**
- **Low cost**
- **Vibration resistant**
- **Single and Dual Window**
- **Designed to comply with Telcordia GR-910**

Applications

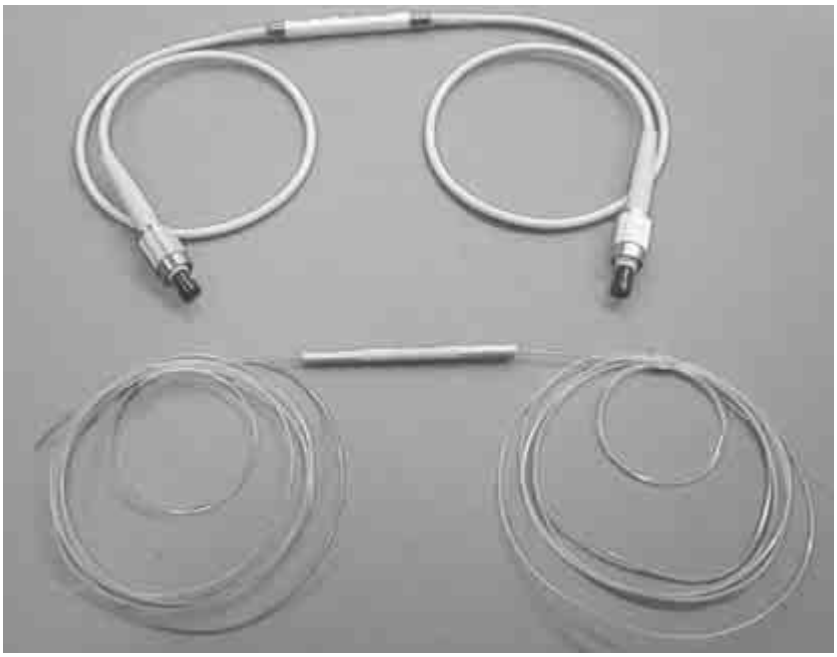
- **Power leveling in DWDM transmission systems**
- **Test and Measurement**
- **Power attenuation at the receiver**

Available Collateral

- **Product Specification**
  108-2103 Heavy Duty 3 mm cable
  108-2130 Medium Duty 900 µm cable
- **Customer Drawings**

Customizable Features

- **Lead lengths**
- **Connectorized types, including SC, FC, ST, & LC**
- **LC available in Medium Duty (900 µm cable) only**
- **Available in Heavy Duty (3 mm cable) and Medium Duty (900 µm cable)**



Specifications

Attenuation Values —
1-20 dB and 25 dB (Fixed)

Reflectance —
≤ -55 and -60 dB for UPC and unterminated respectively

Operating Temperature —
-40°C to +75°C

Vibration Resistance —
< 0.1 x attenuation

Tyco Electronics' high performance In Line Attenuators utilize a unique all fiber construction to absorb the optical signal.

By employing a Tyco Electronics' technology, the design minimizes reflectance, attenuation tolerance, and PDL while maximizing reliability, environmental stability, and power handling. There are no filters, air gaps, or core mismatches.

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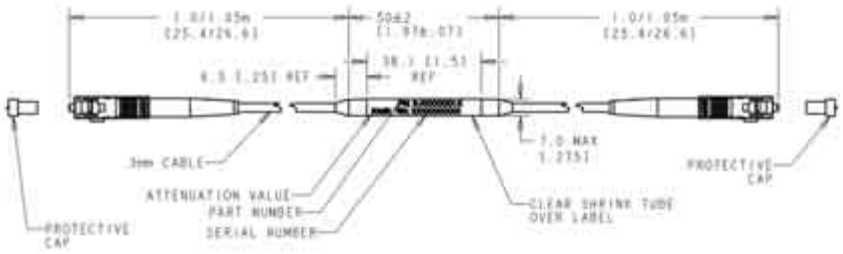
Attenuators (Continued)

Singlemode In Line Attenuators, Heavy Duty (3 mm cable), Fixed Value SC - SC



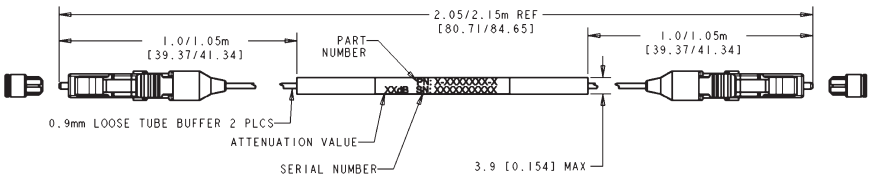
Dual Window In Line Attenuators

Operating Wavelength 1310/1550 nm ±25 nm

Attenuation (dB)	Part Number
1	6588517-1
2	6588517-2
3	6588517-3
4	6588517-4
5	6588517-5
6	6588517-6
7	6588517-7
8	6588517-8
9	6588517-9
10	1-6588517-0
11	1-6588517-1
12	1-6588517-2
13	1-6588517-3
14	1-6588517-4
15	1-6588517-5
16	1-6588517-6
17	1-6588517-7
18	1-6588517-8
19	1-6588517-9
20	2-6588517-0
25	2-6588517-5

Note: Attenuation Tolerance, Ambient
≥ 5 dB: ± .10 x nominal attenuation value
< 5 dB: ± 0.50 dB
Reflectance ≤ -55 dB

Singlemode In Line Attenuators, Medium Duty (900 µm cable), Fixed Value LC to LC



Dual Window In Line Attenuators

Operating Wavelength 1310/1550 nm ±25 nm

Attenuation (dB)	Part Number
1	6588564-1
2	6588564-2
3	6588564-3
4	6588564-4
5	6588564-5
6	6588564-6
7	6588564-7
8	6588564-8
9	6588564-9
10	1-6588564-0
11	1-6588564-1
12	1-6588564-2
13	1-6588564-3
14	1-6588564-4
15	1-6588564-5
16	1-6588564-6
17	1-6588564-7
18	1-6588564-8
19	1-6588564-9
20	2-6588564-0
25	2-6588564-5

Note: Attenuation Tolerance, Ambient
≥ 5 dB: ± .10 x nominal attenuation value
< 5 dB: ± 0.50 dB
Reflectance ≤ -50 dB

Note: All part numbers are RoHS compliant.

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Lensed Wavelength Division Multiplexer and Demultiplexer (LWDM) Products

Singlemode and Multimode Lensed WDM's

Features

- High isolation
- Wide bandpass
- Excellent reflectance
- Small footprint

Applications

- Two-way, single-fiber video links
- Instrumentation

Available Collateral

- Customer Drawings

Customizable Features

- Lead Lengths
- Connector Type
- Labels
- Optical Specifications

Tyco Electronics' Multiplexers allow use of a single fiber for simultaneous transmission of two signals of different wavelengths.

Tyco Electronics' Demultiplexers separate the combined wavelengths from the single fiber into individual fibers. The universal MUX/DEMUX's are available for multimode as well as singlemode applications.

Through the use of high-quality dichroic coatings, which act as bandpass filters, numerous wavelength combinations from 800-1600 nm can be accommodated.

Unlike the narrow bandpass of fused multiplexers, the minimum bandpass of these devices around the central wavelength is ±50 nm. This feature makes these multiplexers ideal for use in broadband communication applications.

These devices are unique in that their optical performance is independent of polarization effects of the light source.

The 11.9 mm [7/16 inch] thick encapsulated devices with monolithic lens structures tolerate vibration and shock; their low profile permits easy printed circuit board mounting.

Specifications — Multimode

Insertion Loss (per FOTP-180) —

	Maximum
Without connectors	1.3 dB
With 2 connectors	2.3 dB

Change in Transmission over operating temperatures +/- 0.5 dB

Directivity (50/125, 62.5/125 only) —
Minimum: >45 dB

Wavelength Bandpass (nm) —
Minimum: 100 nm

Isolation —
35 dB Minimum

Fiber Types — 50/125 and 62.5/125

Specifications — Singlemode

Insertion Loss (per FOTP-180) —

	Maximum
Without connectors	1.3 dB
With 2 connectors	2.3 dB

Change in Transmission over operating temperatures +/- 0.5 dB

Directivity —
Minimum: >55 dB

Wavelength Bandpass (nm) —
Minimum: 100 nm

Return Loss (Reflectance) —

Port 1	≤ –40 dB
Port 2	≤ –55 dB
Port 3	≤ –55 dB

Without connectors

Isolation —
35 dB Minimum

Polarization Sensitivity — <0.1 dB

Fiber Types — (Corning SMF-28)

Temperature

Multimode —
–40°C to +65°C (Operating)
–40°C to +75°C (Storage)

Singlemode —
–20°C to +60°C (Operating)
–20°C to +60°C (Storage)

Weight — 42 grams [1.5 oz.]

Pigtail — 0.5 meter, [3 mm] OD cable, 900 µm OD cable.

Terminations and connectors available on request.

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Lensed Wavelength Division Multiplexer and Demultiplexer (LWDM) Products (Continued)

Singlemode and Multimode Lensed WDM's (Continued)

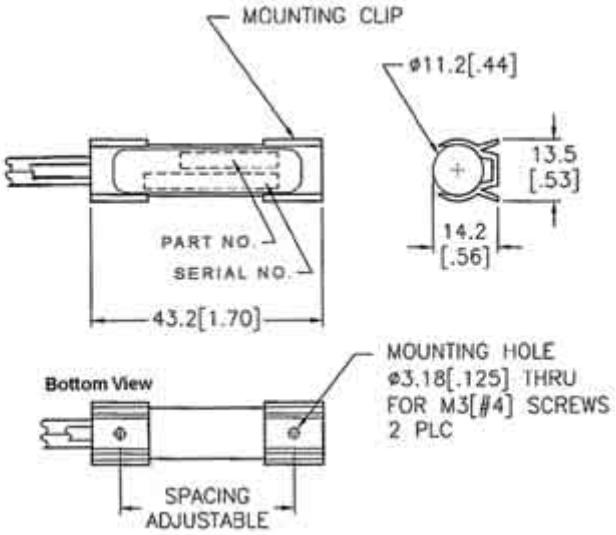
Part Numbers

Fiber	Cable Diameter	Connector	850/1310 nm	1310/1550 nm
	3 mm	ST	5099102-2	5099105-2
50/125 Multimode	3 mm	None	5099108-1	—
	900 µm	ST	9-5099102-2	—
	900 µm	None	9-5099108-1	9-5099111-1
	3 mm	ST	5099102-3	5099105-3
62.5/125 Multimode	3 mm	None	5099108-2	—
	900 µm	ST	9-5099102-3	9-5099105-3
	900 µm	None	9-5099108-2	9-5099111-2
	3 mm	FC/APC	—	5099717-4
	3 mm	None	—	5099717-5
	3 mm	FC/UPC	—	5099717-6
	3 mm	ST/UPC	—	5099717-7
	3 mm	SC/UPC	—	5099717-8
Singlemode	900 µm	FC/APC	—	9-5099717-4
	900 µm	None	—	9-5099717-5
	900 µm	FC/UPC		9-5099717-6
	900 µm	ST/UPC		9-5099717-7
	900 µm	SC/UPC		9-5099717-8

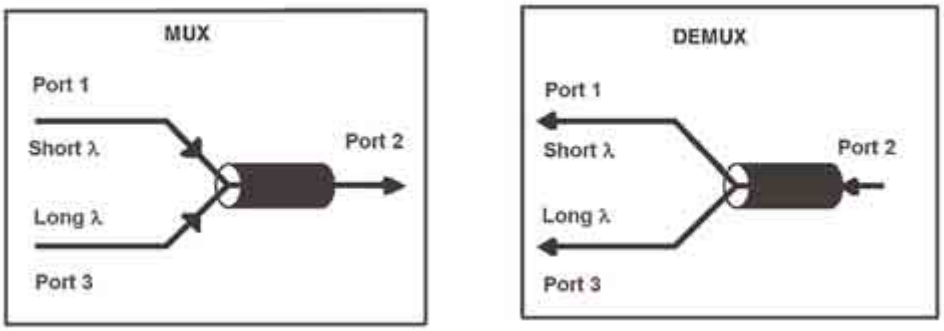
Note: Mux specific versions available when higher return loss required. Contact your local Tyco Electronics Sales Office. Cable length is 0.5 meter.

Note: All part numbers are RoHS compliant.

For custom mounting options, please contact your local Tyco Electronics' Sales Representative.



Application



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Switches

Ruggedized Multimode Switches

Refractive Plate Switch 2 x 2 Bypass Configuration

Part Number 6588871-1

Product Facts:

- **No optical path interruption @200 G's for 8 ms**
- **Successfully passed MIL-S-901D (Navy) Heavyweight Shock Test (Barge Test)**
- **Fiber type 62.5/125 µm multimode**

Specifications

Operating Temperature Range — -30° to +85° C

Storage Temperature Range — -40° to +85° C

Durability — >1,000,000 cycles

Minimum Actuation Voltage — 4.75 V

Maximum Actuation Voltage — 5.25 V

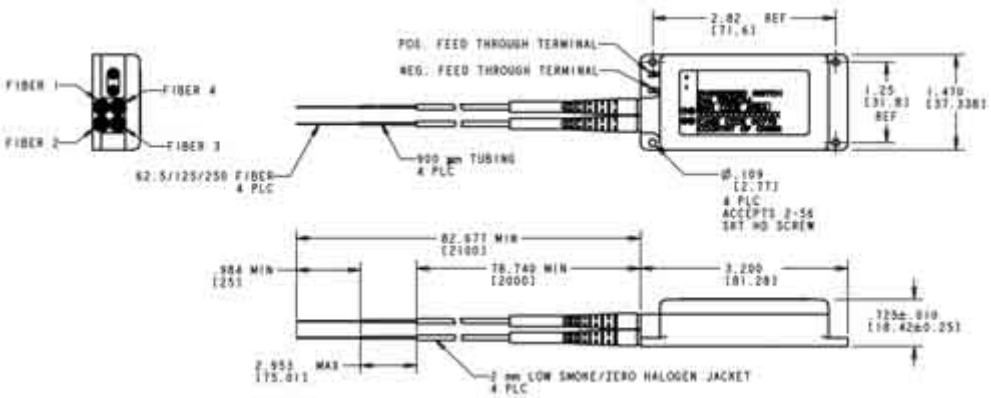
Actuation Current at Typical — 5.0 V

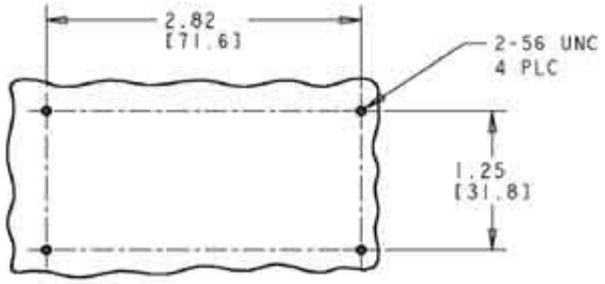
Actuation Voltage — 100mA (maximum)

Tyco Electronics' "Ruggedized" Refractive Plate Switch is a multimode optical switch that is capable of withstanding a 200 G shock with a duration of >8ms without interruption of the signal path.

This switch is designed for extreme environments that require absolute product quality on optical installations and optical signal integrity.

Product Dimensions:





Recommended Mounting Layout

NOTE
Dimensions are Inches over millimeters

Note: All part numbers are RoHS compliant.

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Switches (Continued)

Multimode
1 x 2 SPDT Switch
Dual 1 x 2 DPDT Switch
2 x 2 Bypass Switch

Product Facts

- **Low profile**
- **Utilizes pivoting mirror**
- **Wide wavelength range**
- **Low insertion loss**
- **Excellent repeatability**
- **Environmentally stable**
- **Shock and vibration resistant**
- **Board or chassis mounting**
- **Optical & electrical leads exit from one end for easy cable routing**

Tyco Electronics Low Profile Fiber Optic Switches are miniature, board mountable devices that permit the switching of an optical signal from one fiber to another. Switching is accomplished by a slight pivoting motion of a spherical mirror which reflects the optical signal to the appropriate fiber. This patented imaging technology provides very low optical loss.

Tyco Electronics' Fiber Optic Switches can be terminated with any Tyco fiber optic connector, and they are available in the following configurations:

- **1 x 2 SPDT Switch**
- **Dual 1 x 2 DPDT Switch**

Tyco Electronics' SPDT and DPDT Switches permit the transfer of optic signals from an input fiber to either of two output fibers. Switches are applied to the positive terminal. The switch reverts to its original state when power is removed.

- **2 x 2 Bypass Switch**

Tyco Electronics' Bypass Switches provide bypass protection for fiber optic ring networks. They also provide bypass protection for fiber optic ring networks per IEEE 802.5 and ANSI FDDI standards.

A self-test path permits testing the node's transmitter against its receiver when the switch is in the bypass mode. This transmitter - receiver path is attenuated to prevent saturation of the receiver, while maintaining minimal light loss in the bypass path.

Specifications		
Configuration	**1 x 2 and Dual 1 x 2**	**2 x 2 Fully Reversing Bypass**
Switching speed	10 milliseconds maximum	10 milliseconds maximum
Operating wavelength	750–1450 nanometers	750–1450 nanometers
Insertion loss at 1300 nm (Includes 2 connectors)	1.8 dB max. per FOTP-34, Method A2	1.8 dB max. per FOTP-34, Method A2
		5 dB on loopback path max
Crosstalk	≤45 dB per FOTP-42	≤45 dB per FOTP-42
Switch driver	5 V at 80mA max.	5 V at 80mA max.
Drop In/Drop Out	Drop In: 4.0 V minimum	Drop In: 4.0 V minimum
Voltage	Drop Out: 0.5 V minimum	Drop Out: 0.5 V minimum
Fiber types	Graded index 50/125, 62.5/125	Graded index 50/125, 62.5/125
	(others available upon request)	(others available upon request)
Lead length	1 meter	1 meter
Temperature range	Operating –10°C to +65°C per FOTP-3, C2	Operating –10°C to +65°C per FOTP-3, C2
	Storage –30°C to +70°C per FOTP-188, 4	Storage –30°C to +70°C per FOTP-188, 4
Connector styles	ST Style	ST Style
	(others available upon request)	(others available upon request)
Electrical interface	Bent pins for PCB soldering	Bent pins for PCB soldering
	Straight pins for soldering, or Tyco Electronics modular connector	Straight pins for soldering, or Tyco Electronics modular connector
Durability	>1 million cycles	>1 million cycles
Weight (unconnectorized)	<1 oz.	<1 oz.

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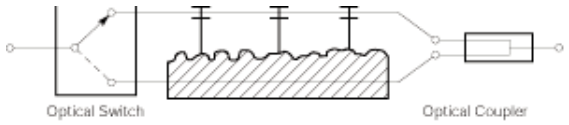
Switches (Continued)

Multimode
1 x 2 SPDT Switch
Dual 1 x 2 DPDT Switch
2 x 2 Bypass Switch (Continued)

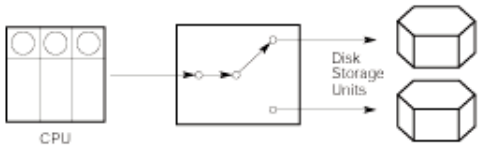
1 x 2 SPDT

Application Information

Possible Application

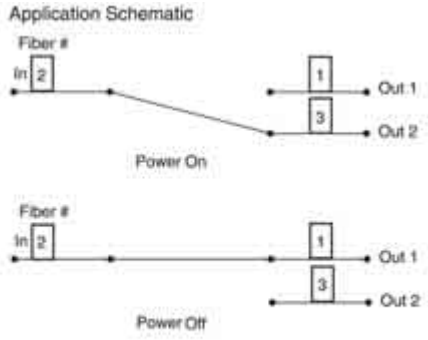


Redundant Circuit



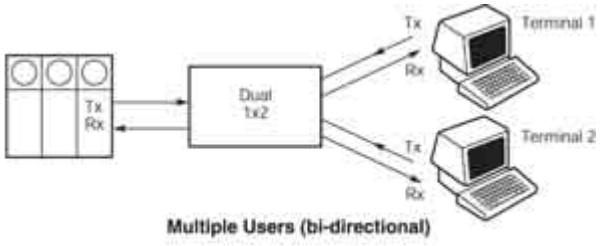
Multiple Users (uni-directional)

Schematic



Dual 1 x 2 DPDT

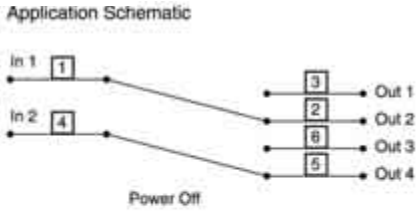
Possible Application



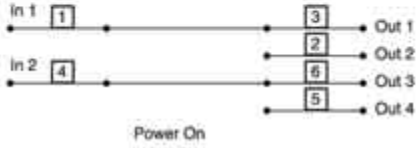
Multiple Users (bi-directional)

Schematic

Position 1

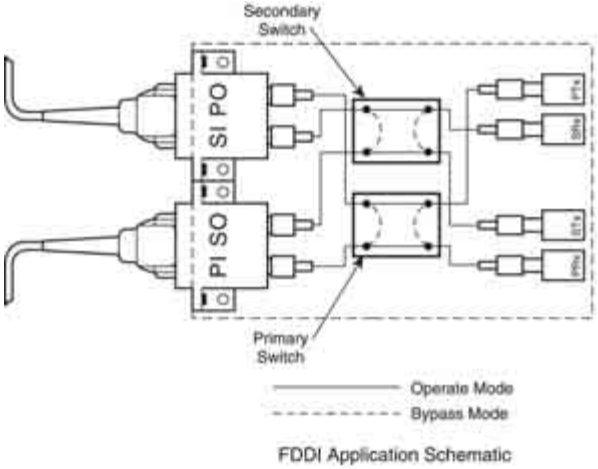


Position 2



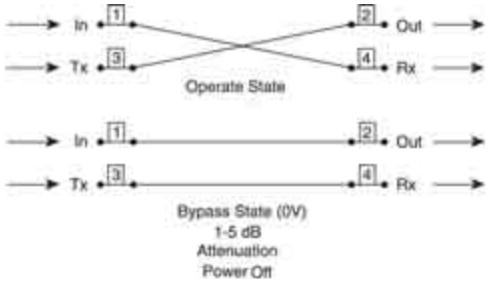
2 x 2 Bypass Fully Reversing

Possible Application



FDDI Application Schematic

Schematic



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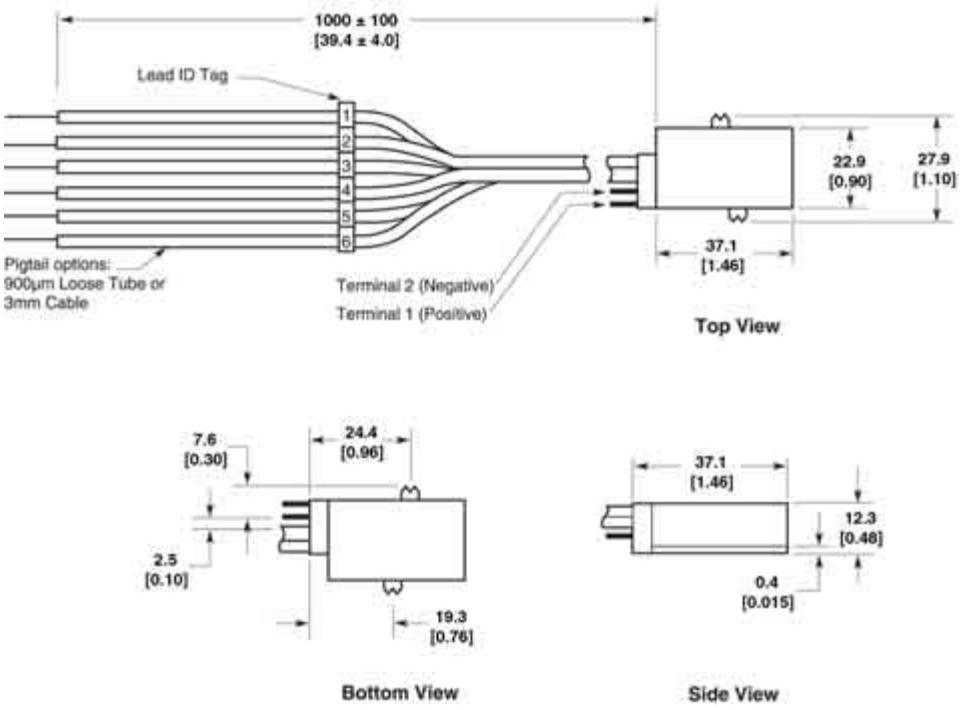
Switches (Continued)

Multimode
1 x 2 SPDT Switch
Dual 1 x 2 DPDT Switch
2 x 2 Bypass Switch (Continued)

Dimensions

Switch	Fiber Leads Used
1 x 2 SPDT	1,2,3
Dual 1 x 2 DPDT	1,2,3,4,5,6
2 x 2 Bypass	1,2,3,4



Part Number Information

Switch Type:	Electrical Interface	Fiber Connector	900 µm Loose Tube Cable		3 mm Cable Jacket	
			Fiber Size 50/125	Fiber Size 62.5/125	Fiber Size 50/125	Fiber Size 62.5/125
1 X 2	Bent Pin	None	—	—	5099403-1	5099403-2
		ST Style	5099414-1	5099414-2	5099415-1	5099415-2
		SC Style	—	—	8-5099403-1	8-5099403-2
	Straight Pin	None	5099420-1	5099420-2	—	5099421-2
		ST Style	—	—	5099427-1	5099427-2
		SC Style	8-5099420-1	8-5099420-2	—	8-5099421-2
Dual 1 X 2	Bent Pin	None	5099973-1	5099973-2	5099974-1	5099974-2
		ST Style	—	—	—	—
		SC Style	8-5099973-1	8-5099973-2	8-5099974-1	8-5099974-2
	Straight Pin	None	5099979-1	5099979-2	—	—
		ST Style	5099981-1	5099981-2	5099982-1	5099982-2
		SC Style	8-5099979-1	8-5099979-2	—	—
2 X 2 Bypass	Bent Pin	None	—	—	5099405-1	5099405-2
		ST Style	5099416-1	5099416-2	5099417-1	5099417-2
		SC Style	—	—	8-5099405-1	8-5099405-2
	Straight Pin	None	—	—	5099423-1	5099423-2
		ST Style	—	—	5099429-1	5099429-2
		SC Style	—	—	8-5099423-1	8-5099423-2

Fiber Type:	50/125	62.5/125
	-1	-2

Note: All part numbers are RoHS compliant.

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Switches (Continued)

Multimode Bypass Switches

Product Facts

- Increases reliability of mission-critical network applications
- Low insertion loss — 1.8 dB typical, including connectors
- Choice of 62.5/125 µm, 50/125 µm
- Choice of FSD MIC, ST-style, or duplex SC connectors and ports
- Rack or panel-mount versions
- Compact size with all front-mounted connections to conserve space
- High-speed optical switching
- Simple to install

Tyco Electronics' Bypass Switch is a second-generation device that allows a dual-attach station to be bypassed without loss of ring integrity. The switch module contains two fully reversing optical bypass switches that direct the optical signals to the appropriate fiber according to signals on the device's electrical interface.

A spherical mirror, which is pivoted at high speeds between two stable positions, reflects light into specific fibers in either the operate or bypass state. Signal attenuation is very low on the network path. In the bypass state, the path from transmitter to receiver is attenuated to prevent receiver saturation. Holding the switches in the operating (non-bypass) state requires a 5-VDC, 160-mA power. Both switches return to the bypass state if the power is removed. Switching occurs in less than 10 ms.

The modules are easy to install between a dual-attached station and the ring. Pigtailed optical-fiber cables connect the switch module to the node, while the primary and secondary ring cables connect to the switch's A and B ports.

The electrical connection is supplied by one of three standard electrical interfaces. A status LED lights when the switch is in the operate state. The bypass switch can be either booth panel or rack mounted.

Singlemode Bypass Modules

Tyco Electronics offers Singlemode Bypass Modules designed to meet your optical path protection needs. For more information, please consult your local Tyco Electronics Sales Representative or call Tyco Electronics Product Information Center at 1-800-522-6752.

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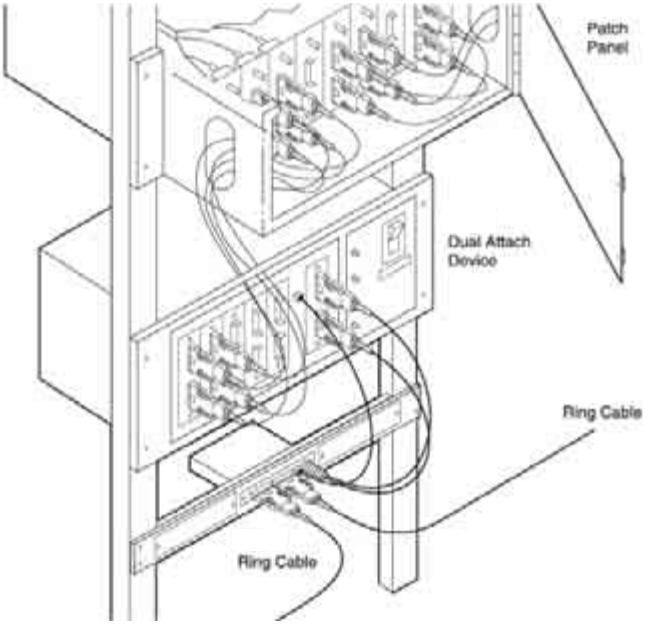
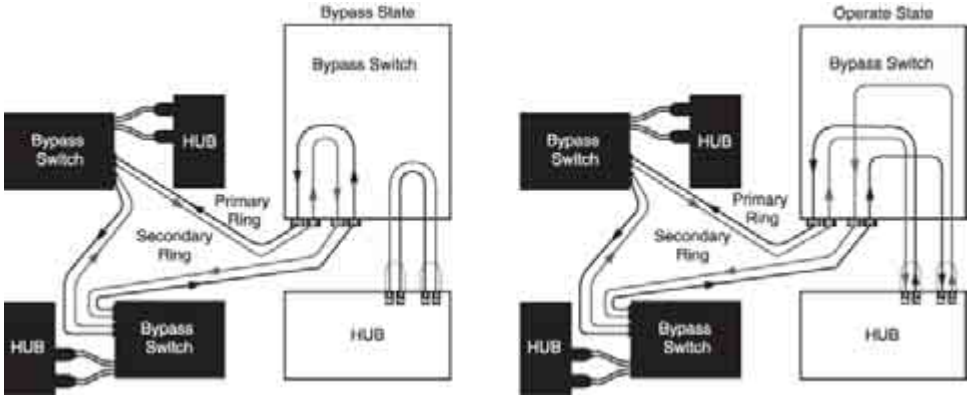
Switches (Continued)

Multimode Bypass Switches (Continued)



Switch Operation: Bypass and Operate States



Insertion Loss

Operate Mode	Power On
PI Line to PRX Station	1.8 dB Max.
SI Line to SRX Station	1.8 dB Max.
PTX Station to PO Line	1.8 db Max.
STX Station to SO Line	1.8 dB Max.
Bypass Mode	**Power Off**
PI Line to PO Line	1.8 dB Max.
SI Line to SO Line	1.8 dB Max.
PTX Station to PRX Line	5.0 dB Max.
STX Station to SRX Line	5.0 dB Max.

Note: FOTP-34, Method A2. IL values given for ST/SC options.

Specifications

Switching Speed — 10 ms max.

Operating Wavelength — 750 - 1450 nm

Crosstalk — ≤45 dB (FOTP-42)

Switch Driver — 5 V at 160 mA

Fiber Type — 62.5/125 µm or 50/125 µm graded index

Operating Temperature — -10°C to +65°C (FOTP-3, Condition C2)

Storage Temperature — -30°C to +70°C (FOTP-3, Condition C2)

Durability — >1 million cycles

Weight — 12 oz [340 g]

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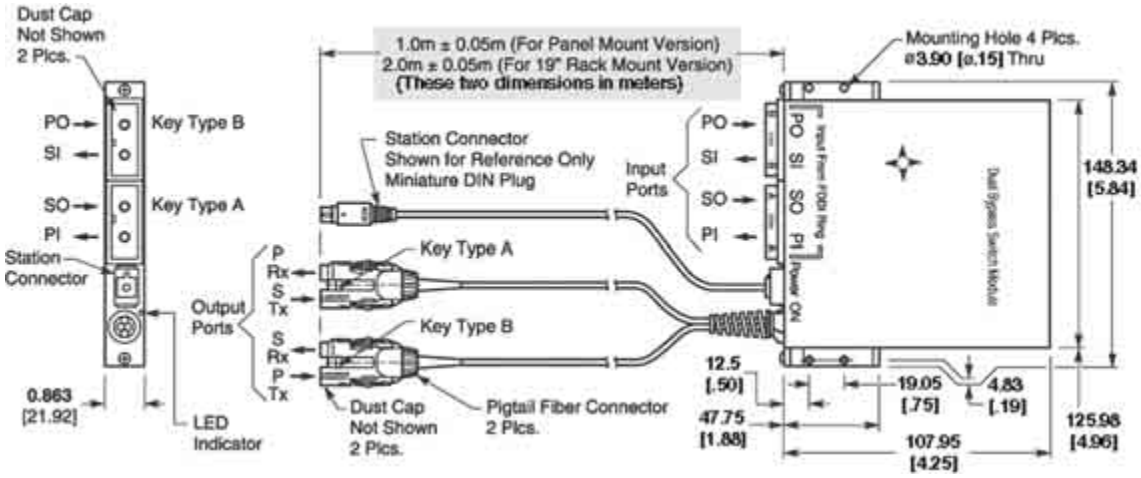
Switches (Continued)

Multimode Bypass Switches
(Continued)



Switch Module Base Part Numbers

Input Port Interface	Mounting	Part Numbers					
		Optical Fiber Pigtails					
		62.5/125 µm Fiber				50/125 µm Fiber	
		FSD MIC	ST-style	SC	LC	FSD MIC	SC
FSD MIC	Panel	5209161	5209162	5209163	—	5209167	—
	Rack	5209164	5209165	5209166	—	5209170	—
ST	Panel	—	5209174	5209175	—	—	—
	Rack	—	5209177	—	—	—	—
Duplex SC	Panel	—	—	5209187	1918973	—	5209193
	Rack	5209188	—	5209190	—	—	5209196

Note: All part numbers are RoHS compliant.

Switch Module Dash Numbers: Electrical Interface

Dash Number	Station Connector
-3	6-pos. Shielded Modular Plug
-4	6-pos. Shielded Miniature Circular DIN Plug
-6	4-pos. Modular Plug

Note: The electrical cable consists of an 8-position modular plug at one end for connecting to the switch and one of the connectors listed at the other end.

Ordering Information

Select the required switch module. To the base part number for the module, add the dash number for the electrical interface you require for the station connector. Example: 5209163-3 is a switch with FSD MIC receptacles on ring ports, duplex SC connectors on the fiber pigtails, and a 6-position modular plug on the electrical cable.

For other connector interfaces, contact your local Tyco Electronics Sales Representative

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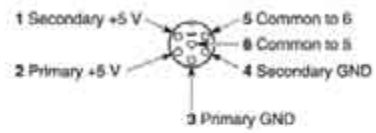
Switches (Continued)

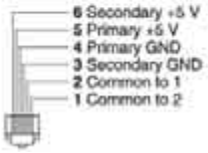
Multimode Bypass Switches (Continued)

Station Connector and Pinouts

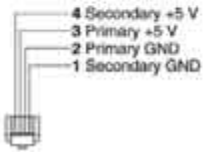
Contact ID Shown from Mating End of Station Connector



6-Position Miniature DIN



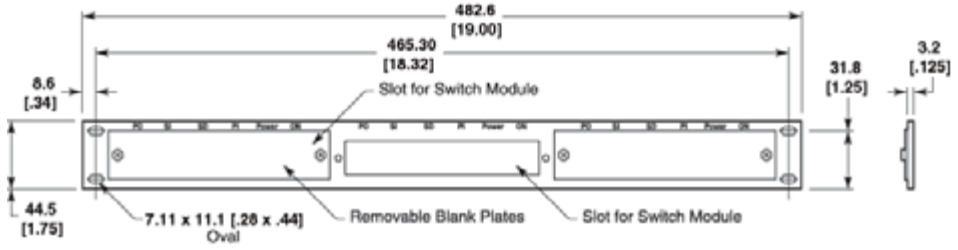
6-Position Shielded Modular Plug



4-Position Modular Plug

To Order the Electrical Interface Powercord Separately:

Part Number	Station Connector
5209503-1	6-pos. Modular Plug
5209504-1	6-pos. Shielded Miniature DIN Plug
5209506-1	4-pos. Modular Plug



Rack-Mount Panel

Part Number 209197-1 Mounts in a 19-inch rack and accepts up to three switch modules.

Note: All part numbers are RoHS compliant.

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Part Number Index

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