

tyco

Electronics

Pluggable Input / Output Solutions



RoHS
Ready 

AMP

Table of Contents

Introduction	3
Small Form-factor Pluggable (SFP) System - Single Port	4, 5
Ganged (Single Row) SFP System	6, 7
Stacked (Dual Row) SFP System	8, 9
Ganged SFP Cage with Integrated Electrical Connector	10
SFP with Enhanced EMI Gaskets	11
SFP Direct Attach Cable Assemblies	12, 13
10 Gigabit Serial Pluggable Solution (XFP)	14
XFP Cable Assemblies	15
X2 Guide Rail	16
Dense Wavelength Division Multiplexing (DWDM) SFP System	17
Part Number Index	18
Tyco Electronics Global Locations	19

Disclaimer

While Tyco Electronics Corporation and its affiliates referenced herein ("Tyco Electronics") have made every reasonable effort to ensure the accuracy of the information in this catalog, Tyco Electronics does not guarantee that it is error-free, nor does Tyco Electronics make any other representation, warranty or guarantee that the information is accurate, correct, reliable or current.

Tyco Electronics reserves the right to make any adjustments to the information contained herein at any time without notice. Tyco Electronics expressly disclaims all implied warranties regarding the information contained herein, including, but not limited to, any implied warranties of merchantability or fitness for a particular purpose. Tyco Electronics' only obligations are those in the Tyco Electronics Standard Terms and Conditions of Sale, and in no case will Tyco Electronics be responsible for any incidental, indirect, or consequential damages arising from the sale, resale, use, or misuse of its products. Users should independently evaluate the suitability of, and test each product for, their application.

The dimensions, specifications, designs, construction, materials and processes in this catalog are for reference purposes only and are subject to change without notice. Please consult Tyco Electronics for the most current product information.

The export of certain Tyco Electronics products is restricted by the Arms Export Control Act (Title 22, U.S.C. Sec 2751, et seq.) or the Export Administration Act of 1979, as amended (Title 50, U.S.C., App. 2401 et seq.). Orders may be subject to export approval by the U.S. Government. Buyer must comply with all applicable export laws of all applicable jurisdictions.

© Copyright 2006, and 2004 by Tyco Electronics Corporation. All International Rights Reserved.

AMP and TYCO are trademarks.

Other products, logos, and company names mentioned herein may be trademarks of their respective owners.

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.

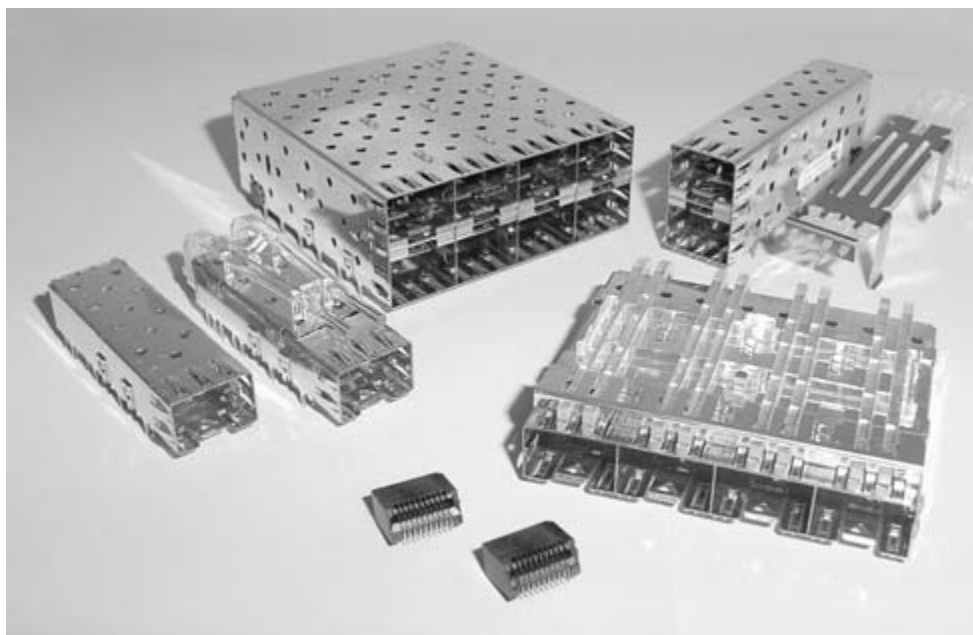
NOTE: Information regarding RoHS compliance is provided based on reasonable inquiry of our suppliers and represents our current actual knowledge based on the information provided by our suppliers. This information is subject to change. For latest compliance status, refer to our website referenced at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

Introduction


As a founding member of the Small Form-factor Pluggable (SFP) Multi-Source Agreement (MSA), Tyco Electronics supports the market with a full range of SFP products, including single port and high density SFP products in single row and stacked configurations.

As the market's demand for increased functionality and higher data rates continues to grow, Tyco Electronics responds. Products introduced to support the rapidly expanding product line include: single cage press fit designs, integrated light pipes for port indicators, modified connector contact formation for improved signal integrity,

enhanced spring finger designs for increased EMI suppression, and riding heat sinks for improved thermal management.

Light Pipes:

Tyco Electronics provides a complete line of light pipes for single cages, ganged (single row), and stacked (double row) SFP products.

Enhanced EMI fingers:

As the data rates using the SFP form factor increase, the need for increased EMI suppression becomes imperative. Addressing both cabinet and module-generated noise, tests suggest Tyco Electronics' enhanced EMI fingers on the SFP cages can add up to 20dB of margin.

Riding Heat Sinks:

As the SFP form factor is adopted across multiple platforms, Tyco Electronics addresses the need for increased thermal dissipation by incorporating riding heat sinks. The riding heat sinks use direct contact to the pluggable module to draw heat away from its source.

As increased functionality and data rates exceeded 10 Gigabits per second, Tyco Electronics actively participated in the 10 Gigabit Serial (XFP) standard, and the X2 MSA, the Xaui based 10 Gigabit solution.

Product Facts

- RoHS Compliant
- Used in conjunction with 20 pin SMT SFP Connector
- Offers full metal housing for superior grounding and EMI suppression
- Solder, SMT, and Press Fit configurations available
- Single piece and two piece available
- Hot Swappable
- Compatible with SFP MSA Compliant Modules
- UL/CSA Report File E28476
- Connector supports data rates beyond 10 Gb/s
- Chassis grounds for pass through EMI protection to 12.5 Gb/s

Applications

- Fiber Channel
- Fast/Gigabit Ethernet
- ATM/SONET/SDH
- InfiniBand (IB)

Technical Documents

Instruction Sheet

408-8495 SFP Connector and Cage Assembly

Application Specification

114-13017 SFP Connector a SMT Cage Assembly
114-13120 SFP Connector and Press Fit Cage Assy

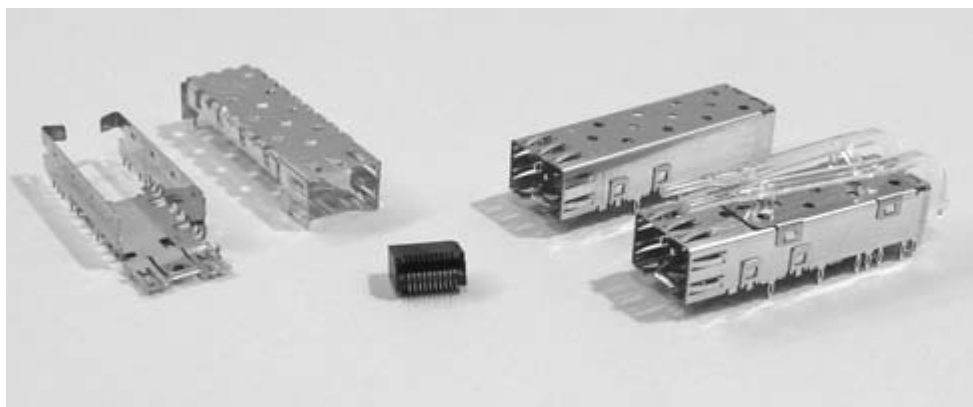
Product Specifications

108-1949 SFP Connector
108-1950 SFP Cage

SFP Documentation

INF-8074

Small Form-factor Pluggable (SFP) System — Single Port



Tyco Electronics, continuing to support the OEM market with high speed I/O product, offers a full line of Small Form-factor Pluggable (SFP) products, including SFP cages, connectors, dust caps, and

SFP direct attach cable assemblies. The SFP system can be used with any SFP MSA compliant optic or copper module. The cage system is a copper alloy with nickel sub-plate with a matte tin finish.

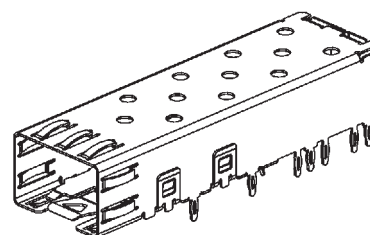
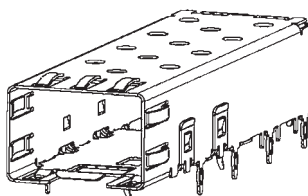
The SFP system is part of the Tyco Electronics family of Pluggable I/O solutions.

Part Number	Description	Belly-to-Belly Applications
6367034-1	SFP Bottom Cage (2 pc SMT)	Yes
6367035-1	SFP Top Cage (2 pc)	Yes
1489669-1	One Piece Press Fit	Yes
1489779-1	One Piece Press Fit	No
1489662-1	One Piece SMT or Wave Solder	No
1367629-1	One Piece Press Fit w/Light Pipes	No

Related Products

Part Number	Description
1367073-1	20 pin, surface mount connector; 15µm gold plating
1367073-2	20 pin, surface mount connector; 30µm gold plating
1658197-1	20 pin, surface mount connector; 30µm gold plating with contact surface treatment
1888247-1	20 pin, surface mount connector; enhanced contact formation
1367147-1	SFP Dust Cap with AMP logo
1367147-3	SFP Dust Cap without AMP logo

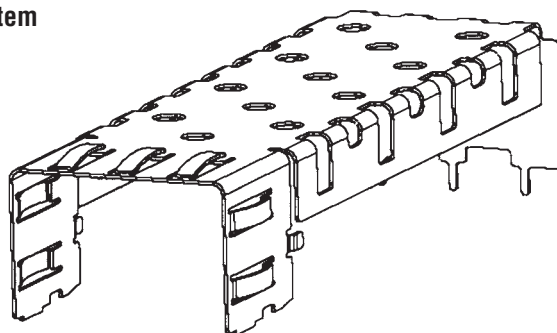
Note: For a listing of SFP Direct Attach Cable Assemblies, refer to page 12.



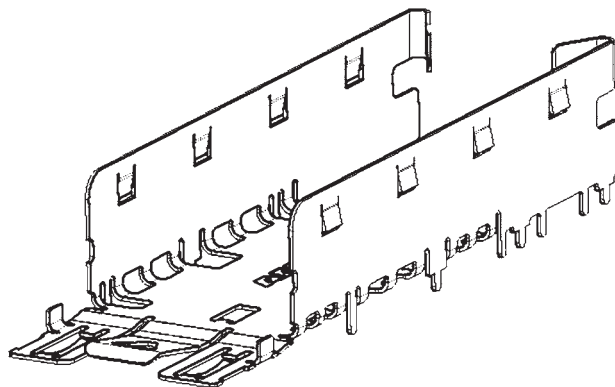
Note: All part numbers are RoHS compliant.

SFP Top Plate
Part Number 6367035-1

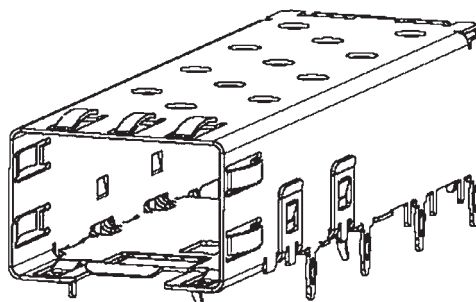
2 Pc Cage System



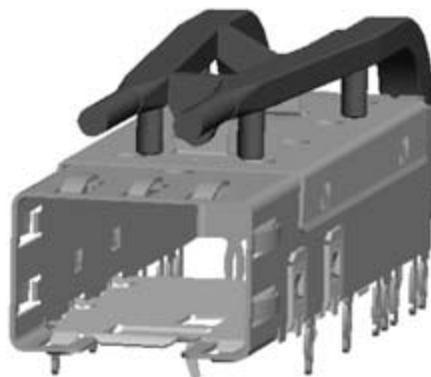
SFP Bottom Plate
Part Number 6367034-1



SFP Press Fit Cage Assembly
Part Number 1489669-1



SFP Press Fit Cage Assembly with Light Pipe Assembly
Part Number 1367629-1



Note: All part numbers are RoHS compliant.

Product Facts

- Used in conjunction with 20 pin SMT SFP Connector
- RoHS Compliant
- Offers full metal housing for superior grounding and EMI reduction
- Solder and Press Fit configurations available
- Hot Swappable
- Compatible with SFP MSA Compliant Modules
- UL/CSA Report File E28476
- Connector supports data rates beyond 10 Gb/s
- Application tooling available for press fit SFP cages

Applications

- Fiber Channel
- Fast/Gigabit Ethernet
- ATM/SONET/SDH
- InfiniBand (IB)

Technical Documents

Instruction Sheet

- 408-8848 SFP Cage Assembly Seating Tool
- 408-8849 SFP Cage Assembly Extraction Tool

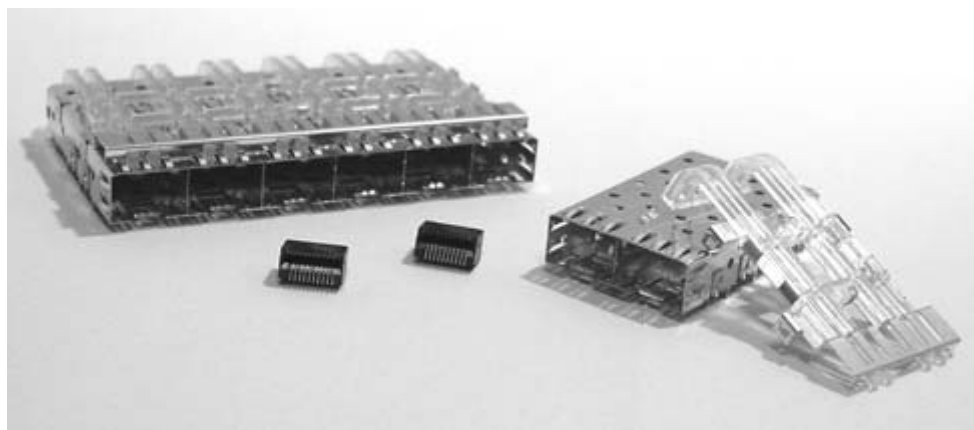
Application Specification

- 114-13017 SFP Connector and SMT Cage Assembly
- 114-13120 SFP Connector and Press Fit Cage Assy

Product Specifications

- 108-1949 SFP Connector
- 108-1950 SFP Cage

Ganged (Single Row) SFP System



The Ganged SFP product line allows for single row, high density port designs to maximize the horizontal I/O space. The design allows for belly-to-belly orientation to maximize port density. The lateral port-to-port

spacing is minimized to 14.25mm. The entire product family is compliant to RoHS by using a matte tin, pre-plated copper alloy. Port configurations include 1x2, 1x4 and 1x6, with options including:

- Light Pipe Assembly
 - Enhanced EMI contact finger (page 11).
- Application tooling is required for press fit configurations.

Part Number	Port Configuration	PCB Attachment	Light Pipes Included	Special Attributes
1761014-1	1x2	Press Fit	No	
1761007-1	1x2	Press Fit	Yes	
1658744-1	1x4	Press Fit	No	
1888038-1	1x4	Solder Tail	No	No Vent Holes
1658723-1	1x4	Solder Tail	No	
1761008-1	1x4	Press Fit	Yes	
1761015-1	1x6	Press Fit	No	
1658939-1	1x6	Press Fit	Yes	

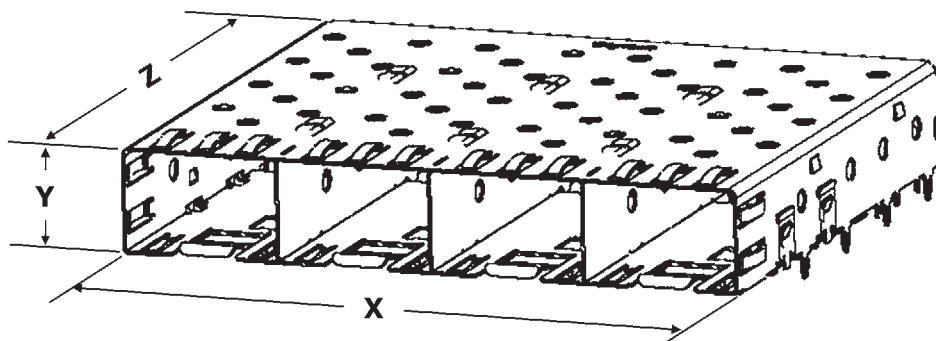
Related Products

Part Number	Description
1367073-1	20 pin, surface mount connector; 15µm gold plating
1367073-2	20 pin, surface mount connector; 30µm gold plating
1658197-1	20 pin, surface mount connector; 30µm gold plating with contact surface treatment
1888247-1	20 pin, surface mount connector; enhanced contact formation
1761394-1	SFP Dust Cap

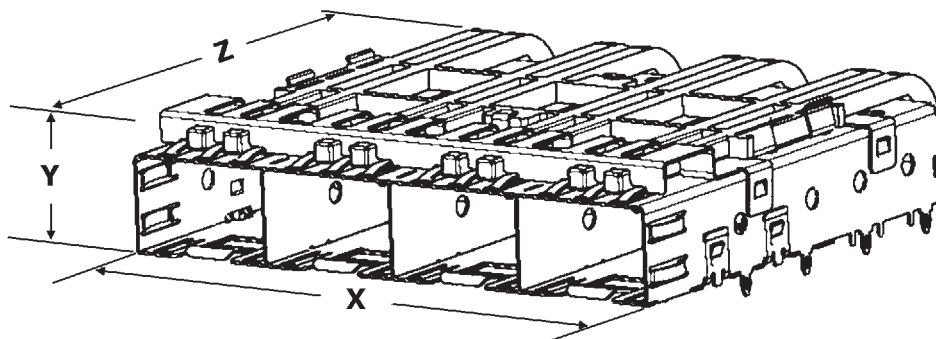
Note: For a complete listing of SFP Direct Attach Cable Assemblies, refer to page 12.

Note: All part numbers are RoHS compliant.

**Ganged 1x4
Configuration View
Part Number 1658744-1**



**Ganged 1x4 w/Light Pipes
Configuration View
Part Number 1761008-1**



Nominal Dimensions

Part Number	Description	X Dim	Y Dim	Z Dim
1761014-1	1x2 SFP Cage	28.75 [1.132]	9.70 [.382]	50.00 [1.969]
1761007-1	1x2 SFP Cage w/Light Pipes	28.75 [1.132]	13.00 [.512]	55.63 [2.190]
1658744-1	1x4 SFP Cage	57.25 [2.254]	9.70 [.382]	50.00 [1.969]
1761008-1	1x4 SFP Cage w/Light Pipes	57.25 [2.254]	13.00 [.512]	55.63 [2.190]
1761015-1	1x6 SFP Cage	85.75 [3.376]	9.70 [.382]	50.00 [1.969]
1658939-1	1x6 SFP Cage w/Light Pipes	85.75 [3.376]	13.00 [.512]	55.63 [2.190]

Note: All part numbers are RoHS compliant.

Stacked (Dual Row) SFP System

Product Facts

- RoHS Compliant
- Utilizes fully integrated stacked connector
- Offers full metal housing for superior grounding and EMI reduction
- Incorporates press fit eye-of-the-needle contacts for both mechanical cages and electrical connector
- Connector contacts 30um gold plating w/contact surface treatment
- Hot Swappable
- Compatible with SFP MSA Compliant Modules
- Connector supports data rates beyond 10 Gb/s
- Application tooling available

Applications

- Switches/Routers
- Fiber Channel
- Fast/Gigabit Ethernet
- ATM/SONET/SDH
- InfiniBand (IB)

Technical Documents

Instruction Sheet

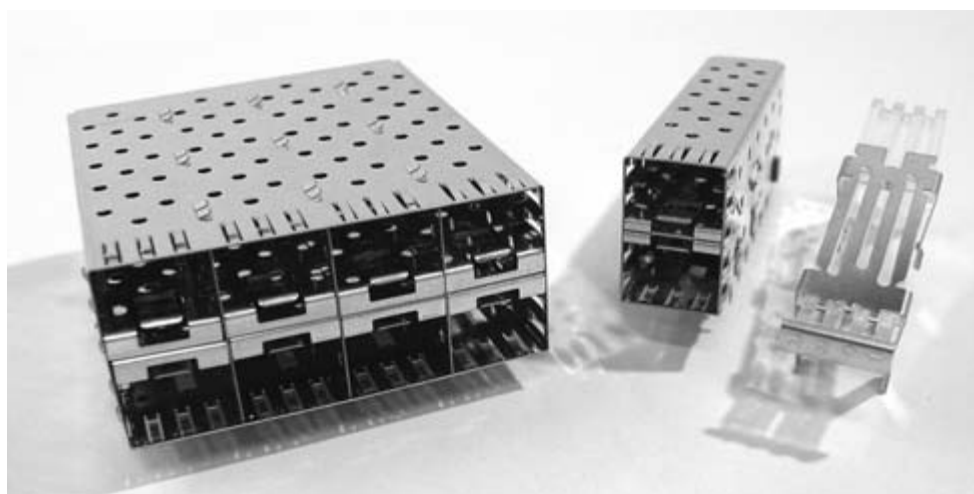
- 408-8848 SFP Cage Assembly Seating Tool
- 408-8849 SFP Cage Assembly Extraction Tool
- 408-8850 Stacked SFP Connector Extraction Tool

Application Specification

- 114-13103 Stacked SFP Connector & Cage Assembly

Product Specifications

- 108-2161 SFP Connector & Cage Assemblies



The Stacked SFP configuration allows original equipment manufacturers and designers the ability to maximize port density by decreasing the horizontal port spacing from 16.25mm, in the original

SFP MSA, to 14.25mm allowing a common wall to support two side by side ports:

- Minimizing height requirements
- Decreasing horizontal port spacing

Tyco Electronics supports 2x1, 2x4 and 2x6 configurations.

For increased flexibility, Tyco Electronics also offers a single row SFP cage with integrated connector, which is footprint compatible with its stacked SFP cages. See page 10 for details.

Part Number	Port Configuration	Height Profile	Light Pipes Included	Press Fit Exemption Tin-Lead on I/O Contacts
1658391-1	2x1	Standard	No	1761937-1
1658628-1	2x1	Low Profile	No	1888126-1
1658859-1	2x1	Low Profile	Yes	
1658390-1	2x4	Standard	No	1761938-1
1658629-1	2x4	Low Profile	No	
1658758-1	2x4	Low Profile	Yes	
1761327-1	2x6	Standard	No	1761939-1
1658894-1	2x6	Low Profile	No	
1658895-1	2x6	Low Profile	Yes	

Note: Tyco Electronics Light Pipe assemblies are sold with the SFP cage assembly. The Light Pipes attach to the top of the SFP cage for clear visibility in a high density application.

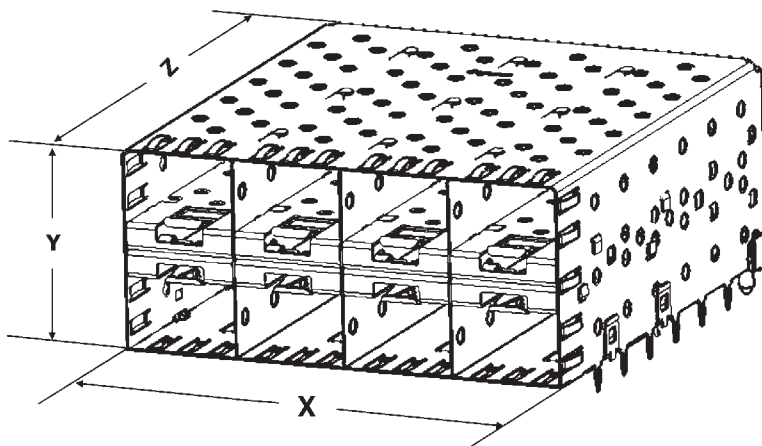
Related Products

Part Number	Description
1761394-1	SFP Dust Cap

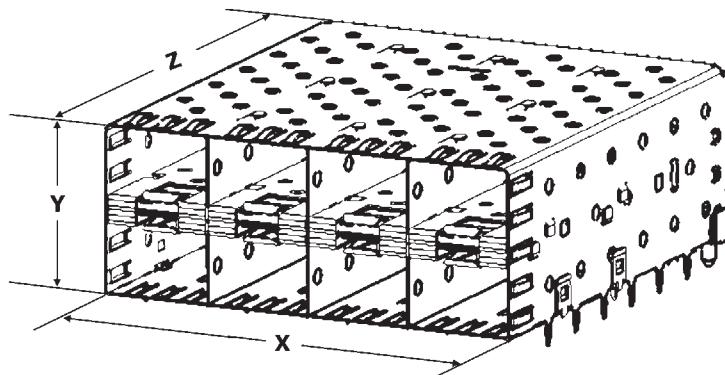
Note: For a complete listing of SFP Direct Attach Cable Assemblies, refer to page 12.

Note: All part numbers are RoHS compliant.

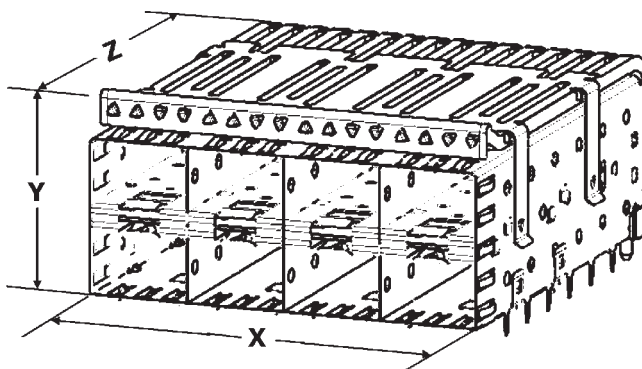
Standard Profile 2x4
Configuration View
Part Number 1658390-1



Low Profile 2x4
Configuration View
Part Number 1658629-1



Low Profile 2x4
with Light Pipe
Configuration View
Part Number 1658758-1



Nominal Dimensions

Part Number	Description	X Dim	Y Dim	Z Dim
1658391-1	2x1 SFP Cage	14.50 [.571]	25.50 [1.004]	63.25 [2.490]
1658628-1	2x1 Low Profile SFP Cage	14.50 [.571]	22.55 [.888]	63.25 [2.490]
1658859-1	2x1 Low Profile SFP Cage w/Light Pipes	14.50 [.571]	28.35 [1.116]	68.75 [2.707]
1658390-1	2x4 SFP Cage	57.25 [2.254]	25.50 [1.004]	63.25 [2.490]
1658629-1	2x4 Low Profile SFP Cage	57.25 [2.254]	22.55 [.888]	63.25 [2.490]
1658758-1	2x4 Low Profile SFP Cage w/Light Pipes	57.25 [2.254]	28.35 [1.116]	68.75 [2.707]
1761327-1	2x6 SFP Cage	85.75 [3.376]	25.50 [1.004]	63.25 [2.490]
1658894-1	2x6 Low Profile SFP Cage	85.75 [3.376]	22.55 [.888]	63.25 [2.490]
1658895-1	2x6 Low Profile SFP Cage w/Light Pipes	85.75 [3.376]	28.35 [1.116]	68.75 [2.707]

Note: All part numbers are RoHS compliant.

Ganged SFP Cage with Integrated Electrical Connector

Product Facts

- RoHS Compliant
- Utilizes fully integrated 20 position SFP connector
- Offers full metal housing for superior grounding and EMI reduction
- Incorporates press fit eye-of-the-needle contacts for both mechanical cages and electrical connector
- Connector contacts 30um gold plating w/contact surface treatment
- Hot Swappable
- Compatible with SFP MSA Compliant Modules
- Connector supports data rates beyond 10 Gb/s
- Application tooling available

Applications

- Switches/Routers
- Fiber Channel
- Fast/Gigabit Ethernet
- ATM/SONET/SDH
- InfiniBand (IB)

Technical Documents

Instruction Sheet

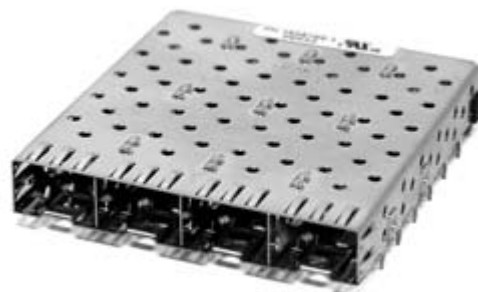
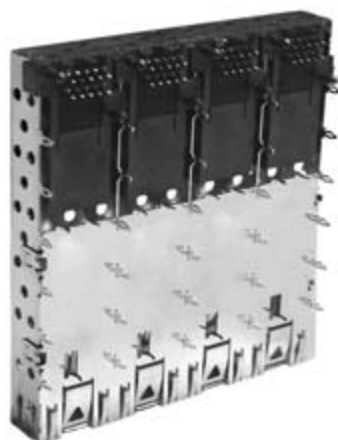
- 408-8848 SFP Cage Assembly Seating Tool
- 408-8849 SFP Cage Assembly Extraction Tool
- 408-8850 Stacked SFP Connector Extraction Tool

Application Specification

- 114-13121 SFP Ganged Press Fit Connector & Cage Assembly

Product Specifications

- 108-2161 SFP Connector & Cage Assembly

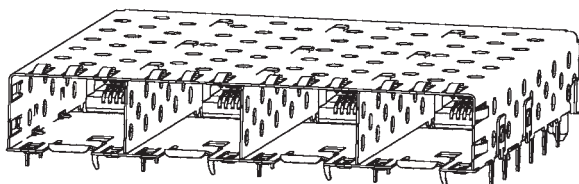


For increased flexibility with Original Equipment Manufacturers', Tyco Electronics has developed a line of Ganged (Single Row) SFP products that are footprint

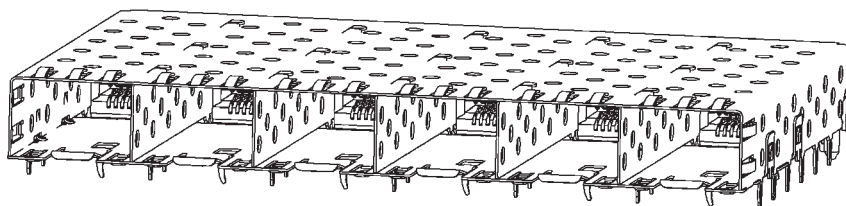
compatible with its Stacked SFP product line. The SFP cages are fully RoHS compliant with a Tin finish over Nickel subplate. The connector uses the same

press fit technology as was incorporated into the stacked SFP connector system. Products currently offered are in 1x4 and 1x6 configurations.

Part Number 1658706-1



Part Number 1761322-1



Part Number	Port Configuration	Footprint Compatible with Stacked SFP	Light Pipes Available	Press Fit Exemption Tin Lead on I/O Contacts
1658706-1	1x4	1658390-1 1658629-1	No	No
1761322-1	1x6	1761327-1 1658894-1	No	No
1761960-1	1x6	1761327-1 1658894-1	No	Yes

Related Products

Part Number	Description
1761394-1	SFP Dust Cap

Note: For a complete listing of SFP Direct Attach Cable Assemblies, refer to page 12.

Note: All part numbers are RoHS compliant.

Product Facts

- RoHS Complaint
- Used in conjunction with 20 pin SMT SFP connector
- Offers full metal housing for superior grounding and EMI reduction
- Available in 1x1, 1x2, and 1x4 configurations
- Compatible with existing SFP MSA compliant modules
- Hot Swappable
- Enhanced EMI gasket, increasing the contact points between EMI contact fingers on bezel opening
- Double-sided EMI contacts
- 20dB EMI suppression improvement possible
- Connector supports data rates beyond 10 Gb/s

Applications

- Servers
- Storage
- Networking Equipment
- Switching (Telephone)
- SFP+

Technical Documents

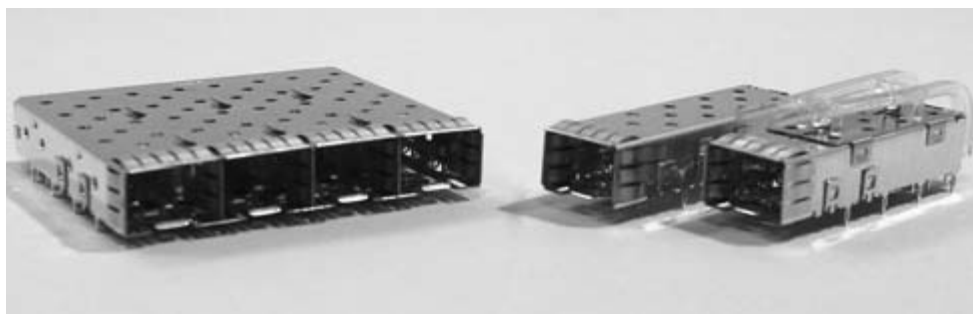
Application Specification

114-13017 SFP Connector and Cage Assembly

Product Specification

108-1950 SFP Cage

SFP with Enhanced EMI Gaskets



As data rates exceed 2.5 Gb/s, there is a greater need for higher EMI suppression. Enhanced EMI gaskets are added to the existing SFP product line to meet the increased EMI requirements at higher data rates.

The SFP Cages with enhanced EMI Gaskets are

compatible with the existing SFP MSA panel cutout. The enhanced EMI gaskets offer increased surface area for improved EMI suppression.

EMI gaskets are double sided to reduce emissions between both cage and panel, as well as cage and module. Testing suggests a 20dB improvement on EMI

suppression can be achieved.

Initial product will focus on single port, ganged 1x2 and ganged 1x4 configurations.

Part Number	Description
1761783-1	Cage Assy, Enhanced EMI, II Press Fit
1761896-1	Cage Assy, 8 Press Fit, SFP
1761497-1	Cage Assy, 20 Press Fit, Enhanced EMI SFP
1888424-1	Cage Assy, 1x2 Press Fit
1888425-1	Cage Assy, 1x4 Press Fit

Related Products

Part Number	Description
1367073-1	20 pin, surface mount connector; 15µm gold plating
1367073-2	20 pin, surface mount connector; 30µm gold plating
1658197-1	20 pin, surface mount connector; 30µm gold plating with contact surface treatment
1888247-1	20 pin, surface mount connector; enhanced contact formation
1367147-1	SFP Dust Cap with AMP logo
1367147-3	SFP Dust Cap without AMP logo

Note: For a complete listing of SFP Direct Attach Cable Assemblies, refer to page 12.

Note: All part numbers are RoHS compliant.

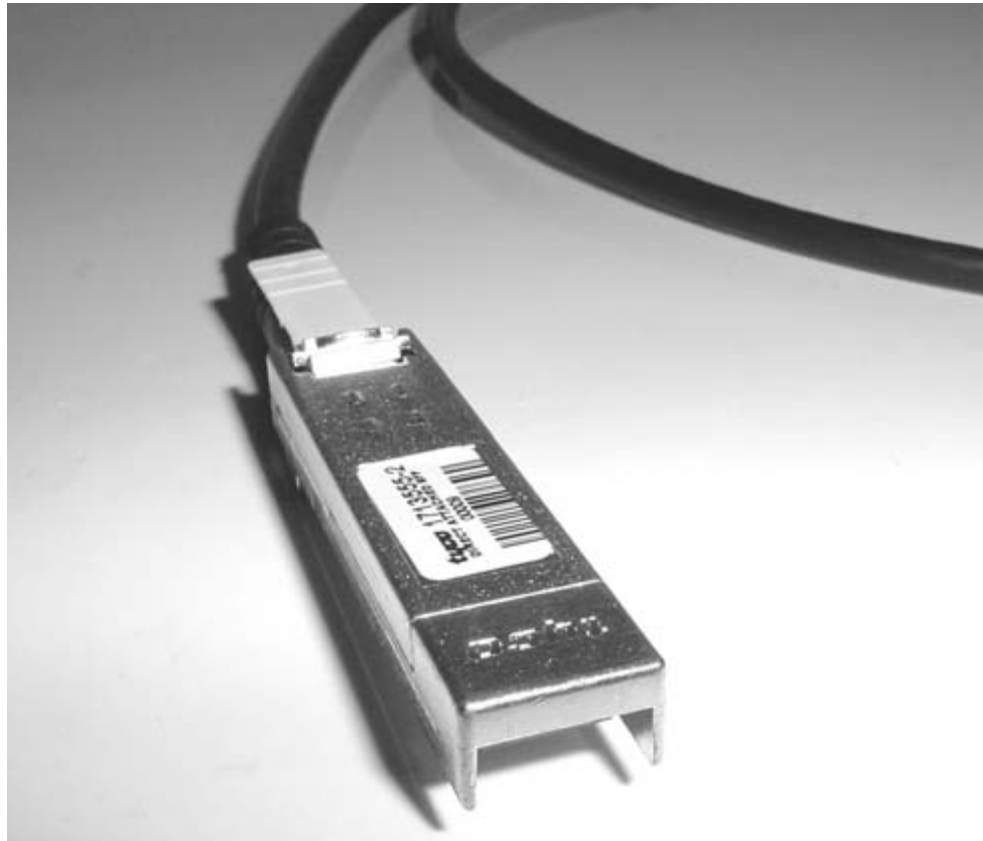
SFP Direct Attach Cable Assemblies

Product Facts

- Supports SFP & SFP+ applications
- SFP+ active cable assemblies support data rates of 500 Mhz to 10 Gb/s
- Broadband — will work at all frequencies up to and including 8.5 Gb/s Fibre Channel and 10 Gb/s Ethernet
- Low cost solution for short reach applications (1-5 meters)
- Three stage sequencing — GND, VDD, Signal — addresses the sequence the pads engage the connector
- Compatible with MSA Compliant SFP cages

Applications

- Servers
- Storage
- Any 8.5 Gb/s Fibre Channel and 10 Gb/s Ethernet applications



Cable Assembly Part Numbers

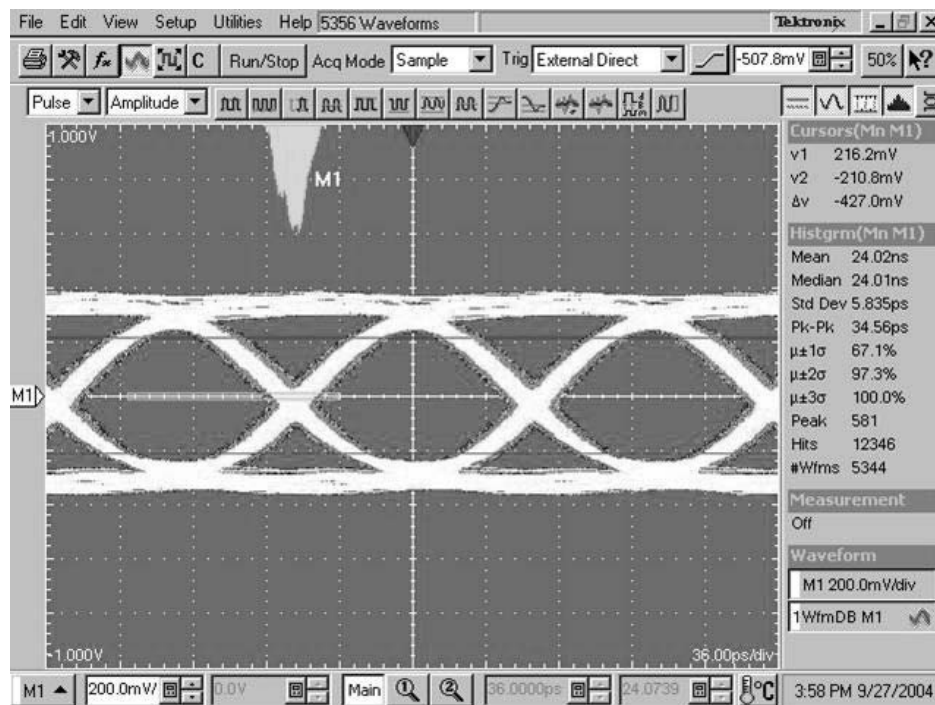
Description	.5 meter	1 meter	2 meters	3 meters	4 meters	5 meters
2 Gb/s Passive	1902495-1	1902495-2	1902495-3	1902495-4	1902495-5	1902495-6
4 Gb/s Passive	1948134-1	1948134-2	1948134-3	1948134-4	1948134-5	1948134-6
4 Gb/s Active	1948135-1	1948135-2	1948135-3	1948135-4	1948135-5	1948135-6
10 Gb/s Passive	1948136-1	1948136-2	1948136-3	1948136-4	1948136-5	1948136-6
10 Gb/s Active	1812997-1	1812997-2	1812997-3	1812997-4	1812997-5	1812997-6

Note: Contact Tyco Electronics for other configuration / length requirements.

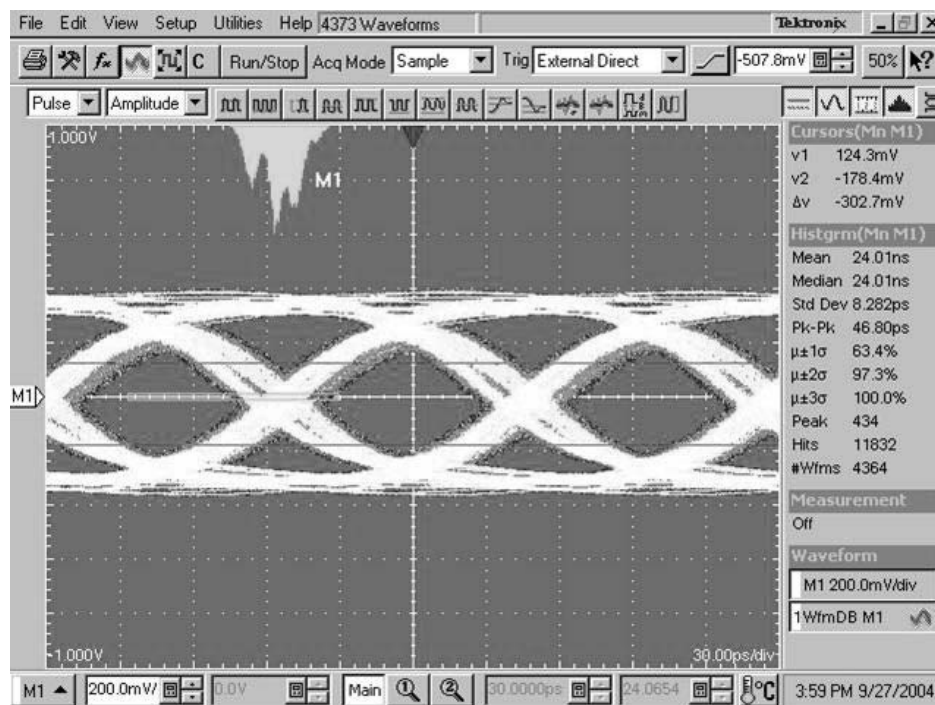
Note: All part numbers are RoHS compliant.

SFP Direct Attach Cable Assemblies (Continued)
8.5 Gb/s Eye Pattern for SFP+ (Active SFP) — 12 meters

- Bit Rate: 8.5 Gb/s
- Source: Advantest 12 Gb/s Source
- Input Voltage: 1000 mV
- Data pattern: PRBS (2⁷-1)
- Aggressor Source: HP 8133A
- Aggressor Voltage: 1600 mV
- Aggressor Bit Rate: 3.5 Gb/s
- Eye Opening: 427.0 mV
- Jitter: 34.56 ps
- 12m 24AWG SFP Cable Assembly


10 Gb/s Eye Pattern for SFP+ (Active SFP) — 12 meters

- Bit Rate: 10 Gb/s
- Source: Advantest 12 Gb/s Source
- Input Voltage: 1000 mV
- Data pattern: PRBS (2⁷-1)
- Aggressor Source: HP 8133A
- Aggressor Voltage: 1600 mV
- Aggressor Bit Rate: 3.5 Gb/s
- Eye Opening: 302.7 mV
- Jitter: 46.8 ps
- 12m 24AWG SFP Cable Assembly



10 Gigabit Serial Pluggable Solution (XFP)

Product Facts

- Fully compliant to XFP MSA
- RoHS compliant
- Used in conjunction with 30 pin surface mount connector
- Press fit PCB attach
- Improved EMI containment features
 - Module to XFP Cage
 - XFP Cage to Chassis
- Designed to allow for riding heat sink
- Designed for use in belly-to-belly applications

Applications

- 10 Gigabit Ethernet Switches and Routers
- 10 Gigabit Aggregator ports
- ATM/SONET/SDH (OC-192)

Technical Documents

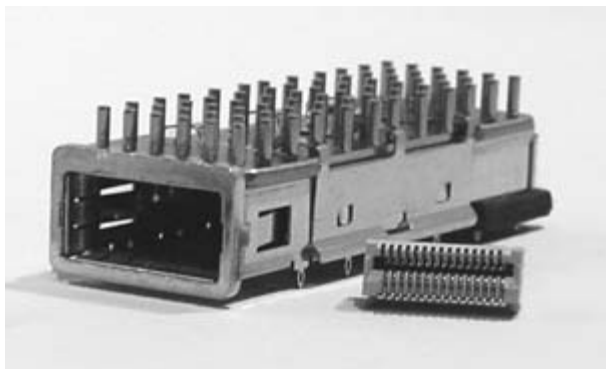
Instruction Sheet
408-8723

Application Specification

114-13096

Product Specifications

108-2127



The XFP Multi-Source Agreement (MSA) specifies the next generation pluggable transceiver. Tyco Electronics' line of XFP products is fully compliant with the XFP MSA. The MSA specifies the mechanical and electrical requirements for the pluggable modules, cage hardware, thermal heat sinks, and PCB surface mount connector. This technology converts

external serial optical or electrical signals and is intended to be flexible enough to support OC192/STM-64, G.709, and 10 Gigabit Ethernet.

The goal of the XFP MSA is to provide a universal design for the transceiver that will be suitable for all applications (one size fits all).

- Intuitive latch
- Simple design based on SFP where possible

- Provide a range of options for:
 - EMI containment and thermal dissipation that are controlled by various EMI gasket, cage and heat sink designs specified by the customer.
 - Accommodate a wide range of industry applications
 - Provide an industry accepted, robust design that will be accepted by the industry.

Part Number	Description	PCB Attachment
1489951-1	XFP Cage	Press Fit
1658871-1	XFP Cage w/Insulating Tape	Press Fit
1888101-1	XFP Cage without Rear Gasket	Press Fit
1658945-1	XFP Cage w/Insulating Tape & without Rear Gasket	Press Fit
1888116-1	XFP Kit: XFP Cage with SAN Heat Sink (6.5mm)	Press Fit
1888116-2	XFP Kit: XFP Cage with PCI Heat Sink (4.2mm)	Press Fit
1888065-1	XFP Kit: XFP Cage with Networking Heat Sink (13.5mm)	Press Fit
1888481-1	XFP Kit: XFP Cage w/insulating tape with PCI Heat Sink (4.2mm)	Press Fit
1888481-2	XFP Kit: XFP Cage w/insulating tape with SAN Heat Sink (6.5mm)	Press Fit
1888481-3	XFP Kit: XFP Cage w/insulating tape w/Networking Heat Sink (13.5mm)	Press Fit

Related Products

Part Number	Description
788862-1	30 Pos SMT XFP Conn. 15 um gold plating
788862-2	30 Pos SMT XFP Conn, 30um gold plating
1367500-1	30 Pos SMT XFP Conn, 30um gold plating with contact treatment, and enhanced contact formation for high speed signals
1489948-2	XFP Heat Sink Clip
1658294-2	XFP Dust Cap
1542618-2	PCI Heat Sink (4.2mm)
1542656-2	SAN Heat Sink (6.5mm)
1652706-2	Networking Heat Sink (13.5mm)

Note: All part numbers are RoHS compliant.

Product Facts

- 10 Gb/s Serial
- Excellent EMI/RFI shielding
- XFP compliant
- Part of a complete product line
- Three stage sequencing — GND, VDD, Signal — addresses the sequence the pads engage the connector

Applications

- Switches
- Routers
- Desktop Applications

Product Offering

XFP Compliant

- XFP active cable assembly
Part Number 1902639-X

Non-compliant passive assembly

- XFP passive (no active components, may be suitable for going 6-12 inches card to card)
Part Number 1902480-1

XFP Cable Assemblies

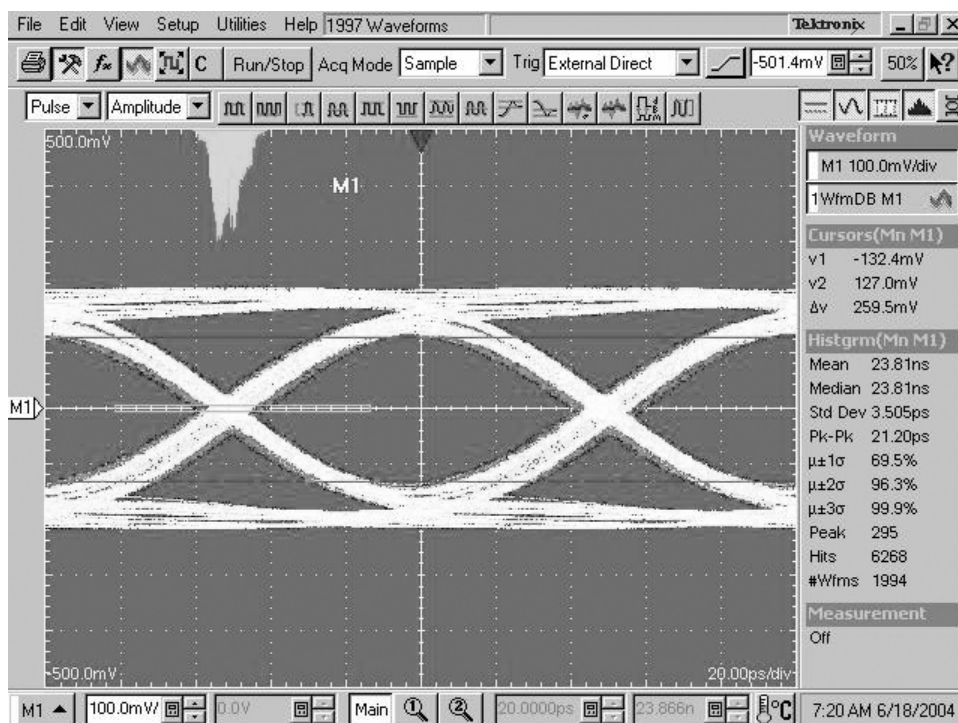


Part Numbers

Description	.3 meter	1 meter	2 meters	3 meters	4 meters	5 meters
XFP Passive	1902480-1	—	—	—	—	—
XFP Active	—	1902639-1	1902639-2	1902639-3	1902639-4	1902639-5

Note: All part numbers are RoHS compliant.

XFP, 10.0 Meter Length, 10.0 Gb/s



Product Facts

- Fully supports X2 MSA
- Used in conjunction with 70 position SMT connector
- RoHS Compliant
- Offers full metal EMI shielding to contact X2 compliant module
- Application tooling available

Applications

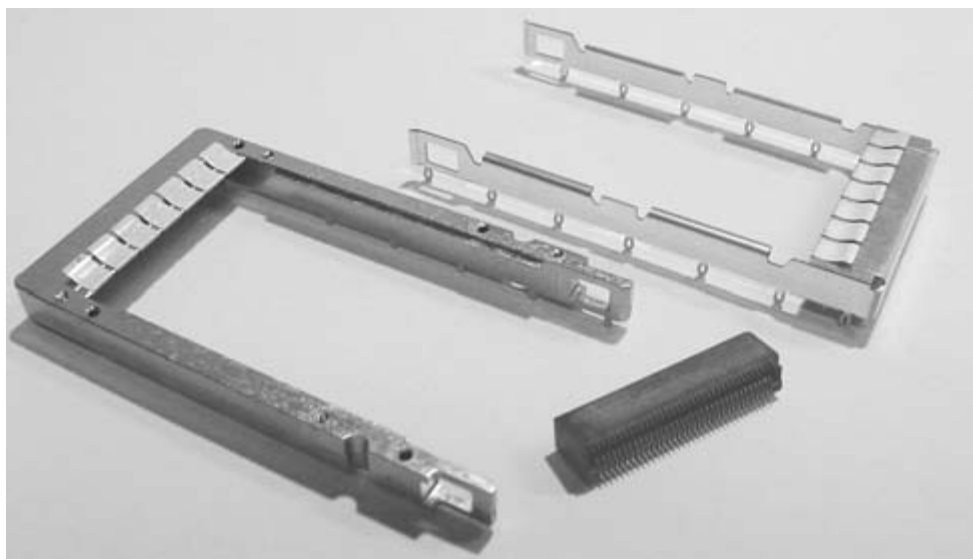
- Switches
- Routers
- Desktop Applications

Technical Documents

Instruction Sheet

408-8983

X2 Guide Rail



Tyco Electronics, continuing to support the OEM market with high speed I/O product, offers an X2 compliant guide rail system. X2 is a next generation Xau-i-based system that offers four channels of data throughput operating up to 3.125 Gb/s. The guide rail is used in

conjunction with an X2 compliant module.

Tyco Electronics offers both a stamped guide rail, with tin finish and a robust die cast rail, with nickel plate.

The X2 Guide Rail System is the latest product to be added to the

Tyco Electronics family of Pluggable I/O solutions. Other products include SFP cages and connectors, High Density SFP cages and connectors, XFP, SFP Direct Attach cable assemblies, and DWDM SFP.

Part Number	PCB Configuration	Material	PCB Attachment
1367608-1	Standard	Stamped Copper Alloy w/Tin Plate	Press Fit
1367610-1	Belly-to-Belly	Stamped Copper Alloy w/Tin Plate	Press Fit
1367709-1	Standard	Die Cast Zinc Alloy	Screw Down
1367710-1	Belly-to-Belly	Die Cast Zinc Alloy	Screw Down

Related Products

Part Number	Description
1367337-1	70 pin, surface mount connector; 15µm gold plating
1367337-2	70 pin, surface mount connector; 30µm gold plating
1658198-1	70 pin, surface mount connector; 30µm gold plating with surface treatment

Note: All part numbers are RoHS compliant.

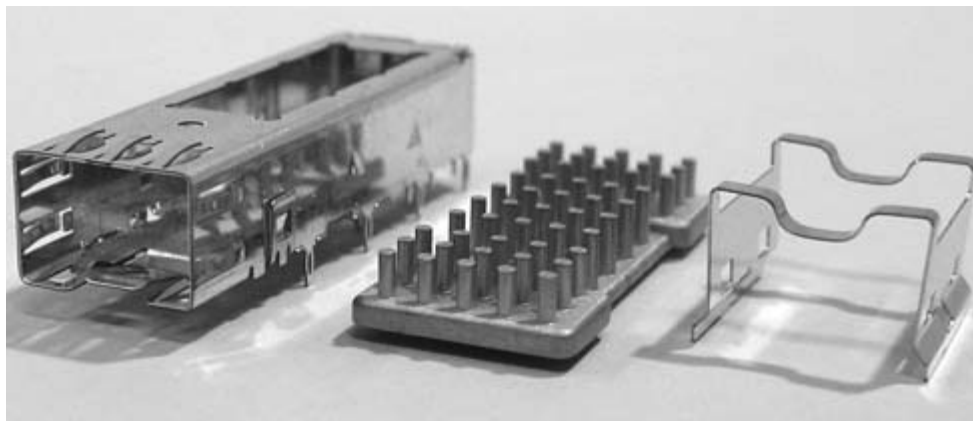
Product Facts

- RoHS Complaint
- Used in conjunction with 20 pin SMT SFP Connector
- Offers full metal housing for superior grounding and EMI reduction
- Incorporates press fit eye-of-the-needle contacts for mechanical cages
- Hot Swappable
- Available in Press Fit version only
- Compatible with DWDM MSA compliant transceivers

Applications

- DWDM Switch applications
- High Density application requiring additional Thermal Management

Dense Wavelength Division Multiplexing (DWDM) SFP System



In response to the DWDM market, Tyco Electronics introduced an SFP system incorporating a riding heat sink to the SFP to assist in managing excess heat when using SFP modules.

Tyco Electronics adopted a similar design to the industry accepted 10 Gigabit or XFP form factor.

The DWDM SFP solution will include a RoHS press fit cage, a stainless steel heat

sink clip, and an aluminum heat sink.

DWDM SFP Cage product is compatible with any DWDM MSA compliant transceiver.

Part Number	Product Description	PCB Attachment
1367643-1	1x1 DWDM SFP Cage	Press Fit
1367646-1	Heat Sink Clip, Stainless Steel	N/A
1829903-2	DWDM PCI Heat Sink (4.2mm)	N/A
1829904-2	DWDM SAN Heat Sink (6.5mm)	N/A
1829905-2	DWDM Networking Heat Sink (13.5mm)	N/A
1367645-1	DWDM Kit: Cage, Clip and PCI Heat Sink (4.2mm)	Press Fit
1367645-2	DWDM Kit: Cage, Clip and SAN Heat Sink (6.5mm)	Press Fit
1367645-3	DWDM Kit: Cage, Clip and Networking Heat Sink (13.5mm)	Press Fit

Related Products

Part Number	Description
1367073-1	20 pin, surface mount connector; 15µm gold plating
1367073-2	20 pin, surface mount connector; 30µm gold plating
1658197-1	20 pin, surface mount connector; 30µm gold plating with contact surface treatment
1888247-1	20 pin, surface mount connector; enhanced contact formation
1367147-1	SFP Dust Cap with AMP logo
1367147-3	SFP Dust Cap without AMP logo

Note: All part numbers are RoHS compliant.

Note: This index lists all cataloged parts by base no. only. Complete part nos. (with prefixes and/or suffixes) are shown on the page(s) indicated.

Part Number Index

Part No.	Page	Part No.	Page	Part No.	Page
788862	14	1658391	8, 9	1761939	8
1367073	4, 6, 11, 17	1658628	8, 9	1761960	10
1367147	4, 11, 17	1658629	8, 9, 10	1812997	12
1367337	16	1658706	10	1829903	17
1367500	14	1658723	6	1829904	17
1367608	16	1658744	6, 7	1829905	17
1367610	16	1658758	8, 9	1888038	6
1367629	4, 5	1658859	8, 9	1888065	14
1367643	17	1658871	14	1888101	14
1367645	17	1658894	8, 9, 10	1888116	14
1367646	17	1658895	8, 9	1888126	8
1367709	16	1658939	6, 7	1888247	4, 6, 11, 17
1367710	16	1658945	14	1888424	11
1489662	4	1761007	6, 7	1888425	11
1489669	4, 5	1761008	6, 7	1888481	14
1489779	4	1761014	6, 7	1902480	15
1489948	14	1761015	6, 7	1902495	12
1489951	14	1761322	10	1902639	15
1542618	14	1761327	8, 9, 10	1948134	12
1542656	14	1761394	6, 8, 10	1948135	12
1652706	14	1761497	11	1948136	12
1658197	4, 6, 11, 17	1761783	11	6367034	4, 5
1658198	16	1761896	11	6367035	4, 5
1658294	14	1761937	8		
1658390	8, 9, 10	1761938	8		

Americas

Argentina – Buenos Aires
Phone: +54-11-4733-2200
Fax: +54-11-4733-2211

Brasil – São Paulo
Phone: +55-11-3611-1311
Fax: +55-11-3611-0397

Canada – Toronto
Phone: +905-475-6222
Fax: +905-474-5520
Product Information Center:
(Technical Support)
Phone: +905-470-4425
Fax: +905-474-5525

Colombia – Bogota
Phone: +57-1-231-9398
Fax: +57-1-660-0206

Mexico – Mexico City
Phone: +52-55-1106-0800
Fax: +52-5-361-8545

United States – Harrisburg, PA
Phone: +717-564-0100
Fax: +717-986-7575
Product Information Center:
(Technical Support)
Phone: +800-522-6752
Fax: +717-986-7575

For Latin/South American Countries not shown
Phone: +54-11-4733-2015
Fax: +54-11-4733-2083

Asia/Pacific

Australia – Sydney
Phone: +61-2-9554-2600
Fax: +61-2-9502-2556
Product Information Center:
(Technical Support)
Phone: +61-2-9840-8200
Fax: +61-2-9634-6188

India – Bangalore
Phone: +91-80-285-40800
Fax: +91-80-285-40820

Indonesia – Jakarta
Phone: +65-6482-0311
Fax: +65-6482-1012

Japan – Tokyo
Phone: +81-44-844-8111
Fax: +81-44-812-3207
Raychem & Identification Products
Phone: +81-44-844-8183
Fax: +81-44-844-8184
Product Information Center:
(Technical Support)
Phone: +81-44-844-8013
Fax: +81-44-812-3200

Korea – Seoul
Phone: +82-2-3415-4500
Fax: +82-2-3486-3810

Malaysia – Kuala Lumpur
Phone: +60-3-78053055
Fax: +60-3-78053066

New Zealand – Auckland
Phone: +64-9-634-4580
Fax: +64-9-634-4586

Philippines – Makati City
Phone: +632-848-0171
Fax: +632-867-8661

People's Republic of China
Hong Kong
Phone: +852-2735-1628
Fax: +852-2735-0243

Shanghai
Phone: +86-21-64857333/64850602
Fax: +86-21-64856222/54260190

Singapore – Singapore
Phone: +65-6482-0311
Fax: +65-6482-1012
Raychem Products
Phone: +65-4866-151
Fax: +65-6545-514
Identification Products
Phone: +65 (0) 6482-0311
Fax: +65 (0) 6481-5514

Taiwan – Taipei
Phone: +886-2-8768-2788
Fax: +886-2-8768-2268

Thailand – Bangkok
Phone: +66-2-955-0500
Fax: +66-2-955-0505

Vietnam and Indochina –
Ho Chi Minh City
Phone: +84-8 930-5546
Fax: +84-8 930-3443

Europe/Middle East/Africa

Austria – Vienna
Phone: +43-1 90 5 60-0
Fax: +43-1 90 5 60-1333

Belgium – Kessel-Lo
Phone: +32-16-35-23-00
Fax: +32-16-35-23-52

Bulgaria – Sofia
Phone: +359-2-971-2152
Fax: +359-2-971-2153

Czech Republic – Kurim
Phone: +420-5-41-162-111
Fax: +420-5-41-162-223

Denmark – Glostrup
Phone: +45-43-480-452
Fax: +45-43-441-414

Egypt – Cairo
Phone: +20-2-417-76-47
Fax: +20-2-419-23-34

Finland – Helsinki
Phone: +358-95-12-34-20
Fax: +358-95-12-34-250

France – Cergy-Pontoise
Phone: +33-1-3420-8888
Fax: +33-1-3420-8600
Product Information Center:
(Technical Support)
Phone: +33-1-3420-8943
Fax: +33-1-3420-8623

Germany – Bensheim
Phone: +49-6251-133-0
Fax: +49-6251-133-1600
Product Information Center:
(Technical Support)
Phone: +49-6251-133-1999
Fax: +49-6251-133-1988

Germany – Langen
Phone: +49-6103-709-0
Fax: +49-6103-709-1223

Germany – Speyer
Phone: +49-6232-30-0
Fax: +49-6232-30-2243

Germany - HTS Division – Neunkirchen
Phone: +49-2247-305-0
Fax: +49-2247-305-122

Great Britain –
Stanmore Middlesex
Phone: +44-8706-080-208
Fax: +44-1793-572-109
Product Information Center:
(Technical Support)
Freephone GB: 0800-267-666
Phone: +44-208-420-8341 or 8343
+44-208-420-8081

Great Britain – Raychem & Identification Products
Phone: +44-1793-528171
Fax: +44-1793-572-516

Greece – Athens
Phone: +30-1-9370-396/397
Fax: +30-1-9370-655

Hungary – Budapest
Phone: +36-1-289-1000
Fax: +36-1-289-1010

Ireland – Dublin
Phone: +353-1-820-3000
Fax: +353-1-820-9790

Israel – Yokneam
Phone: +972-4-959-0508
Fax: +972-4-959-0506

Italy – Collegno (Torino)
Phone: +39-011-4012-111
Fax: +39-011-4031116

Lithuania – Vilnius
Phone: +370-5-2131-402
Fax: +370-5-2131-403

Netherlands – 's-Hertogenbosch
Phone: +31-73-624-62-46
Fax: +31-73-621-23-65
Product Information Center:
(Technical Support)
Phone: +31-73-6246-999
Fax: +31-73-6246-998

Norway – Nesbru
Phone: +47-66-77-8886
Fax: +47-66-77-8855

Poland – Warsaw
Phone: +48-22-45-76-700
Fax: +48-22-45-76-720

Romania – Bucharest
Phone: +40-21-311-3479/3596
Fax: +40-21-312-0574

Russia – Moscow
Phone: +7-095-926-5506/07/08/09
Fax: +7-095-926-5505

Russia – St. Petersburg
Phone: +7-812-718-8192
Fax: +7-812-718-8193

Slovenia – Ljubljana
Phone: +386-1561-3270
Fax: +386-1561-3240

South Africa – Port Elizabeth
Phone: +2741-503-4500
Fax: +2741-581-0440

Spain – Barcelona
Phone: +34-93-291-0330
Fax: +34-93-201-7879
Product Information Center:
(Technical Support):
Phone: +34-93-291-0330
Fax: +34-93-200-3779

Sweden – Upplands Väsby
Phone: +46-8-50-72-50-00
Fax: +46-8-50-72-50-01

Switzerland – Steinach
Phone: +41-71-447-0447
Fax: +41-71-447-0444

Turkey – Istanbul
Phone: +90-212-281-8181/2/3
Fax: +90-212-281-8184

Ukraine – Kiev
Phone: +380-044-206-2265
Fax: +380-044-206-2264

For Middle East/African Countries Not Shown
Phone: +33-1-3420-8866
Fax: +33-1-3420-8300



Tyco Electronics Corporation
Harrisburg, Pennsylvania
www.tycoelectronics.com