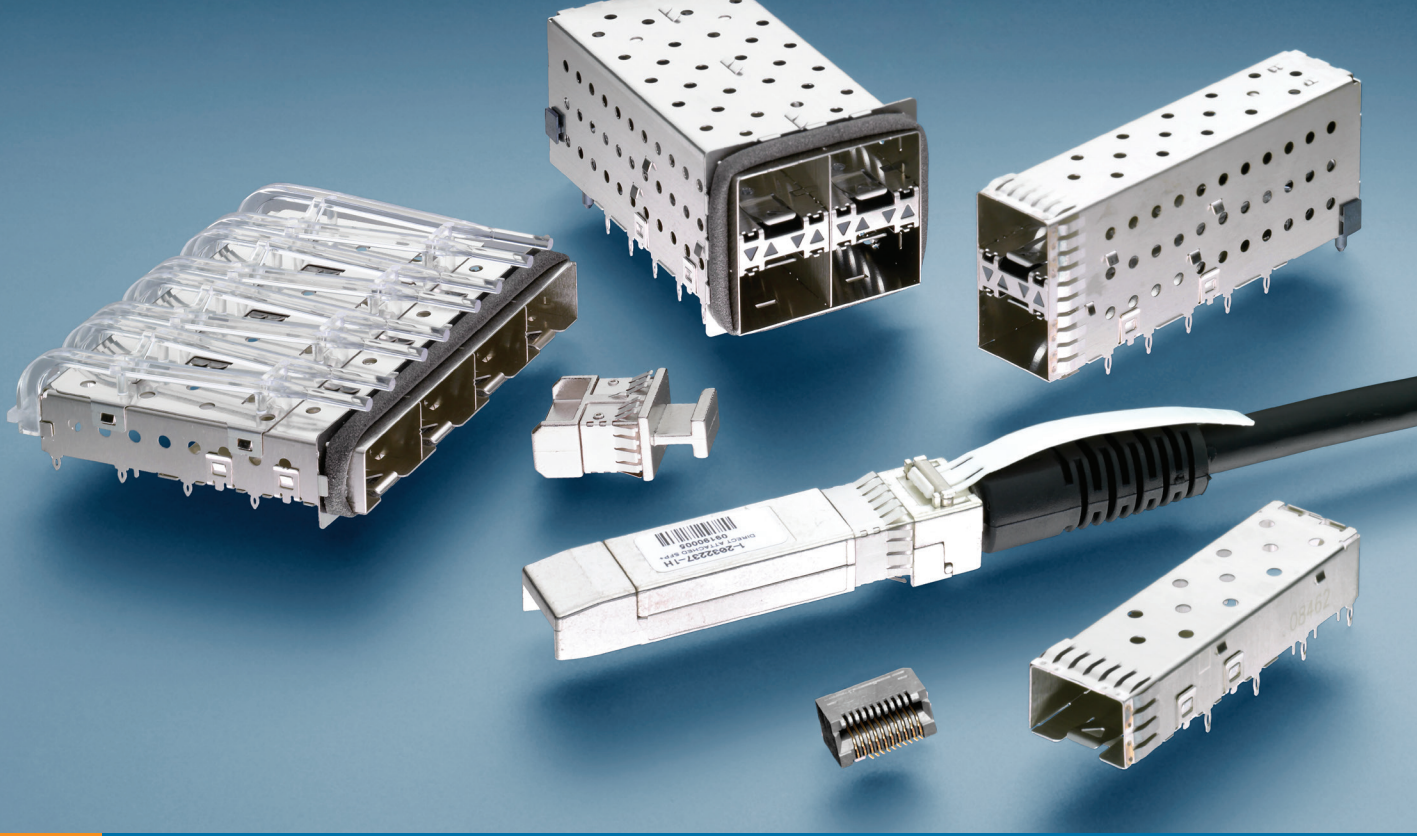




# SFP+ PLUGGABLE I/O INTERCONNECT

TE Connectivity's (TE) family of SFP+ interconnects is designed to transfer data at speeds of up to 16 Gb/s. The portfolio features 20-position SMT connectors as well as cages in multiple configurations, and with elastomeric gasket or enhanced EMI springs to address EMI containment at higher data rates. The SFP+ interconnect family also includes thermal- and EMI-enhanced stacked configurations to further improve performance.

Complementary SFP+ direct-attach copper cable assemblies are also offered by TE as high-speed, cost-effective alternatives to fiber optic cables. The assemblies enable hardware OEMs and data center operators to achieve high port density and configurability at low costs and with reduced power requirements.

## FEATURES AND BENEFITS

### Interconnect

- Supports applications up to 16 Gb/s
- Offers cages in single-port, ganged and stacked configurations. Belly-to-belly mounting cages also offered
- Uses enhanced 20-position connector that is backward-compatible with SFP connectors
- Features elastomeric gaskets and springs for EMI containment
- Offers heat sink and light pipe options

### Direct-Attach Copper Cable Assemblies

- Comply to SFF-8431 specifications
- Support up to 10 Gb/s serial data rates
- Serve as a low-cost alternative to fiber optic cables
- Consume low power
- Offer enhanced EMI suppression
- Feature pull-to-release retractable pin latch

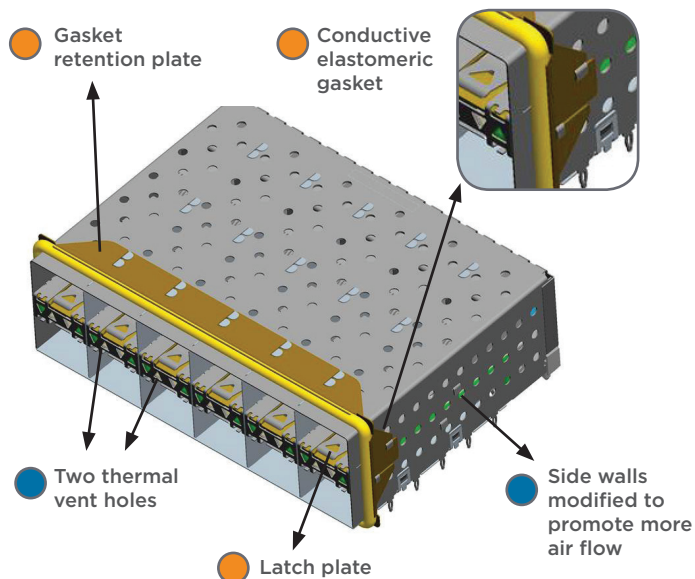
## Product Applications

- Storage, servers, routers, switches and hubs
- Network Interface Cards (NICs)
- Other telecommunications equipment

## Applications by Protocol

- 10 Gigabit Ethernet (IEEE802.3ae)
- Fibre Channel: 2G, 4G, 8G and 16G
- Fibre Channel over Ethernet (FCoE)

## SFP+ Thermal and EMI Enhancements



### Thermal Enhancements

SFP+ stacked cages have been modified to enhance thermal performance. These changes include revised side walls of the cage for airflow through the middle of the cage to promote cooling of lower ports

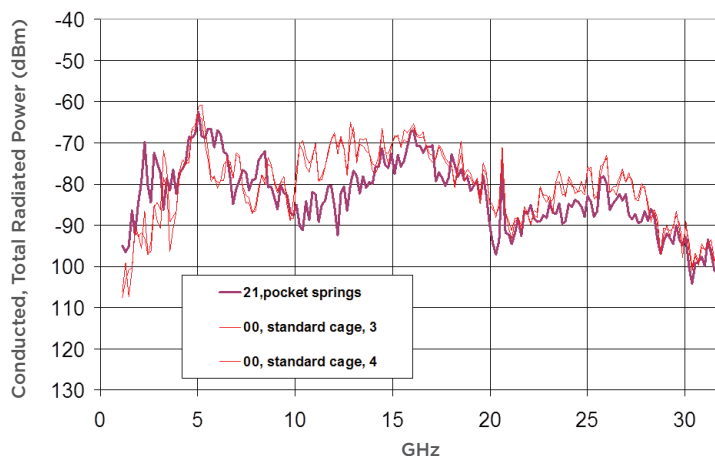
Additionally, two thermal vent holes have been added to each port to further enhance thermal performance.

### EMI Enhancements

SFP+ stacked cages with EMI enhancements feature a gasket retention plate with multiple attachment points that improve the electrical connection to the cage. A new right-angle design of the gasket retention plate also improves the strength of the product.

A pocket spring has been added to the latch plate area to further reduce EMI emission. This component is internal to the cage assembly. The additional component still allows airflow through the front of the cage assembly.

SFP+ 2x4 EMI-Enhanced Cage vs. SFP+ 2x4 Standard Cage



| Configuration | Part Number | Cage Design            |
|---------------|-------------|------------------------|
| Single Port   | 2007198-1   | 11-Pin Press-Fit (PF)  |
|               | 2110304-1   | Standard Solder Tail   |
|               | 2007194-1   | PCI Solder Tail        |
|               | 2057086-2   | Enhanced Footprint     |
| 1x2           | 2007263-1   | PF, Thermal Vent Holes |
| 1x4           | 2169260-1   | Heat Sink Slots        |
| 1x5           | 2284170-1   | Heat Sink Slots        |
| 1x6           | 2007251-1   | PF, Thermal Vent Holes |

| Configuration | Part Number | Cage Design        |
|---------------|-------------|--------------------|
| 2x1           | 2007538-X   | Elastomeric Gasket |
| 2x1           | 2170409-X   | Thermally-Enhanced |
| 2x2           | 2007637-X   | EMI Spring Version |
| 2x4           | 2007399-X   | Elastomeric Gasket |
| 2x4           | 2274010-X   | Thermally-Enhanced |
| 2x6           | 2007562-X   | EMI Spring Version |
| 2x6           | 2180640-X   | Thermally-Enhanced |
| 2x8           | 2149490-X   | EMI Spring Version |

To see more part numbers, visit [www.te.com/products/sfpplus](http://www.te.com/products/sfpplus) or refer to the Pluggable Input/Output Solutions Catalog 1773408-1

| 20 Pin SMT Connector |              |
|----------------------|--------------|
| PN                   | Description  |
| 2110759-1            | Rated to 16G |
| 1888247-1            | 30 µin Au    |
| 1888247-2            | 15 µin Au    |

| Dust Cap  |                                       |
|-----------|---------------------------------------|
| PN        | Description                           |
| 1367147-X | Dust Cap                              |
| 1888901-1 | EMI Plug                              |
| 1761394-1 | Dust Cap (narrow for multiport cages) |

## Cable Assembly Features and Benefits

- Truly broadband - operates from 1 to 10 Gb/s
- 100 Ohm differential impedance
- 3.3 V input source voltages
- Pull tab allows compact belly-to-belly application
- 360 degree cable braid crimp and enhanced EMI skirt
- Uses MADISON CABLE brand TurboTwin parallel pair cable

| Direct Attach Copper Cable Assemblies |                      |     |                       |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |
|---------------------------------------|----------------------|-----|-----------------------|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|
| PN                                    | Description          | AWG | Cable Length (meters) |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |
|                                       |                      |     | 0.5                   | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9   | 10  | 11  | 12  | 13  | 14  | 15  |
| 2127934                               | Standard Passive     | 24  | -1                    | -2 | -3 | -4 | -5 | -6 | -7 | -8 |    |     |     |     |     |     |     |     |
| 2127933                               | Other Passive        | 26  | -1                    | -2 | -3 | -4 | -5 | -6 | -7 |    |    |     |     |     |     |     |     |     |
| 2127932                               |                      | 28  | -1                    | -2 | -3 | -4 | -5 | -6 |    |    |    |     |     |     |     |     |     |     |
| 2127931                               |                      | 30  | -1                    | -2 | -3 | -4 |    |    |    |    |    |     |     |     |     |     |     |     |
| 2032757                               | Active               | 24  |                       |    |    |    |    |    |    |    |    |     |     | -12 | -13 | -14 | -15 | -16 |
|                                       |                      | 28  |                       |    |    |    |    |    |    |    |    | -10 | -11 |     |     |     |     |     |
|                                       |                      | 30  | -1                    | -2 | -3 | -4 | -5 | -6 | -7 | -8 | -9 |     |     |     |     |     |     |     |
| 2053453                               | SFP+ to QSFP+ Hybrid | 26  |                       |    |    |    |    | -6 |    |    |    |     |     |     |     |     |     |     |
|                                       |                      | 28  |                       |    |    |    | -5 |    |    |    |    |     |     |     |     |     |     |     |
|                                       |                      | 30  | -1                    | -2 | -3 | -4 |    |    |    |    |    |     |     |     |     |     |     |     |

## Frequently Asked Questions

### What is belly-to-belly mounting?

- Belly-to-belly mounting allows a customer to install connectors and cages on both sides of a PCB. This design reduces board space and is an alternative solution to stacked connectors.

### If I am currently using SFP cabling, can I use SFP+ host board configurations?

- Yes. SFP+ configurations support higher rates. You can design SFP+ products in the host board for future upgrades.

### What data rate does SFP support?

- SFP supports up to 16Gb/s.

### What are the PCB termination options?

- Cages are offered in press-fit and solder PCB termination styles.

### Is TE's footprint compatible with other suppliers?

- It depends. The single port cages are designed to industry standards. The ganged versions are not compatible with all other sources.

### Are heat sinks available?

- Yes. Riding heat sink technology is available for thermal management.

### Is application tooling required?

- Single port assemblies do not require application tooling, yet ganged assemblies do require application tooling.

## For More Information

[te.com/products/sfpplus](http://te.com/products/sfpplus)

## TE Technical Support Center

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| Germany:          | +49 (0) 6251-133-1999 |
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| France:           | +33 (0) 1-3420-8686   |
| Netherlands:      | +31 (0) 73-6246-999   |
| China:            | +86 (0) 400-820-6015  |

Part numbers in this brochure are RoHS Compliant\*, unless marked otherwise.

\*as defined [www.te.com/leadfree](http://www.te.com/leadfree)

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