

## **zSFP+ (SFP28/56) 28/56 GBPS PLUGGABLE I/O INTERCONNECT**

The zSFP+ interconnect is currently one of the fastest single-channel I/O connectors on the market today, transferring data at 28 Gbps with possible expansion to 56 Gbps. Through a design that is backward-compatible to SFP/SFP+ products, the interconnect is hot-swappable with existing SFP+ connectors for fast system upgrades of 28-56 Gbps. Alternatively, users can design-in the zSFP+ connector for 10-16 Gbps data rates, establishing a progressive path to higher speeds—an upgradeability that can result in longterm cost savings as this would eliminate the need to fully redesign for higher performance.

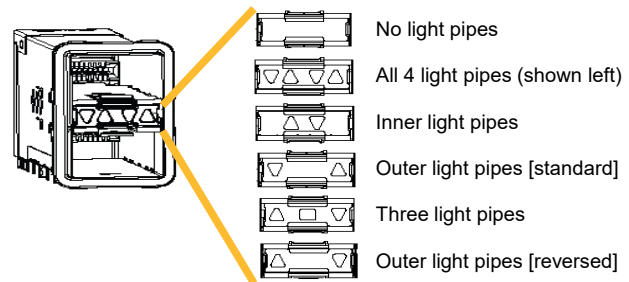
The zSFP+ interconnect is compliant to SFF-8402 and has been adopted for Fibre Channel 32G (28.05 Gbps line rate). The entire product family is offered as a dual source option with Molex. LLC.

# zSFP+ 28/56 Gbps Pluggable I/O Interconnect

## FEATURES

- Data rates: Up to 56 Gbps, 10 Gbps Ethernet and 16 Gbps Fibre Channel
- Surface-mount connector design for single high 1xN cages
- Press-fit 1xN cages and stacked assemblies (connector and cage) for one-step, easy PCB placement
- Coupled, narrow-edged, blanked- and formed-contact beam geometry and insert molding for superior signal integrity, mechanical and electrical performance
- Backwards-compatibility: Shares same mating interface and cage dimensions with the SFP+ connector (connector/single high cages are also PCB footprint-compatible)
- Elastomeric gasket or spring finger options for EMI containment
- Single high cages (1xN) for design flexibility; accommodates belly-to-belly applications for increased density and PCB space savings; available in 1x1, 1x2, 1x4 or 1x6 port configurations
- Stacked assemblies offered in 2x1, 2x2, 2x4, 2x6, 2x8 or 2x12 port
- Heat sinks, LEDs and plating choices offered
- Additional light pipe configurations available

Light pipe options include:



## APPLICATIONS

- **Telecommunications:** Cellular infrastructure, central office uplink equipment, optical transport equipment, switches/routers, access equipment (CMTS, PON, DSL, etc)
- **Data Center:** Data center switches and routers, servers, storage
- **Medical:** Medical diagnostic equipment
- **Networking:** Network interface, switches, routers
- **Test and Measurement Equipment**

## 20-Pin Surface-Mount Connector

### Electrical

- Voltage (max.): 120V AC
- Current (max.): 0.5A
- Dielectric Withstanding Voltage: 300V AC between contacts



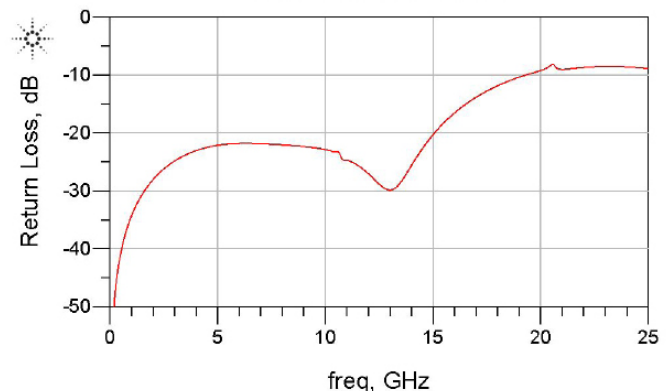
### Mechanical

- Mating Force: 25N
- Unmating Force: 11.5N
- Durability (min.): 250 cycles

### Physical

- High-temperature thermoplastic housing (glass-filled, UL 94V-0 black)
- High-performance copper alloy contacts
- Plating:
  - Nickel underplating; Tin plating on solder tail area; Gold plating on mating area
  - Plating options: 15 and 30µ" Gold or Palladium Nickel
- Operating Temperature: -40 to +85°C

Differential Return Loss



# zSFP+ 28/56 Gbps Pluggable I/O Interconnect

Connector P/N	Description
2170088-1	30μ" in Au or Au Flash Over PdNi
2170088-2	15μ" in Au or Au Flash Over PdNi



## Cages with Elastomeric Gaskets



EMI Suppression	Light Pipe Option	1X1	1X2	1X4	1X6	1X8
EMI gasket	No	2198709-1*	2198720-1	2198722-1	2198724-1	TBD**
	Yes	2198708-1*	2198719-1	2198721-1	2198723-1	TBD**

## Cages with EMI Springs



EMI Suppression	Light Pipe Option	Heat Sink Option	1X1	1X2	1x3	1X4	1X6	1X8
EMI Spring Fingers	No	No	2274001-1 2291579-1 (PCI)	2227728-1	2349050-1	2227730-1	2227732-1	2304921-1 2295325-6
	Yes	No	2274000-1	2227727-1	TBD**	2227729-1	2227731-1	TBD**
	Yes	Yes	TBD*	TBD**	TBD**	2304342-X	2293156-X	2294408-X

\*Tooling in process \*\*Not yet tooled, but planned

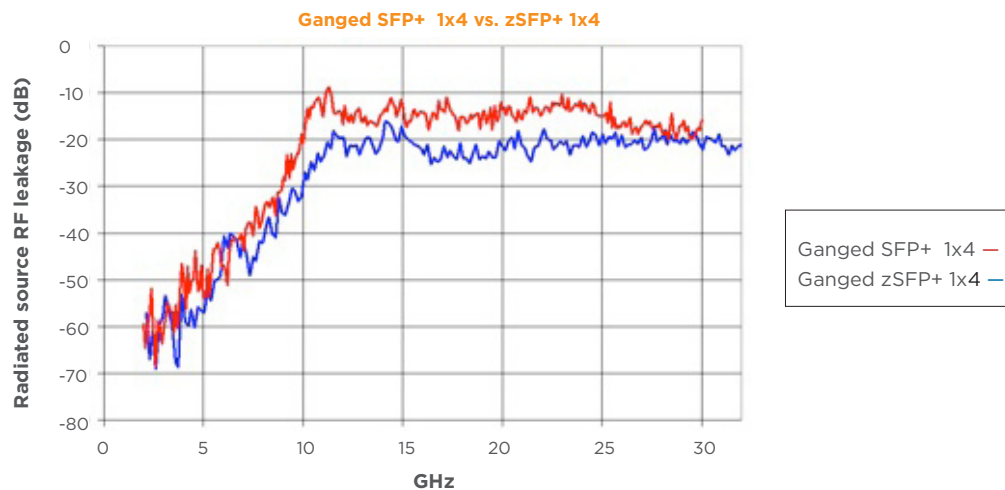
## Ganged 1xN Cages

### Mechanical

- Transceiver insertion force (max.): 34 N without heat sink and clip; 45.37 N with heat sink and clip
- Transceiver extraction force (max.): 12.5 N without heat sink and clip; 14.36 N with heat sink and clip
- SFP+ module to surface-mount connector and zSFP+ cage.
- Cage press fit insertion force (max.): 44.5 N for single port cage, 54.3 N for ganged cage
- Cage press fit extraction force (min.): 8.9 N for single port and ganged cages
- Durability (min.): 100 cycles

### Physical

- Cage material: Nickel Silver
- PCB thickness (min.): 1.50mm in single sided applications; 2.25mm (EMI springs) or 3.0mm (elastomeric gasket) in belly-to-belly applications
- Operating Temperature: -40 to +85°C



# zSFP+ 28/56 Gbps Pluggable I/O Interconnect

## Stacked 2xN Assemblies

### Electrical

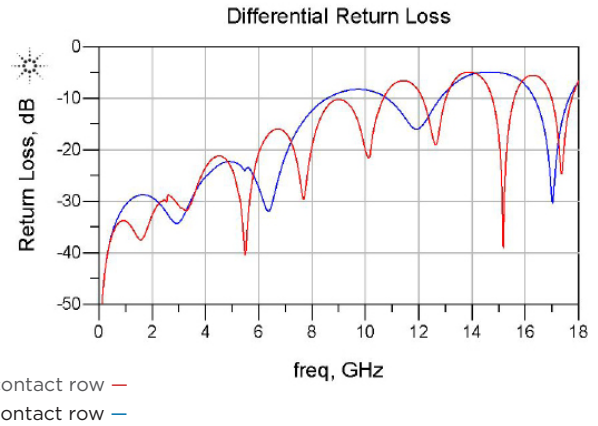
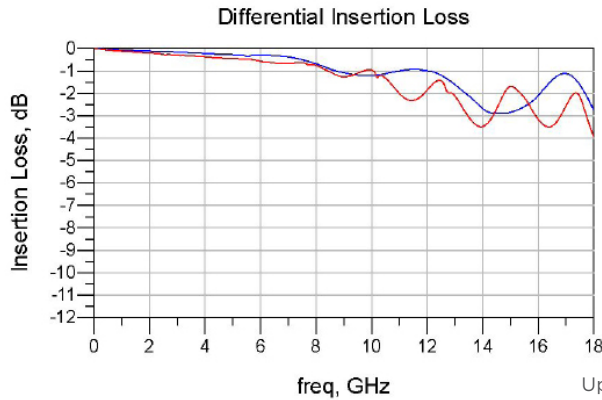
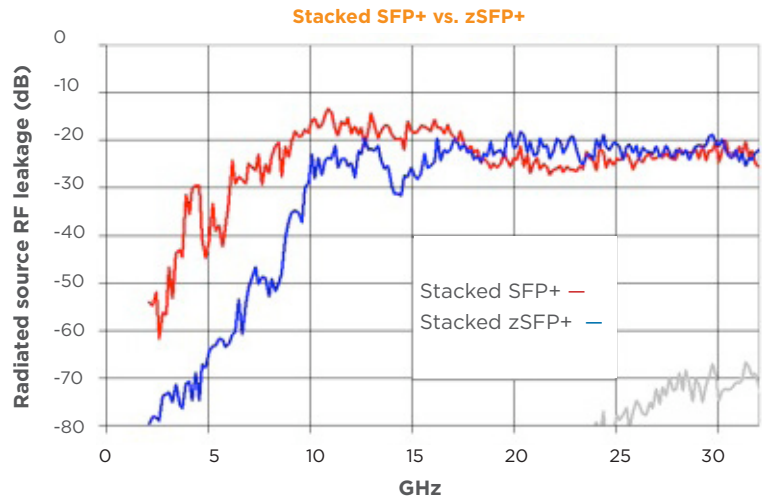
- Voltage (max.): 120V AC
- Current (max.): 0.5A
- Dielectric Withstanding Voltage: 300V AC between contacts

### Mechanical

- Durability (min.): 100 cycles

### Physical

- Cage material: Nickel Silver
  - High-temperature thermoplastic housing (glass-filled, UL 94V-0 black)
  - High-performance copper alloy contacts
  - Plating: Nickel underplating; Tin plating on solder tail area; 30µ" Gold plating on mating area
- PCB thickness (min.): 1.57mm
- Operating Temperature: -40 to +85°C



EMI Suppression	Performance	Light Pipe Configuration	2x1	2x2	2x4	2x6	2x8	2x12
			2198318-(x)	2198325-(x)	2180324-(x)	2198339-(x)	2198346-(x)	2288172-(x)
EMI gasket	Standard	None	2198318-1	2198325-1	2180324-1	2198339-1	2198346-1	2288172-1
		All 4	2198318-2	2198325-2	2180324-2	2198339-2	2198346-2	2288172-2
		Inner	2198318-3	2198325-3	2180324-3	2198339-3	2198346-3	2288172-3
		Outer	2198318-4	2198325-4	2180324-4	2198339-4	2198346-4	2288172-4
		3	1-2198318-7	1-2198325-7	1-2180324-7	1-2198339-7	1-2198346-7	1-2288172-7
		Outer (reversed)	1-2198318-8	1-2198325-8	1-2180324-8	1-2198339-8	1-2198346-8	1-2288172-8
	Thermally Enhanced	Multiple	--	--	3-2180324-0	--	--	2227838-8
EMI spring fingers	Standard	None	2198318-5	2198325-5	2180324-5	2198339-5	2198346-5	2288172-5
		All 4	2198318-6	2198325-6	2180324-6	2198339-6	2198346-6	2288172-6
		Inner	2198318-7	2198325-7	2180324-7	2198339-7	2198346-7	2288172-7
		Outer	2198318-8	2198325-8	2180324-8	2198339-8	2198346-8	2288172-8
		3	1-2198318-9	1-2198325-9	1-2180324-9	1-2198339-9	1-2198346-9	1-2288172-9
		Outer (reversed)	2-2198318-0	2-2198325-0	2-2180324-0	2-2198339-0	2-2198346-0	2-2288172-0
	Thermally Enhanced	Multiple	--	--	3-2180324-1	2291491-1	--	2227838-7 2301210-2

# zSFP+ 28/56 Gbps Pluggable I/O Interconnect

## SFP28/56 Passive Copper Cable Assemblies

Our SFP28/56 passive copper cable assembly features two differential copper pairs, providing one data transmission channel at speeds up to 56 Gbps per channel.

Offered in a broad range of wire gages - from 30AWG through 32AWG - this next generation copper cable assembly features low insertion loss and low cross talk. Our SFP28/56 assemblies share the same mating interface with SFP+ form factors, making them backward compatible with existing SFP+ I/O ports. SFP28/56 cable assemblies can be used with legacy 10G Ethernet and 16G Fibre Channel applications with substantial signal integrity margin.

In addition to SFP28/56 straight cables, we offer breakout assemblies with a 100G QSFP28 or 200G QSFP56 module on one end splitting to four SFP28/56 modules on the opposite end of the assembly. In-line signal integrity (SI) based production testing ensures that each cable assembly meets the electrical performance requirements of the applicable industry standard specification.

### Features and Benefits

- Compatible with IEEE 802.3by and Fibre Channel industry standards
- Supports single lane data rate up to 56 Gbps
- Optimized construction to minimize insertion loss and cross talk
- Customized cable braid termination limits EMI radiation
- Backward compatible with existing SFP+ form factor connectors and cages
- Pull-to-release latch design
- 30AWG through 32AWG cable
- Straight and breakout cable assembly configurations available
- Customizable EEPROM mapping for cable signature
- RoHS compliant

### Industry Standards

- 25G Ethernet (IEEE 802.3by)
- Fibre Channel
- SFF-8402 SFP+ 1X 28Gb/s Pluggable Transceiver Solution (SFP28)
- SFF-8665 QSFP+ 28G 4X Pluggable Transceiver Solution (QSFP28)



SFP28/56 to SFP28/56 Straight Cable Assembly



QSFP28/56 to 4x SFP28/56 Breakout Cable Assembly

### SFP28 Part Number Detail

Base Part Number	Description	AWG	Dash to Length (meters)								
			0.5	1	1.5	2	2.5	3	3.5	4	5
2334985	SFP28 to SFP28 Straight Assembly	32	-1	-2	-3	-4					
2821222		30	-5	-3	-4	-2	-6	-1	-1		
2821223		28	-1	-2	-3	-4	-5	-6	-7	-8	
2821224		26		-1	-5	-3	-4	-5	-6	-7	-8

### SFP56 Part Number Detail

Base Part Number	Description	AWG	Dash to Length (meters)					
			0.5	1	1.5	2	2.5	3
2334985	SFP56 to SFP56 Straight Assembly	32	-41	-42	-43			
2821222		30	-41	-43	-44	-45		
2821223		28	-41	-42	-43	-44	-45	
2821224		26		-41	-42	-43	-44	-45

Contact your TE Representative for customized lengths and breakouts.

## For More Information

[te.com/products/zsfp+](http://te.com/products/zsfp+)

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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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