microQSFP INTERCONNECT SOLUTIONS

28 Gbps Pluggable I/O & Cable Assemblies

TE Connectivity (TE) is leading the industry in the design of micro Quad Small Form-Factor Pluggable (microQSFP) Connectors, providing a higher density solution for next generation pluggable connectivity. With increasing bandwidth requirements, demand is increasing for smaller form factors that will offer increased faceplate density and higher port count. These products need to maintain superior thermal performance to keep energy costs low and maximize reliability. The technological innovations of the microQSFP form factor have the potential to revolutionize the development of pluggable interconnect for next generation designs.

SOLUTIONS FOR THE DATA-DRIVEN WORLD

Higher Density Design Saves Space for Increased Bandwidth

- 4x28G solution provides QSFP28 functionality in a smaller, generally SFP-sized form factor
- 33% higher density than QSFP to fit more ports (up to 72) on a standard line card, saving significant design space
- 14.25mm port-to-port pitch
- Routable, 3-high belly-to-belly faceplate architecture with low cost PCB design

Increased Thermal Performance Saves Energy Cost

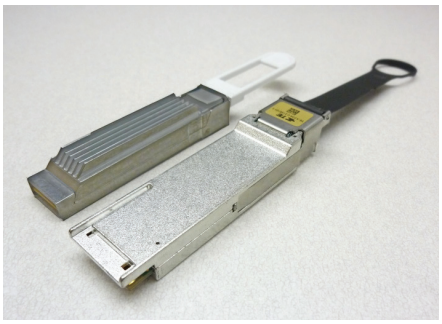
- Integrated module thermal solution offers significantly better thermal performance than QSFP28 solutions
- Thermal performance does not suffer in high density applications
- Thermal solution can be optimized based on power level design
- Ports provide additional equipment airflow, allowing for high port counts in traditional line card designs

Standardized Form Factor Supports Next-Generation Designs and Easy, Low Cost Implementation

- 56 Gbps (PAM-4) performance with backwards compatibility to 28 Gbps (NRZ)
- Future 56 Gbps (NRZ version will be backwards compatible)
- Enables total data center functionality and broad market adoption
- Multi-source agreement (MSA) has defined the mechanical features of the plug, cage and receptacle to provide a standard interface with multiple connector, cable assembly and fiber optic suppliers (visit **www.microQSFP.com** to learn more)

Product Applications

- Networking switches
- Routers
- Servers (blade, rack mountable and multi-node)
- Networking interface cards
- Optical transport equipment



Comparing size of microQSFP (on left) to QSFP

Key Features

- Re-uses QSFP electrical pinout for ease of adoption in networking systems
- 14.25mm port width enables up to 72 ports in a traditional 1RU linecard while enabling direct attach copper cables, optical transceivers with MPO or LC functionality, and active optical cables (AOCs).
- Integrated heatsink in module provides more efficient thermal path for cooling active optical and copper cables
- Cages allow for optimized airflow while providing excellent EMI suppression
- Both side to side and front to back airflow cages are available in stacked and ganged configurations
- Cage solutions are designed to be belly to belly compatible in both 1xN / 1xN and 2xN / 1xN configurations in a 4-6 layer PCB

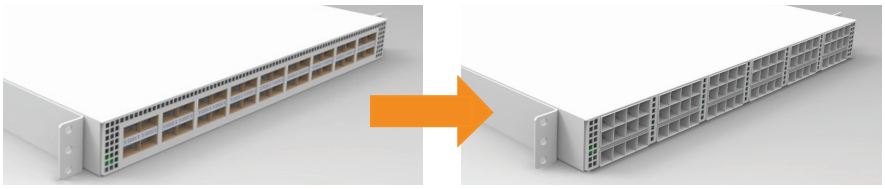
Standards

The µQSFP (microQSFP) MSA references the following protocol applications:

- 25G/100G Ethernet
- 100G InfiniBand EDR
- 32G/128G Fibre Channel
- 25G/50G Ethernet Consortium

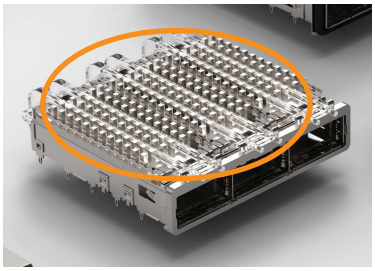
Visit **www.microQSFP.com** to learn more.

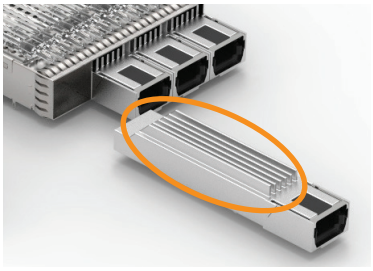
ENABLING THE MOVE FROM 36 TO 72 PORTS WITH THE SAME OPTICS TECHNOLOGY



33% higher density than QSFP means you can fit more ports (up to 72) on a standard line card, saving significant design space.

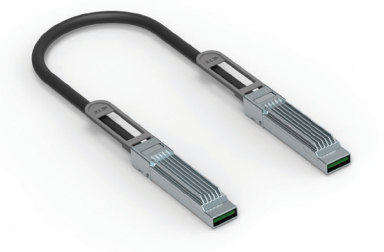
ENABLING HIGH ELECTRICAL DENSITY BY SHIFTING THE THERMAL PARADIGM



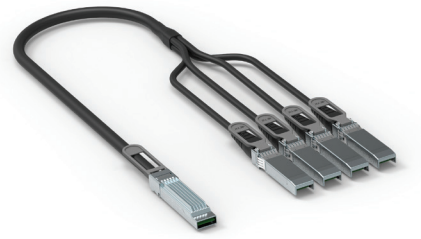


An integrated module thermal solution offers significantly better thermal performance than QSFP28 solutions and removes the largest source of thermal resistance, ultimately requiring less energy to cool equipment and increasing the ease of your system thermal design.

MICROQSFP COPPER CABLE ASSEMBLIES



microQSFP to microQSFP Straight Cable



microQSFP to SFP28 Breakout Cable

- Low loss and low cross talk design
- 26 AWG through 32 AWG cable solutions available
- Straight and breakout assembly configurations available
- Breakout configurations combine microQSFP with QSFP28 and SFP28 form factors

Part Number Details

Connector & Accessories

TE Part Number	Description
2300088-1	microQSFP EMI Plug
2300260-1	microQSFP Dust Plug
2291536-1	microQSFP surface mount connector

Cages

TE Part Number	Description
2296273-1	2x1 microQSFP cage with EMI springs
2296273-2	2x1 microQSFP cage with EMI gasket
2-2296273-1	2x1 microQSFP cage with EMI springs and 2 LPs
2-2296273-2	2x1 microQSFP cage with EMI gasket and 2 LPs
4-2296273-1	2x1 microQSFP cage with EMI springs and 4 LPs
4-2296273-2	2x1 microQSFP cage with EMI gasket and 4 LPs
2296070-1	2x4 microQSFP cage with EMI springs
2296070-2	2x4 microQSFP cage with EMI gasket
2-2296070-1	2x4 microQSFP cage with EMI springs and 2 LPs
2-2296070-2	2x4 microQSFP cage with EMI gasket and 2 LPs
4-2296070-1	2x4 microQSFP cage with EMI springs and 4 LPs
4-2296070-2	2x4 microQSFP cage with EMI gasket and 4 LPs
2297551-1	1x1 microQSFP cage with EMI springs
2297551-2	1x1 microQSFP cage with EMI gasket
1-2297551-1	1x1 microQSFP cage with EMI springs and 1 LP
1-2297551-2	1x1 microQSFP cage with EMI gasket and 1 LP
2-2297551-1	1x1 microQSFP cage with EMI springs and 2 LPs
2-2297551-2	1x1 microQSFP cage with EMI gasket and 2 LPs
4-2297551-1	1x1 microQSFP cage with EMI springs and 4 LPs
4-2297551-2	1x1 microQSFP cage with EMI gasket and 4 LPs
2297550-1	1x4 microQSFP cage with EMI springs
2297550-2	1x4 microQSFP cage with EMI gasket
1-2297550-1	1x4 microQSFP cage with EMI springs and 1 LP
1-2297550-2	1x4 microQSFP cage with EMI gasket and 1 LP
2-2297550-1	1x4 microQSFP cage with EMI springs and 2 LPs
2-2297550-2	1x4 microQSFP cage with EMI gasket and 2 LPs
4-2297550-1	1x4 microQSFP cage with EMI springs and 4 LPs
4-2297550-2	1x4 microQSFP cage with EMI gasket and 4 LPs

Passive copper reach capabilities

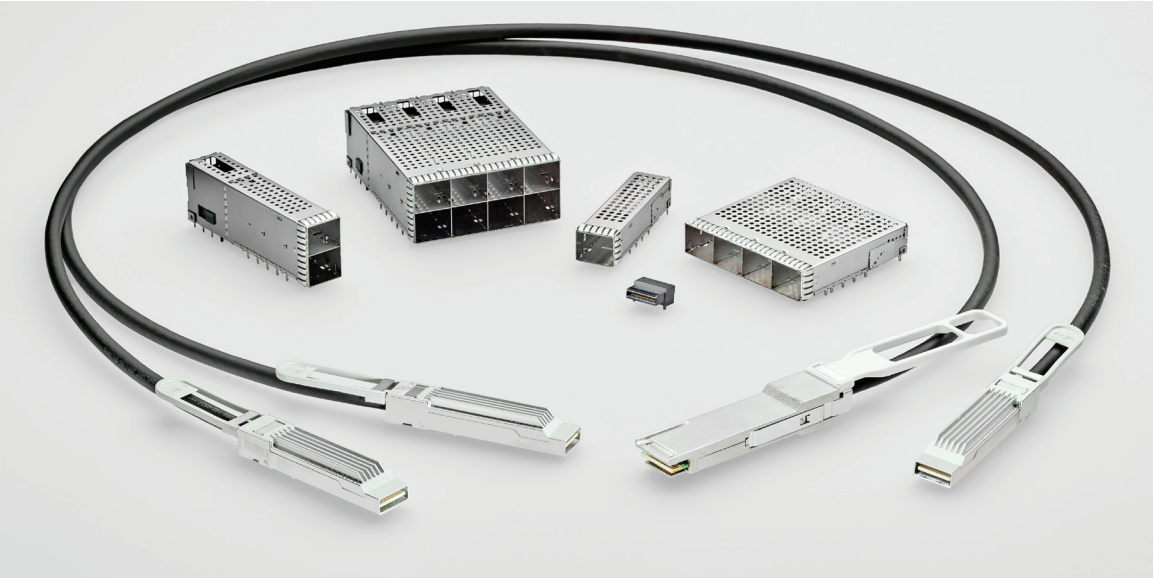
Cond. Size	IEEE 802.3bj	InfiniBand EDR
26 AWG	5 meters	4 meters
28 AWG	4 meters	3 meters
30 AWG	3 meters	2 meters
32 AWG	2 meters	1 meters

Cable Assemblies

TE Part Number	Description	AWG	Cable Assembly Length (meters)				
			0.5	1	2	3	4
2821236	microQSFP Cable Assembly	32	-1	-2	-3		
2821310	microQSFP Cable Assembly	30	-1	-2	-3	-4	
2821313	microQSFP Cable Assembly	28	-1	-2	-3	-4	-5
2821644	microQSFP TO (4) SFP28 Breakout	32	-1	-2	-3		
2821635	microQSFP TO (4) SFP28 Breakout	30	-1	-2	-3	-4	
2821645	microQSFP TO (4) SFP28 Breakout	28	-1	-2	-3	-4	-5
2821783	microQSFP to (2) microQSFP Breakout	32	-1	-2	-3		
2821784	microQSFP to (2) microQSFP Breakout	30	-1	-2	-3	-4	
2821785	microQSFP to (2) microQSFP Breakout	28	-1	-2	-3	-4	-5
2821779	microQSFP to QSFP28 Cable Assembly	32	-1	-2	-3		
2821781	microQSFP to QSFP28 Cable Assembly	30	-1	-2	-3	-4	
2821782	microQSFP to QSFP28 Cable Assembly	28	-1	-2	-3	-4	-5

Application Tooling

TE Part Number	Description
2185205-1	Seating Tool Kit for 1x1 microQSFP cage
2185205-4	Seating Tool Kit for 1x4 microQSFP cage
2185206-1	Seating Tool Kit for 2x1 microQSFP cage and connector
2185206-4	Seating Tool Kit for 2x4 microQSFP cage and connector
1-2215067-1	Extraction Tool for 1x1 microQSFP cage
1-2215067-4	Extraction Tool for 1x4 microQSFP cage
2185208-1	Extraction Tool for 2x1 microQSFP cage and connector
2185208-4	Extraction Tool for 2x4 microQSFP cage and connector



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