



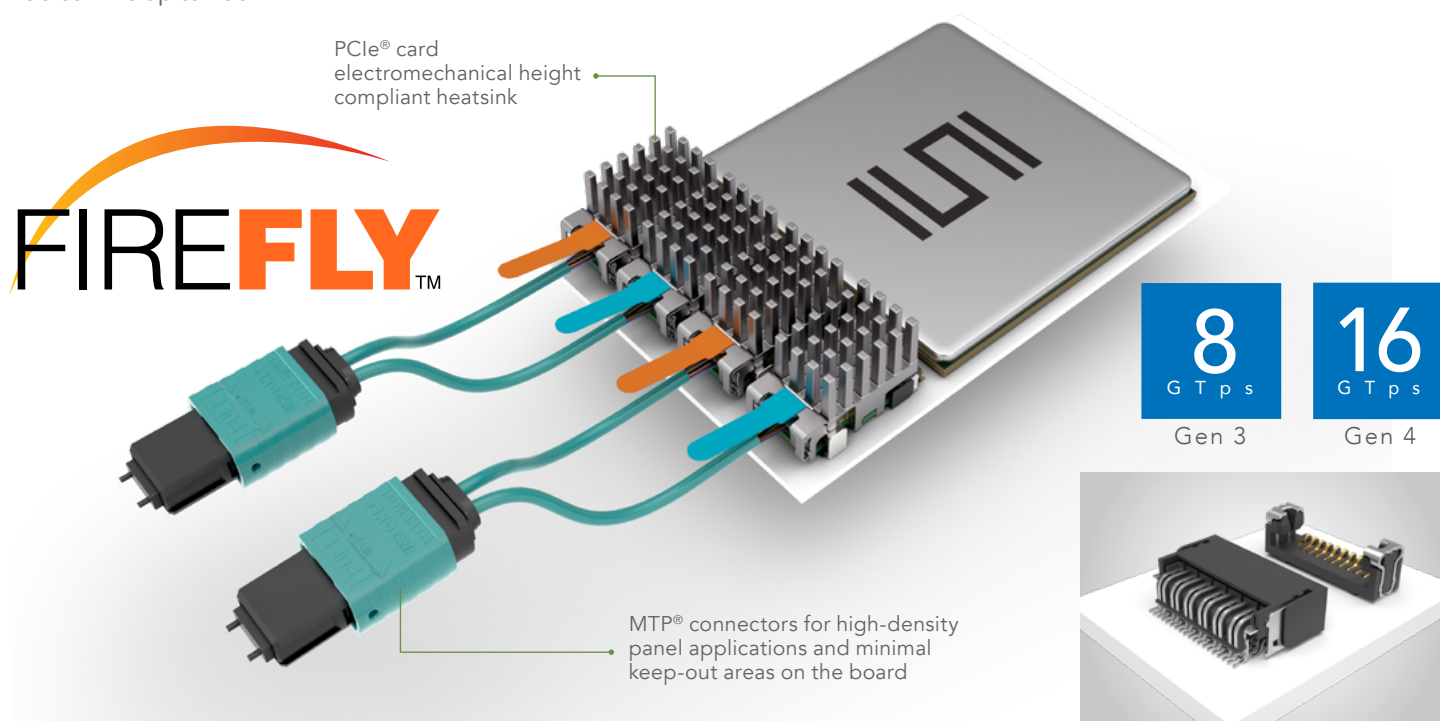
PCI EXPRESS® MID-BOARD OPTICS

PCI Express®-OVER-FIBER FIREFLY™ OPTICAL SYSTEM

The PCI Express® protocol offers many benefits to today's system designers not offered by other fabrics: low latency, power savings and guaranteed transmission. Traditionally, this protocol has been constrained to inside the box type applications with some limited extension and expansion applications that use short, bulky copper cables.

Samtec's FireFly™ based PCI Express®-Over-Fiber solution offers key features that solve the challenges of transmitting the PCIe® protocol over longer links. The miniature size of Samtec's high-density optical engines allows them to be easily designed into the downstream system, ultimately making these systems smaller. Highly flexible, small diameter, industry standard optical patch cords provide connection to the control system. Other key features include:

- Gen 3/4 x4, x8 and x16 widths
- Support for PCIe® low power states
- Duplex auxiliary signals allow both transparent and non-transparent bridging
- High-performance signal quality with BER better than $1E^{-15}$
- Enables links up to 100 m
- Enables nontraditional FPGA/ASIC based endpoints
- Industry leading miniature footprint allows close placement to the IC, which enables lower drive voltages/pre-emphasis resulting in reduced power consumption
- Host/Target adaptor card supporting transparent and NTB links in development



PCI-SIG®, PCI Express® and the PCIe® design marks are registered trademarks and/or service marks of PCI-SIG. MTP® is a registered trademark of US Conec Ltd.

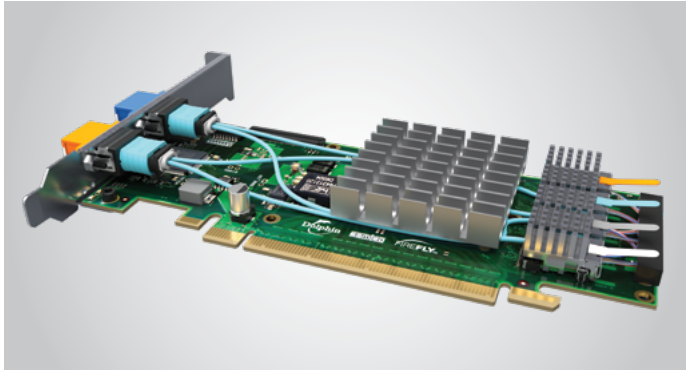
Low insertion force 2-piece connector system

System

- **PCUO** – PCI Express®-Over-Fiber FireFly™ Optical Cable System
- **UEC5** – Micro Edge Card Socket
- **UCC8** – Positive Latching Receptacle

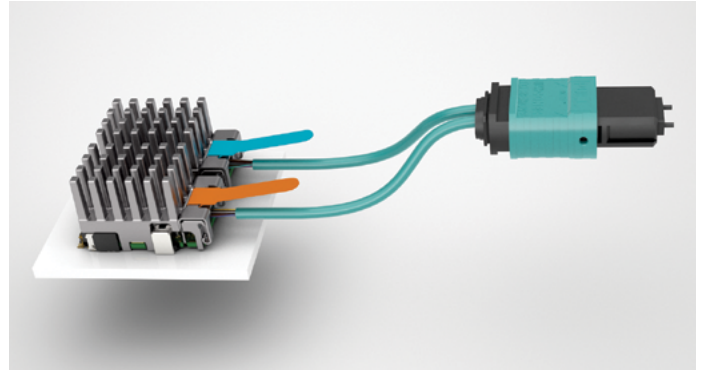
For more information on Samtec's PCI Express®-Over-Fiber FireFly™ solutions, please visit samtec.com/firefly or contact Samtec Optical Group at firefly@samtec.com

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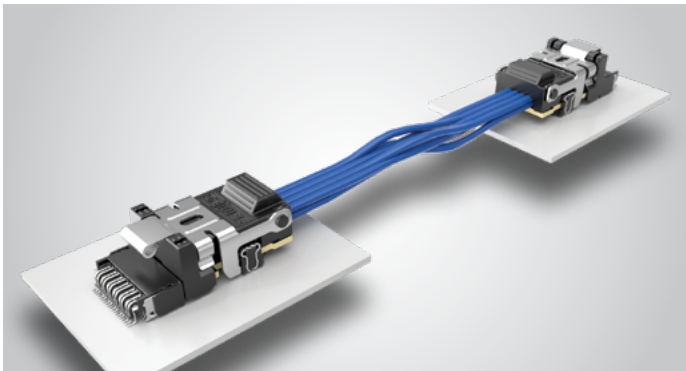
ADAPTOR CARD WITH FIREFLY™ (PCOA)

- PCIe® x16 card edge connector
- Reconfigurable switch allows single x4, dual x4, quad x4, single x8, dual x8 and x16 connections
- Reconfigurable Host/Target or NTB Host
- Supports PCI Express® Gen 3/4



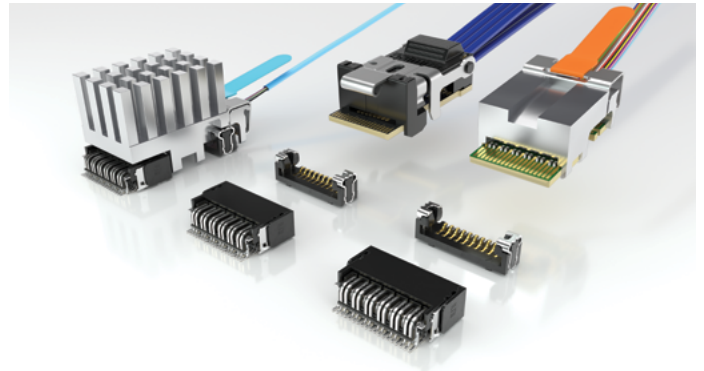
EXTENDED TEMP PCI Express®-OVER-FIBER FIREFLY™ SYSTEM (PTUO)

- Extended temperature range from -40 °C to 85 °C
- Operational shock and vibration to methods specified in MIL-STD 810
- MT38999 connector options
- Supports Gen 3; Gen 4 in development



PCI Express®-OVER-FIREFLY™ COPPER SYSTEM (PCUE)

- Gen 4 compatible
- 34 AWG Eye Speed® ultra low skew twinax cable
- Cost-effective drop-in replacement for shorter inside the box applications
- Optimized for use with connector UEC5-2



PCI Express®-Over-Fiber assemblies are part of Samtec's family of FireFly™ optical and copper solutions:

Optical FireFly™ (ECUO)

- 14 Gbps x12
- 14 Gbps x4
- 16 Gbps x12
- 25 Gbps x4
- 28 Gbps x4

Extended Temp Optical FireFly™ (ETUO)

- 10 Gbps x12
- 10 Gbps x4
- 25 Gbps x4

Copper FireFly™

- 14 Gbps x4 bidirectional (ECUE)
- 14 Gbps x12 unidirectional (ECUE)
- 56 Gbps PAM4 x4 bidirectional (ECUE-2)

For more information on Samtec's PCI Express®-Over-Fiber FireFly™ solutions, please visit samtec.com/firefly or contact Samtec Optical Group at firefly@samtec.com