KEY BENEFITS

Latency – Direct connect, all photonic fabric provides the lowest possible latency allowing valuable machine resources to be directly connected in a machine cluster.

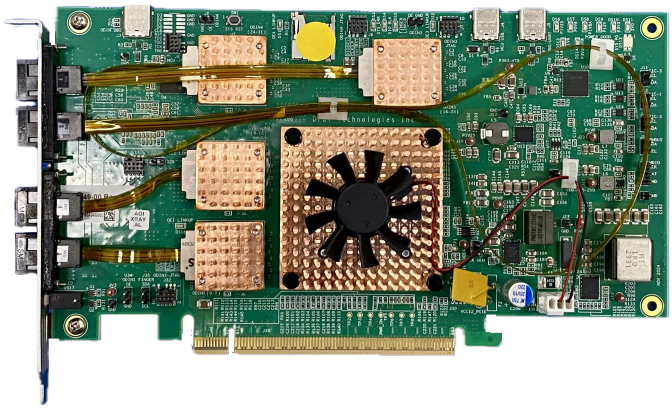
Distance – Photonics eliminates the distance and physical locality challenges in the data center

Complexity – Independent connections between resources simplifies configuration

Efficiency – Grouping resources via direct connection around workloads resolves the stranded resource challenge

Security – PCIe remoting traffic is physically isolated from system to system

OPEX – Increased resource efficiencies



Next-Generation Photonic Fabric Card for Accelerated Application Workloads

Overview

Drut's (Target) Fabric Interface Card (tFIC) (of FIC 2500 Family) is a next-generation, photonic fabric card designed to accelerate application workloads using PCIe remoting technology. Compatible with PCIe Gen5 x16, the FIC 2500 connects compute resources to servers equipped with (Initiator) Fabric Interface Cards (iFIC) 2500.

Each tFIC 2500 features two CPO 2.0 connectors, offering 8 independent connectivity channels through MPO16 fiber cables. These cables can be directly connected to servers or integrated into Optical Switch networks, including the Drut Photonic Switch (PXC).

Requiring a full-height, half-length PCIe Gen 5x16 slot, the FIC 2500 can be deployed in any combination, from one to four cards, per resource unit. The card is designed for use in Drut PRU 2500 or other compatible PCIe resource chassis, offering 2x8 or 1x16 PCIe lanes per resource. Supporting up to 40 or 80 GPUs per host.

FIC 2500 Target Applications

The FIC 2500 can be used as the interface module, to build a Drut disaggregated photonic fabric.

Some of the more valuable use cases for this module are as follows:

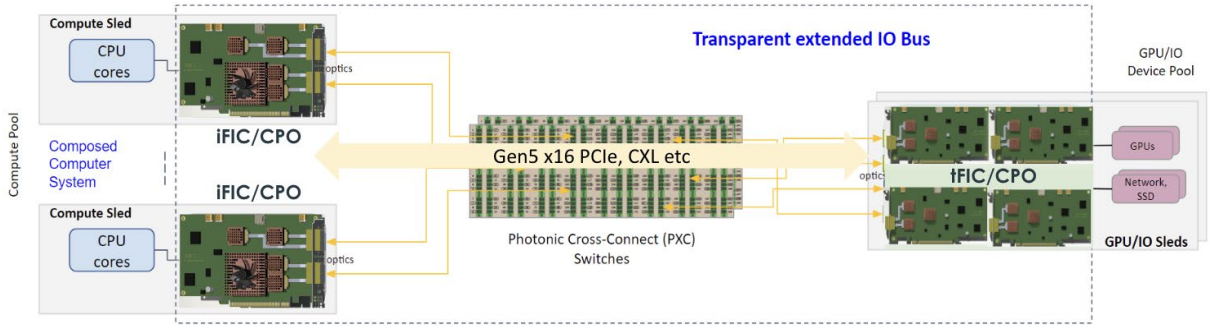
- GPU Farms for AI/ML Inference Workloads
- Photonic HPC Clusters
- Storage pools
- FPGA Farms for Trading
- High-performance private cloud for IaaS

tFIC 2500 Use Case

PCIe Remoting :

The following diagram illustrates how the FIC 2500s are connected to a pair of servers using an optical fabric. Each tFIC 2500 typically uses two ports, each containing 8 channels via a co-packaged optics (CPO) chiplet. Best practice recommends using both ports. These ports will be connected to the photonic fabric using single-mode fiber via MPO16. The Photonic Resource Unit (PRU) will have 1-2 FIC 2500s connected to the photonic fabric. Drut's Fabric Manager (DFM) will build a resource pool and allow for the creation of machines by attaching and detaching resources from the resource pool.

FIC 2500 Use Case Diagram



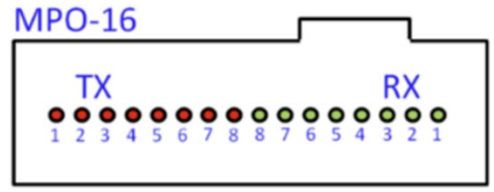
Management and Control

- SMBus
- MCTP Over SMBus - BMC and MCTP over PCIe to Host OS
- PLDM for Monitor and Control
- PLDM for Firmware update

- I2C interface for device control and configuration
- GPIOs
- Debug Interfaces (USB-Type C/UART)

Fiber Map, MPO Cable

Physical Fiber Assignment:



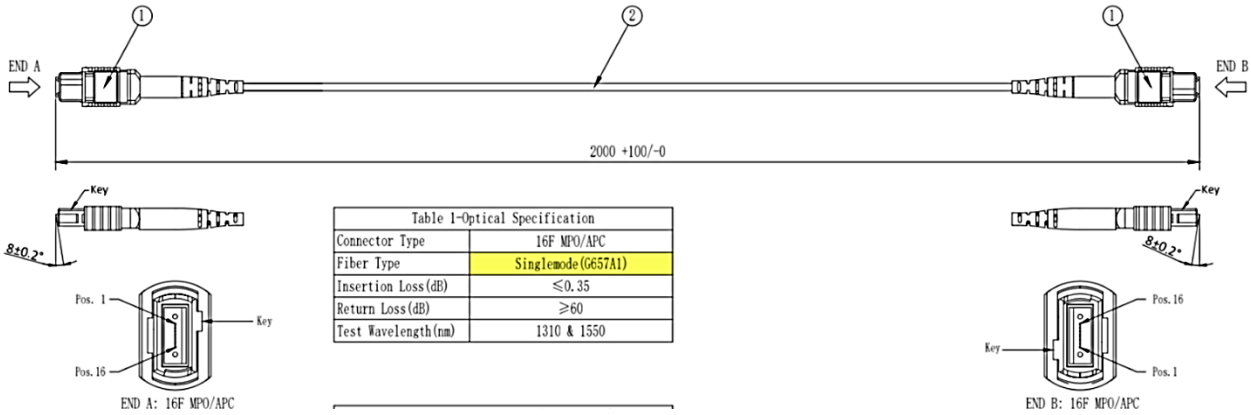


Table 1-Optical Specification	
Connector Type	16F MPO/APC
Fiber Type	Singlemode(G657A1)
Insertion Loss(dB)	≤0.35
Return Loss(dB)	≥60
Test Wavelength(nm)	1310 & 1550

FIC 2500 Specifications

PCIe Gen	5.0
Host Interface	PCIe Gen5.0 x16
Fabric Interfaces	CPO 2.0 via MPO16 cable SMF
Wavelength Range	1304.5nm(min), 1311nm(nom), 1317.5(max)
Supported Line Rate	NRZ(32G/lane x16 lanes) or NRZ(32G/lane x 8 lanes)
Number of Ports	1x16, 2x8
Card Form Factor	FHFL (Full Height Full Length) PCIe Gen 5.0 slot

Power	<70 W
Compliance	Rohs, EN-55032, etc
Operating Voltage	+12v +/-8%; 3.3v +/-9%
Hardware Warranty	1 year standard, 3 year extended.
Chassis Support	
Cable Support	
Connectors	
Operating Conditions	Operating: 10°C to 55°C, 20 to 80% non-condensing Airflow: 200 LFM Storage: -45°C to 105°C, 5 to 90% non-condensing
Ordering Information	
Single Pack	
Dual Pack	
Four Pack	

Contact Information

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