High-Performance I/O Connectivity for Next-Gen Embedded Applications

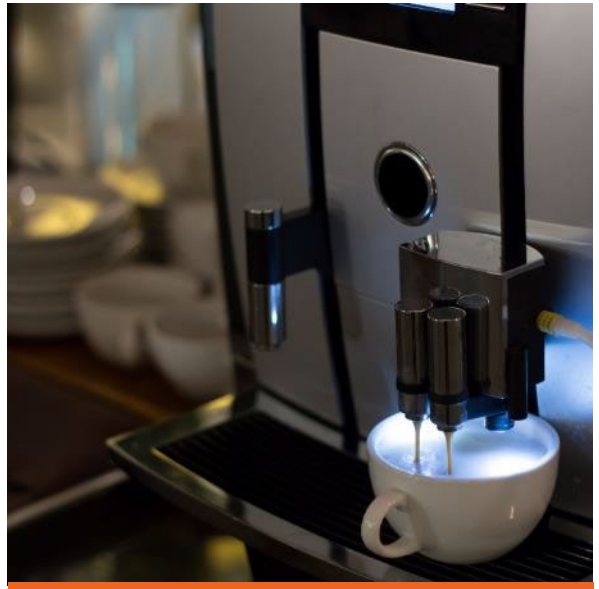
Matthew Burns | Technical Marketing Manager | January 23, 2023

INNOVATIVE TECHNOLOGIES • SUDDEN SERVICE • GLOBAL REACH

Embedded Applications of Today

Inflight Entertainment

Gaming

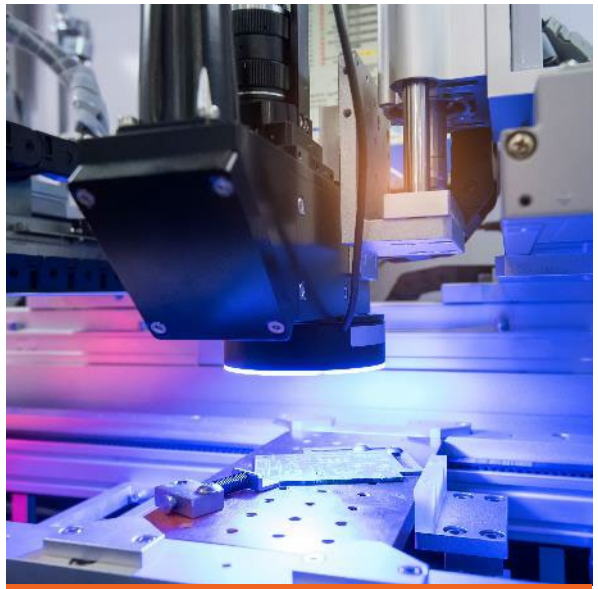


Morning Caffeine

Getting Around . . .

Next-Gen Embedded Applications

AI/ML



Embedded Vision

Robotics

Auto 2.0

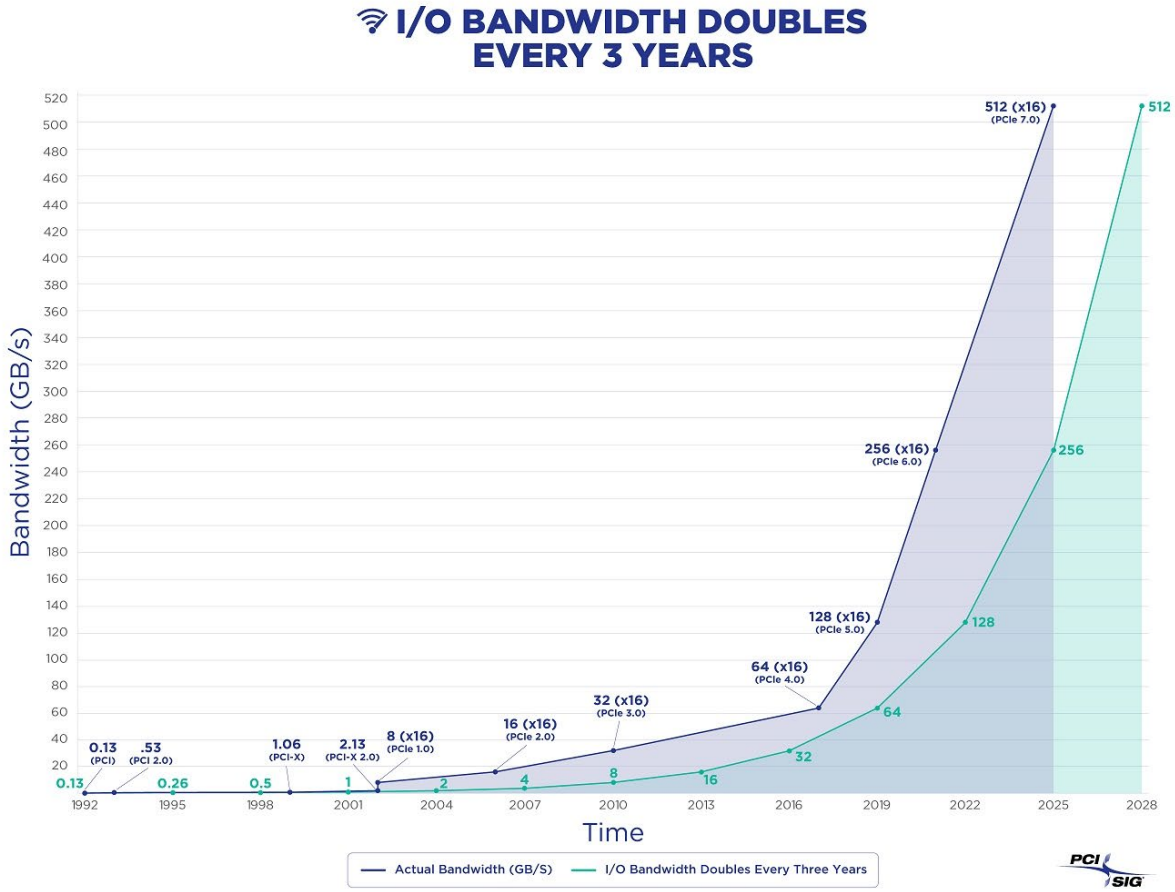
Next-Gen Embedded Applications – The Trends

Market Trends

- Ubiquitous digitization
- 5G/6G and AI with tremendous data growth and processing requirements
- Autonomous vehicles, factory floor & HPC workloads with server-class processors
- Industry 4.0 → Data/Pre-processing “at the edge”
- Greater adoption of open standards

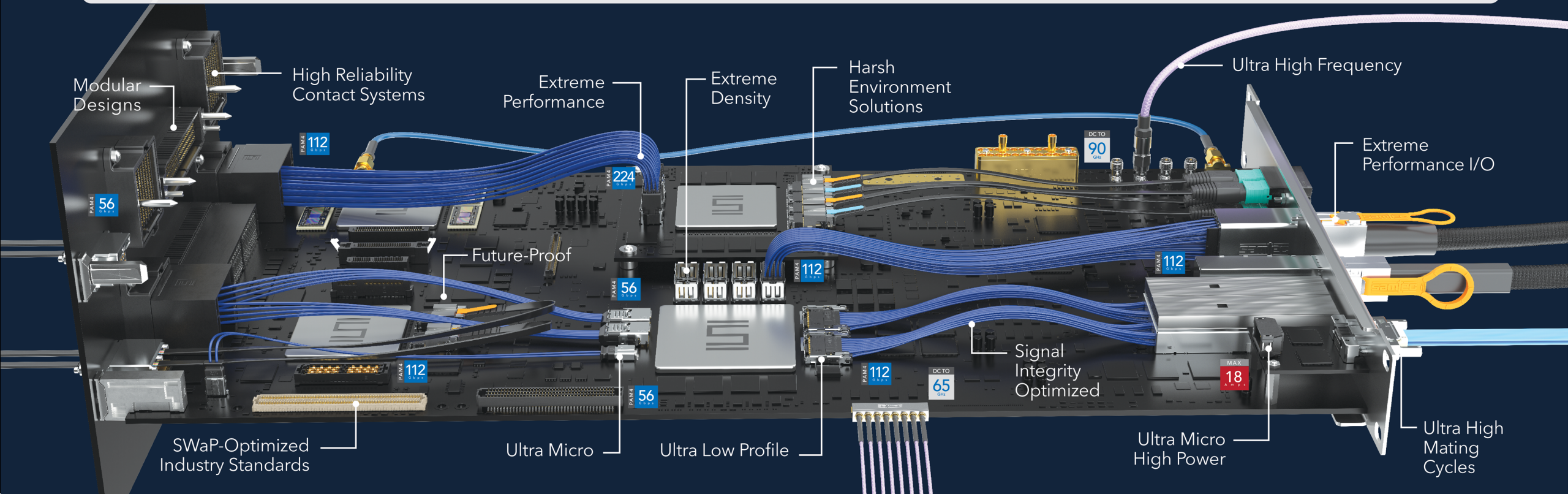
Technology Evolution

- PCIe 4.0 (16 GT/s) and PCIe 5.0 (32 GT/s)
- 100 Gigabit Ethernet
- USB4
- Manageability down to embedded units
- Intelligent sensors



SILICON-TO-SILICON™ CONNECTIVITY SOLUTIONS

Samtec's **Silicon-to-Silicon™ Solutions** are high-performance interconnect systems and technologies that are engineered to ***meet and exceed industry-standard demands***. These solutions, combined with high-level design assistance and technical expertise, uniquely position Samtec to help ensure **Full System Optimization, from Silicon-to-Silicon™** – and all points in between.



CoM/SoM Advantages

Concept

- CPU module with compute core functions
- Carrier board with customer specific functions & size

Benefits

- Faster time to market
- Reduced development costs
- Scalable product range
- Allows customer focus on system features
- Faster reaction to market trends
- Second source philosophy
- Minimize inventory cost

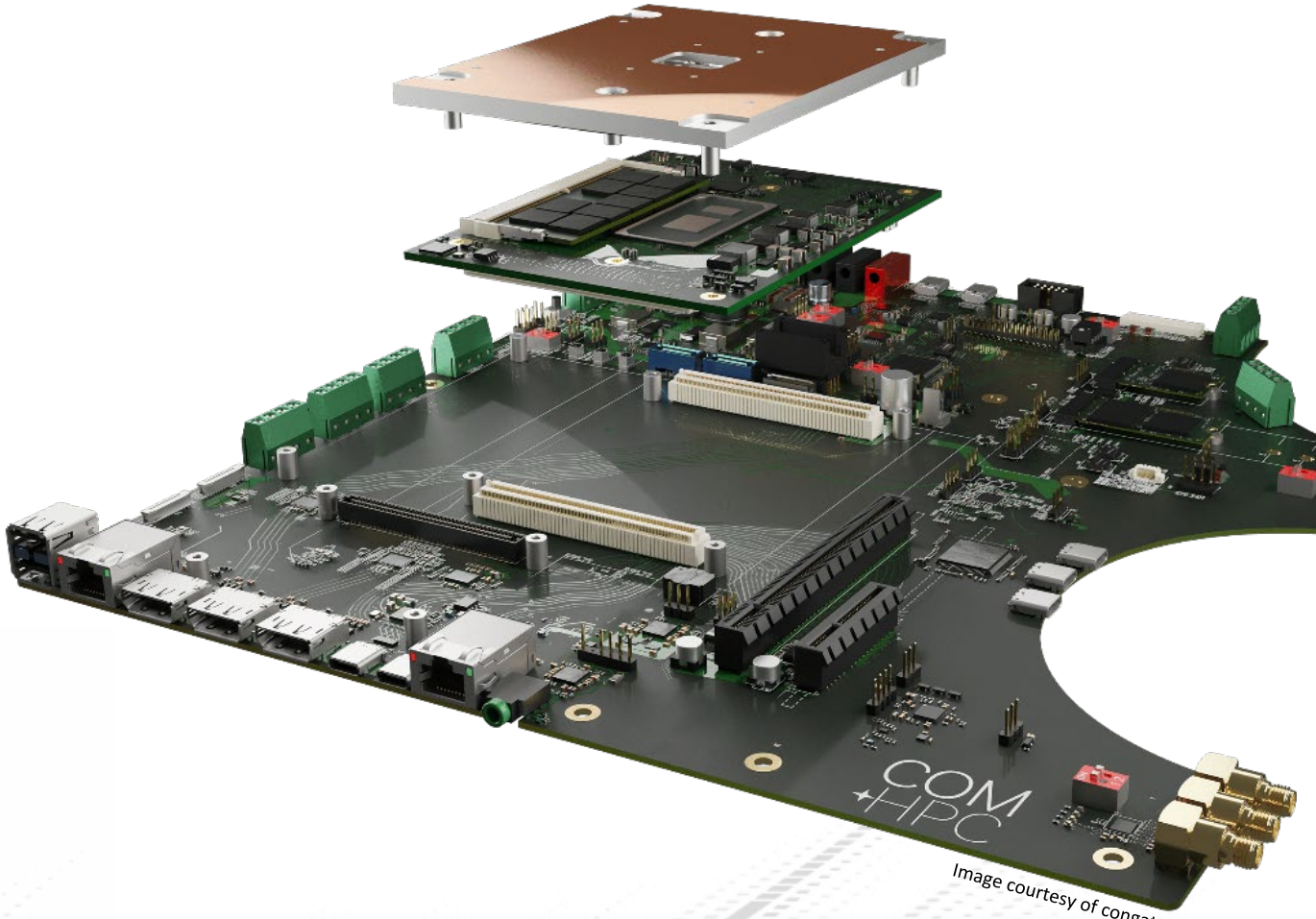


Image courtesy of congatec

Computer-On-Module for High Performance Computing

Why a new standard?

- The COM Express connector is limited
- Max. 32 lanes PCIe Gen 3.0 (8 Gb/s)
- Max. 10 Gb Ethernet per signal pair

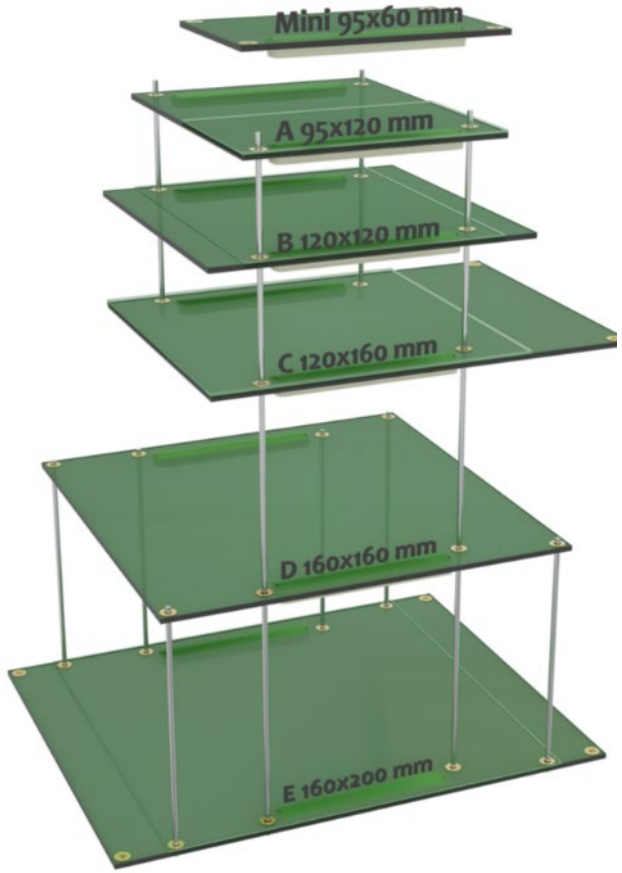
COM-HPC target

- Support for PCIe Gen 5.0 (32 Gb/s)
- 64 PCIe Lanes
- Min. 25 Gb Ethernet per signal pair to support 100 Gb Ethernet
- Update of other interfaces

COM-HPC will not replace COM Express®

It extends the Server-On-Module ideas

Feature	COM-HPC	COM Express
Connector Bandwidth	32 Gbps	10 Gbps
Connector Pins	800	440 max
Full size DIMMS	up to 8	up to 2
SO-DIMM Support	up to 4	up to 2
CPU power support	150W	80W
PCIe	up to 5.0	up to 3.0
PCIe lanes	65	32
10G BASE-T	2	1
Ethernet KR interfaces	8x @25 Gbps	4x @10 Gbps
USB Support	Up to USB4	Up to USB 3.0
Non x86 CPU Support	Yes	No



New COM-HPC Mini form factor targeted for release in 2023

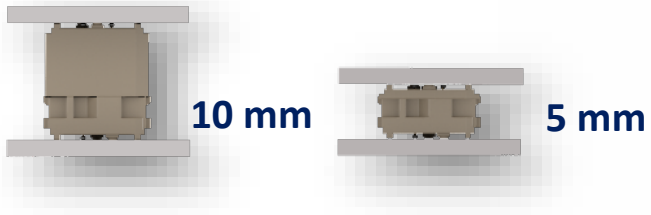
Samtec COM-HPC Interconnect Solutions

High-performance, flexible open-pin-field array

High-speed PCIe® 5.0 and 100 Gb Ethernet capable

400 pin (4 x 100) BGA mount

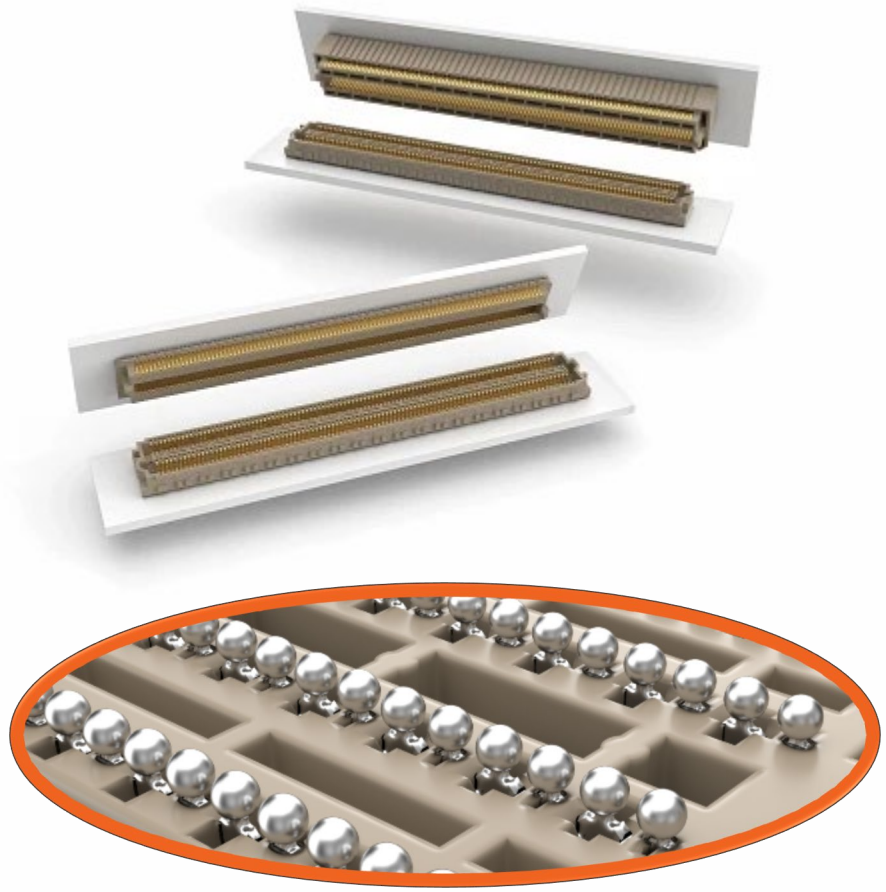
2.2 / 2.4 / 2.2 mm row pitch



0.635 mm pitch

Dimensions: 68.62 mm x 9 mm x stack height

Up to 360 W at 11.4 – 12.6 Volts



BGA mount increases density and performance

PCI Express® Interconnect Solutions

PCI Express® 5.0 Edge Card Sockets

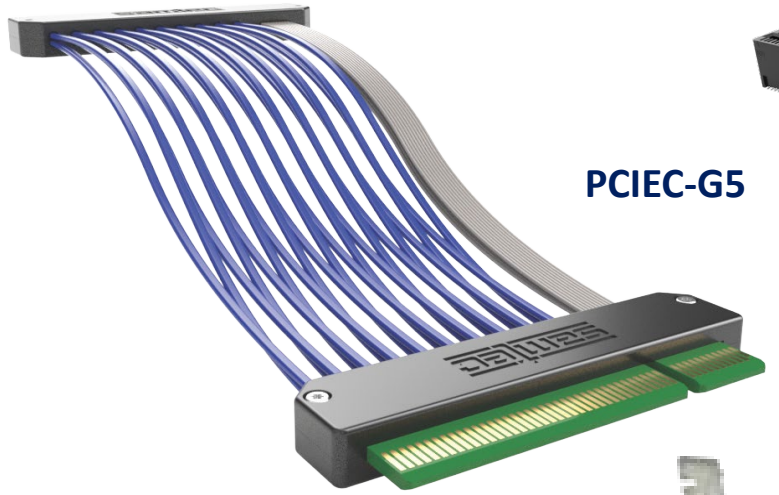
- 1 mm pitch: x1 (36P), x4 (64P), x8 (98P), x16 (164P)
- Mates with .062" (1.60 mm) thick cards
- PCIE-G5 edge mount in development

PCI Express® 5.0 Edge Card Cable Assemblies

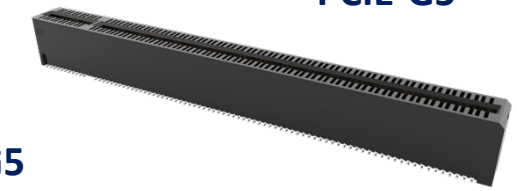
- 1 mm pitch: x1 (36P), x4 (64P), x8 (98P), x16 (164P)
- Edge card or connector end options available
- Configured as a jumper or an extension cable
- Available in custom lengths to suit any application.

PCI Express® -Over-Fiber Cable Assemblies

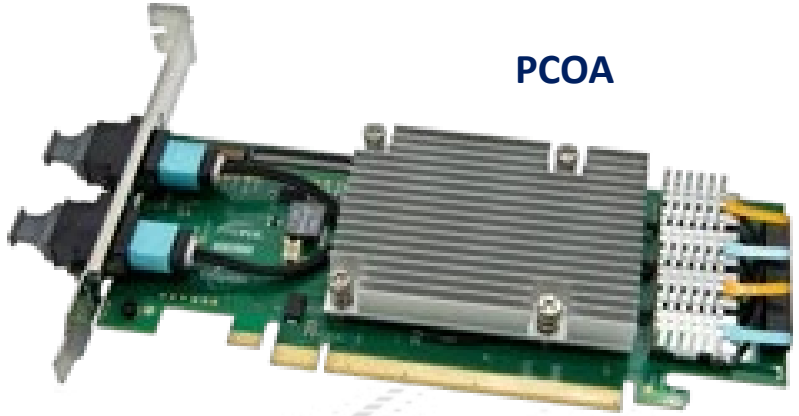
- PCIe® 4.0 Optical Cable Assembly (PCUO Series)
- PCIe® 4.0 Adaptor Card with Optical FireFly™ (PCOA Series)
- Transparent or non-transparent bridging
- Reconfigurable host or target operation



PCIEC-G5



PCIE-G5



PCOA

Single Pair Ethernet

Targeting a diverse set of applications

- Process/factory automation
- IIoT/Industry 4.0

IEC 63171-6 Compliant

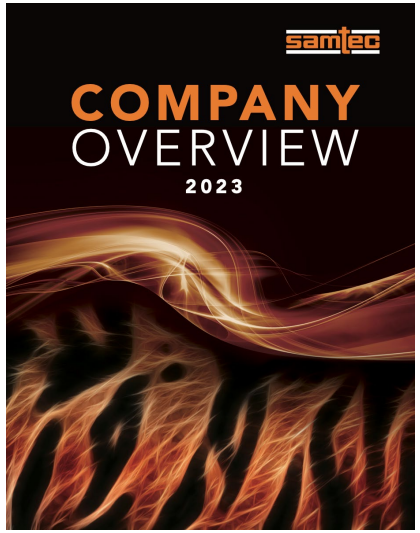
Supports multiple ethernet specifications

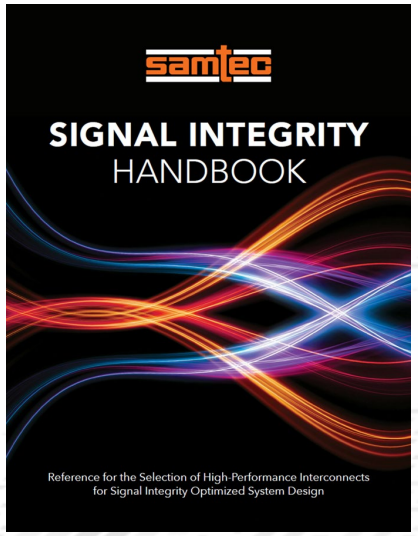
4A CCC for PoDL

Twisted pair configuration for cost-sensitive applications

Eye Speed® Twinax for high-speed designs

New Literature & Key Takeaways





Samtec Silicon-to-Silicon solutions meet and exceed industry standard demands for High-Performance I/O Connectivity in next-gen embedded applications

- PICMG COM-HPC Interconnect Solutions
- PCI Express Interconnect Solutions
- Single Pair Ethernet

Updated Corporate Literature

- Available for download at www.samtec.com/literature

For more information:

- www.samtec.com/literature

ANY QUESTIONS?

SUDDEN SERVICE®