

A large, abstract graphic on the right side of the cover. It consists of multiple overlapping, curved bands of color that sweep from the bottom left towards the top right. The colors transition from light grey and white at the top, through shades of blue, green, and yellow, to deep reds, oranges, and finally to dark purples and blacks at the bottom. The bands have a slight gradient and a soft glow, creating a sense of motion and depth.

# 2015 TECHNOLOGY OVERVIEW

# TECHNOLOGY CAPABILITIES FOR...

...ULTRA FAST ...ULTRA DENSE ...ULTRA MICRO.

To meet the interconnect challenges of tomorrow and beyond, Samtec has developed Technology Centers to help optimize your entire signal transmission path... from the IC to the panel and beyond, and all points in between.

ADVANCED  
INTERCONNECT  
DESIGN

SIGNAL  
INTEGRITY  
GROUP

HIGH SPEED  
CABLE PLANT

OPTICAL  
GROUP

IC  
PACKAGING

TERASPEED®  
CONSULTING



10 GBPS

25 GBPS

56 GBPS

500 I/Os

100 I/Os

1000 I/Os

CHIP  
SCALE

0.635 MM  
PITCH

1.27 MM  
PITCH

ULTRA FAST

ULTRA DENSE

ULTRA MICRO

10 Gbps

0,50 mm pitch

500 I/Os

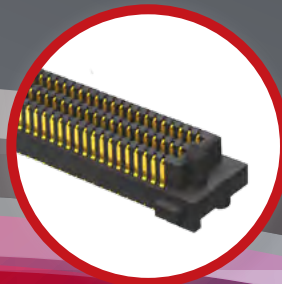
### SEARAY™ 1,27 mm

28+ Gbps Open Pin Field Arrays  
40-500 Positions



### SEARAY™ 0,80 mm

28+ Gbps  
Highest Density Arrays  
up to 720 Positions



### SEARAY™ LP

34+ Gbps Low  
Profile Arrays  
down to 4 mm

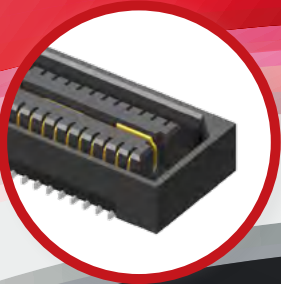


### SkyRay™

28+ Gbps  
Elevated Arrays

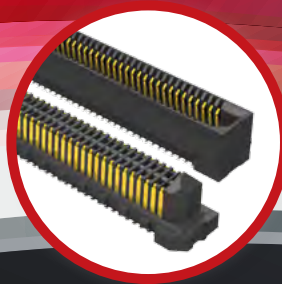


## ADVANCED INTERCONNECT DESIGN



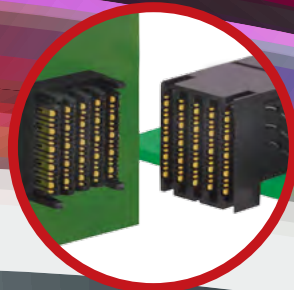
### Q Strip®

28+ Gbps Low Profile  
Ground Plane Connectors



### Edge Rate™

28+ Gbps Rugged  
Connectors



### High Speed Backplane

25 to 40 Gbps  
Solutions

## Advanced Interconnect Design

High precision stamping, plating, molding, and automated assembly for fine pitch and array interconnects used for board-to-board, interposers, micro backplane, and high speed/high density cable assemblies.

- TECHNOLOGY CENTERS
- HIGH SPEED BOARD-TO-BOARD
- IC-TO-BOARD/ULTRA MICRO
- HIGH SPEED COPPER CABLES
- FUTURE PROOF/ACTIVE OPTICS

## Samtec Microelectronics

Advanced IC packaging with precision die attach, fine pitch/low profile wire bonding, flip chip/underfill, and dam/encapsulation. Complete "IC-to-Board" design, application support and manufacturing for custom IC packaging, substrates, and micro high density interposers. Advanced IC packaging services include layouts for signal integrity and power optimization, package/materials characterization and structural analysis. Also, manufacturing of Samtec's micro optical engines.

### Eye Speed®

High Performance/  
Dynamic Applications



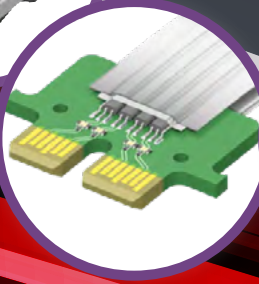
### AcceleRate™

High Performance/  
Lowest Cost



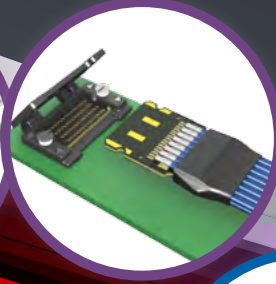
### Equalized

Passive or Active for  
25-40% Increased  
Performance



### Z-Ray™

High Speed  
Low Profile Interposer  
28+ Gbps down to 1 mm  
up to 1,000 Pins



## IC PACKAGING

## HIGH SPEED CABLE PLANT



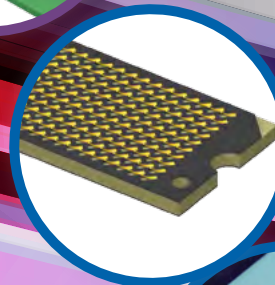
### Bull's Eye®

20+ GHz Test  
Point System



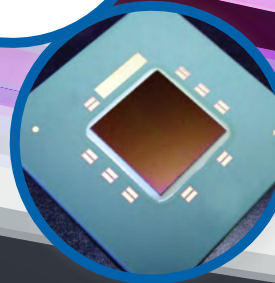
### Bull's Eye®

40+ GHz Test  
Point System



### Flip Chip

Accuracy to  
+/- 3  $\mu$ m



### Wire Bond

Diameters Starting  
at 0.0007" (19  $\mu$ m)

## High Speed Cable Plant

R&D and manufacturing of precision extruded micro coax and twinax cable used for high speed/high density cable assemblies. Capabilities include 26-38 AWG center conductors, 50/75/85/100 $\Omega$  impedance, and assemblies rated at 28+ Gbps.



## Samtec Optical Group

Engineering team dedicated to the design, development, and application support of high performance micro optical engines, active optical assemblies, and high density ganged passive optical panel solutions. Capable of 14 Gbps, 28 Gbps, and soon 56 Gbps, Samtec's FireFly™ micro on-board optical engines occupy the smallest overall footprint, consume the least amount of power, and enable fast, easy and low cost fiber termination.

## Signal Integrity Group

High speed characterization reports, simulations up to 40 GHz, advanced break out regions using technologies such as Differential Vias™ and routing recommendations using Tri-Planar™ trace technology. Live EE support is available worldwide 24/7.

### QSFP+ 14 Gbps

InfiniBand™ QDR  
up to 100 m

### PCIe® Optic

Supports Gen 3 PCIe®  
up to 100 m

## OPTICS GROUP

## SIGNAL INTEGRITY GROUP

56 Gbps

14 Gbps

28 Gbps

### FireFly™

14 Gbps | 28 Gbps | 56 Gbps

Micro  
Flyover

Future-proof Copper  
or Optical

Highest Bandwidth  
Density Available

**FinalInch®**  
CERTIFIED

### Final Inch®

Performance Certified  
Break Out Regions

### Die Attach

Accuracy to  
+/- 3 µm

### Dam & Encapsulate

Automated or Manual  
Encapsulation

# TECHNOLOGY OVERVIEW

## Teraspeed® Consulting

Signal Integrity Services team providing complete system design, full channel signal integrity analysis, and SI optimized advanced IC packaging for 28+ Gbps and beyond.

**56 Gbps**

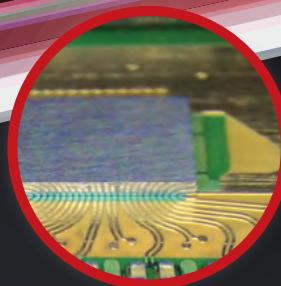
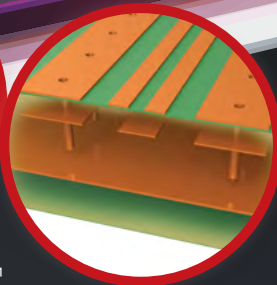
**Chip Scale Pitch**

**1,000+ I/Os**

**Solutionator®**  
*Design in a Minute™ for  
Mated Connector Sets and Cables*

**Simulator™**  
*Simulate in a Minute™  
Performance Verification  
for Mated Connector  
Sets and Cables*

**TERASPEED®  
CONSULTING**



**Differential Vias™**  
*High Speed Array  
Break Out Region Technology*

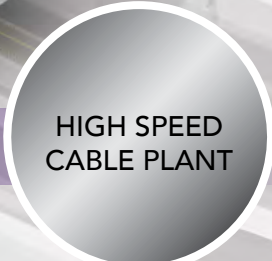
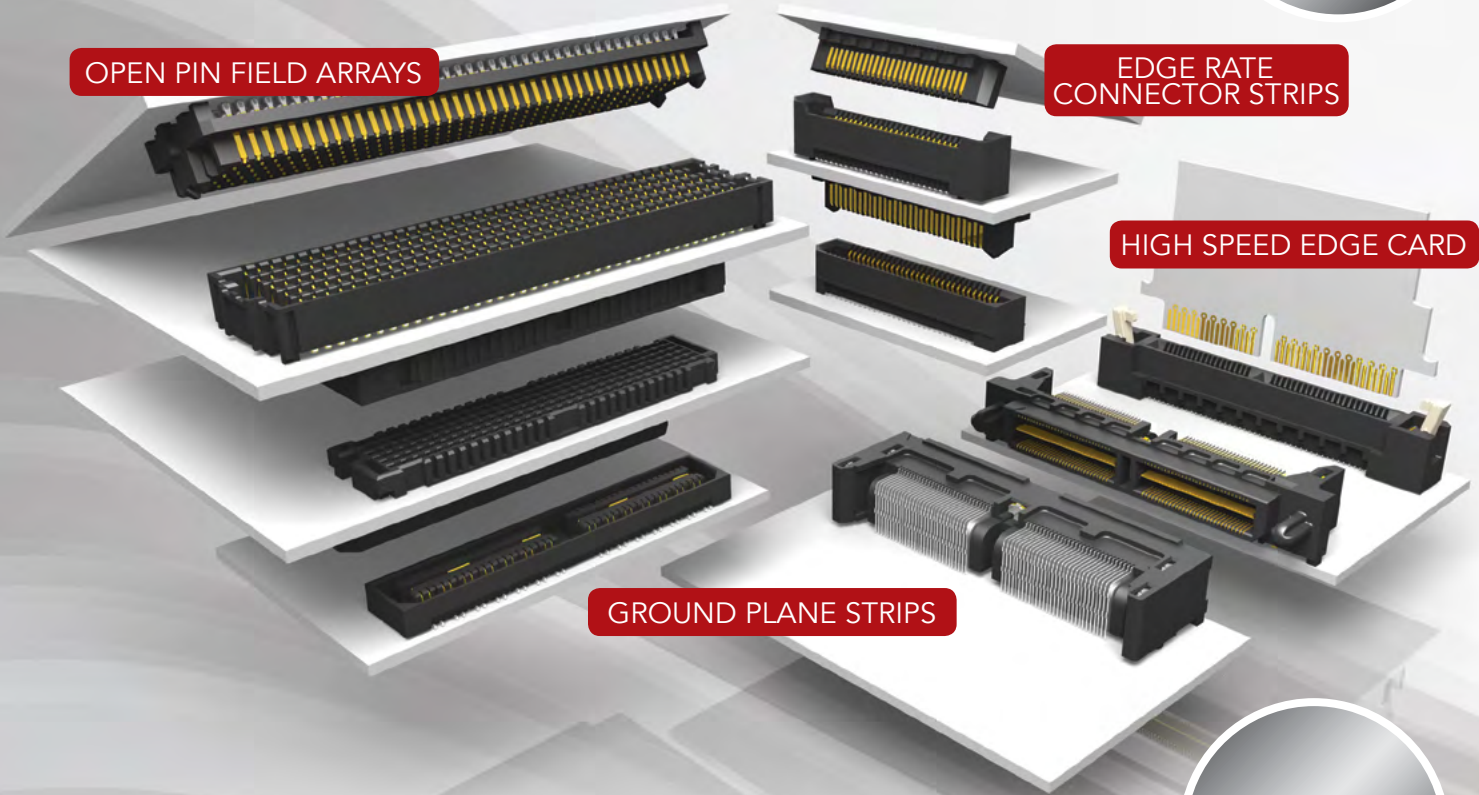
**Tri-Planar™**  
*Highest Trace Density  
for High Speed Routing*

**IC Packaging  
Optimized**  
*Modeling, Simulation,  
and Measurements  
up to 56 Gbps*

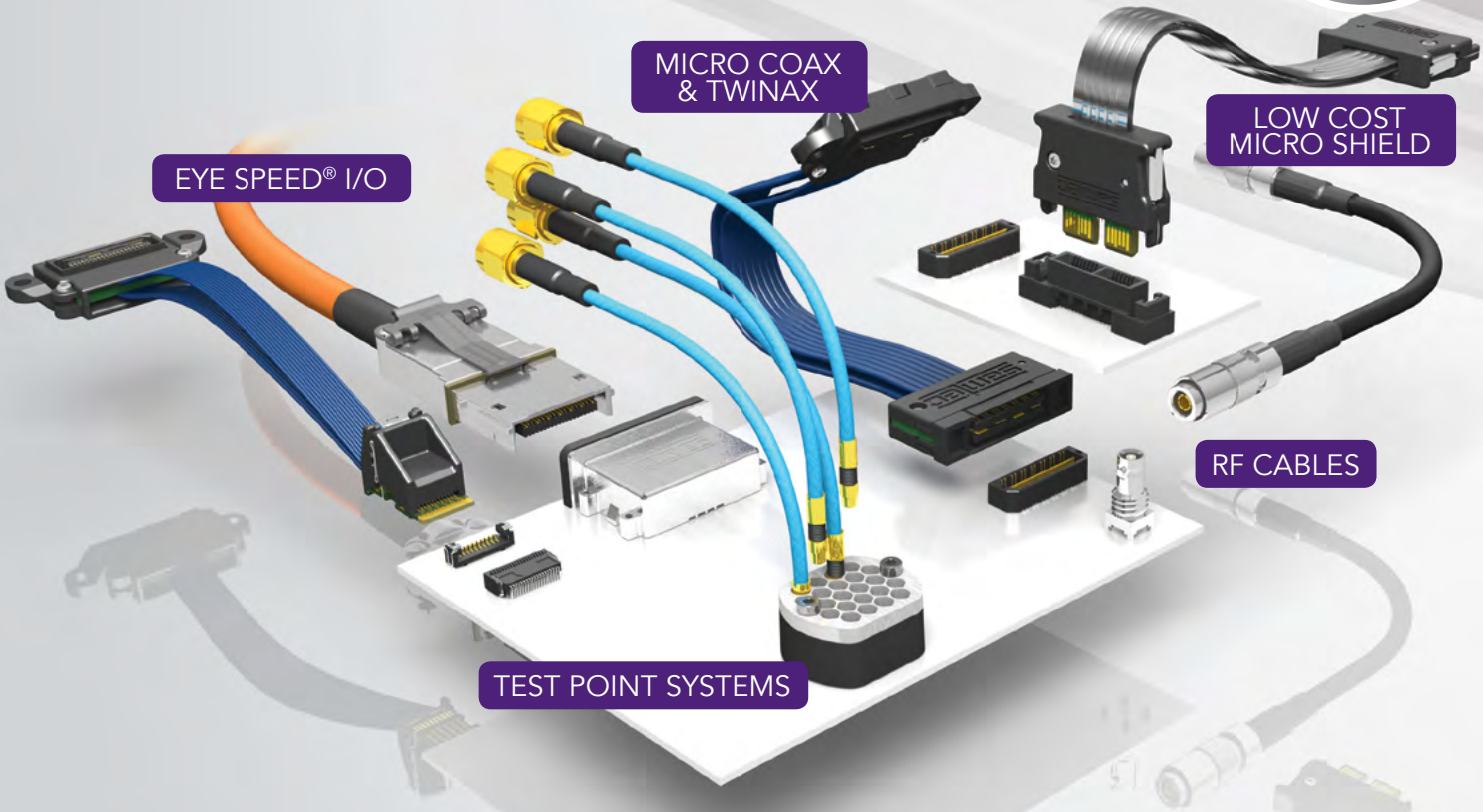
**Live EE Support**  
*24/7 Access to  
Signal Integrity Support*



# HIGH SPEED BOARD-TO-BOARD



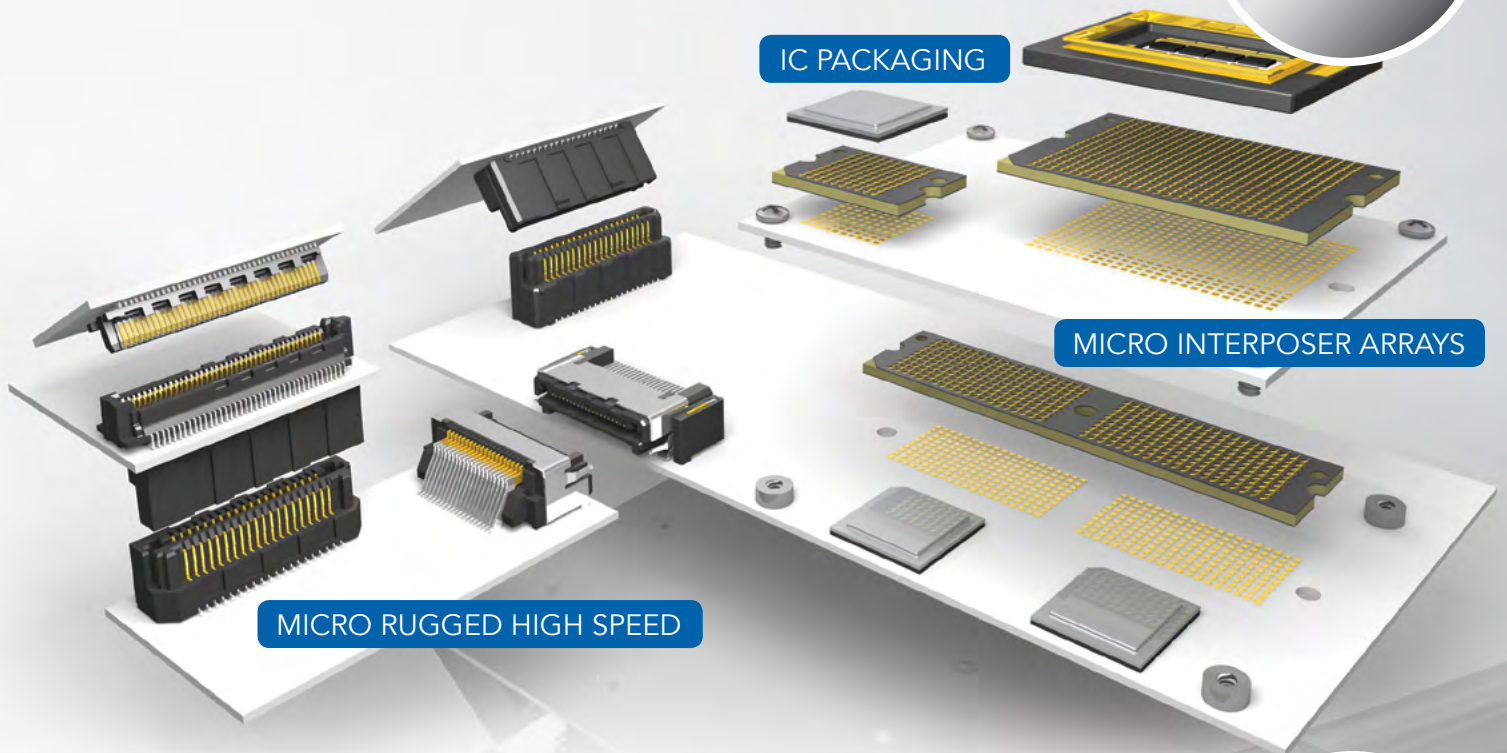
# HIGH SPEED COPPER CABLES





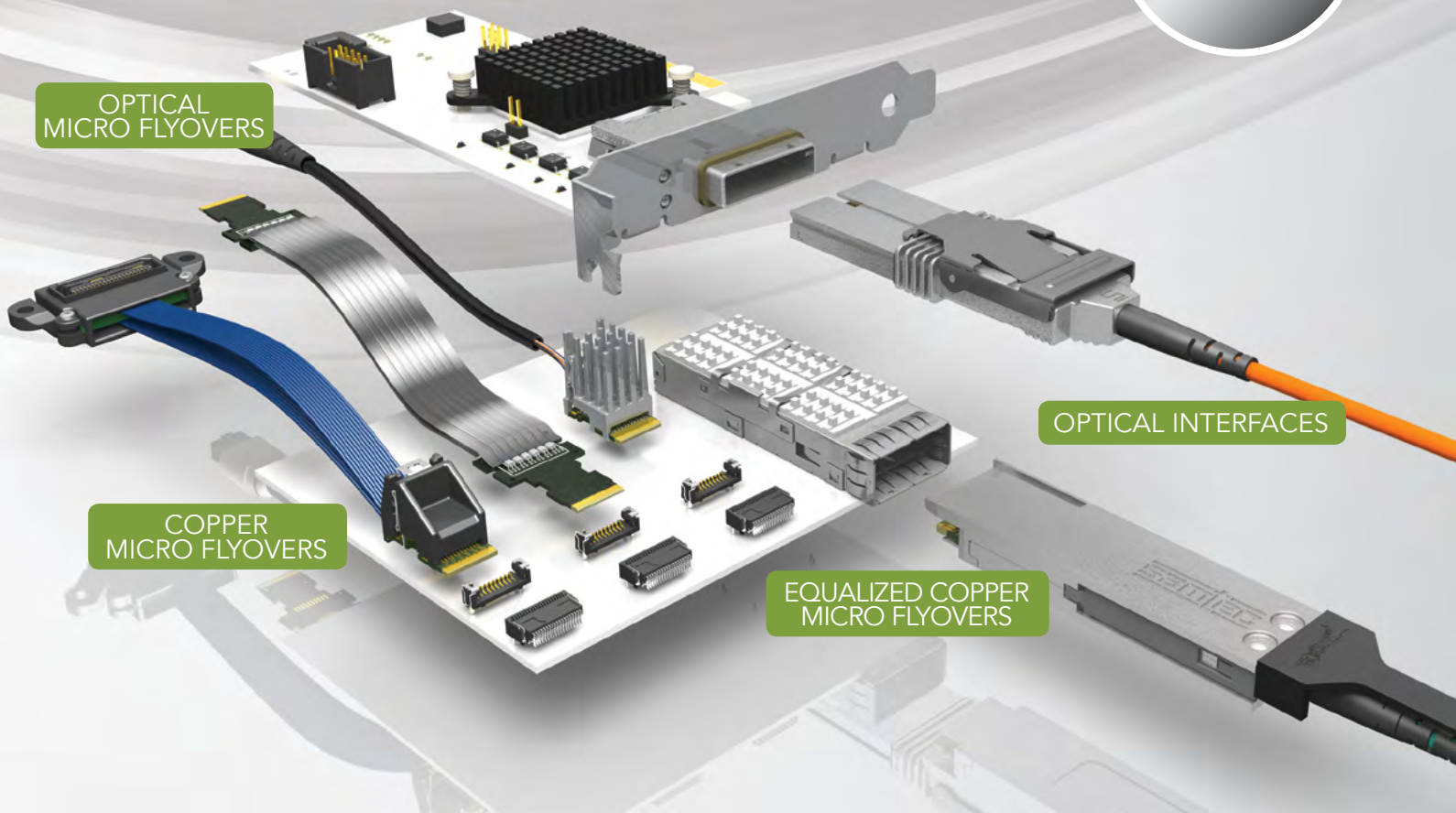
# IC-TO-BOARD/ULTRA MICRO

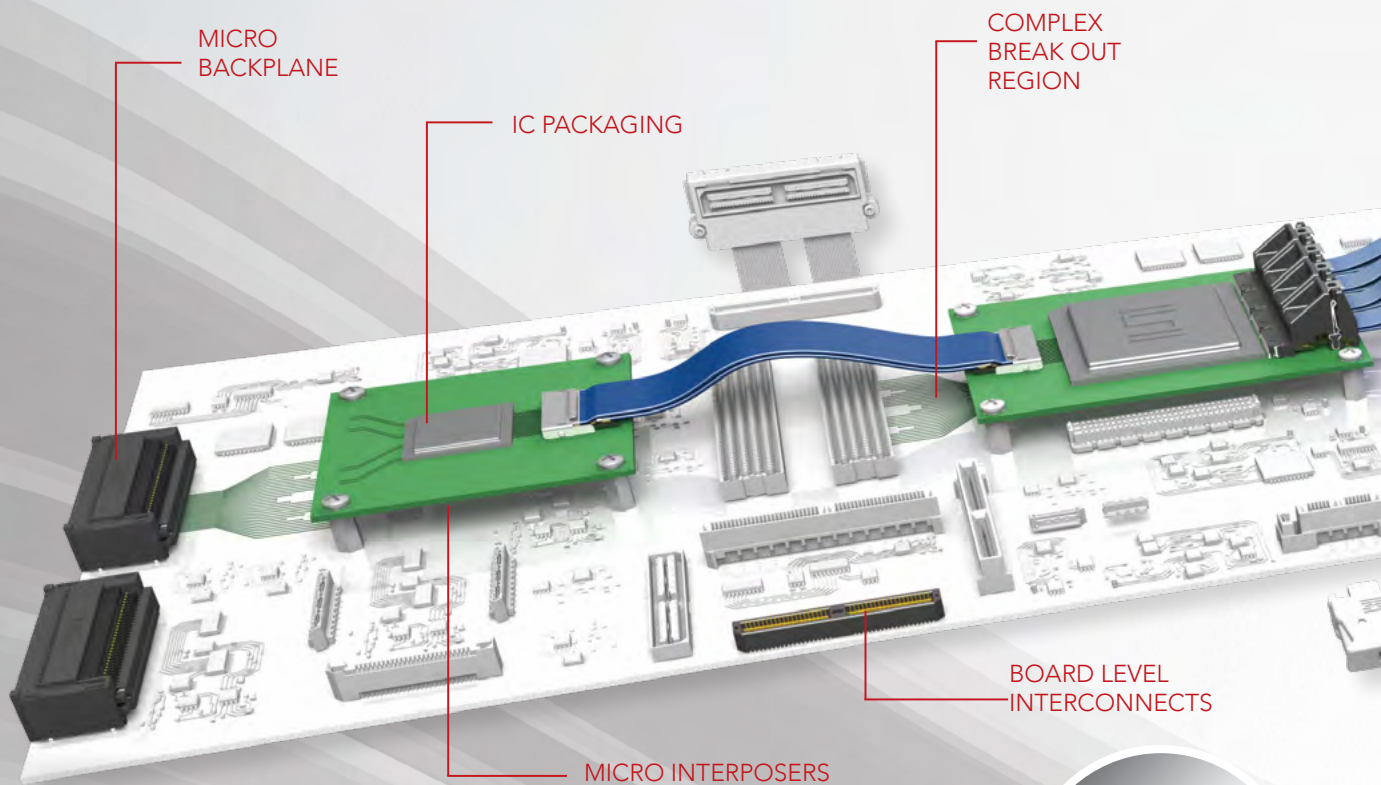
IC PACKAGING



# OPTICAL SYSTEMS

OPTICS GROUP





# DESIGN, ENGINEERING & DEVELOPMENT

**SIGNAL  
INTEGRITY  
GROUP**

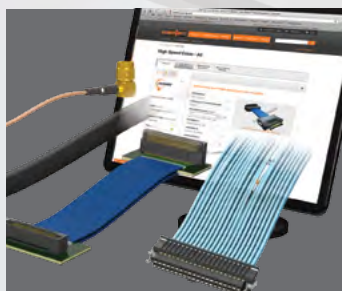
Samtec's Signal Integrity Group offers unparalleled support at a local level, helping you determine the best solution for your particular application by providing easy access to free online data, as well as engineer-to-engineer support for more complex applications.



## SUPPORT

### Signal Integrity Support

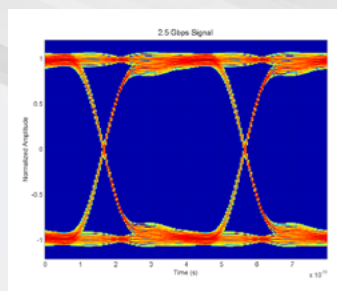
- Worldwide 24/7 EE access
- Full channel analysis
- High data rate simulations
- Break out region layout and routing recommendations
- Application specific design and development assistance
- Contact [sig@samtec.com](mailto:sig@samtec.com) for more information.



## SOLUTIONATOR®

### Solutionator® Online Connector Set Generator

- Design your mated set solution in less than a minute
- Get free Specs Kit instantly: 3D models, drawings, and prints
- Order 24 hour samples and/or chat with an engineer



## SIMULATOR™

### Online Performance Simulator™

- Real-time performance simulations for assemblies
- Integrates and blends data from separate models to project insertion loss, return loss, NEXT and FEXT, along with supporting eye patterns
- Stand-alone program for additional standard high speed connectors and cables – coming soon!

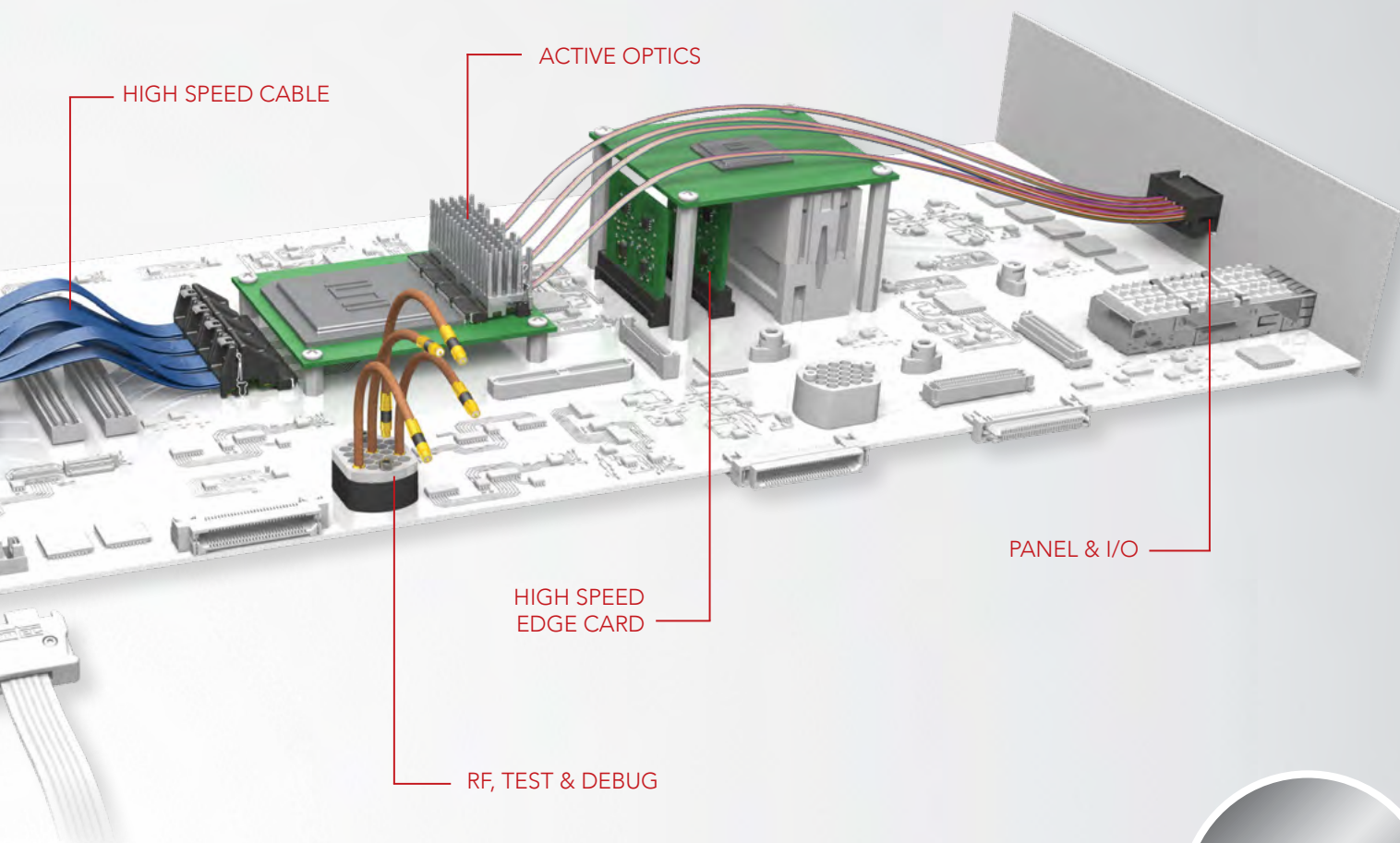


## BOR TECHNOLOGY

### Advanced Break Out Region Support

- Differential Vias™ for high density arrays in the PCB break out region
- Tri-Planar™ transmission line design for high density routing of differential signals
- Final Inch® PCB Design Tools: pre-optimized break out region reference designs that save design, development and resources

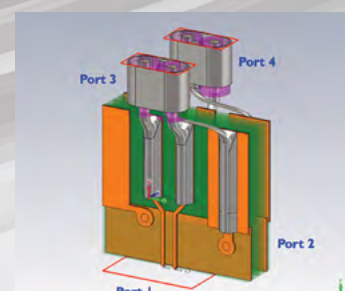
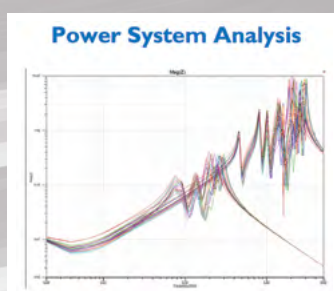
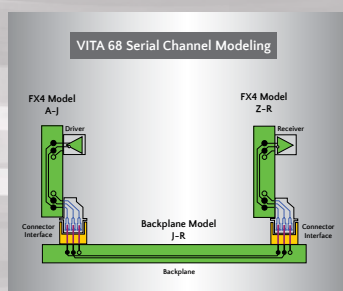
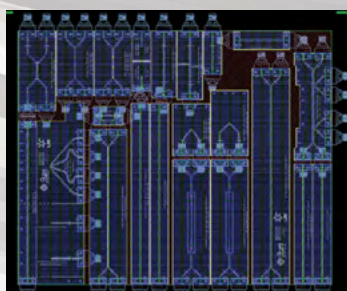




# SIGNAL INTEGRITY CONSULTING SERVICES

**TERASPEED®  
CONSULTING**

Teraspeed® Consulting offers Silicon to Silicon signal integrity expertise and capabilities delivered directly to your engineering team. From complete system design, signal integrity analysis and engineering, and in-depth signal integrity training, our vision is to provide enabling technology and support in the design and implementation of your extreme performance systems.



## ADVANCED SERVICES

### Advanced Packaging & IC-to-Board Services

- SI-enabled layouts for 28 Gbps and 56 Gbps systems
- Advanced design of OC-48, XAUI and OC-192 packages operating at speeds to 40 Gbps
- Package characterization
- I/O buffer sizing
- Design kits

## ENGINEERING

### System Engineering

- Comprehensive system engineering
- Sub-system design
- EMI and regulatory engineering
- Enclosures and standards
- Mitigation of risk and increased success of advanced technology integration
- "Right by Design" results for performance in the real world

## SIGNAL AND POWER

### Signal and Power Integrity

- Backplane design
- Copper, cable and optical interconnect engineering
- Board design
- Design kits

## MODELING

### Electromagnetic Modeling

- Advanced characterization and modeling
- Measurement-based and IBIS modeling
- Semiconductor package modeling
- 3D and 2D structure modeling

Visit [www.teraspeed.com](http://www.teraspeed.com) for more information.

# **samtec**

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