

MICRO BACKPLANE

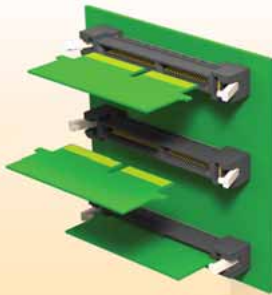
DESIGN GUIDE



HIGH SPEED MICRO BACKPLANES

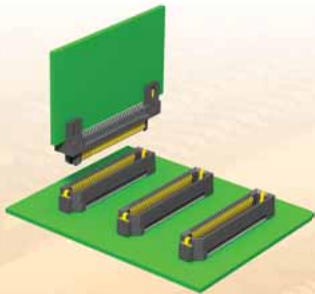
High Speed
Edge Cards

Page 4



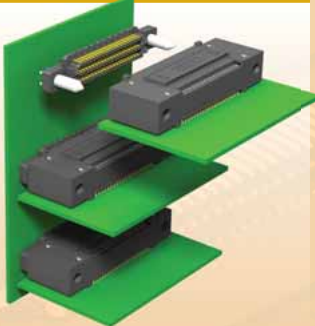
High Speed Rugged
Contact Systems

Page 5



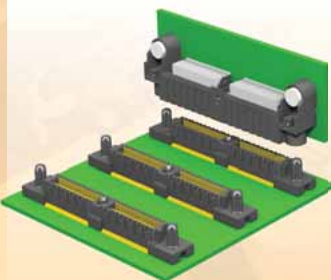
High Density High
Speed Systems

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High Speed
Ground Plane

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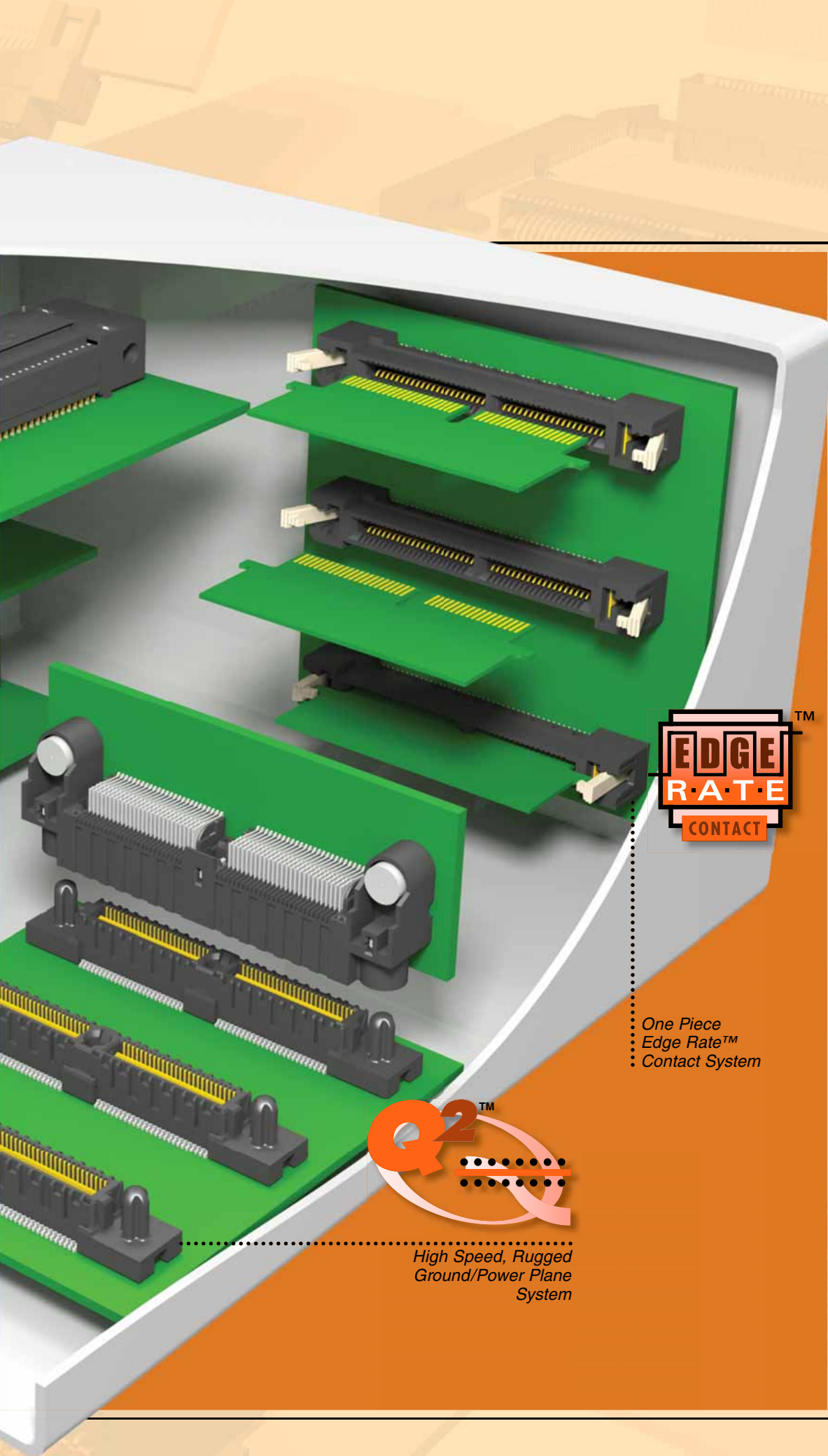


High Density
Edge Rate™
Contact System

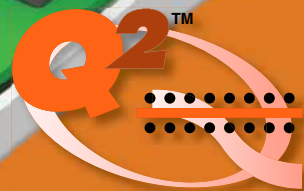
SEARAY™
OPEN PIN FIELD
INTERCONNECTS

**EDGE
R·A·T·E™**
CONTACT

Two Piece
Edge Rate™
Contact System



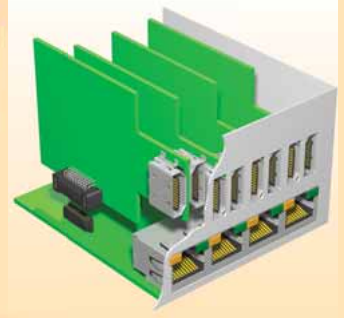
One Piece
Edge Rate™
Contact System



High Speed, Rugged
Ground/Power Plane
System

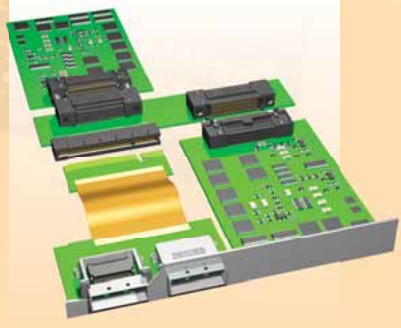
Creative
I/O Solutions

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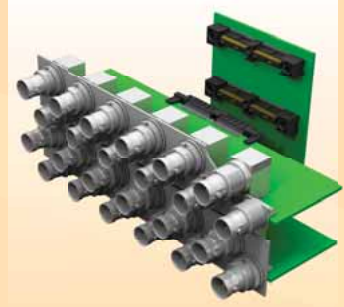
High Speed
Jumpers

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3G SDI Broadcast
Video

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Signal Integrity
Services

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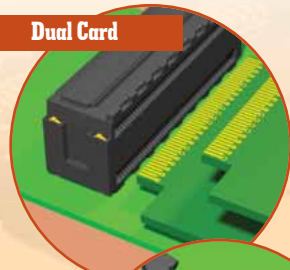


HIGH SPEED EDGE CARD SOCKETS

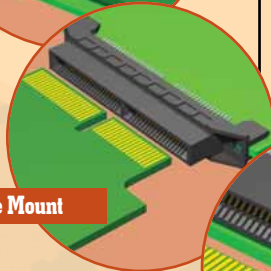
One Piece Edge Rate™ Contact Sockets

- Edge Rate™ contacts optimized for Signal Integrity performance
- Surface mount and edge mount designs for parallel, perpendicular and planar board mating
- Mates with standard .062" (1,60mm) PCB cards
- Optional rugged board locking and cable latching features
- Direct card to socket interface reduces cost (HSEC8 Series)
- 0,8mm pitch

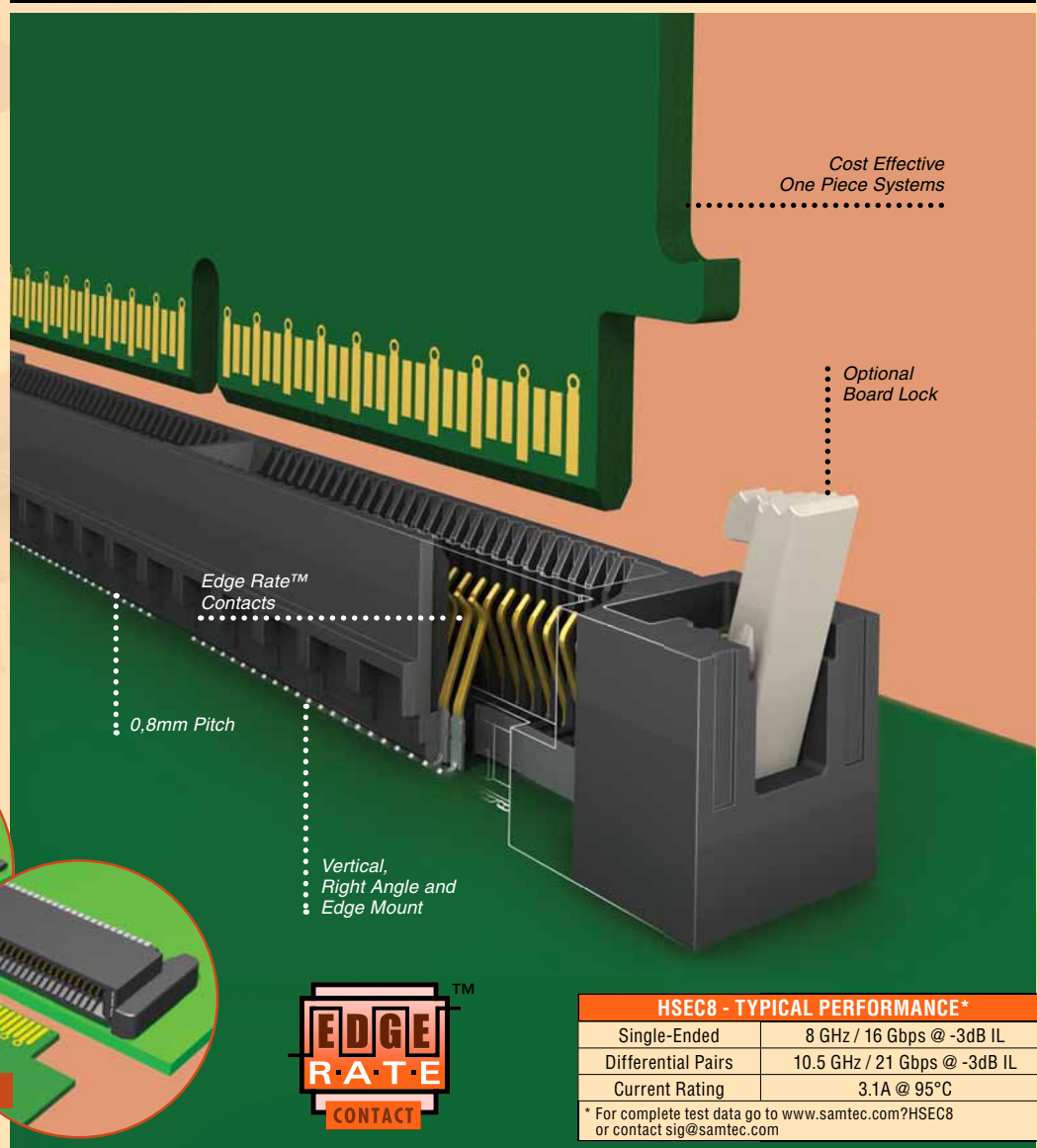
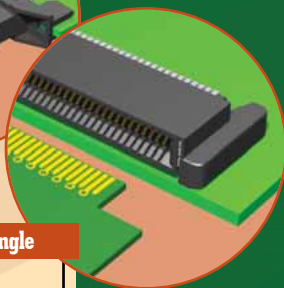
Dual Card



Edge Mount



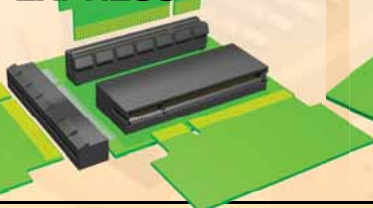
Right Angle



PCI Express® Sockets

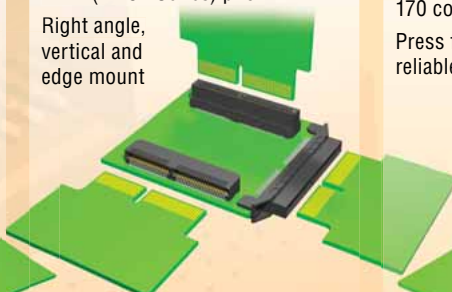
1mm pitch (PCIE Series)
Vertical or right angle PCB Mount
and Card Edge Mount
Supports one, four, eight and
sixteen *PCI Express® links

**PCI
EXPRESS**



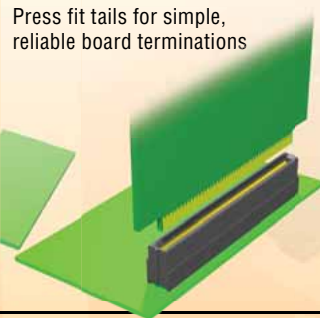
Edge Card Sockets

0,635mm (MEC6 Series),
1mm (MEC1 Series),
1,27mm (MECF Series) &
2mm (MEC2 Series) pitch
Right angle,
vertical and
edge mount



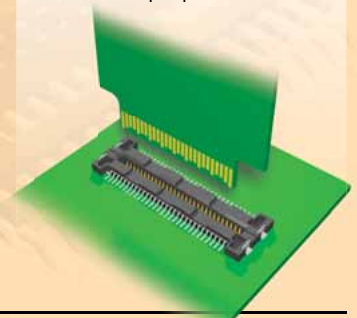
Micro TCA Connectors

0,75mm pitch (MTCA Series)
Identical to Molex in form, fit
and function
170 contacts
Press fit tails for simple,
reliable board terminations



Micro Plane Interface

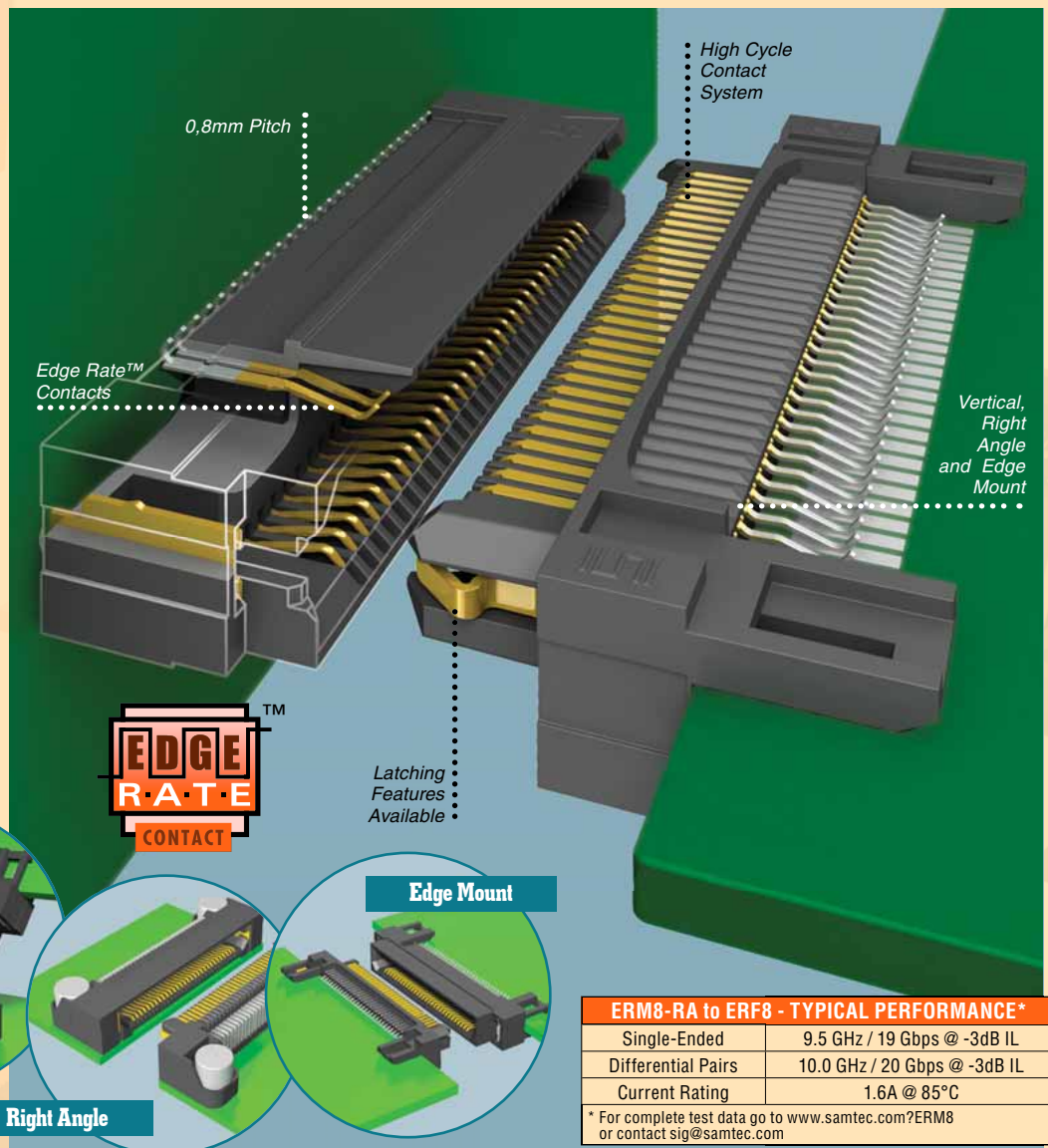
Variable card mating thickness
Large deflection BeCu contact
1mm pitch (SAL1 Series)
40 to 80 I/Os per pair



HIGH SPEED RUGGED CONTACT SYSTEMS

Two Piece Edge Rate™ Contact System

- Smooth broad milled surface for mating
- Robust when "zippered" during unmating
- Edge Rate™ contacts optimized for Signal Integrity performance
- High performance, lower cost system
- 0,5mm and 0,8mm pitch



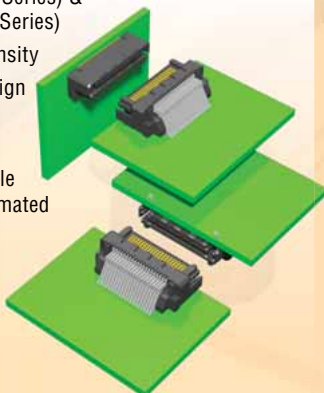
ERM8-RA to ERF8 - TYPICAL PERFORMANCE*

Single-Ended	9.5 GHz / 19 Gbps @ -3dB IL
Differential Pairs	10.0 GHz / 20 Gbps @ -3dB IL
Current Rating	1.6A @ 85°C

* For complete test data go to www.samtec.com?ERM8 or contact sig@samtec.com

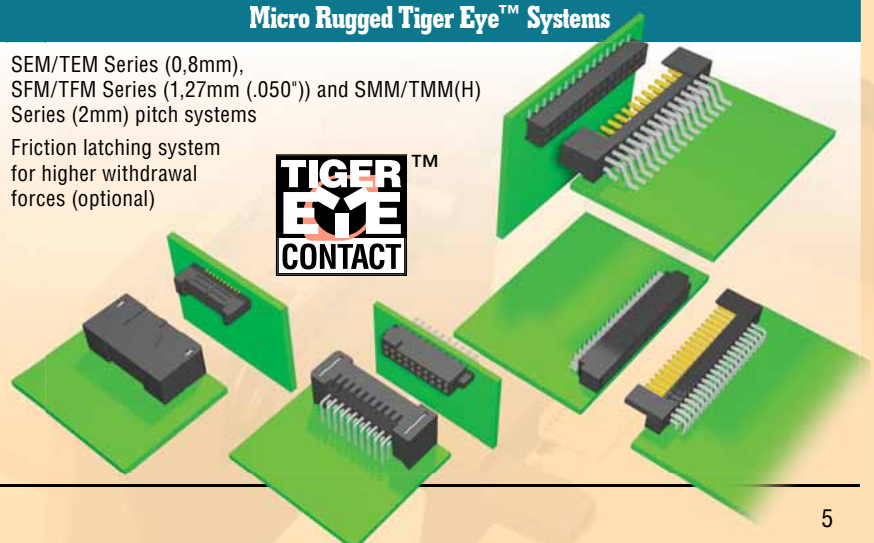
Micro Rugged Hermaphroditic

- 0,5mm pitch (LSHM Series) & 0,8mm pitch (LSEM Series)
- High Speed/High Density
- Slim row-to-row design
- Low cost blade and beam contact
- Shrouded with audible click when properly mated



Micro Rugged Tiger Eye™ Systems

- SEM/TEM Series (0,8mm), SFM/TFM Series (1,27mm (.050")) and SMM/TMM(H) Series (2mm) pitch systems
- Friction latching system for higher withdrawal forces (optional)

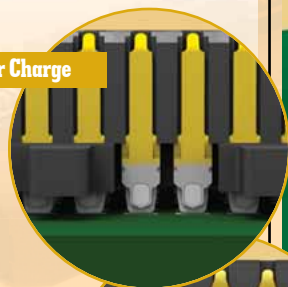


HIGH SPEED HIGH DENSITY SYSTEMS

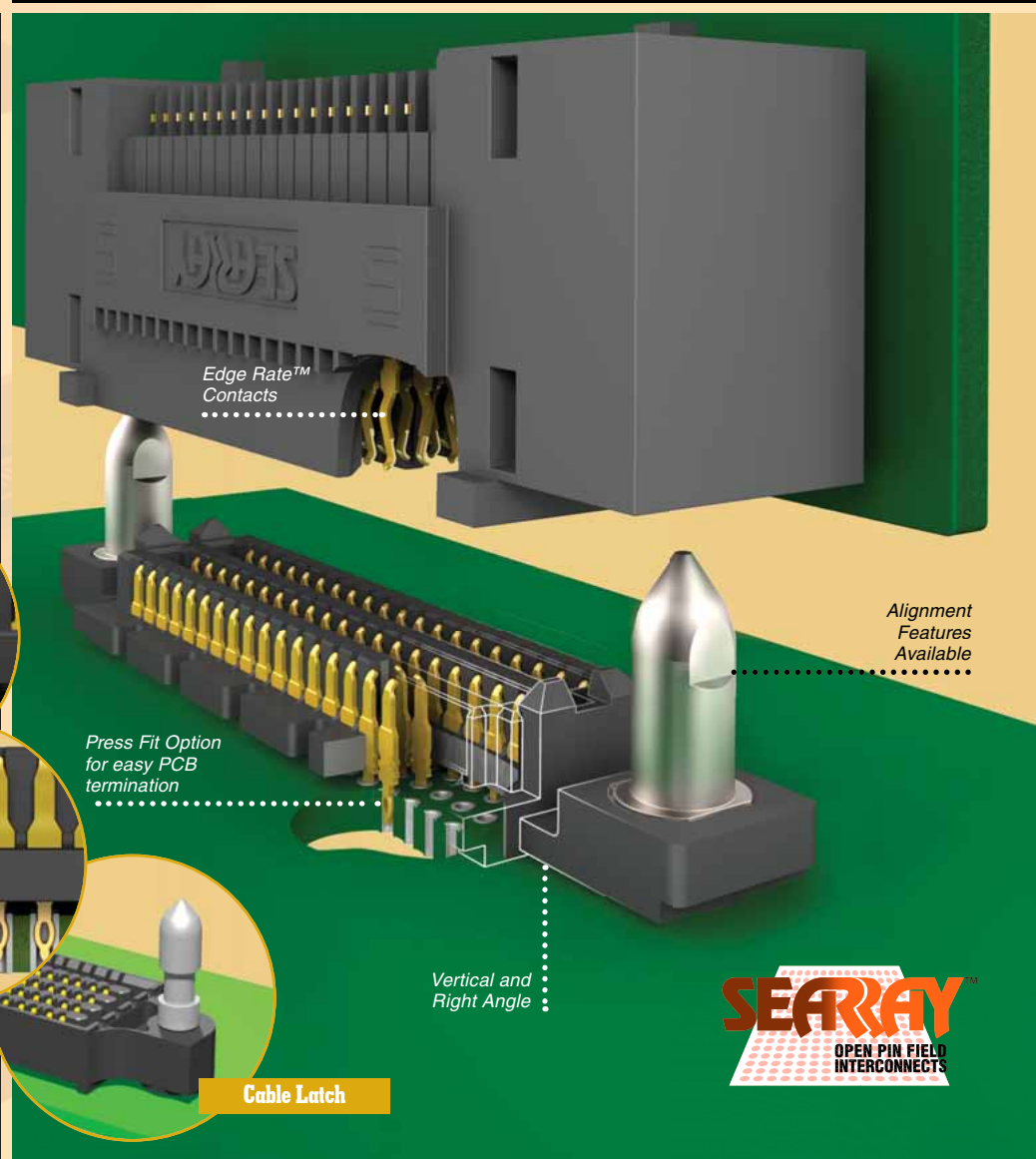
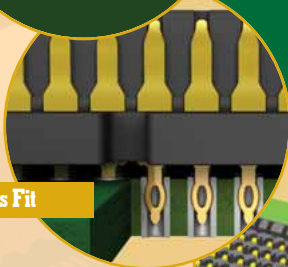
Right Angle/ Micro Backplane

- Right angle arrays optimized to reduce skew and impedance mismatch
- Choice of 4 and 6 row designs with 20 to 50 contacts per row
- Rugged Edge Rate™ contacts
- Lower insertion/extraction forces
- Optional guide posts for blind mating
- Optional Press Fit tails
- Optional Solder Charge tails for improved solderability/reliability

Solder Charge

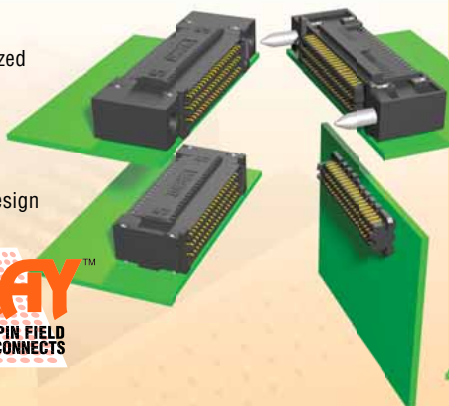


Press Fit



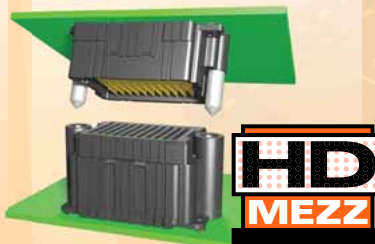
SEARAY™ High Density Edge Rate™

1,27mm pitch
(SEAM/SEAF Series)
Right angle arrays optimized to reduce skew and impedance mismatch
Optional guide posts for blind mating
Press fit termination in design



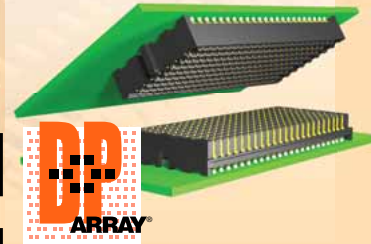
HD Mezz

Open pin field for maximum grounding and routing flexibility
Can be routed single-ended or differentially
20mm, 25mm, 30mm and 35mm standard board stack heights



DP Array®

Perimeter grounds and staggered pin layout eliminates interstitial grounds and makes board routing easier
Performance of up to a terabit per connector (up to 4 GHz per pair)

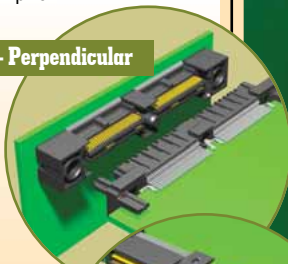


HIGH SPEED GROUND PLANE SYSTEMS

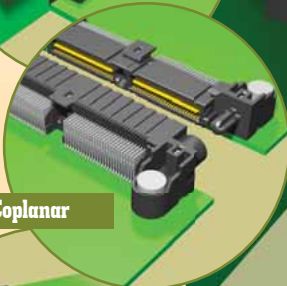
Right Angle & Edge Mount

- Integral ground/power plane rated for up to 8.9A @ 80°
- 50Ω single-ended standard and application specific 100Ω differential pair
- Perpendicular (90°) and horizontal (180°) coplanar applications
- Optional locking screws/holes and guide posts/holes
- 0,635mm pitch

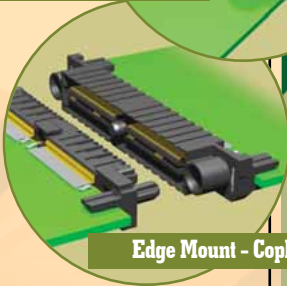
Edge Mount - Perpendicular



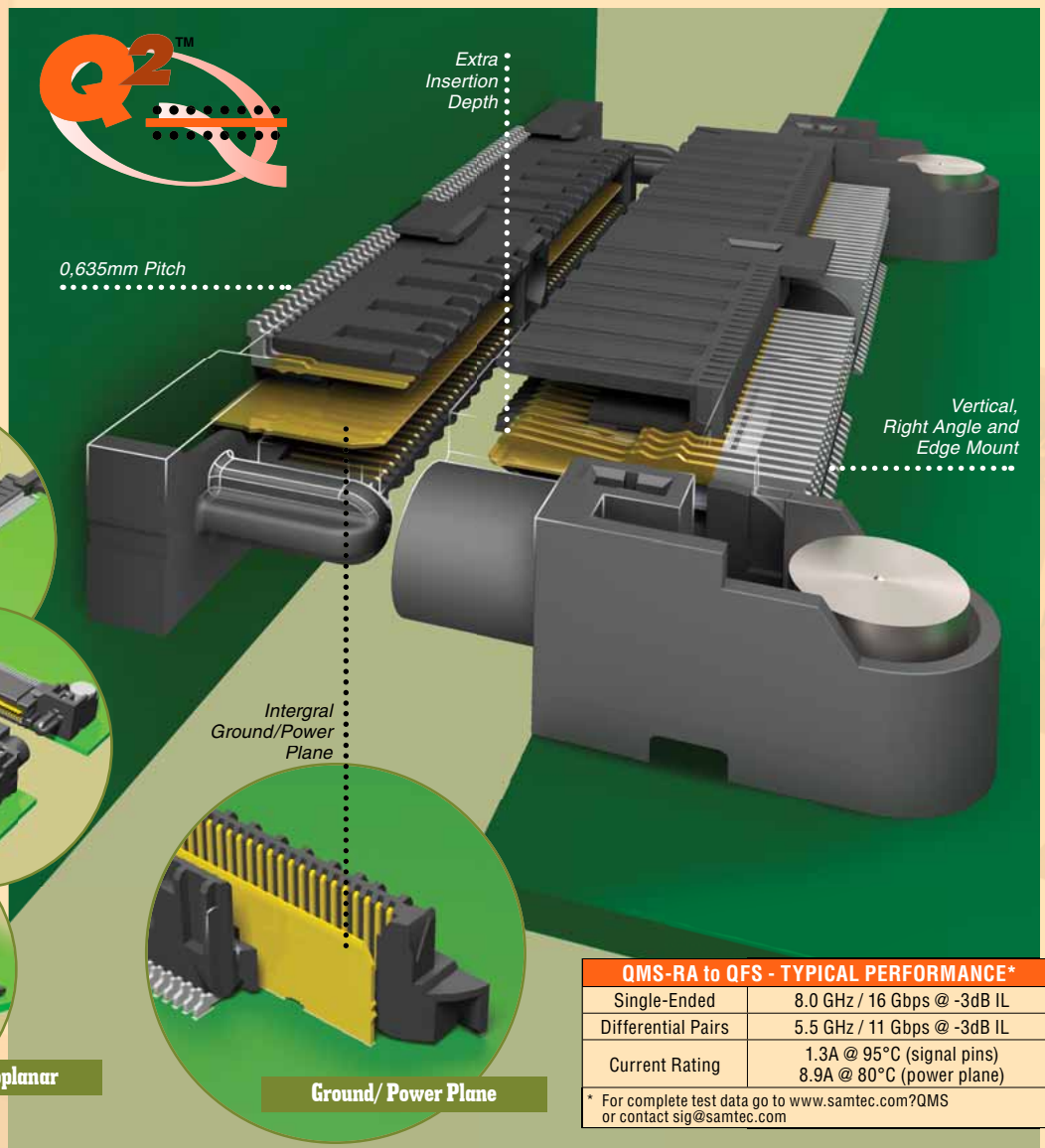
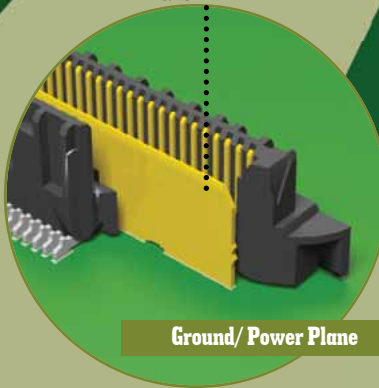
Right Angle - Coplanar



Edge Mount - Coplanar



Ground/ Power Plane



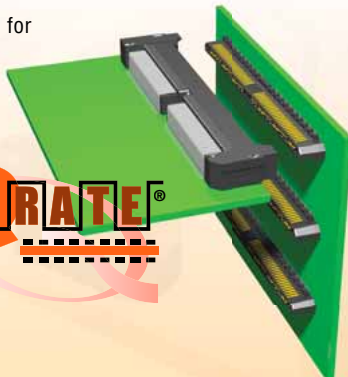
QMS-RA to QFS - TYPICAL PERFORMANCE*

Single-Ended	8.0 GHz / 16 Gbps @ -3dB IL
Differential Pairs	5.5 GHz / 11 Gbps @ -3dB IL
Current Rating	1.3A @ 95°C (signal pins) 8.9A @ 80°C (power plane)

* For complete test data go to www.samtec.com?QMS or contact sig@samtec.com

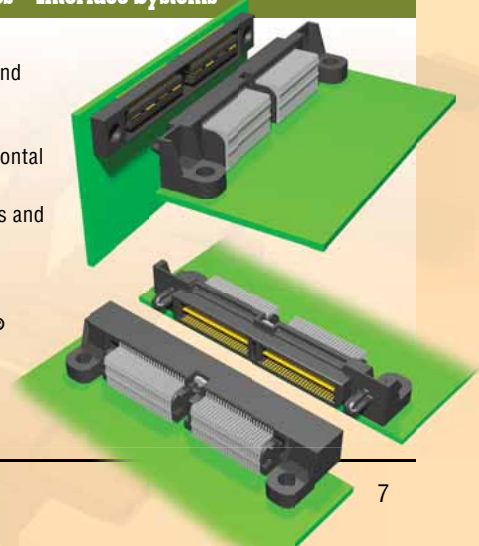
Q Rate® Interface System

QRM8/QRF8 Series
Edge Rate™ contacts optimized for Signal Integrity performance
Widely accepted industry standard ground/power plane
Slim 5mm body width
0,8mm pitch



Q Series® Interface Systems

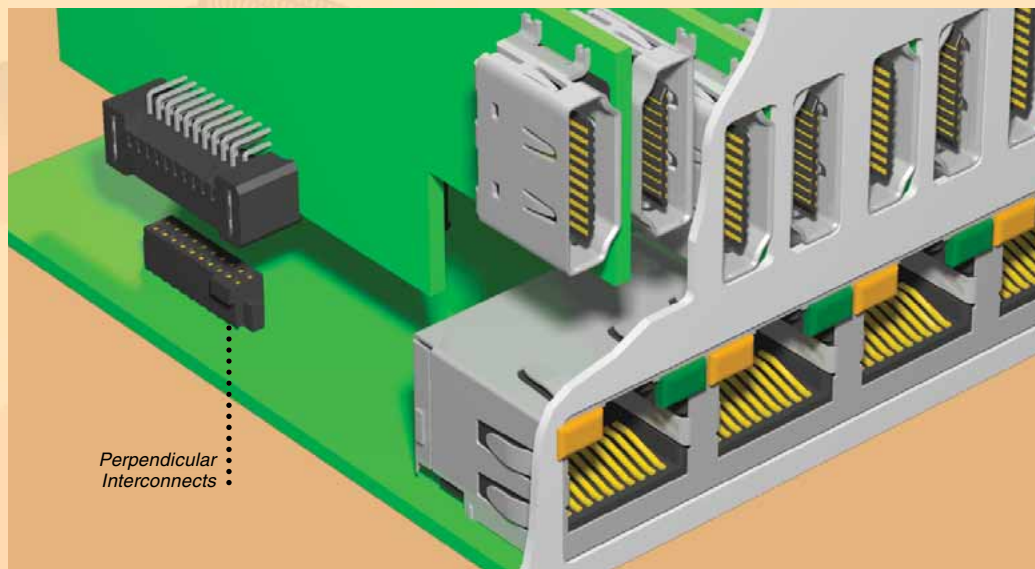
QTS/QSS Series
50Ω single-ended standard and application specific 100Ω differential pair
Perpendicular (90°) and horizontal (180°) coplanar applications
Optional locking screws/holes and guide posts/holes
0,635mm pitch



MICRO BACKPLANES FOR CREATIVE I/O SOLUTIONS

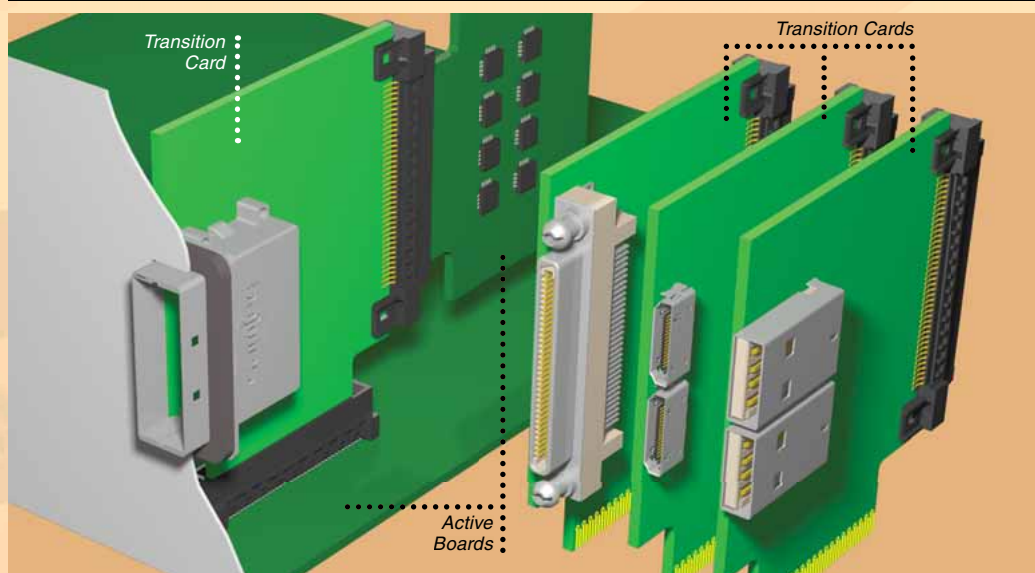
Maximize Panel Density

- Creative I/O to motherboard connection schemes
- Wide variety of micro backplane connectors to interface with the transition card
- High speed edge card, connector strips and arrays
- Right angle, vertical and edge mount designs

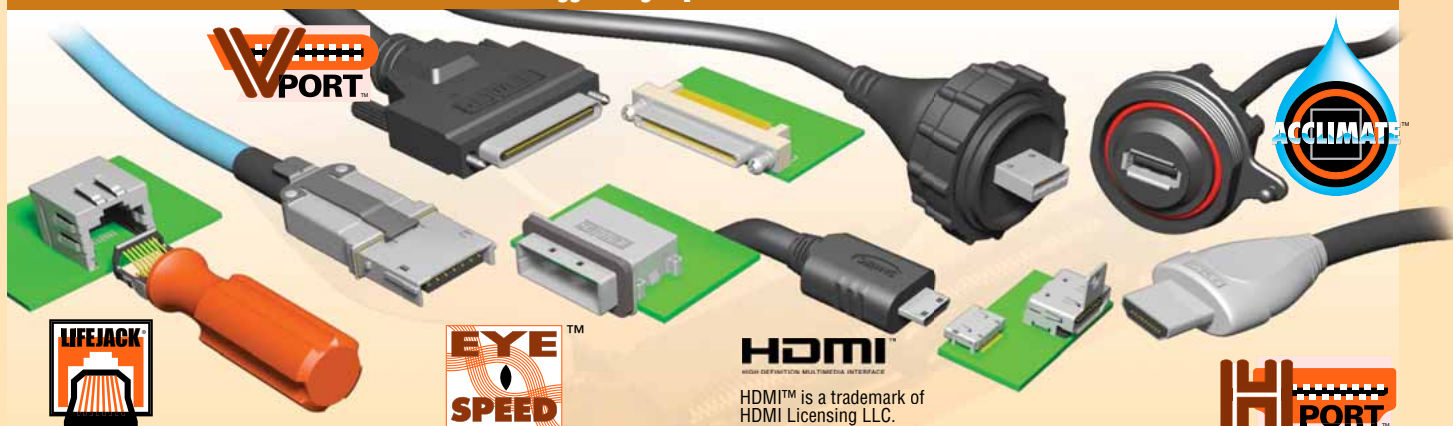


Achieve I/O Flexibility

- Economies of scale on critical boards is maintained with low cost transition cards
- Provides ability to customize I/Os in small volume applications
- Wide variety of I/O interfaces
- Potential for equalization circuitry to improve or maintain performance



Rugged/High Speed I/O Interfaces



STANDARD & CUSTOM HIGH SPEED JUMPERS

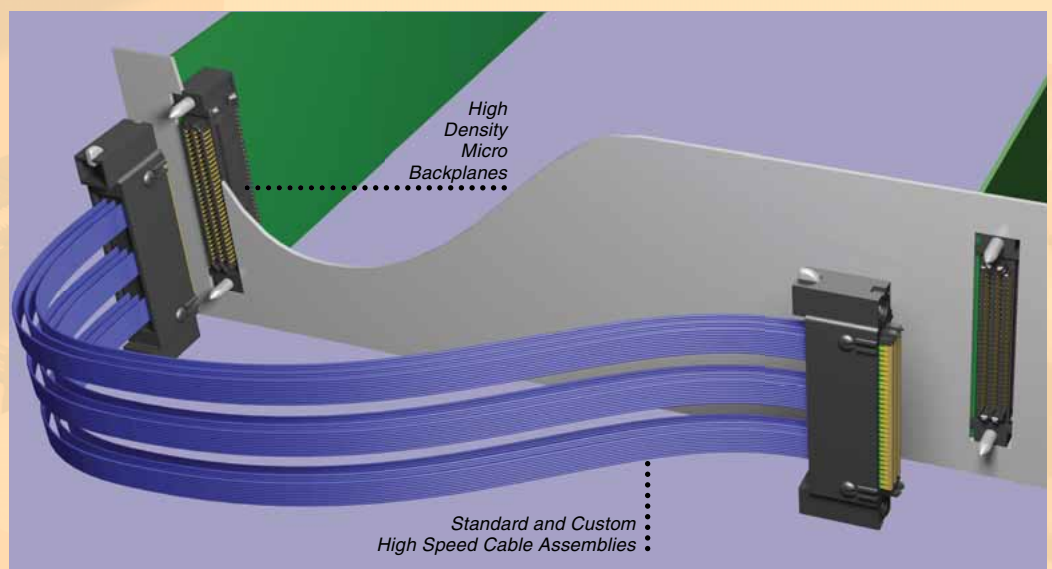
Increase Packaging Efficiency

- Bring high speed signals from the back of the box to the panel
- High speed cables for long distances and high speed flex circuits for shorter distances
- Standard I/O interfaces or complete custom designs



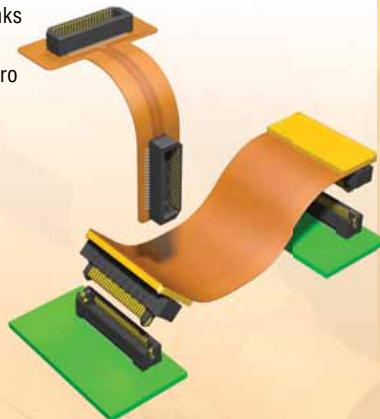
Bypass Rack-to-Rack Backplanes

- Route high speed signals on different boards with high speed jumpers
- High speed coax cables for long distances and high speed flex data links for shorter distances



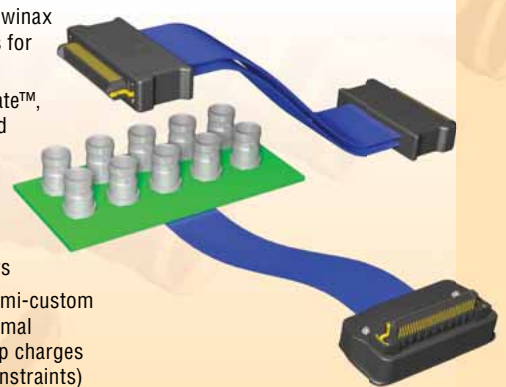
Sudden Circuits®

Quick turn high speed flex data links for short cable runs
 Q2™, Q Series®, Edge Rate™, micro and standard pitch connectors
 Any length to 22" (559mm)
 Any connector gender/key orientation or pin count
 Any ground/signal pattern
 Small quantity or large, without NREs (nonrecurring engineering charges)
 Semi-custom and full custom available with longer lead times and possible NREs



High Speed Cable Jumpers

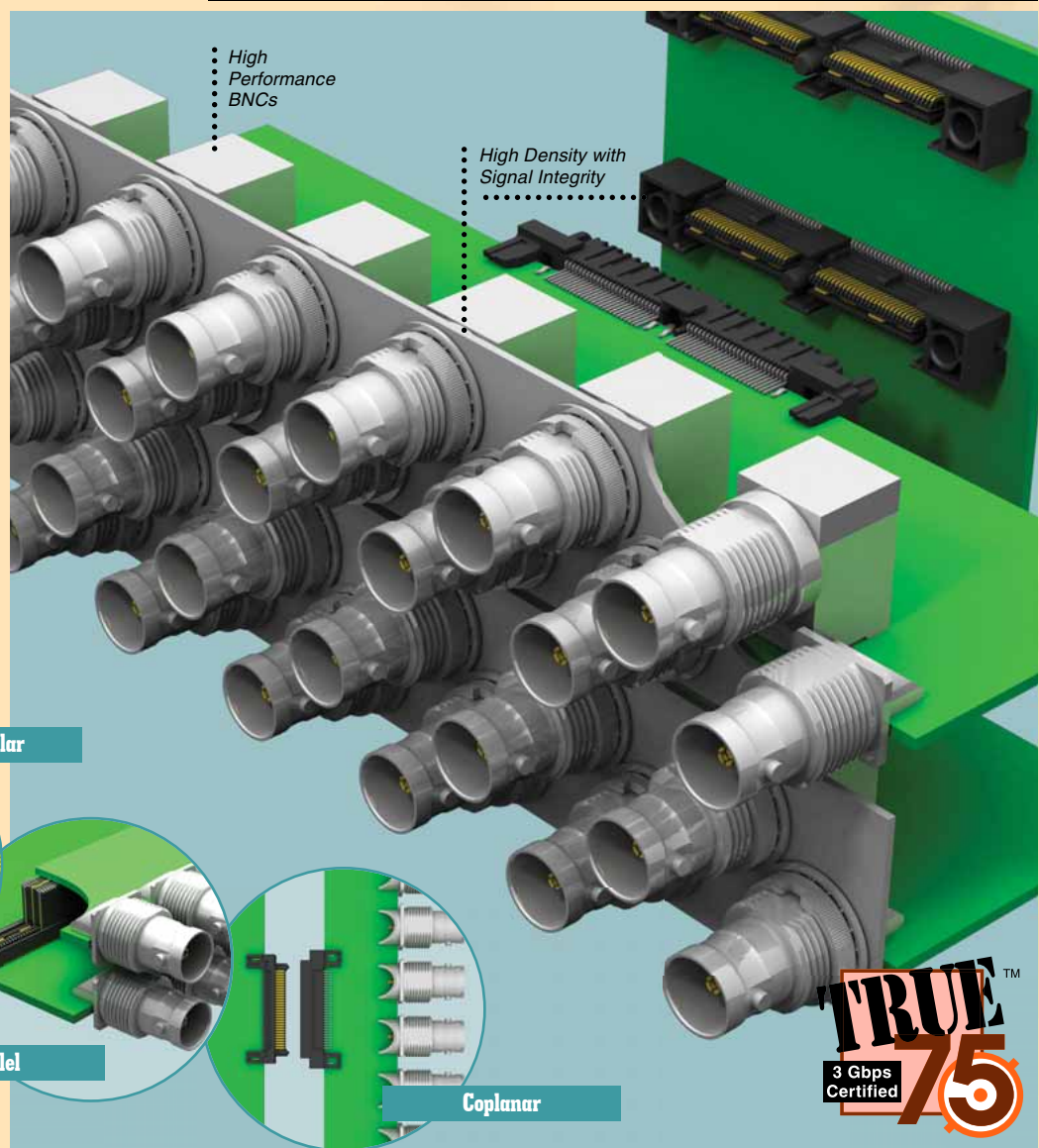
Coax (50Ω & 75Ω) and twinax (100Ω) cable assemblies for long cable runs
 Q2™, Q Series®, Edge Rate™, SEARAY™ Edge Card and RF connectors
 Standard hot swap and ruggedizing options
 RF/microwave/isolated transmission line jumpers
 Standard, custom and semi-custom available, often with minimal engineering and/or set-up charges (depending on design constraints)



3G SDI BROADCAST VIDEO

Solve 3G SDI Challenges

- True75™ BNC connectors are certified 75 ohm ± 3 ohm for Straight and ± 4 ohm for Right Angle.
- Samtec micro backplane and high speed stacking interconnects meet or exceed requirements for 3G SDI rear panel I/O card interfaces.
- Demonstration kits that are exceptionally accurate at measuring 3G SDI signal quality in the connector breakout regions are available. Contact 3GSDI@samtec.com for more information.
- Samtec's signal integrity expertise, and high speed interconnect solutions, are ideal for many of the physical and electrical routing challenges facing the broadcast video industry.



3G SDI Demonstration Kit

Allows accurate measuring of 3G SDI signal quality in the connector breakout regions

Simulation of the entire transmission line paths from BNCs through high speed interconnect and the equalizers and cable drivers on the active board



Download e-brochure at
www.samtec.com

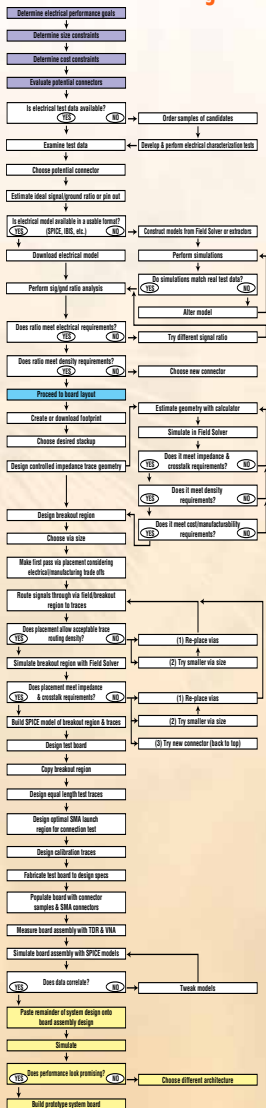
Micro Backplane	Page	Perpendicular	Coplanar
High Speed Edge Card	4	HSEC8-DV to Card Edge	HSEC8-EM to Card Edge
Edge Rate™ Strips	5	ERM8-RA to ERF8	ERM8-RA to ERF8-RA
		ERM8-EMX to ERF8	ERM8-EMX to ERF8-EMX
		ERM8 to ERF8-RA	
SEARAY™ High Density	6	SEAM to SEAF-RA	SEAM-RA to SEAF-RA
		SEAM-RA to SEAF	
Q2™ Series Strips	7	QMS-RA to QFS	QMS-RA to QFS-RA
		QMS to QFS-RA	
		QMS-EM to QFS	QMS-EM to QFS-EM
		QMS to QFS-EM	

SIGNAL INTEGRITY SERVICES

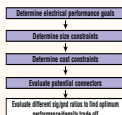
Final Inch® PCB Design Tools

Pre-optimized BOR reference designs that save design, development and validation time and resources.

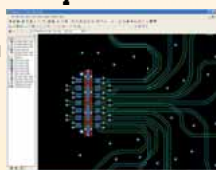
Traditional PCB Design



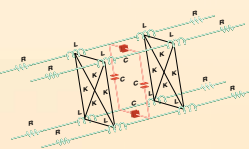
SamtecFinal Inch®



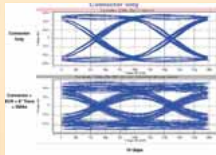
Physical Models



Electrical Models



Empirical Models



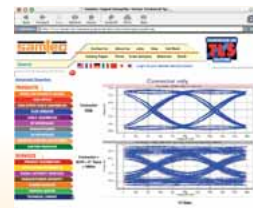
See www.samtec.com/FI for downloadable/printable flow chart

Samtec Final Inch®	Other Suppliers
Real World	Lab Optimized
Test boards designed to study connector, footprint, Break Out Region and traces in an actual application environment	Test boards are designed to study connector and footprint, with the electrical effects of vias and traces minimized
Standard materials and manufacturing processes show connector and board under real-world conditions	Exotic materials and difficult manufacturing processes show connector under ideal conditions
Real-world performance expectations	Unrealistic performance expectations

Signal Integrity Center

Online support and reference tools for the selection, development, simulation and testing of high speed systems.

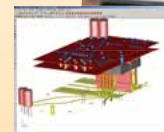
- High speed connector simulations, models, reports and drawings
- HSPICE, PSpice® model, Allegro® SigXplorer model, IBIS, ICM, HyperLinX ELDO and ADS models for simulation
- PCB libraries and footprint files
- High speed characterization reports
- Time and frequency domain test data
- Bandwidth Performance Selector
- Cable Performance Calculator
- Interactive Cable Builders
- High Speed Connector Selector
- Engineering prints, product specifications, PCB footprints
- Application Notes, White Papers, presentations and articles
- Final Inch® design tools
- Test Data comparison program
- www.samtec.com



Signal Integrity Group

Personal support via Samtec's highly qualified, in-house staff of Signal Integrity engineers.

- Interpret test data, performance results and capabilities
- PCB layout, trace and routing assistance
- Connector ground pin assignment and assistance
- Extensive modeling, simulation and testing capabilities
- De-embedding capabilities
- On-request test data, including eye patterns for Final Inch® circuits using Agilent PLTS 50 GHz Characterization System



Custom Signal Integrity Services

Application specific design, modeling and testing of circuits, subsystems or complete systems.

- Choose the depth of involvement and the breadth of service
- Layout and component strategies during the concept phase
- Customized simulation models to better optimize performance and enhance signal integrity during the design phase
- Testing and verification during the final development stages
- Electrical engineering services tailored to specific needs and products
- PCB design support for more advanced design needs





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