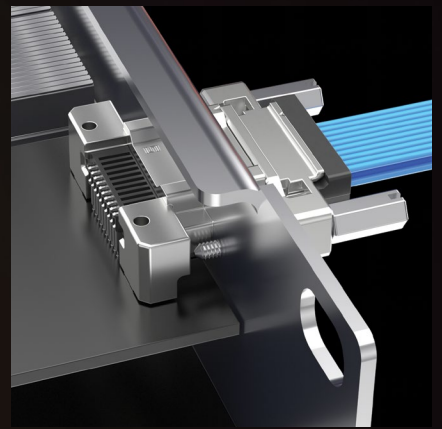
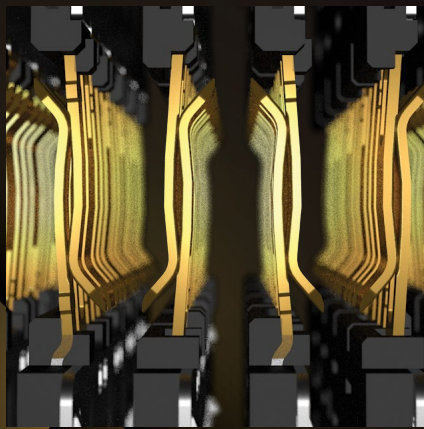
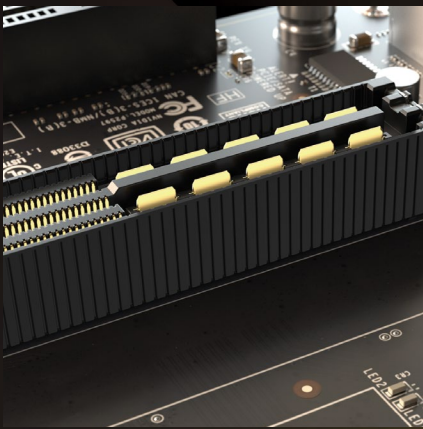




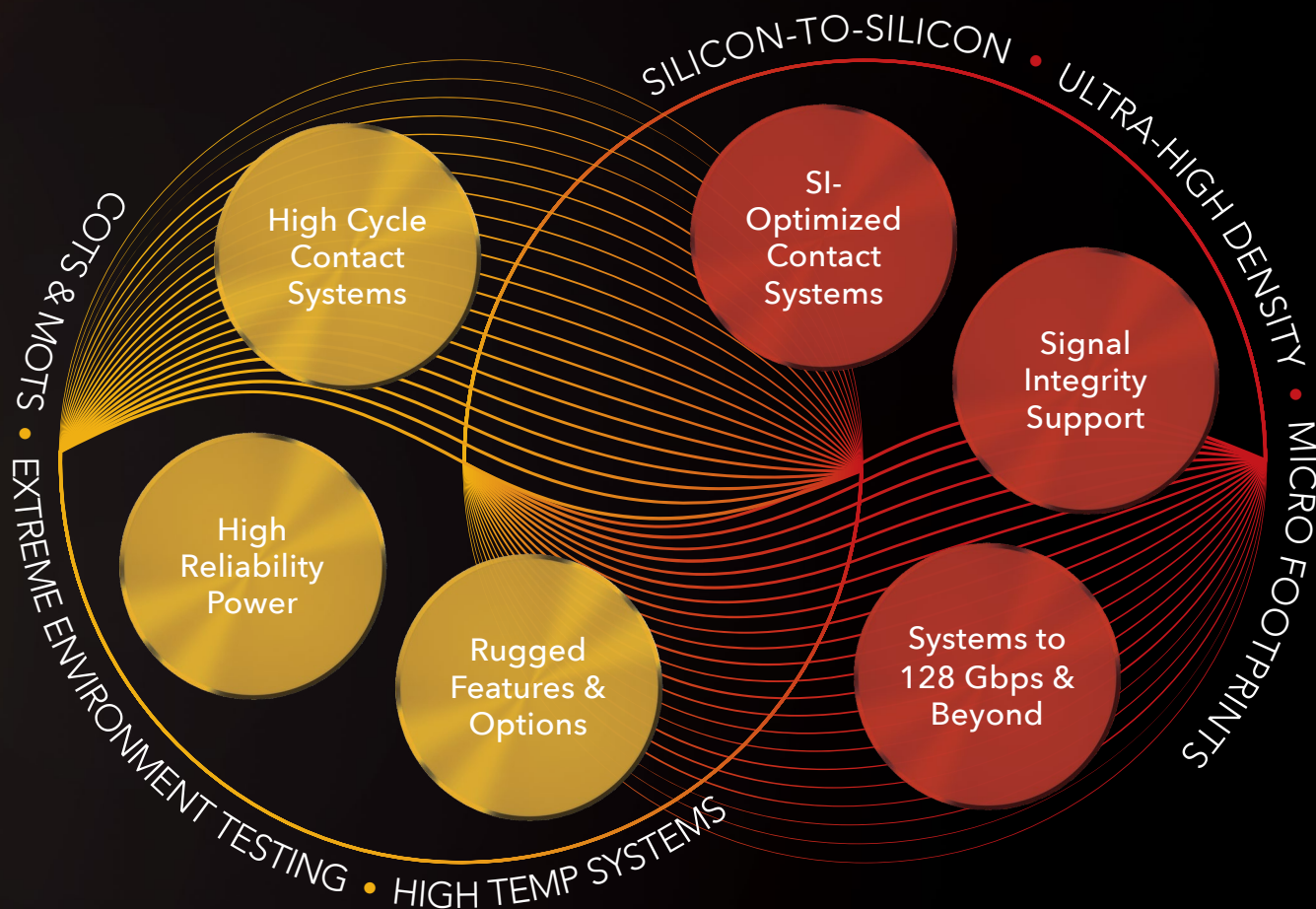
RUGGED HIGH-SPEED INTERCONNECT SOLUTIONS



Performance & Reliability for the Most Demanding Applications

RUGGED HIGH-SPEED INTERCONNECT SOLUTIONS

Samtec offers a robust line of high-speed interconnect systems that are optimized for performance, durability and reliability in the most demanding environments.



APPLICATIONS & INDUSTRIES



Mil/Aero



Industrial











Medical



Automotive

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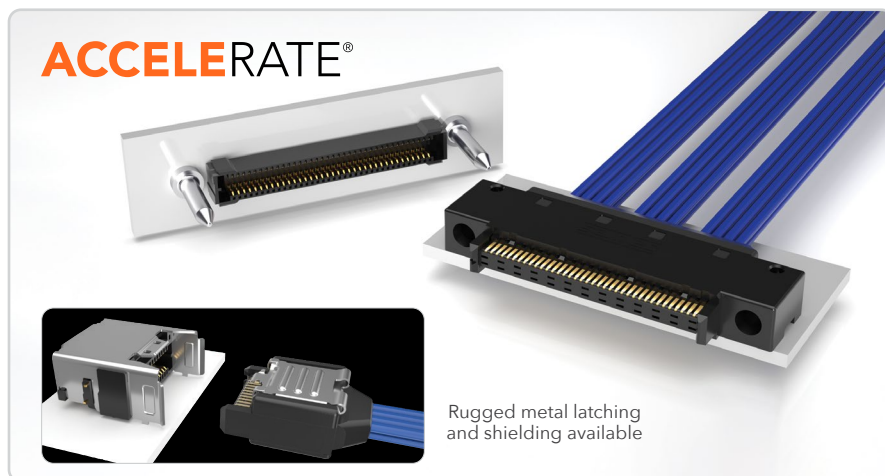
	RUGGED HIGH-SPEED SYSTEMS (Cable & Board-to-Board)	4-5
	RUGGED HIGH-SPEED SYSTEMS (Precision RF & Optics)	6-7
	ULTRA RUGGED OPTIONS	8-9
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RUGGED HIGH-SPEED SYSTEMS

PANEL & MID-BOARD CABLE SYSTEMS

- URSA® I/O features Hyper Claw™ contacts; 1 to 5 banks with high-speed, RF and power configurations in development
- NovaRay® I/O bulkhead or threaded 38999 panel connection
- ExaMAX® I/O features a fully shielded external cable and cage
- AcceleRate® features a slim body with integrated guide posts
- EMI shielding limits signal degradation, optimizes performance
- Ruggedizing features include captive panel screws, strain relief, pull latches, slim latching, and guide posts for blind mating
- SI Evaluation Kits available, visit samtec.com/kits



EXAMAX® is a registered trademark of Amphenol FCI Asia Pte. Ltd. Used with permission.

BOARD-TO-BOARD & BACKPLANE SOLUTIONS

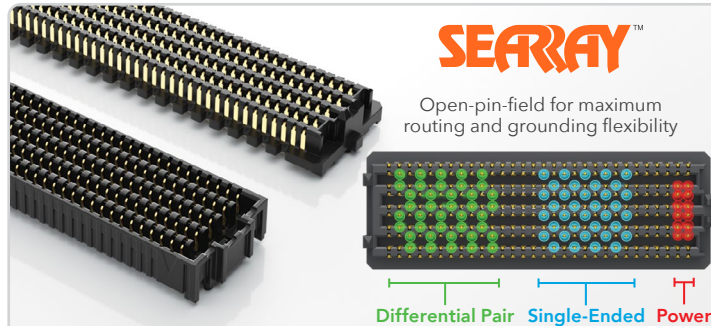
- SEARAY™ high-density arrays offer the most power versatility
- AcceleRate® mP best in class density for power and signal
- ExaMAX® & NovaRay® backplane systems offer two reliable points of contact
- Edge Rate® strips optimized for high performance and cycles
- Generate® edge cards with signal/power and tucked beam options
- Q Series® with integral ground/power plane for reliable SI/power
- Razor Beam™ self-mating interfaces reduce inventory costs
- SI Evaluation Kits available, visit samtec.com/kits

PAM4	PAM4	PAM4	PAM4	MAX
56	64	112	128	25
Gbps	Gbps	Gbps	Gbps	Amps

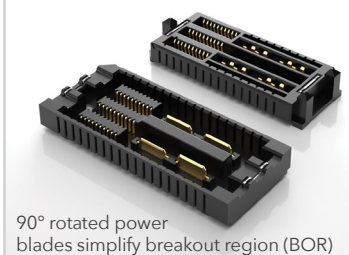


RUGGED OPTIONS

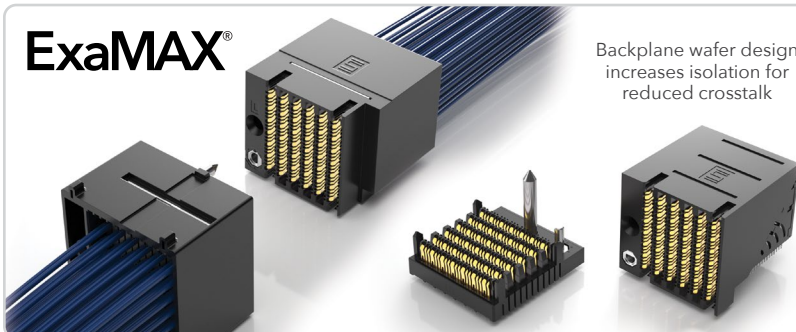
360° EMI Shielding
Metal Latching
Extended Guide Posts
Friction/Board Locks
Weld Tabs



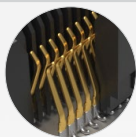
ACCELERATE®mP



ExaMAX®

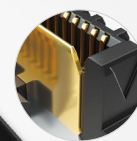


NOVARAY®



EDGE
RATE
SYSTEM

QSERIES®



RAZOR
BEAM
SYSTEM

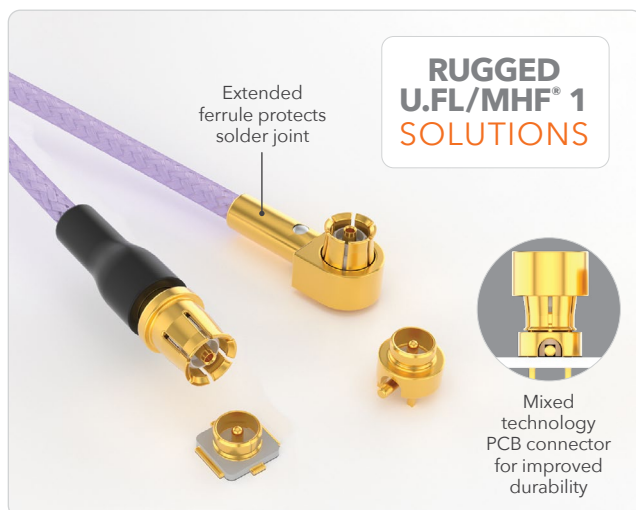
GENERATE®

RUGGED HIGH-SPEED SYSTEMS

PRECISION RF SOLUTIONS

- Magnum RF® ganged, multi-port blocks and cable assemblies feature a push-on SMPM interface with varying retention forces
- Nitrowave™ high-performance microwave cable assemblies are phase and amplitude stable with flexure; dynamic performance layer (DPL) minimizes loss and improves stability
- Rugged U.FL/MHF® 1 cable assemblies with metalized strain relief for increased durability; 500 mating cycles
- VITA™ 90 VNX+™ solutions with rugged blind mate RF modules, SEARAY™ right-angle array and rugged optics; enables SWaP-C reductions
- Custom and quick turn modifications available

DC TO	DC TO	DC TO
10 GHz	65 GHz	110 GHz

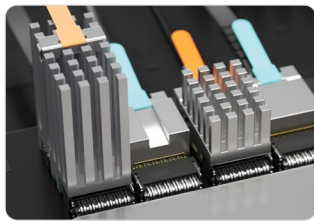


MHF® is a registered trademark of I-PEX® Inc.
MTP® and MXC® are registered trademarks of US Conec Ltd.
VITA/VNX/VNX+ are all respective trademarks of VITA.

MID-BOARD OPTICAL TRANSCEIVERS

- FireFly™ EXT with an extended temperature range of -40 °C to +85 °C
- FireFly™ EET features a parylene conformal coating for extreme environments; tin whisker mitigation, and salt fog resistance capabilities
- Halo® optical transceivers are designed for next gen embedded applications, and withstand high shock and vibration in a low 6.35 mm profile for space savings
- SWaP optimized designs for longer connections
- Multiple end options, including MTP®, MXC®, MT, and a variety of rugged interfaces
- SI Evaluation Kits available, visit samtec.com/kits

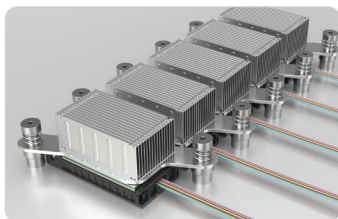
PAM 4		
10 Gbps	28 Gbps	56 Gbps



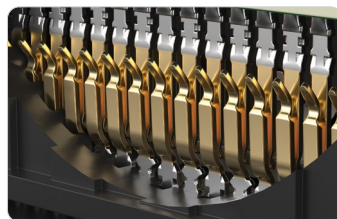
Variety of heat sink options for optimal cooling



Engineered for harsh/ rugged environments



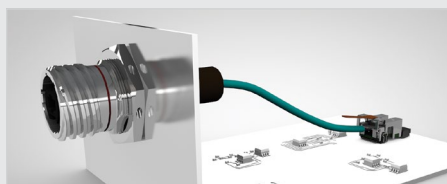
Variety of heat sink options for thermal relief



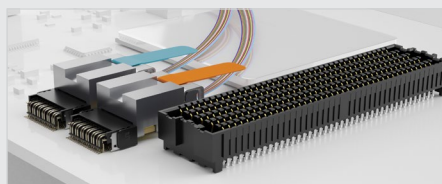
E.L.P.™ & SET certified AcceleRate® contacts for rugged applications



RUGGED END OPTIONS



Amphenol® MT38999



VITA™ 66.1/66.4 Interface



Glenair® Series 79 MT Connector

ULTRA RUGGED OPTIONS

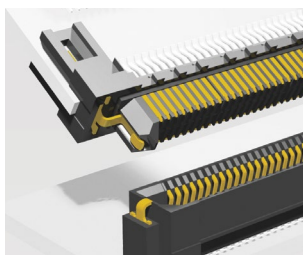
Most Samtec interconnect systems are available with a variety of standard and optional features, plus hardware and coatings, to further ensure quality and durability in rugged and harsh environments. For added reliability, Samtec also offers rugged contact systems designed to support high-speed performance, as well as high mating cycles and high-shock/vibration applications.

RUGGEDIZING OPTIONS



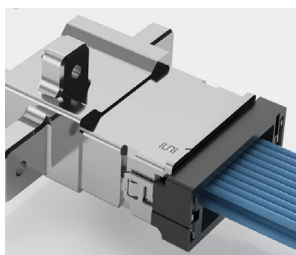
LATCHING

Manually activated latches increase unmating force by up to 200%



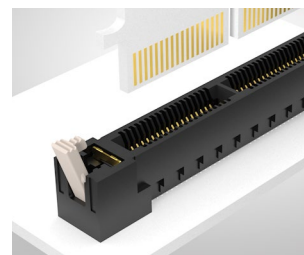
FRICTION LOCKS

Metal or plastic friction locks increase retention/withdrawal force



STRAIN RELIEF

Helps protect against damage caused by frequent movement, strain or stress



BOARD LOCKS

Boards are mechanically locked together



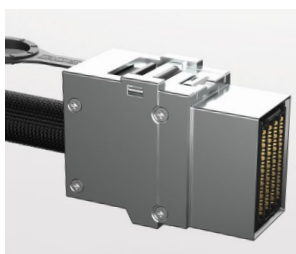
WELD TABS

Significantly increases shear resistance of connector to PCB



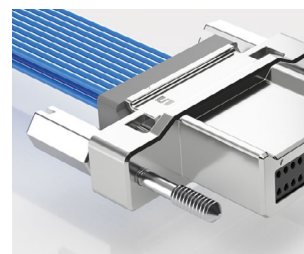
GUIDE POSTS

Easy and secure mating



SHIELDING

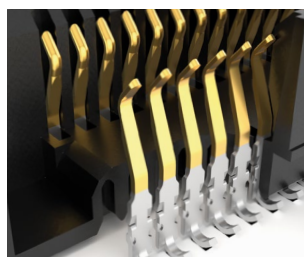
360° shielding reduces EMI



SCREW DOWNS / PANEL SCREWS

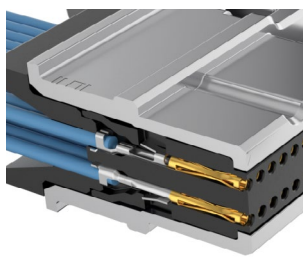
Secure mechanical attachment to the board or panel

RUGGED/HIGH-RELIABILITY CONTACT SYSTEMS



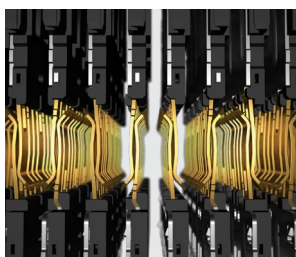
EDGE RATE®

Designed for signal integrity
Superior impedance control
Reduced broadside coupling



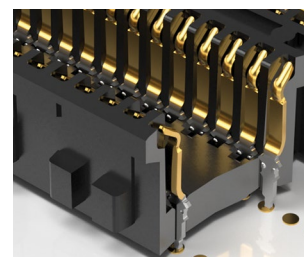
HYPER CLAW™

Micro hyperboloid contact
Four reliable points of contact
Extreme mating cycles



EXAMAX®

Two reliable points of contact
2.40 mm mating surface area
Excellent contact normal force

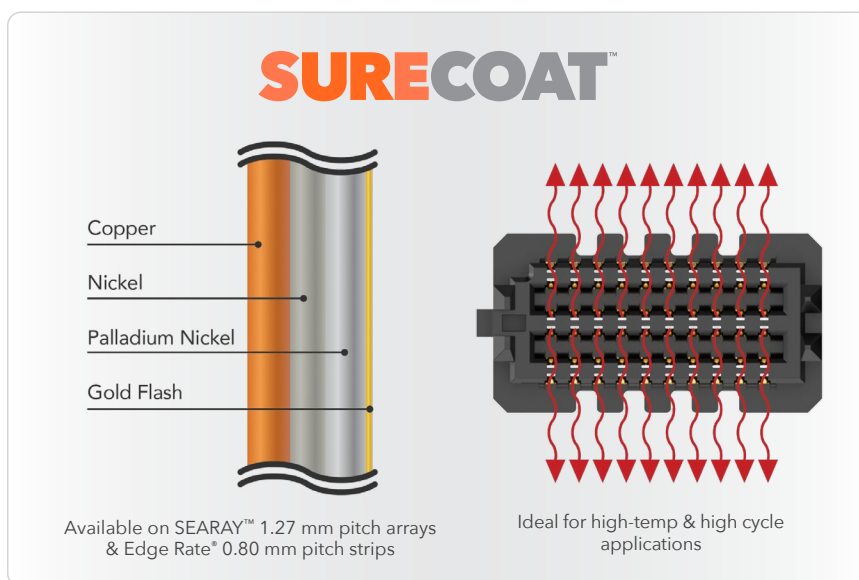


ACCELERATE®

Designed for high-performance & reliability
SET & E.L.P.™ qualified

PRECISION HARDWARE & NEXT GEN MATERIALS

- Guide post standoffs allow for .035" of initial misalignment and blind mate
- Jack screw precision standoffs reduce component damage
- Standoffs with precision machined tolerances (+/- 0.50 mm)
- Guide post with built in grounding pin available for first mate last break applications
- SureCoat™ high-reliability 30 μ" palladium nickel plating with gold flash; qualified to 150 °C ambient and 5,000 cycles
- Power guide posts, with Hyper Claw™ contacts, pair with high-speed connectors for a power/signal solution; in development, contact RuggedPower@samtec.com
- Roadmap: High cycle super lube withstands reflow and extreme mating cycles, provides increased corrosion resistance; contact RuggedPower@samtec.com



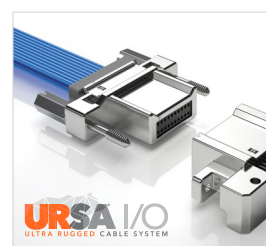
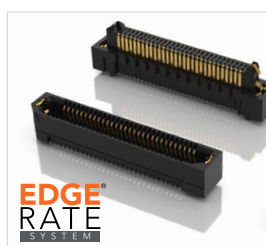
ULTRA RUGGED TESTING

SEVERE ENVIRONMENT TESTING (SET) | [SAMTEC.COM/SET](https://samtec.com/SET)

Additional testing beyond typical industry standards for performance confidence in military, space, automotive, industrial and other extreme environment applications. Qualified products are Commercial Off-the-Shelf (COTS) and modified COTS for quick-to-market solutions. Please visit samtec.com/SET or contact SET@samtec.com for more information and test results.



VITA™ STANDARD		MEETS	EXCEEDS	QUALIFIED SERIES	PITCH	TYPE
47.1	Module Insertions	✓		LSHM	0.50 mm	Razor Beam™ Hermaphroditic Strips
	Operating Shock Class OS2	✓		ERF8/ERM8	0.80 mm	Edge Rate® Rugged, High-Speed Strips
	Vibration Class VS3	✓		SEAF8/SEAM8	0.80 mm	SEARAY™ 0.80 Ultra-High Density Arrays
	Electrostatic Discharge Resistance	✓		B1SDT/P1M	1.00 mm	URSA® I/O Ultra Rugged Cable System
	Temperature Cycling Class C4		✓	SFM/TFM/SFSDT	1.27 mm	Rugged Tiger Eye™ Connectors
	Non-Operating Temp Class C4		✓	SEAF/SEAM	1.27 mm	SEARAY™ High-Density Arrays
	Altitude for DWV		✓	FTSH/CLP	.050"	Flexible Stacking Header & Socket
47.3	Humidity	✓		S2M/T2M	2.00 mm	Tiger Eye™ Micro Rugged System
				UMPS/UMPT	2.00 mm	mPOWER® Ultra Micro Power Connectors
				SSM/TSM	.100"	Square Post Header & Socket



LOT SCREEN TESTING

This program provides assurance for upscreening board-to-board interconnects for mission critical applications. Lot Screen Testing and Qualification Conformance Inspection (QCI) are both modeled after MIL-DTL-55302 and parallel EIA-364 standards. Contact map@samtec.com or visit samtec.com/mil-aero for details.

NASA-ALIGNED SOLUTIONS

SET products are approved for NASA Class D missions including LEO satellites, SmallSats, CubeSats and other space exploration applications. NASA outgassing data is used to determine if certain products meet ASTM E595-77/84/90 requirements. Visit outgassing.nasa.gov.

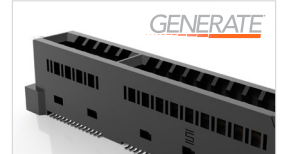
TESTING OPTIONS	LOT SCREEN TESTING	QCI
Visual & Mechanical Inspection	✓	✓
Mating/Unmating Forces	✓	✓
Low Level Contact Resistance	✓	✓
Insulation Resistance	✓ (Pin-to-Pin & Row-to-Row)	✓ (Pin-to-Pin, Row-to-Row & Closest Metallic Hardware)
Dielectric Withstanding Voltage	✓ (Sea Level)	✓ (Sea Level & High Altitude)
Solderability	✓	✓
Contact Resistance	✓	✓
Mechanical Shock		✓
Random Vibration		✓
Extended Life		✓ (Plating Thickness Verification, Mating Cycle, Thermal Shock, Humidity)
Workmanship		✓

EXTENDED LIFE PRODUCT™ (E.L.P.™) | SAMTEC.COM/ELP

E.L.P.™ Products are tested to rigorous standards, which evaluate contact resistance in simulated storage and field conditions.

- 10 year Mixed Flowing Gas (MFG)
- High Mating Cycles (250 to 2,500)
- Certain plating and/or contact options will apply

For complete details about Samtec's E.L.P.™ program, a list of qualifying products and test results, please visit samtec.com/ELP or email the Customer Engineering Support Group at ASG@samtec.com.



DESIGN QUALIFICATION TESTING (DQT)

All Samtec series undergo Design Qualification Testing, which includes:

- Gas Tight
- Normal Force
- Thermal Aging
- Mating/Unmating/Durability
- IR/DWV
- Current Carrying Capacity (CCC)
- Mechanical Shock/Random Vibration/LLCR
- Mechanical Shock/Random Vibration/Event Detection



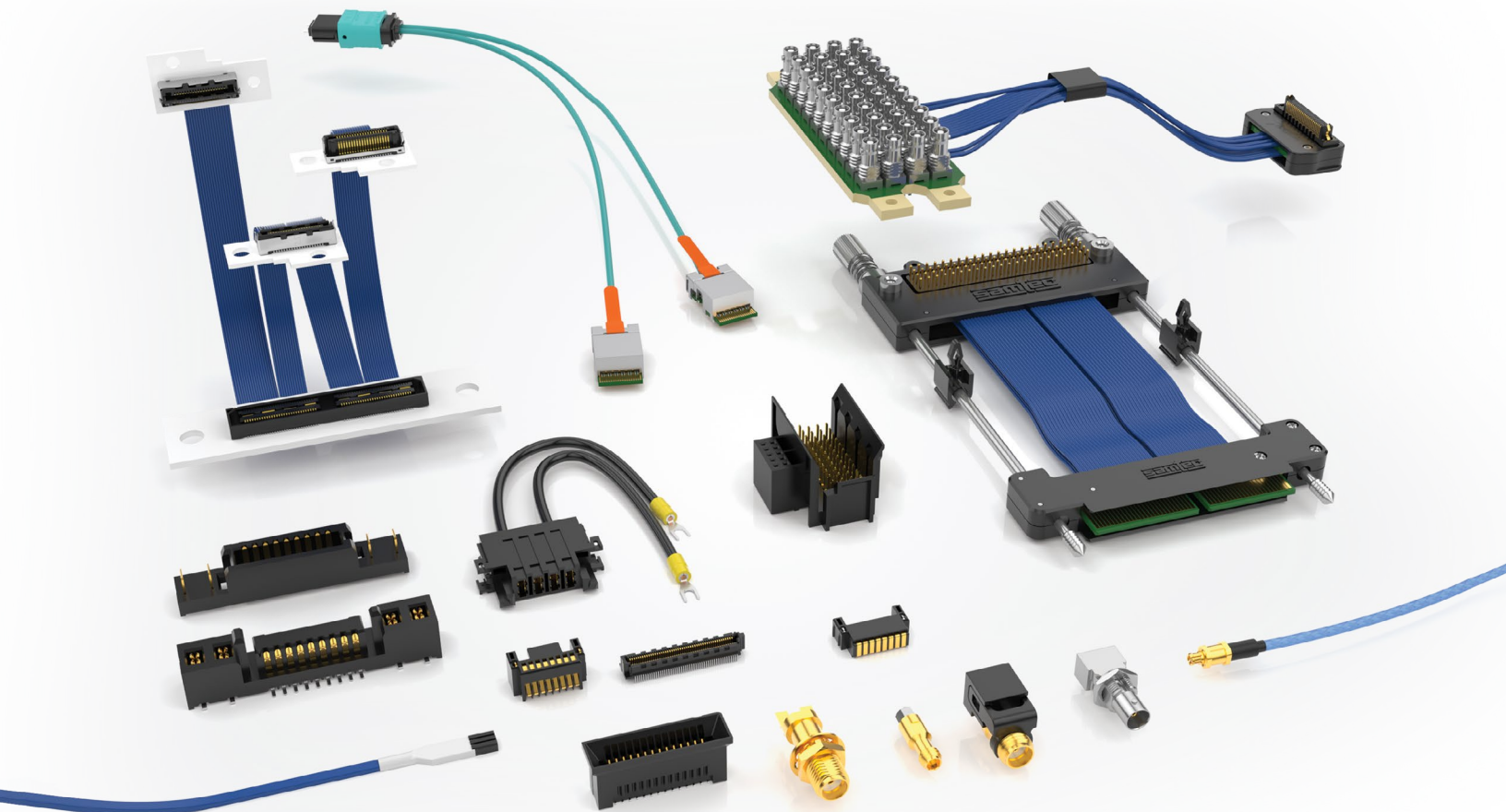
TESTING REFERENCE CHART

TYPE OF TEST	SET	E.L.P.™	DQT
Gas Tight	✓*	✓*	✓
Normal Force	✓*	✓*	✓
Thermal Aging	✓*	✓*	✓
Mating/Unmating/Durability (240 Hrs)	✓ (100% RH, 250 Cycles)	✓* (90-98% RH, 100 Cycles)	✓ (90-98% RH, 100 Cycles)
IR/DWV	✓ (At Altitude of 70,000 Feet)	✓*	✓
CCC	✓*	✓*	✓
Mechanical Shock/Random Vibration/LLCR & Nanosecond Event Detection	✓ (40 G Peak, 11 ms, Half Sine & 12gRMS, 5 - 2,000 Hz, 1 Hr / Axis)	✓* (100 G Peak, 6 ms, Half Sine & 7.56gRMS Avg, 2 Hr / Axis)	✓ (100 G Peak, 6 ms, Half Sine & 7.56gRMS Avg, 2 Hr / Axis)
Temperature Cycling (500 Cycles)	✓	N/A	N/A
Non-Operating Class Temperature	✓	N/A	N/A
Electrostatic Discharge (ESD)	✓	N/A	N/A
10 Year MFG (Mixed Flowing Gas)	N/A	✓	N/A
Mating Cycles (250 to 2,500)	N/A	✓	N/A

* Completed as part of initial Design Qualification Testing (DQT). E.L.P.™ and SET testing are performed in addition to DQT.

CUSTOMS & EXPRESS MODIFICATIONS

Samtec's industry-leading customer service, signal integrity expertise, and our flexible, in-house manufacturing capabilities allow us to provide new and/or completely custom designs, as well as common simple modifications to standard products - often with low or no NRE charges, short lead times, quick-turn samples, and low or no MOQ's.



RUGGEDIZING FEATURES

- Contacts & bodies
- Stamping, plating & molding
- Screw downs
- Latches & locks
- Shielding modifications
- Polarization

HIGH-SPEED CABLE

- Contacts
- Wiring
- Packaging
- Bodies
- Strain relief
- Labeling
- Ink printing
- HDR@samtec.com

RF

- Board termination types
- Tin dipping capabilities
- Automated assembly counterweights
- Heat-shrink tubing
- Alternate platings
- Pick & place machine designs
- RFGroup@samtec.com

OPTICS

- Parylene coating
- Mitigation for tin whiskers
- Custom or secure firmware
- Custom optical connectors
- Custom fiber mapping
- Custom optical link budget
- Custom assemblies with multiple FireFly™ optical connectors
- OpticsOTP@samtec.com

SPACE HERITAGE (INDUSTRY STANDARDS)

For 25+ years, Samtec has been developing products and supporting standards for systems that launch into space. The first stage of Samtec's space heritage began when one of Samtec's earliest products, SamArray® High-Density Open-Pin-Field Array, was selected as part of the VITA™ 42 XMC™ standard in 2002.

Since then, Samtec engineers have continued to engage with numerous standards bodies to develop the standards and interconnects that make leading-edge space-qualified designs possible and continue to expand on Samtec's space heritage.

2002



VITA™ 42 XMC™ STANDARD

Samtec's SamArray® Open-Pin-Field Arrays with solder ball technology are specified for the VITA™ 42 XMC™ standard. Applications: mil/aero, embedded computing, signals intelligence (SIGINT), image processing.



2004



SEARAY™ HIGH-DENSITY ARRAYS

Samtec's SEARAY™ Open-Pin-Field Array is released. The high-speed, high-density connector features a rugged contact system, lower insertion/withdrawal forces and maximum grounding and routing flexibility.



2007



VITA™ 57.1 FMC™/57.4 FMC+™ STANDARDS

SEARAY™ High-Density Open-Pin-Field Arrays are selected for VITA™ FMC™ & FMC+™ standards. Applications: avionics/payload subsystems, signal processing, vision, AI and small chassis radar.



2010



FIREHAWK® OPTICAL TRANSCEIVERS

Rad-Hard Compact, Lightweight Optical Mid-Board Transceivers are released. Applications: satellite, radar, vision systems, communications, surveillance and reconnaissance.



2019



VITA™ 88 XMC+™ STANDARD

SEARAY™ High-Density Open-Pin-Field high-pin-count connectors are specified for the XMC+™ standard. Applications: small chassis radar systems, data acquisition, SpaceCube™ v2.0 mini.



2022



EXTENDED TEMP FIREFLY™ OPTICS

Samtec's FireFly™ Mid-Board Optical Transceiver family is expanded to include an extended temperature range design, ideal for harsh environments with high radiation potential.



VITA™ 90 VNX+™ STANDARD

SEARAY™ High-Pin-Count, Right-Angle Connector is specified for the VNX+™ standard. Applications: space-constrained deployments, compute modules, SDR modules, tactical grade sensors.



ACCELERATE® SLIM DIRECT ATTACH CABLE SYSTEM

AcceleRate® Slim, High-Performance Cable developed. Optional rugged screw down retention and external shielding provide EMI protection; Tin/Lead plating and low-outgassing materials meet LEO specifications.



VITA/VNX+/FMC/FMC+/XMC/XMC+ are all respective trademarks of VITA.

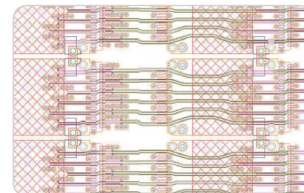
SIGNAL INTEGRITY EXPERTISE

Samtec is the industry leader in Signal Integrity. Offering unparalleled support for all aspects of high-performance system design, our mission is to help ensure full system optimization – from Silicon-to-Silicon™. For assistance with your application, contact the Signal Integrity Group at sig@samtec.com.

FULL SYSTEM SIGNAL INTEGRITY OPTIMIZATION

Samtec provides industry-leading SI expertise, both at the component and system level, to ensure optimized performance throughout the entire high-speed system.

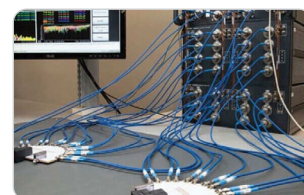
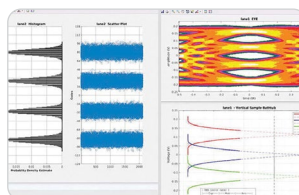
- High-performance system architectures and design solutions
- PCB/BOR layout and routing recommendations
- System level design support for full channel SI optimization
- High-performance interconnect selection assistance



SIGNAL INTEGRITY TESTING, ANALYSIS & EVALUATION

Leveraging the industry's leading software and hardware, along with expertise in Signal Integrity, enables Samtec to provide reliable data for the evaluation of high-performance systems.

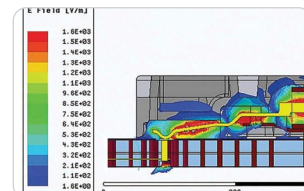
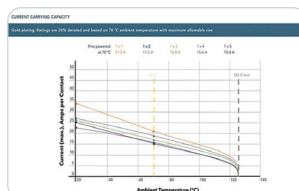
- 3D signal integrity modeling and simulation
- Qualification and characterization testing/test reports
- Support and tools for full-channel simulation and analysis
- Signal integrity evaluation boards and development kits



PDN / THERMAL MODELING, TESTING & SIMULATION

Samtec engineers offer complete support for testing, evaluating and optimizing challenging thermal and power considerations of high-performance system designs.

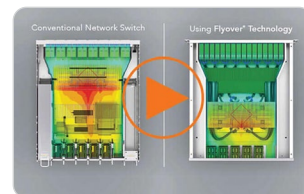
- Power and thermal modeling, simulation and characterization
- Power integrity characterization test reports
- Analysis/optimization of PDN components and sub-components
- Testing/qualification for application-specific requirements



POWER ARCHITECTURE SYSTEM DESIGN & ROUTING SUPPORT

Samtec provides complete design and development support, routing strategies and recommendations for the optimization of system power architectures.

- System power architectures and design solutions
- Reference routing development for application-specific solutions
- Safety and reliability design assurance
- Recommendations for customer-specific requirements

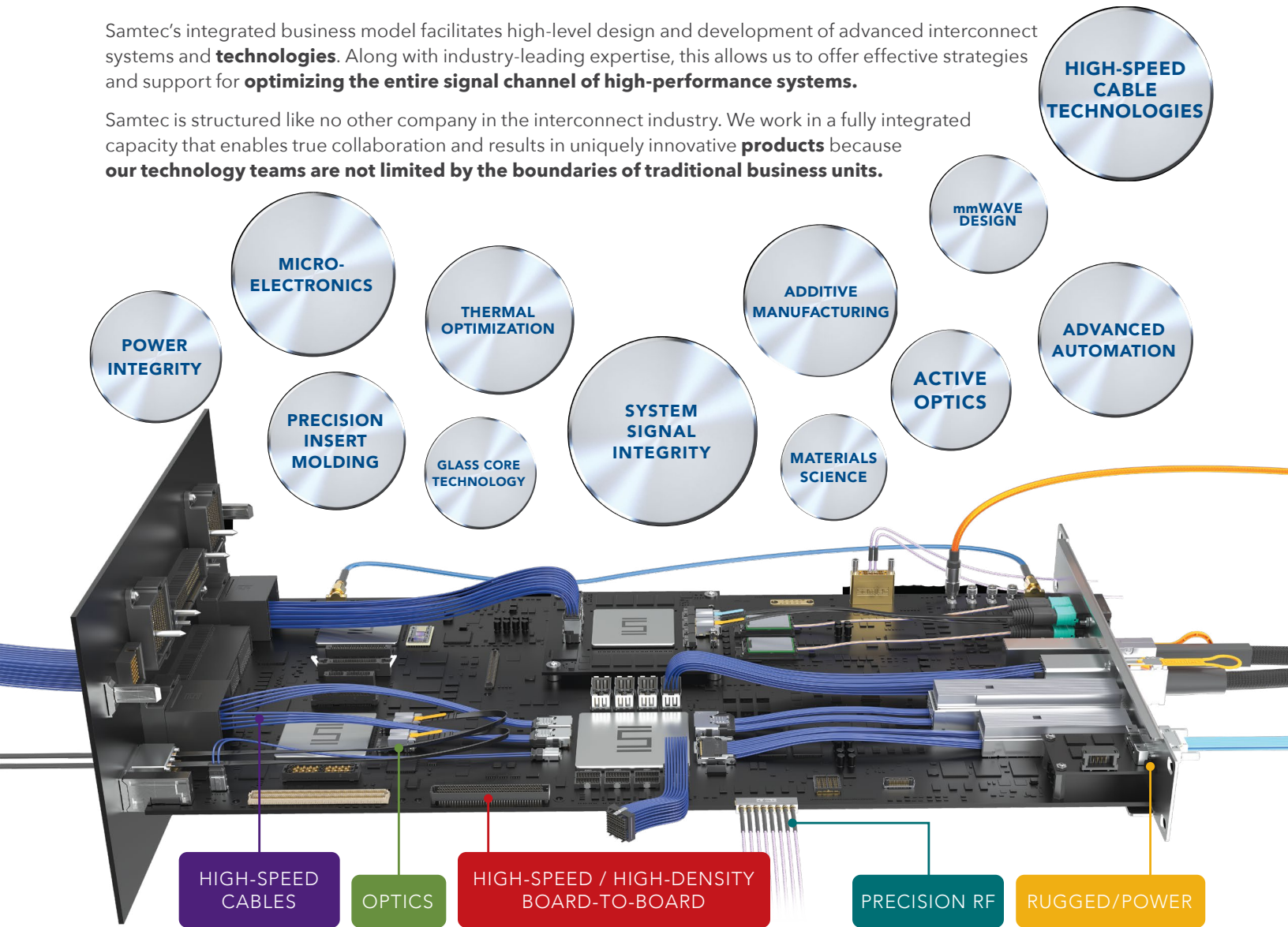


INTEGRATION LEADS TO INNOVATION

FULL SYSTEM OPTIMIZATION FROM SILICON-TO-SILICON™

Samtec's integrated business model facilitates high-level design and development of advanced interconnect systems and **technologies**. Along with industry-leading expertise, this allows us to offer effective strategies and support for **optimizing the entire signal channel of high-performance systems**.

Samtec is structured like no other company in the interconnect industry. We work in a fully integrated capacity that enables true collaboration and results in uniquely innovative **products** because **our technology teams are not limited by the boundaries of traditional business units**.



SILICON-TO-SILICON™ SOLUTIONS

NEXT GENERATION CONNECTIVITY TO 224 Gbps & BEYOND

As bandwidth, scale and power requirements continue to challenge conventional engineering methods, Samtec strives to help **optimize the landscape of your entire system** - and develop solutions, together.

Samtec's industry-leading signal integrity expertise, full system optimization strategies, and innovative products and technologies help address the challenges of **next gen data transmission to 224 Gbps & beyond**.

GLOBAL SUPPORT & SERVICE



Technical Support

Signal Integrity Group:
sig@samtec.com

Application Support Group:
asg@samtec.com

Interconnect Processing Group:
ipg@samtec.com

Supply Chain Support

MySamtec™ Real-Time Account Access:
account.samtec.com

Personal Account Managers/CSRs:
eCustomerService@samtec.com

Upfront, Aggressive 24-Hour Quotes:
ePricing@samtec.com

Reserve
SHIPS TOMORROW

More than 200,000
Part Numbers Ship in 1 Day

24HOUR
SUDDEN SAMPLE

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