

The background of the slide is a dynamic, futuristic image of a highway or road. The road is composed of multiple lanes, with light trails in shades of blue and yellow streaking across it, suggesting high speed and advanced technology. The overall color palette is dominated by various shades of blue, from light sky blues to deep, dark blues.

smiths interconnect

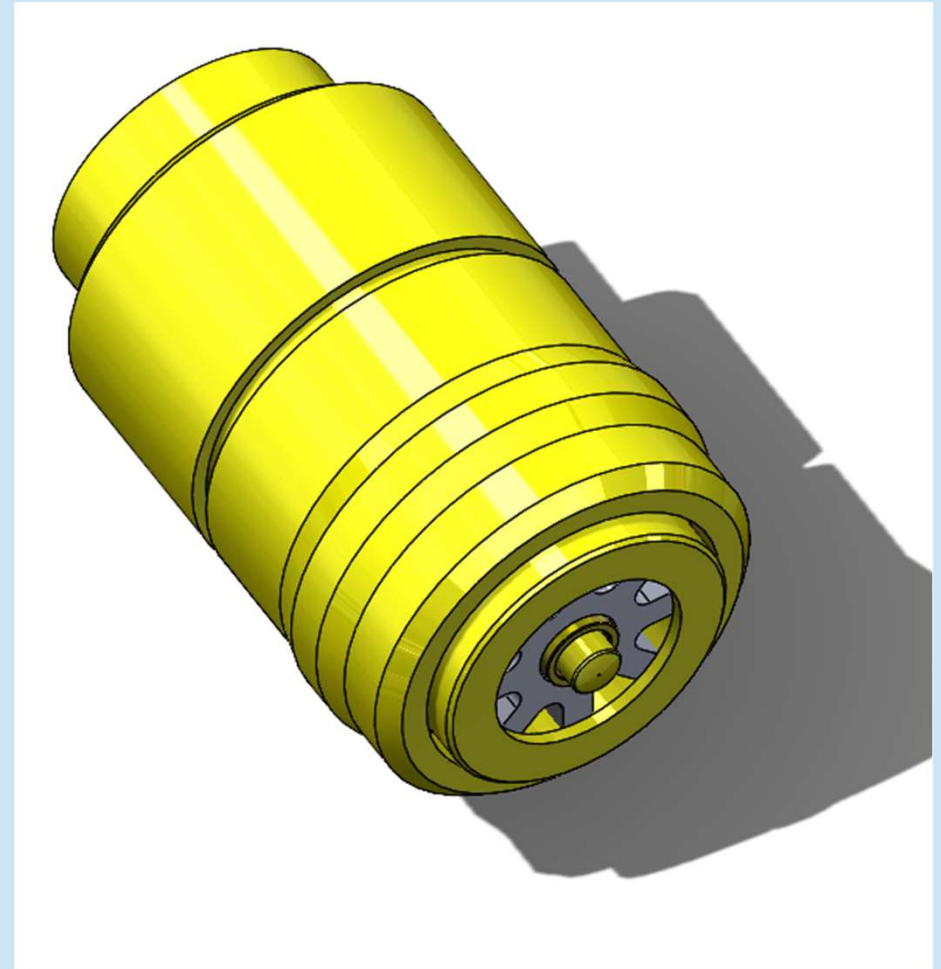
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SPDC Oct 2022 TIC – EziCoax – Compression Mount Miniature Coax
Kevin DeFord

BEYOND
CONNECTIVITY

EziCoax

1. Introduction
2. Value Proposition
3. Specification
4. Solution
5. Test & Simulation Results
6. Conclusion



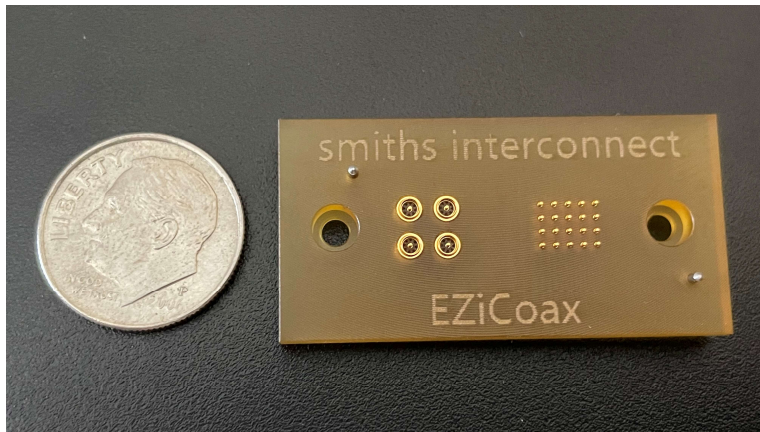
Introduction – EziCoax

Objective

- Develop a single-piece, spring-loaded, solderless, board to board coax for high-speed RF transmission
- Use in Interposers in mixed array with Spring Probes
- Adapt to Right Angle solution
- Suitable for Space, Radar and Automotive applications

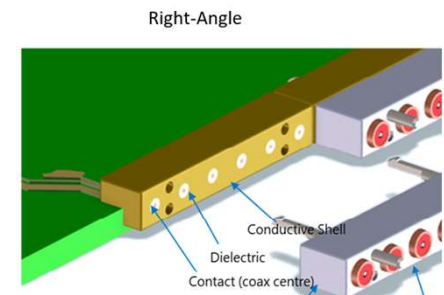
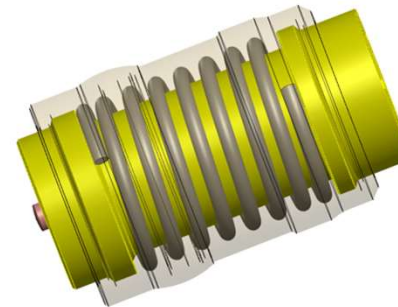
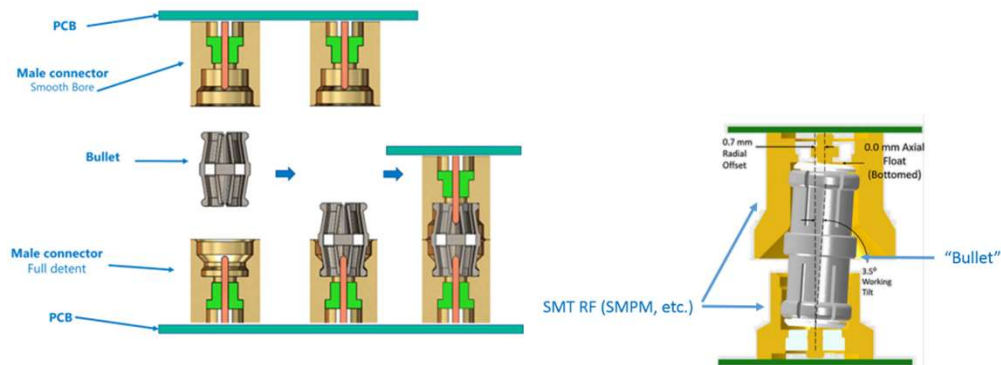
Benefits

- **Low Cost of ownership**
- **Ease of Installation**
- **Single-Piece Construction**
- **Low Profile**
- **Low mating & de-mating force**
- **Absorbs X, Y & Z tolerances**
- **Integrates with Spring Probe arrays in Interposers**



EZi Coax - VALUE PROPOSITION

	Current RF BTB Interconnect	EZiCoax RF BTB Interconnect
No. of Components	3	1
Cost of Ownership	HIGH: Labor Intensive, Multi-Step Process	LOW: Single-Step Alignment
Assembly Difficulty	HIGH: Snap-on Bullet requires 2-4 lb _f	LOW: < 4 oz mating force
Rework Difficulty	HIGH: Requires tool to de-mate; frequent PCB damage	LOW: De-mating requires no tool

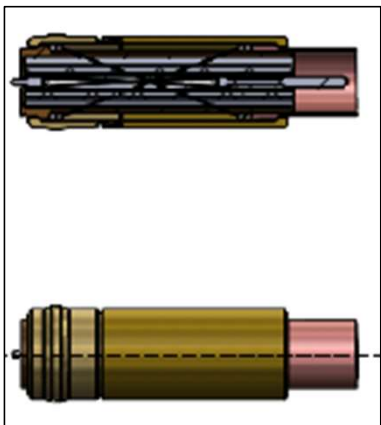


EZi Coax - DESIGNS

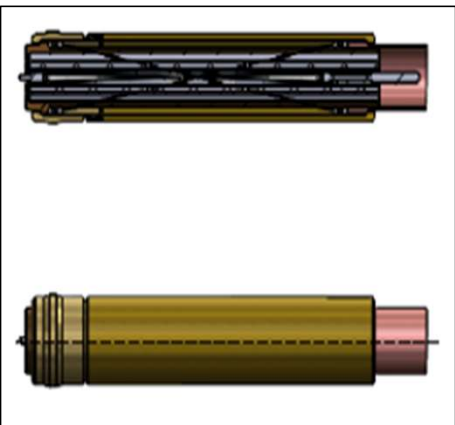
851-1001909-0130
Rated Height = .13 (3.25 mm)



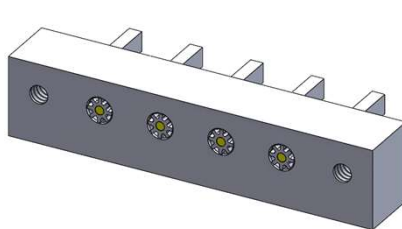
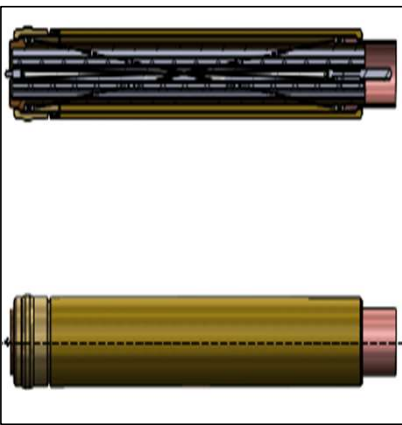
851-1001909-300
Rated Height = .295" = (7.5 mm)



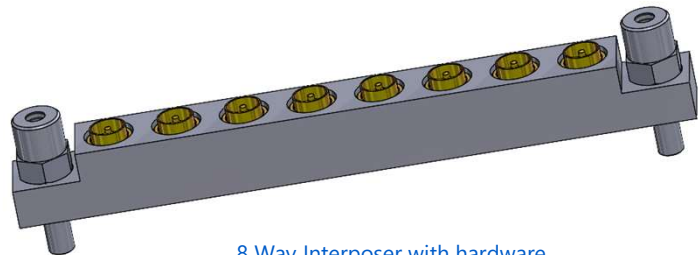
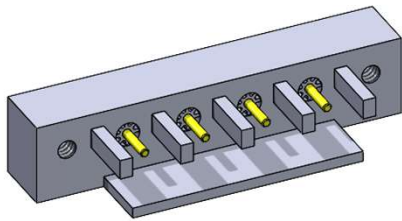
851-1001909-500
Rated Height = .492 (12.5 mm)



851-1001909-750
Rated Height = .738 (18.75 mm)



4 Way right-angle PCB adapter



8 Way Interposer with hardware

Target Specifications

Attribute	Spec	Units	Comments
Impedance	50	Ohms	
Mating Cycles	1000		
Current Capacity	1	A	DC
Power Capacity	20	W	CW**
Voltage Rating	60	V rms	
Dielectric Withstanding Voltage	5000	V	DC
Impedance	50	Ω	
Insertion Loss	-1	dB	DC to 40 GHz
Insertion Loss	-2	dB	40-67 GHz
Return Loss	>20	dB	DC to 40 GHz
Return Loss	>10	dB	40-67 GHz
NEXT	> 60	dB	DC to 67 GHz
FEXT	> 60	dB	DC to 67 GHz
Temperature Range	-50 to 165	° C	
Thermal Shocks	100		
Vibration	10 to 2000	Hz	EIA-364, Condition IV, 10 NanoSecond
Shock	300	G	EIA 364, Half Sine
EMI	> 65	dB	Immunity
Shock	300	G	EIA 364, Half Sine

Initial RF Test Results



Test Equipment for measurement:

Keysight N5227A PNA

67GHz Ecal Module

2X 305320-000 0.5mm RF Test Fixtures

Tools for Analysis:

PLTS Software

Automatic Fixture Removal (AFR) with the 2X Thru method

Bandwidth: 10MHz to 67GHz

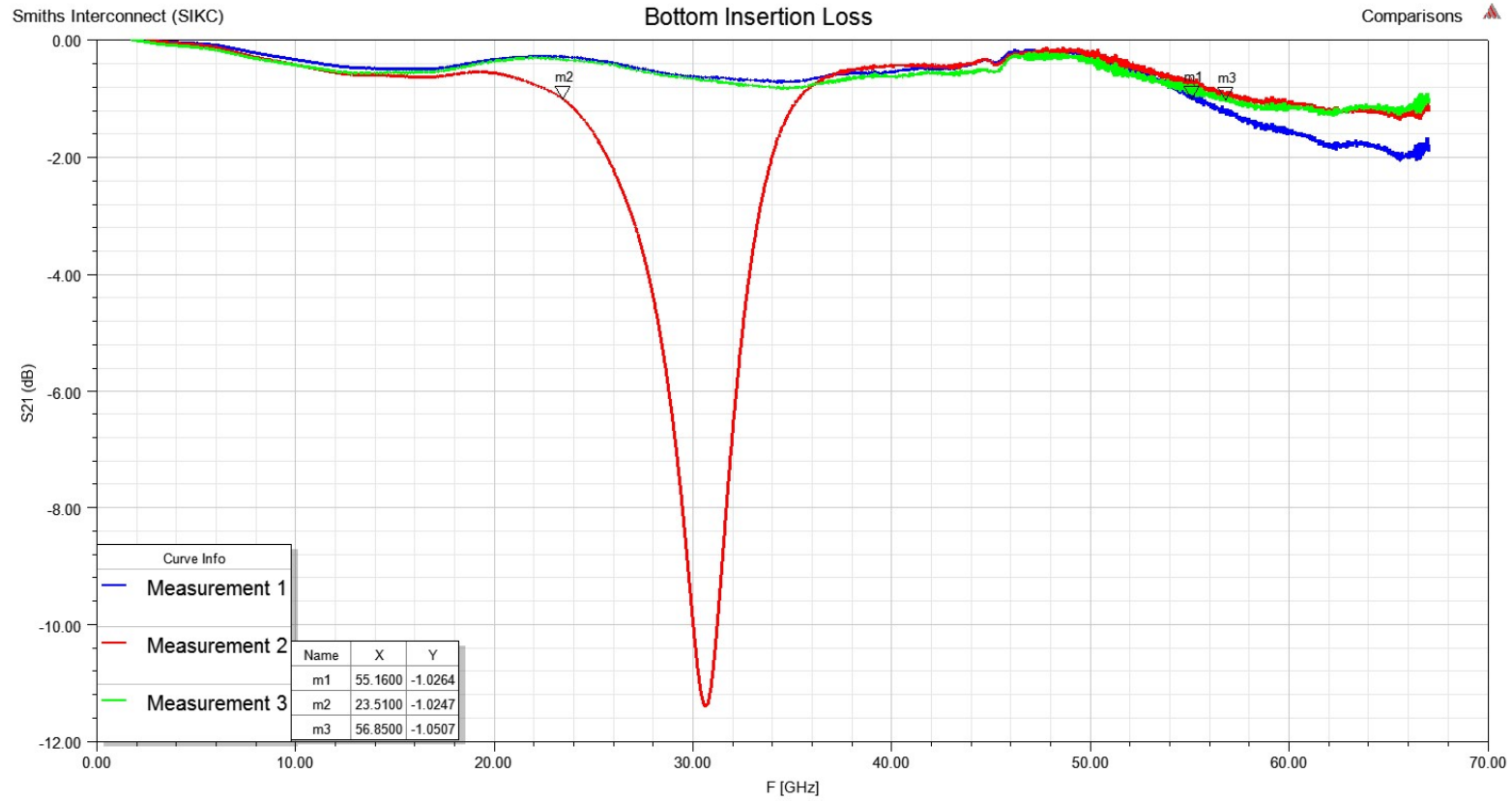
Port Impedance: 50 Ohms

Note:

All measurements were calibrated with SOLT calibration and/or de-embedding techniques to isolate the RF test block for characterization only.

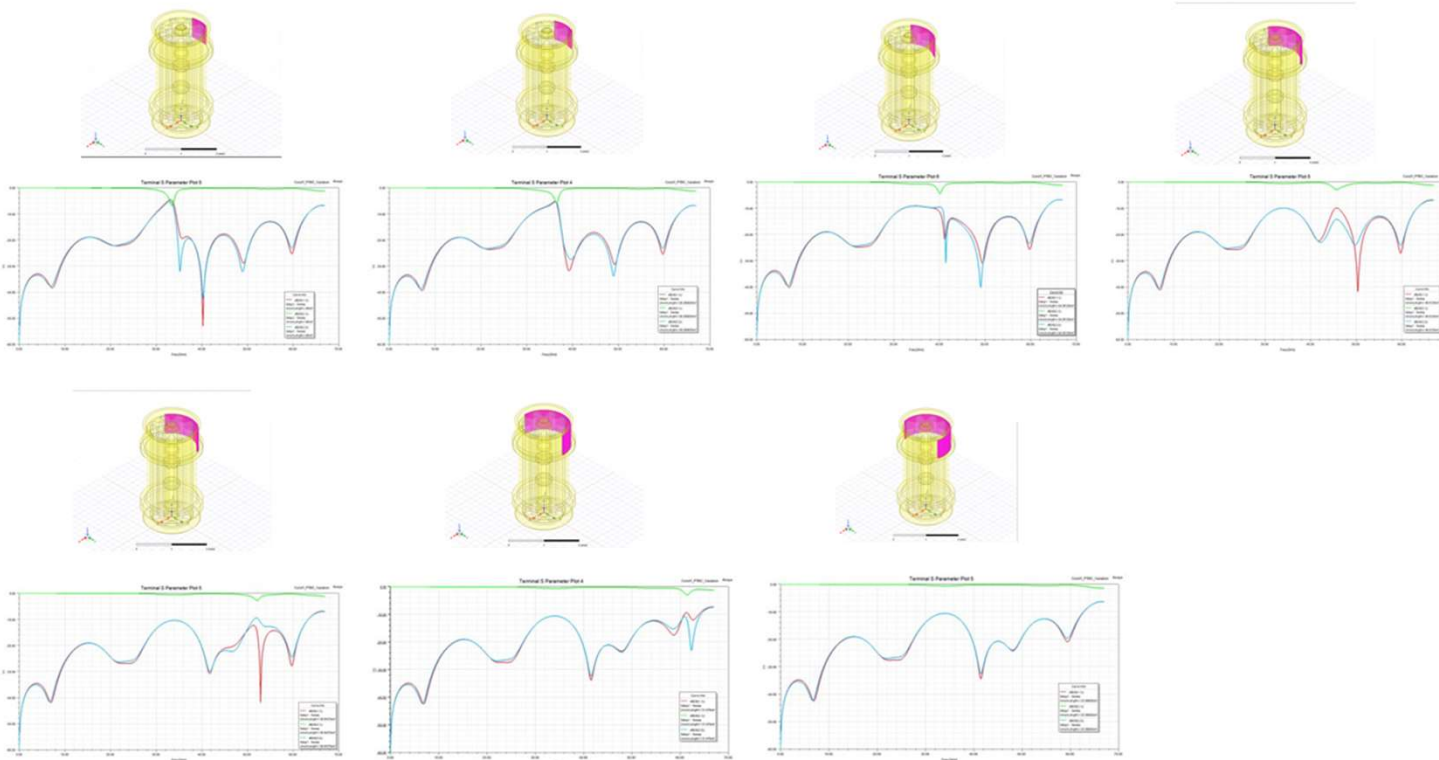
Preliminary Results show good frequency response and impedance match.

Insertion Loss –Coax Repeated Measurements



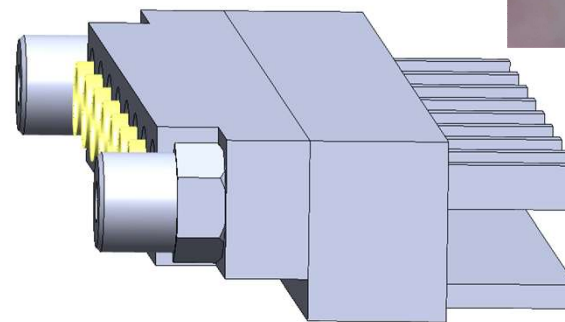
Simulation Results

HFSS Simulation of contact area does show resonance movement and change.



Conclusion

- **EZiCoax has low cost of ownership**
 - Solderless
 - Compression Mount
 - 1 Piece
 - Low Insertion/Extraction Force
- **Absorbs X, Y & Z Alignment Issues**
- **Can be integrated into Interposers**
- **Offered in B2B and RA Versions**
- **Band Limited to 23.5 GHz**
 - Issue internal contact with Shield Plunger
 - Solution is understood and in progress
- **Qualification will be to ESA 3401 Specification**
- **Estimate Jan 2023 for full Automation of assembly**



Smiths Group - Facts and Revenues by Division

- Founded in **1851**
- FTSE100 Listed Global Technology Business
- A World Leader in the Practical Application of Advanced Technologies
- Over **15,000** Employees
- More than **50** Countries
- Revenues £ **2.4bn**



John Crane

Mission-critical solutions for global energy and process industries

36%



Smiths Detection

Detection and screening technologies for the identification of safety and security threats

30%



Flex-Tek

Innovative components to heat and move fluids and gases

21%



Smiths Interconnect

Solutions for high-speed, secure connectivity in demanding applications

13%

Smiths Interconnect Business Unit Structure

A Business Unit structure focused on addressing customers' needs



Connectors

High-reliability electrical interconnect solutions from highly integrated assemblies to microminiature connectors and spring probe contacts

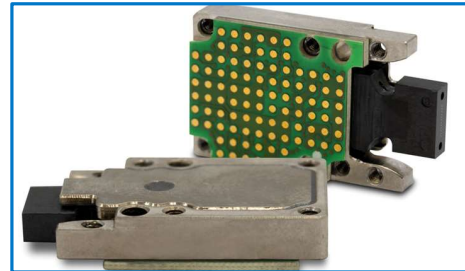
44%



Smiths Interconnect Inc.

Antenna systems, multi-function RF systems, as well as time and frequency solutions for Aerospace and Defence subsystem applications

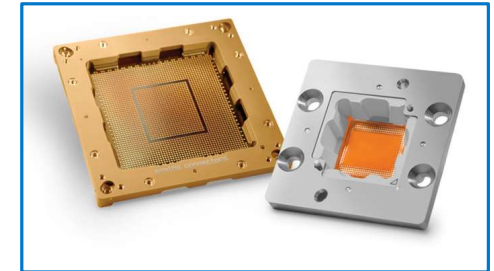
22%



Fibre Optics and RF Components

Broad range of RF and MW devices, transceivers and transceivers modules for demanding high reliability environments

16%



Semiconductor Test

Test socket and probe card solutions with spring probe contact technology for semiconductor test applications

18%

Smiths Interconnect Overview

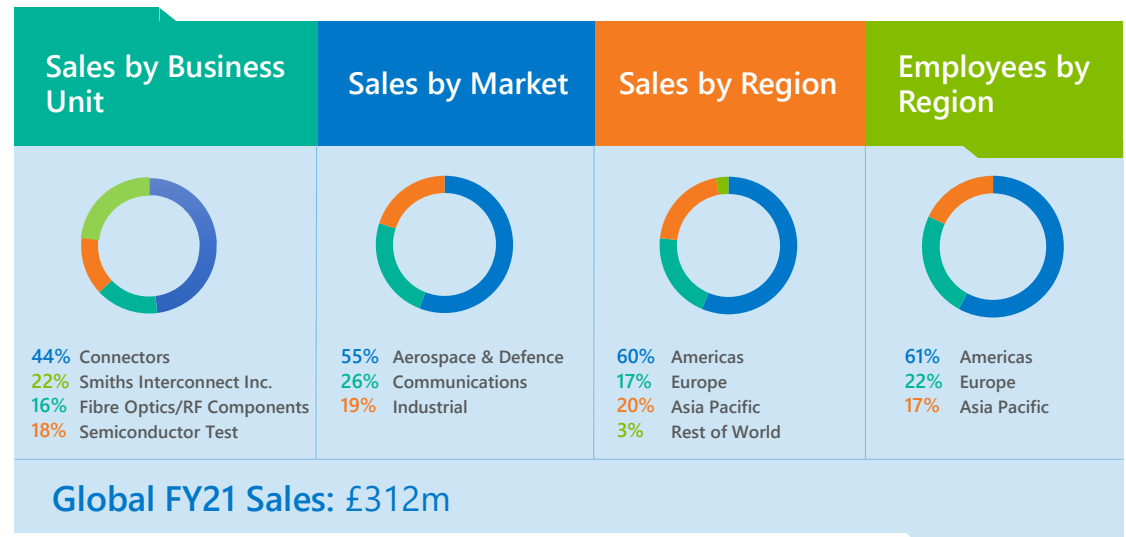


We Offer:

- Technical excellence and broad market experience
- A comprehensive product portfolio of technically differentiated, advanced engineering solutions
- Business units focused on addressing customers' needs: Connectors, Fibre Optics and RF Components, Semiconductor Test, and Smiths Interconnect Inc.
- Optimised quality through first class materials, state-of-the-art development methods, and world class talent
- Robust financial pedigree and reputable heritage of Smiths Group

The Global Partner

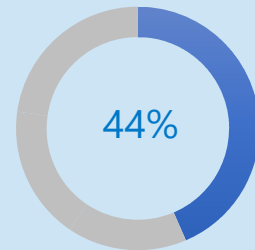
for Innovative Connectivity Solutions



Connectors - Quick Facts and Technology Brands

- Application-specific, high-reliability electrical interconnect solutions from highly integrated assemblies to micro-miniature connectors and spring probe contacts.
- Hyperboloid, Spring Probe, High Speed, Fibre Optic, High Power and High Temperature contact technologies.

% of SINT Revenues



7 Customer Service Centres

6 Manufacturing Sites

6 R&D Locations



Americas

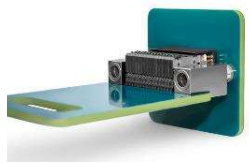
Santa Ana **CA, US**
Hudson **MA, US**
Kansas City **KS, US**
Tijuana, **Mexico**

Europe

Deggendorf, **Germany**
Elstree, **UK**
Genoa, **Italy**
Monastir, **Tunisia**
St. Aubin, **France**

Asia

Bangalore, **India**
Shanghai, **China**
Mianyang, **China**
Singapore



HYPERTAC

- High reliability hyperboloid contact technology
- Platform and custom products providing exceptional performance in critical applications and harsh environments



IDI

- Spring probe contact technology
- Compliant interconnect products ideal for high density, miniature and blind mate applications



HSI

- Joint venture with Sichuan Huafeng Enterprise Group Co. Ltd, one of the major manufacturers of electronic components in China
- Industry-leading connectivity solutions for commercial aerospace and railway markets in mainland China



SABRITEC

- High speed Quadrax, Twinax, Fibre Optic, Filtered, Coax and Triax connectors, contacts and cable assemblies
- Custom multi-pin circular, rack and panel connectors

Connector Solutions

High Power

- Rugged, single and multi-way formats
- Power up to 700 Amps
- Suitable for harsh environmental conditions
- High number of mating cycles



Circular

- Available in metal and plastic shells
- Crimp and solder terminations
- Push/pull latching mechanism
- Colour coding options available



High Speed

- Standard 100 and 150 Ω quadrx and twinax contacts
- Formats: MIL-DTL-38999, ARINC 600, MIL-DTL-83527 and D-Subminiature
- Fibre Channel, Ethernet Firewire, USB, DVI and InfiniBand protocols



Modular/Rectangular

- Configurable with signal, power, RF, twinax, triax, quadrx and fibre optic contacts into a single connector
- Guided hardware for blind mating



Spring Probe

- Low profile, high compliance ratio
- Z-axis compliance
- Blind mate engagement
- Low, stable resistance with long cycle life



PCB

- Low, medium and high density connectors with long life cycle
- Signal, power, coaxial and high speed configurations
- Board to board, cable to board, cable to cable and stacking



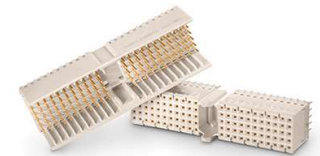
EMI/EMP Filter

- Intermateable and interchangeable with standard non-filter connectors
- C, L and Pi style EMI filters
- TVS protection meeting the requirements of TCA D160 section 22 up to level 5



SpaceNXT™ Platform

- High reliability products pre-tested and qualified for next generation space applications
- Shorter time to market through Theme & Variation processes on standard COTS+ platforms
- Support higher bandwidths on VHTS satellites with flexible digital payloads



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