

smiths interconnect



# Space

Connectivity Solutions

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CUTTING-EDGE  
CONNECTIVITY

# About Smiths Interconnect



## We Offer



Smiths Interconnect is a leading provider of high reliability connectivity products and solutions serving segments of aerospace and defense, medical, semiconductor test, and industrial markets. It designs and manufactures technically differentiated electronic components, microwave, optical and radio frequency products and multi-functional systems that connect, protect and control critical applications.

Smiths Interconnect is the supplier of choice for safe, efficient and highly reliable connectivity in space applications. Our proven expertise and know how, gained over more than 80 years in the space market, enable us to design innovative solutions that are smaller, lighter weight and robust where increased ruggedness is paramount to withstand vibration, shock, temperature extremes and radiation.

Our technology brands (EMC, Hypertac, IDI, Lorch, Plastronics, Reflex Photonics, RF Labs, Sabritec, TRAK and HSI) are synonymous with exceptional performance in technologically advanced, high quality solutions required for a high degree of safety and durability. Our extensive product portfolio includes high reliability electrical connectors and cable assemblies, rugged embedded transceivers and a wide range of innovative RF and microwave solutions.



## Defense & Aerospace



## Communications



## Industrial



Your partner  
of choice for  
cutting-edge  
connectivity  
solutions

**80+**

Years  
Experience

### Technology

Broad Range of Advanced  
Interconnect Technologies

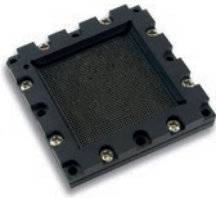
### Flexibility

High Volume Product Platforms  
& Complete Tailored Solutions

### Service

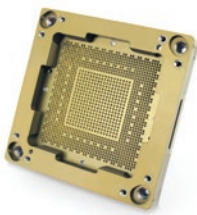
Global Reach with  
Local Support

# Technology Brands



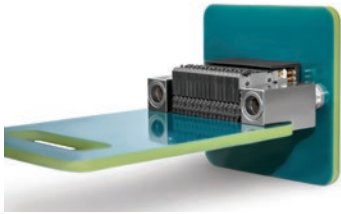
## PLASTRONICS

A leading supplier of burn-in test socket solutions for all the latest packaged devices. With the most comprehensive QFN catalog in the world, in addition to a large portfolio of sockets for burn-in, HAST, failure analysis and other test requirements for Leaded, LGA and BGA devices.



## IDI

World's most comprehensive offering of spring probe based solutions, including: contacts, connectors, interposers, semiconductor test sockets, and ATE interfaces. Proven off-the-shelf and custom products deliver the best solution for the customer's specific application.



## HYPERTAC

Premium interconnect solutions for electrical and electronic applications requiring optimized quality, performance, and reliability. Hypertac connectors utilize the original high performance hyperboloid contact technology; ideal for harsh environments and safety critical 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, fiber optic, filter, coax and triax connectors, contacts and cable assemblies. Custom multi-pin circular, D-Sub rack and panel connectors and MIL-Spec interface type products.

Connectors

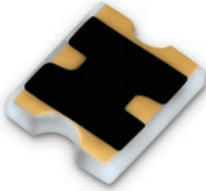
Fiber Optics & RF Components

Semiconductor Test

Connectors

Fiber Optics &amp; RF Components

Semiconductor Test



## EMC

Board-level components incorporating advanced resistive and signal distribution technologies for a broad range of frequency spectrum applications. Extensive portfolio of RF devices used to attenuate, level, or terminate signals available in a variety of packages and footprints.



## LORCH

Innovative solutions for the electronics and communications industries. Ranging from high performance wireless and RF products to micro-miniature, cavity, discrete, waveguide, tunable, ceramic, and printed filters and integrated assemblies.



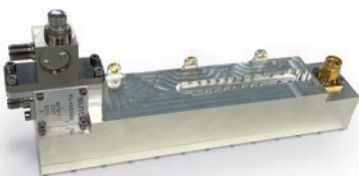
## REFLEX PHOTONICS

Embedded transceivers and transmit/receive modules for advanced interconnect-based solutions. Targeting high data rate interconnects where ruggedness and radiation resistance are required for defense, space, commercial aerospace and industrial applications.



## RF LABS

High performance microwave cable assemblies and coaxial components supporting high performance operations, application-specific premium interconnects for high durability and harsh environments.



## TRAK

High reliability multi-function RF systems, isolator and circulator products, and waveguides for defense, commercial aerospace, space, homeland security, and public safety applications.

# Our Markets

Aerospace & Defense



## Commercial Aerospace

Our relentless pursuit of innovative high performance connectivity solutions enables us to provide high density, high power handling, EMI/EMP protection, RF and high speed capabilities focused on the next generation of airframe applications.

- Avionics Equipment
- Engine Systems
- Power Distribution



Communications

## Wireless Infrastructure

Our solutions help evolution to 5G, while maximizing the use of existing infrastructure. Our components and optical transceivers help ensure reliability in mission critical wireless communications.

- 4/5G Networks
- Remote Radio
- Installations
- Distributed Antenna Systems
- Data Centers



## Semiconductor Test

We develop sockets and probe card products that ensure superior quality and reliability in testing applications. Our solutions support the finest micron pitches while meeting requirements for higher bandwidths.

- Area Array Test
- Package-on-Package Test
- Wafer Level Packaging Test
- Peripheral Package Test

Industrial



## Transportation

We offer multiple interconnect technologies able to withstand harsh environments of extreme temperatures, pressure, shock and vibration, ensuring system quality and reliability.

- Rolling Stock
- Signaling
- Infrastructures
- Vehicles
- Automotive
- Unmanned Vehicles



## Defense

We partner with our customers to design and manufacture products and solutions including connectors, cable assemblies, multi-function RF systems, SATCOM terminals and datalinks to achieve optimal system performance in the most demanding end-user environments.

- Radar
- Electronic Warfare
- Integrated Vehicle Systems
- Intelligence, Surveillance, Reconnaissance (ISR)



## Space

We engineer superior NASA and ESA-certified solutions to ensure continuous connectivity within environments where shock and vibration, corrosive atmosphere, and thermal deviations are prevalent.

- GEO/MEO Satellites
- LEO Satellites
- Launchers
- Ground Support Equipment



## Test & Measurement

We create high quality connector and cable assemblies that deliver increased phase stability, decreased insertion loss, and design flexibility for long lasting performance in lab and production test environments.

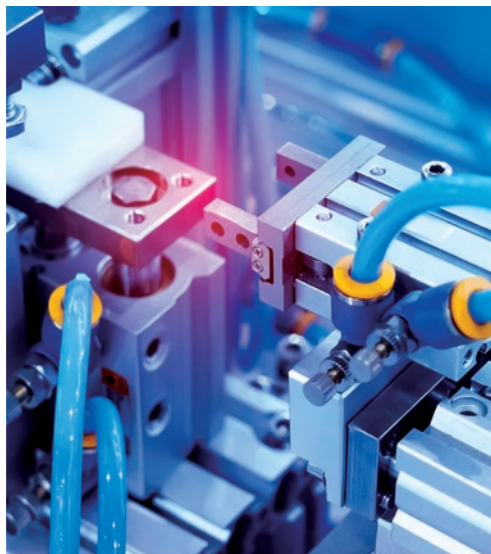
- Electronics Testing
- Automotive Testing
- Telecommunications
- RF and Microwave Testing



## Medical

We provide solutions that protect, connect, and control critical medical devices which meet requirements for invasive procedures, disposable components, embedded electronics, high cycle life, and sterilization.

- Surgical Systems
- Patient Monitoring
- Imaging Systems
- Disposables

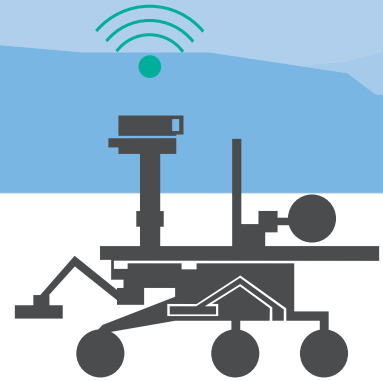
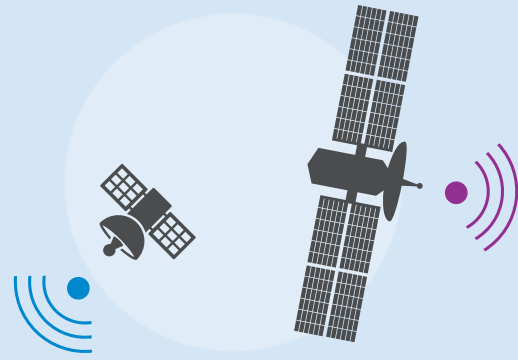


## Industrial

We design durable and robust platform products and customized solutions combining rugged backshells with high reliability contact technologies for easy assembly.

- Heavy Equipment/Machinery
- Industrial Automation
- Utilities

# Applications



## Satellites GEO/MEO

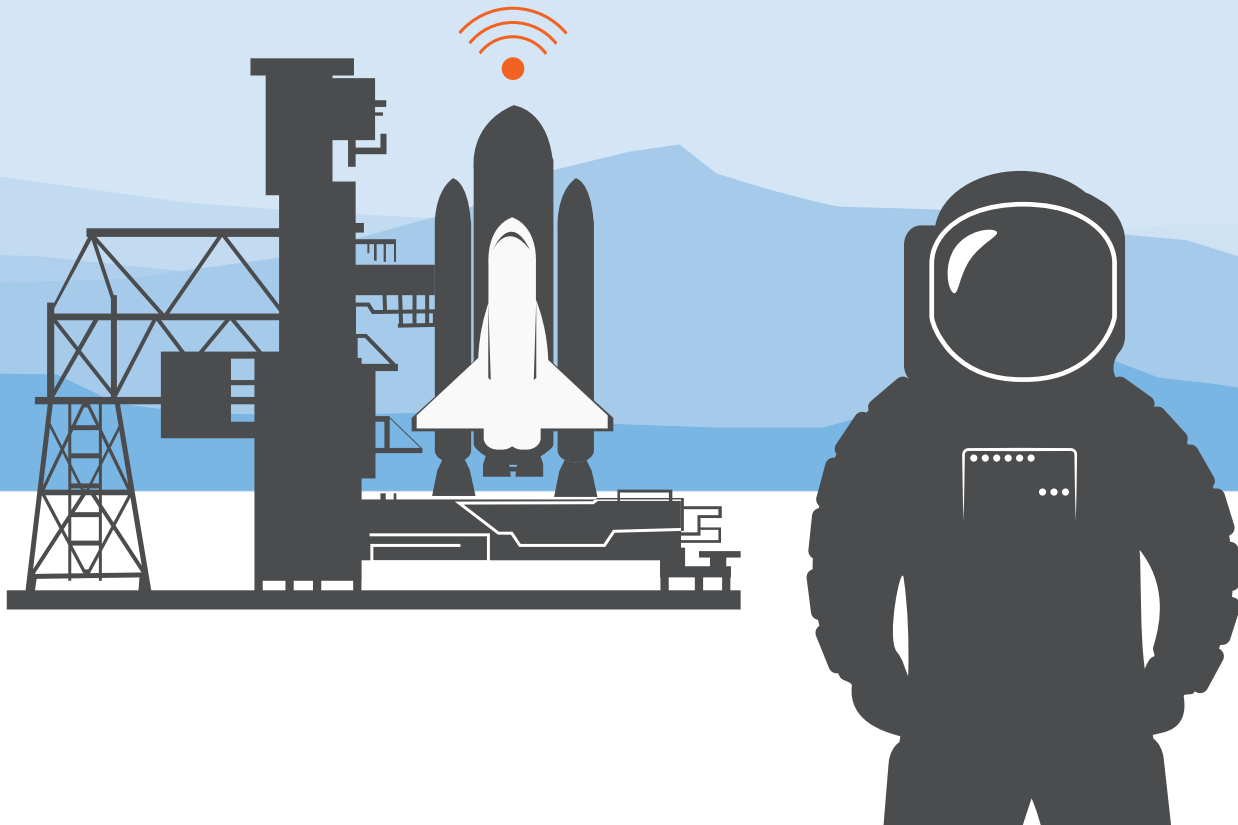
- Navigation & Communication
- Gamma Ray Detection
- Weather Monitoring
- Radio/TV Networks
- Broadband
- Space Environmental Sciences

## Satellites LEO

- Earth Observation
- Surveillance
- Telecom
- Space Telescopes
- Earth Sensing
- Space Cubes

# Providing A Competitive Advantage

We design, develop and manufacture high reliability RF, microwave and mmW systems and components, connectors and cable assemblies that ensure optimal performance, durability and safety in space-related operating environments. We are an approved vendor for international space agencies including ESA, ISRO, JAXA and NASA, and have proudly delivered failure-free performance in numerous spaceflight programs. We work globally with our customers and space agencies to design the next generation of solutions for launchers, satellites, manned space flight and ground systems support.



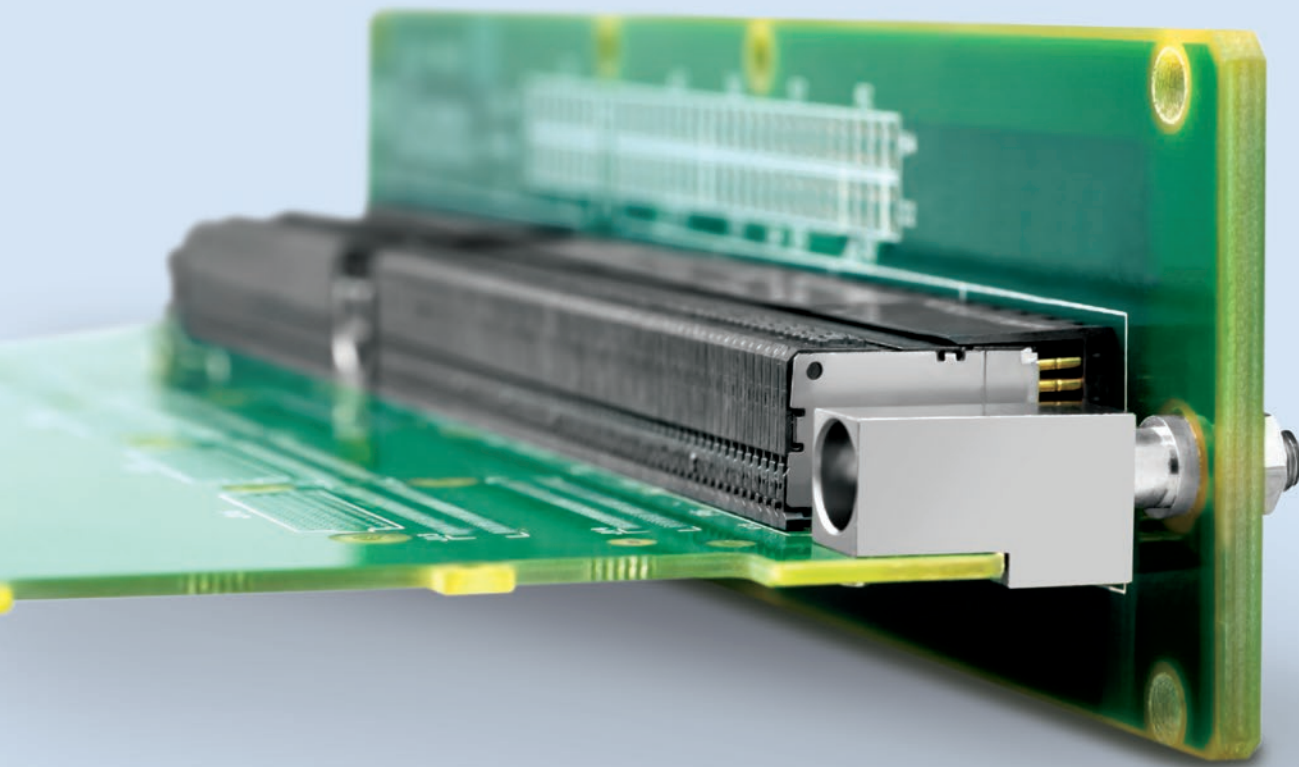
## Launchers

- Attitude Correction Module
- Central Units / Communication
- Command Memory Boxes
- Control Boxes
- Sensors

## Ground Systems

- Docking Systems
- Ground Stations
- Communications
- Mars Rovers
- Mobility
- Navigation Systems

# Connectors



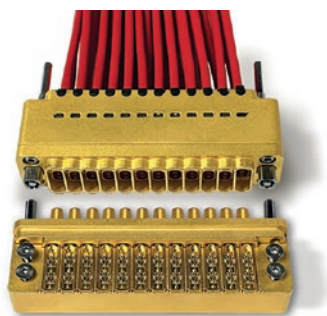
## Reliability & Safety

Through our Hypertac, HSI, IDI, RF Labs and Sabritec technology brands, we supply application-specific, high-reliability electrical interconnect solutions from highly integrated assemblies to microminiature connectors and spring probe contacts. Our reliable contact technologies are the core of our advanced interconnect solutions: Hyperboloid, Spring Probe, High Speed, Fiber Optic, High Power and High Temperature.

**Providing  
exceptional  
performance  
in critical  
applications**

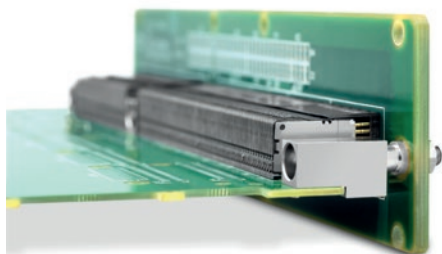
## Ultra-High Density, Space Qualified

- Tested for high speed space applications up to 50 Gbps per channel
- Available in 4 and 12 high speed quadrx modules, 2-dual twinax at 100  $\Omega$  each pair
- Solderless PCB termination reducing risks and damages to the board
- Gold plated, low mass composite shell
- Using Micro-Hyperboloid contact technology
- Withstands high shock and vibration, above 2100G



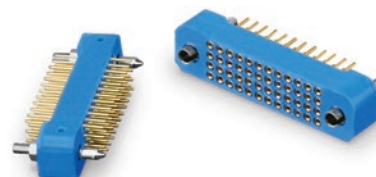
## Rugged, High Speed VITA Backplane

- Compatible with VITA 46/48, 63, and 78 standards
- Flexible modular design for standard 3U, 6U and custom configurations
- 100  $\Omega$  impedance for differential pair configurations
- Data rate performance up to 20 Gbps



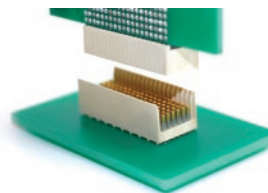
## High Density PCB

- Up to 5 rows and 400 contacts
- Signal, power & coaxial
- ESA & NASA space approved
- Next generation VITA 63 connectors
- Space approved VME architecture and multi-channel



## Rugged, 2mm Hard Metric Backplane

- NASA GSFC qualified
- Reliable Hypertac<sup>®</sup> contact technology
- High-temp LCP insulator meeting outgassing requirements
- Reverse gender to commercial 2mm products
- Keying feature ensures proper mating
- Modular design for 3U/6U configurations
- Available in press fit version



## Spring Probe Interposers

- Low-profile, high-density solutions
- PCB compliant solderless contacts
- Integration of coaxial, digital and DC Probes for a comprehensive solution
- ESA ESCC 3401/076 approved stacking variants



# Enhancing high reliability in mission-critical applications



## High Frequency

- Small lightweight connectors
- High frequency up to 110 GHz
- Single-piece spring probe coax for interposer solutions up to 40 GHz
- Micro-D coax connectors up to 40 GHz



## High Speed Copper

- Standard 100 and 150  $\Omega$  quadax & twinax contacts
- Micro twinax and quadax connectors
- Rugged D-Sub, ARINC and MIL-DTL-38999 standard quadax and twinax
- Data rates up to 6.25 Gbps
- Reverse gender quadax contacts



## Modular Rectangular

- Mixed signal, power, data and coaxial modules
- Up to 200 A power
- Cable to chassis and rack and panel
- Plastic backshell with strain relief and half turn quick disconnect jackscrew
- Float mountable for blind mating



## EMI Filter

- Optimized filter style and value on receipt of signal type and data rate
- Improved shock and vibration resistance
- Transient protection in accordance with RTCA D 160F waveform and level specifications



## Fiber Optic

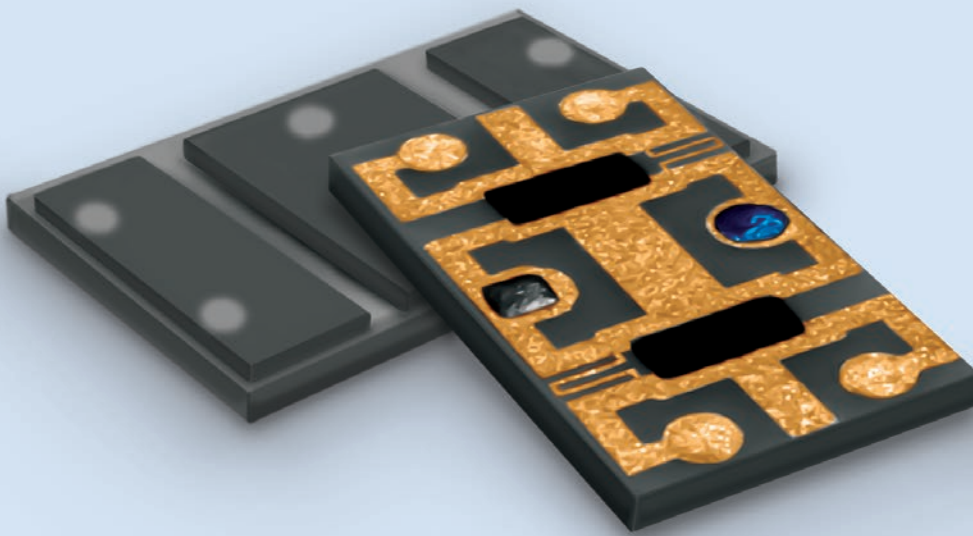
- Single and multimode
- Expanded beam & butt joint termini
- Electro-optical transceiver products
- MIL-DTL-38999 connectors
- Added value solution with cable assemblies



## Did you know?

Our high performance ruggedized cPCI 2mm is assisting the Mars Perseverance Rover to explore the Red Planet and seek signs of ancient microbial life.

# Fiber Optics & RF Components



## Ruggedized & Small Form Factors

Through our EMC, RF Labs, Lorch, Reflex Photonics and Trak brands we provide RF/Microwave components including: resistive & signal distribution components; cable assemblies; isolators and waveguide products; filters and integrated assemblies; embedded transceivers and transceiver modules for demanding high reliability environments.

**Extensive  
portfolio in a  
variety of  
packages and  
footprints**

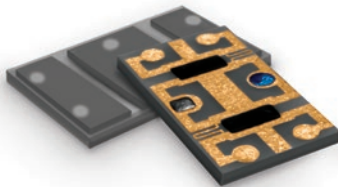
## Diamonds RF Resistives

- Highest power to size ratio resistive components available
- Extremely low parasitic capacitance resulting in broadband performance
- Standard footprints available from 0402 (20 watts) up to 2010 (300 watts)
- Substantial size and weight reduction for space and high reliability applications
- Easy to implement packages; solderable & wirebondable chips or tabbed and flange options are available



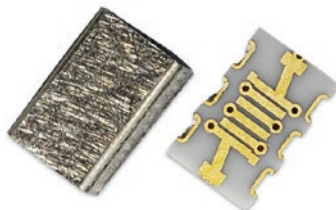
## Attenuators

- Surface mount, wire bondable, tab and cover, coaxial configurations
- Support every application from DC to 50 GHz
- 0.1 to 400 watt versions
- Commercial and high reliability product lines
- Space and military qualified



## RF Filters

- RF filters, multiplexers, switched filter banks, and integrated assemblies, from 100 KHz to 65 GHz
- Bandpass, lowpass, highpass, notch, diplexed & multiplex options
- Small footprint and light weight
- Surface mountable for pick and place applications with Planar X topology



## RF Components

- Product versions from DC to 50 GHz
- Excellent RF broadband performance
- Footprint compatibility with Thermopad®
- Surface mount, wire bond, tab, flange and coaxial configurations



## RF Ferrites & Passives

- Microwave and millimeter-wave
- Waveguide coaxial, drop-in and stripline isolators and circulators
- Low loss and high power single and multiple junctions with integrated terminations



## Flexible Cable Assemblies

- Qualified to NASA & ESA requirements
- Flexible low loss up to 40 GHz
- Robust and reliable cable to connector technology



**Securing optimal  
performance,  
durability & safety in  
demanding applications**



## Semi-rigid Assemblies

- High performance RF
- Wide range of connector, plating and jacket type options
- Custom bent configurations or packaged straight for on-site routing
- Space qualified



## Rugged Mid-Board Optical Transceivers

- Proven: Used in many defense applications
- Small: Height as low as 5.5mm with interposer
- Rugged: MIL-STD 883 shock and vibration qualified
- Sealed: Moisture and thermal shock resistant
- Storage temperature:  $-57^{\circ}\text{C}$  to  $125^{\circ}\text{C}$
- Performance: Up to 28 Gbps/lane
- Operating temperature: From  $-40^{\circ}\text{C}$  to  $85^{\circ}\text{C}$
- Sensitivity: Up to  $-12\text{dBm}$  @ BER  $10^{-12}$
- Low power consumption: As low as 100 mW/lane
- Channel configurations: 4TRx, 12TRx (10G only), 12Rx, and 12Tx

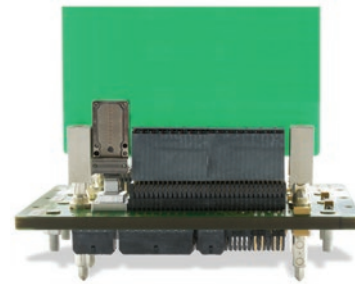


## Did you know?

We are providing the entire Ethernet data cabling network for the Orion spacecraft that will fly astronauts to Mars.

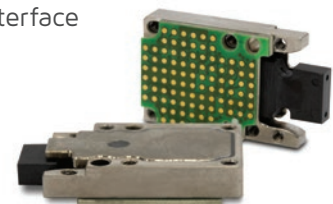
## Active Blind Mate Interconnect

- VITA 66.5 standard (forthcoming)
- Plug-in module and backplane connectors in Styles A, C and D
- Saves board space and eliminates fiber cable handling
- 28 Gbps per channel over  $-40^{\circ}\text{C}$  to  $85^{\circ}\text{C}$
- 4+4 transceiver and 12-channel transmit and receive versions
- Transceiver plug-in screw attaches to PCB with LGA interposer

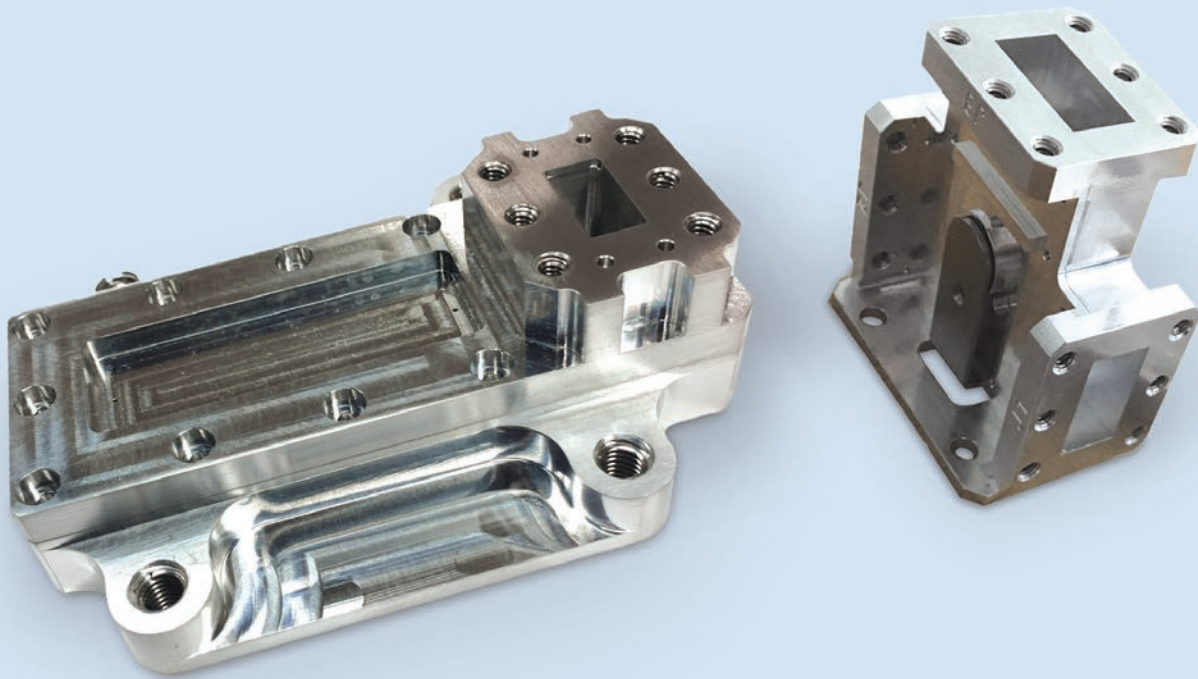


## Radiation-Resistant Optical Transceiver, Board Mount

- Space heritage (TRL 9) since 2021
- Small: Height as low as 5.5mm with interposer
- Space qualified for radiation, shock and vibration, TVAC, and outgassing
- Expected life: Up to 20 years
- Cold start temperature:  $-55^{\circ}\text{C}$
- 10 and 25 Gbps data rates on 4-lane transceivers and 12-channel transmitters/receivers
- Operating temperature: From  $-40^{\circ}\text{C}$  to  $85^{\circ}\text{C}$
- Sensitivity: Up to  $-9\text{dBm}$  @ BER  $10^{-12}$
- Power consumption: As low as 85 mW/lane ( $<10$  pJ per bit)
- LGA interposer interface



# Space NXT™ Range



## Pre-tested & Qualified for Space Use

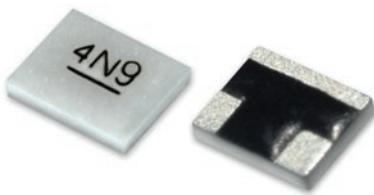
SpaceNXT™ Range is an overarching initiative that entails the creation of higher reliability products for next generation space applications that are readily available to the market. By offering solutions that are pre-tested and qualified for space use, Smiths Interconnect helps customers reduce their lead times.

**A combination  
of technology  
and lower cost  
of ownership  
solutions**

## Temperature Variable Attenuators

### SpaceNXT™ HC Series

- Up to 18 GHz, with attenuation values from 0 dB to 20 dB
- Design flexibility, small footprint
- Solderable surface mount
- Wide attenuation and TCA shifts available
- High volume solution



## Ku-Band Multiway Isolated Splitter

### SpaceNXT™ MWC Series

- 2-port Ku-Band isolated splitter
- Operating from 10.7 to 12.8 GHz
- EMC shielded, RoHS stackable housing
- Factory configuration to operate as a combiner or a splitter
- Low insertion loss, <1.4 dB over temperature



## Temperature Variable Attenuators

### SpaceNXT™ K2TVA Thermopad® Series

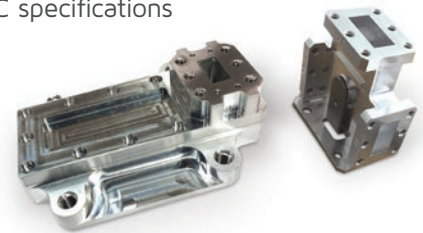
- Rated for 17-22 GHz and 27-32 GHz
- Up to 4 times temperature coefficient of attenuation over the original KTVA series
- Using robust proven thick film process technology on an alumina substrate
- Mounting configuration options available



## High Power Waveguide Circulators & Loads

### SpaceNXT™ Ku Series

- Guaranteed low and stable insertion loss under maximum power
- Proven circulator design tested to 350 Watts CW Power. Unconditionally linear
- Meeting EMC specifications to -80 dBi



## Coaxial Cable Assemblies

### SpaceNXT™ QT Series

- Mode Free performance up to 40-110 GHz - for high frequency applications depending on connector & cable configuration
- Phase Stable Fluoropolymer dielectric - Minimized electrical length changes over a wide temperature range
- >-90dB shielding effectiveness
- Compliant to NASA/ESA outgassing specifications



# Global Capabilities



## Reliable Solutions

In-house capabilities encompassing design, development, manufacturing and testing to anticipate market needs, respond quickly and accurately to customers, and provide the most reliable connectivity solutions.

## Market-leading Engineering and Technology Solutions

# 80+

## Years Experience





## Certifications, Standards & Compliance

- AS9100D
- ISO 9001
- ISO 14001
- ISO 45001
- NF F 61-030
- NF F 61-032
- NF F 16-101
- NF F 16-102
- NF-C 93421
- DIN 41612
- DIN 43652
- EN 50124
- EN 45545-2
- IEEE-1101.2-'92
- IEC 1076-4 101
- IEC 61373
- IEC 61984
- HE 501
- HE 704
- UTE C93-425
- UL94 VO
- RoHS compliance
- IRIS

## Engineering

- 3D EM Modeling
- Advanced RF & System Modeling
- CAD/CAM & Solid Modeling
- Finite Element Analysis
  - Thermal Analysis
  - Shock & Vibration Analysis
- Reliability Analysis

## Prototyping

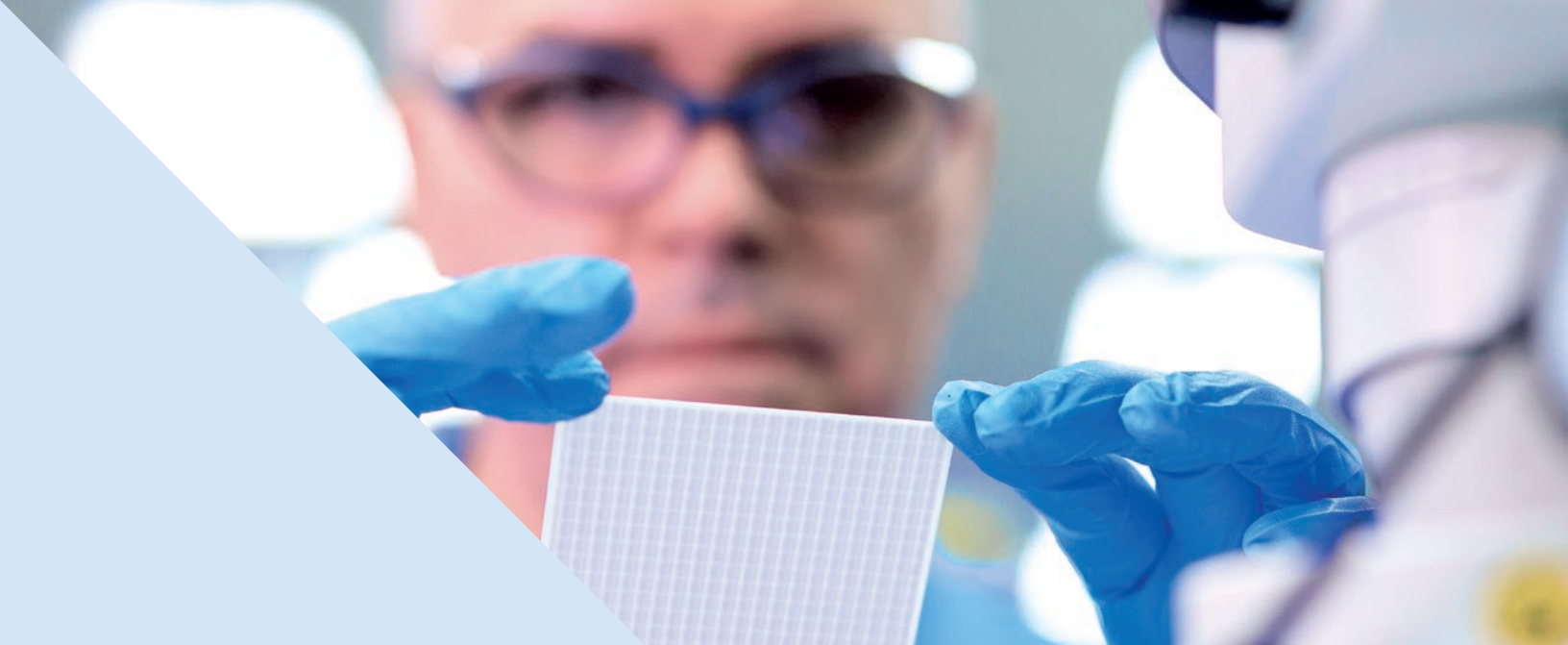
- CNC Turning & Milling Centers
- Cabling / Prototype Assembly
- 3D Printing
- Ceramic Grinding
- EDM
- Circuit Board Routing

## Manufacturing

- Precision Machine Shops
- Connector, Contact & Cable Assembly
- Automated PCB Assembly & Inspection
- Automated Hybrid Assembly
  - Die Placement
  - Wedge & Wire Bonding
  - Gap Welding
- NASA Certified Soldering
- Automated Test & Tune
- Optical Alignment
- System Integration
- Validation Testing

## Testing/Qualification

- Electrical Acceptance & LOT Test
- RF Test Capability, up to 325 GHz
- High Speed Digital
- Anechoic Chamber Testing
- ESS Environmental Qualification
- ESS Temperature, Shock & Vibration
- Metallurgical
- Real Time X-Ray
- Thermal Vacuum
- High Power RF Testing
- Optics Lab
- Multi paction, SRS mechanical shock



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## Connecting Global Markets

Smiths Interconnect's strong focus on serving international markets and customers is supported by our sales and technical teams across the Americas, Europe and Asia.

[smithsinterconnect.com](https://smithsinterconnect.com) | [in](#) [X](#) [YouTube](#) [WhatsApp](#)

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## Business Unit

Connectors

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Fiber Optics &  
RF Components

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Semiconductor  
Test

# Worldwide Support

## Americas

### Sales

connectors.uscsr@smithsinterconnect.com

### Technical Support

connectors.ustechsupport@smithsinterconnect.com

## Europe

### Sales

connectors.emeacsr@smithsinterconnect.com

### Technical Support

connectors.emeatechsupport@smithsinterconnect.com

## Asia

### Sales

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# Pioneers of Progress

## Advancing the world through cutting-edge connectivity

We aim to be the partner of choice for innovative connectivity solutions where reliability, high quality, technical expertise, application knowledge, and a reputation for excellence is vital.



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