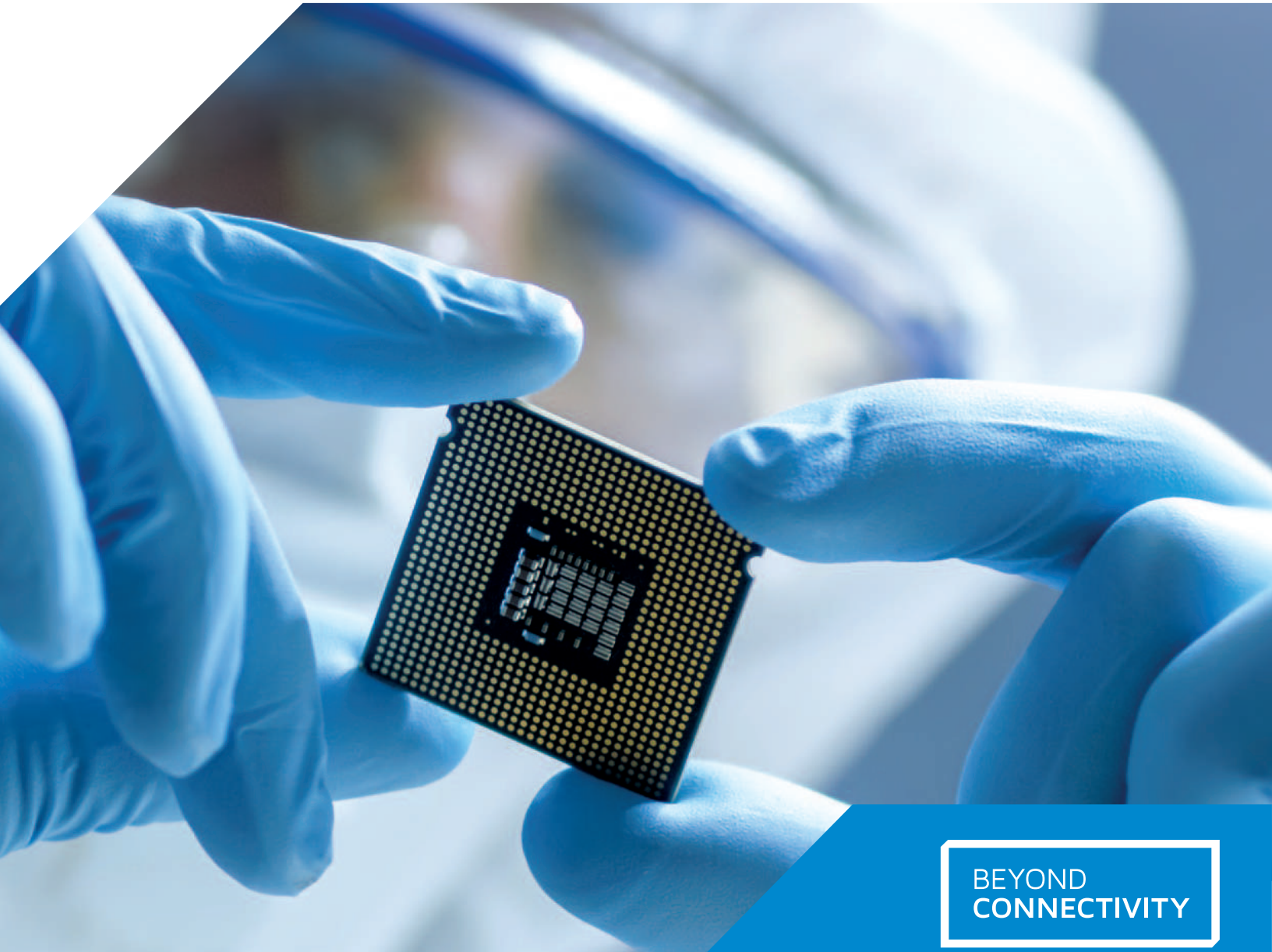


smiths interconnect



BEYOND
CONNECTIVITY

Semiconductor

Test Capabilities



About Smiths Interconnect

Smiths Interconnect is a leading provider of technically differentiated electronic components, subsystems, microwave and radio frequency products that connect, protect and control critical applications in the Defence and Aerospace, Communications and Industrial markets.

Smiths Interconnect is a leading provider of innovative solutions for critical semiconductor test applications. Smiths Interconnect's test sockets and probe card solutions offer superior quality and reliability, providing customers with a competitive advantage. Our best-in-class engineering, development and technical expertise ensure support of automated, system level and development test platforms for area array, peripheral, wafer level and Package on Package (PoP) devices as well as high performance spring probe technology and cable assemblies. Our extensive product portfolio accommodates devices with finest micro pitches as well as those with very high bandwidth requirements. Off-the-shelf and custom products are proven to deliver the best solution for the customer's specific needs.

Your global partner for innovative connectivity solutions

Our technology brands (EMC, Hypertac, IDI, Lorch, Millitech, Reflex Photonics, RF Labs, Sabritec, TECOM, 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, solutions for antenna systems, and a wide range of innovative RF and microwave solutions.

Smiths Interconnect is part of Smiths Group plc, a global leader in applying advanced technologies for markets in threat and contraband detection, energy, medical devices, communications and engineered components. Smiths Group employs around 23,000 people in more than 50 countries.



DEFENCE
& AEROSPACE



COMMUNICATIONS

INDUSTRIAL



We Offer

Technical excellence and broad market experience

A comprehensive product portfolio providing customers with a single point of supply across multiple markets

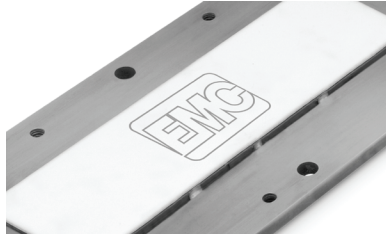
Advanced engineered solutions integrating the combined expertise of our technology brands to create value for our customers

Optimised quality through first-class materials, state-of-the-art development practices, and world class talent

Robust financial pedigree and reputable heritage of Smiths Group

Technology Brands

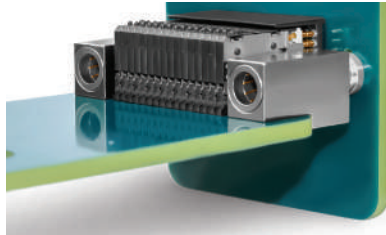
EMC



High Reliability RF/Microwave Resistive & Signal Distribution Components

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.

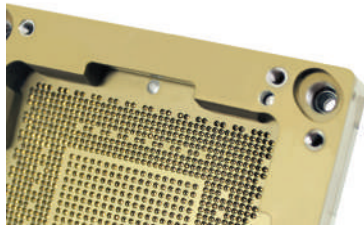
HYPERTAC



Superior Performing Electrical Connectors for the Most Demanding Applications

Premium interconnect solutions for electrical and electronic applications requiring optimised quality, performance, and reliability. Utilising the original Hypertac hyperboloid contact technology to achieve high performance in harsh environments and safety critical applications.

IDI



High Density Interconnect & Semiconductor Test Solutions with Spring Probe Technology

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.

LORCH



RF/Microwave Conditioning Products with High Selectivity Using Multiple Topologies

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 tubular filters and integrated assemblies.

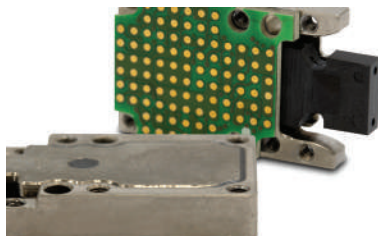
MILLITECH



Leader in Millimeter-Wave Technology & Product Solutions

Specialising in the engineering, manufacturing, and testing of millimeter-wave components, assemblies, and fully integrated subsystems for space, SATCOM, test and measurement, radar, and scientific applications.

REFLEX
PHOTONICS



Developer of Rugged, High Speed Optical Transceiver Modules & Parallel Embedded Optics Products

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

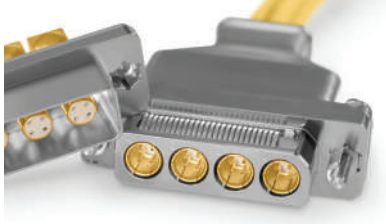
RF LABS



High Frequency Microwave Cable Assemblies & Coaxial Components

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

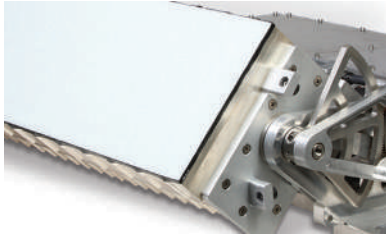
SABRITEC



High Speed Data and Transient Protection Interconnect Solutions

High speed quadrax, twinax, fibre 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.

TECOM



Advanced Antenna Systems & Solutions for RF/Microwave Applications

Industry leading innovator of antennas and positioning systems for SATCOM in-flight connectivity, instrumentation, datalink, command & control, and telemetry applications integrated into the world's most advanced commercial and military platforms.

TRAK



High Reliability RF/Microwave Subsystems & Components

High reliability multi-function RF systems, ferrite microwave products, and precision time & frequency systems for defence, commercial aerospace, space, homeland security, and public safety applications.

HSI

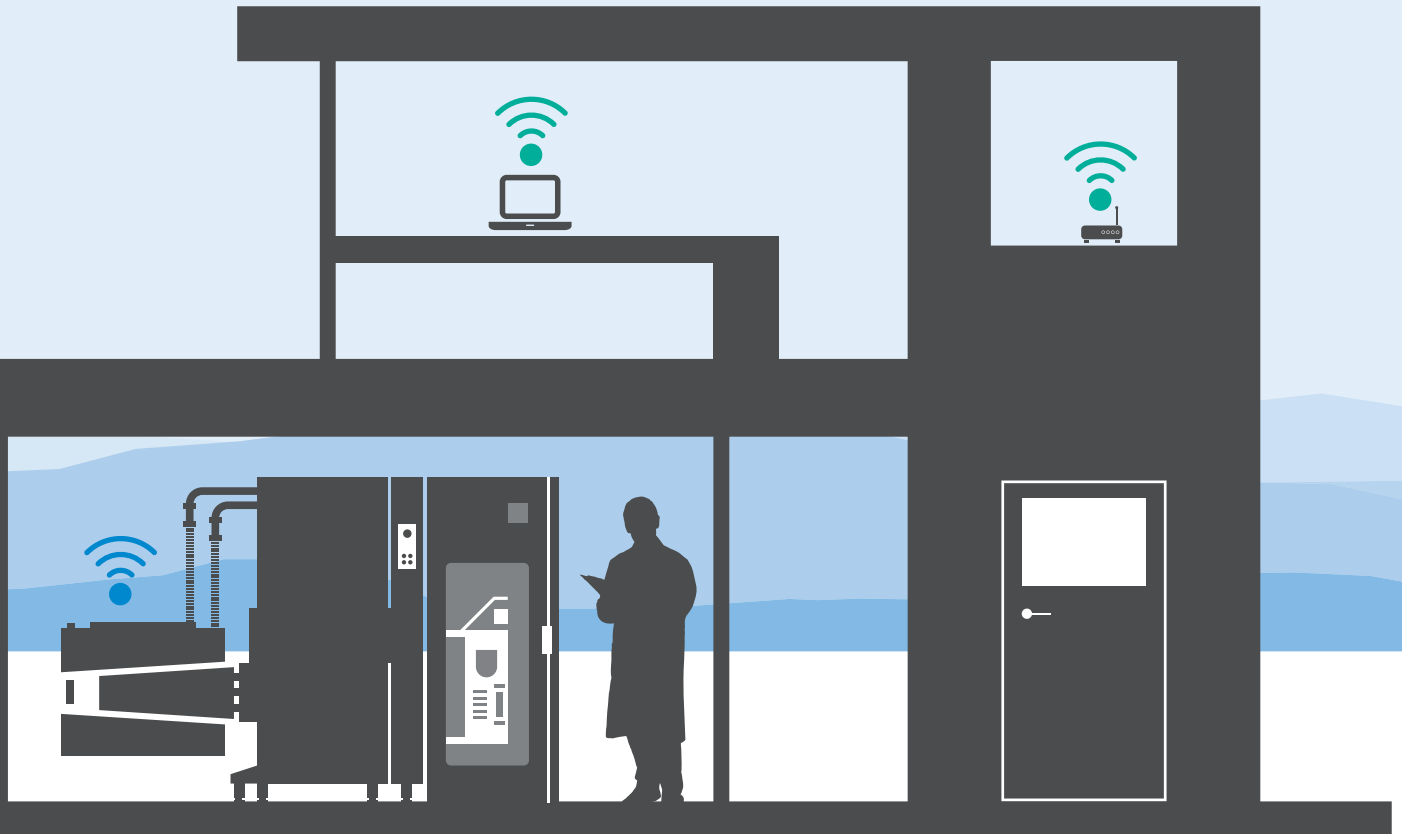


High Reliability Connectors for Commercial Aerospace & Railway

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.

Synonymous with exceptional performance, safety and durability

Applications



Area Array Test



- GPU
- CPU
- Artificial Intelligence
- Deep Learning
- High-speed Memory
- Analog RF

Package on Package Test

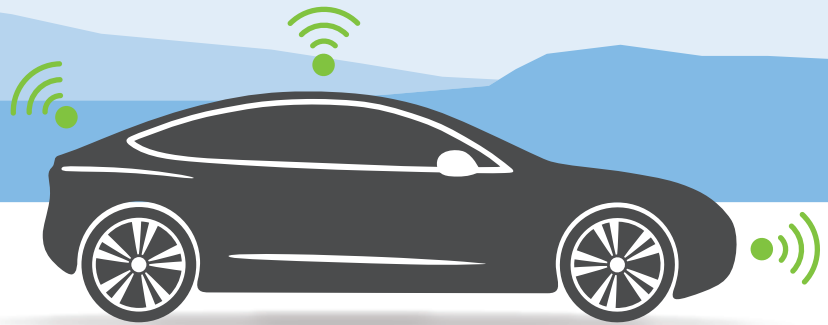


- Smart Phone CPU
- Wearable Technology
- NFC - Near Field Communications

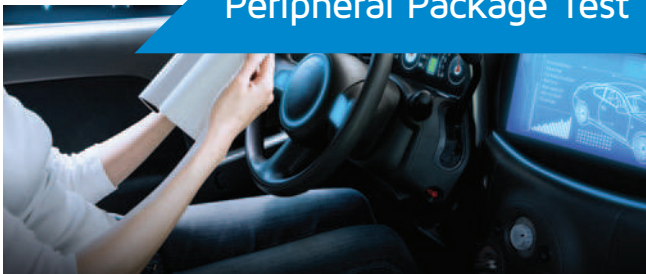
Providing A Competitive Advantage



Proliferation of data devices and the growth of cloud computing, artificial intelligence and big data is resulting in complex systems and new materials that require rigorous, efficient validation. Smiths Interconnect's test sockets and probe card solutions ensure superior quality and reliability in the semiconductor test applications. Our best-in-class engineering, development and technical expertise ensure support of automated, system level and development test platforms for area array, peripheral, wafer level and Package on Package (PoP) devices as well as high performance spring probe technology and cable assemblies.



Peripheral Package Test



- Wireless Communications
- Infotainment
- Automotive
- Industrial

Wafer Level Test



- Bluetooth
- Wi-Fi
- Power Management



Area Array

Test



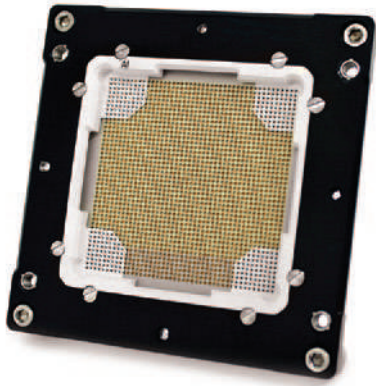
Top: Smiths Interconnect's test solutions are an enabling technology for high speed area array test.

Quality and Reliability

Smiths Interconnect area array test products support high pin count and high speed signal applications. Our design structure ensures low power inductance, high current carrying capacity and low contact resistance embedding quality and reliability in testing of GPUs, CPUs and other high speed digital applications.

Key Benefits

- Easily configurable
- Field maintainable
- Entire signal path shielded (DaVinci only)
- Controlled impedance (DaVinci only)
- High speed analog and digital

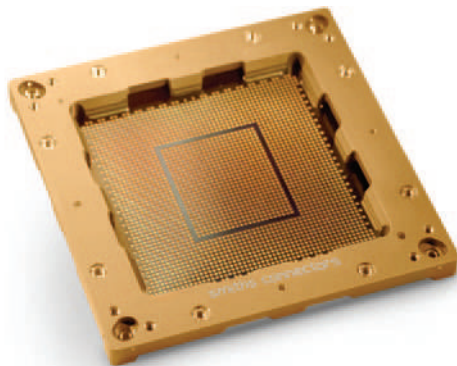
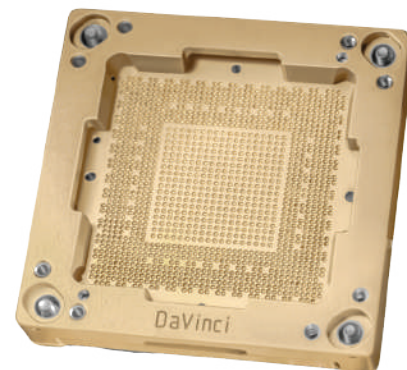


Array Test Socket

- Innovative design with a wide range of material options
- Proprietary engineered plastic body for larger size BGA / LGA test
- Precision alignment calculation
- Replaceable floating or fixed device alignment guide feature
- Z-axis tolerance stacking analysis
- FEA analysis
- Customization and design flexibility

DaVinci – High Speed Test Socket

- High performance coaxial socket
- Proprietary insulated metal socket
- Spring probe simplicity
- Entire signal path shielded
- Insensitive to temperature changes and humidity
- Extreme rigidity (very low deflection rate)
- Impedance controlled
- Low contact resistance
- High current carrying capacity
- High speed: up to 67GHz / 56Gbps



Silmat® Array Test Socket

- Electrically transparent contact
- Low and stable contact resistance
- High frequency bandwidth > 80GHz
- Signal path length < 1mm



Package on Package

Test



Top: Smiths Interconnect's PoP test solutions are used in smart phone CPUs and portable devices.

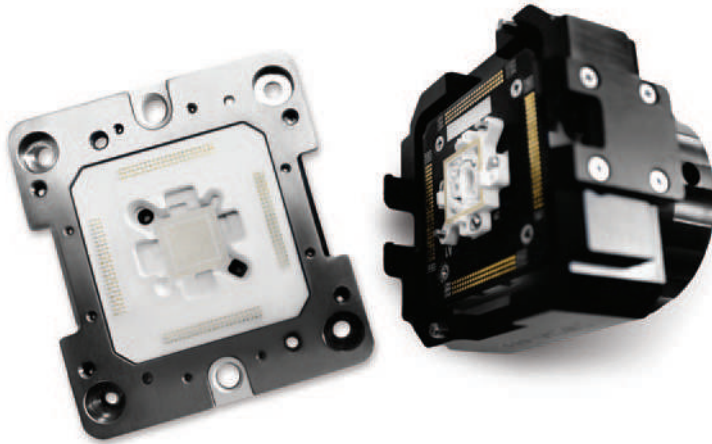
Best-in-class Design

Smiths Interconnect's advanced, low profile contact technology provides customers with a competitive edge in testing Package on Package (PoP) devices used in smart phone CPUs and wearable technology. The unique ability of our PoP test sockets to accurately and simultaneously align both the upper and lower device pads increases fault coverage and reduces the cost of test.

Key Benefits

- Maximum signal integrity
- Reduced maintenance and tester downtime through quicker changeovers
- Long cycle life
- High signal integrity
- Memory function availability during test
- Simultaneous alignment

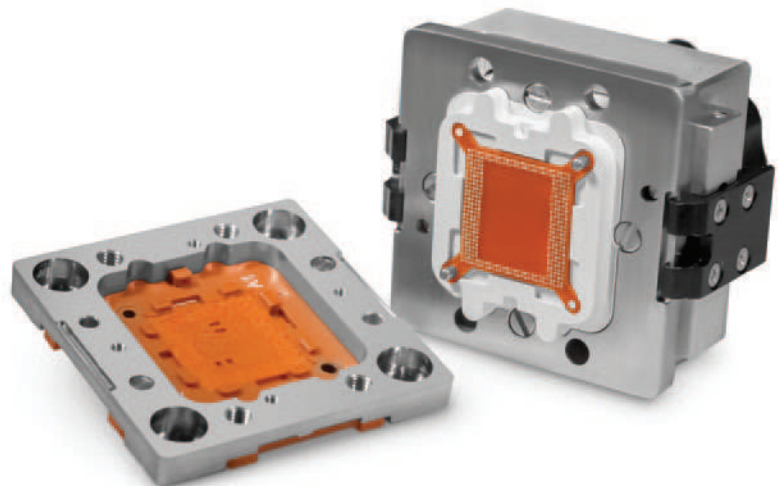
Euclid PoP Test Socket



- Memory-bearing, memory-less and manual sockets
- Advanced alignment features for both top and bottom devices
- Refined analysis tools ensure production-ready solutions
- Controlled impedance available for maximum signal integrity
- Features optional coaxial interposer for memory-less test
- RF simulation used to determine appropriate signal integrity solution
- 6Gbps options available
- Tester or socket supplies memory function during test through topside attach features
- Solutions are valid in both manual and automated test environments

Silmat® PoP Test Socket

- Electrically transparent contact
- Solderless memory replacement
- Short signal path <1mm
- Conformal to recessed LGAs
- High frequency bandwidth > 40GHz
- Low inductance
- Long cycle life > 500,000 cycles (application dependent)
- No PCB or solder ball damage
- Minimal labour and tester downtime





Peripheral

Package Test

Top: Smiths Interconnect's technology is widely used to test peripheral ICs found in wireless communications, automotive and industrial applications.

Consistently Stable

Smiths Interconnect's innovative test sockets offer significant advantages in testing peripheral ICs for automotive and industrial applications. Our peripheral test solutions utilize vertical spring probe technology to provide consistently low and stable contact resistance with minimal cleaning and extended mechanical life.

Key Benefits

- Product stability
- Easy maintenance
- Design flexibility
- Wide temperature range
- High compliance

Celsius Peripheral IC Package Test Socket

- Wiping action ensures good device contact with minimal board side scrub
- Requires minimal cleaning
- Patented technology
- Suited for tri-temp peripheral testing
- Resistance < 20m
- Bandwidth > 10GHz @ -1dB
- Temperature rated: -50°C to 175°C



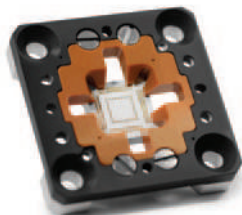
Gutenberg Peripheral Lead Frame Test Socket

- Excellent co-planarity
- High suitability to auto cleaning
- High reliability
- Mendeleev contact technology available
- Minimised overdrive and simplified bring-up
- Analysis of thermal, alignment and pin travel
- Capable of high parallelism



Peripheral IC Package Test Socket

- Innovative design with a wide range of material selection
- Precision alignment calculation
- Replaceable device alignment guide feature
- Customisation and design flexibility
- Harder Mendeleev spring pins



Silmat® Peripheral IC Package Test Socket

- Electrically transparent contact
- Low, stable contact resistance
- High frequency bandwidth > 80GHz
- Signal path length < 1mm





Wafer Level

Test



Top: Smiths Interconnect offers advanced technology in wafer level package testing.

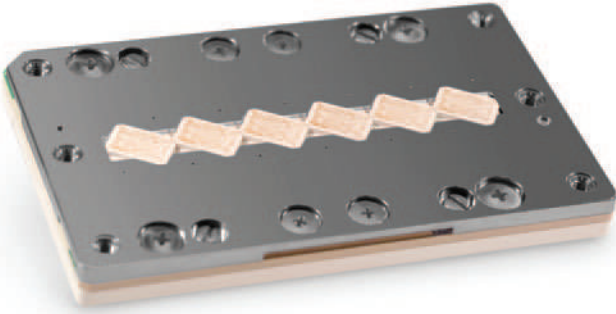
Ensuring Product Performance

As phones and smart devices get more powerful, so do the integrated chips that support them. Smiths Interconnect's innovative wafer level package test solutions help customers deliver higher quality products by ensuring the chips in them perform as they should.

Key Benefits

- Reliable RF signal integrity
- Excellent compliance and contact force
- Easy maintenance
- Quick installation

Monet Probe Head



- Reduced cost of ownership
- End user serviceable
- Replaceable cartridges
- High degree of test site parallelism
- Ideal for pitches $\geq 200\mu\text{m}$
- Short signal path $< 3\text{mm}$
- Stable C-res over 750k cycles
- Superior signal integrity
- High contact density
- Short length with optimized compliance
- Reliable contact force
- HVM robustness
- Excellent accuracy

Volta Probe Head

- Minimal compression force
- Exceptional mating cycles
- Unrivaled signal reliability
- Optimized travel at 500, 400, 350, 300, 250, 200, 180 μm pitch
- Exceptional DC and RF performance
- Floating spring probe designs allow for seamless deployment in test WLCSP
- Replacement for cantilever and traditional vertical probe card technologies
- Easy maintenance
- High performance engineered plastic and ceramic material
- Consistent tip co-planarity



Signal Path

Contacts & Cables



Quality & Clarity

Smiths Interconnect's signal path contacts and cables ensure the quality and clarity of the entire signal path from the tester through to the device under test.

Our high performance cables are designed to rigorous quality standards in support of customer technical requirements with attention to quick delivery. Our extensive spring probe portfolio is developed to ensure the highest possible test yields and longest cycle life through careful material selection and consideration of spring force to optimize the balance between contact reliability and socket fatigue.

Our broad portfolio of high reliability cable assemblies offers our customers the best solution for their application with short lead times and technical assistance during the initial design phase.

Key Benefits

- Premium, high performance flexible cable assemblies with the lowest insertion loss and highest frequency response when compared to other cables of the same diameter (Lab-Flex® family)
- Solutions for test applications up to 18GHz in a durable, cost effective, premier test cable (Titan-Flex family)
- Cost effective alternatives to our premium Lab-Flex® product line, for applications where slightly higher loss is not an issue (Mini-Flex family)

Mendeleev Homogeneous Tips

- 100% precious metal tips
- Optimized for aggressive cleaning
- Sharper, harder tips for enhanced first pass yields
- Significantly reduced cost per cycle
- Incomparable durability



Spring Probe Technology

- Internally designed and manufactured
- Dual plunger, floating probe and modular designs
- 250µm pitch and higher
- Long cycle life
- Low and stable contact resistance
- Superior compliance
- High signal integrity



Capabilities

Smiths Interconnect's in-house capabilities encompass design, development, manufacturing and testing to respond quickly and accurately to customers' needs, and provide the most reliable connectivity solutions.

Certifications Standards Compliance

- AS9100C
- ISO 9001
- ISO 14001
- ISO 13485
- ISO 45001
- QPL (MIL-DTL-55302)
- MIL-I-45208A



Engineering

- 3D EM Modelling
- Advanced RF & System Modelling
- CAD/CAM & Solid Modelling
- Finite Element Analysis
- Reliability Analysis

Manufacturing

- Precision Machine Shops
- Connector, Contact & Cable Assembly
- Automated PCB Assembly & Inspection
- Automated Hybrid Assembly
- Automated Test & Tune
- System Integration
- Validation Testing

Prototyping

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

Testing/Qualification

- Electrical Acceptance & Lot Test
- Mechanical
- Environmental
- RF Test Capability up to 325GHz
- High Speed Digital
- Anechoic Chamber Testing
- ESS Environmental Qualification
- ESS Temperature, Shock & Vibration
- Metallurgical
- Real Time X-ray
- Near Field/Compact Antenna Range
- Probe Analysis Capabilities

Locations



Connecting Global Markets

Smiths Interconnect's strong focus on serving international markets and customers is supported by our global network of sales offices across America, Europe and Asia.

Americas

- Kansas City, KS
+1 913 342 5544
info.us@smithsinterconnect.com
- Kirkland, QC, Canada
+1 514 842 5179
info.us@smithsinterconnect.com
- Milpitas, CA
+1 408 957 9607 x 1125
info.us@smithsinterconnect.com
- Salisbury, MD
+1 800 780 2169
info.us@smithsinterconnect.com
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info.asia@smithsinterconnect.com
- Suzhou, China
+86 512 6273 1188
info.asia@smithsinterconnect.com
- Singapore
+65 6846 1655
info.asia@smithsinterconnect.com



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



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