smiths interconnect
a molex company



SPCD 2026 - ReadyStack Interposer

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Kevin Deford - Senior Product Line Manager

Smiths Interconnect, a Molex company
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CUTTING-EDGE
CONNECTIVITY

OUR VISION

We make a connected world possible by working together as a global team to enable technology that transforms the future and **improves lives.**

OUR COMPANY

$8B REVENUE

7% SALES REINVESTED INTO R&D

50k+ EMPLOYEES WORLDWIDE

40 COUNTRIES

18k+ SUPPLIERS

90+ MANUFACTURING LOCATIONS

160k+ PRODUCTS

88 YEARS OF INNOVATION

OUR APPROACH

CUSTOMER NEEDS ASSESSMENT › PRODUCT DESIGN & INNOVATION › TESTING & QUALITY ASSURANCE › SOURCING & SUPPLY CHAIN OPTIMIZATION › DESIGN VERIFICATION & LAUNCH › DELIVERY EXCELLENCE › TAILORED CUSTOMER SERVICE

OUR MARKETS


AEROSPACE & DEFENSE


CONSUMER/ MOBILE


DATACENTER, CLOUD & TELECOM


HOME APPLIANCE & HVAC


INDUSTRIAL


MEDICAL & PHARMA


TRANSPORTATION/ AUTOMOTIVE

OUR DIFFERENCE

- QUALITY ENGINEERING
- GLOBAL OPERATIONAL EXCELLENCE
- EXPANSIVE KNOWLEDGE NETWORKS
- SOUND ENVIRONMENTAL PRACTICES
- SUPERIOR CUSTOMER EXPERIENCE
- WORLD-CLASS MANUFACTURING CAPABILITIES
- DEEP ENGINEERING EXPERTISE
- PRIVATELY HELD
- STABLE & TENURED MANAGEMENT TEAM
- PRINCIPLE-BASED MANAGEMENT®
- STRONG FINANCIAL FOUNDATION
- SUPPLY CHAIN INTELLIGENCE AND AGILITY
- COMMITMENT TO DIVERSITY AND INCLUSION
- DIGITAL TRANSFORMATION

OUR FOUNDATION

120k+ EMPLOYEES WORLDWIDE

50+ COUNTRIES

$125B+ ANNUAL REVENUE*

1 OF THE LARGEST PRIVATELY-HELD COMPANIES IN THE U.S.

90% EARNINGS REINVESTED

10k PATENTS GRANTED

KOCH

**Our revenues fluctuate with the price of commodities. They have exceeded $125 billion.*

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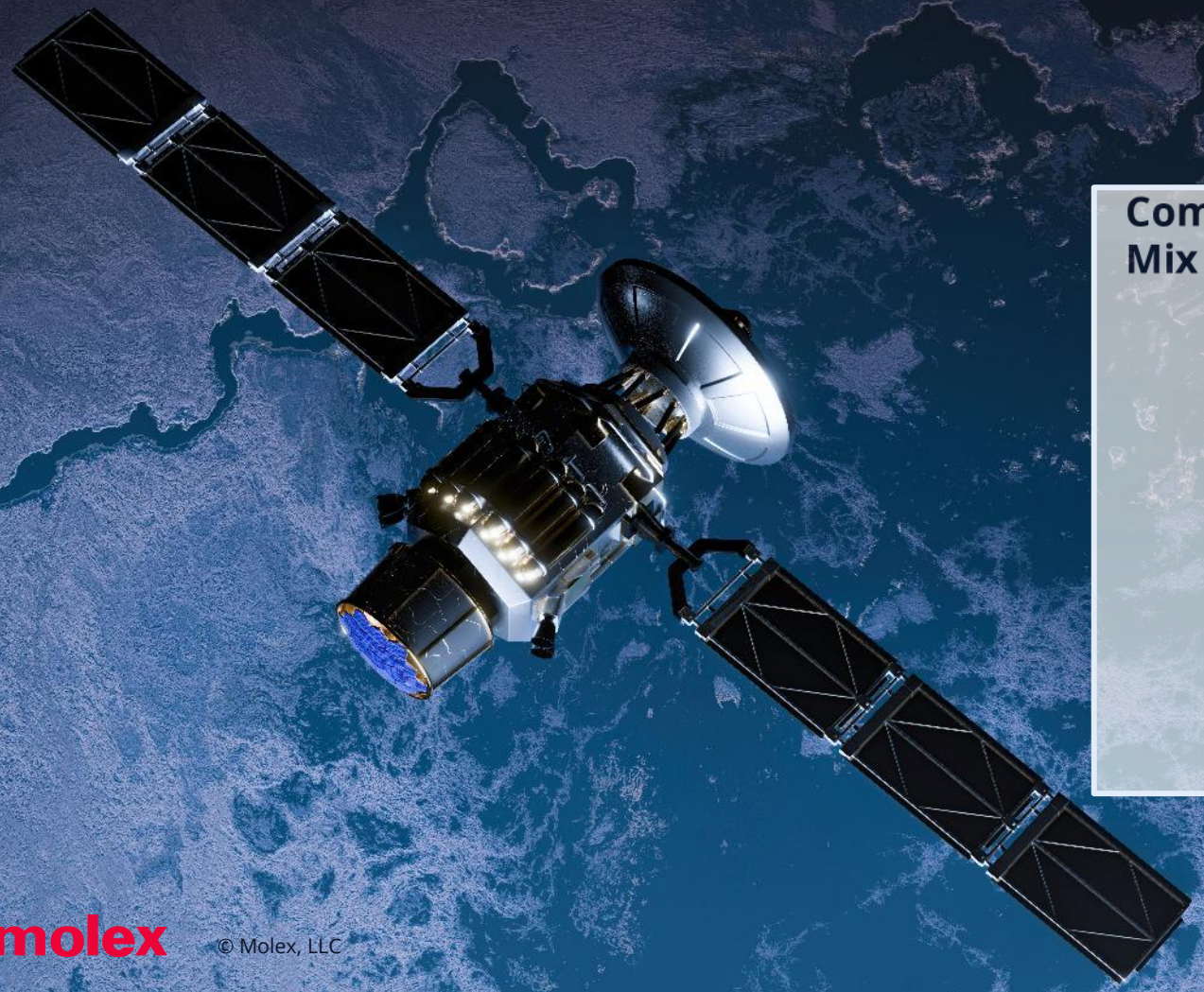
~$900M
2026 REVENUE

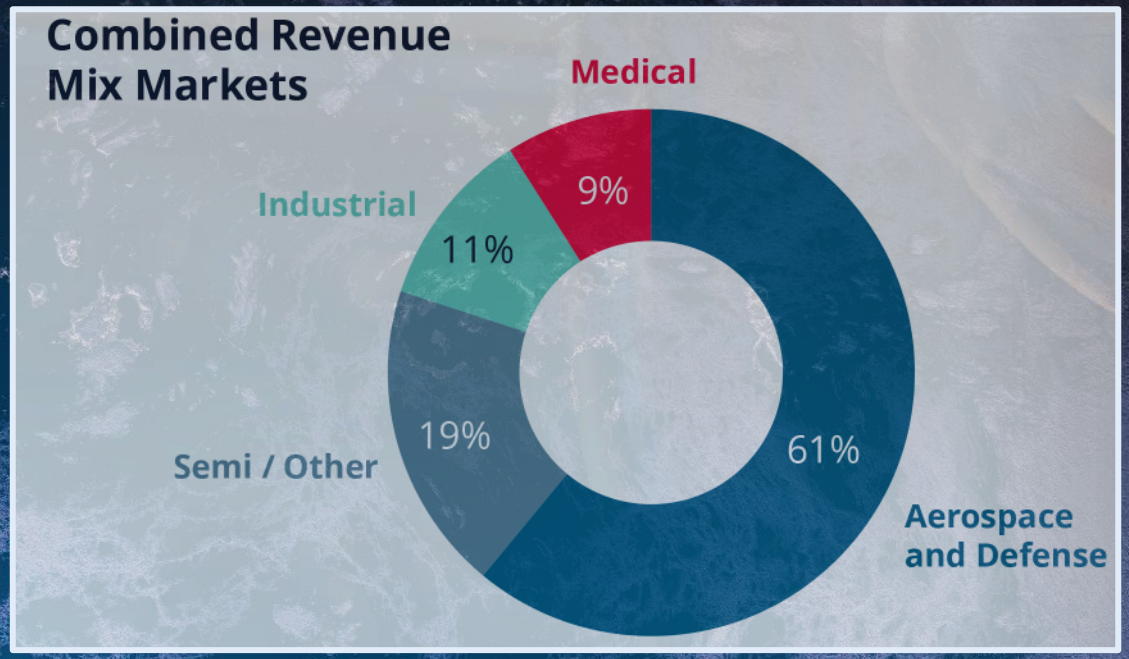
4,300+
EMPLOYEES

22
MANUFACTURING LOCATIONS

65+
YEARS OF **BRAND AWARENESS & TRUST**

HIGH RELIABILITY
INTERCONNECT & ELECTRONIC ASSEMBLIES





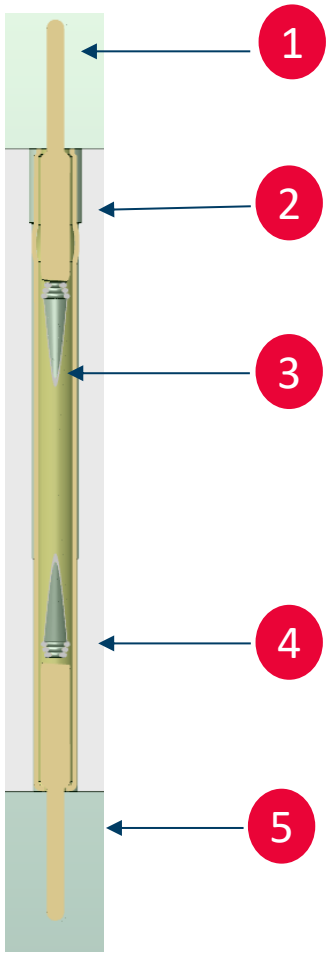
molex

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SPRING PROBE TECHNOLOGY

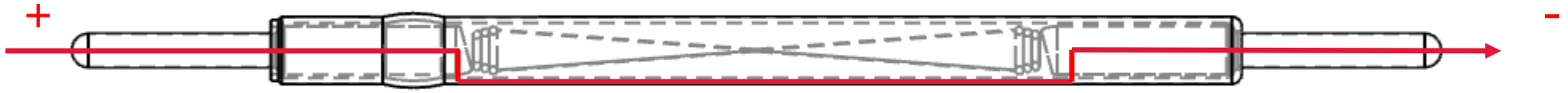


Probe Basics



1. Plunger(s)
2. Retention Feature
3. Spring
4. Barrel
5. Insulator

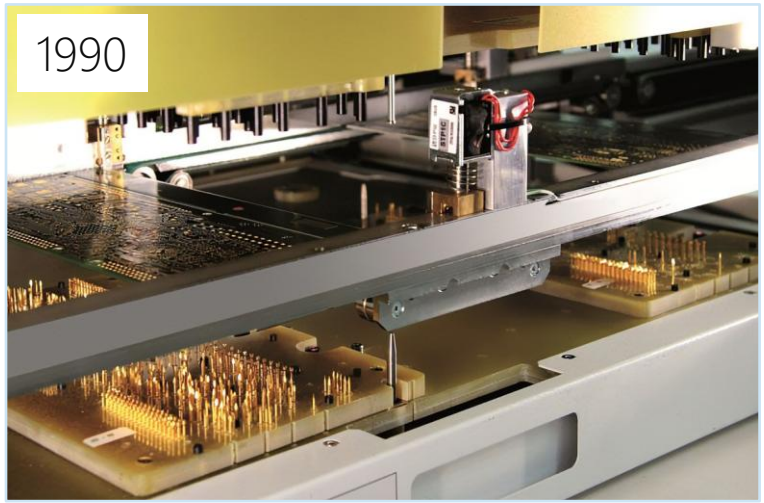
- Telescopic Electromechanical Interconnect
- One or more moving elements (plunger)
- A metal Tube called the Barrel
- Helicoil Spring
- Insulator to hold the Probe
- Travel (Working Range)
- Biasing Technique



Current Flow

Spring Probe Evolution

1990



2000

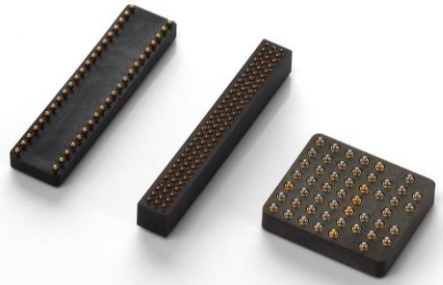


2005



2010-Today







H-PIN®

HIGH-PERFORMANCE, LOW-COST STAMPED PIN PROBES



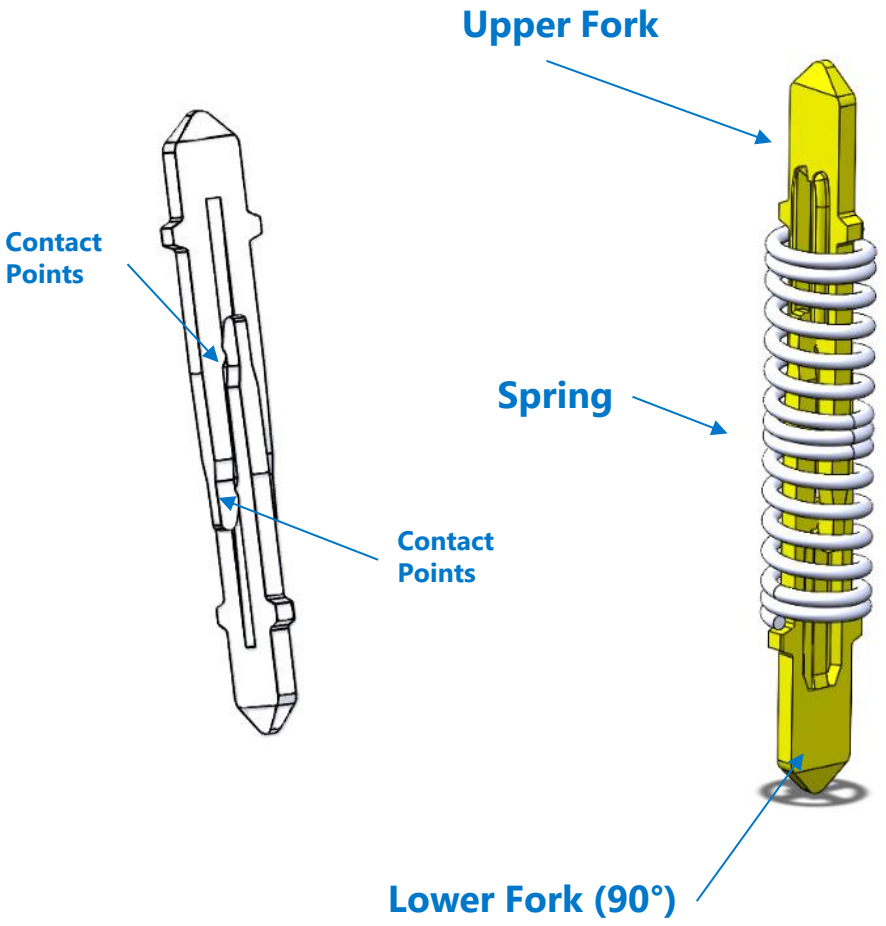
H-Pin Contact Technology

Mechanical

- Stamped Contact
- Bifurcated Blades at 90 Degrees
- 4-Point Electrical Contact
- Base Material: Beryllium Copper
- Plating: Gold over Electroless Nickel
- Stainless Steel Spring
- Compliance – 27. 5 mils (0.7 mm)
- Force – 18 g @ Preload, 35 g @ 27.5 mils
- Board-to-Board Height – 148 mils (3.75 mm)

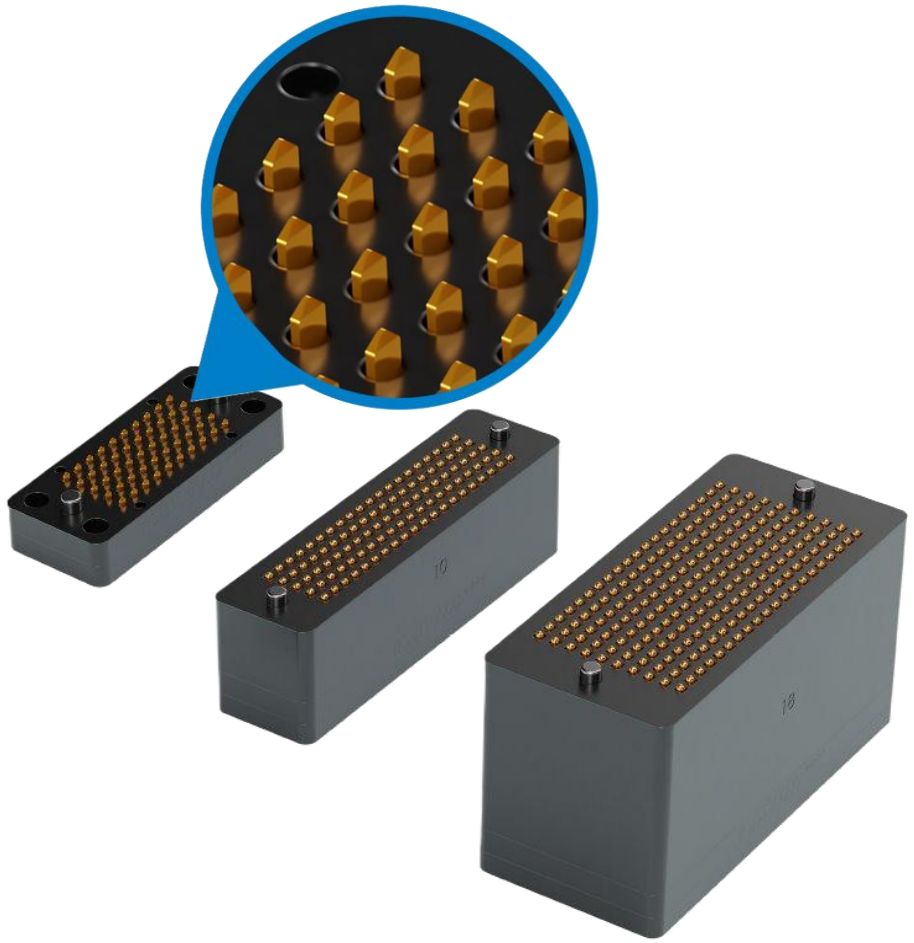
Performance

- Operating Temperature: -55°C to 180°C
- Current Capacity: 4 A
- Typical Resistance: 30 mΩ
- Cycle Life: 25,000 Contacts



ReadyStack Standard Interposers, featuring H-Pin® technology

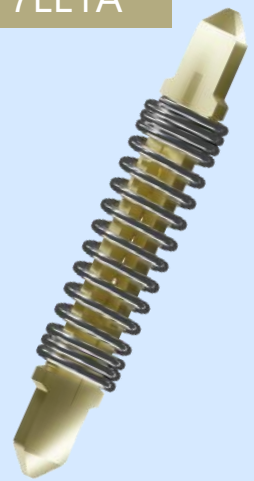
- **Versatile, standard platform** available in a wide range of pin counts, layouts, and stack heights.
- **Proprietary H-Pin technology** utilizes stamped spring probes for superior electrical and mechanical performance.
- **Cost-effective solution** designed to reduce production costs without compromising performance.
- Stack **heights up to 20 mm** enabled by a molded **Top-Hat insulator.**
- Maximum **design flexibility**
- **Optimized and scalable manufacturing** process for efficient production and deployment.



ReadyStack Interposers

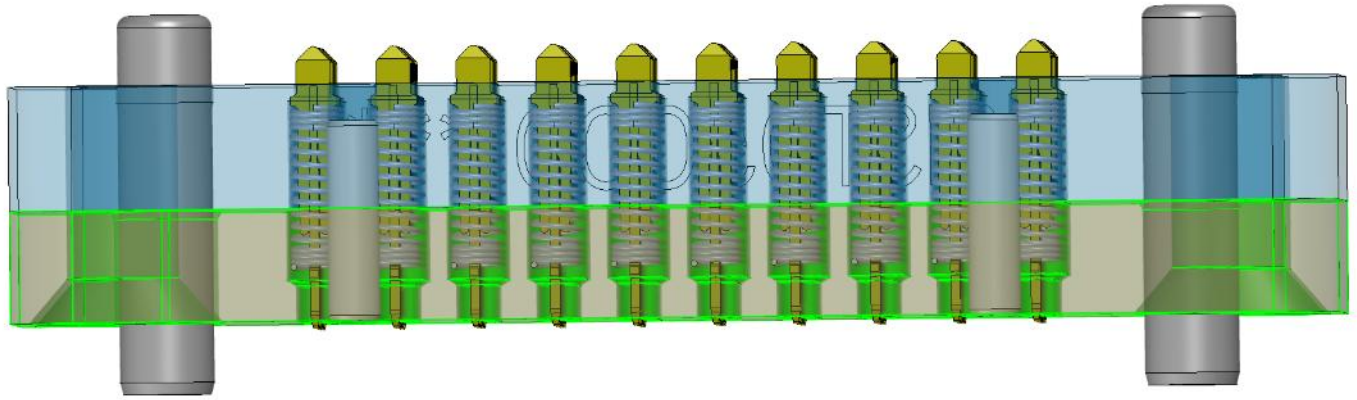
- **Interposer with stamped H-Pin technology**
- **Initial offering around H077LLA**
- **Standard Interposers in pre-defined layouts and different heights**
- **Available Off-the-Shelf**
- **⚠ Lower Performance than Spring Probe Technology**

H077LL1A



Mechanical Properties

- Pitch: 1.0 mm (min)
- Working Travel: 0.70 mm
- Contact Force: 34.9 gf
- Full Length: 4.4 mm
- Compressed Length: 3.75 mm
- Operating Temperature: +180°C



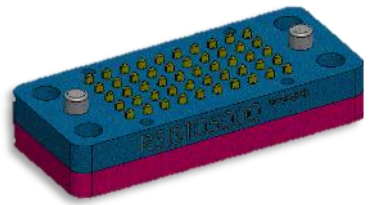
Off-the-Shelf | **Standard Layouts** | **Multiple Heights** | **Lower System Cost**

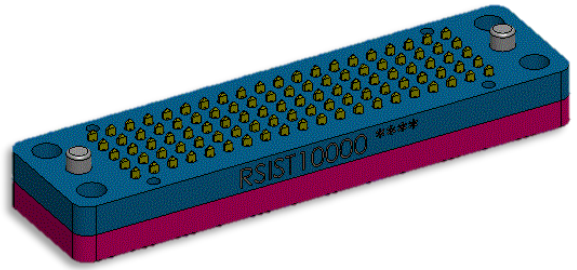
Top-Hat Technology

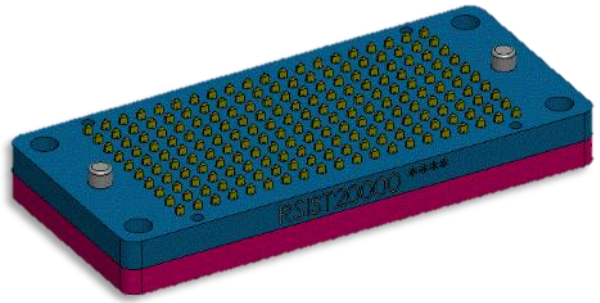
Top Hats are used to extend the height of the interposer. From 6 mm to 20 mm, in 2 mm increments.



Interposer Configurations



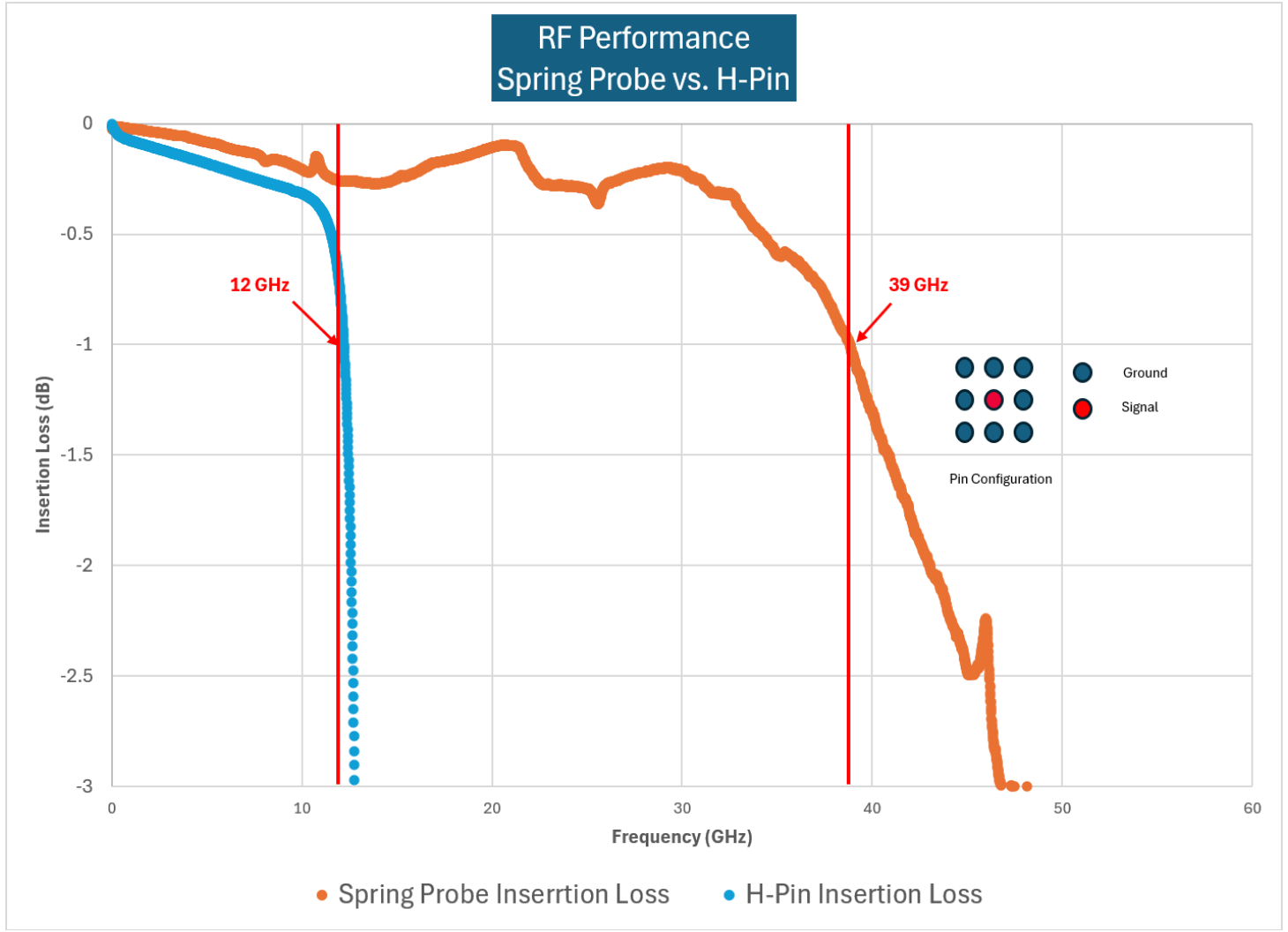




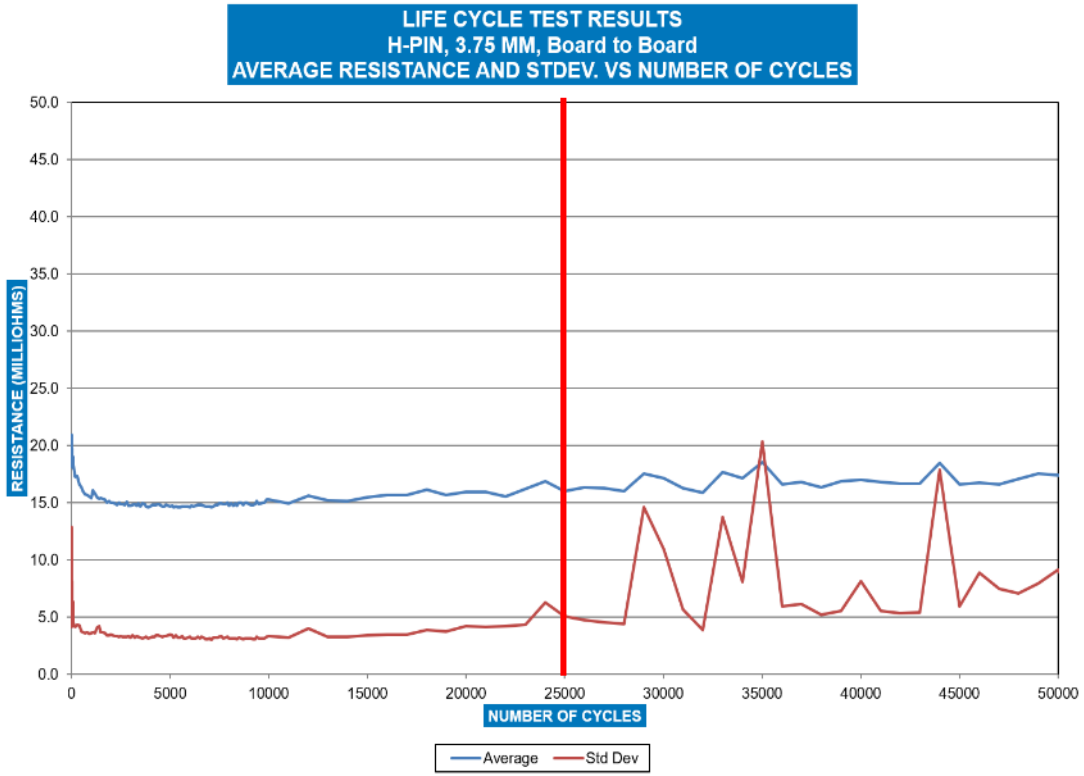
Board-to-Board Height (mm)	50-pin	100-pin	200-pin
3.75	✓	✓	✓
6.00	✓	✓	✓
8.00	✓	✓	✓
10.00	✓	✓	✓
12.00	✓	✓	✓
14.00	✓	✓	✓
16.00	✓	✓	✓
18.00	✓	✓	✓
20.00	✓	✓	✓

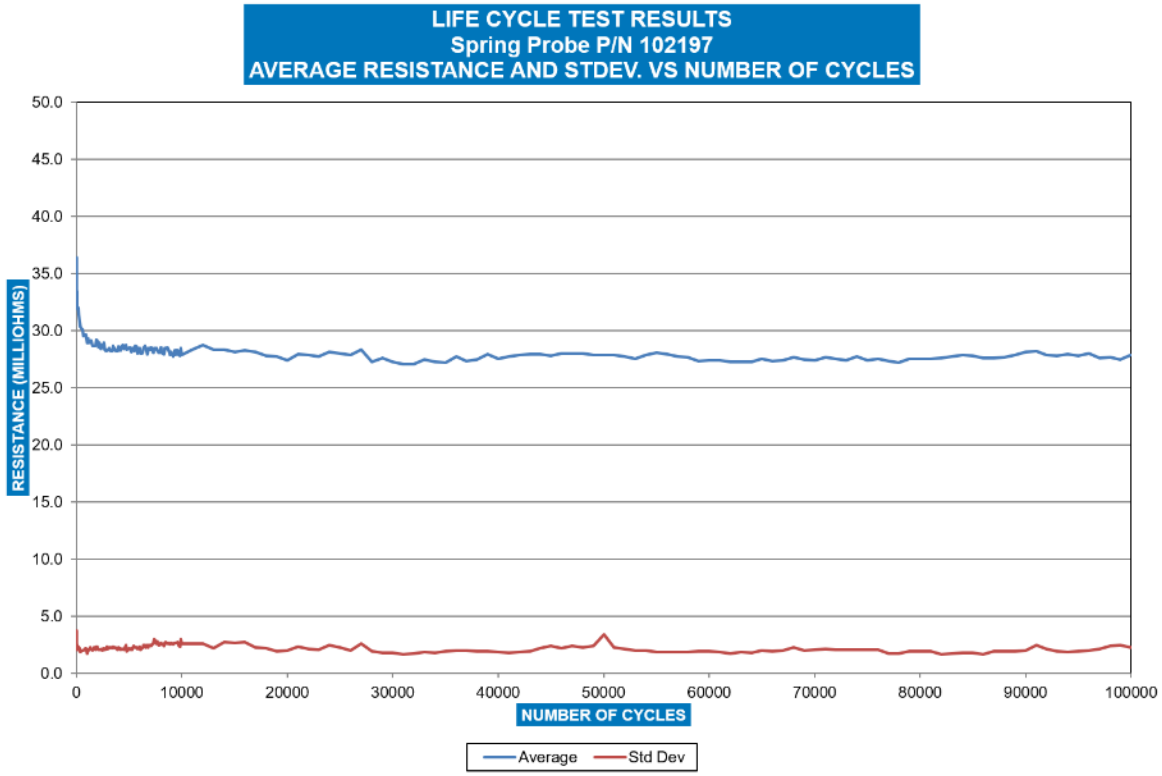
RF Performance: H-Pin vs Spring Probe Interposer

- Blue line – RF Performance of H-Pin Interposer
  - **-1 dB Insertion Loss ~ 12 GHz**
  - **-3 dB Insertion Loss ~ 12.5 GHz**
- Orange Line – RF Performance of Spring Probe Interposer
  - **-1 dB Insertion Loss ~ 38 GHz**
  - **-3 dB Insertion Loss ~ 47 GHz**



Mating Cycles



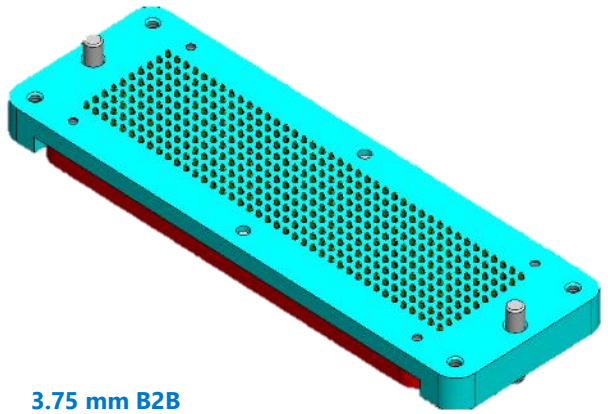


H-Pin resistance above becomes unstable after 25K cycles

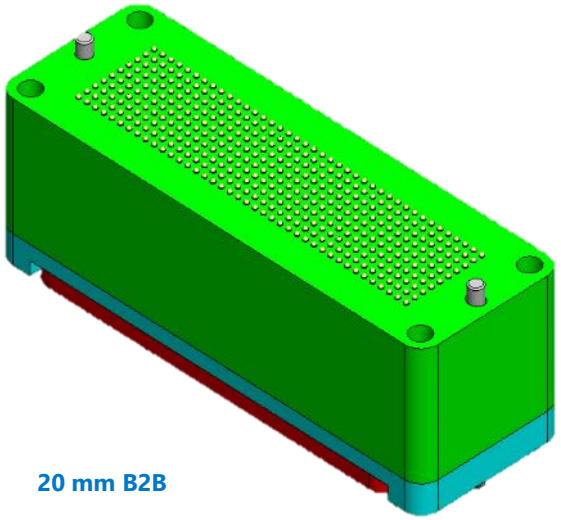
Spring Probe resistance above is stable out to 100K cycles

Qualification

- **Qualification to MIL-DTL-55302**
- **Sample Size: 3 each**
- **2 Variants**
  - 400 Pin, 3.75 mm Board-to-Board Ht.
  - 400 Pin, 20 mm Board-to-Board Ht.



3.75 mm B2B



20 mm B2B

MIL-DTL-55302 Qualification Test Sequence

Test Procedure	Paragraph Reference	Pass/Fail Criteria	
Subgroup 1 – All DUT #s (All Connector Samples)		**Pass/Fail Criteria**	**Pass/ Fail**
Visual and Mechanical	10.1	Free from defects, meet drawing requirements, H-Pins and spring probes move freely	Pass
Mating and Unmating	10.2	No damage to contacts	Pass
Contact Resistance	10.3	< 50 mΩ (Short) & < 75 mΩ (Long)	Pass
Low Level Contact Resistance	10.4	< 50 mΩ (Short) & < 75 mΩ (Long)	Pass
Dielectric Withstanding Voltage	10.5	< 5 mA Leakage current @ 750 VDC – Ref. Only	Pass
Insulation Resistance	10.6	≥ 5,000 MΩ @ 250 VDC – Ref. Only	Pass
Visual and Mechanical	10.7	Free from defects, meet drawing requirements, H-Pins and spring probes move freely	Pass
Subgroup 2 – DUTs #1, #4, #7, #10 (1/3 of Connector Samples)		**Pass/Fail Criteria**	
Dielectric Withstand Voltage at High Altitude (70,000 ft.)	11.1	< 5 mA Leakage current @ 300 VAC – Ref. Only	Pass
Mating and Unmating	11.2	No damage to contacts	Pass
Low Level Contact Resistance	11.3	< 50 mΩ (Short) & < 75 mΩ (Long)	Pass
Vibration	11.4	No discontinuities ≥ 1 ns	Pass
Shock (specified pulse)	11.5	No discontinuities ≥ 1 ns.	Pass
Low Level Contact Resistance	11.6	< 50 mΩ (Short) & < 75 mΩ (Long)	Pass
Contact Resistance	11.7	< 50 mΩ (Short) & < 75 mΩ (Long)	Pass
Dielectric Withstand Voltage	11.8	< 5 mA Leakage current @ 750 VDC – Ref. Only	Pass
Insulation Resistance	11.9	≥ 5,000 MΩ @ 250 VDC – Ref. Only	Pass
Visual and Mechanical	11.10	Free from defects, meet drawing requirements, H-Pins and spring probes move freely	Pass
Subgroup 3 – DUTs #2, #6, #8, #11 (1/3 of Connector Samples)		**Pass/Fail Criteria**	
Thermal Shock	12.1	5 cycles, -55°C to +165°C (30 min. dwell at each temperature extreme)	Pass
Low Level Contact Resistance	12.2	< 50 mΩ (Short) & < 75 mΩ (Long)	Pass
Dielectric Withstand Voltage	12.3	< 5 mA Leakage current @ 750 VDC – Ref. Only	Pass
Insulation Resistance	12.4	≥ 5,000 MΩ @ 250 VDC – Ref. Only	Pass
Mating and Unmating	12.5	No damage to contacts	Pass
Humidity	12.6	Insulation resistance ≥ 1 MΩ after step 6 of the final cycle – (IR portion is Ref. Only)	Pass
Low Level Contact Resistance	12.7	< 50 mΩ (Short) & < 75 mΩ (Long)	Pass
Insulation Resistance	12.8	≥ 5,000 MΩ @ 250 VDC – Ref. Only	Pass
Visual and Mechanical	12.9	Free from defects, meet drawing requirements, H-Pins and spring probes move freely	Pass

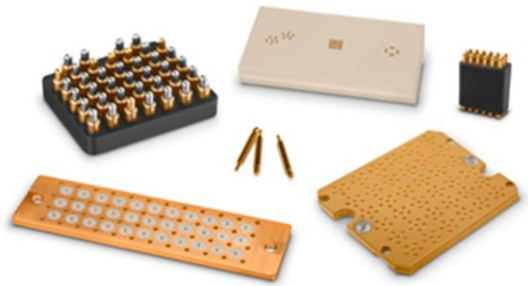
Product Overview

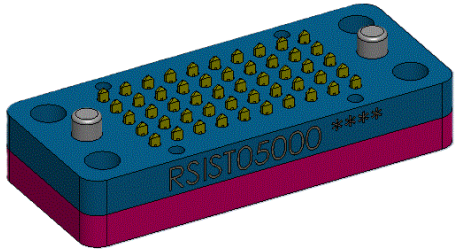
	Spring Probes	$$$	H-Pins	$
Bandwidth	Up to 50 GHz		< 12 GHz	
Compliance Range	.01 - 1.0 Inches		.014 - .031 Inches	
Number of Pin Layouts	Infinite		3	
Contact Wiping	No		No	
Power	1-3 Amps		4 Amps	
Operating Temperature	-65 to 165 °C		180°C	
Minimum Pitch	0.45mm (0.018 in)		1.27mm (0.050 in)	
Cycle Life	Up to 100,000		< 25,000	

Top

Middle

Lowest





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