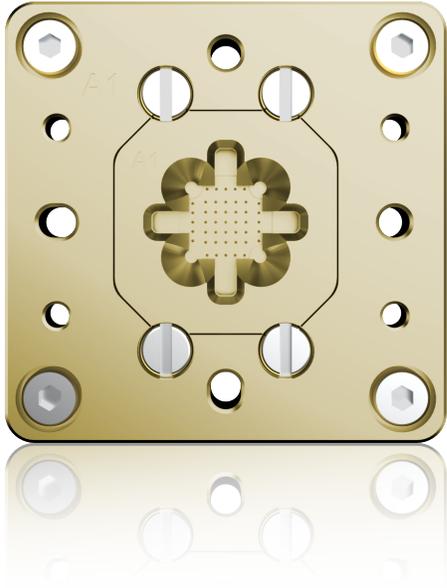


# Kepler Test Socket

High performance scrub contact technology for IC Testing



The semiconductor test industry has traditionally used spring pin technology for BGA, LGA, QFN, and QFP devices, while the cantilever scrubbing contact design has been used in peripheral segments to remove surface oxides and contaminants. However, the vertical spring probe technology used in the array segment allows for a dense population of individual contacts in the array with more Z-axis compliance.

While both contact technologies require maintenance and performance monitoring to ensure optimal results during testing cycles, the piercing effect of spring probes on gold pads has been a challenge due to the buildup of surface oxides. Additionally, the cantilever type has been associated with expensive PCB damage from rocking motion on PCB pad during cycling.

To address these issues, Smiths Interconnect developed the Kepler contact technology that combines the scrub motion of a cantilever contact with the versatility and modularity of a spring probe. The design includes horizontal movement during the downward stroke of the device to break surface oxides, provide stable and reliable contact, and inflict no damage to the PCB.

Furthermore, the fact that this new probe technology is integrated into a trusted Smiths Interconnect socket system ensures high performance, long life, and easy cleaning and maintenance.

Whether for testing high performance computing, wearables and other automotive chips, Kepler is the only solution that provides two-axis of motion during a single actuation of the socket. As a result, Kepler provides a boosted first pass yield, enhanced production reliability, and extended maintenance intervals.

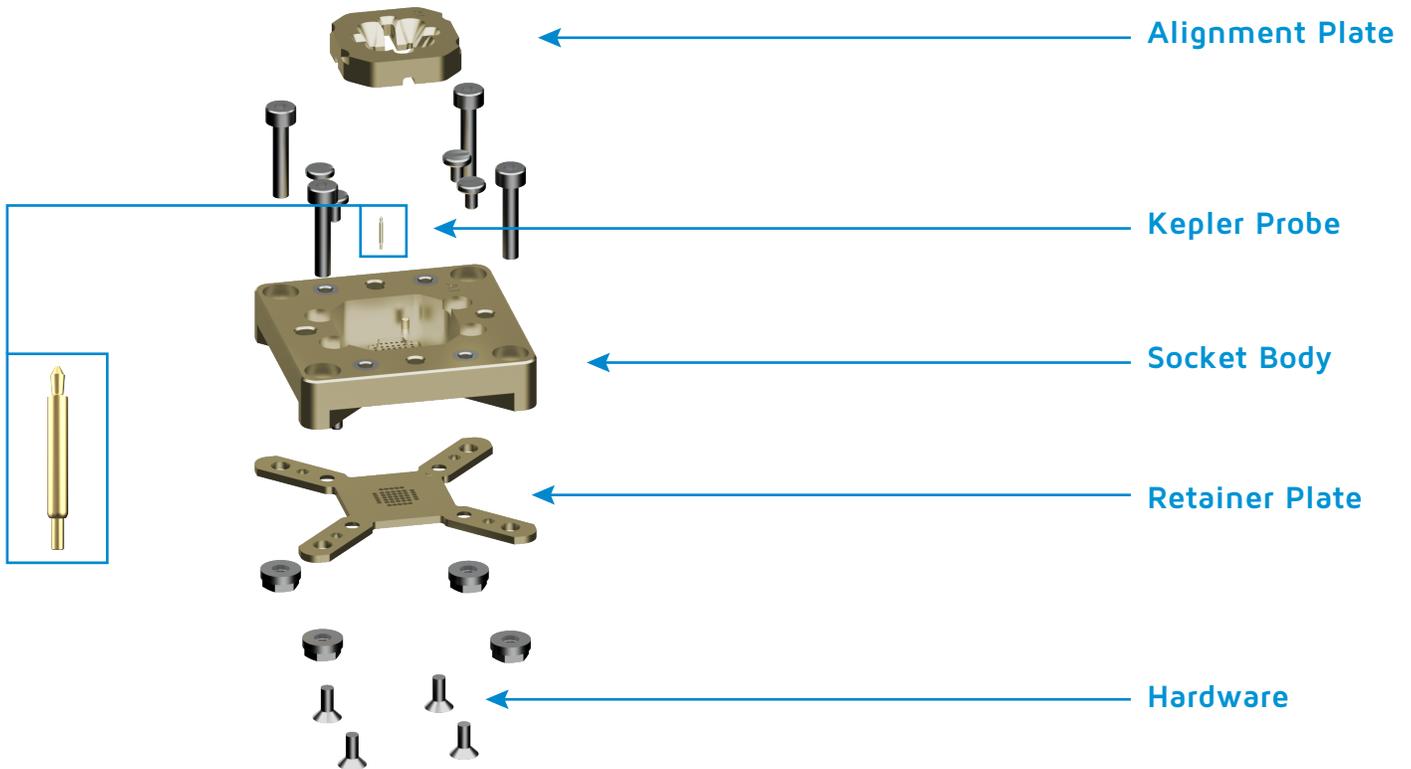
## Benefits

- Long contact life, low wear, tested to over 500K insertions
- Provides reliable and consistent contact for Matte Tin or NiPdAu pads, low contact resistance (CRES)
- Exceptional signal integrity
- Covers wide range of test applications
- Match existing PCB socket footprint and test hardware lead to cost saving for customers
- Field repairable, easy cleaning and maintenance
- Low Dielectric constant, Low CLTE, exceptional Flexural Modulus
- Allows for PCB topside components to be placed close to DUT for better signal performance and less signal loss

## Technical Features

- For testing LGA, QFN, QFP and other variants
- Scrub action breaks through surface oxides on device pad
- Short signal path
- Tri-Temp socket design to support -55°C to +150°C
- Configurable design flexibility for integrating into existing hardware setups
- Designed for manual test, bench test, and HVM production test
- Insulator housing made from high performance polyimide
- Small socket footprint

## Product Structure



## Technical Characteristics

### Mechanical Properties

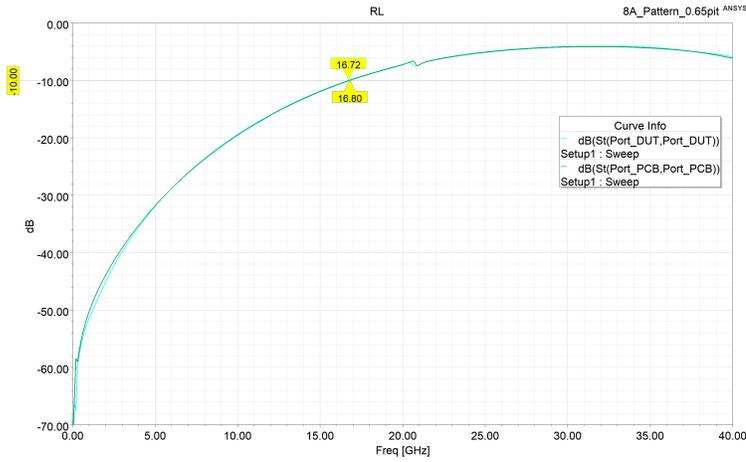
- Typical Application: LGA, QFN, QFP
- Pitches Accommodated:  $\geq 0.65\text{mm}$
- Contact Compressed Height:  $4.00\text{mm}$
- Contact Compliance:  $0.55\text{mm}$
- Contact Force:  $27\text{Grams}$
- Contact Wiping length:  $< 0.168\text{mm}$
- Operating Temperature:  $-55^{\circ}\text{C}$  to  $+150^{\circ}\text{C}$
- Socket Material: PI-5
- Contact Life: Contacts tested to  $500\text{K}$
- Socket Housing:  $\geq 1000\text{K}$

### Electrical Properties

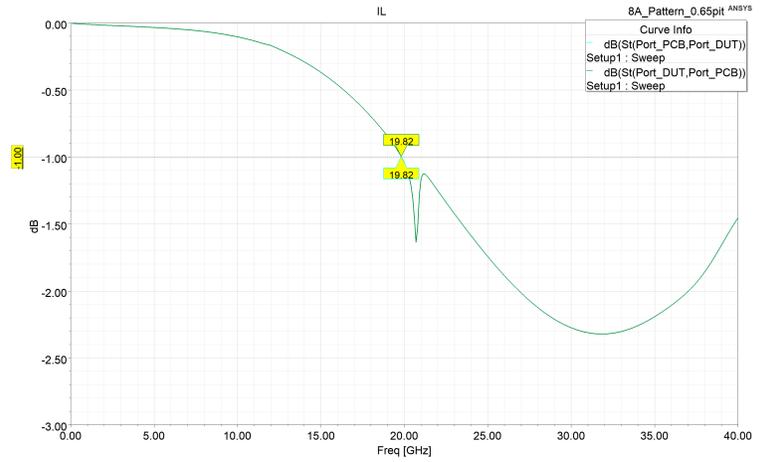
- Contact Resistance:  $50\text{m}\Omega$  @  $500\text{K}$
- Current Carrying Capacity:  $3.1\text{Amps}$
- Insertion Loss (GSG):  $19.82\text{GHz}$  @  $-1\text{dB}$
- Return Loss (GSG):  $16.80\text{GHz}$  @  $-10\text{dB}$
- Decoupling Area:  $> 1.0\text{mm}$

# S-Parameter

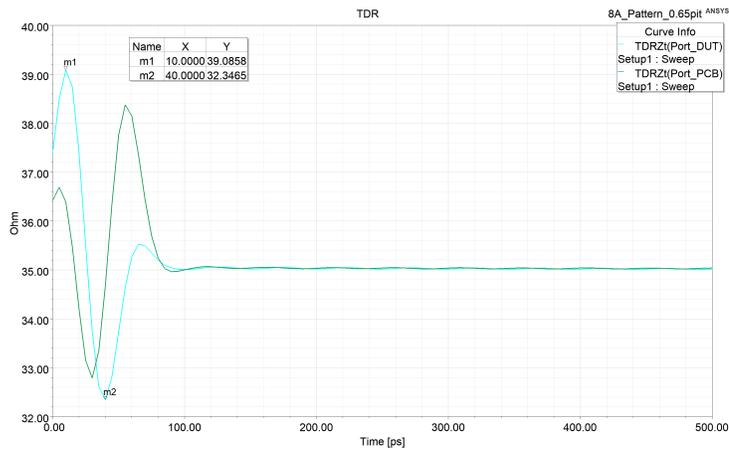
Return Loss



Insertion Loss



TDR



# Worldwide Support

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## Connecting Global Markets

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