

TWENTY-SEVENTH ANNUAL



TestConX™

Archive

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High frequency, High pin count, High current carrying Spring probe pin

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Introduction

Extremely high-frequency test and high pin count sockets have become key requirements in next-generation semiconductor test and interconnect applications.

By optimizing pin structures with low-resistance design, spring probe pins can provide a solution that simultaneously meets High Frequency, High Pin Count, and High Current Carrying requirements.

Features and Specification

- Extremely high-frequency performance up to ~ 80 GHz
- Designed for high pin count applications (up to 10,060 pins)
- High current carrying capability, Over 33 Ampere (at 1.5mm pitch)
- Very low contact resistance preferably
- Stable electrical performance under repeated mechanical cycling

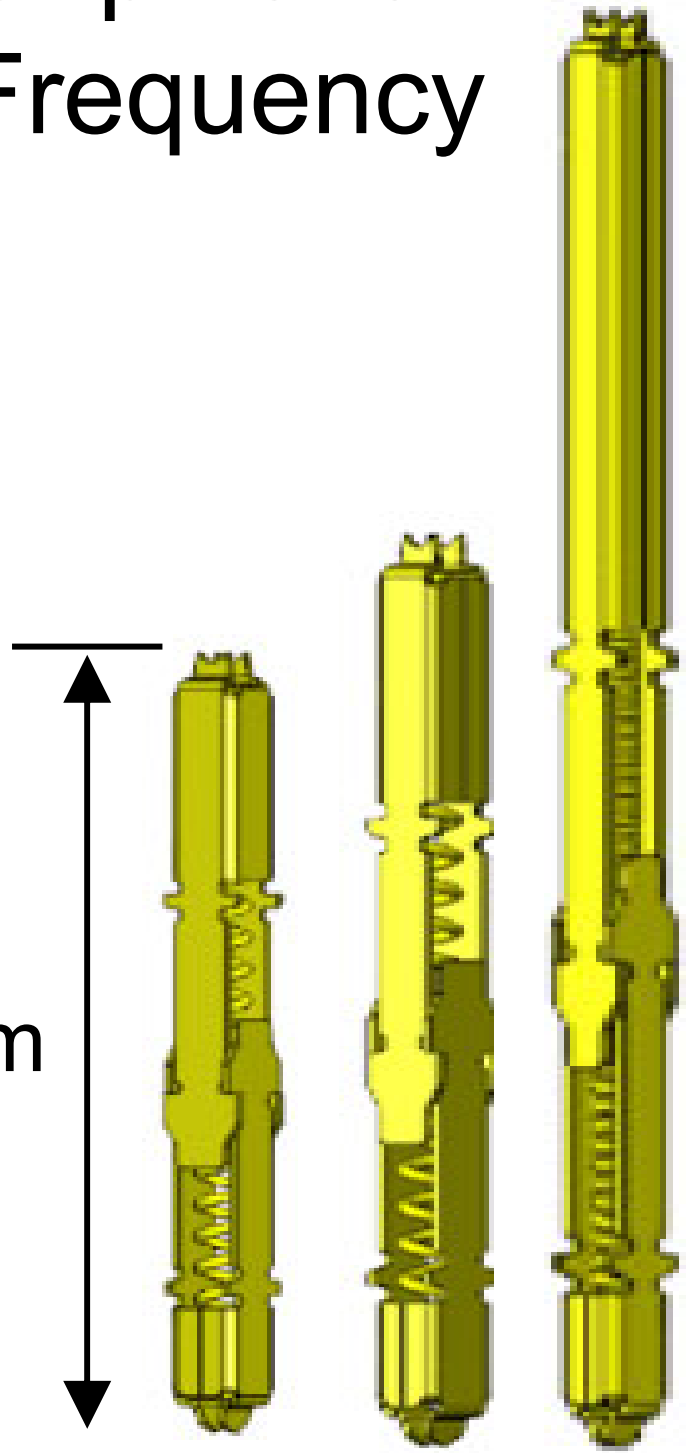
Why are High Frequency, High Pin Count, and High Current Carrying Spring Probe Pins Important ?

- Customers increasingly demand spring probe pins with precisely optimized high frequency, current capacity and low contact resistance tailored to harsh application conditions.
- Therefore, balanced pin designs that simultaneously address High Frequency, High Pin Count, and High Current Carrying requirements are essential for achieving customer-specific optimal performance.
- The next section illustrates how each of these key requirements is addressed and optimized in detail.

High Frequency Spring Probe Pin

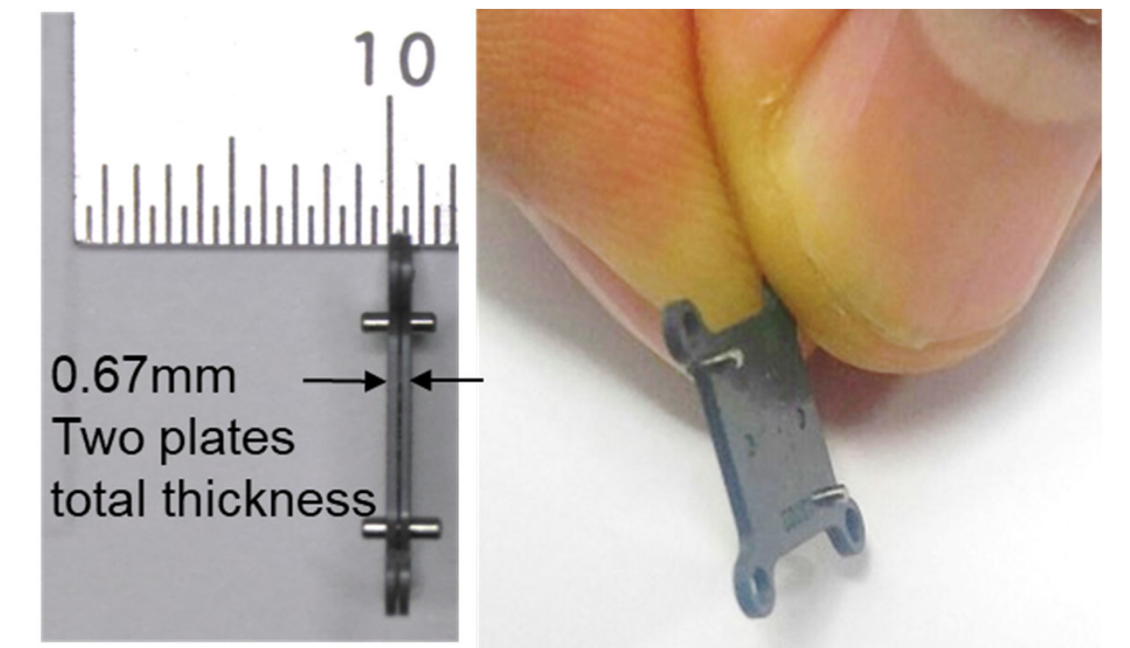
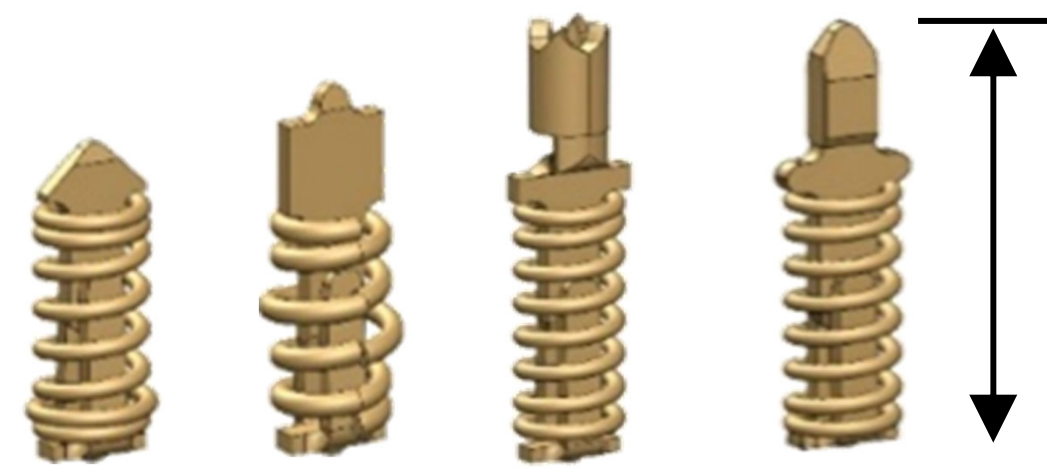
Longer pins for High Frequency

3.70mm



Shorter pins for High Frequency

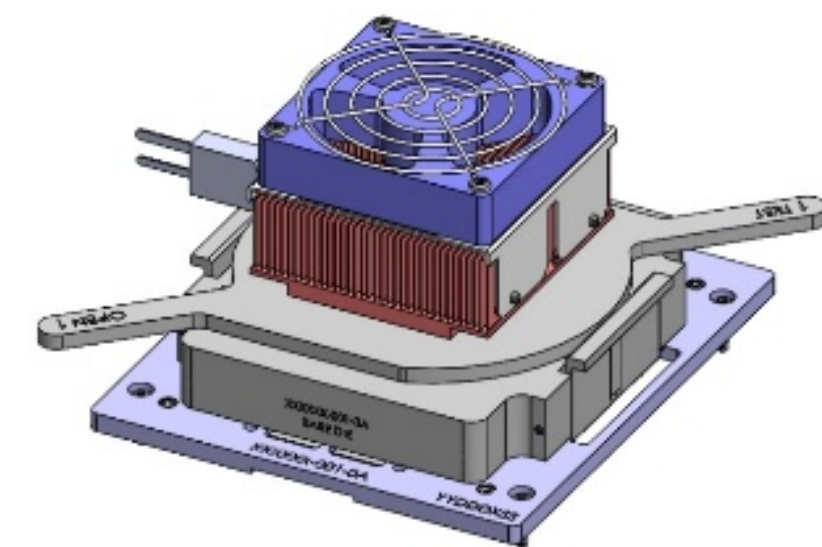
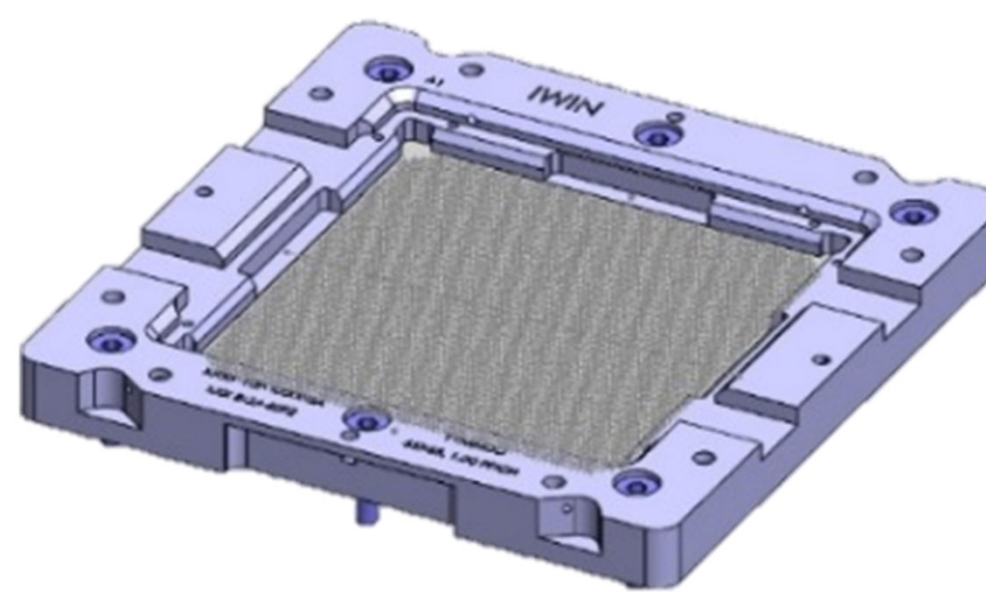
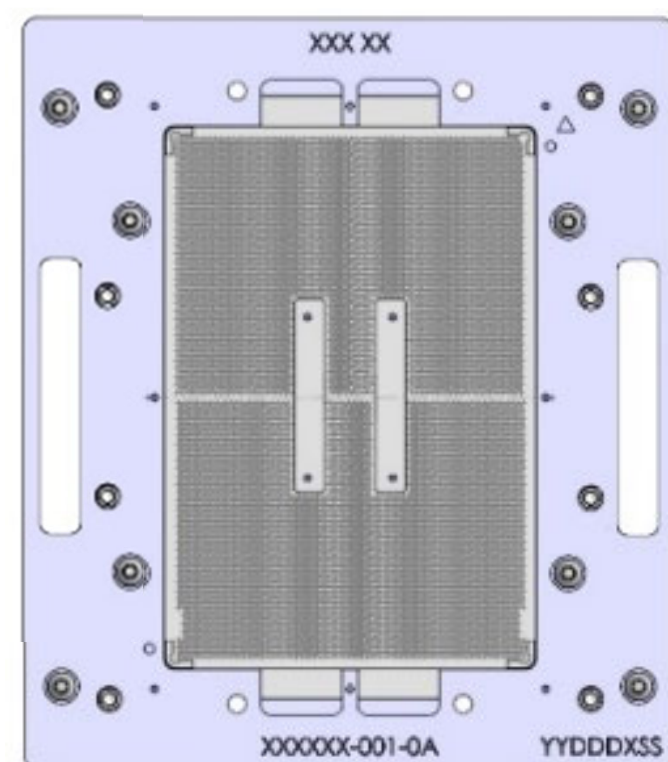
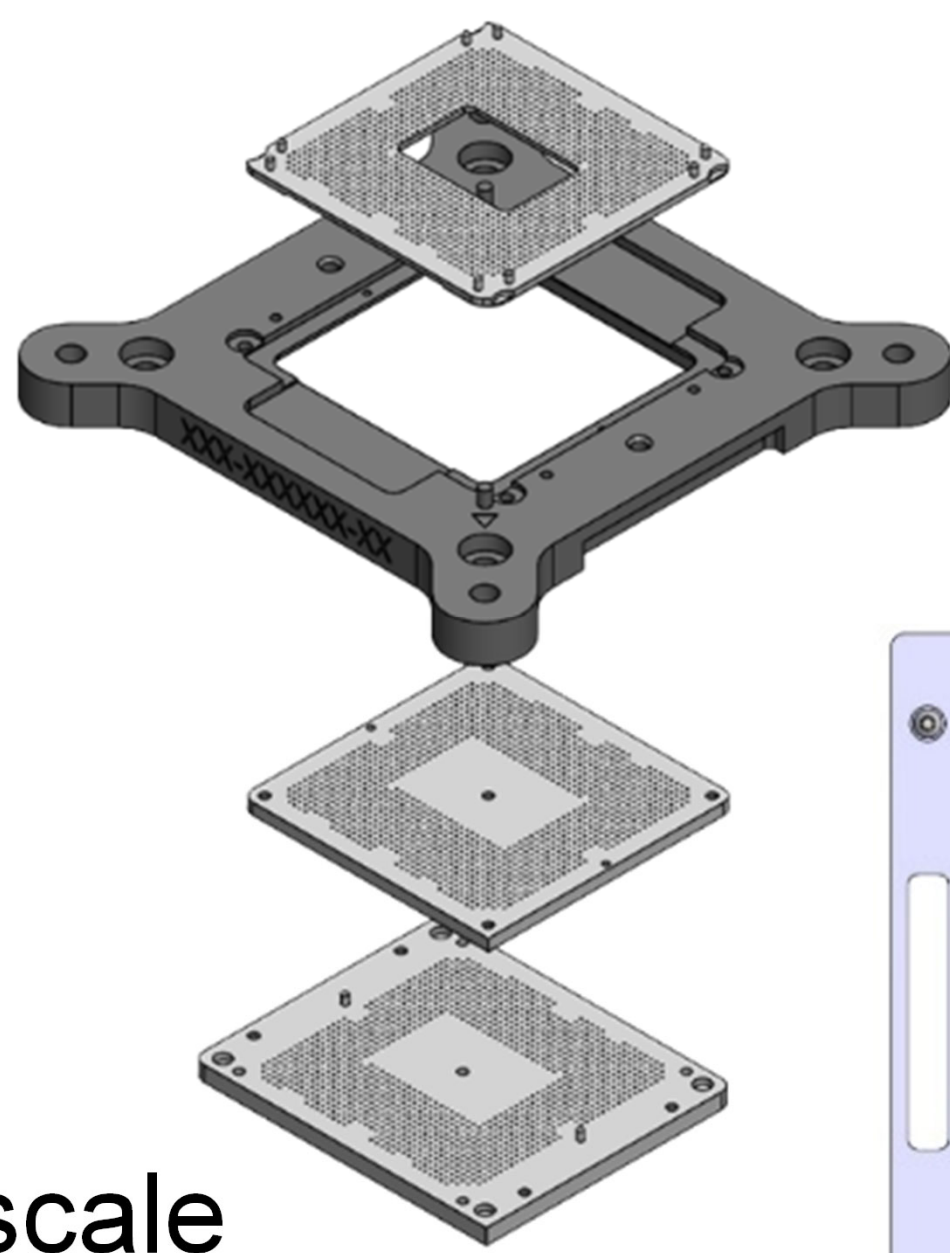
0.83mm



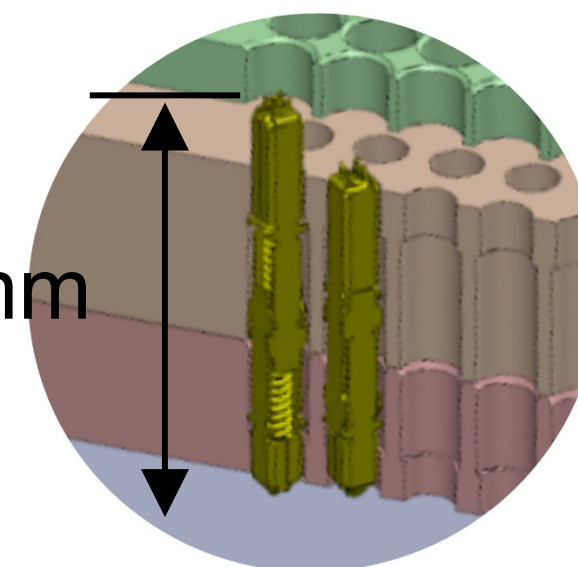
The short pins had been serving the high frequency requirements successfully. Later on there are cases high pin count such as 10,060 pin count. Furthermore, what if high frequency/high pin count/ adding requirement of high current carrying ?

High pin count sockets

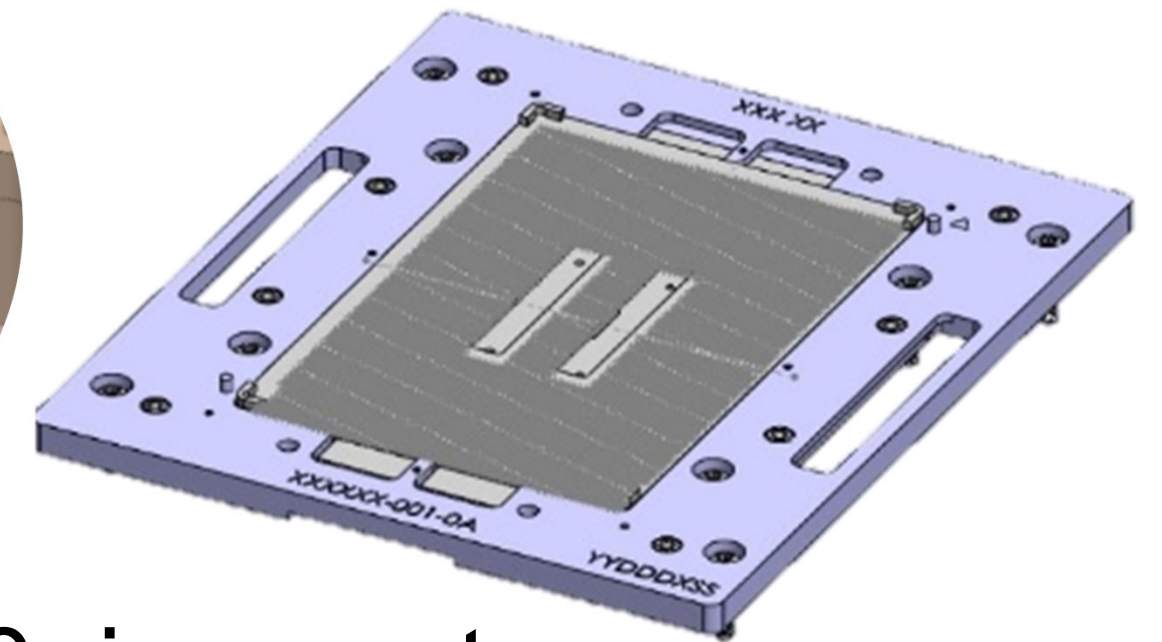
Big scale High pin count



6.70mm



10,060 pin count

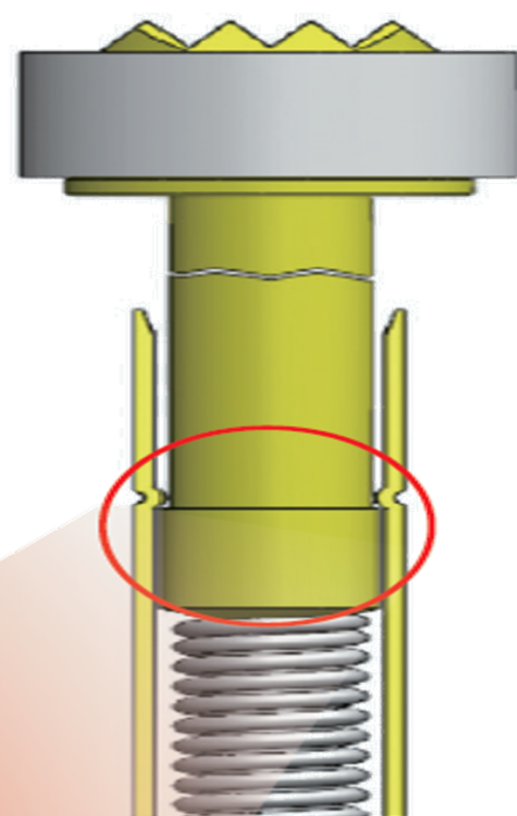


High current carrying Spring probe pin

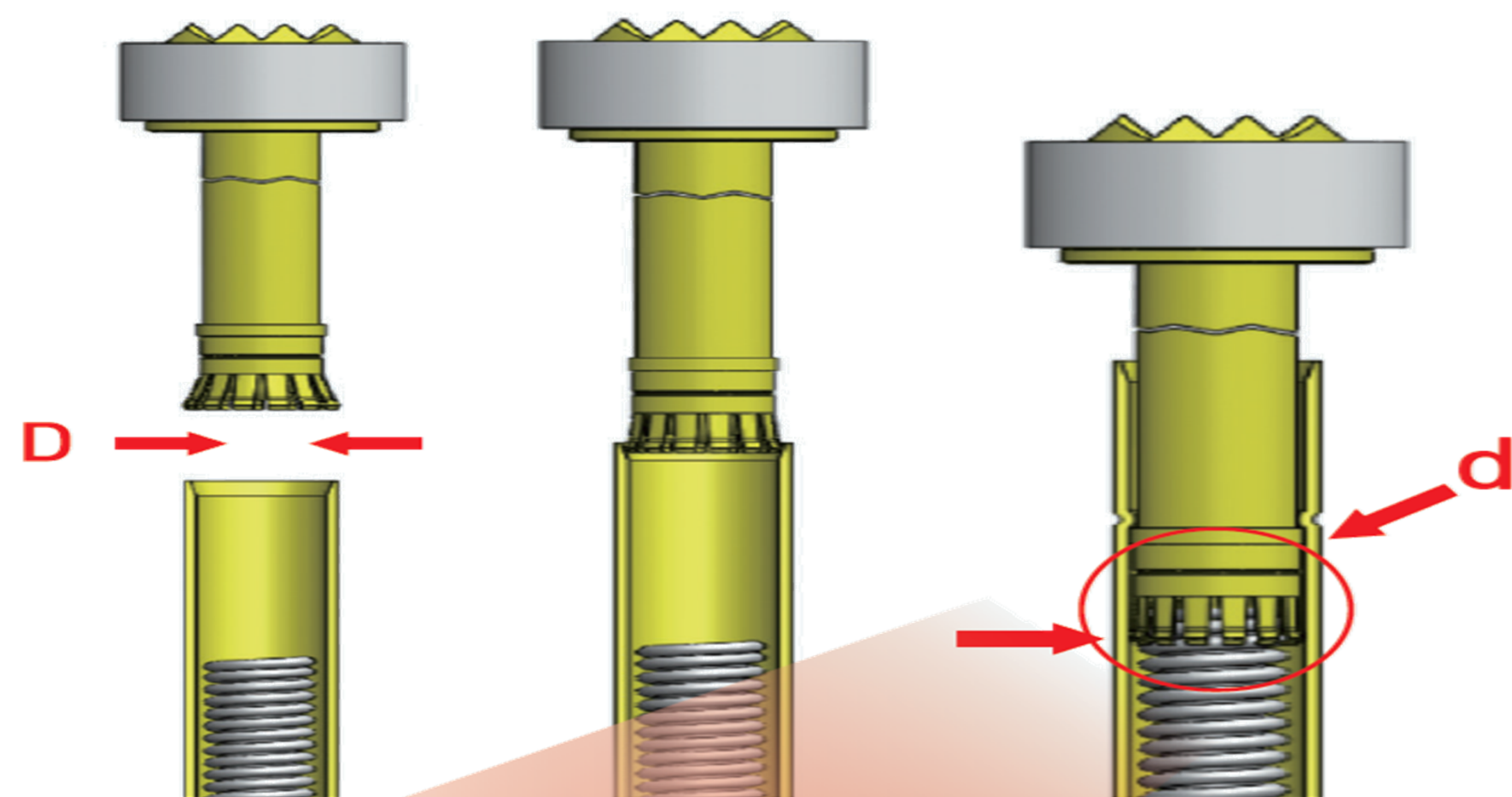
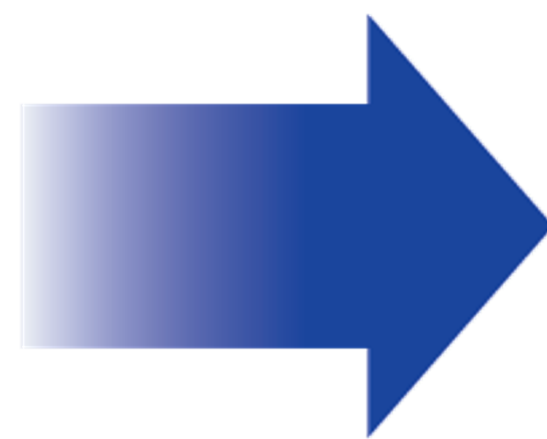
Before

New Technology

At free, brush with bigger diameter

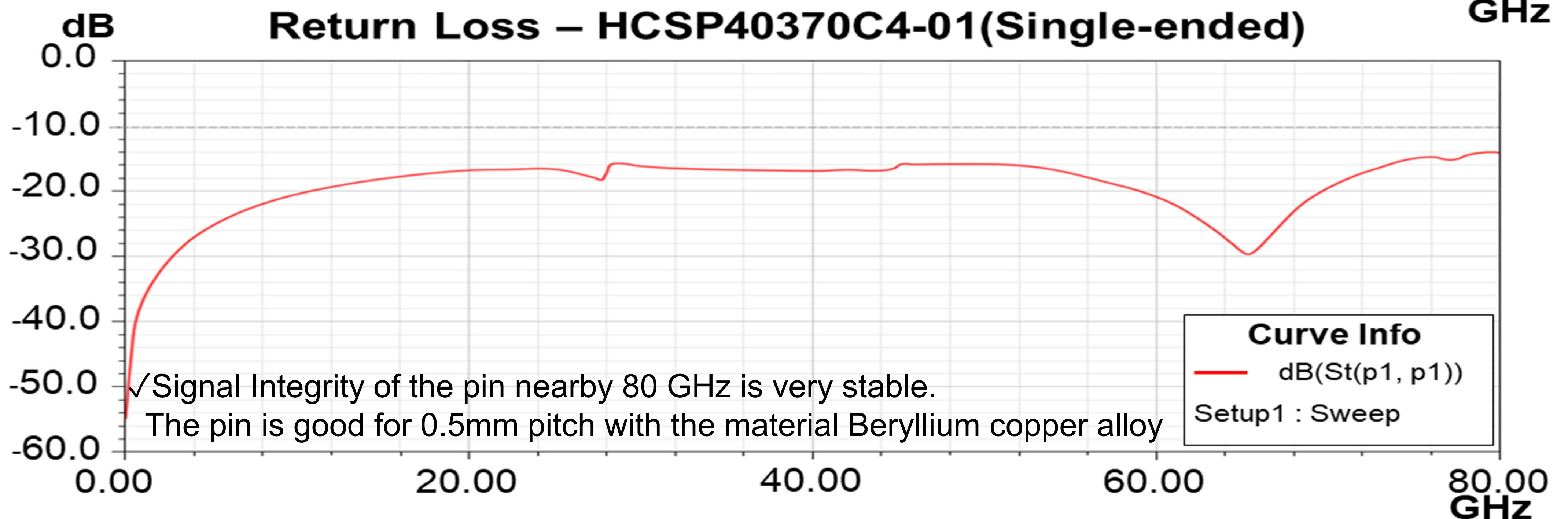
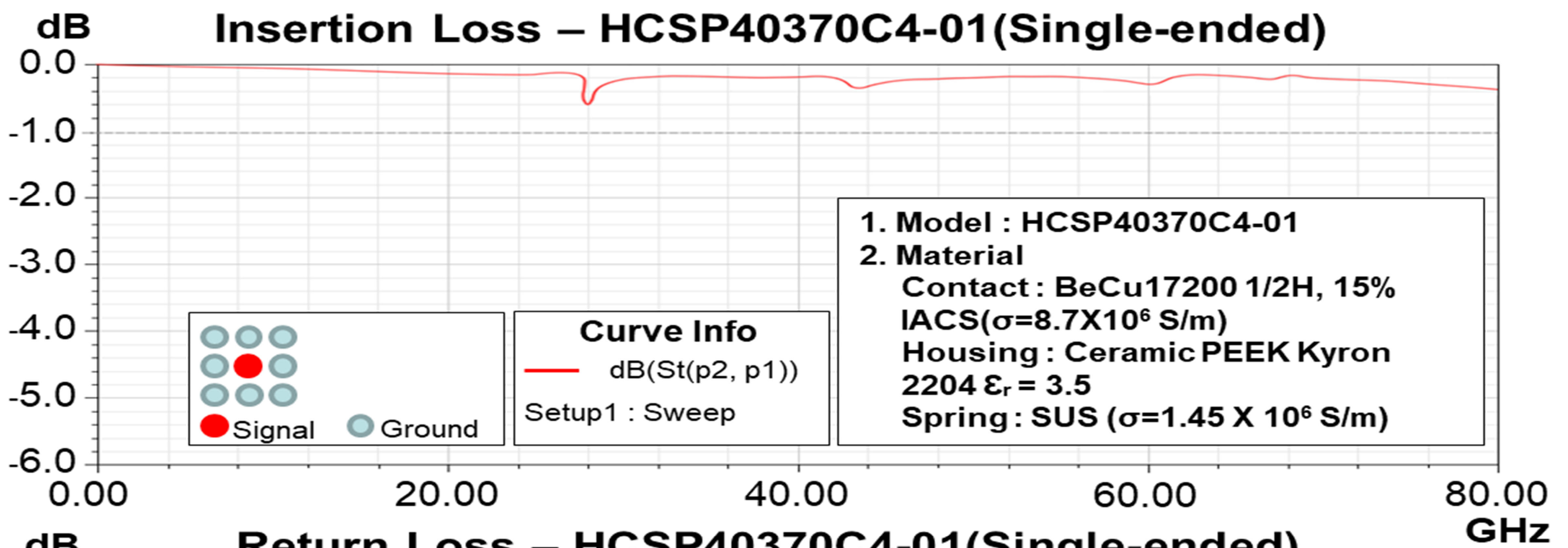


Clearance for up/down movement, but it causes Inconsistent/low current flow.

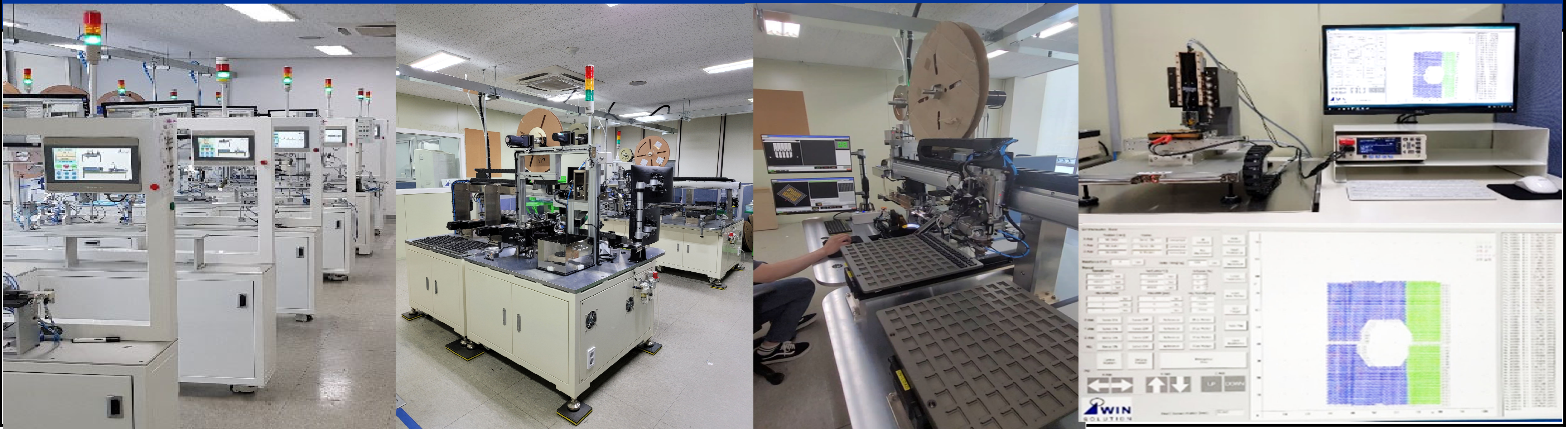


Assembled condition, brush compressed, diameter smaller with elasticity force. Multi brushes stable/ smooth contact to barrel body. Enabling reliable/ high current carrying capacity.

HCSP40370C4-01 – 3.7mm length pin but high speed



Automation



Summaries

We present solutions to the key technical challenges faced by the market through the following approaches.

- High-frequency requirements are met by applying pin geometries optimized for high-frequency performance, ensuring signal integrity.
- High current requirements are addressed by improving the contact interface design to achieve low resistance and stable current delivery.
- High pin count requirements are addressed through structural designs that minimize pin-to-pin interference, ensuring stable operation.

High frequency, High pin count, High current carrying Spring probe pin

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