TWENTY-SEVENTH ANNUAL

TestConX™

Archive

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Stamped Spring Probe Pin with Pd Alloy for Cost-Effective, High-Performance Solution

AJ Park
IWIN Co., Ltd.

G Justice
Deringer-Ney Inc.

Introduction

A Paliney 25 (Pd alloy) spring probe pin designed for stable electrical performance and cost-effective operation across demanding high-frequency and high-pin-count test applications.

Why Is Paliney 25 (Pd Alloy) Gaining Attention?

Paliney 25 is gaining attention as a practical alternative to gold (Au) amid continuously rising Au prices, while maintaining the stable contact reliability and electrical performance required in high-frequency, high-pin-count, and high-current test environments.

- Maintains stable contact resistance even in high-frequency applications
- Excellent wear durability under repetitive testing conditions
- Ensures signal integrity in fine-pitch, high-pin-count arrays
- Cost-effective material solution mitigates impact of rising gold (Au) prices

Features and Specification

- Cost reduction and mass production enabled through a stamped structure
- Optimized for high-frequency, high-pin-count, and high-current environments that require long-term stability
- Stable contact resistance ensured by Paliney 25 (Pd alloy) noble metal contact material
- Excellent signal integrity at all test frequencies due to lack of resistive films
- Supports pitches down to 0.15 mm

Technical Performance Comparison

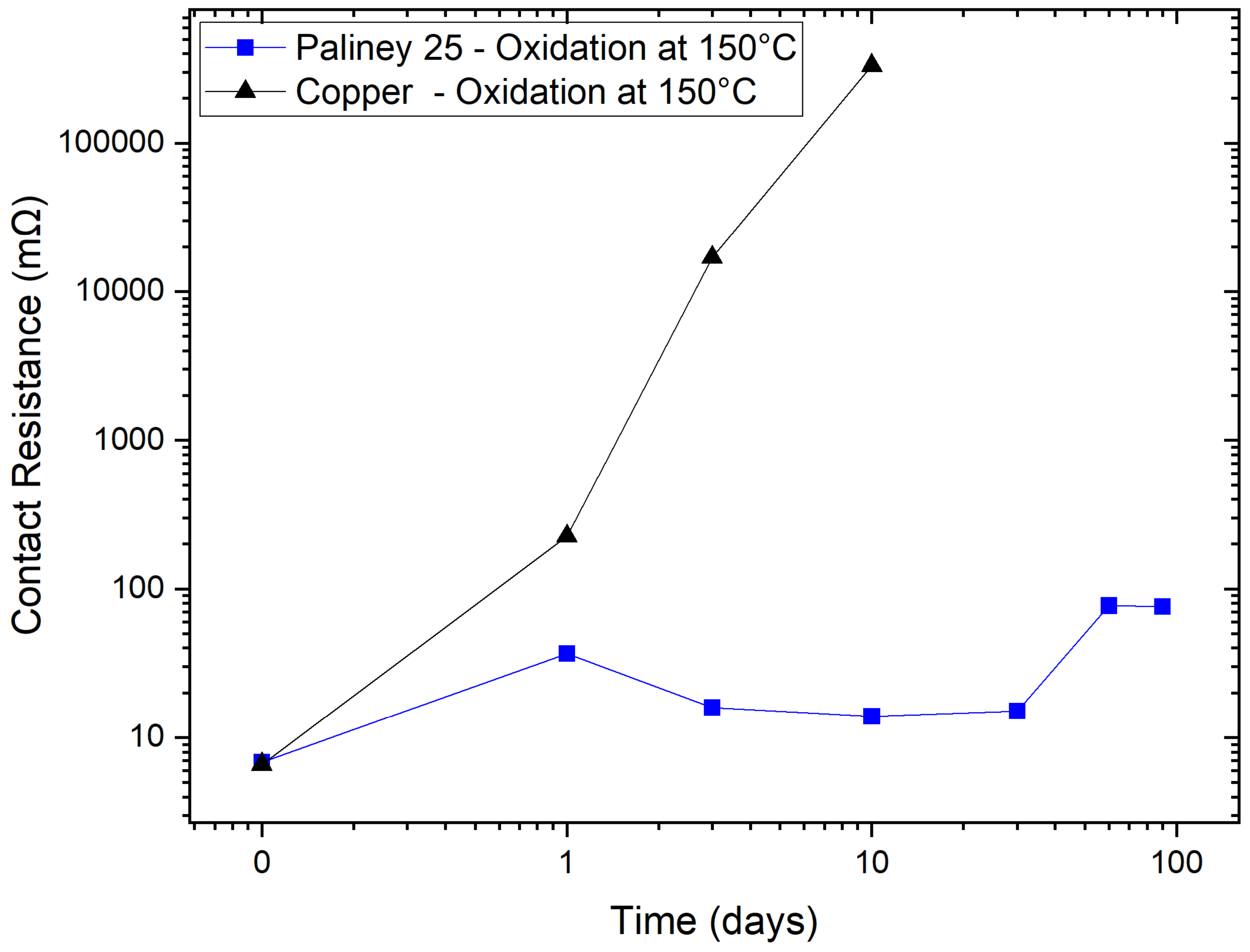
- **Contact Resistance (Initial / After Cycling)**: Comparable initial contact resistance to Au-plated pins, with stable performance after cycling
- **Wear Life (Cycle count):** Improved wear resistance under repeated insertion cycles due to Pd alloy contact surface
- **High-Frequency Stability**: Stable electrical performance in high-frequency test environments
- **Cost Index:** Reduced material cost and lower exposure to gold (Au) price volatility

Performance and Contact Resistance Result (Graph)

Nominal Properties	C17200 (Beryllium-Copper)	Paliney 25 Strip / Foil
Temper	1/2 HT (TH02)	HTA
Density, g/cm^3	8.4	10.6
Electrical Conductivity, %IACS (µΩ-cm)	22-28 (7.8-6.2)	25-28 (6.9-6.2)
Thermal Conductivity, Btu/hr-ft-°F (W/m-K)	60 (105)	67.1 (116)
Cres, oxidized 1,440h@150°C, 31 gf, mΩ	∞ (open circuit)	77.5
0.2% Offset Yield Strength, ksi (MPa)	170 (1175)	145 (1000)
Ultimate Tensile Strength, ksi (MPa)	190 (1300)	165 (1150)
Elongation to Failure, %	6	8
Knoop Microhardness, HK	380	390

Paliney 25 designed for:

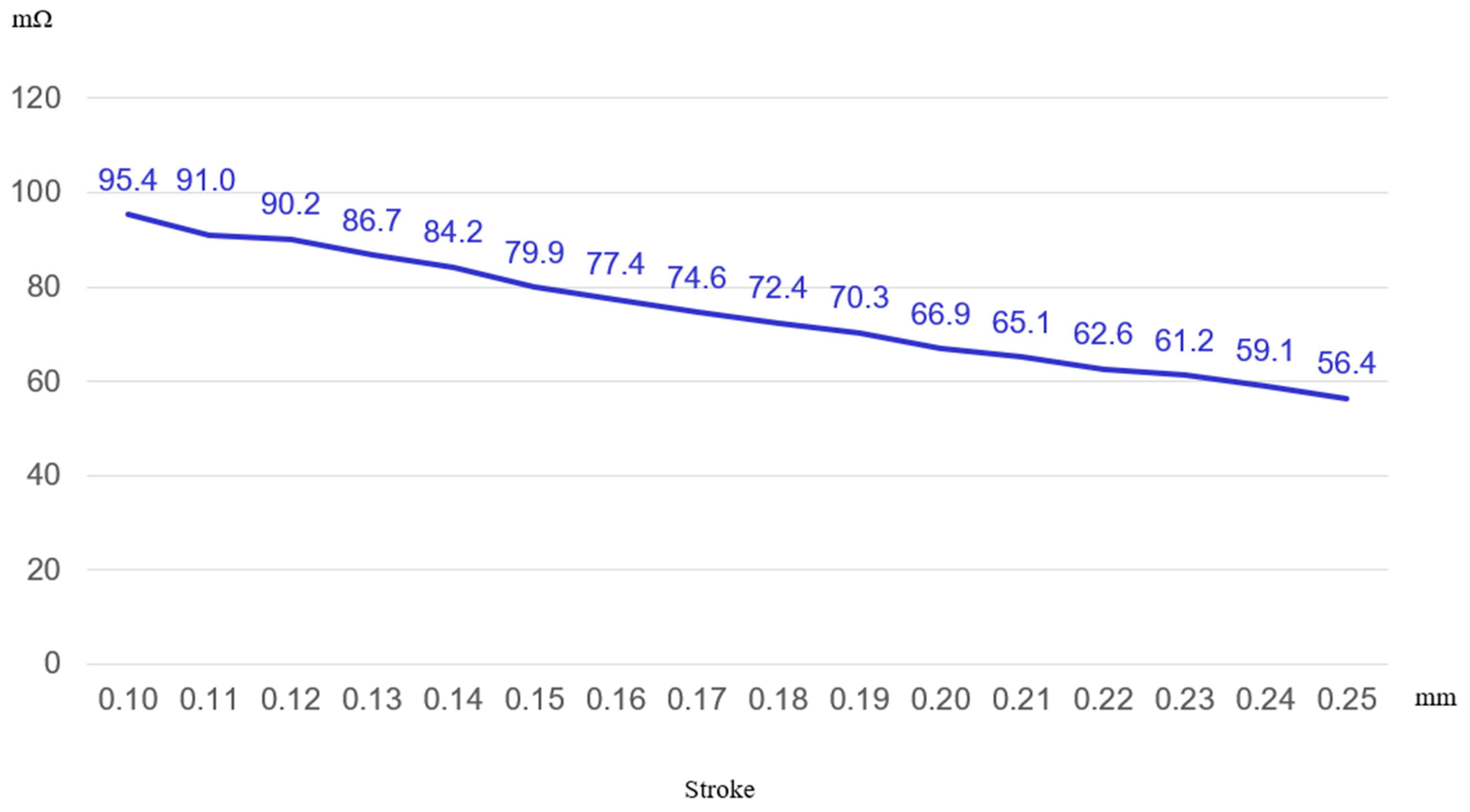
- High bulk conductivity
- Low contact resistance (<100 mΩ) / Stable at 150°C
- High hardness / wear resistance



Application Areas

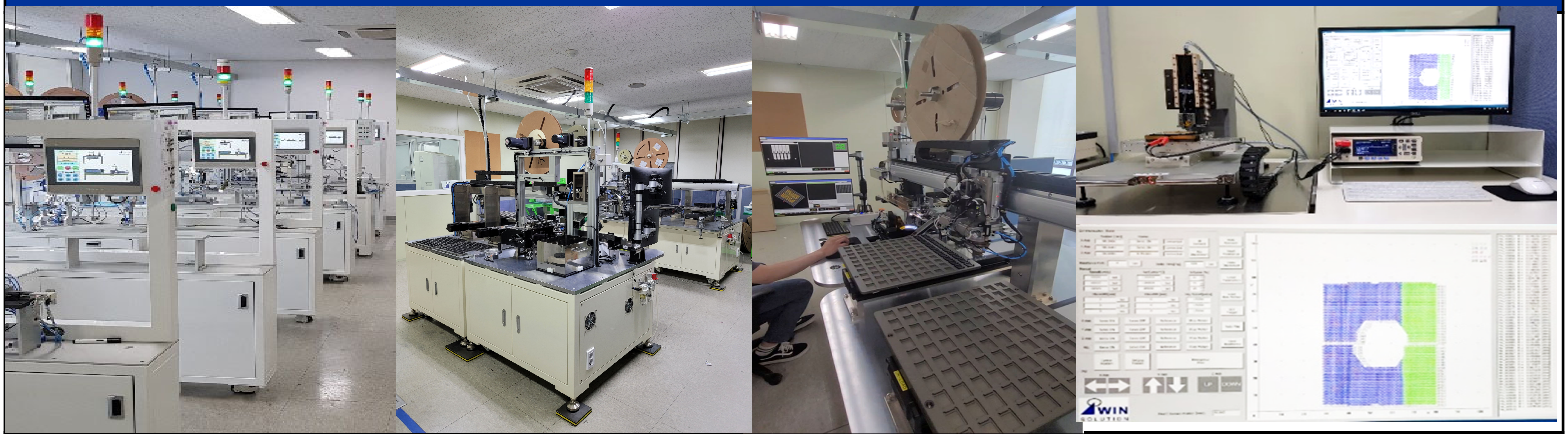
High-Frequency IC Test
AI / HPC / High-Pin-Count Packages
Fine-Pitch Test Sockets
High-Current Test Applications

Test Result from Prototype Spring Probe



- **Test method:**
  - Apply the specified current for 1 minute, then cool for 1 minute
  - Start at 1 Amp increase by 0.5 Amp and test
  - Measure allowable current carrying
- **Results:**
  - Over 2.4A, contact force was changed
  - Acceptable 2.3A for one minute
- **Discussion:** Results consistent with high temperature capability and high conductivity of Paliney 25 (Pd Alloy)

Automation



Summary

A Paliney 25 (Pd alloy) stamped spring probe pin delivering stable performance in high-frequency and high-pin-count test environments, while providing a cost-effective alternative to gold (Au) with reliable durability for repetitive testing.

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