HAWK
A Hybrid Probe Card

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Outline

- Roadmap
- HAWK Concept
- Electrical and Mechanical Data
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- Specifications
- Summary
# JEM Technology Overview

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Pitch Roadmap

- VCPC (64 Die)
- HAWK (128 Die)
- Epoxy (32 Die)

Year:
- 2001
- 2002
- 2003
- 2004

Pitch (μm):
- 150
- 130
- 110
- 90
- 70
- 50
Why HAWK?

- Smaller pitch
- Lower probe force
- Individually-replaceable probes
- Improved DUT layout flexibility
- Fewer cleanings
- Higher bandwidth
HAWK
HAWK Probe

SWTW 2002

Probing for the 21st century
Contact Mechanism

Over Drive

Release

SWTW 2002

Probing for the 21st century
Probe Force

Overdrive (µm)

OD25  OD50  OD75

Probe Force (g)

Max  Min  Avg

0  1  2  3  4

Probing for the 21st century
Scrub Mark

50 µm OD

70 µm OD
Alignment

TEST CONDITIONS
Temp : 100°C
OD  : 70 um
Load : 50mA; 10 ms
Pad  : Al-Cu

SWTW 2002
Probing for the 21st century
Planarity

TEST CONDITIONS
Temp : 100°C
OD  : 70 um
Load: 50mA; 10 ms
Pad : Al-Cu
CRES vs. Overdrive

TEST CONDITIONS
Temp : 100°C
OD : 10 - 80 um
Load : 50mA; 10 ms
Pad : Al-Cu

Overdrive (µm)

CRES (Ω)

max
avg.
min

0 20 40 60 80 100
0 20 40 60 80 100

max
avg.
min
CRES Stability

TEST CONDITIONS

Temp.  : 90 °C
OD     : 60 um
Load   : 50mA; 10 ms
Pad    : Al-Cu
No cleaning

CRES Stability Graph:
Cleaning Data

Cleaning

CRES (Ω)

Touchdowns

SWTW 2002

Probing for the 21st century
Probe Tip Cleaning

70 µm OD / 85 °C / Al-Cu

5K TD | Clean | 5K TD | Clean | 5K TD | Clean | 5K TD | Clean

Probing for the 21st century
Probe Tip Wear

One cycle of 10 touchdowns on the cleaning sheet is repeated 500 times.

==> Probe tip wear is relatively little.
Specifications

- Minimum Pitch: 80 µm
- Probe Force: 2.8 gf @ 70 µm OD
- Max. Scrub Mark: 30 µm
- Alignment: ±10 µm
- Planarity: ±10 µm
- Tip Shape: Flat-top pyramid
- Tip Size: 10 ±5 µm
- Tip to Guide Plate: 750 µm
- Max. Current: 250 mA (continuous)
Summary

- New solution for highly-parallel memory.
- Fine pitch.
- Easy to repair.
- Uniform probe shape.
- In use at multiple production sites.