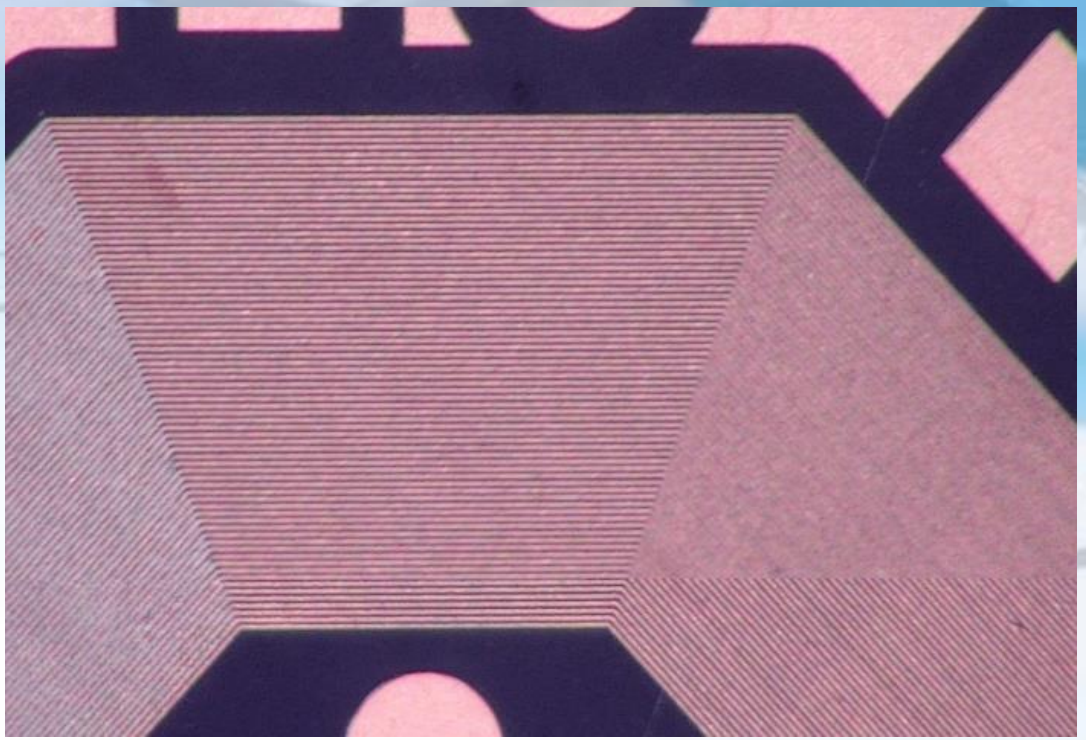
Partners In Performance

Operational Excellence

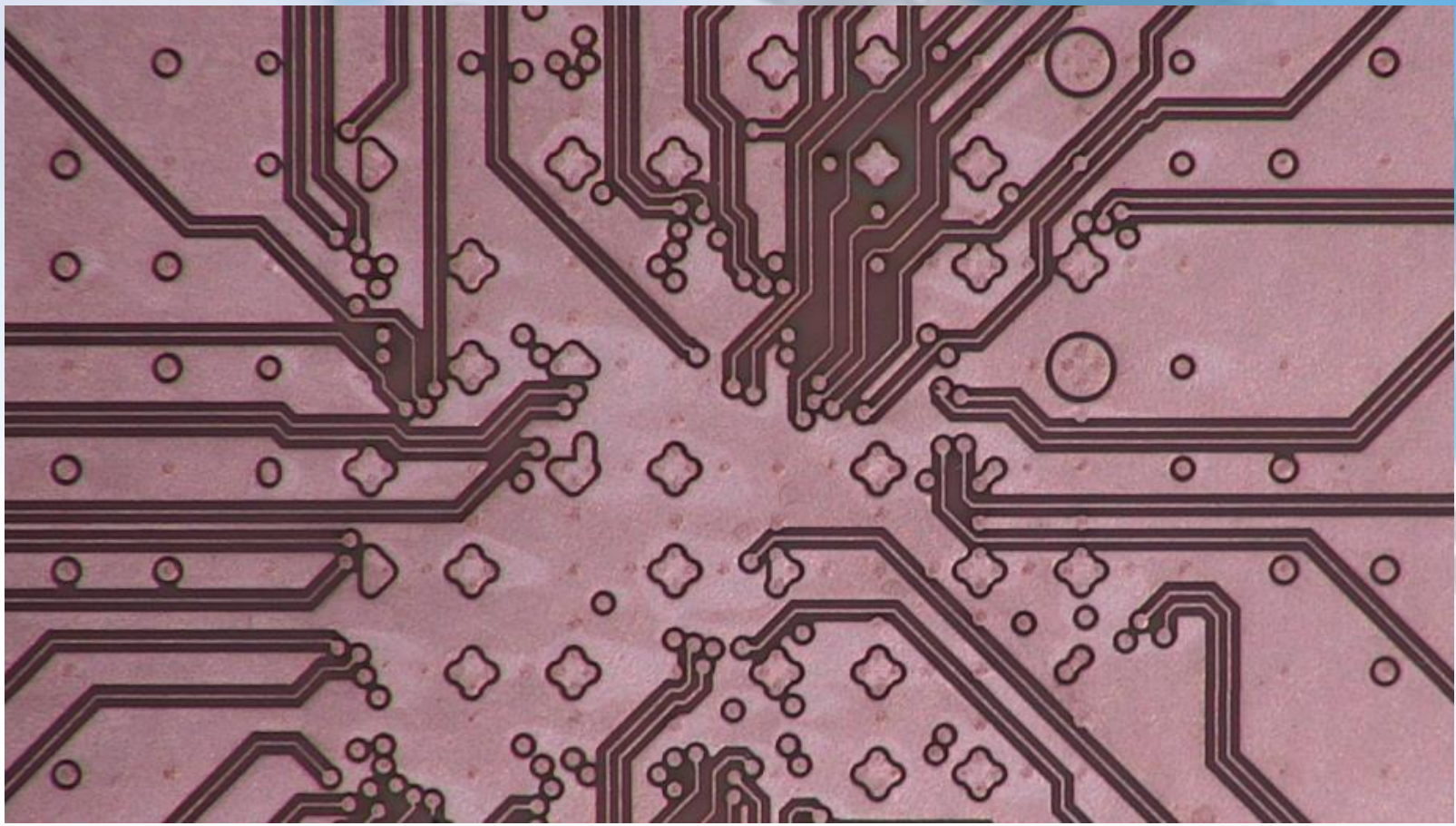
FTG Corporation
FTG:TSX

Averatek A-SAP™ Process



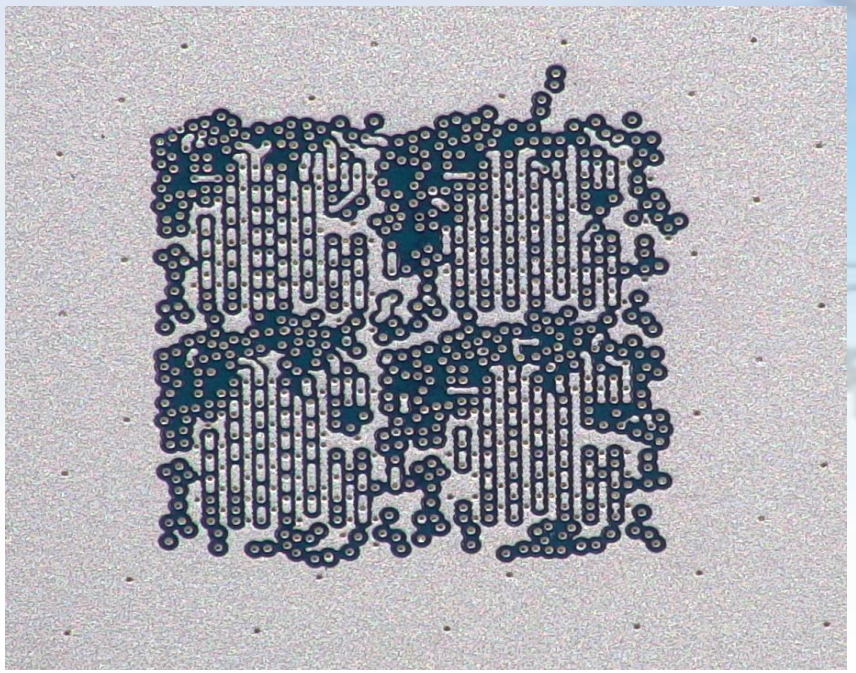
25µm (0.001”) Line Width and Spacing after Plating
Copper Thickness 20.8µm (0.00082”)

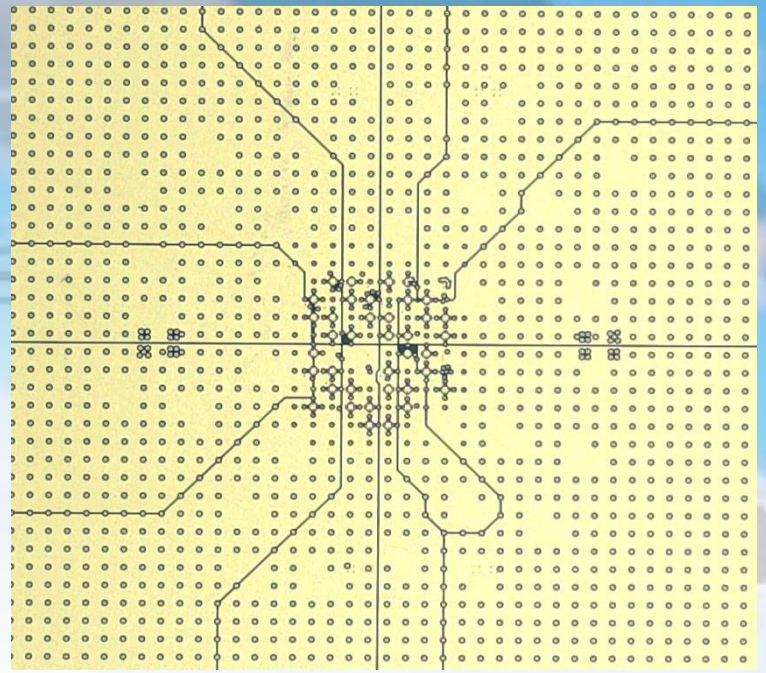
Averatek A-SAP™ Process



“25µm (0.001”) Line Width, 50µm (0.002”) Spacing after Plating and Etching – Copper Thickness 23.6µm (0.00093”)

Averatek A-SAP™ Process
6 layer Build Up Design

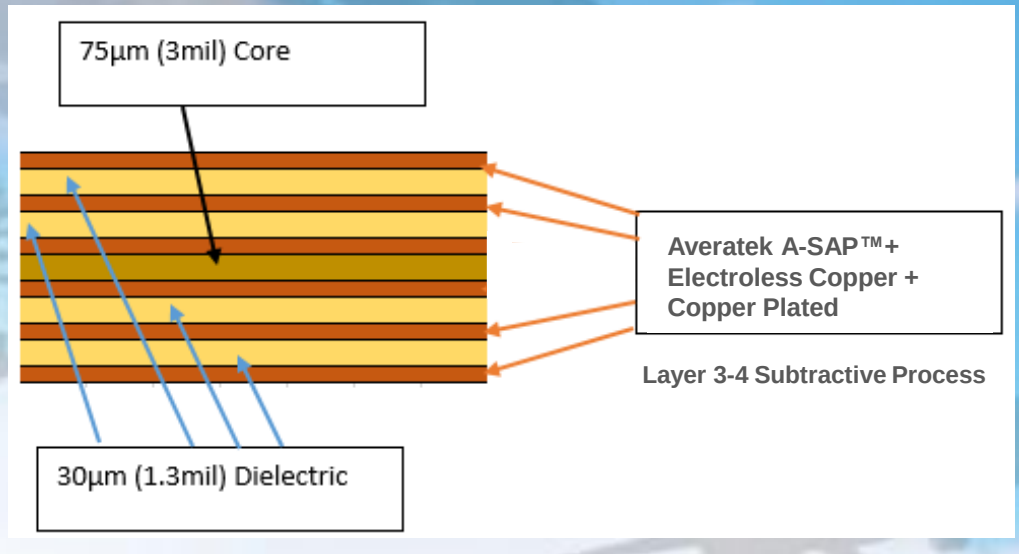




25µm (0.001”) Line Width, 50µm (0.002”) Spacing after Plating and
Etching – Copper Thickness 23.6µm (0.00093”)

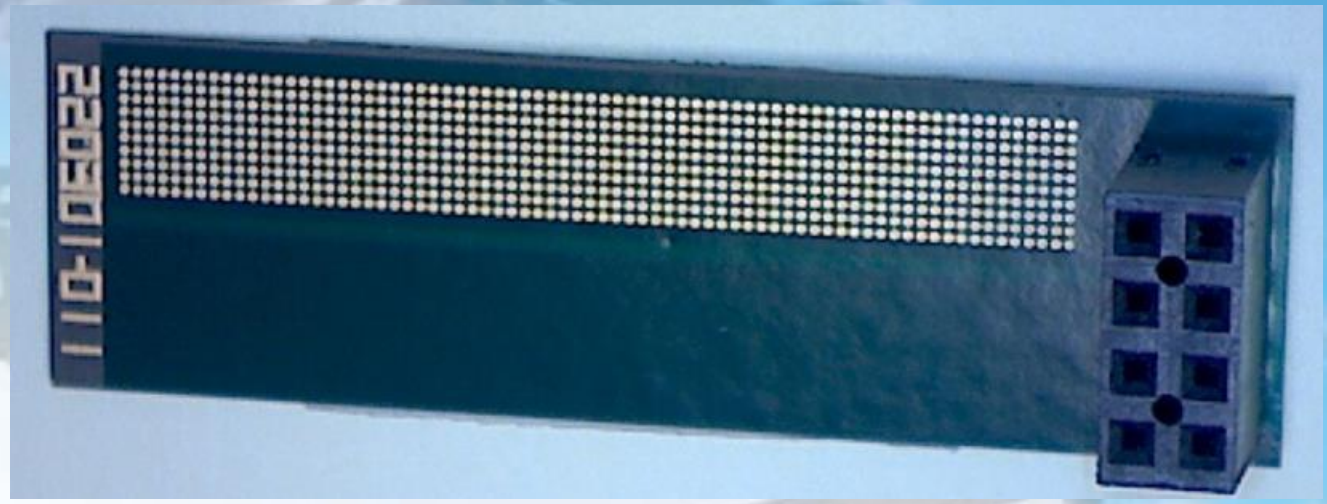
Reliability – Coupon Design

- A 6 layers - 400µm (16mil) thick ‘D’ coupon using build up technology.
- Material: Panasonic R1755V/R1650V
- Design was a build up technology using 100µm (4mil) microvias (0.33 to 1 aspect ratio)
- Only internal Microvias were copper plated shut.
- Surface finish- ENIG



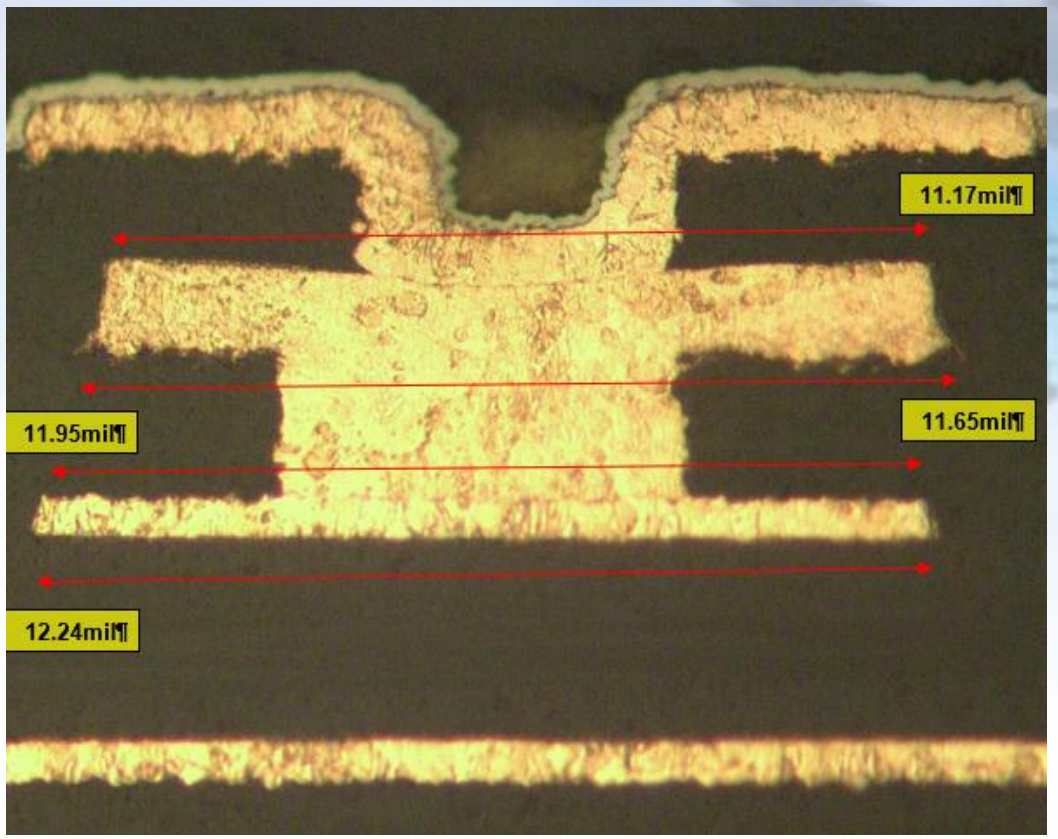
Thermal Stress Testing

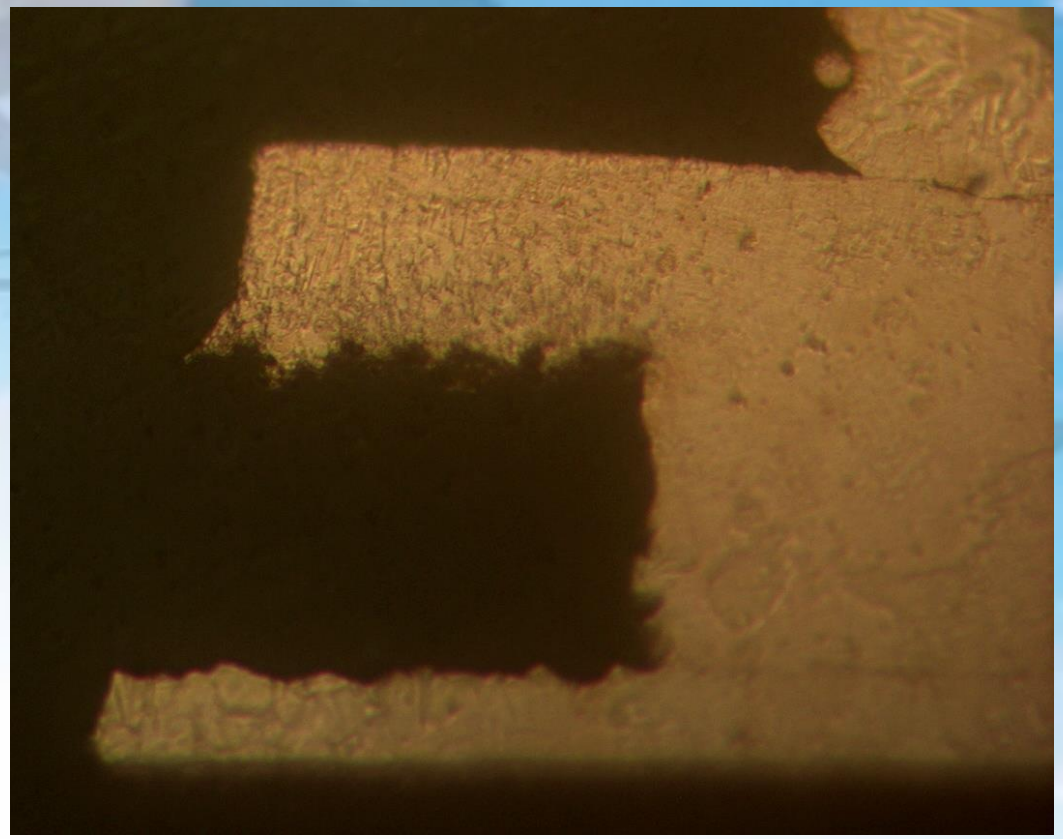
- Coupons were sent to CAT Inc. for Om testing
- Test Parameters:
  - 6X Reflow @ 265^0 C
  - Thermal Shock – 100 Cycles @ (-)45^0 – 150^0 C
- Acceptance criteria – Change in resistance <5%
- No visual delamination



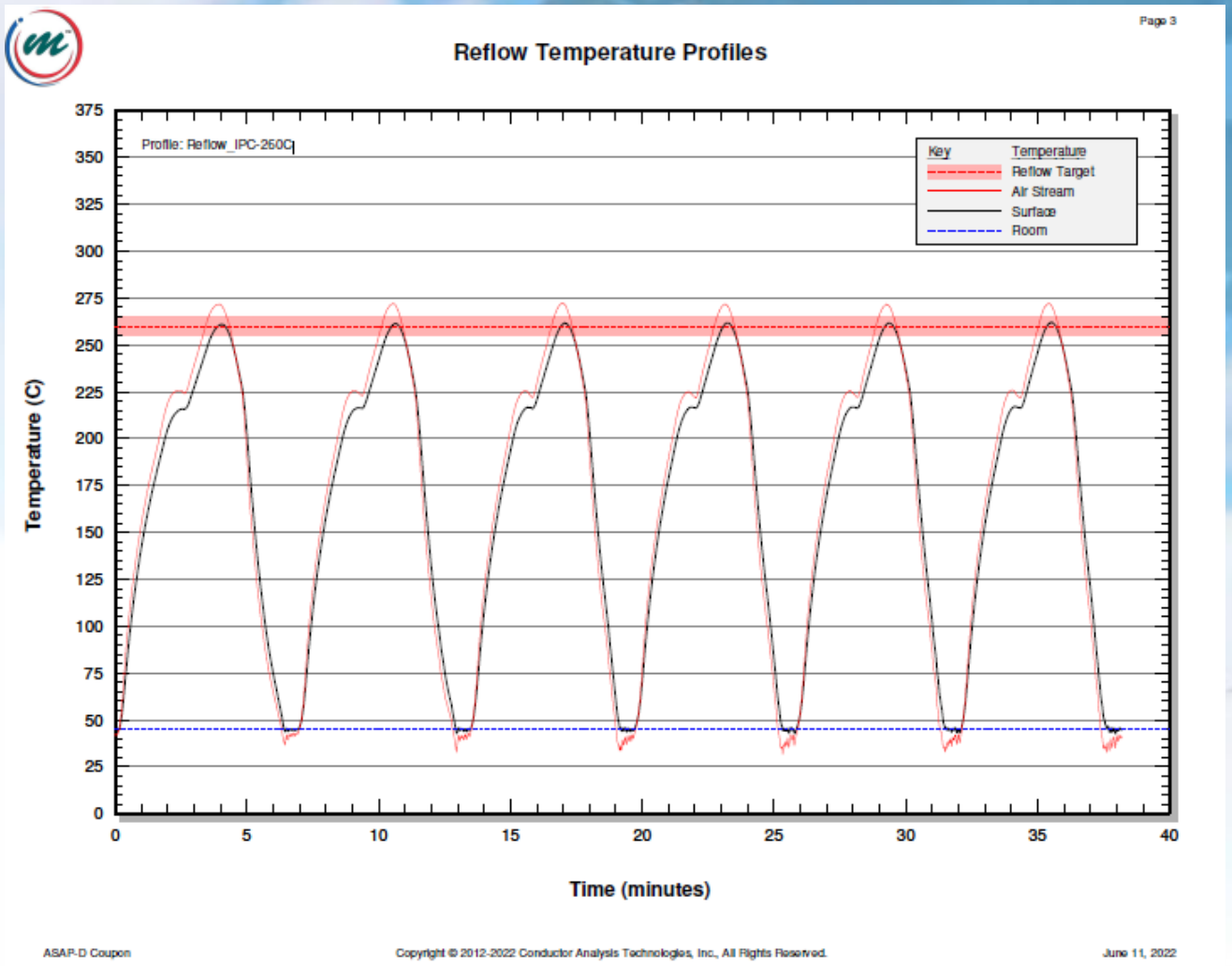
Averatek A-SAP™ Etch Capability

Operational Excellence



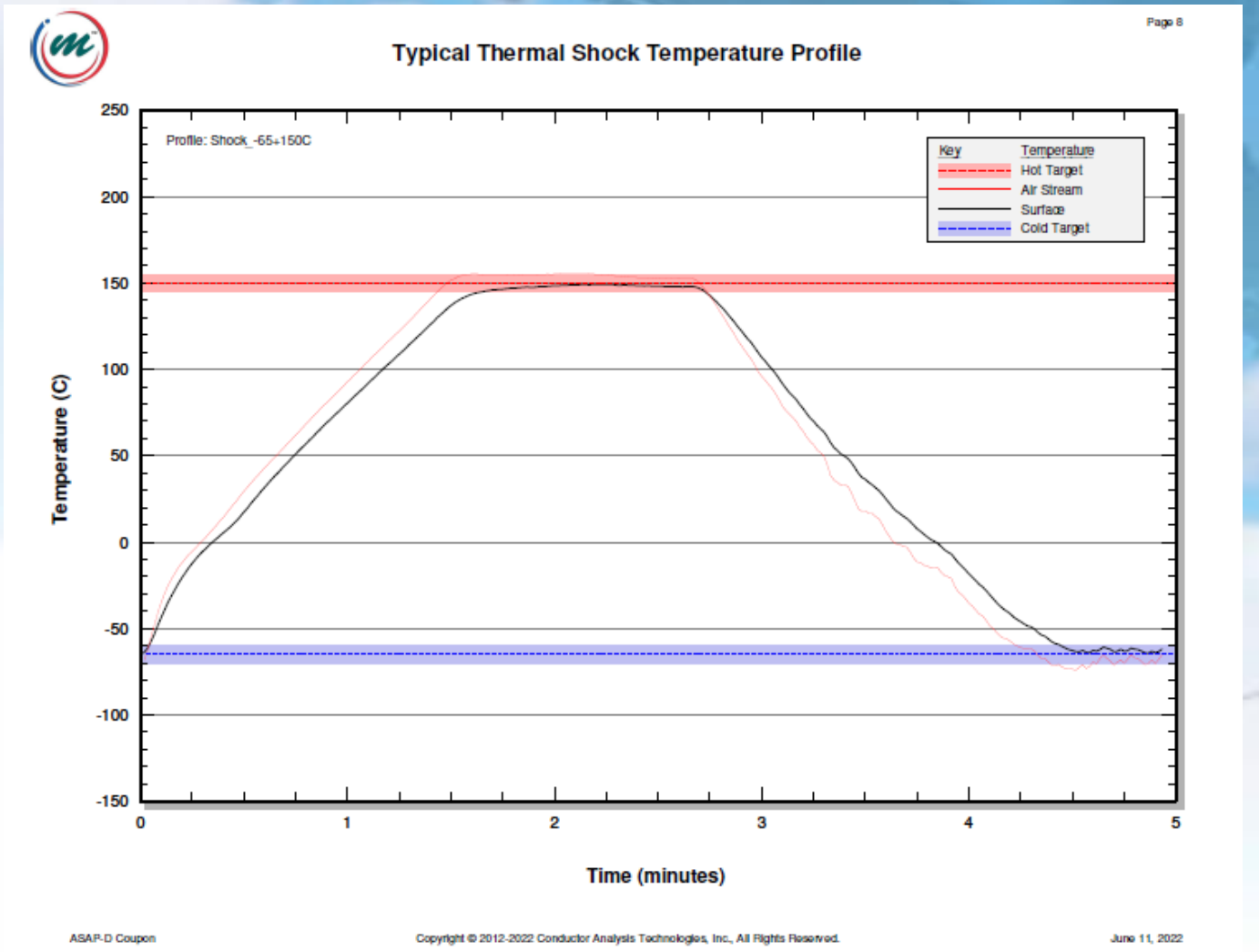


Thermal Stress Testing



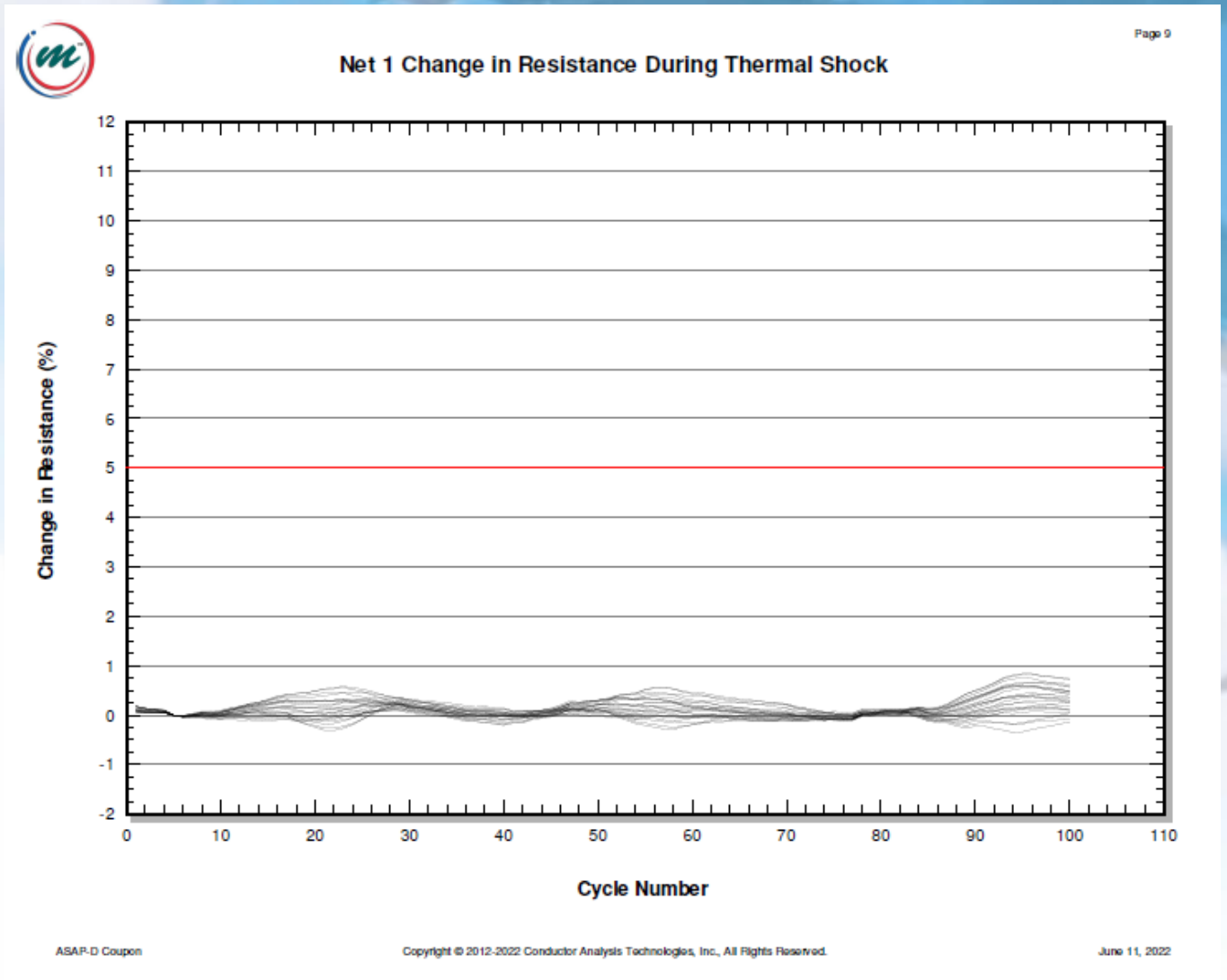
Pre-conditioning – Reflow 6X @265^{0}C

Thermal Stress Testing



Thermal Shock Profile

Thermal Stress Testing



Change in Resistance during Thermal Shock