



Honeywell Thermal Interface Materials Reliability Report

PTM7950



Honeywell

Introduction

- **Purpose**

- This test is intended to provide the thermal performance stability data of Honeywell Thermal Interface Material via different accelerated conditions.

- **Test Method**

- Thermal Impedance via Laser Flash Test (ASTM E1461)

- **Test Procedure**

- 20x20mm standard dimension TIM is prepare for TI test.
- TIM is applied both Cu plates as sandwich structure.
- Measure TI data before and after each test read point.

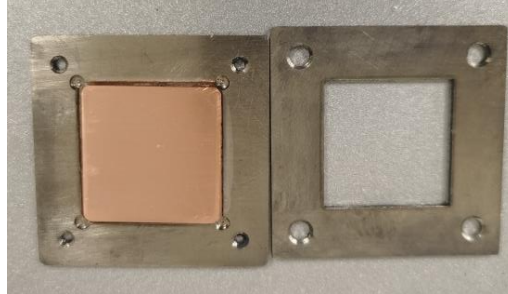
- **Test Items/Condition**

- 85°C, 85%RH 2000hrs
- Thermal shock Test -40~200°C ; 1 hr hold in each temperature 1000x
- High Temperature Baking Test 150°C 2000hrs

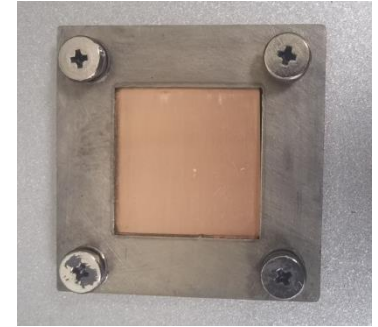
Sandwich Structure sample preparation



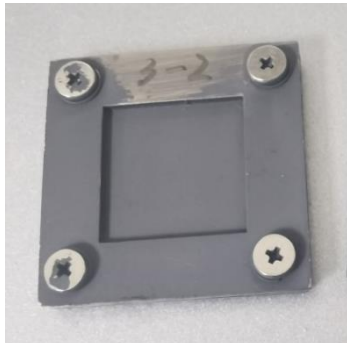
1. Paste sample on the center of Cu plate (20X20mm),



2. Cover it with another Cu plate and put it in the fixture



3. Tighten the screws



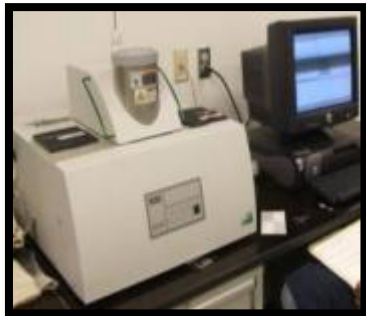
5. graphite spraying on both surface of sample with thin thickness



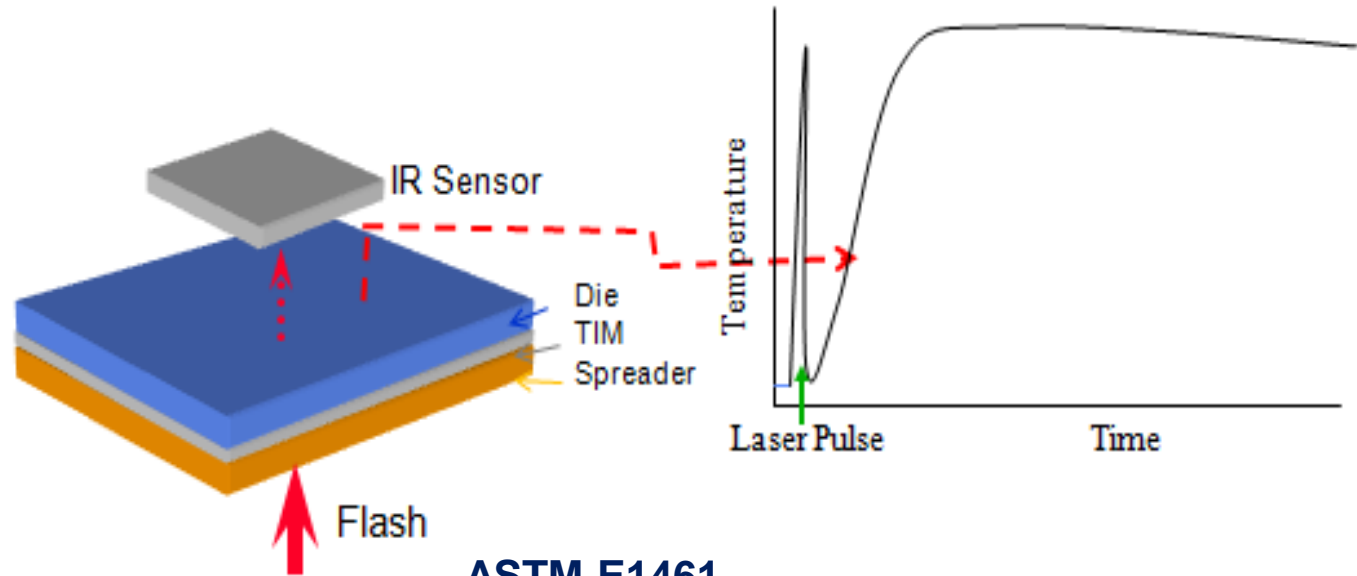
Oven

4. Put it into 90°C oven for 60 min

Thermal Impedance Test Method: Laser Flash



Netzsch Laser Flash™



$$k = (\alpha)(C_p)(\rho)$$

k = Thermal Conductivity (W/cmK)

α = Thermal Diffusivity (cm²/s)

$$\alpha = 0.13879L^2 / t_{1/2}$$

L = specimen thickness, meter

$t_{1/2}$ = the time required for the

temperature

rise to reach 50% percent of ΔT_{max}

C_p = Specific Heat Capacity (J/gK)

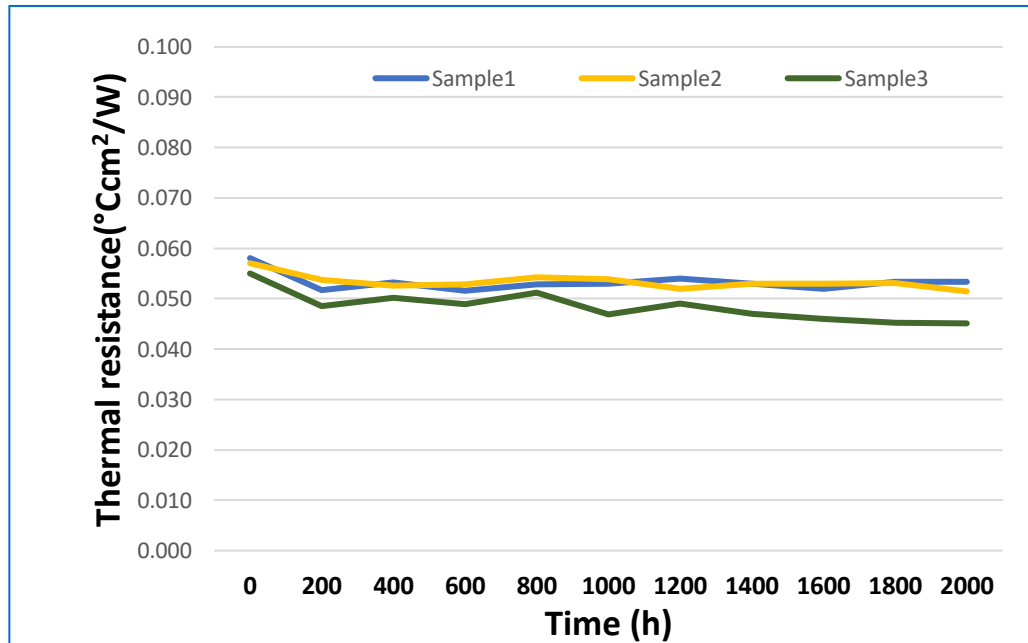
ρ = Density (g/cm³)

ASTM E1461

- **Thermal Impedance Both Ni-plated Cu Surfaces**
 - Includes the CTE mismatch
 - includes actual surface finish
- **Typical Coupons:**
 - Ni-plate copper, 0.5"X0.5"X0.03"
- **Suitable for Accelerated Life Test**

85°C, 85%RH Test 2000h

- The samples were placed into the test chamber at 85°C, 85%RH for 2000 hours. Every 200 hours, the samples were taken out and test thermal resistance, then put them back in oven.
- Sample size: 3 pcs samples.

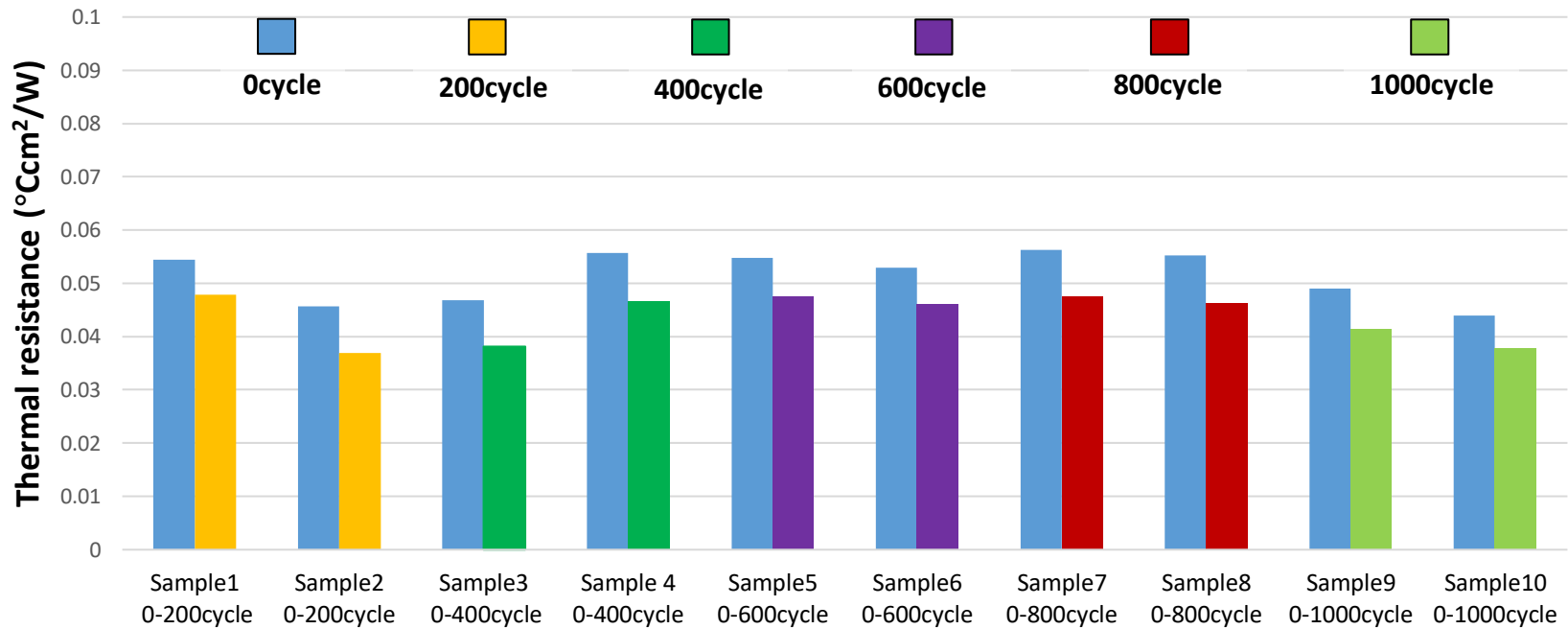


HAST chamber

PTM7950 remain reliable up to 2000hrs for 85°C,85%RH Test

Thermal shock Test -40~200°C

- Testing Condition: -40°C to 200°C, 1000 cycles, each temperature hold 1hour. Every 200 cycles, two of the samples were taken out test thermal resistance.
- Sample size: 10 pcs samples.

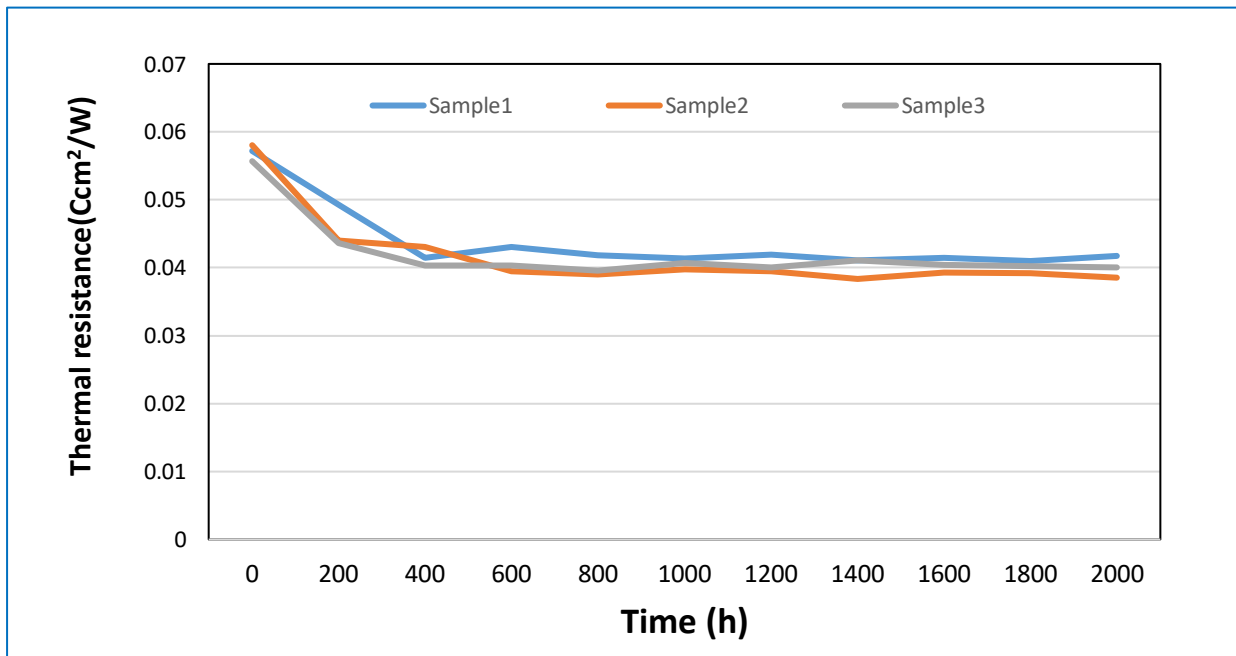


PTM7950 remain reliable up to 1000 cycles for thermal shock test.

High Temperature Baking

Testing Condition: 150°C, 2000 hours

- The samples were placed into the test chamber at 150°C for 2000 hours. Every 200 hours, the samples were taken out and test thermal resistance, then put them back in oven.
- Sample size: 3 pcs samples.



PTM7950 remain reliable up to 2000hrs for 150°C baking

THANK YOU

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www.honeywell.com