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FROM OUTSIDERS

Dexerials

20 December 2012

# TECHNICAL REPORT

# CP34531-18AB

## *Anisotropic Conductive Film for Chip on Glass*

*Products Development Department*
*Advanced Material Division*

# *Features*

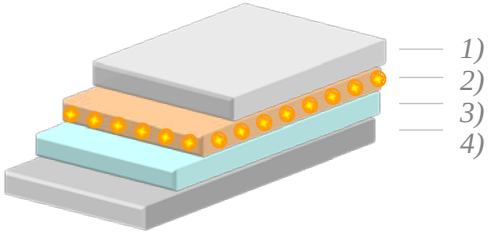
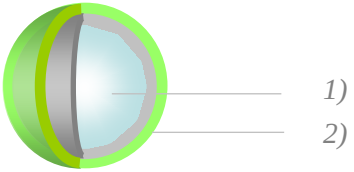
*-COG application for TFT*

*-Interconnect a small-to-medium-sized FPD with an IC chip.*

*-Fine pitch (smaller and Insulated particle)*

*-Low temperature bonding*

# Specifications

| Items | | CP34531-18AB | Remarks |
|---|---|---|---|
| Curing system | | Epoxy-Cation | *1 |
| Structure and thickness | 1) Cover film / color | 25μm / transparent |  |
| | 2) ACF-layer | 8μm | |
| | 3) NCF-layer | 10μm | |
| | 4) Base film / color | 38μm / white | |
| Conductive particles | 1) Material | Ni plated polymer |  |
| | 2) Insulator coated | Yes | |
| | Particle diameter | 3μm | |
| | Particle density | 8.9M pcs/mm$^3$ | *Design value. Calculated in ACF later* |
| Minimum overlap area of conductors | | 1000μm$^2$ | *(Average -4.5σ ≧ 3pcs)* *2 |
| Minimum bump space | | 12μm | *Space between bumps.* |
| Minimum conductor space | | 7μm | *Space between neighboring circuits.* |





**1: There is a possibility that interference of cation curing reaction happens depending on the material.(PI layer of IC,Panel with Soda line glass,etc). Confirmation tests of the interference is required on each material.*

**2:Where the faced conductor overlaps.*

# *Bonding conditions and Properties*

## Bonding conditions *1

| items | | CP34531-18AB | Remarks |
|---|---|---|---|
| ACF laminating conditions | Temperature | 50～80℃ | *2 |
| | Pressure | 0.5～1.0MPa | *3 |
| | Time | 1～2sec | *4 |
| Main bonding conditions | Temperature | 150℃～180℃ | *2 |
| | Pressure | 30～80MPa | *5 |
| | Time | 5sec | *4 |

*1: Bonding condition may differ depending on chip size and metal pattern. We recommend this as a starting point to determine your own optimized conditions.
*2: Temperature of ACF lamination and main bonding: It is not equipment temperature, but actual temperature of ACF.
*3: Pressure of ACF lamination: It is calculated based on the area of ACF lamination.
*4: Time of ACF lamination and main bonding: Time from the start of bonding to the point where the temperature reaches the target.
*5: The pressure is calculated based on the total area of bumps.

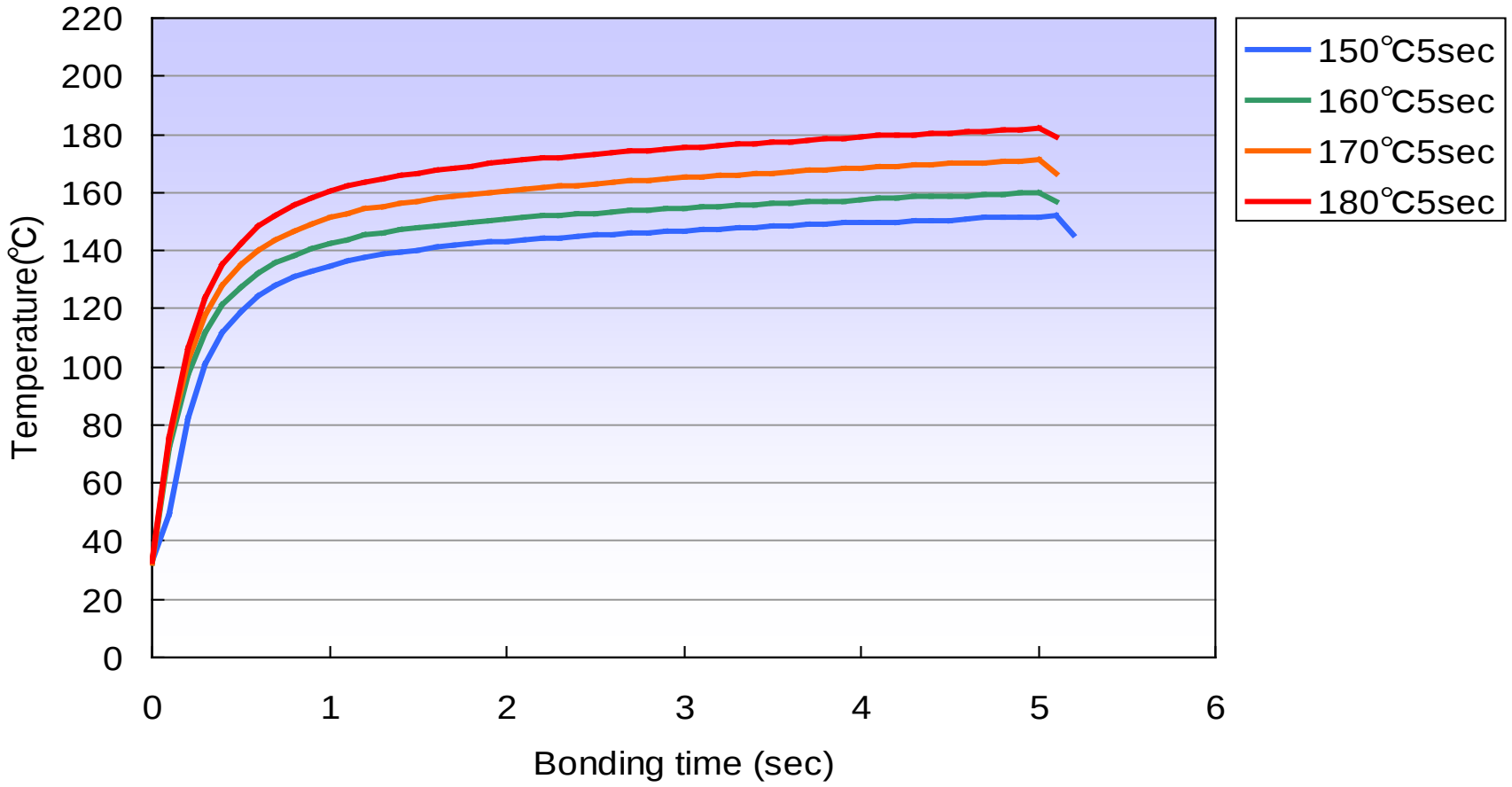
## Properties of cured ACF

| items | | CP34531-18AB | Remarks |
|---|---|---|---|
| Elastic modulus | at 30℃ | 2.7GPa | DMA |
| Glass transition temperature (Tg) | | 154℃ | DMA, tan δ peak |

Note: This report has been prepared on the basis of our reliable tests, however is not intended to guarantee the performance described hereunder.

# *Bonding temperature profile*

Measurement : Date Logger
Cushion material Teflon 50μmt

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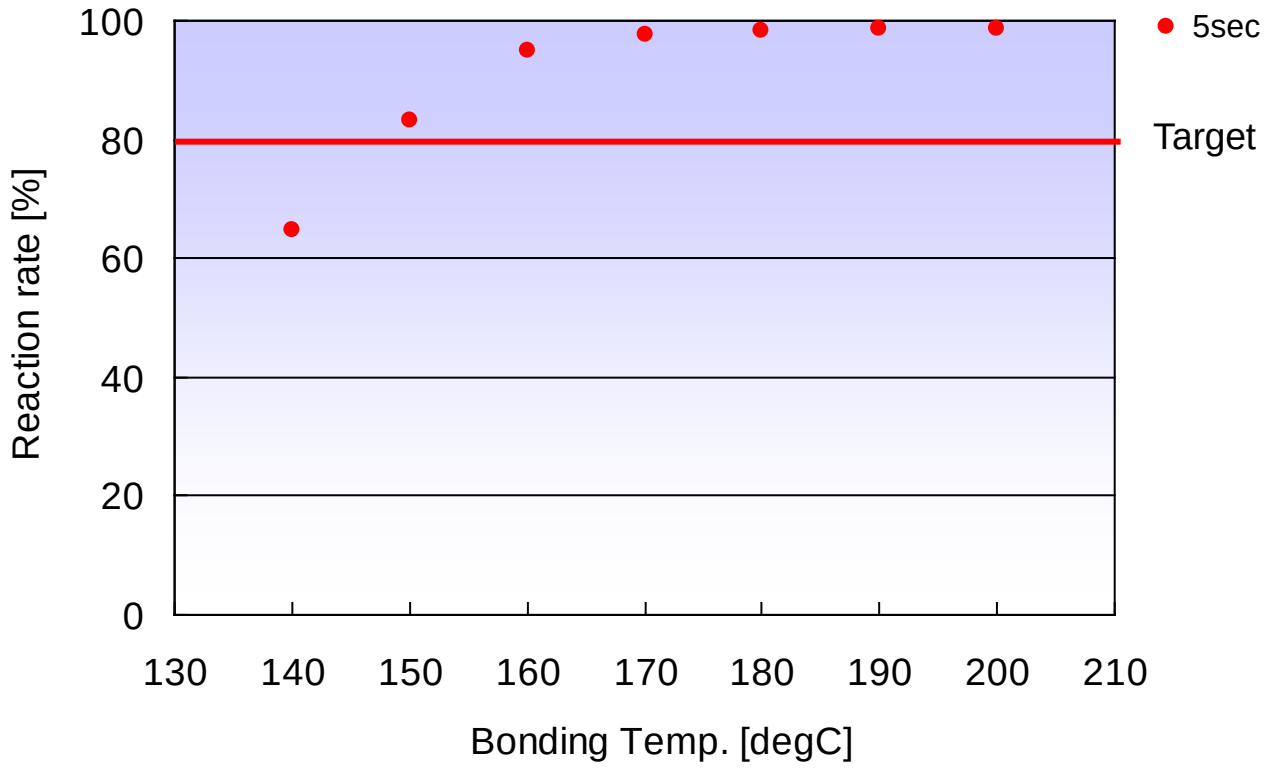
# Reaction rate

| | |
|---|---|
| IC | : 1.8mm × 20mm, t= 0.5mm, Au-plated bump 30μm × 85μm, h=15μm |
| Glass | : t =0.5mm , ITO 10 Ω/□ |
| Bonding condition | : 140-200℃, 60MPa, 5sec |
| Measurement | : FT-IR Method |

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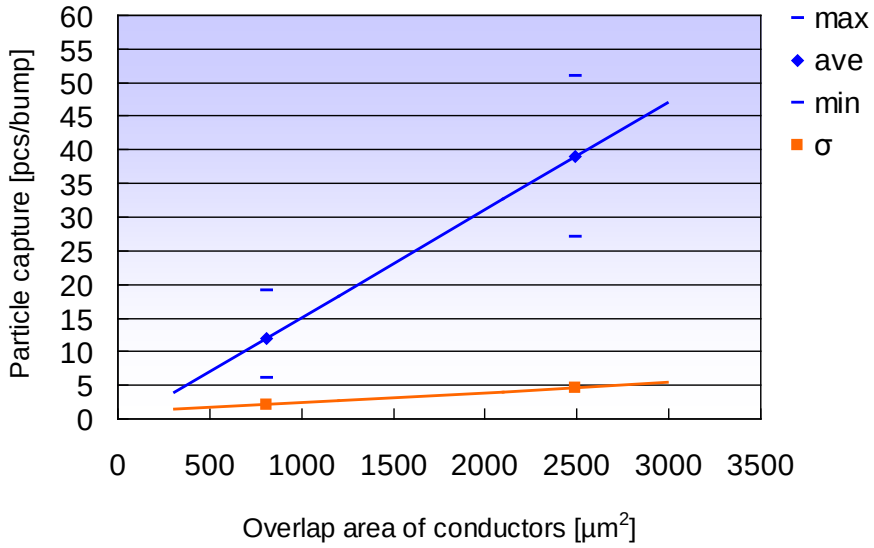
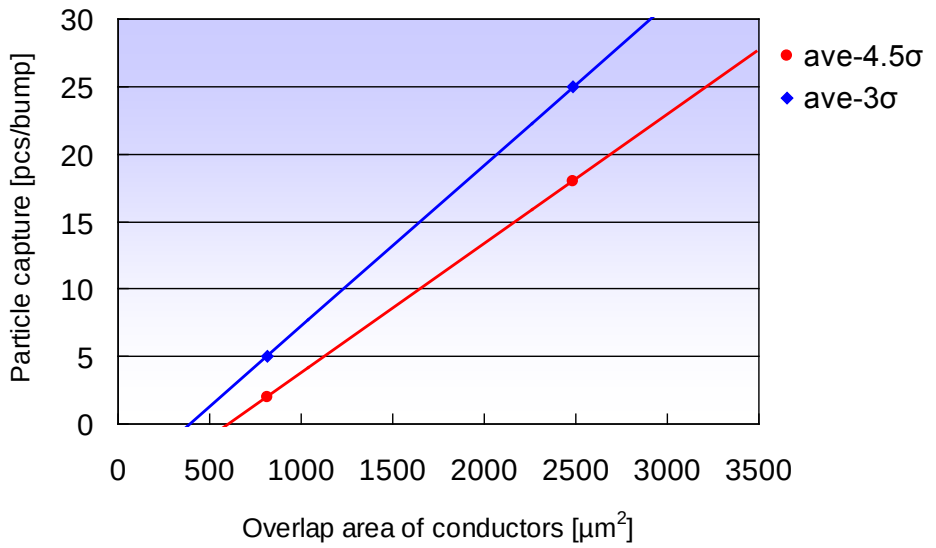
# *Particle capture*

| | |
|---|---|
| IC | : 1.8mm × 20mm, t= 0.5mm, Au-plated bump, h=15μm |
| Glass | : t =0.7mm , ITO 10 Ω/□ |
| Bonding condition | : 170℃, 60MPa, 5sec |
| Measurement | : 100bumps |

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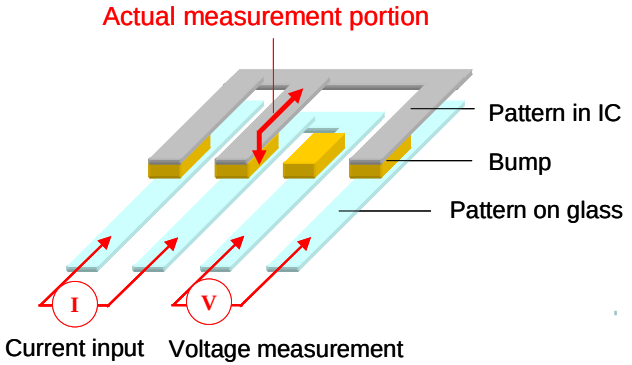
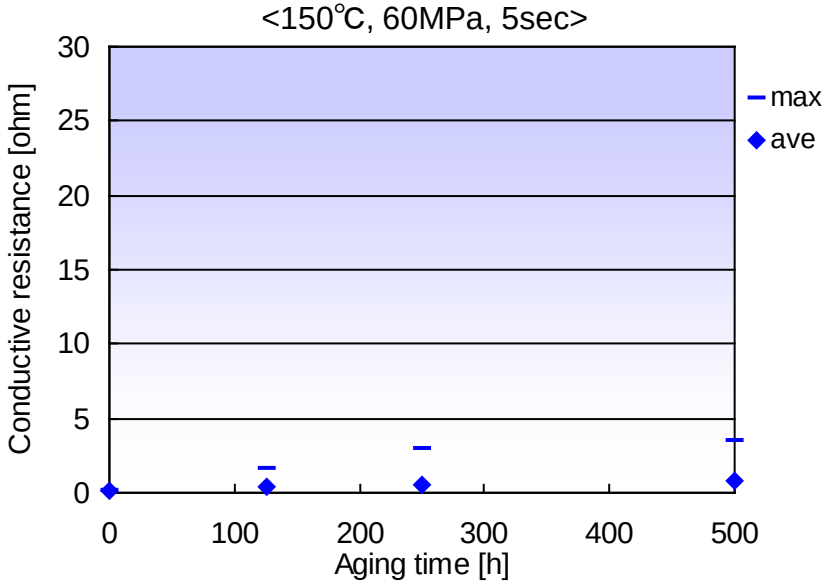
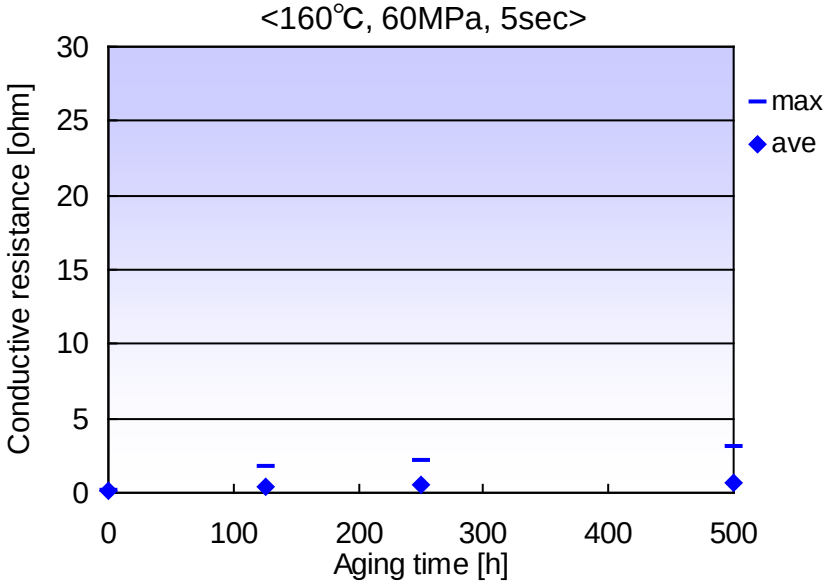
# Conductive resistance

| | |
|---|---|
| IC | : 1.8mm × 20mm, t= 0.5mm, |
| | Au-plated bump 30μm × 85μm, h=15μm |
| Glass | : t =0.5mm , ITO 10 Ω/□ |
| Bonding condition | : 150/160℃, 60MPa, 5sec |
| Aging condition | : 85℃85%RH |

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# Conductive resistance

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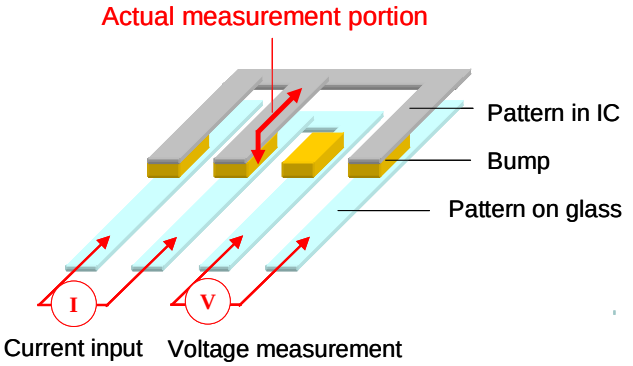
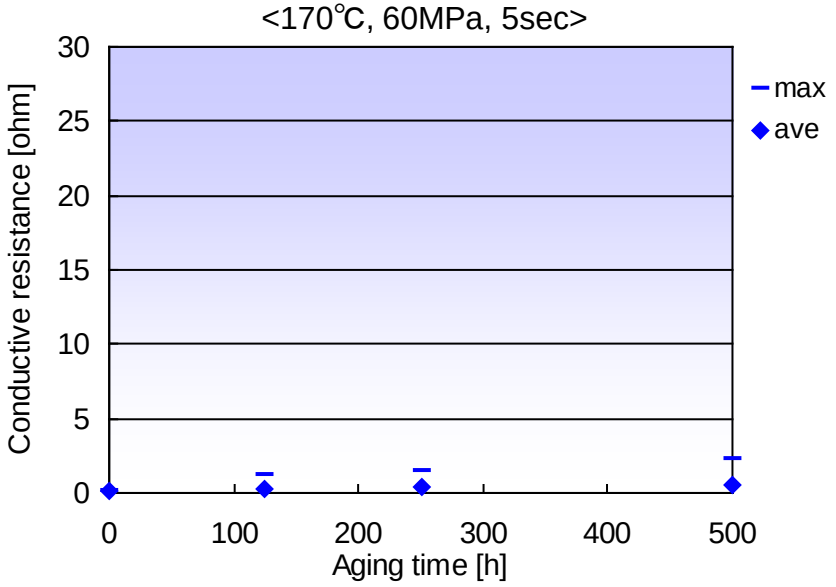
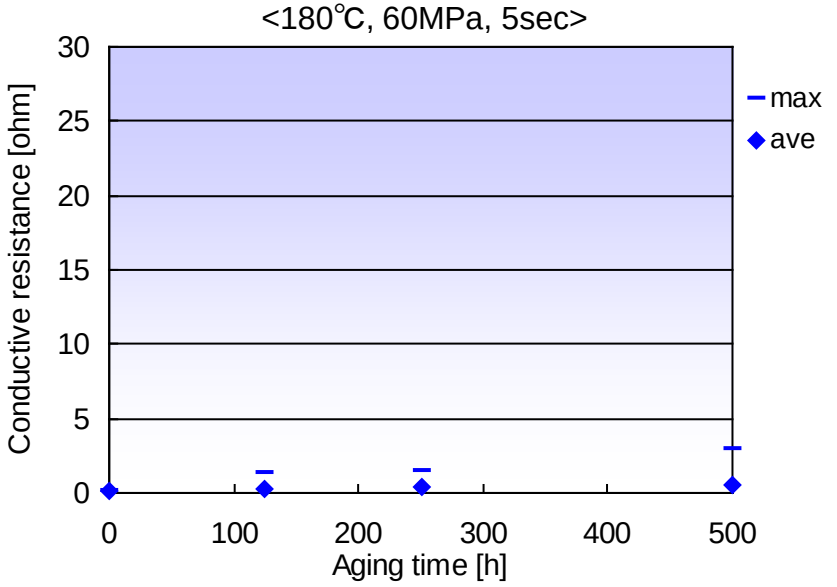
|---|---|
| IC | : 1.8mm × 20mm, t= 0.5mm, |
| | Au-plated bump 30μm × 85μm, h=15μm |
| Glass | : t =0.5mm , ITO 10 Ω/□ |
| Bonding condition | : 170/180℃, 60MPa, 5sec |
| Aging condition | : 85℃85%RH |

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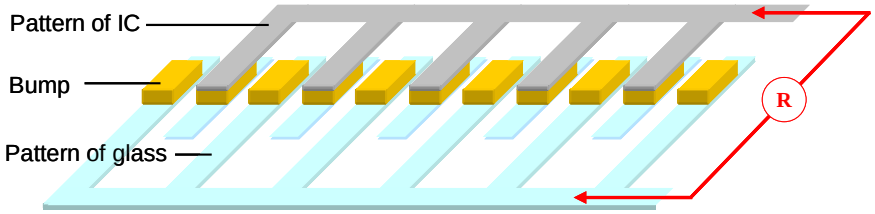
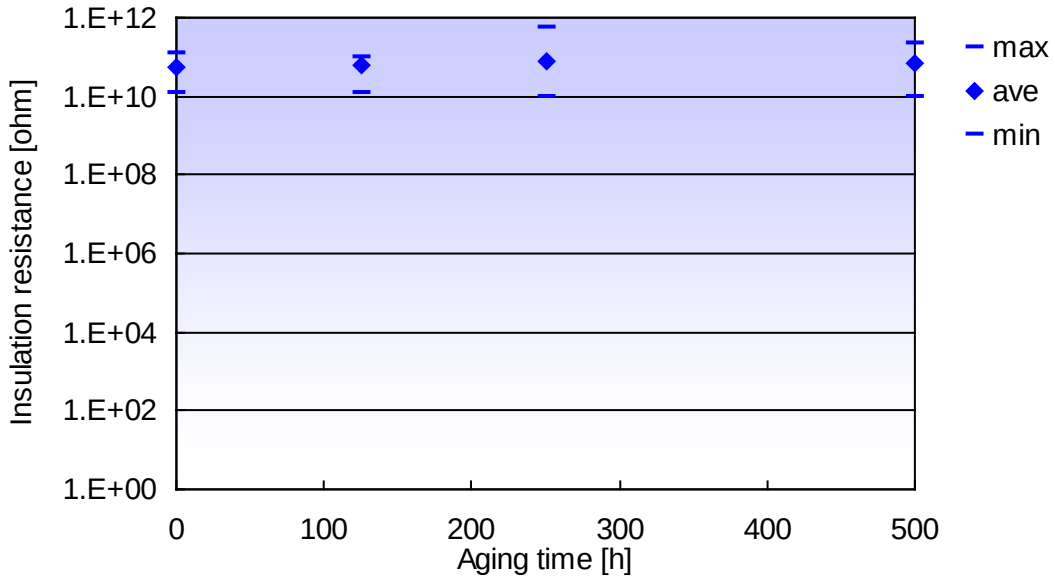
# Insulation resistance

IC : 1.5mm × 13mm, t= 0.5mm, Au-plated bump 25 × 140um
Bump space=10μm, The number of gap =16sets (10points/set)
Glass : t =0.5mm , ITO 10 Ω/□
Bonding condition : 170℃, 60MPa, 5sec
Aging condition : 85℃85%R.H.

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