Data Package 3103WLV-3104WXL

Henkel Westerlo TCS - 2018

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Agenda

1. **Introduction**
2. Cure schedules
3. Viscosity measurements
4. Properties
5. Reliability Data

CE3103WLV – CE3104WXL
Introduction

Technology	Rigid Ag Epoxy 1 component heat cure
Operating temperature	-40°C / +150°C
Cure	3min@150°C
Product benefits	Lead free alternative to solder, cure possibilities using standard solder reflow profile Low viscosity for good dispensing (CE3103WLV) Anti-corrosion technology
Applications	Bonding of noble passive components onto noble terminated LTCC boards Bonding of Sn or AgSn coated Cu ribbon to front contact (TCO) of thin film PV cells
CE3103WLV vs CE3104WXL	CE3103WLV for dispensing CE3104WXL for printing
Primary manufacturing site	Westerlo IDH CE3103WLV: 1189520 (10CC – 25g) IDH CE3104WXL: 1189530 (10CC – 25g)

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CE3103WLV – CE3104WXL
Introduction

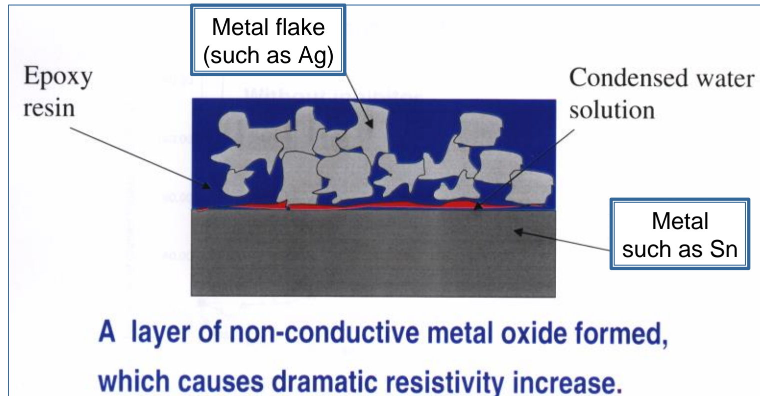
- Traditional electrically conductive adhesive display an unstable contact resistance on common electronic metallisations such as Cu, SnPb and Sn under elevated temperature and humidity.

  ⇒ Formation of an electrochemical cell resulting in oxidation of non-noble metallisation.

- Metals with electrochemical potential < 0,40 V

  ⇒ Potential risk of unstable contact resistance : galvanic corrosion

- Based on these fundamental understandings, Henkel developed electrically conductive adhesives using anti-corrosion agent (US patents 6344157, 6583201)



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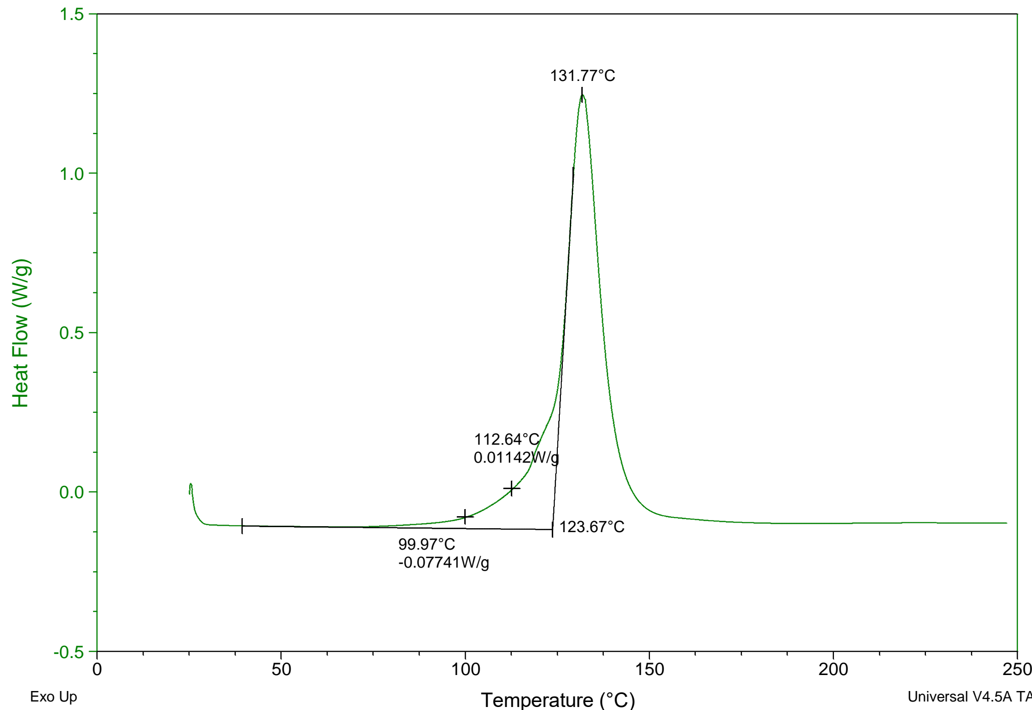
Cure Schedules – Dynamic DSC



Test: Dynamic DSC – CE3103WLV
Aluminum Hermatic Pan – 14,4 mg
Range: 25°C – 250°C
Ramp: 10°C / minute

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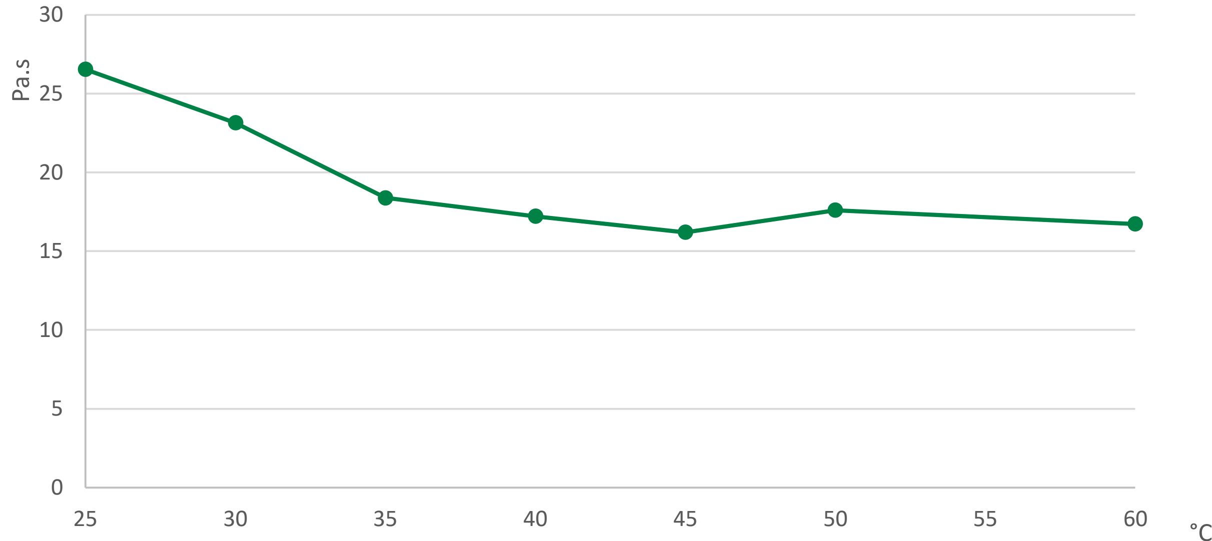
CE3103WLV – CE3104WXL

Viscosity Measurements – IFO Temperature

Test parameters:
Method: TP-Ag – Plate 2 cm – Gap 200µ - 15s-1
Device: Rheometer TA-AR 200
Sample: CE3103WLV



Viscosity of CE3103WLV is going down a little in function of the application temperature

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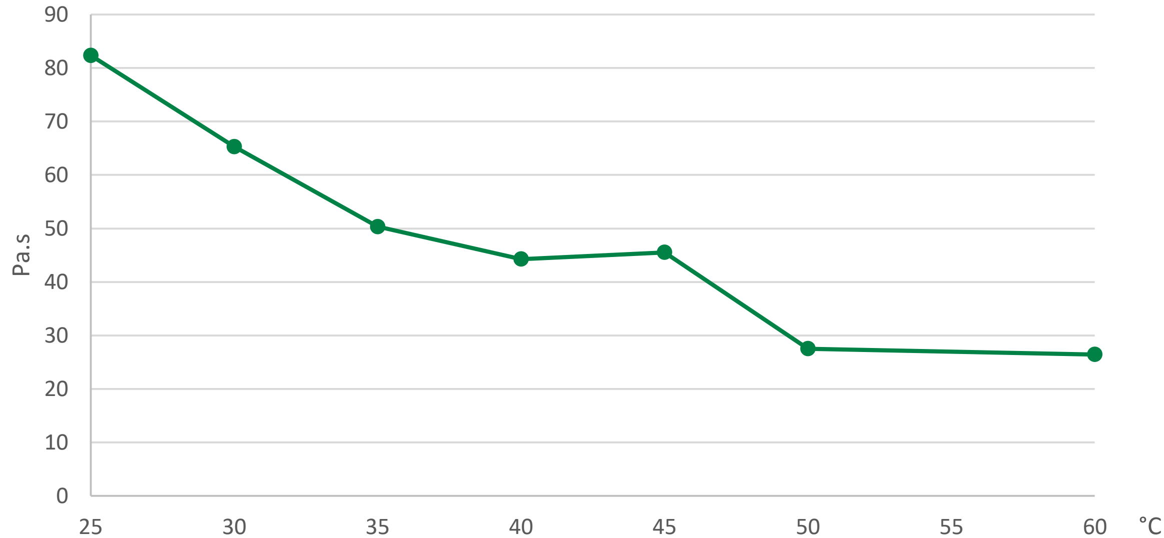
CE3103WLV – CE3104WXL

Viscosity Measurements – IFO Temperature

Test parameters:
Method: TP-Ag – Plate 2 cm – Gap 200µ - 15s-1
Device: Rheometer TA-AR 200
Sample: CE3104WXL



Viscosity of CE3104WXL is going down a lot more in function of the application temperature

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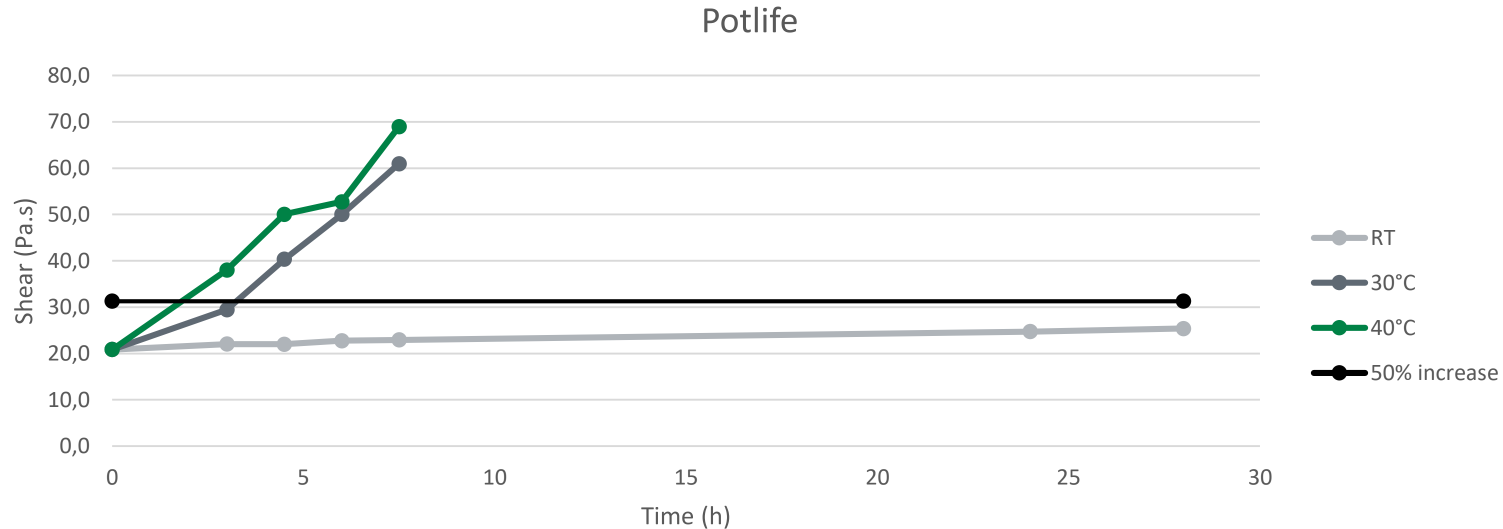
CE3103WLV – CE3104WXL

Viscosity Measurements – Potlife

Test parameters:
Method: TP-Ag – Plate 2 cm – Gap 200µ
Device: Rheometer TA-AR 200
Sample: CE3103WLV



Potlife of CE3103WLV is depending a lot on the application temperature

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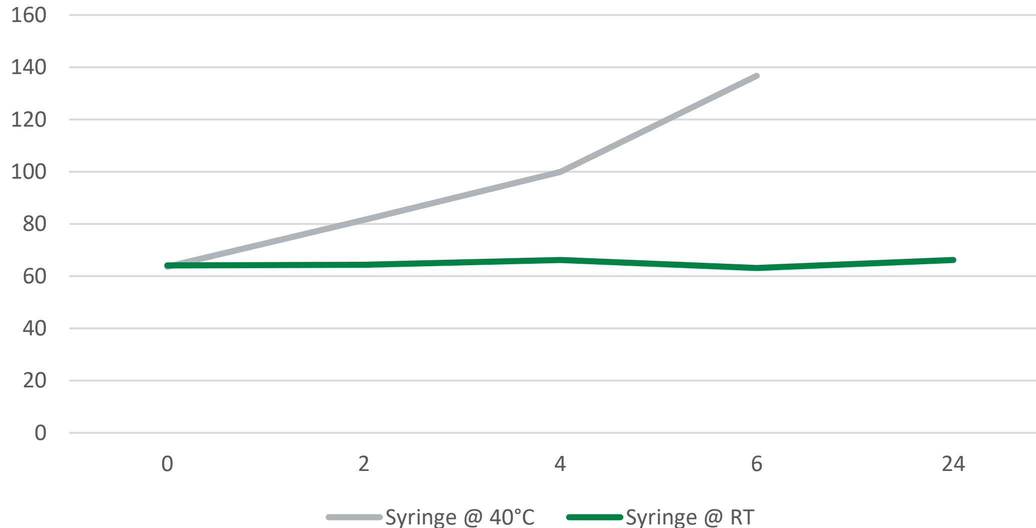
CE3103WLV – CE3104WXL
Viscosity Measurements – Potlife

Test parameters:
Method: TP-Ag – Plate 2 cm – Gap 200µ
Device: Rheometer TA-AR 200
Sample: CE3104WXL



- **Potlife of CE3104WXL is depending a lot on the application temperature**
- **Temperature should be controlled during printing**

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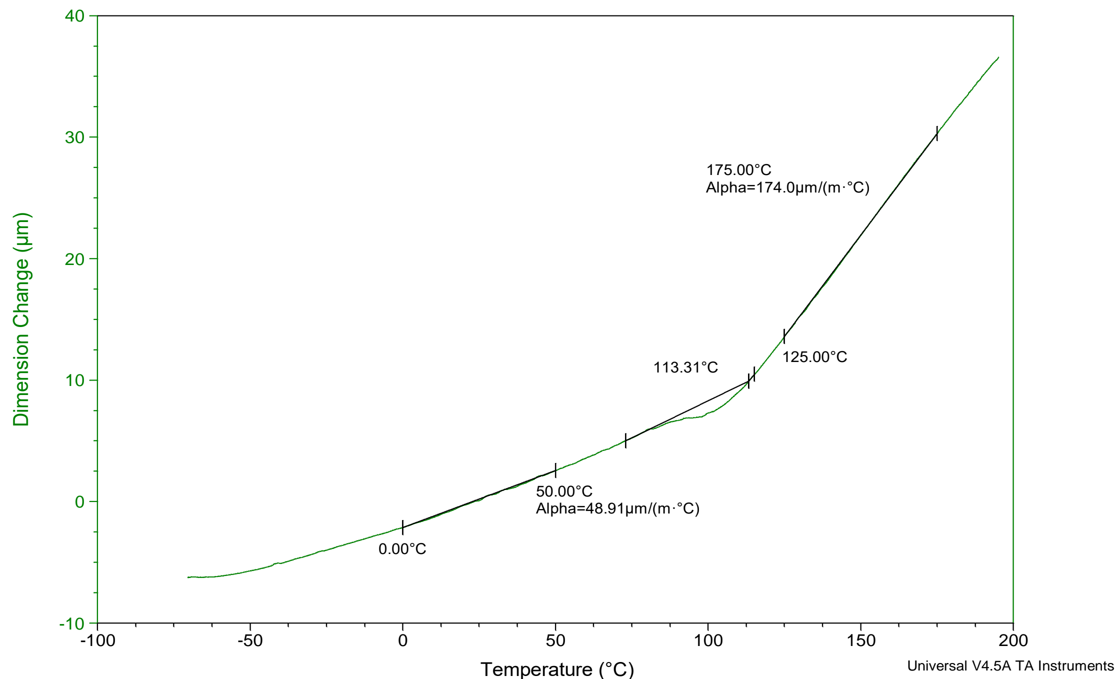
CE3103WLV – CE3104WXL

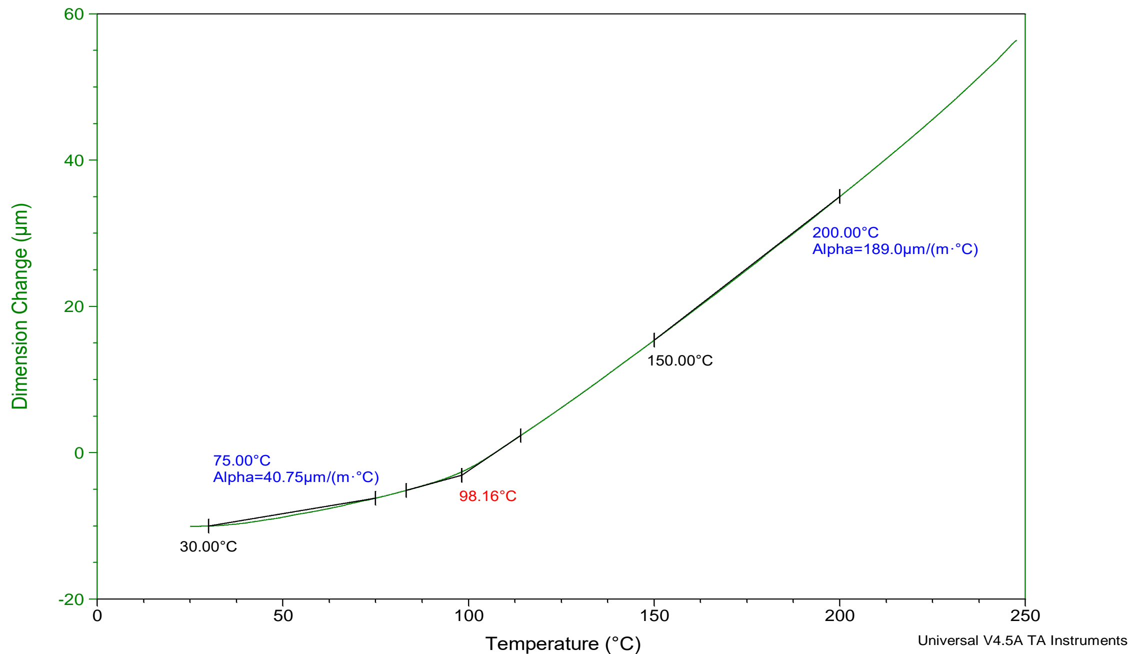
TMA – Tg and CTE



Test: TMA
Sample: cured 5 min @ 150°C
Range: -50 to 150°C
Ramp: 10°C / minute
CE3103WLV

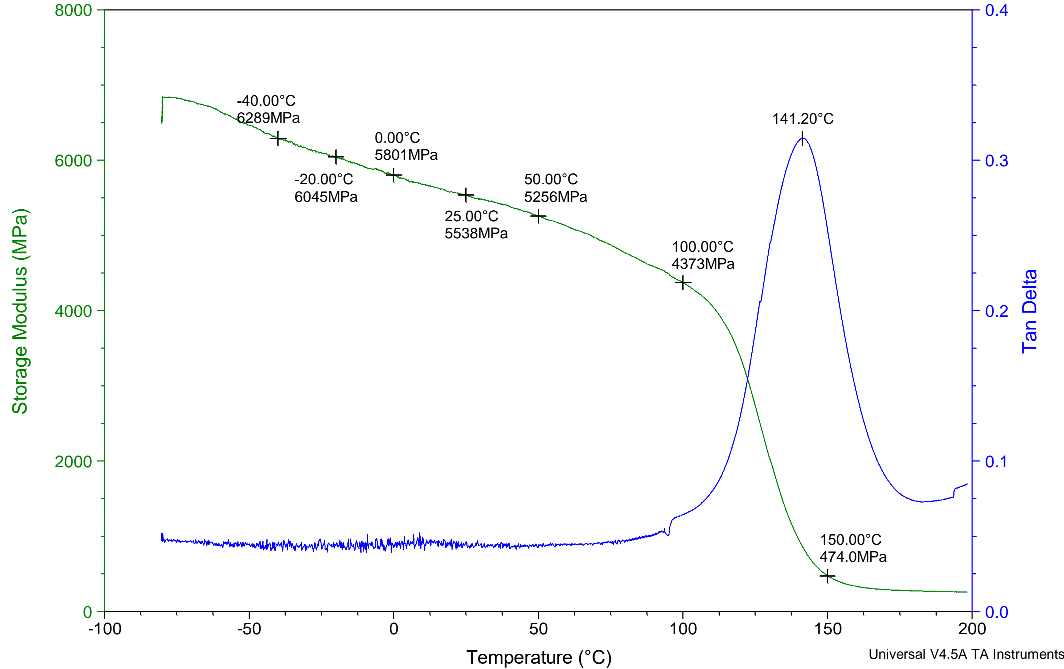
CE3103WLV – CE3104WXL

TMA – Tg and CTE



Test: TMA
Sample: cured 5 min @ 150°C
Range: -50 to 150°C
Ramp: 10°C / minute
CE3104WXL

CE3103WLV – CE3104WXL
DMA – Modulus



Test: DMA
Sample: cured 5 min @ 150°C
Range: -50 to 200°C
Ramp: 10°C / minute
CE3104WXL

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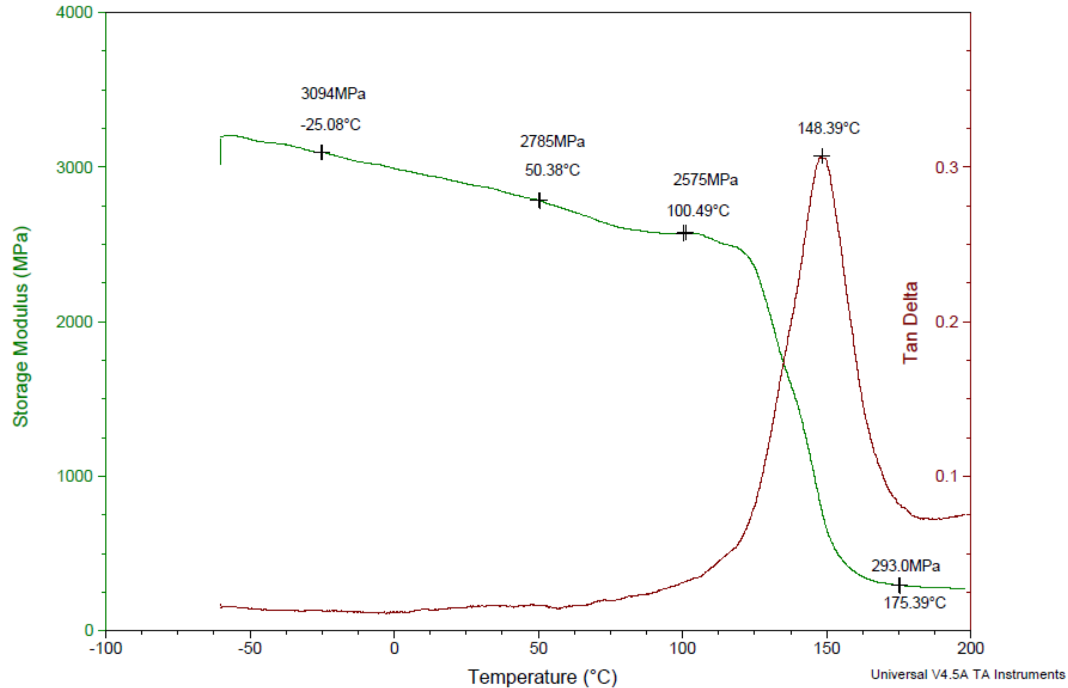
CE3103WLV – CE3104WXL
DMA – Modulus



Test: DMA
Sample: cured 5 min @ 150°C
Range: -50 to 200°C
Ramp: 10°C / minute
CE3103WLV

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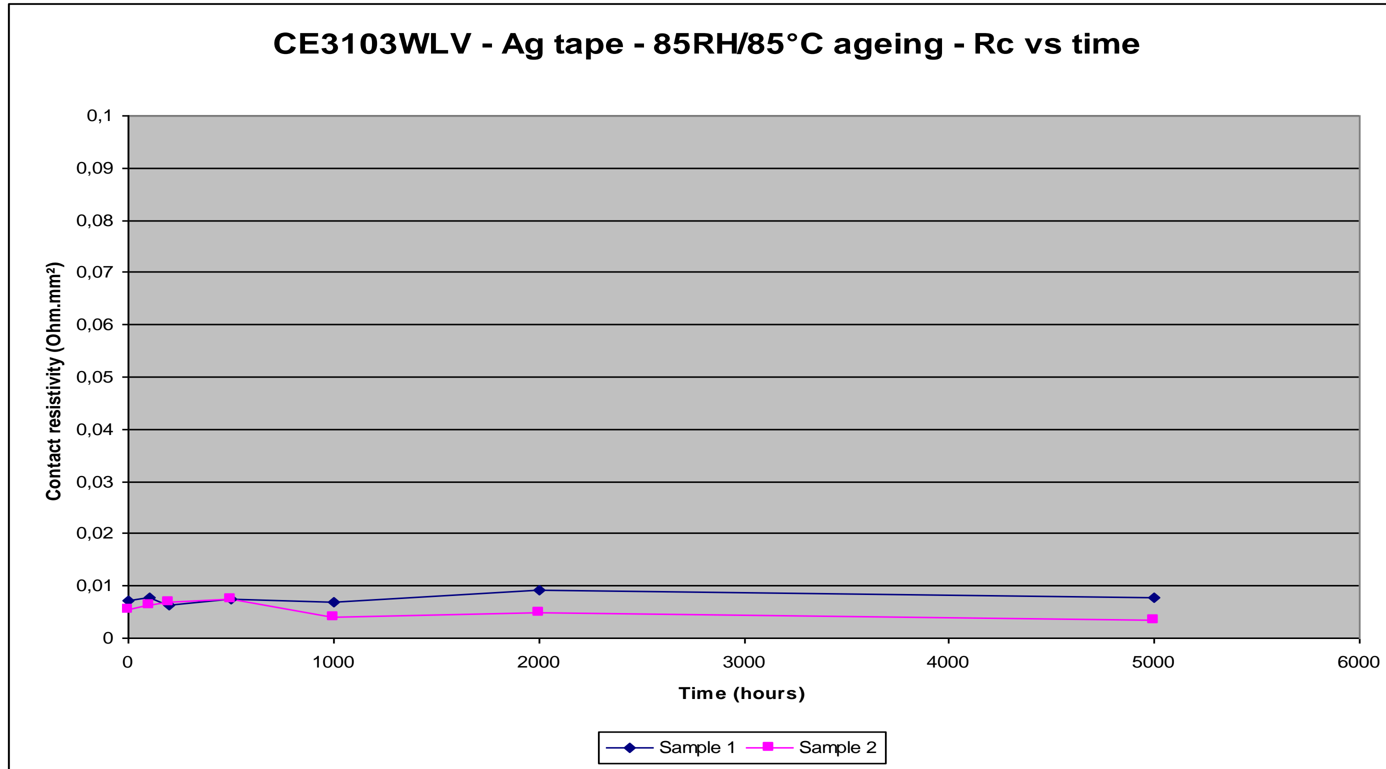
CE3103WLV – CE3104WXL
Reliabilty – SJCR after 85/85



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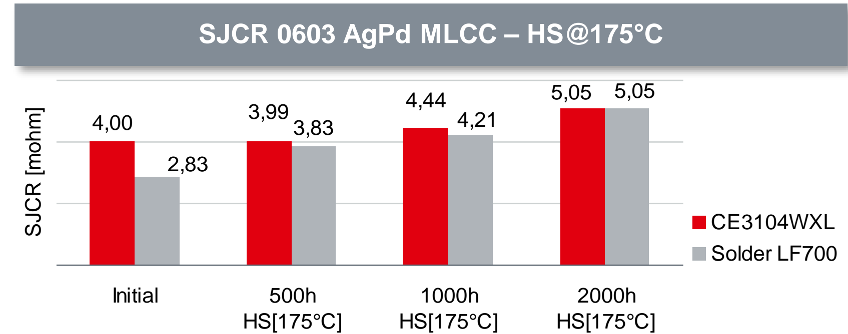
Electrically Conductive Adhesives
Products – CE3103WLV/CE3104WXL

Product	CE3104WXL
Test	**Electrical Reliability of Assembled Components 0603 AgPd MLCC**
Substrate	Au-plated High Tg PCB
Test	**SJCR & DSS after HS 175°C**
Cure	**Reflow solder profile @ 260°C**

Z1	Z2	Z3	Z4	Z5	Z6
250°C	210°C	210°C	210°C	280°C	320°C
Speed	65 cm/min				

- CE3103WLV/CE3104WXL can be used as a solder replacement, shows the capability to cure under standard solder reflow profiles.
- In addition, CE3103WLV/CE3104WXL can be cured in a conventional oven
- 3 min @ 150°C
- 10 min @ 120°C

SJCR 0603 AgPd MLCC – HS@175°C



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Thank you!

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