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| Title of Change: | Qualification of Advantek Carrier Tape for Products produced at the ON Semiconductor Seremban, Malaysia Factory |
| Proposed first ship date: | 10 June 2017 or earlier if approved by the customer |
| Contact information: | Contact your local ON Semiconductor Sales Office or <todd.manes@onsemi.com> |
| Samples: | Contact your local ON Semiconductor Sales Office |
| Additional Reliability Data: | Contact your local ON Semiconductor Sales Office |
| Type of notification: | This is a Final Product/Process Change Notification (FPCN) sent to customers. FPCNs are issued 90 days prior to implementation of the change. ON Semiconductor will consider this change accepted, unless an inquiry is made in writing within 30 days of delivery of this notice. To do so, contact <PCN.Support@onsemi.com>. |
| Change Part Identification: | Products with date code 1723 or later will utilize the new tape. (If customer approval for earlier implementation is received, the implementation date code will be modified accordingly.) |
| Change category: | <input type="checkbox"/> Wafer Fab Change <input type="checkbox"/> Assembly Change <input type="checkbox"/> Test Change <input checked="" type="checkbox"/> Other <u>Tape and Reel Carrier Tape</u> |

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| Change Sub-Category(s): | | |
| <input type="checkbox"/> Manufacturing Site Change/Addition | <input checked="" type="checkbox"/> Material Change | <input type="checkbox"/> Datasheet/Product Doc change |
| <input type="checkbox"/> Manufacturing Process Change | <input type="checkbox"/> Product specific change | <input checked="" type="checkbox"/> Shipping/Packaging/Marking |
| <input type="checkbox"/> Other: _____ | | |

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| Sites Affected: | | | |
| <input type="checkbox"/> All site(s) | <input type="checkbox"/> not applicable | <input checked="" type="checkbox"/> ON Semiconductor site(s) : | <input type="checkbox"/> External Foundry/Subcon site(s) |
| | | ON Seremban, Malaysia | |

Description and Purpose:

ON Semiconductor announces the qualification of Advantek as a supplier of Tape and Reel carrier tape for the products listed below. Note that no other changes to the products are occurring. There are no electrical or mechanical changes to the products listed.

| | Before Change | After Change |
|---------------------|-----------------------|----------------------------|
| ON Semi Part Number | (3M Tape Part Number) | (Avantek Tape Part Number) |
| NB3RL02FCT2G | 3M065031 | ABH155-ABA500.M5C |
| NCP2811AFCT1G | 3M053491 | ABH116-ABA500.M5C |
| NCP2811BFCCT1G | 3M053491 | ABH116-ABA500.M5C |
| NCP335FCT2G | 3M070321 | ABH118-ABA500.M5C |
| NCP435FCT2G | 3M070321 | ABH118-ABA500.M5C |
| NCP392ARFCCT1G | 3M077421 | ABH115-ABA500.M5C |
| NCP392BRFCCT1G | 3M077421 | ABH115-ABA500.M5C |
| NCP392CRFCCT1G | 3M077421 | ABH115-ABA500.M5C |
| NCP392CSFCCT1G | 3M077421 | ABH115-ABA500.M5C |
| NCP392DRFCCT1G | 3M077421 | ABH115-ABA500.M5C |
| TCC-103A-RT | 3M079591 | ABH117-ABA500.M5C |
| TCC-103B-RT | 3M079591 | ABH117-ABA500.M5C |
| TCC-103C-RT | 3M079591 | ABH117-ABA500.M5C |
| TCC-103D-RT | 3M079591 | ABH117-ABA500.M5C |

The following table provides a comparison of carrier tape pocket sizes for the existing (3M) tape and the newly qualified (Avantek) tape:



| Device | NCP435 / NCP335 | | TCC-103A | | NCP2811 | | NCP392D | | NB3RL02 | |
|---------------------------|-----------------|------------|------------|-------------|------------|------------|------------|------------|------------|------------|
| Carrier Tape Details | Before | After | Before | After | Before | After | Before | After | Before | After |
| Supplier | 3M | Avantek | 3M | Avantek | 3M | Avantek | 3M | Avantek | 3M | Avantek |
| Part # | 3M070321 | ABH118 | 3M079591 | ABH117 | 3M053491 | ABH116 | 3M077421 | ABH115 | 3M065031 | ABH155 |
| Tape width | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| Pitch | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Tape thickness | 0.20 ±0.02 | 0.20 ±0.03 | 0.25 ±0.02 | 0.20 ±0.03 | 0.20 ±0.02 | 0.20 ±0.03 | 0.20 ±0.02 | 0.20 ±0.03 | 0.25 ±0.02 | 0.20 ±0.03 |
| Pocket X - Dimension (mm) | 1.09. ±0.05 | 1.1 ±0.03 | 2.05 ±0.05 | 2.06. ±0.05 | 1.67 ±0.05 | 1.66 ±0.05 | 1.42 ±0.05 | 1.50 ±0.03 | 0.90 ±0.05 | 0.90 ±0.03 |
| Pocket Y - Dimension (mm) | 1.09 ±0.05 | 1.1 ±0.03 | 2.33 ±0.05 | 2.26 ±0.05 | 2.17 ±0.05 | 2.16 ±0.05 | 2.10 ±0.05 | 2.20 ±0.03 | 1.75 ±0.05 | 1.70 ±0.03 |
| Pocket Z - Dimension (mm) | 0.76 ±0.05 | 0.71 ±0.03 | 0.85 ±0.05 | 0.72 ±0.05 | 0.73 ±0.05 | 0.70 ±0.05 | 0.76 ±0.05 | 0.68 ±0.03 | 0.60 ±0.05 | 0.58 ±0.03 |
| Material Type | PC | PC Tri-Lam | PC | PC Tri-Lam | PC | PC Tri-Lam | PC | PC Tri-Lam | PC | PC Tri-Lam |

Reliability Data Summary:

The following evaluations have been completed with the new carrier tape with passing results. Further details are available upon request:

- Visual Inspection (14000 units)
- Peel Back Test (14000 units)
- Visual Inspection and Peel Back Test After MSL1 Aging (3 lots)

Electrical Characteristic Summary: No changes to device electrical characteristics or performance

List of affected Standard Parts:

| Part Number | Qualification Vehicle |
|----------------|--------------------------------|
| NB3RL02FCT2G | NCP435FCT2G and TCC-103A-RT |
| NCP2811AFCT1G | |
| NCP2811BFCCT1G | |
| NCP335FCT2G | |
| NCP435FCT2G | |
| NCP392ARFCCT1G | |
| NCP392BRCCT1G | |
| NCP392CRFCCT1G | |
| NCP392CSFCCT1G | |
| NCP392DRFCCT1G | |
| TCC-103A-RT | |
| TCC-103B-RT | |
| TCC-103C-RT | |
| TCC-103D-RT | |