



Final Product/Process Change Notification

Document #: FPCN22966Z1

Issue Date: 07 Sep 2021

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| Title of Change: | Wafer Fab Transfer for Trench 6 MOSFET Technology to Global Foundries in New York, US with additional clip change for device NVMFS5C442NL |
| Proposed Changed Material First Ship Date: | 08 Jan 2022 or earlier if approved by customer |
| Current Material Last Order Date: | 26 Nov 2021 <i>Orders received after the Current Material Last Order Date expiration are to be considered as orders for new changed material as described in this PCN. Orders for current (unchanged) material after this date will be per mutual agreement and current material inventory availability.</i> |
| Current Material Last Delivery Date: | 07 Jan 2022 <i>The Current Material Last Delivery Date may be subject to change based on build and depletion of the current (unchanged) material inventory</i> |
| Product Category: | Active components – Discrete components |
| Contact information: | Contact your local onsemi Sales Office or Ammar.Anuar@onsemi.com |
| PCN Samples Contact: | Contact your local onsemi Sales Office to place sample order or < PCN.samples@onsemi.com >. Sample requests are to be submitted no later than 45 days after publication of this change notification. Samples delivery timing will be subject to request date, sample quantity and special customer packing/label requirements. |
| Sample Availability Date: | 01 Jan 2021 |
| PPAP Availability Date: | 01 Jan 2021 |
| Additional Reliability Data: | Contact your local onsemi Sales Office or Robert.Baran@onsemi.com |
| Type of Notification: | This is a Final Product/Process Change Notification (FPCN) sent to customers. The change will be implemented at 'Proposed Change Material First Ship Date' in compliance to J-STD-46 or ZVEI, or earlier upon customer approval, or per our signed agreements. onsemi will consider this proposed change and it's conditions acceptable, unless an inquiry is made in writing within 45 days of delivery of this notice. To do so, contact PCN.Support@onsemi.com . |
| Change Category | |
| Category | Type of Change |
| Packing/Shipping | Dry pack requirements change |
| Test Flow | Move of all or part of electrical wafer test and/or final test to a different location/site/subcontractor |
| Process - Wafer Production | Move of all or part of wafer fab to a different location/site/subcontractor, New wafer diameter |
| Process - Assembly | Move of all or part of assembly to a different location/site/subcontractor., Change in process technology (e.g., plating) Change of specified assembly process sequence (deletion and/or additional process step) |
| Description and Purpose: | |
| <p>This Product Change Notification, is an update to FPCN22966Z1, specifically on device NVMFS5C442NL series, which is intended to qualify a new clip design for SO8FL package assembly in onsemi Seremban, Malaysia. New clip design is to improve package robustness for better product performance.</p> <p>As per FPCN22966Z1, the changes also includes the increase of capacity for onsemi automotive 40V Trench 6 MOSFET technology products by transferring wafer fabrication for these products to the Global Foundries Fab located in New York, US.</p> <p>The changes include transferring wafer fabrication, back grind and back metal, to Global Foundries, and utilizing 300mm instead of 200mm diameter wafers. And while the assembly location remains unchanged (at onsemi, Seremban, Malaysia), wafer saw and die attach tooling are being updated to accommodate 300mm wafers.</p> | |

There is no change to the orderable part number.
There is no product marking change as a result of this change.

| | Before Change | After Change |
|-----------------------------|--|-----------------------------|
| Wafer Fabrication Site | onsemi Aizu, Japan onsemi Gresham, US | <u>Global Foundries, US</u> |
| Wafer Diameter | 200mm (existing sites) | 300mm (Global Foundries) |
| Wafer Probe Site | onsemi, Malaysia | <u>Global Foundries, US</u> |
| Back Grind, Back Metal Site | onsemi, Malaysia | <u>Global Foundries, US</u> |
| Clip Change | | |

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| Reason / Motivation for Change: | Source/Supply/Capacity Changes Process/Materials Change |
| Anticipated impact on fit, form, function, reliability, product safety or manufacturability: | <p>The device has been qualified and validated based on the same Product Specification. The device has successfully passed the qualification tests. Potential impacts can be identified, but due to testing performed by onsemi in relation to the PCN, associated risks are verified and excluded.</p> <p>No anticipated impacts.</p> |

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| Sites Affected: | |
| onsemi Sites | External Foundry/Subcon Sites |
| onsemi Gresham, United States | GlobalFoundries, Fab 10, New York, US |
| onsemi Aizu, Japan | |
| onsemi Seremban, Malaysia | |
| onsemi ISMF, Malaysia | |

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| Marking of Parts/ Traceability of Change: | Material will be traceable with onsemi lot trace code & tracking |
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Reliability Data Summary:

QV DEVICE NAME (DIE QUAL): NVMF55C404NL

RMS: 66099, 67744, 67566, 67567

PACKAGE: SO8FL-HE

| Test | Specification | Condition | Interval | Results |
|------|---------------------------------|---|-----------|---------|
| HTRB | JESD22-A108 | Ta=175°C, 100% max rated Vds | 2016 hrs | 0/231 |
| HTGB | JESD22-A108 | Ta=175°C, 100% max rated Vgss | 2016 hrs | 0/231 |
| HTSL | JESD22-A103 | Ta= 175°C | 2016 hrs | 0/231 |
| IOL | MIL-STD-750 (M1037) AEC-Q101 | Ta=+25°C, delta Tj=100°C On/off =2 min | 30000 cyc | 0/231 |
| TC | JESD22-A104 | Ta= -55°C to +150°C | 1000 cyc | 0/231 |



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|-------|---------------------|-----------------------------------|---------|-------|
| HAST | JESD22-A110 | 130°C, 85% RH, 18.8psig, bias | 192 hrs | 0/231 |
| uHAST | JESD22-A118 | 130°C, 85% RH, 18.8psig, unbiased | 96 hrs | 0/231 |
| PC | J-STD-020 JESD-A113 | MSL1 @ 260°C | | |
| RSH | JESD22- B106 | Ta = 265C, 10 sec | | 0/30 |

QV DEVICE NAME (DIE QUAL): NVMF55C404N

RMS: 66100

PACKAGE: SO8FL-HE

| Test | Specification | Condition | Interval | Results |
|------|---------------|-------------------------------|----------|---------|
| HTGB | JESD22-A108 | Ta=175°C, 100% max rated Vgss | 2016 hrs | 0/231 |

QV DEVICE NAME (DIE QUAL): NVMF55C645NLT1G

RMS: 45829

PACKAGE: SO8FL

| Test | Specification | Condition | Interval | Results |
|--------|-----------------------------|---|-----------|---------|
| AC | JESD22 A102 | Ta = 121°C, P= 15 PSIG, RH = 100%, 96 Hours | 96 hrs | 0/231 |
| H3TRB | JESD22-A101 | Temp = 85C, RH=85%, bias = 80% of rated V or 100V max | 2016 hrs | 0/231 |
| TC+PC | JESD22-A104 | Ta = -55°C to +150°C | 1000 cyc | 0/231 |
| IOL+PC | MIL STD750, M 1037 AEC Q101 | Ta=+25°C, deltaTj=100°C max, Ton = Toff = 2min | 30000 cyc | 0/231 |
| PC | J-STD-020 JESD-A113 | MSL 1 @ 260 °C | | 0/504 |
| RSH | JESD22-B106 | Ta = 265°C, 10 sec | | 0/90 |
| SD | JSTD002 | Ta = 245°C, 10 sec | | 0/45 |

Electrical Characteristics Summary:

Electrical characteristics are not impacted.

List of Affected Parts:

Note: Only the standard (off the shelf) part numbers are listed in the parts list. Any custom parts affected by this PCN are shown in the customer specific PCN addendum in the PCN email notification, or on the [PCN Customized Portal](#).

| Current Part Number | New Part Number | Qualification Vehicle |
|---------------------|-----------------|--|
| NVMF55C442NLT3G | NA | NVMF55C404NWFT3G-K, NVMF55C404NLT1G, NVMF55C645NLT1G |
| NVMF55C442NLT1G | NA | NVMF55C404NWFT3G-K, NVMF55C404NLT1G, NVMF55C645NLT1G |
| NVMF55C442NLAFT3G | NA | NVMF55C404NWFT3G-K, NVMF55C404NLT1G, NVMF55C645NLT1G |
| NVMF55C442NLAFT1G | NA | NVMF55C404NWFT3G-K, NVMF55C404NLT1G, NVMF55C645NLT1G |

Appendix A: Changed Products**PCN#: FPCN22966Z11**
Issue Date: Sep 06, 2021

| Product | Customer Part Number | Qualification Vehicle | New Part Number | Replacement Supplier |
|-------------------|----------------------|--|-----------------|----------------------|
| NVMFS5C442NLAFT1G | | NVMFS5C404NWFT3G-K, NVMFS5C404NLT1G, NVMFS5C645NLT1G | NA | |