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| <b>Title of Change:</b>             | Qualification of ON Semiconductor's Trench IGBT fab in Niigata (Japan) for 600V/650V and ON Semiconductor Vietnam (OSV) Assembly-Test operations of TO247 package IGBTs for Co-pack dual die.   |
| <b>Proposed first ship date:</b>    | 4 March 2016  |
| <b>Contact information:</b>         | Contact your local ON Semiconductor Sales Office or <Gk.sua@onsemi.com>; <way-shan.yong@onsemi.com>   |
| <b>Samples:</b>                     | Contact your local ON Semiconductor Sales Office  |
| <b>Additional Reliability Data:</b> | Contact your local ON Semiconductor Sales Office or <cheanching.sim@onsemi.com>; <xiaohu.zhang@onsemi.com >   |
| <b>Type of notification:</b>        | 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>.  |
| <b>Change Part Identification:</b>  | VN site code on the marking, effective NH08G product may be sourced from either fab.  |
| <b>Change category:</b>             | <input checked="" type="checkbox"/> Wafer Fab Change <input checked="" type="checkbox"/> Assembly Change <input checked="" type="checkbox"/> Test Change <input type="checkbox"/> Other _____   |
| <b>Change Sub-Category(s):</b>      | <input checked="" type="checkbox"/> Manufacturing Site Change/Addition <input type="checkbox"/> Material Change <input type="checkbox"/> Datasheet/Product Doc change<br><input type="checkbox"/> Manufacturing Process Change <input type="checkbox"/> Product specific change <input type="checkbox"/> Shipping/Packaging/Marking<br><input type="checkbox"/> Other: _____  |
| <b>Sites Affected:</b>              | <input type="checkbox"/> All site(s) <input type="checkbox"/> not applicable <input checked="" type="checkbox"/> ON Semiconductor site(s) :<br>ON Dong Nai Province, Vietnam<br>ON Niigata, Japan <input type="checkbox"/> External Foundry/Subcon site(s)  |
| <b>Description and Purpose:</b>     | <p>This FPCN announces the planned capacity expansion of ON Semiconductor's TIGBT fab and assembly/test operations of TO247 package IGBTs Co-pack dual die.</p> <p>Wafer fabrication of the 600V/650V devices are sourced from ON Semiconductor at Czech Republic (CZ4). ON Semiconductor Niigata, Japan is added as additional fabrication site. Upon the expiration of this FPCN, 600V and 650V TIGBT devices will be produced in either of the two locations, ON Semiconductor at Czech Republic (CZ4) or On Semiconductor Niigata (JPF) effective February 2016. These products have been qualified to industrial requirements.</p> <p>Currently, assembly and test of these devices is performed at Nantong Fujitsu Microelectronics (NMFE), China. ON Semiconductor Vietnam (OSV) is being added as an additional assembly and test site. Upon the expiration of this FPCN, TO247 packaged IGBTs Co-pack dual die for the affected devices will be produced in either of the two locations, Nantong Fujitsu Microelectronics (NMFE) or On Semiconductor Vietnam (OSV). These products have been qualified to industrial requirements. These products will be Pb-free, Halide free and RoHS compliant.</p> |



## Reliability Data Summary for Assembly Expansion:

QV DEVICE NAME: NGTB75N65FL2WG  
PACKAGE: TO247

| Test  | Specification                      | Condition                                    | Interval | Results |
|-------|------------------------------------|--|----------|---------|
| HTRB  | JESD22-A108                        | Ta = 145°C, 80% max rated V                  | 1008 hrs | 0/240   |
| HTGB  | JESD22-A108                        | Ta = 150°C, 100% max rated Vgss              | 1008 hrs | 0/240   |
| HTSL  | JESD22-A103                        | Ta = 175°C                                   | 1008 hrs | 0/240   |
| IOL   | MIL-STD-750<br>(M1037)<br>AEC-Q101 | Ta = +25°C, delta Tj=100°C<br>On/off = 5 min | 6000 cyc | 0/240   |
| TC    | JESD22-A104                        | Ta = -55°C to +150°C                         | 1000 cyc | 0/240   |
| H3TRB | JESD22-A101                        | 85°C, 85% RH, 18.8psig, bias                 | 1008 hrs | 0/240   |
| uHAST | JESD22-A102                        | 121°C, 100% RH, 15psig, unbiased             | 96 hrs   | 0/240   |
| RSH   | JESD22- B106                       | Ta = 265°C, 10 sec                           |          | 0/90    |
| SD    | JSTD002                            | Ta = 245°C, 10 sec                           |          | 0/45    |

QV DEVICE NAME: NGTB50N120FL2WG  
PACKAGE: TO247

| Test  | Specification                      | Condition                                    | Interval | Results |
|-------|------------------------------------|--|----------|---------|
| HTRB  | JESD22-A108                        | Ta = 145°C, 80% max rated V                  | 1008 hrs | 0/240   |
| HTGB  | JESD22-A108                        | Ta = 150°C, 100% max rated Vgss              | 1008 hrs | 0/240   |
| HTSL  | JESD22-A103                        | Ta = 175°C                                   | 1008 hrs | 0/240   |
| IOL   | MIL-STD-750<br>(M1037)<br>AEC-Q101 | Ta = +25°C, delta Tj=100°C<br>On/off = 5 min | 6000 cyc | 0/240   |
| TC    | JESD22-A104                        | Ta = -55°C to +150°C                         | 1000 cyc | 0/240   |
| H3TRB | JESD22-A101                        | 85°C, 85% RH, 18.8psig, bias                 | 1008 hrs | 0/240   |
| uHAST | JESD22-A102                        | 121°C, 100% RH, 15psig, unbiased             | 96 hrs   | 0/240   |
| RSH   | JESD22- B106                       | Ta = 265°C, 10 sec                           |          | 0/90    |
| SD    | JSTD002                            | Ta = 245°C, 10 sec                           |          | 0/45    |


**Niigata Fab 600V/650V Trench IGBT Reliability Data Summary:**
**QV DEVICE NAME: NGTB75N60FL2WG**
**PACKAGE: TO247**

| Test  | Specification                      | Condition                                    | Interval | Results |
|-------|------------------------------------|--|----------|---------|
| HTRB  | JESD22-A108                        | Ta = 145°C, 80% max rated V                  | 1008 hrs | 0/240   |
| HTGB  | JESD22-A108                        | Ta = 175°C, 100% max rated Vgss              | 1008 hrs | 0/240   |
| HTSL  | JESD22-A103                        | Ta = 150°C                                   | 1008 hrs | 0/240   |
| IOL   | MIL-STD-750<br>(M1037)<br>AEC-Q101 | Ta = +25°C, delta Tj=100°C<br>On/off = 5 min | 6000 cyc | 0/240   |
| TC    | JESD22-A104                        | Ta = -55°C to +150°C                         | 1000 cyc | 0/240   |
| H3TRB | JESD22-A101                        | 85°C, 85% RH, 18.8psig, bias                 | 1008 hrs | 0/240   |
| uHAST | JESD22-A102                        | 121°C, 100% RH, 15psig, unbiased             | 96 hrs   | 0/240   |
| RSH   | JESD22- B106                       | Ta = 265°C, 10 sec                           |          | 0/90    |
| SD    | JSTD002                            | Ta = 245°C, 10 sec                           |          | 0/45    |
|       |                                    |  |          |         |

**Electrical Characteristic Summary:**

Electrical characteristics are not impacted.

**List of Affected Standard Parts: (Trench IGBT Copack 1200V)**

| Part Number     | Qualification Vehicle |
|-----------------|-----------------------|
| NGTB15N120FL2WG | NGTB50N120FL2WG       |
| NGTB25N120FL2WG | NGTB50N120FL2WG       |
| NGTB25N120SWG   | NGTB50N120FL2WG       |
| NGTB30N120FL2WG | NGTB50N120FL2WG       |
| NGTB30N120L2WG  | NGTB50N120FL2WG       |
| NGTB40N120FL2WG | NGTB50N120FL2WG       |
| NGTB40N120SWG   | NGTB50N120FL2WG       |
| NGTB50N120FL2WG | NGTB50N120FL2WG       |



List of Affected Standard Parts: (Trench IGBT Copack 600V/650V)

| Part Number     | Qualification Vehicle          |
|-----------------|--------------------------------|
| NGTB30N60IHLWG  | NGTB75N65FL2WG, NGTB75N60FL2WG |
| NGTB30N65IHL2WG | NGTB75N65FL2WG, NGTB75N60FL2WG |
| NGTB35N60FL2WG  | NGTB75N65FL2WG, NGTB75N60FL2WG |
| NGTB35N65FL2WG  | NGTB75N65FL2WG, NGTB75N60FL2WG |
| NGTB40N60IHLWG  | NGTB75N65FL2WG, NGTB75N60FL2WG |
| NGTB40N60L2WG   | NGTB75N65FL2WG, NGTB75N60FL2WG |
| NGTB40N65IHL2WG | NGTB75N65FL2WG, NGTB75N60FL2WG |
| NGTB45N60S1WG   | NGTB75N65FL2WG, NGTB75N60FL2WG |
| NGTB45N60S2WG   | NGTB75N65FL2WG, NGTB75N60FL2WG |
| NGTB45N60SWG    | NGTB75N65FL2WG, NGTB75N60FL2WG |
| NGTB50N60FL2WG  | NGTB75N65FL2WG, NGTB75N60FL2WG |
| NGTB50N60L2WG   | NGTB75N65FL2WG, NGTB75N60FL2WG |
| NGTB50N60S1WG   | NGTB75N65FL2WG, NGTB75N60FL2WG |
| NGTB50N60SWG    | NGTB75N65FL2WG, NGTB75N60FL2WG |
| NGTB50N65FL2WG  | NGTB75N65FL2WG, NGTB75N60FL2WG |
| NGTB75N60FL2WG  | NGTB75N65FL2WG, NGTB75N60FL2WG |
| NGTB75N60SWG    | NGTB75N65FL2WG, NGTB75N60FL2WG |
| NGTB75N65FL2WG  | NGTB75N65FL2WG, NGTB75N60FL2WG |
| NGTB40N60FL2WG  | NGTB75N65FL2WG, NGTB75N60FL2WG |
| NGTB40N65FL2WG  | NGTB75N65FL2WG, NGTB75N60FL2WG |