

|  |  |                                       |  |
|--|--|---------------------------------------|--|
| <b>PCN Number:</b>   | 20170306001  | <b>PCN Date:</b>                      | Mar 08, 2017   |
| <b>Title:</b>  | Qualify New Assembly Material set for Selected Device(s) |                                       |  |
| <b>Customer Contact:</b>   | <a href="#">PCN Manager</a>                              | <b>Dept:</b>                          | Quality Services   |
| <b>Proposed 1<sup>st</sup> Ship Date:</b>  | June 08, 2017  | <b>Estimated Sample Availability:</b> | Date provided at sample request  |
| <b>Change Type:</b>  |  |                                       |  |
| <input type="checkbox"/>   | Assembly Site  | <input type="checkbox"/>              | Design   |
| <input checked="" type="checkbox"/>  | Assembly Process   | <input type="checkbox"/>              | Data Sheet   |
| <input checked="" type="checkbox"/>  | Assembly Materials                                       | <input type="checkbox"/>              | Part number change   |
| <input type="checkbox"/>   | Mechanical Specification                                 | <input type="checkbox"/>              | Test Site  |
| <input type="checkbox"/>   | Packing/Shipping/Labeling                                | <input type="checkbox"/>              | Test Process   |
| <input type="checkbox"/>   |  | <input type="checkbox"/>              | Wafer Bump Site  |
| <input type="checkbox"/>   |  | <input type="checkbox"/>              | Wafer Bump Material  |
| <input type="checkbox"/>   |  | <input type="checkbox"/>              | Wafer Bump Process   |
| <input type="checkbox"/>   |  | <input type="checkbox"/>              | Wafer Fab Site   |
| <input type="checkbox"/>   |  | <input type="checkbox"/>              | Wafer Fab Materials  |
| <input type="checkbox"/>   |  | <input type="checkbox"/>              | Wafer Fab Process  |
| <b>PCN Details</b>   |  |                                       |  |
| <b>Description of Change:</b>  |  |                                       |  |
| Texas Instruments is pleased to announce the qualification of new assembly material for devices listed in "Product affected" section below. Devices will remain in current assembly facility and intended piece part changes will be as follows: |  |                                       |  |
| <b>Material Differences:</b>   |  |                                       |  |
|  | <b>Material</b>  | <b>Current</b>                        | <b>Proposed</b>  |
|  | Mount compound   | 1400230112                            | <a href="#">1400329111</a>   |
|  | Mold compound  | 1800819111                            | <a href="#">1800900161</a>   |
| <b>Reason for Change:</b>  |  |                                       |  |
| Continuity of supply.  |  |                                       |  |
| <b>Anticipated impact on Fit, Form, Function, Quality or Reliability (positive / negative):</b>  |  |                                       |  |
| None.  |  |                                       |  |
| <b>Anticipated impact on Material Declaration</b>  |  |                                       |  |
| <input type="checkbox"/>   | No Impact to the Material Declaration                    | <input checked="" type="checkbox"/>   | Material Declarations or Product Content reports are driven from production data and will be available following the production release. Upon production release the revised reports can be obtained from the <a href="#">TI ECO website</a> . |
| <b>Changes to product identification resulting from this PCN:</b>  |  |                                       |  |
| None.  |  |                                       |  |
| <b>Product Affected:</b>   |  |                                       |  |
| TPD1E05U06DPYR   | TPD1E10B06DPYR   | TPD1E10B09DPYR                        |  |
| TPD1E05U06DPYT   | TPD1E10B06DPYT   | TPD1E10B09DPYT                        |  |

# Qualification Report

## TPD1E05U06DPYR TPD1E10B06DPYR TPD1E10B09DPYR

### Qualification at ASEN using Automotive BOM

Approve Date 01-Mar-2017

#### Product Attributes

| Attributes          | Qual Device:<br>TPD1E05U06DPYR | Qual Device:<br>TPD1E10B06DPYR | Qual Device:<br>TPD1E10B09DPYR | QBS Product Reference:<br>TPD1E05U06QDPYRQ1 |
|---------------------|--------------------------------|--------------------------------|--------------------------------|---|
| Assembly Site       | ASEN                           | ASEN                           | ASEN                           | ASEN  |
| Package Family      | X1SON                          | X1SON                          | X1SON                          | X1SON                                       |
| Flammability Rating | UL 94 V-0                      | UL 94 V-0                      | UL 94 V-0                      | UL 94 V-0                                   |
| Wafer Fab Supplier  | CFAB                           | CFAB                           | CFAB                           | CFAB  |
| Wafer Process       | VDIODE                         | VDIODE                         | VDIODE                         | VDIODE.ULC                                  |

| Attributes          | QBS Product Reference:<br>TPD1E10B09QDPYRQ1 | QBS Process Reference:<br>TPD1E10B09DPYR | QBS Process Reference:<br>TPD4E1U06DCKR | QBS Package Reference:<br>TPD1E10B06QDPYRQ1 |
|---------------------|---|--|---|---|
| Assembly Site       | ASEN  | JCET                                     | NFME                                    | ASEN  |
| Package Family      | X1SON                                       | X2SON                                    | SC70-6A (6F2)                           | X1SON                                       |
| Flammability Rating | UL 94 V-0                                   | UL 94 V-0                                | -                                       | UL 94 V-0                                   |
| Wafer Fab Supplier  | CFAB  | CFAB                                     | CFAB                                    | CFAB  |
| Wafer Process       | VDIODE.BD                                   | V-Diode                                  | VD-ULC                                  | VDIODE.BD                                   |

- QBS: Qual By Similarity

- Qual Devices qualified at LEVEL1-260C: TPD1E05U06DPYR, TPD1E10B06DPYR, TPD1E10B09DPYR

#### Qualification Results

Data Displayed as: Number of lots / Total sample size / Total failed

| Type      | Test Name / Condition                     | Duration                    | Qual Device:<br>TPD1E05U06DPY<br>R | Qual Device:<br>TPD1E10B06DPY<br>R | Qual Device:<br>TPD1E10B09DPY<br>R | QBS Product<br>Reference:<br>TPD1E05U06QDP<br>YRQ1 |
|-----------|---|-----------------------------|------------------------------------|------------------------------------|------------------------------------|--|
| -         | High Temp Reverse Bias,<br>125C           | 1000 Hours                  | -                                  | -                                  | -                                  | 3/231/0  |
| AC        | Autoclave 121C                            | 96 Hours                    | -                                  | -                                  | -                                  | -  |
| ED        | Electrical Distributions                  | Cpk>1.67                    | -                                  | -                                  | -                                  | 3/75/0   |
| ED        | Electrical Characterization               | Per Datasheet<br>Parameters | Pass                               | Pass                               | Pass                               | -  |
| HAS<br>T  | Biased HAST, 110C/85%RH                   | 264 Hours                   | -                                  | -                                  | -                                  | -  |
| HBM       | ESD - HBM                                 | 10000 V                     | -                                  | -                                  | -                                  | 1/10/0   |
| CDM       | ESD - CDM                                 | 1500 V                      | -                                  | -                                  | -                                  | 1/10/0   |
| HTO<br>L  | Life Test, 150C                           | 300 Hours                   | -                                  | -                                  | -                                  | -  |
| EHT<br>SL | Extended High Temp.<br>Storage Bake, 150C | 500 Hours                   | -                                  | -                                  | -                                  | -  |
| HTSL      | High Temp. Storage Bake,<br>150C          | 500 Hours                   | -                                  | -                                  | -                                  | -  |
| HTSL      | High Temp. Storage Bake,<br>170C          | 420 Hours                   | -                                  | -                                  | -                                  | -  |
| SD        | Surface Mount Solderability               | Pb                          | -                                  | -                                  | -                                  | -  |
| SD        | Surface Mount Solderability               | Pb Free                     | -                                  | -                                  | -                                  | -  |

|           |                              |            |   |   |   |        |
|-----------|------------------------------|------------|---|---|---|--------|
| TC        | Temperature Cycle, -65/150C  | 500 Cycles | - | - | - | -      |
| TC        | Temperature Cycle, -55/150C  | 400 Cycles | - | - | - | -      |
| UHA<br>ST | Unbiased HAST,<br>130C/85%RH | 96 Hours   | - | - | - | -      |
| WBP       | Bond Pull                    | Wires      | - | - | - | 1/10/0 |
| WBS       | Bond Shear                   | Wires      | - | - | - | 1/10/0 |

| Type      | Test Name / Condition                  | Duration                 | QBS Product Reference:<br>TPD1E10B09QD<br>PYRQ1 | QBS Process Reference:<br>TPD1E10B09DPY<br>R | QBS Process Reference:<br>TPD4E1U06DCK<br>R | QBS Package Reference:<br>TPD1E10B06QD<br>PYRQ1 |
|-----------|--|--------------------------|---|--|---|---|
| -         | High Temp Reverse Bias, 125C           | 1000 Hours               | 3/231/0   | -  | -   | 3/231/0   |
| AC        | Autoclave 121C                         | 96 Hours                 | -   | -  | -   | 3/231/0   |
| ED        | Electrical Distributions               | Cpk>1.67                 | 3/75/0  | -  | -   | 3/75/0  |
| ED        | Electrical Characterization            | Per Datasheet Parameters | -   | Pass   | Pass  | -   |
| HAS<br>T  | Biased HAST, 110C/85%RH                | 264 Hours                | -   | -  | -   | 3/231/0   |
| HBM       | ESD - HBM                              | 10000 V                  | 1/10/0  | -  | -   | 1/10/0  |
| CDM       | ESD - CDM                              | 1500 V                   | 1/10/0  | -  | 3/9/0                                       | 1/10/0  |
| HTO<br>L  | Life Test, 150C                        | 300 Hours                | -   | 3/231/0                                      | 3/231/0                                     | -   |
| EHT<br>SL | Extended High Temp. Storage Bake, 150C | 500 Hours                | -   | -  | -   | 3/15/0  |
| HTSL      | High Temp. Storage Bake, 150C          | 500 Hours                | -   | -  | -   | 1/77/0  |
| HTSL      | High Temp. Storage Bake, 170C          | 420 Hours                | -   | -  | 3/231/0                                     | -   |
| SD        | Surface Mount Solderability            | Pb                       | -   | -  | -   | 1/10/0  |
| SD        | Surface Mount Solderability            | Pb Free                  | -   | -  | -   | 1/10/0  |
| TC        | Temperature Cycle, -65/150C            | 500 Cycles               | -   | -  | 3/231/0                                     | -   |
| TC        | Temperature Cycle, -55/150C            | 400 Cycles               | -   | -  | -   | 3/231/0   |
| UHA<br>ST | Unbiased HAST, 130C/85%RH              | 96 Hours                 | -   | -  | 3/231/0                                     | -   |
| WBP       | Bond Pull                              | Wires                    | 1/10/0  | -  | -   | 1/10/0  |
| WBS       | Bond Shear                             | Wires                    | 1/10/0  | -  | -   | 1/10/0  |

- Preconditioning was performed for Autoclave, Unbiased HAST, THB/Biased HAST, Temperature Cycle, Thermal Shock, and HTSL, as applicable

- The following are equivalent HTOL options based on an activation energy of 0.7eV : 125C/1k Hours, 140C/480 Hours, 150C/300 Hours, and 155C/240 Hours

- The following are equivalent HTSL options based on an activation energy of 0.7eV : 150C/1k Hours, and 170C/420 Hours

- The following are equivalent Temp Cycle options per JESD47 : -55C/125C/700 Cycles and -65C/150C/500 Cycles

Quality and Environmental data is available at TI's external Web site: <http://www.ti.com/>

**Green/Pb-free Status:**

Qualified Pb-Free(SMT) and Green

For questions regarding this notice, e-mails can be sent to the regional contacts shown below or your local Field Sales Representative.

| Location     | E-Mail   |
|--------------|--|
| USA          | <a href="mailto:PCNAmericasContact@list.ti.com">PCNAmericasContact@list.ti.com</a> |
| Europe       | <a href="mailto:PCNEuropeContact@list.ti.com">PCNEuropeContact@list.ti.com</a>     |
| Asia Pacific | <a href="mailto:PCNAsiaContact@list.ti.com">PCNAsiaContact@list.ti.com</a>         |
| Japan        | <a href="mailto:PCNJapanContact@list.ti.com">PCNJapanContact@list.ti.com</a>       |