

|                                                                                                                                                                                               |                                                                        |                                               |                                               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|-----------------------------------------------|-----------------------------------------------|
| <b>PCN Number:</b>                                                                                                                                                                            | 20230928002.1                                                          | <b>PCN Date:</b>                              | September 28, 2023                            |
| <b>Title:</b>                                                                                                                                                                                 | Qualification of HFTF as an alternate Assembly site for select devices |                                               |                                               |
| <b>Customer Contact:</b>                                                                                                                                                                      | Change Management Team                                                 | <b>Dept:</b>                                  | Quality Services                              |
| <b>Proposed 1<sup>st</sup> Ship Date:</b>                                                                                                                                                     | Dec 29, 2023                                                           | <b>Sample requests accepted until:</b>        | Oct 29, 2023*                                 |
| *Sample requests received after Oct 29, 2023 will not be supported.                                                                                                                           |                                                                        |                                               |                                               |
| <b>Change Type:</b>                                                                                                                                                                           |                                                                        |                                               |                                               |
| <input checked="" type="checkbox"/> Assembly Site                                                                                                                                             | <input type="checkbox"/> Design                                        | <input type="checkbox"/> Wafer Bump Material  |                                               |
| <input type="checkbox"/> Assembly Process                                                                                                                                                     | <input type="checkbox"/> Data Sheet                                    | <input type="checkbox"/> Wafer Bump Process   |                                               |
| <input checked="" type="checkbox"/> Assembly Materials                                                                                                                                        | <input type="checkbox"/> Part number change                            | <input type="checkbox"/> Wafer Fab Site       |                                               |
| <input type="checkbox"/> Mechanical Specification                                                                                                                                             | <input type="checkbox"/> Test Site                                     | <input type="checkbox"/> Wafer Fab Material   |                                               |
| <input checked="" type="checkbox"/> Packing/Shipping/Labeling                                                                                                                                 | <input type="checkbox"/> Test Process                                  | <input type="checkbox"/> Wafer Fab Process    |                                               |
| <b>PCN Details</b>                                                                                                                                                                            |                                                                        |                                               |                                               |
| <b>Description of Change:</b>                                                                                                                                                                 |                                                                        |                                               |                                               |
| Texas Instruments Incorporated is announcing the qualification of HFTF as an additional Assembly site for set of devices listed below. Construction differences are as follows:               |                                                                        |                                               |                                               |
|                                                                                                                                                                                               | <b>UTL</b>                                                             | <b>ASESH</b>                                  | <b>HFTF</b>                                   |
| Wire type                                                                                                                                                                                     | 1.3mil Au, 1.3mil Cu                                                   | 1.3mil Au, 1.0mil Cu                          | 1.0 mil Cu                                    |
| Mold Compound                                                                                                                                                                                 | CZ0094                                                                 | EN2000515                                     | R-32                                          |
| Mount Compound                                                                                                                                                                                | PZ0013                                                                 | EY1000063                                     | A-24                                          |
| <b>Package Outline Differences:</b>                                                                                                                                                           |                                                                        |                                               |                                               |
| <b>UTL/ASESH</b>                                                                                                                                                                              |                                                                        | <b>HFTF</b>                                   |                                               |
|                                                                                                                                                                                               |                                                                        |                                               |                                               |
| Smaller thermal pad area                                                                                                                                                                      |                                                                        | Larger thermal pad area                       |                                               |
| <b>Reason for Change:</b>                                                                                                                                                                     |                                                                        |                                               |                                               |
| Supply continuity                                                                                                                                                                             |                                                                        |                                               |                                               |
| <b>Anticipated impact on Form, Fit, Function, Quality or Reliability (positive / negative):</b>                                                                                               |                                                                        |                                               |                                               |
| None                                                                                                                                                                                          |                                                                        |                                               |                                               |
| <b>Impact on Environmental Ratings</b>                                                                                                                                                        |                                                                        |                                               |                                               |
| Checked boxes indicate the status of environmental ratings following implementation of this change. If below boxes are checked, there are no changes to the associated environmental ratings. |                                                                        |                                               |                                               |
| <b>RoHS</b>                                                                                                                                                                                   | <b>REACH</b>                                                           | <b>Green Status</b>                           | <b>IEC 62474</b>                              |
| <input checked="" type="checkbox"/> No Change                                                                                                                                                 | <input checked="" type="checkbox"/> No Change                          | <input checked="" type="checkbox"/> No Change | <input checked="" type="checkbox"/> No Change |

### Changes to product identification resulting from this PCN:

| Assembly Site | Assembly Site Origin (22L) | Assembly Country Code (23L) | Assembly City |
|---------------|----------------------------|-----------------------------|---------------|
| UTL           | NS2                        | THA                         | Bangpakong    |
| ASESH         | ASH                        | CHN                         | Shanghai      |
| <b>HFTF</b>   | <b>HFT</b>                 | <b>CHN</b>                  | <b>Hefei</b>  |

Sample product shipping label (not actual product label)



### Product Affected:

|               |               |               |               |
|---------------|---------------|---------------|---------------|
| TPS5401DGQ    | TPS54040DGQ   | TPS54060DGQR  | TPS54160ADGQ  |
| TPS5401DGQR   | TPS54040DGQR  | TPS54140ADGQ  | TPS54160ADGQR |
| TPS5401DGQT   | TPS54060ADGQ  | TPS54140ADGQR | TPS54160DGQ   |
| TPS54040ADGQ  | TPS54060ADGQR | TPS54140DGQ   | TPS54160DGQR  |
| TPS54040ADGQR | TPS54060DGQ   | TPS54140DGQR  |               |

## Qualification Report

Approve Date 01-AUGUST -2023

### Qualification Results

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

| Type  | #  | Test Name                     | Condition                                           | Duration   | Qual Device:<br>TPS54160ADGQR | QBS Reference:<br>LM5165XQDGSRQ1 | QBS Reference:<br>TPS40210QDGQRQ1 |
|-------|----|-------------------------------|-----------------------------------------------------|------------|-------------------------------|----------------------------------|-----------------------------------|
| HAST  | A2 | Biased HAST                   | 130C/85%RH                                          | 96 Hours   | QBS                           | 3/231/0                          | 3/231/0                           |
| UHAST | A3 | Unbiased HAST                 | 130C/85%RH                                          | 96 Hours   | QBS                           | 3/231/0                          | 3/231/0                           |
| TC    | A4 | Temperature Cycle             | -65C/150C                                           | 500 Cycles | QBS                           | 3/231/0                          | 3/231/0                           |
| HTSL  | A6 | High Temperature Storage Life | 175C                                                | 500 Hours  | QBS                           | 3/135/0                          | -                                 |
| SD    | C3 | PB-Free Solderability         | Precondition w.155C Dry Bake (4 hrs +/- 15 minutes) | -          | QBS                           | 1/15/0                           | -                                 |

QBS: Qual By Similarity

Qual Device TPS54160ADGQR is qualified at MSL1 260C

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/>

For questions regarding this notice, e-mails can be sent to Change Management team or your local Field Sales Representative.

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