

| <b>PCN Number:</b>  | 20230731002.2                                       |   |  | <b>PCN Date:</b>                              | August 02, 2023     |  |         |          |             |        |          |
|---|---|---|--|---|---------------------|--|---------|----------|-------------|--------|----------|
| <b>Title:</b>   | Qualification of new BOM for select package Devices |   |  |   |                     |  |         |          |             |        |          |
| <b>Customer Contact:</b>  | Change Management team                              |   | <b>Dept:</b>                           | Quality Services                              |                     |  |         |          |             |        |          |
| <b>Proposed 1<sup>st</sup> Ship Date:</b>   | Jan 28, 2024  |   | <b>Sample requests accepted until:</b> | Aug 31, 2023*                                 |                     |  |         |          |             |        |          |
| *Sample requests received after Aug 31, 2023 will not be supported.   |   |   |  |   |                     |  |         |          |             |        |          |
| <b>Change Type:</b>   |   |   |  |   |                     |  |         |          |             |        |          |
| <input 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 type="checkbox"/>  | Packing/Shipping/Labeling                           | <input type="checkbox"/>                      | Test Process                           | <input type="checkbox"/>                      | Wafer Fab Process   |  |         |          |             |        |          |
|   |   |   |  | <input type="checkbox"/>                      | Wafer Fab Process   |  |         |          |             |        |          |
| <b>PCN Details</b>  |   |   |  |   |                     |  |         |          |             |        |          |
| <b>Description of Change:</b>   |   |   |  |   |                     |  |         |          |             |        |          |
| <p>Texas Instruments Incorporated is announcing the qualification of new material set for the devices listed in the "Product Affected" Section. Devices will remain at current location.</p> <p><b>Material Difference:</b></p> <table border="1"> <thead> <tr> <th></th> <th>Current</th> <th>Proposed</th> </tr> </thead> <tbody> <tr> <td>Lead finish</td> <td>NiPdAu</td> <td>Matte Sn</td> </tr> </tbody> </table> <p>Upon expiration of this PCN, TI will combine lead free solutions in a single <a href="#"><u>standard part number</u></a>, for example; <a href="#"><u>TPS25850QRPQRQ1</u></a> – can ship with both Matte Sn and NiPdAu.</p> <p>Example:</p> <ul style="list-style-type: none"> <li>– Customer order for 7500 units of TPS25850QRPQRQ1 with 2500 units SPQ (Standard Pack Quantity per Reel).</li> <li>– TI can satisfy the above order in one of the following ways. <ul style="list-style-type: none"> <li>I. 3 Reels of NiPdAu finish.</li> <li>II. 3 Reels of Matte Sn finish</li> <li>III. 2 Reels of Matte Sn and 1 reel of NiPdAu finish.</li> <li>IV. 2 Reels of NiPdAu and 1 reel of Matte Sn finish.</li> </ul> </li> </ul> |   |   |  |   |                     |  | Current | Proposed | Lead finish | NiPdAu | Matte Sn |
|   | Current   | Proposed                                      |  |   |                     |  |         |          |             |        |          |
| Lead finish   | NiPdAu  | Matte Sn                                      |  |   |                     |  |         |          |             |        |          |
| <b>Reason for Change:</b>   |   |   |  |   |                     |  |         |          |             |        |          |
| Continuity of supply.   |   |   |  |   |                     |  |         |          |             |        |          |
| <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>                           |                     |  |         |          |             |        |          |
| <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:

Sample product shipping label (not actual product label)

G4 = NiPdAu

G3 = Matte Sn

TEXAS  
INSTRUMENTS

MADE IN: Malaysia  
2DC: 2Q:

MSL '2 / 260C / 1 YEAR SEAL DT  
MSL 1 / 235C / UNLIM 03/29/04

OPT:  
ITEM:

LBL: 5A (L)T0:1750

G4



(1P) SN74LS07NSR  
(Q) 2000 (D) 0336  
(31T) LOT: 3959047MLA  
(4W) TKY (1T) 7523483S12  
(P)  
(2P) REV: (V) 0033317  
(20L) CS0: SHE (21L) CC0: USA  
(22L) AS0: MLA (23L) AC0: MYS

## Product Affected:

|                    |                 |                 |                  |
|--------------------|-----------------|-----------------|------------------|
| PTPS25850A0QRPQTQ1 | TPS25854QRPQRQ1 | TPS25860QRPQRQ1 | TPS25868QRPQRQ1  |
| TPS25850QRPQRQ1    | TPS25855QRPQRQ1 | TPS25862QRPQRQ1 | TPS25869QRPQRQ1  |
| TPS25851QRPQRQ1    | TPS25858QRPQRQ1 | TPS25864QRPQRQ1 | TPS552882QRPMRQ1 |
| TPS25852QRPQRQ1    | TPS25859QRPQRQ1 | TPS25865QRPQRQ1 | TPS55288QRPMRQ1  |

## Qualification Report Automotive New Product Qualification Summary (As per AEC-Q100 and JEDEC Guidelines)

Approve Date 25-Jul-2023

## Product Attributes

| Attributes               | Qual Device:            | Qual Device:           |
|--------------------------|-------------------------|------------------------|
|                          | <u>TPS552882QRPMRQ1</u> | <u>TPS25858QRPQRQ1</u> |
| Automotive Grade Level   | Grade 1                 | Grade 1                |
| Operating Temp Range (C) | -40 to 125              | -40 to 125             |
| Product Function         | Power Management        | Power Management       |
| Wafer Fab Supplier       | RFAB                    | RFAB                   |
| Assembly Site            | CDAT                    | CDAT                   |
| Package Group            | QFN                     | QFN                    |
| Package Designator       | RPM                     | RPQ                    |
| Pin Count                | 26                      | 25                     |

QBS: Qual By Similarity

Qual Device TPS552882QRPMRQ1 is qualified at MSL2 260C

Qual Device TPS25858QRPQRQ1 is qualified at MSL2 260C

## Qualification Results

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

| Type   | #  | Test Spec                           | Min Lot Qty | SS / Lot | Test Name                             | Condition          | Duration    | Qual Device: <a href="#">TPS552882QRPMRQ1</a> | Qual Device: <a href="#">TPS25858QRPMRQ1</a>  |
|--|----|-------------------------------------|-------------|----------|---------------------------------------|--------------------|-------------|---|---|
| Test Group A - Accelerated Environment Stress Tests  |    |                                     |             |          |                                       |                    |             |   |   |
| PC   | A1 | JEDEC J-STD-020 JESD22-A113         | 3           | 77       | Preconditioning                       | MSL2 260C          | -           | 3/462/0                                       | 3/462/0                                       |
| AC/UHAST   | A3 | JEDEC JESD22-A102/JEDEC JESD22-A118 | 3           | 77       | Autoclave                             | 121C/15psig        | 96 Hours    | 3/231/0                                       | 3/231/0                                       |
| TC   | A4 | JEDEC JESD22-A104 and Appendix 3    | 3           | 77       | Temperature Cycle                     | -55C/150C          | 1000 Cycles | 3/231/0                                       | 3/231/0                                       |
| Test Group B - Accelerated Lifetime Simulation Tests |    |                                     |             |          |                                       |                    |             |   |   |
| Test Group C - Package Assembly Integrity Tests      |    |                                     |             |          |                                       |                    |             |   |   |
| SD   | C3 | JEDEC J-STD-002                     | 1           | 15       | PB-Free Solderability                 | >95% Lead Coverage | -           | 1/15/0  | 1/15/0  |
| Test Group D - Die Fabrication Reliability Tests     |    |                                     |             |          |                                       |                    |             |   |   |
| EM   | D1 | JESD61                              | -           | -        | Electromigration                      | -                  | -           | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements |
| TDDb   | D2 | JESD35                              | -           | -        | Time Dependent Dielectric Breakdown   | -                  | -           | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements |
| HCI  | D3 | JESD60 & 28                         | -           | -        | Hot Carrier Injection                 | -                  | -           | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements |
| NBTI   | D4 | -                                   | -           | -        | Negative Bias Temperature Instability | -                  | -           | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements |
| SM   | D5 | -                                   | -           | -        | Stress Migration                      | -                  | -           | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements |

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

### Ambient Operating Temperature by Automotive Grade Level:

Grade 0 (or E): -40C to +150C

Grade 1 (or Q): -40C to +125C

Grade 2 (or T): -40C to +105C

Grade 3 (or I) : -40C to +85C

### E1 (TEST): Electrical test temperatures of Qual samples (High temperature according to Grade level):

Room/Hot/Cold : HTOL, ED

Room/Hot : THB / HAST, TC / PTC, HTSL, ELFR, ESD & LU

Room : AC/uHAST

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

### ZVEI ID: SEM-PA-05

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

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