



**12500 TI Boulevard, MS 8640, Dallas, Texas 75243**

**PCN# 20250902000.2**  
**Qualification of TI Philippines (PHI) as an additional Assembly & Test**  
**site for select package devices**  
**Change Notification / Sample Request**

**Date:** September 03, 2025  
**To:** MOUSER PCN

Dear Customer:

This is an announcement of a change to a device that is currently offered by Texas Instruments. The details of this change are on the following pages.

Texas Instruments requires acknowledgement of receipt of this notification within 60 days of the date of this notice. Lack of acknowledgement of this notice within 60 days constitutes acceptance and approval of this change. If samples or additional data are required, requests must be received within 60 days of this notification.

The changes discussed within this PCN will not take effect any earlier than the proposed first ship date on Page 3 of this notification, unless customer agreement has been reached on an earlier implementation of the change.

This notice does not change the end-of-life status of any product. Should product affected be on a previously issued product withdrawal/discontinuance notice, this notification does not extend the life of that product or change the life time buy offering/discontinuance plan.

For questions regarding this notice or to provide acknowledgement of this PCN, you may contact your local Field Sales Representative or the change management team.

For sample requests or sample related questions, contact your local Field Sales Representative.

TI values customer engagement and feedback related to TI changes. Customers should contact TI if there are questions or concerns regarding a change notification.

Sincerely,

Change Management Team  
SC Business Services

**20250902000.2**  
**Change Notification / Sample Request**  
**Attachments**

**Products Affected:**

The devices listed on this page are a subset of the complete list of affected devices. According to our records, you have recently purchased these devices. The corresponding customer part number is also listed, if available.

| DEVICE          | CUSTOMER PART NUMBER |
|-----------------|----------------------|
| INA186A1QDBVRQ1 | NULL                 |
| INA186A3QDBVRQ1 | NULL                 |
| INA186A2QDBVRQ1 | NULL                 |

Technical details of this Product Change follow on the next page(s).

| <b>PCN Number:</b>   | 20250902000.2  |   |   | <b>PCN Date:</b>         | September 03, 2025  |               |                            |                             |                 |   |   |   |   |                |           |           |           |                       |            |            |                    |               |            |         |         |             |        |          |        |
|--|--|---|---|--------------------------|---------------------|---------------|----------------------------|-----------------------------|-----------------|---|---|---|---|----------------|-----------|-----------|-----------|-----------------------|------------|------------|--------------------|---------------|------------|---------|---------|-------------|--------|----------|--------|
| <b>Title:</b>  | Qualification of TI Philippines (PHI) as an additional Assembly & Test site 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>  | March 02, 2026   |   | <b>Estimated Sample Availability:</b>         | November 02, 2025        |                     |               |                            |                             |                 |   |   |   |   |                |           |           |           |                       |            |            |                    |               |            |         |         |             |        |          |        |
| <b>*Sample requests received after November 02, 2025 will not be supported.</b>  |  |   |   |                          |                     |               |                            |                             |                 |   |   |   |   |                |           |           |           |                       |            |            |                    |               |            |         |         |             |        |          |        |
| <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 checked="" 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>  |  |   |   |                          |                     |               |                            |                             |                 |   |   |   |   |                |           |           |           |                       |            |            |                    |               |            |         |         |             |        |          |        |
| <p>Texas Instruments is pleased to announce the Qualification of TI Philippines (PHI) as an additional Assembly &amp; Test site for select package devices. Material differences between sites as follows.</p> <table border="1"> <thead> <tr> <th></th> <th colspan="2">Current Site</th> <th>Additional Site</th> </tr> <tr> <th>Assembly/Test site</th> <th>HNA</th> <th>CDAT</th> <th>PHI</th> </tr> </thead> <tbody> <tr> <td>Wire diam/type</td> <td>1.0mil Au</td> <td>0.8mil Cu</td> <td>0.8mil Cu</td> </tr> <tr> <td>Mount compound</td> <td>SID#400194</td> <td>4226215</td> <td>4226215</td> </tr> <tr> <td>Mold compound</td> <td>SID#450207</td> <td>4222198</td> <td>4222198</td> </tr> <tr> <td>Lead finish</td> <td>NiPdAu</td> <td>Matte Sn</td> <td>NiPdAu</td> </tr> </tbody> </table> |  |   |   |                          |                     |               | Current Site               |                             | Additional Site | Assembly/Test site                            | HNA   | CDAT  | PHI   | Wire diam/type | 1.0mil Au | 0.8mil Cu | 0.8mil Cu | Mount compound        | SID#400194 | 4226215    | 4226215            | Mold compound | SID#450207 | 4222198 | 4222198 | Lead finish | NiPdAu | Matte Sn | NiPdAu |
|  | Current Site   |   | Additional Site                               |                          |                     |               |                            |                             |                 |   |   |   |   |                |           |           |           |                       |            |            |                    |               |            |         |         |             |        |          |        |
| Assembly/Test site   | HNA  | CDAT  | PHI   |                          |                     |               |                            |                             |                 |   |   |   |   |                |           |           |           |                       |            |            |                    |               |            |         |         |             |        |          |        |
| Wire diam/type   | 1.0mil Au  | 0.8mil Cu                                     | 0.8mil Cu                                     |                          |                     |               |                            |                             |                 |   |   |   |   |                |           |           |           |                       |            |            |                    |               |            |         |         |             |        |          |        |
| Mount compound   | SID#400194   | 4226215                                       | 4226215                                       |                          |                     |               |                            |                             |                 |   |   |   |   |                |           |           |           |                       |            |            |                    |               |            |         |         |             |        |          |        |
| Mold compound  | SID#450207   | 4222198                                       | 4222198                                       |                          |                     |               |                            |                             |                 |   |   |   |   |                |           |           |           |                       |            |            |                    |               |            |         |         |             |        |          |        |
| Lead finish  | NiPdAu   | Matte Sn                                      | NiPdAu  |                          |                     |               |                            |                             |                 |   |   |   |   |                |           |           |           |                       |            |            |                    |               |            |         |         |             |        |          |        |
| <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>  |  |   |   |                          |                     |               |                            |                             |                 |   |   |   |   |                |           |           |           |                       |            |            |                    |               |            |         |         |             |        |          |        |
| <p>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.</p> <table border="1"> <thead> <tr> <th>RoHS</th> <th>REACH</th> <th>Green Status</th> <th>IEC 62474</th> </tr> </thead> <tbody> <tr> <td><input checked="" type="checkbox"/> No Change</td> <td><input checked="" type="checkbox"/> No Change</td> <td><input checked="" type="checkbox"/> No Change</td> <td><input checked="" type="checkbox"/> No Change</td> </tr> </tbody> </table>   |  |   |   |                          |                     | RoHS          | REACH                      | Green Status                | IEC 62474       | <input checked="" type="checkbox"/> No Change | <input checked="" type="checkbox"/> No Change | <input checked="" type="checkbox"/> No Change | <input checked="" type="checkbox"/> No Change |                |           |           |           |                       |            |            |                    |               |            |         |         |             |        |          |        |
| RoHS   | REACH  | Green Status                                  | IEC 62474                                     |                          |                     |               |                            |                             |                 |   |   |   |   |                |           |           |           |                       |            |            |                    |               |            |         |         |             |        |          |        |
| <input checked="" type="checkbox"/> No Change  | <input checked="" type="checkbox"/> No Change  | <input checked="" type="checkbox"/> No Change | <input checked="" type="checkbox"/> No Change |                          |                     |               |                            |                             |                 |   |   |   |   |                |           |           |           |                       |            |            |                    |               |            |         |         |             |        |          |        |
| <b>Changes to product identification resulting from this PCN:</b>  |  |   |   |                          |                     |               |                            |                             |                 |   |   |   |   |                |           |           |           |                       |            |            |                    |               |            |         |         |             |        |          |        |
| <table border="1"> <thead> <tr> <th>Assembly Site</th> <th>Assembly Site Origin (22L)</th> <th>Assembly Country Code (21L)</th> <th>Assembly City</th> </tr> </thead> <tbody> <tr> <td>Hana Semiconductor</td> <td>HNT</td> <td>THA</td> <td>Ayutthaya</td> </tr> <tr> <td>TI Chengdu</td> <td>CDA</td> <td>CHN</td> <td>Chengdu</td> </tr> <tr> <td><b>TI Philippines</b></td> <td><b>PHI</b></td> <td><b>PHL</b></td> <td><b>Baguio City</b></td> </tr> </tbody> </table>  |  |   |   |                          |                     | Assembly Site | Assembly Site Origin (22L) | Assembly Country Code (21L) | Assembly City   | Hana Semiconductor                            | HNT   | THA   | Ayutthaya                                     | TI Chengdu     | CDA       | CHN       | Chengdu   | <b>TI Philippines</b> | <b>PHI</b> | <b>PHL</b> | <b>Baguio City</b> |               |            |         |         |             |        |          |        |
| Assembly Site  | Assembly Site Origin (22L)   | Assembly Country Code (21L)                   | Assembly City                                 |                          |                     |               |                            |                             |                 |   |   |   |   |                |           |           |           |                       |            |            |                    |               |            |         |         |             |        |          |        |
| Hana Semiconductor   | HNT  | THA   | Ayutthaya                                     |                          |                     |               |                            |                             |                 |   |   |   |   |                |           |           |           |                       |            |            |                    |               |            |         |         |             |        |          |        |
| TI Chengdu   | CDA  | CHN   | Chengdu                                       |                          |                     |               |                            |                             |                 |   |   |   |   |                |           |           |           |                       |            |            |                    |               |            |         |         |             |        |          |        |
| <b>TI Philippines</b>  | <b>PHI</b>   | <b>PHL</b>                                    | <b>Baguio City</b>                            |                          |                     |               |                            |                             |                 |   |   |   |   |                |           |           |           |                       |            |            |                    |               |            |         |         |             |        |          |        |
| Sample product shipping label (not actual product label)   |  |   |   |                          |                     |               |                            |                             |                 |   |   |   |   |                |           |           |           |                       |            |            |                    |               |            |         |         |             |        |          |        |

TEXAS  
INSTRUMENTS  
MADE IN: Malaysia  
2DC: 2Q:



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

OPT:  
ITEM: 39  
LBL: 5A (L)T0:1750

(1P) SN74LS07NSR  
(Q) 2000 (D) 0336  
(31T) LOT: 3959047MLA  
(4W) TKY (1T) 7523483SI2  
(P)  
(2P) REV: (V) 0033317  
(20L) CS0: SHE (21L) CC0: USA  
(22L) AS0: MLA (23L) ACO: MYS

### Product Affected:

|                 |                 |                 |
|-----------------|-----------------|-----------------|
| INA186A1QDBVRQ1 | INA186A3QDBVRQ1 | INA186A5QDBVRQ1 |
| INA186A2QDBVRQ1 | INA186A4QDBVRQ1 | SN1906023DBVRQ1 |

## Qualification Data

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

Approve Date 09-MAY -2025

### Product Attributes

| Attributes               | Qual Device:<br>INA186A1QDBVRQ1 | QBS Package Reference:<br>INA241A2QDDERQ1 | QBS Package Reference:<br>INA241A3QDDERQ1 | QBS Package Reference:<br>INA241A5QDDERQ1 | QBS Process Reference:<br>TMUX4051DYYRQ1 | QBS Package Reference:<br>TMUX4052DYYRQ1 | QBS Package Reference:<br>QPA4991QYYRQ1 | QBS Package Reference:<br>TLV7032QDDERQ1 | QBS Package, Process Reference:<br>INA186A1QDDERQ1 | QBS Package, Process Reference:<br>INA186A2QDDERQ1 | QBS Package, Process Reference:<br>INA186A3QDDERQ1 |
|--------------------------|---------------------------------|---|---|---|--|--|---|--|--|--|--|
| Automotive Grade Level   | Grade 1                         | Grade 1                                   | Grade 1                                   | Grade 1                                   | Grade 1                                  | Grade 1                                  | Grade 1                                 | Grade 1                                  | Grade 1  | Grade 1  | Grade 1  |
| Operating Temp Range (C) | -40 to 125                      | -40 to 125                                | -40 to 125                                | -40 to 125                                | -40 to 125                               | -40 to 125                               | -40 to 125                              | -40 to 125                               | -40 to 125   | -40 to 125   | -40 to 125   |
| Product Function         | Signal Chain                    | Signal Chain                              | Signal Chain                              | Signal Chain                              | Signal Chain                             | Signal Chain                             | Signal Chain                            | Signal Chain                             | Signal Chain                                       | Signal Chain                                       | Signal Chain                                       |
| Wafer Fab Supplier       | DMOS6                           | AIZU                                      | AIZU                                      | AIZU                                      | RFAB                                     | RFAB                                     | RFAB                                    | DMOS6                                    | DMOS6  | DMOS6  | DMOS6  |
| Assembly Site            | PHI                             | PHI                                       | PHI                                       | PHI                                       | PHI                                      | PHI                                      | PHI                                     | PHI                                      | PHI  | PHI  | PHI  |
| Package Group            | SOT                             | SOT                                       | SOT                                       | SOT                                       | SOT                                      | SOT                                      | SOT                                     | SOT                                      | SOT  | SOT  | SOT  |
| Package Designator       | DBV                             | DDF                                       | DDF                                       | DDF                                       | DYY                                      | DYY                                      | DYY                                     | DDF                                      | DDF  | DDF  | DDF  |
| Pin Count                | 5                               | 8   | 8   | 8   | 16                                       | 16                                       | 14                                      | 8  | 8  | 8  | 8  |

QBS: Qual By Similarity, also known as Generic Data  
Qual Device INA186A1QDBVRQ1 is qualified at MSL1 260C

## Qualification Results

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

| Type  | #  | Test Spec                           | Test Name                 | Condition   | Duration   | Qual Device:<br>INA186A1QDBVRQ1 | QBS Package Reference:<br>INA241A2QDDERQ1 | QBS Package Reference:<br>INA241A3QDDERQ1 | QBS Package Reference:<br>INA241A5QDDERQ1 | QBS Process Reference:<br>TMUX4051DYYRQ1 | QBS Package Reference:<br>TMUX4052DYYRQ1 | QBS Package Reference:<br>QPA4991QYYRQ1 | QBS Package Reference:<br>TLV7032QDDERQ1 | QBS Package, Process Reference:<br>INA186A1QDDERQ1 | QBS Package, Process Reference:<br>INA186A2QDDERQ1 | QBS Package, Process Reference:<br>INA186A3QDDERQ1 |
|---|----|-------------------------------------|---------------------------|-------------|------------|---------------------------------|---|---|---|--|--|---|--|--|--|--|
| Test Group A - Accelerated Environment Stress Tests |    |                                     |                           |             |            |                                 |   |   |   |  |  |   |  |  |  |  |
| PC  | A1 | JEDEC J-STD-020 JESD22-A113         | Preconditioning           | MSL1 260C   | -          | -                               | 1/0/0                                     | 1/0/0                                     | 1/0/0                                     | 1/0/0                                    | 2/0/0                                    | 3/0/0                                   | 1/3080 <sup>1</sup>                      | 1/276/0  | 1/276/0  | 1/276/0  |
| HAST  | A2 | JEDEC JESD22-A110                   | Biased HAST               | 110C/85%RH  | 264 Hours  | -                               | -   | -   | -   | -  | -  | 3/231/0                                 | -  | -  | -  | -  |
| HAST  | A2 | JEDEC JESD22-A110                   | Biased HAST               | 130C/85%RH  | 96 Hours   | -                               | 1/77/0                                    | 1/77/0                                    | 1/77/0                                    | 1/77/0                                   | 2/154/0                                  | -                                       | 1/77/0                                   | 1/77/0   | 1/77/0   | 1/77/0   |
| ACU/HAST  | A3 | JEDEC JESD22-A102/JEDEC JESD22-A118 | Autoclave                 | 121C/15psig | 96 Hours   | -                               | -   | -   | -   | -  | -  | 3/231/0                                 | -  | -  | -  | -  |
| ACU/HAST  | A3 | JEDEC JESD22-A102/JEDEC JESD22-A118 | Unbiased HAST             | 130C/85%RH  | 96 Hours   | -                               | 1/77/0                                    | 1/77/0                                    | 1/77/0                                    | 1/77/0                                   | 2/154/0                                  | -                                       | 1/77/0                                   | 1/77/0   | 1/77/0   | 1/77/0   |
| TC  | A4 | JEDEC JESD22-A104 and Appendix 3    | Temperature Cycle         | -65C/150C   | 500 Cycles | -                               | 1/77/0                                    | 1/77/0                                    | 1/77/0                                    | 1/77/0                                   | 2/154/0                                  | 3/231/0                                 | 1/77/0                                   | 1/77/0   | 1/77/0   | 1/77/0   |
| TC-8P   | A4 | MIL-STD883 Method 2011              | Post Temp Cycle Bond Pull | -           | -          | -                               | 1/5/0                                     | 1/5/0                                     | 1/5/0                                     | -  | -  | -                                       | 1/5/0                                    | 1/5/0  | 1/5/0  | 1/5/0  |

|  |    |                            |  |   |            |   |   |   |   |   |   |   |   |   |   |   |
|--|----|----------------------------|--|---|------------|---|---|---|---|---|---|---|---|---|---|---|
| HTSL   | A6 | JEDEC JESD22-A103          | High Temperature Storage Life              | 150C                                    | 1000 Hours | -   | 1/450   | 1/450   | 1/450   | 1/450   | 2/900   | 3/1350  | -   | 1/450   | 1/450   | 1/450   |
| HTSL   | A6 | JEDEC JESD22-A103          | High Temperature Storage Life              | 175C                                    | 500 Hours  | -   | -   | -   | -   | -   | -   | -   | 1/770   | -   | -   | -   |
| ESD  | B5 | -                          | ESD CDM                                    | -                                       | 1500 Volts | -   | -   | -   | -   | -   | -   | 1/30  | -   | 1/30  | 1/30  | 1/30  |
| ESD  | B5 | -                          | ESD CDM                                    | -                                       | 500 Volts  | -   | 1/30  | 1/30  | 1/30  | -   | -   | -   | 1/30  | -   | -   | -   |
| ESD  | B5 | -                          | ESD CDM                                    | -                                       | 750 Volts  | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| ESD  | B5 | -                          | ESD HBM                                    | -                                       | 2000 Volts | -   | 1/30  | 1/30  | 1/30  | -   | -   | -   | 1/30  | -   | -   | -   |
| ESD  | B5 | -                          | ESD HBM                                    | -                                       | 4000 Volts | -   | -   | -   | -   | -   | -   | 1/30  | -   | 1/30  | 1/30  | 1/30  |
| LU   | B7 | -                          | Latch-Up                                   | Per JESD78                              | -          | -   | 1/60  | 1/60  | 1/60  | -   | -   | 1/60  | 1/60  | 1/60  | 1/60  | 1/60  |
| Test Group B - Accelerated Lifetime Simulation Tests |    |                            |  |   |            |   |   |   |   |   |   |   |   |   |   |   |
| HTOL   | B1 | JEDEC JESD22-A108          | Life Test                                  | 125C                                    | 1000 Hours | -   | 1/770   | 1/770   | 1/770   | -   | -   | -   | -   | -   | -   | -   |
| HTOL   | B1 | JEDEC JESD22-A108          | Life Test                                  | 150C                                    | 300 Hours  | -   | -   | -   | -   | -   | -   | -   | 1/770   | 1/770   | 1/770   | 1/770   |
| HTOL   | B1 | JEDEC JESD22-A108          | Life Test                                  | 150C                                    | 408 Hours  | -   | -   | -   | -   | -   | -   | 1/770   | -   | -   | -   | -   |
| ELFR   | B2 | AEC Q100-009               | Early Life Failure Rate                    | 125C                                    | 48 Hours   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| EDR  | B3 | AEC Q100-005               | NVM Endurance, Data Retention, and Op Life | Per QSS-009-018                         | 1 Step     | -   | 1/770   | 1/770   | 1/770   | -   | -   | -   | -   | -   | -   | -   |
| Test Group C - Package Assembly Integrity Tests      |    |                            |  |   |            |   |   |   |   |   |   |   |   |   |   |   |
| WBS  | C1 | AEC Q100-001               | Wire Bond Shear                            | Minimum of 5 devices, 30 wires Cpk>1.67 | Wires      | 1/300   | 1/300   | 1/300   | 1/300   | 1/300   | 2/600   | 3/900   | 1/300   | 1/300   | 1/300   | 1/300   |
| WBP  | C2 | ML-STD883 Method 2011      | Wire Bond Pull                             | Minimum of 5 devices, 30 wires Cpk>1.67 | Wires      | 1/300   | 1/300   | 1/300   | 1/300   | 1/300   | 2/600   | 3/900   | 1/300   | 1/300   | 1/300   | 1/300   |
| SD   | C3 | JEDEC J-STD-002            | PB Solderability                           | >95% Lead Coverage                      | -          | -   | 1/150   | 1/150   | 1/150   | -   | -   | 1/150   | 1/150   | 1/150   | 1/150   | 1/150   |
| SD   | C3 | JEDEC J-STD-002            | PB-Free Solderability                      | >95% Lead Coverage                      | -          | -   | 1/150   | 1/150   | 1/150   | -   | -   | 1/150   | 1/150   | 1/150   | 1/150   | 1/150   |
| PD   | C4 | JEDEC JESD22-B100 and B108 | Physical Dimensions                        | Cpk>1.67                                | -          | 1/100   | 1/100   | 1/100   | 1/100   | 1/100   | 2/200   | 3/300   | 1/100   | 1/100   | 1/100   | 1/100   |
| Test Group D - Die Fabrication Reliability Tests     |    |                            |  |   |            |   |   |   |   |   |   |   |   |   |   |   |
| EM   | D1 | JESD61                     | Electromigration                           | -                                       | -          | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements |
| TDOB   | D2 | JESD35                     | Time Dependent Dielectric Breakdown        | -                                       | -          | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | 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 | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements |
| BTI  | D4 | -                          | Bias Temperature Instability               | -                                       | -          | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements |
| SM   | D5 | -                          | Stress Migration                           | -                                       | -          | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements |
| Test Group E - Electrical Verification Tests         |    |                            |  |   |            |   |   |   |   |   |   |   |   |   |   |   |
| ESD  | E2 | AEC Q100-002               | ESD HBM                                    | -                                       | 2000 Volts | -   | 1/30  | 1/30  | 1/30  | -   | -   | -   | 1/30  | -   | -   | -   |
| ESD  | E2 | AEC Q100-002               | ESD HBM                                    | -                                       | 4000 Volts | -   | -   | -   | -   | -   | -   | 1/30  | -   | 1/30  | 1/30  | 1/30  |
| ESD  | E3 | AEC Q100-011               | ESD CDM                                    | -                                       | 1500 Volts | -   | -   | -   | -   | -   | -   | 1/30  | -   | 1/30  | 1/30  | 1/30  |
| ESD  | E3 | AEC Q100-011               | ESD CDM                                    | -                                       | 500 Volts  | -   | 1/30  | 1/30  | 1/30  | -   | -   | -   | 1/30  | -   | -   | -   |
| LU   | E4 | AEC Q100-004               | Latch-Up                                   | Per AEC Q100-004                        | -          | -   | 1/60  | 1/60  | 1/60  | -   | -   | 1/60  | 1/60  | 1/60  | 1/60  | 1/60  |
| ED   | E5 | AEC Q100-009               | Electrical Distributions                   | Cpk>1.67 Room, hot and cold             | -          | -   | 1/300   | 1/300   | 1/300   | -   | -   | 3/900   | 3/900   | 1/300   | 1/300   | 1/300   |
| Additional Tests                                     |    |                            |  |   |            |   |   |   |   |   |   |   |   |   |   |   |
| PD   | C1 | -                          | Physical Dimensions                        | Cpk>1.67                                | -          | 1/100   | 1/100   | 1/100   | 1/100   | 1/100   | 2/200   | 3/300   | 1/100   | 1/100   | 1/100   | 1/100   |

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/>

TI Qualification ID: R-CHG-2504-068

[1]-Precon unit 38 for HTSL lot was lost during precon. HTSL completed with 84 units.

[2]-1 Failure CMRR Hot. Incomplete deep trench etching.

## Qualification Data

### Automotive Qualification Summary (As per AEC and JEDEC Guidelines)

**Q006 SOT at PHI**  
Approve Date 09-May-2025

#### Product Attributes

| Attributes               | Q006 Package Reference:                |              |              |
|--------------------------|--|--------------|--------------|
|                          | <a href="#"><u>INA241A2QDDFRQ1</u></a> |              |              |
|                          | <a href="#"><u>INA241A3QDDFRQ1</u></a> |              |              |
|                          | <a href="#"><u>INA241A5QDDFRQ1</u></a> |              |              |
| Automotive Grade Level   | Grade 1                                | Grade 1      | Grade 1      |
| Operating Temp Range (C) | -40 to 125                             | -40 to 125   | -40 to 125   |
| Product Function         | Signal Chain                           | Signal Chain | Signal Chain |
| Wafer Fab Supplier       | AIZU                                   | RFAB         | RFAB         |
| Assembly Site            | PHI                                    | PHI          | PHI          |
| Package Group            | SOT                                    | SOT          | SOT          |
| Package Designator       | DDF                                    | DYY          | DYY          |
| Pin Count                | 8                                      | 16           | 14           |

#### 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  | Q006 Package Reference: | Q006 Package Reference: | Q006 Package Reference: |
|---|--------|-----------------------------|-------------|----------|---------------------------------------|---------------------------|-----------|-------------------------|-------------------------|-------------------------|
|   |        |                             |             |          |                                       |                           |           | INA241A2QDDFRQ1         | TMUX4051DYYRQ1          | OPA4991QDYYRQ1          |
|   |        |                             |             |          |                                       |                           |           | INA241A3QDDFRQ1         | TMUX4052DYYRQ1          |                         |
|   |        |                             |             |          |                                       |                           |           | INA241A5QDDFRQ1         |                         |                         |
| Test Group A - Accelerated Environment Stress Tests |        |                             |             |          |                                       |                           |           |                         |                         |                         |
| PC  | A1     | JEDEC J-STD-020 JESD22-A113 | 3           | 77       | Preconditioning                       | MSL1 260C                 | -         | 3/Pass                  | 3/Pass                  | 3/Pass                  |
| PC  | A1.1   | -                           | 3           | 22       | SAM Precon Pre                        | Review for delamination   | -         | 3/66/0                  | 3/66/0                  | 3/66/0                  |
| PC  | A1.2   | -                           | 3           | 22       | SAM Precon Post                       | Review for delamination   | -         | 3/66/0                  | 3/66/0                  | 3/66/0                  |
| HAST  | A2.1   | JEDEC JESD22-A110           | 3           | 77       | Biased HAST                           | 110C/85%RH                | 264 Hours | -                       | -                       | 3/231/0                 |
| HAST  | A2.1   | JEDEC JESD22-A110           | 3           | 77       | Biased HAST                           | 130C/85%RH                | 96 Hours  | 3/231/0                 | 3/231/0                 | -                       |
| HAST  | A2.1.2 | -                           | 3           | 1        | Cross Section, post bHAST, 1X         | Post stress cross section | Completed | 3/3/0                   | 3/3/0                   | 3/3/0                   |
| HAST  | A2.1.3 | -                           | 3           | 3        | Wire Bond Shear, post bHAST, 1X       | Post stress               | -         | 3/9/0                   | 3/9/0                   | 3/9/0                   |
| HAST  | A2.1.4 | -                           | 3           | 3        | Bond Pull over Stitch, post bHAST, 1X | Post stress               | -         | 3/9/0                   | 3/9/0                   | 3/9/0                   |
| HAST  | A2.1.5 | -                           | 3           | 3        | Bond Pull over Ball, post bHAST, 1X   | Post stress               | -         | 3/9/0                   | 3/9/0                   | 3/9/0                   |
| HAST  | A2.2   | JEDEC JESD22-A110           | 3           | 70       | Biased HAST                           | 110C/85%RH                | 528 Hours | -                       | -                       | 3/210/0                 |
| HAST  | A2.2   | JEDEC JESD22-A110           | 3           | 70       | Biased HAST                           | 130C/85%RH                | 192 Hours | 3/210/0                 | 3/210/0                 | -                       |



|   |        |                                  |   |    |                                       |   |             |         |         |         |
|---|--------|----------------------------------|---|----|---------------------------------------|---|-------------|---------|---------|---------|
| HAST  | A2.2.1 | -                                | 3 | 22 | SAM Analysis, post bHAST, 2X          | Review for delamination                 | Completed   | 3/66/0  | 3/66/0  | 3/66/0  |
| HAST  | A2.2.2 | -                                | 3 | 1  | Cross Section, post bHAST, 2X         | Post stress cross section               | Completed   | 3/3/0   | 3/3/0   | 3/3/0   |
| HAST  | A2.2.3 | -                                | 3 | 3  | Wire Bond Shear, post bHAST, 2X       | Post stress                             | -           | 3/9/0   | 3/9/0   | 3/9/0   |
| HAST  | A2.2.4 | -                                | 3 | 3  | Bond Pull over Stitch, post bHAST, 2X | Post stress                             | -           | 3/9/0   | 3/9/0   | 3/9/0   |
| HAST  | A2.2.5 | -                                | 3 | 3  | Bond Pull over Ball, post bHAST, 2X   | Post stress                             | -           | 3/9/0   | 3/9/0   | 3/9/0   |
| TC  | A4.1   | JEDEC JESD22-A104 and Appendix 3 | 3 | 77 | Temperature Cycle                     | -65C/150C                               | 500 Cycles  | 3/231/0 | 3/231/0 | 3/231/0 |
| TC  | A4.1.1 | -                                | 3 | 22 | SAM Analysis, post TC, 1X             | Review for delamination                 | Completed   | 3/66/0  | 3/66/0  | 3/66/0  |
| TC  | A4.1.2 | -                                | 3 | 1  | Cross Section, post TC, 1X            | Post stress cross section               | Completed   | 3/3/0   | 3/3/0   | 3/3/0   |
| TC  | A4.1.3 | -                                | 3 | 3  | Wire Bond Shear, post TC, 1X          | Post stress                             | -           | 3/9/0   | 3/9/0   | 3/9/0   |
| TC  | A4.1.4 | -                                | 3 | 3  | Bond Pull over Stitch, post TC, 1X    | Post stress                             | -           | 3/9/0   | 3/9/0   | 3/9/0   |
| TC  | A4.1.5 | -                                | 3 | 3  | Bond Pull over Ball, post TC, 1X      | Post stress                             | -           | 3/9/0   | 3/9/0   | 3/9/0   |
| TC  | A4.2   | JEDEC JESD22-A104 and Appendix 3 | 3 | 70 | Temperature Cycle                     | -65C/150C                               | 1000 Cycles | 3/210/0 | 3/210/0 | 3/210/0 |
| TC  | A4.2.1 | -                                | 3 | 22 | SAM Analysis, post TC, 2X             | Review for delamination                 | Completed   | 3/66/0  | 3/66/0  | 3/66/0  |
| TC  | A4.2.2 | -                                | 3 | 1  | Cross Section, post TC, 2X            | Post stress cross section               | Completed   | 3/3/0   | 3/3/0   | 3/3/0   |
| TC  | A4.2.3 | -                                | 3 | 3  | Wire Bond Shear, post TC, 2X          | Post stress                             | -           | 3/9/0   | 3/9/0   | 3/9/0   |
| TC  | A4.2.4 | -                                | 3 | 3  | Bond Pull over Stitch, post TC, 2X    | Post stress                             | -           | 3/9/0   | 3/9/0   | 3/9/0   |
| TC  | A4.2.5 | -                                | 3 | 3  | Bond Pull over Ball, post TC, 2X      | Post stress                             | -           | 3/9/0   | 3/9/0   | 3/9/0   |
| HTSL  | A6.1   | JEDEC JESD22-A103                | 3 | 45 | High Temperature Storage Life         | 150C                                    | 1000 Hours  | 3/135/0 | 3/135/0 | 3/135/0 |
| HTSL  | A6.1.1 | -                                | 3 | 1  | Cross Section, post HTSL, 1X          | Post stress cross section               | Completed   | 3/3/0   | 3/3/0   | 3/3/0   |
| HTSL  | A6.2   | JEDEC JESD22-A103                | 3 | 44 | High Temperature Storage Life         | 150C                                    | 2000 Hours  | 3/132/0 | 3/132/0 | 3/132/0 |
| HTSL  | A6.2.1 | -                                | 3 | 1  | Cross Section, post HTSL, 2X          | Post stress cross section               | Completed   | 3/3/0   | 3/3/0   | 3/3/0   |
| Test Group C - Package Assembly Integrity Tests |        |                                  |   |    |                                       |   |             |         |         |         |
| WBS   | C1     | AEC Q100-001                     | 1 | 30 | Wire Bond Shear                       | Minimum of 5 devices, 30 wires Cpk>1.67 | Wires       | 3/90/0  | 3/90/0  | 3/90/0  |
| WBP   | C2     | MIL-STD883 Method 2011           | 1 | 30 | Wire Bond Pull                        | Minimum of 5 devices, 30 wires Cpk>1.67 | Wires       | 3/90/0  | 3/90/0  | 3/90/0  |

This report represents AEC-Q006 7.1 Family Data Usage using technology driver and lead products that are most representative of the technology family.

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Room : AC/uHAST

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

TI Qualification ID: R-CHG-2504-068

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ZVEI ID: SEM-PA-18, SEM-PA-08, SEM-PA-07, SEM-PA-11, SEM-PA-05, SEM-TF-01

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