



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

**PDN# 20201117001.3**

**Discontinuance of select MicroStar BGA & MicroStar BGA Jr. devices  
Product Discontinuance Notification**

**Date:** November 20, 2020

**To:** TOKYO ELECTRON DEVICE (DSTR) PCN

Dear Customer:

The recipient has been identified for notification of changes for one or more of the products affected by the change detailed in the notice. Customers are notified based on the past twenty-four (24) months of the customer's purchase history or the recipient is listed as being part of GIDEP (Government-Industry Data Exchange Program).

TI would appreciate it if you would notify us of any future demand and estimated quantities needed for the affected products as soon as possible.

In an attempt to satisfy continuing requirements, TI is offering a non-cancelable, non-refundable last time buy for the product. Related dates are included in the notification. We will contact you as soon as we have completed a review of all customer responses and determined the appropriate course of action required to satisfy the need for this/these products.

Any inquiries should be directed to your local Field Sales Representative.

If additional supply is required beyond the dates defined in this letter, please contact your local Field Sales Representative to determine if the parts may be available from a TI-authorized distributor for discontinued products. There is no guarantee of continued supply for these products.

For questions regarding this notice, contact your local Field Sales Representative or the PCN Team ([PCN\\_ww\\_admin\\_team@list.ti.com](mailto:PCN_ww_admin_team@list.ti.com)).

Sincerely,

PCN Team  
SC Business Services

**20201117001.3**  
**Attachments1**

**Products Affected:**

The devices listed on this page are a subset of the complete list of affected devices. According to our records, you have purchased this device within the past twenty-four (24) months. The corresponding customer part number is also listed, if available.

| <b>DEVICE</b>      | <b>CUSTOMER PART NUMBER</b> |
|--------------------|-----------------------------|
| SN65DSI84ZQER      | null                        |
| TMS320C2834MZHH    | null                        |
| PCI2050BIZHK       | null                        |
| PCI2050BZHK        | null                        |
| XIO2000AZHH        | null                        |
| XIO2001IZGU        | null                        |
| XIO2001ZGU         | null                        |
| XIO3130IZHC        | null                        |
| TSB43EC42ZGU       | TSB43EC42ZGU                |
| CDCU2A877ZQLT      | null                        |
| TMS320F2812ZHHA    | null                        |
| TPA6205A1ZQVR      | null                        |
| TSC2046IZQCR       | null                        |
| PCI1510ZGU         | null                        |
| PCI1520IZHK        | null                        |
| CDCU2A877ZQLR      | null                        |
| SN74AVC32T245ZKER  | null                        |
| SN74AVCH24T245ZRGR | null                        |
| SN74LVCH32373AZKER | null                        |
| MSP430F5528IZQER   | null                        |
| TXS0108EZXYR       | null                        |
| SN65DSI83ZQER      | null                        |
| TMS320C2834FZHH    | null                        |
| TMS320C2834HZHH    | null                        |
| TMS320C2834LZHH    | null                        |
| SN65LVDS302ZQER    | null                        |
| CDCUA877ZQLR       | null                        |
| SN74AVC24T245ZRGR  | null                        |

Details of this Product Discontinuance follow on the next page(s).

|                            |                                                                    |                           |                  |
|----------------------------|--------------------------------------------------------------------|---------------------------|------------------|
| <b>PDN Number:</b>         | 20201117001.3                                                      | <b>PDN Date:</b>          | Nov 20, 2020     |
| <b>Title:</b>              | Discontinuance of select MicroStar BGA & MicroStar BGA Jr. devices |                           |                  |
| <b>Customer Contact:</b>   | <a href="#">PCN Manager</a>                                        | <b>Dept:</b>              | Quality Services |
| <b>Last date to order:</b> | May 20, 2021                                                       | <b>Last date to ship:</b> | May 20, 2022     |
| <b>Change Type:</b>        | Product Discontinuance - End Of Life                               |                           |                  |

### Product Discontinuance Notification Details

#### Description of Discontinuance:

Texas Instruments Incorporated (TI) is announcing the discontinuance of select MicroStar BGA & MicroStar BGA Jr. package devices. A non-cancelable, non-refundable last time buy is being offered per the date shown above. Part numbers are shown in the Product Affected section below. Recommended replacements are being offered on some devices as shown in the Product Affected Section.

**Group 1 Devices: Products in the Microstar BGA package were redesigned using a laminate BGA package (nFBGA). These products have Pb-Free Package Balls.**

**Group 2 Devices: Products in the Microstar BGA package were redesigned using a laminate BGA package (nFBGA). These Products being Discontinued currently have SnPb Package Balls.** Some customers may wish to stay with SnPb package balls in the nFBGA package; some may wish to move to Pb-free nFBGA package balls. Both SnPb and Pb-free replacement part numbers are provided.

#### Group 1 and 2 Devices additional information:

Availability of replacement devices (in nFBGA packages) may vary. The replacements that are not yet released to production as of the date on this PDN are noted in **red text** in the Product Affected section. For questions regarding the release status of a particular device, please contact [UBGAMKT@list.ti.com](mailto:UBGAMKT@list.ti.com).

The devices in the MicroStar BGA package were redesigned using a laminate BGA package (nFBGA). nFBGA provides the same X and Y dimensions as MicroStar BGA, and provides pin-to-pin and footprint compatibility. However the nFBGA PCB land pattern and stencil recommendations have been updated to achieve better soldering results after extensive testing and evaluation. For more details, please refer to this [nFBGA application note](#).

#### BOM for new nFBGA Package:

|                | Assembly Site nFBGA      |
|----------------|--------------------------|
| Assembly Site  | <b>TI Philippines</b>    |
| Mount Compound | <b>film/epoxy</b>        |
| Mold compound  | <b>4205283 / 4208515</b> |
| Wire Type      | <b>Cu</b>                |
| Substrate      | <b>Laminate</b>          |

**Group 3 Devices: Products in the Microstar BGA package are being discontinued and were not redesigned into a laminate BGA package. TI has recommended replacements for some of these devices, but not all.**

NOTE: There are no samples offered for withdrawn/obsolete products. For samples of any replacement products, please contact your local sales representative or visit the TI store at <https://www.ti.com/store>.

| Reason for Withdrawal/Discontinuance:                                                                                                                                        |                                                                                |                   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|-------------------|
| Due to an equipment End-Of-Life notice from our substrate supplier, we are phasing out certain MicroStar BGA & MicroStar BGAjr package devices and offering a last time buy. |                                                                                |                   |
| Product Affected: Group 1 Products with Pb-Free Package Balls                                                                                                                |                                                                                |                   |
| Product Being Discontinued<br>(Pb-Free Package Balls)                                                                                                                        | RECOMMENDED REPLACEMENT<br>PRODUCTS (nFBGA Package)<br>(Pb-Free Package Balls) | REPLACEMENT CODES |
| CDCU2A877ZQLR                                                                                                                                                                | CDCU2A877NMKR                                                                  | Q                 |
| CDCU2A877ZQLT                                                                                                                                                                | CDCU2A877NMKT                                                                  | Q                 |
| CDCU877AZQLR                                                                                                                                                                 | CDCU877ANMKR                                                                   | Q                 |
| CDCU877AZQLT                                                                                                                                                                 | CDCU877ANMKT                                                                   | Q                 |
| CDCUA877ZQLR                                                                                                                                                                 | CDCUA877NMKR                                                                   | Q                 |
| CDCUA877ZQLT                                                                                                                                                                 | CDCUA877NMKT                                                                   | Q                 |
| DE111001ZHHA                                                                                                                                                                 | DE111001ZAYA                                                                   | Q                 |
| DE129003ZHHA                                                                                                                                                                 | DE129003ZAYA                                                                   | Q                 |
| DEF01000ZHHA                                                                                                                                                                 | DEF01000ZAYA                                                                   | Q                 |
| DFDF2812ZHAR                                                                                                                                                                 | TMS320F2812ZAYAR                                                               | Q                 |
| DRV8601ZQVR                                                                                                                                                                  | DRV8601NMBR                                                                    | Q                 |
| HD3SS212ZQER                                                                                                                                                                 | Contact UBGAMKT@list.ti.com                                                    | Not Applicable    |
| HD3SS212ZQET                                                                                                                                                                 | Contact UBGAMKT@list.ti.com                                                    | Not Applicable    |
| HD3SS213ZQER                                                                                                                                                                 | Contact UBGAMKT@list.ti.com                                                    | Not Applicable    |
| HD3SS214IZQER                                                                                                                                                                | Contact UBGAMKT@list.ti.com                                                    | Not Applicable    |
| HD3SS214ZQER                                                                                                                                                                 | Contact UBGAMKT@list.ti.com                                                    | Not Applicable    |
| HD3SS215IZQER                                                                                                                                                                | Contact UBGAMKT@list.ti.com                                                    | Not Applicable    |
| HD3SS215IZQET                                                                                                                                                                | Contact UBGAMKT@list.ti.com                                                    | Not Applicable    |
| HD3SS215ZQER                                                                                                                                                                 | Contact UBGAMKT@list.ti.com                                                    | Not Applicable    |
| HPA00394ZQLR                                                                                                                                                                 | CDCUA877NMKR                                                                   | Q                 |
| M430F5438AQZQWRET                                                                                                                                                            | M430F5438AQZCARET                                                              | Q                 |
| MSP430A147IZQER                                                                                                                                                              | MSP430F5522IZXHR                                                               | Q                 |
| MSP430BT5190IZQWR                                                                                                                                                            | MSP430BT5190IZCAR                                                              | Q                 |
| MSP430BT5190IZQWT                                                                                                                                                            | MSP430BT5190IZCAT                                                              | Q                 |
| MSP430F5324IZQE                                                                                                                                                              | MSP430F5324IZXH                                                                | Q                 |
| MSP430F5324IZQER                                                                                                                                                             | MSP430F5324IZXHR                                                               | Q                 |
| MSP430F5326IZQE                                                                                                                                                              | MSP430F5326IZXH                                                                | Q                 |
| MSP430F5326IZQER                                                                                                                                                             | MSP430F5326IZXHR                                                               | Q                 |
| MSP430F5328IZQE                                                                                                                                                              | MSP430F5328IZXH                                                                | Q                 |
| MSP430F5328IZQER                                                                                                                                                             | MSP430F5328IZXHR                                                               | Q                 |
| MSP430F5335IZQWR                                                                                                                                                             | MSP430F5335IZCAR                                                               | Q                 |
| MSP430F5335IZQWT                                                                                                                                                             | MSP430F5335IZCAT                                                               | Q                 |
| MSP430F5338IZQWR                                                                                                                                                             | MSP430F5338IZCAR                                                               | Q                 |
| MSP430F5338IZQWT                                                                                                                                                             | MSP430F5338IZCAT                                                               | Q                 |
| MSP430F5358IZQWR                                                                                                                                                             | MSP430F5358IZCAR                                                               | Q                 |
| MSP430F5358IZQWT                                                                                                                                                             | MSP430F5358IZCAT                                                               | Q                 |
| MSP430F5359IZQWR                                                                                                                                                             | MSP430F5359IZCAR                                                               | Q                 |
| MSP430F5359IZQWT                                                                                                                                                             | MSP430F5359IZCAT                                                               | Q                 |
| MSP430F5419AIZQWR                                                                                                                                                            | MSP430F5419AIZCAR                                                              | Q                 |

|                   |                             |                |
|-------------------|-----------------------------|----------------|
| MSP430F5419AIZQWT | MSP430F5419AIZCAT           | Q              |
| MSP430F5436AIZQWR | MSP430F5436AIZCAR           | Q              |
| MSP430F5436AIZQWT | MSP430F5436AIZCAT           | Q              |
| MSP430F5438AIZQWR | MSP430F5438AIZCAR           | Q              |
| MSP430F5438AIZQWT | MSP430F5438AIZCAT           | Q              |
| MSP430F5522IZQE   | MSP430F5522IZXH             | Q              |
| MSP430F5522IZQER  | MSP430F5522IZXHR            | Q              |
| MSP430F5524IZQE   | MSP430F5524IZXH             | Q              |
| MSP430F5524IZQER  | MSP430F5524IZXHR            | Q              |
| MSP430F5526IZQE   | MSP430F5526IZXH             | Q              |
| MSP430F5526IZQER  | MSP430F5526IZXHR            | Q              |
| MSP430F5528IZQE   | MSP430F5528IZXH             | Q              |
| MSP430F5528IZQER  | MSP430F5528IZXHR            | Q              |
| MSP430F5632IZQWR  | MSP430F5632IZCAR            | Q              |
| MSP430F5635IZQWR  | MSP430F5635IZCAR            | Q              |
| MSP430F5635IZQWT  | MSP430F5635IZCAT            | Q              |
| MSP430F5638IZQWR  | MSP430F5638IZCAR            | Q              |
| MSP430F5638IZQWT  | MSP430F5638IZCAT            | Q              |
| MSP430F5659IZQWR  | MSP430F5659IZCAR            | Q              |
| MSP430F5659IZQWT  | MSP430F5659IZCAT            | Q              |
| MSP430F6433IZQWR  | MSP430F6433IZCAR            | Q              |
| MSP430F6433IZQWT  | MSP430F6433IZCAT            | Q              |
| MSP430F6438IZQWR  | MSP430F6438IZCAR            | Q              |
| MSP430F6634IZQWR  | MSP430F6634IZCAR            | Q              |
| MSP430F6635IZQWR  | MSP430F6635IZCAR            | Q              |
| MSP430F6638IZQWR  | MSP430F6638IZCAR            | Q              |
| MSP430F6638IZQWT  | MSP430F6638IZCAT            | Q              |
| MSP430F6659IZQWR  | MSP430F6659IZCAR            | Q              |
| MSP430F6659IZQWT  | MSP430F6659IZCAT            | Q              |
| MSP430FG6626IZQWR | MSP430FG6626IZCAR           | Q              |
| MSP430FG6626IZQWT | MSP430FG6626IZCAT           | Q              |
| MSP430V287IZQWR   | MSP430V287IZCAR             | Q              |
| MSP430V287IZQWT   | MSP430V287IZCAT             | Q              |
| PCI1510ZGU        | Contact UBGAMKT@list.ti.com | Not Applicable |
| PCI1520IZHK       | Contact UBGAMKT@list.ti.com | Not Applicable |
| PCI1520ZHK        | Contact UBGAMKT@list.ti.com | Not Applicable |
| PCI2050BIZHK      | Contact UBGAMKT@list.ti.com | Not Applicable |
| PCI2050BZHK       | Contact UBGAMKT@list.ti.com | Not Applicable |
| SN65DSI83ZQER     | SN65DSI83ZXHR               | Q              |
| SN65DSI84ZQER     | SN65DSI84ZXHR               | Q              |
| SN65DSI85ZQER     | SN65DSI85ZXHR               | Q              |
| SN65DSI86ZQER     | SN65DSI86ZXHR               | Q              |
| SN65LVDS301ZQE    | SN65LVDS301ZXH              | Q              |
| SN65LVDS301ZQER   | SN65LVDS301ZXHR             | Q              |
| SN65LVDS302ZQE    | SN65LVDS302ZXH              | Q              |
| SN65LVDS302ZQER   | SN65LVDS302ZXHR             | Q              |

|                    |                                                |   |
|--------------------|------------------------------------------------|---|
| SN74AVC24T245ZRGR  | SN74AVC24T245NMUR                              | Q |
| SN74AVC32T245ZKER  | SN74AVC32T245NMJR                              | Q |
| SN74AVCH24T245ZRGR | SN74AVCH24T245NMUR                             | Q |
| SN74LVCH32373AZKER | SN74LVCH32373ANMJR                             | Q |
| SN74SSTU32864ZKER  | SN74SSTU32864NMJR                              | Q |
| SN74SSTUB32864ZKER | SN74SSTUB32864NMJR                             | Q |
| SN74SSTUB32866ZKER | SN74SSTUB32866NMJR                             | Q |
| TLV320AIC3106IZQER | TLV320AIC3106IZXHR                             | Q |
| TLV320AIC33IZQE    | TLV320AIC33IZXH                                | Q |
| TLV320AIC33IZQER   | TLV320AIC33IZXHR                               | Q |
| TMS320C28341ZHHT   | TMS320C28341ZAYT                               | Q |
| TMS320C28343ZHHT   | TMS320C28343ZAYT                               | Q |
| TMS320C28345ZHHT   | TMS320C28345ZAYT                               | Q |
| TMS320F28015ZGMA   | TMS320F28015NMFA                               | Q |
| TMS320F2801ZGMA    | TMS320F2801NMFA                                | Q |
| TMS320F2806ZGMA    | TMS320F2806NMFA                                | Q |
| TMS320F2806ZGMS    | TMS320F2806NMFS                                | Q |
| TMS320F2808ZGMA    | TMS320F2808NMFA                                | Q |
| TMS320F2808ZGMS    | TMS320F2808NMFS                                | Q |
| TMS320F2809ZGMA    | TMS320F2809NMFA                                | Q |
| TMS320F2809ZGMS    | TMS320F2809NMFS<br>Contact UBGAMKT@list.ti.com | Q |
| TMS320F2812ZHHA    | TMS320F2812ZAYA                                | Q |
| TMS320F2812ZHHAAR  | TMS320F2812ZAYAR                               | Q |
| TMS320F2812ZHHS    | TMS320F2812ZAYS                                | Q |
| TMS320F28232ZHHA   | TMS320F28232ZAYA                               | Q |
| TMS320F28234ZHHA   | TMS320F28234ZAYA                               | Q |
| TMS320F28334ZHHA   | TMS320F28334ZAYA                               | Q |
| TMS320F28335ZHHA   | TMS320F28335ZAYA                               | Q |
| TPA6203A1ZQVR      | TPA6203A1NMBR                                  | Q |
| TPA6205A1ZQVR      | TPA6205A1NMBR                                  | Q |
| TPS658643ZGUR      | TPS658643ZWSR                                  | Q |
| TPS6591104DA2ZRC   | TPS6591104DA2NMA                               | Q |
| TPS65911062A2ZRCRP | TPS65911062A2NMARP                             | Q |
| TPS659110A2ZRCR    | TPS659110A2NMAR                                | Q |
| TPS659112A2ZRCR    | TPS659112A2NMAR                                | Q |
| TPS6591133A2ZRC    | TPS6591133A2NMA                                | Q |
| TPS659114A2ZRCR    | TPS659114A2NMAR                                | Q |
| TPS65921B1ZQZR     | TPS65921B1ZBHR                                 | Q |
| TPS65921BZQZR      | TPS65921BZBHR                                  | Q |
| TPS65951A1ZGUR     | TPS65951A1ZWSR                                 | Q |
| TWL6040A3ZQZR      | TWL6040A3ZBHR                                  | Q |
| TXB0104ZXUR        | TXB0104NMNR                                    | Q |
| TXB0108ZXYR        | TXB0108NMER                                    | Q |
| TXS0104EZXR        | TXS0104ENMNR                                   | Q |
| TXS0108EZXYR       | TXS0108ENMER                                   | Q |

|              |                             |                |
|--------------|-----------------------------|----------------|
| XIO1100ZGB   | Contact UBGAMKT@list.ti.com | Not Applicable |
| XIO1100ZGBR  | Contact UBGAMKT@list.ti.com | Not Applicable |
| XIO2000AZHH  | Contact UBGAMKT@list.ti.com | Not Applicable |
| XIO2000AZZZ  | Contact UBGAMKT@list.ti.com | Not Applicable |
| XIO2001IZGU  | Contact UBGAMKT@list.ti.com | Not Applicable |
| XIO2001IZGUR | Contact UBGAMKT@list.ti.com | Not Applicable |
| XIO2001ZGU   | Contact UBGAMKT@list.ti.com | Not Applicable |
| XIO3130IZHC  | Contact UBGAMKT@list.ti.com | Not Applicable |
| XIO3130ZHC   | Contact UBGAMKT@list.ti.com | Not Applicable |

**Product Affected – Group 2 Products being Discontinued currently with SnPb Package Balls**

| Product Being Discontinued (SnPb Package Balls) | RECOMMENDED REPLACEMENT PRODUCTS (nFBGA Package) (Pb-Free Package Balls) | RECOMMENDED REPLACEMENT PRODUCTS (nFBGA Package) (SnPb Package Balls) | REPLACEMENT CODES |
|-------------------------------------------------|--------------------------------------------------------------------------|-----------------------------------------------------------------------|-------------------|
| PCI2050BGHK                                     | Contact UBGAMKT@list.ti.com                                              | None                                                                  | Not Applicable    |
| PCI2050BIGHK                                    | Contact UBGAMKT@list.ti.com                                              | None                                                                  | Not Applicable    |
| TLV320AIC33IGQE                                 | TLV320AIC33IZXH                                                          | TLV320AIC33IGVX                                                       | Q                 |
| TMS320F2808GGMA                                 | TMS320F2808NMFA                                                          | TMS320F2808GBAA                                                       | Q                 |
| TMS320F2808GGMS                                 | TMS320F2808NMFS                                                          | TMS320F2808GBAS                                                       | Q                 |
| TMS320F2809GGMA                                 | TMS320F2809NMFA                                                          | TMS320F2809GBAA<br>Contact UBGAMKT@list.ti.com                        | Q                 |
| TMS320F2809GGMS                                 | TMS320F2808NMFS                                                          | TMS320F2809GBAS<br>Contact UBGAMKT@list.ti.com                        | Q                 |
| TMS320F2812GHHA                                 | TMS320F2812ZAYA                                                          | TMS320F2812GBBA                                                       | Q                 |
| TMS320F2812GHHR                                 | TMS320F2812ZAYAR                                                         | TMS320F2812GBBAR                                                      | Q                 |
| TMS320F2812GHHS                                 | TMS320F2812ZAYA                                                          | TMS320F2812GBBS                                                       | Q                 |

**Product Affected: Group 3**

| Product Being Discontinued | RECOMMENDED REPLACEMENT PRODUCTS | REPLACEMENT CODES |
|----------------------------|----------------------------------|-------------------|
| 74SSTUB32866AZKER          | None                             | Not Applicable    |
| CD3215C00ZQZR              | CD3215C00ZBHR                    | Q                 |
| CD3240B0ZRPR               | None                             | Not Applicable    |
| HPA02255ZRQR               | None                             | Not Applicable    |
| MPD23683ZQER               | None                             | Not Applicable    |
| MSP430F5333IZQWR           | MSP430F5335IZCAR                 | Q                 |
| MSP430F5336IZQWR           | MSP430F5338IZCAR                 | Q                 |
| MSP430F5336IZQWT           | MSP430F5338IZCAR                 | Q                 |
| MSP430F5513IZQER           | MSP430F5522IZXHR                 | Q                 |
| MSP430F5514IZQE            | MSP430F5524IZXHR                 | Q                 |
| MSP430F5514IZQER           | MSP430F5524IZXHR                 | Q                 |
| MSP430F5630IZQWR           | MSP430F5632IZCAR                 | Q                 |
| MSP430F5630IZQWT           | MSP430F5632IZCAR                 | Q                 |
| MSP430F5633IZQWR           | MSP430F5635IZCAR                 | Q                 |
| MSP430F5633IZQWT           | MSP430F5635IZCAR                 | Q                 |
| MSP430F5634IZQWT           | MSP430F5635IZCAT                 | Q                 |

|                    |                   |                |
|--------------------|-------------------|----------------|
| MSP430F5658IZQWR   | MSP430F5659IZCAR  | Q              |
| MSP430F5658IZQWT   | MSP430F5659IZCAT  | Q              |
| MSP430F6435IZQWR   | MSP430F6438IZCAR  | Q              |
| MSP430F6435IZQWT   | MSP430F6438IZCAR  | Q              |
| MSP430F6459IZQWT   | MSP430F6659IZCAR  | Q              |
| MSP430F6633IZQWR   | MSP430F6634IZCAR  | Q              |
| MSP430F6633IZQWT   | MSP430F6634IZCAR  | Q              |
| MSP430F6636IZQWR   | MSP430F6638IZCAR  | Q              |
| MSP430FG6425IZQWR  | MSP430FG6626IZCAR | Q              |
| MSP430FG6426IZQWR  | MSP430FG6626IZCAR | Q              |
| MSP430FG6625IZQWR  | MSP430FG6626IZCAR | Q              |
| MSP430V317IZQWR    | MSP430F5635IZCAR  | Q              |
| MSP430V345IZQER    | MSP430F5528IZXH   | Q              |
| SM320F28335GHHAEP  | None              | Not Applicable |
| SN65LVDS306ZQER    | None              | Not Applicable |
| TLV320AIC3010DZQZR | None              | Not Applicable |
| TLV320AIC3010DZQZT | None              | Not Applicable |
| TMS320C2834FZHH    | None              | Not Applicable |
| TMS320C2834HZHH    | None              | Not Applicable |
| TMS320C2834LZHH    | None              | Not Applicable |
| TMS320C2834MZHH    | None              | Not Applicable |
| TMS320F2802ZGMS    | TMS320F2806NMFS   | Q              |
| TPA2005D1ZQYR      | None              | Not Applicable |
| TPA6202A1ZQVR      | None              | Not Applicable |
| TPS65857ZQZR       | None              | Not Applicable |
| TSB43CA42ZGW       | None              | Not Applicable |
| TSB43EA42ZGU       | None              | Not Applicable |
| TSB43EB42ZGU       | None              | Not Applicable |
| TSB43EC42ZGU       | None              | Not Applicable |
| TSC2046IZQCR       | None              | Not Applicable |
| TUSB1211A1ZRQ      | TUSB1210BRHBR     | F              |
| TUSB1211A1ZRQR     | TUSB1210BRHBT     | F              |
| V62/09624-02XE     | None              | Not Applicable |

#### Replacement Notes:

F = Similar functionality but not equivalent.

P = Same functionality but not pin-for-pin equivalent and may not be parametrically equivalent.

Q = Same functionality and PIN-OUT as the compared device but is NOT an exact equivalent.

S = EXACT equivalent in functionality and parametrically to the compared device.

## Qualification Report (nFBGA) Approve Date 20-Jan-2020



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

| Typ e   | Test Name / Condition                         | Durati on                 | Qual Device: <u>OM AP5 912 ZV L</u> | QBS Packag e Reference: <u>AM351 7ZCN</u> | QBS Packag e Reference: <u>CODM IOZW CR</u> | QBS Packag e Reference: <u>LMK0 4616Z CRR</u> | QBS Packag e Reference: <u>MSP43 0FG43 9IZCA</u> | QBS Packag e Reference: <u>MSP43 0FR59 94IZV W</u> | QBS Packag e Reference: <u>PCD32 15C00 AZBH R, PCD32 15C00 BZBH R</u> | QBS Packag e Reference: <u>TMP5 70LS3 137BZ WTO Q1</u> | QBS Packag e Reference: <u>TMS32 0DM64 46ZW T</u> | QBS Packag e Reference: <u>TPS65 9038T ZWSR Q1</u> | QBS Packag e Reference: <u>TS3DD R4000 ZBAR</u> |
|---------|-----------------------------------------------|---------------------------|-------------------------------------|-------------------------------------------|---------------------------------------------|-----------------------------------------------|--------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|--------------------------------------------------------|---------------------------------------------------|----------------------------------------------------|-------------------------------------------------|
| A C     | Autoclave 121C                                | 96 Hours                  | -                                   | -                                         |                                             | -                                             | -                                                | 3/231/0                                            | -                                                                     | -                                                      | -                                                 | -                                                  | -                                               |
| BL R    | Board Level Reliability, Temp Cycle, -40/125C | 1000 Cycles               | -                                   | 1/32/0                                    | 1/32/0                                      | -                                             | -                                                | -                                                  | -                                                                     | 1/32/0                                                 | -                                                 | -                                                  | -                                               |
| BL R    | Board Level Reliability, Temp Cycle, -40/85C  | 1000 Cycles               | -                                   | -                                         | -                                           | -                                             | -                                                | -                                                  | 1/32/0                                                                | -                                                      | -                                                 | -                                                  | -                                               |
| C D M   | ESD - CDM                                     | 250 V                     | 1/3/0                               | -                                         | -                                           | -                                             | 2/6/0                                            | 1/3/0                                              | -                                                                     | -                                                      | -                                                 | -                                                  | -                                               |
| C D M   | ESD - CDM                                     | 500 V                     | 1/3/0                               | -                                         | -                                           | -                                             | -                                                | -                                                  | -                                                                     | 1/3/0                                                  | 1/3/0                                             | 1/3/0                                              | -                                               |
| C D M   | ESD - CDM                                     | 750 V                     | -                                   | -                                         | -                                           | -                                             | -                                                | -                                                  | -                                                                     | 1/3/0                                                  | 1/3/0                                             | 1/3/0                                              | -                                               |
| C D M   | ESD - CDM                                     | 1000 V                    | -                                   | -                                         | -                                           | -                                             | -                                                | -                                                  | -                                                                     | -                                                      | 1/3/0                                             | -                                                  | 1/3/0                                           |
| C D M   | ESD - CDM                                     | 1500 V                    | -                                   | -                                         | -                                           | 1/3/0                                         | -                                                | -                                                  | 6/18/0                                                                | -                                                      | -                                                 | -                                                  | -                                               |
| ED      | Electrical Characterization, side by side     | Per Datash eet Parameters | Pass                                | -                                         | -                                           | -                                             | -                                                | -                                                  | -                                                                     | -                                                      | -                                                 | -                                                  | -                                               |
| ED      | Electrical Characterization                   | Per Datash eet Parameters |                                     | -                                         | -                                           | Pass                                          | -                                                | -                                                  | Pass                                                                  | Pass                                                   | Pass                                              | Pass                                               | Pass                                            |
| FL A M  | Flammability (IEC 695-2-2)                    | -                         | -                                   | -                                         | -                                           | -                                             | -                                                | -                                                  | 3/15/0                                                                | -                                                      | -                                                 | -                                                  | 3/15/0                                          |
| FL A M  | Flammability (UL 94V-0)                       | -                         | -                                   | -                                         | -                                           | -                                             | -                                                | -                                                  | 3/15/0                                                                | -                                                      | -                                                 | -                                                  | 3/15/0                                          |
| FL A M  | Flammability (UL-1694)                        | -                         | -                                   | -                                         | -                                           | -                                             | -                                                | -                                                  | 3/15/0                                                                | -                                                      | -                                                 | -                                                  | 3/15/0                                          |
| H A S T | Biased HAST, 110C/85 %RH                      | 264 Hours                 | -                                   | 3/231/0                                   | -                                           | 3/231/0                                       | -                                                | 3/231/0                                            | 3/231/0                                                               | -                                                      | -                                                 | -                                                  | 1/77/0                                          |
| H B M   | ESD - HBM                                     | 1000 V                    | -                                   | -                                         | -                                           | -                                             | 2/6/0                                            | 1/3/0                                              | -                                                                     | -                                                      | 1/3/0                                             | -                                                  | -                                               |
| H B M   | ESD - HBM                                     | 2000 V                    | -                                   | -                                         | -                                           | -                                             | 2/6/0                                            | -                                                  | 6/18/0                                                                | 1/3/0                                                  | 1/3/0                                             | 1/3/0                                              | -                                               |

| Type | Test Name / Condition                    | Duration                      | Qual Device: <u>OM AP5 912 ZV L</u> | QBS Package Reference: <u>AM351 7ZCN</u> | QBS Package Reference: <u>CODM IOZW CR</u> | QBS Package Reference: <u>LMK0 4616Z CRR</u> | QBS Package Reference: <u>MSP43 0FG43 9IZCA</u> | QBS Package Reference: <u>MSP43 0FR59 94IZV W</u> | QBS Package Reference: <u>PCD32 15C00 AZBH R, PCD32 15C00 BZBH R</u> | QBS Package Reference: <u>TMP5 70LS3 137BZ WTO Q1</u> | QBS Package Reference: <u>TMS32 0DM64 46ZW T</u> | QBS Package Reference: <u>TPS65 9038T ZWSR Q1</u> | QBS Package Reference: <u>TS3DD R4000 ZBAR</u> |
|------|------------------------------------------|-------------------------------|-------------------------------------|------------------------------------------|--------------------------------------------|----------------------------------------------|-------------------------------------------------|---------------------------------------------------|----------------------------------------------------------------------|-------------------------------------------------------|--------------------------------------------------|---------------------------------------------------|------------------------------------------------|
| HBM  | ESD - HBM                                | 3000 V                        | -                                   | -                                        | -                                          | -                                            |                                                 | -                                                 | -                                                                    | -                                                     | -                                                | -                                                 | 1/3/0                                          |
| HBM  | ESD - HBM                                | 4000 V                        | -                                   | -                                        | -                                          | 1/3/0                                        | -                                               | -                                                 | -                                                                    | -                                                     | -                                                | -                                                 | -                                              |
| HTOL | Life Test, 90C                           | 2000 Hours                    | -                                   | -                                        | -                                          | -                                            | -                                               |                                                   |                                                                      | -                                                     | 3/387/0                                          | -                                                 | -                                              |
| HTOL | Life Test, 125C                          | 1000 Hours                    | -                                   | -                                        | -                                          | -                                            | -                                               | -                                                 | 6/462/0                                                              | 3/231/0                                               | -                                                | 3/231/0                                           | -                                              |
| HTOL | Life Test, 115C                          | 1000 Hours                    | -                                   | -                                        | -                                          | 1/77/0                                       | -                                               | -                                                 | -                                                                    | -                                                     | -                                                | -                                                 | -                                              |
| HTOL | Life Test, 140C                          | 480 hours                     | -                                   | -                                        | -                                          | -                                            | -                                               | -                                                 | -                                                                    | -                                                     | -                                                | -                                                 | 1/77/0                                         |
| HTSL | High Temp Storage Bake 150C              | 1000 Hours                    | 3/23 1/0                            | 3/45/0                                   | -                                          | 1/77/0                                       | 3/231/0                                         | 3/231/0                                           | 3/231/0                                                              | 1/45/0                                                | 3/231/0                                          | -                                                 | -                                              |
| HTSL | High Temp Storage Bake 150C              | 500 Hours                     | -                                   | -                                        | -                                          | -                                            | -                                               | -                                                 | -                                                                    | -                                                     | -                                                | 2/90/0                                            | -                                              |
| HTSL | High Temp Storage Bake 170C              | 420 hours                     | -                                   | -                                        | -                                          | -                                            | -                                               | -                                                 | -                                                                    | -                                                     | -                                                | -                                                 | 3/231/0                                        |
| MQ   | Manufacturability (Assembly)             | (per mfg. Site specification) | Pass                                | Pass                                     | Pass                                       | Pass                                         | Pass                                            | Pass                                              | Pass                                                                 | Pass                                                  | Pass                                             | Pass                                              | Pass                                           |
| MSL  | Moisture Sensitivity, JEDEC              | Level 3-260C                  | 3/36 /0                             | -                                        | -                                          | -                                            | 3/36/0                                          | 3/36/0                                            | 3/36/0                                                               | 3/36/0                                                | 3/36/0                                           | 3/36/0                                            | 3/36/0                                         |
| PD   | Physical Dimensions                      | (per mechanical drawing)      | 3/15 /0                             | -                                        | -                                          | -                                            | 1/5/0                                           | -                                                 | 3/15/0                                                               | -                                                     | -                                                | 3/30/0                                            | 3/15/0                                         |
| SBS  | Ball Shear                               | Balls                         | 3/90 /0                             | 3/150/0                                  | -                                          | 3/240/0                                      | 3/60/0                                          | 3/60/0                                            | 3/540/0                                                              | 1/50/0                                                | -                                                | 3/150/0                                           | 3/60/0                                         |
| SD   | Solderability                            | PB-Free Solder                | 3/66 /0                             | -                                        | -                                          | -                                            | 1/12/0                                          | -                                                 | 3/66/0                                                               | -                                                     | -                                                | -                                                 | 3/66/0                                         |
| TC   | Temperature Cycle, -55/125C              | 1000 Cycles                   | -                                   | 3/231/0                                  | -                                          | -                                            | -                                               | -                                                 | -                                                                    | 3/231/0                                               | 3/231/0                                          | 3/231/0                                           | -                                              |
| TC   | Temperature Cycle, -55/125C              | 700 Cycles                    | 3/23 1/0                            | -                                        | -                                          | 3/231/0                                      | 3/231/0                                         | 3/231/0                                           | 3/231/0                                                              | -                                                     | -                                                |                                                   | 3/231/0                                        |
| THB  | Biased Temperature and Humidity, 85C/85% | 1000 Hours                    | -                                   | -                                        | -                                          | -                                            | -                                               | -                                                 | -                                                                    | 3/230/0                                               | 3/231/0                                          | 3/231/0                                           | -                                              |

| Type | Test Name / Condition    | Duration  | Qual Device: <u>OMAP5912ZVL</u> | QBS Package Reference: <u>AM3517ZCN</u> | QBS Package Reference: <u>CODMIOZWCR</u> | QBS Package Reference: <u>LMK04616ZCRR</u> | QBS Package Reference: <u>MSP430FG439IZCA</u> | QBS Package Reference: <u>MSP430FR5994IZVW</u> | QBS Package Reference: <u>PCD3215C00AZBHR</u> , <u>PCD3215C00BZBHR</u> | QBS Package Reference: <u>TMP570LS3137BZWTQ01</u> | QBS Package Reference: <u>TMS320DM6446ZW</u> | QBS Package Reference: <u>TPS659038TZWSRQ1</u> | QBS Package Reference: <u>TS3DDR4000ZBAR</u> |
|------|--------------------------|-----------|---------------------------------|-----------------------------------------|------------------------------------------|--------------------------------------------|-----------------------------------------------|------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------|----------------------------------------------|------------------------------------------------|----------------------------------------------|
|      | RH                       |           |                                 |                                         |                                          |                                            |                                               |                                                |                                                                        |                                                   |                                              |                                                |                                              |
| UHA  | Unbiased HAST 110C/85%RH | 264 Hours | 3/231/0                         | -                                       | -                                        | 3/231/0                                    | 3/231/0                                       | -                                              | 3/231/0                                                                | 3/231/0                                           | 3/231/0                                      | 3/231/0                                        | -                                            |
| UHA  | Unbiased HAST 130C/85%RH | 96 Hours  | -                               | 3/231/0                                 | -                                        | -                                          | -                                             | -                                              | -                                                                      | -                                                 | -                                            | -                                              | 3/231/0                                      |
| WBP  | Wire Pull                | Wires     | 1/76/0                          | 3/228/0                                 | -                                        | 3/228/0                                    | 3/228/0                                       | 3/228/0                                        | 3/228/0                                                                | 3/300/0                                           | 3/228/0                                      | 3/300/0                                        | 3/228/0                                      |
| WBS  | Ball Bond Shear          | Wires     | 1/76/0                          | 3/228/0                                 | -                                        | 3/228/0                                    | 3/228/0                                       | 3/228/0                                        | 3/228/0                                                                | 3/300/0                                           | 3/228/0                                      | 3/300/0                                        | 3/228/0                                      |

- QBS: Qual By Similarity\*

- Qual Device OMAP5912ZVL is qualified at LEVEL3-260CG

- 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

## Qualification Report (nFBGA)

### Approve Date 08-Apr-2020

#### Qualification Results

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

| Type | Test Name / Condition                         | Duration    | Qual Device: <u>AFF4491NMA</u> | Qual Device: <u>DRV8601NMBR</u> | Qual Device: <u>TXS0108ENMER</u> | QBS Package Reference: <u>AM3517ZCN</u> | QBS Package Reference: <u>LMK04616ZCRR</u> | QBS Package Reference: <u>PCD3215C00BZBHR</u> | QBS Package Reference: <u>TMP570LS3137BZWTQ01</u> |
|------|-----------------------------------------------|-------------|--------------------------------|---------------------------------|----------------------------------|-----------------------------------------|--------------------------------------------|-----------------------------------------------|---------------------------------------------------|
| BLR  | Board Level Reliability, Temp Cycle, -40/125C | 1000 Cycles | -                              | -                               | -                                | 1/32/0                                  | -                                          | -                                             | 1/32/0                                            |
| BLR  | Board Level Reliability, Temp Cycle, -40/85C  | 1000 Cycles | -                              | -                               | -                                | -                                       | -                                          | 1/32/0                                        | -                                                 |
| CDM  | ESD - CDM                                     | 250 V       | 1/3/0                          | 1/3/0                           | 1/3/0                            | -                                       | -                                          | -                                             | -                                                 |
| CDM  | ESD -                                         | 500 V       | 1/3/0                          | 1/3/0                           | 1/3/0                            | -                                       | -                                          | -                                             | 1/3/0                                             |

| Type | Test Name / Condition                     | Duration                      | Qual Device: <u>AFF4491N</u><br><u>MA</u> | Qual Device: <u>DRV8601N</u><br><u>MBR</u> | Qual Device: <u>TXS0108E</u><br><u>NMER</u> | QBS Package Reference: <u>AM3517ZC</u><br><u>N</u> | QBS Package Reference: <u>LMK04616</u><br><u>ZCRR</u> | QBS Package Reference: <u>PCD3215C</u><br><u>00BZBHR</u> | QBS Package Reference: <u>TMP570L</u><br><u>S3137BZ</u><br><u>WTQQ1</u> |
|------|-------------------------------------------|-------------------------------|-------------------------------------------|--------------------------------------------|---------------------------------------------|----------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------|-------------------------------------------------------------------------|
|      | CDM                                       |                               |                                           |                                            |                                             |                                                    |                                                       |                                                          |                                                                         |
| CDM  | ESD - CDM                                 | 750 V                         | -                                         | -                                          | -                                           | -                                                  | -                                                     | -                                                        | 1/3/0                                                                   |
| CDM  | ESD - CDM                                 | 1000 V                        | -                                         | -                                          | -                                           | -                                                  | -                                                     | -                                                        | -                                                                       |
| CDM  | ESD - CDM                                 | 1500 V                        | -                                         | -                                          | -                                           | -                                                  | 1/3/0                                                 | 6/18/0                                                   | -                                                                       |
| ED   | Electrical Characterization               | Per Datasheet Parameters      | -                                         | -                                          | -                                           | -                                                  | Pass                                                  | Pass                                                     | Pass                                                                    |
| ED   | Electrical Characterization, side by side | (per datasheet)               | Pass                                      | Pass                                       | Pass                                        | -                                                  | -                                                     | -                                                        | -                                                                       |
| FLAM | Flammability (IEC 695-2-2)                | Method B/IEC 695-2-2          | -                                         | -                                          | -                                           | -                                                  | -                                                     | 3/15/0                                                   | -                                                                       |
| FLAM | Flammability (UL 94V-0)                   | Method A/UL 94V-0             | -                                         | -                                          | -                                           | -                                                  | -                                                     | 3/15/0                                                   | -                                                                       |
| FLAM | Flammability (UL-1694)                    | Method C/UL-1694              | -                                         | -                                          | -                                           | -                                                  | -                                                     | 3/15/0                                                   | -                                                                       |
| HAST | Biased HAST, 110C/85% RH                  | 264 Hours                     | -                                         | -                                          | -                                           | 3/231/0                                            | 3/231/0                                               | 3/231/0                                                  | -                                                                       |
| HBM  | ESD - HBM                                 | 2000 V                        | -                                         | -                                          | -                                           | -                                                  | -                                                     | 6/18/0                                                   | 1/3/0                                                                   |
| HBM  | ESD - HBM                                 | 4000 V                        | -                                         | -                                          | -                                           | -                                                  | 1/3/0                                                 | -                                                        | -                                                                       |
| HTOL | Life Test, 115C                           | 1000 Hours                    | -                                         | -                                          | -                                           | -                                                  | 1/77/0                                                | -                                                        | -                                                                       |
| HTOL | Life Test, 125C                           | 1000 Hours                    | -                                         | -                                          | -                                           | -                                                  | -                                                     | 6/462/0                                                  | 3/231/0                                                                 |
| HTSL | High Temp Storage Bake 150C               | 1000 Hours                    | 3/230/0                                   | 3/231/0                                    | 3/231/0                                     | 3/45/0                                             | 1/77/0                                                | 3/231/0                                                  | 1/45/0                                                                  |
| MQ   | Manufacturability (Assembly)              | (per mfg. Site specification) | Pass                                      | Pass                                       | Pass                                        | Pass                                               | Pass                                                  | Pass                                                     | Pass                                                                    |
| MSL  | Moisture Sensitivity, JEDEC               | Level 2-260C                  | -                                         | 3/36/0                                     | 3/36/0                                      | -                                                  | -                                                     | -                                                        | -                                                                       |
| MSL  | Moisture Sensitivity, JEDEC               | Level 3-260C                  | 3/36/0                                    | -                                          | -                                           | -                                                  | -                                                     | 3/36/0                                                   | 3/36/0                                                                  |

| Type | Test Name / Condition                       | Duration                 | Qual Device: <u>AFE4491N</u><br><u>MA</u> | Qual Device: <u>DRV8601N</u><br><u>MBR</u> | Qual Device: <u>TXS0108E</u><br><u>NMER</u> | QBS Package Reference: <u>AM3517ZC</u><br><u>N</u> | QBS Package Reference: <u>LMK04616</u><br><u>ZCRR</u> | QBS Package Reference: <u>PCD3215C</u><br><u>00BZBHR</u> | QBS Package Reference: <u>TMP570L</u><br><u>S3137BZ</u><br><u>WTQQ1</u> |
|------|---------------------------------------------|--------------------------|-------------------------------------------|--------------------------------------------|---------------------------------------------|----------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------|-------------------------------------------------------------------------|
| PD   | Physical Dimensions                         | (per mechanical drawing) | 3/15/0                                    | 3/15/0                                     | 3/15/0                                      | -                                                  | -                                                     | 3/15/0                                                   | -                                                                       |
| SBS  | Ball Shear                                  | Balls                    | 3/90/0                                    | 3/90/0                                     | 3/90/0                                      | 3/150/0                                            | 3/240/0                                               | 3/540/0                                                  | 1/50/0                                                                  |
| SD   | Solderability                               | PB-Free Solder           | 3/66/0                                    | 3/66/0                                     | 3/66/0                                      | -                                                  | -                                                     | 3/66/0                                                   | -                                                                       |
| TC   | Temperature Cycle, -55/125C                 | 1000 Cycles              | -                                         | -                                          | -                                           | 3/231/0                                            | -                                                     | -                                                        | 3/231/0                                                                 |
| TC   | Temperature Cycle, -55/125C                 | 700 Cycles               | 3/231/0                                   | 3/231/0                                    | 3/231/0                                     | -                                                  | 3/231/0                                               | 3/231/0                                                  | -                                                                       |
| THB  | Biased Temperature and Humidity, 85C/85% RH | 1000 Hours               | -                                         | -                                          | -                                           | -                                                  | -                                                     | -                                                        | 3/230/0                                                                 |
| UHA  | Unbiased HAST 110C/85% RH                   | 264 Hours                | 3/230/0                                   | 3/231/0                                    | 3/231/0                                     | -                                                  | 3/231/0                                               | 3/231/0                                                  | 3/231/0                                                                 |
| UHA  | Unbiased HAST 130C/85% RH                   | 96 Hours                 | -                                         | -                                          | -                                           | 3/231/0                                            | -                                                     | -                                                        | -                                                                       |
| WBP  | Wire Pull                                   | Wires                    | 1/76/0                                    | 1/76/0                                     | 3/228/0                                     | 3/228/0                                            | 3/228/0                                               | 3/228/0                                                  | 3/300/0                                                                 |
| WBS  | Ball Bond Shear                             | Wires                    | 1/76/0                                    | 1/76/0                                     | 3/228/0                                     | 3/228/0                                            | 3/228/0                                               | 3/228/0                                                  | 3/300/0                                                                 |

- QBS: Qual By Similarity\*

- Qual Devices DRV8601NMBR and TXS0108ENMER are qualified at LEVEL2-260C

- Qual Device AFE4491NMA is qualified at LEVEL3-260CG

- Device AFE4491NMA contains multiple dies.

- 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

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| Asia Pacific | <a href="mailto:PCNAsiaContact@list.ti.com">PCNAsiaContact@list.ti.com</a>         |
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