



**PCN#20141208000
Assembly site move from Amkor K1 to Amkor P1
for Select Devices
Change Notification / Sample Request**

Date: 12/16/2014
To: MOUSER PCN

Dear Customer:

Amkor K1 (Korea) is closing its facility by 2015. This product change announcement is to support transfer of products in the QFN package to alternate sites. The details of this change are on the following pages.

We request you acknowledge receipt of this notification within **30** days of the date of this notice. Lack of acknowledgement of this notice within 30 days constitutes acceptance of the change. If you require samples or additional data to support your evaluation, please request within 30 days to ensure you can complete your evaluation and product transfer to the new site can be completed prior to the Amkor K1 site closure.

The changes discussed within this PCN will not take effect any earlier than **90** days from the date of this notification, unless customer agreement has been reached on an earlier implementation of the change. This notification period is per TI's standard process.

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, contact your local Field Sales Representative or the PCN Manager (PCN_ww_admin_team@list.ti.com).

Sincerely,

PCN Team
SC Business Services
Phone: +1(214) 480-6037
Fax: +1(214) 480-6659

20141208000

Attachment: 1

Products Affected:

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

| DEVICE | CUSTOMER PART NUMBER |
|------------------|-----------------------------|
| CC2560ARVMT | null |
| CC2564BRVMT | null |
| CC2564RVMR | null |
| CC2564RVMT | null |
| MSP430F133IRTDT | null |
| MSP430F135IRTDT | null |
| MSP430F147IRTDT | null |
| MSP430F1481IRTDT | null |
| MSP430F148IRTDT | null |
| MSP430F1491IRTDT | null |
| MSP430F149IRTDT | null |
| MSP430F157IRTDT | null |
| MSP430F1611IRTDT | null |
| MSP430F1612IRTDT | null |
| MSP430F167IRTDT | null |
| MSP430F169IRTDT | null |
| MSP430F412IRTDT | null |
| MSP430F413IRTDT | null |
| MSP430F415IRTDT | null |
| MSP430F417IRTDT | null |

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

| | | | | | |
|---|---|--------------------|---------------------------------------|---------------------------------|------------------|
| PCN Number: | 20141208000 | | | PCN Date: | 12/16/2014 |
| Title: | Assembly site move from Amkor K1 to Amkor P1 for Select Devices | | | | |
| Customer Contact: | PCN Manager | Phone: | +1(214)480-6037 | Dept: | Quality Services |
| Proposed 1st Ship Date: | 03/16/2015 | | Estimated Sample Availability: | Date provided at sample request | |
| Change Type: | | | | | |
| <input checked="" type="checkbox"/> Assembly Site | <input type="checkbox"/> | Design | <input type="checkbox"/> | Wafer Bump Site | |
| <input type="checkbox"/> Assembly Process | <input type="checkbox"/> | Data Sheet | <input type="checkbox"/> | Wafer Bump Material | |
| <input checked="" type="checkbox"/> Assembly Materials | <input type="checkbox"/> | Part number change | <input type="checkbox"/> | Wafer Bump Process | |
| <input type="checkbox"/> Mechanical Specification | <input type="checkbox"/> | Test Site | <input type="checkbox"/> | Wafer Fab Site | |
| <input checked="" type="checkbox"/> Packing/Shipping/Labeling | <input type="checkbox"/> | Test Process | <input type="checkbox"/> | Wafer Fab Materials | |
| | | | <input type="checkbox"/> | Wafer Fab Process | |
| PCN Details | | | | | |
| Description of Change: | | | | | |
| Assembly site move from Amkor K1 to Amkor P1 for Select Devices. Material differences are as follows: | | | | | |
| Group 1 Device | | | | | |
| | Amkor K1 | Amkor P1 | | | |
| Mount Compound | 101361223 | 4208458 | | | |
| Mold Compound | 101319571 | 4211649 | | | |
| Wire type | Au | Au, Cu | | | |
| Lead Finish | Matte Sn | NiPdAu | | | |
| Group 2 Device | | | | | |
| | Amkor K1 | Amkor P1 | | | |
| Mount Compound | 101361223 | 4208458 | | | |
| Mold Compound | 101319571 | 4211649 | | | |
| Reason for Change: | | | | | |
| Closure of the Amkor K1 assembly facility. Continuity of supply. | | | | | |
| Anticipated impact on Form, Fit, Function, Quality or Reliability (positive / negative): | | | | | |
| None. | | | | | |
| Changes to product identification resulting from this PCN: | | | | | |

Sample Product Shipping Label (not actual product label)

Group 1: Assembly Site

| | | |
|----------|----------------------------|----------|
| Amkor K1 | Assembly Site Origin (22L) | ASO: AMN |
| Amkor P1 | Assembly Site Origin (22L) | ASO: AKR |



ASSEMBLY SITE CODES: AMN =7, AKR = 4

Product Affected Group: Group 1

| | | | |
|------------------|-------------------|------------------|-----------------|
| MSP430F133IRTDR | MSP430F1491IRTDR | MSP430F1610IRTDT | MSP430F412IRTDT |
| MSP430F133IRTDT | MSP430F1491IRTDT | MSP430F1611IRTDR | MSP430F413IRTDR |
| MSP430F135IRTDR | MSP430F149IRTDR | MSP430F1611IRTDT | MSP430F413IRTDT |
| MSP430F135IRTDT | MSP430F149IRTDRG4 | MSP430F1612IRTDR | MSP430F415IRTDR |
| MSP430F1471IRTDR | MSP430F149IRTDT | MSP430F1612IRTDT | MSP430F415IRTDT |
| MSP430F1471IRTDT | MSP430F155IRTDR | MSP430F167IRTDR | MSP430F417IRTDR |
| MSP430F147IRTDR | MSP430F155IRTDT | MSP430F167IRTDT | MSP430F417IRTDT |
| MSP430F147IRTDT | MSP430F156IRTDR | MSP430F168IRTDR | MSP430V119IRTDR |
| MSP430F1481IRTDR | MSP430F156IRTDT | MSP430F168IRTDT | MSP430V170IRTDR |
| MSP430F1481IRTDT | MSP430F157IRTDR | MSP430F169IRTDR | |
| MSP430F148IRTDR | MSP430F157IRTDT | MSP430F169IRTDT | |
| MSP430F148IRTDT | MSP430F1610IRTDR | MSP430F412IRTDR | |

Product Affected Group: Group 2

| | | |
|-------------|--------------|------------|
| CC2560ARVMR | CC2564NSRVMR | CC2567RVMR |
| CC2560ARVMT | CC2564NSRVMT | CC2567RVMT |
| CC2564BRVMR | CC2564RVMR | CC2569RVMR |
| CC2564BRVMT | CC2564RVMT | CC2569RVMT |

Group 1 Qualification Report

MSP430F1611 AMKOR K1 to P1 Assembly Transfer and Cu Wire Conversion

Product Attributes

| Attributes | MSP430F1611IRTD Cu Wire | MSP430F1611IRTD Au Wire |
|----------------------------|-------------------------------------|-------------------------------------|
| Assembly Site | AMKOR P1 | AMKOR P1 |
| Package Family | QFN, 9.0 X 9.0 MM, 0.5MM Lead Pitch | QFN, 9.0 X 9.0 MM, 0.5MM Lead Pitch |
| Flammability Rating | UL 94-V0 | UL 94-V0 |
| Wafer Fab Site | TSMC FAB 3 | TSMC FAB 3 |
| Wafer Fab Process | TSMC035UM | TSMC035UM |

- Qual Device MSP430F1611IRTD qualified at LEVEL3-260C

Qualification Results

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

| Type | Test Name / Condition | Duration | MSP430F1611IRTD Cu Wire | MSP430F1611IRTD Au Wire |
|------|-------------------------------------|------------------------------|-------------------------|-------------------------|
| HAST | HAST 110C/85% RH | 264 Hours | 3/231/0 | 3/231/0 |
| AC | Autoclave 121C | 96 Hours | 3/231/0 | 3/231/0 |
| TC | Temp Cycle -65/150C | 500 Cycles | 3/231/0 | 3/231/0 |
| HTSL | Bake 170C | 420 Hours | 3/231/0 | 3/231/0 |
| SATM | Salt Atmosphere Testing | 24 Hours | - | 3/66/0 |
| WBS | Wire Bond Shear | Per Assy Site Specifications | 3/90/Pass | 3/90/Pass |
| WBP | Wire Bond Pull | Per Assy Site Specifications | 3/90/Pass | 3/90/Pass |
| SD | Pb Free Surface Mount Solderability | Per Assy Site Specifications | - | 1/22/Pass |
| PD | Physical Dimensions | Per Assy Site Specifications | - | 1/5/Pass |
| XRAY | X-RAY | Per Assy Site Specifications | 1/5/Pass | - |

- 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

Group 2 Qualification Report

Qualification of Orca Offload from Amkor K1 to Amkor P1

Product Attributes

| | Qual Device: BL6450QRVMR | QBS Device: BL6450QRVMR | QBS Device: BL6450QRVMR |
|--------------------------|--------------------------|-------------------------|-------------------------|
| Die Attributes | | | |
| Wafer Fab Site | TSMC F-14 | TSMC F-14 | TSMC F-14 |
| Wafer Fab Process | 1218C021.M6RF | 1218C021.M6RF | 1218C021.M6RF |

| Package Attributes | | | |
|---------------------------|-----------------|-----------------|-----------------|
| Assembly Site | Amkor P1 | Amkor K1 | Amkor K1 |
| Package Family | PVQFN | PVQFN | WSP |
| Package Designator | RVM | RVM | YFV |
| Package Size (mils) | 314.96 X 314.96 | 314.96 X 314.96 | 116.42 x 129.68 |
| Body Thickness (mils) | 0.85 | 0.85 | 19.68 |
| Pin Count | 76 | 76 | 54 |
| Bump Composition | - | - | Sn/Ag/Cu (LF35) |
| Lead Frame Material | Cu | Cu | - |
| Lead Finish | NiPdAu | NiPdAu | - |
| Lead Pitch (mils) | 0.6 | 0.6 | - |
| Mount Compound | 101340002 | 101340002 | - |
| Mold Compound | 101317124 | 101317124 | - |
| Bond Wire Composition | Au | Au | - |
| Bond Wire Diameter (mils) | 0.7 | 0.7 | - |
| Flammability Rating | UL 94 V-0 | UL 94 V-0 | UL 94 V-0 |

- Qual Devices qualified at LEVEL3-260C

Qualification Plan

| Type | # | Test Name / Condition | Duration | Qual Device: BL6450QRVMR Expected Date | QBS Device: BL6450QRVMR | QBS Device: BL6450QRVMR |
|--|----|---|--------------------------|---|-------------------------|-------------------------|
| Test Group A - Accelerated Environment Stress Test | | | | | | |
| PC | A1 | PreCon Level 3 | 3 Cyc/260C +5 / -0C | 2/28/2015 | - | - |
| THB | A2 | THB 85/85 (Automotive) | 1000 Hr | 2/28/2015 | - | - |
| UHAST | A3 | Unbiased HAST 130C/85%RH | 96 Hr | 2/28/2015 | - | - |
| TC | A4 | Temperature Cycle, -50/150C | 500 Cyc | 2/28/2015 | - | - |
| HTSL | A6 | High Temp Storage Bake 150C | 1000 Hr | 2/28/2015 | - | - |
| Test Group B - Accelerated Lifetime Simulation Test | | | | | | |
| HTOL | B1 | HTOL, 125C | 1000 Hr | - | 3/230/0 | - |
| ELFR | B2 | Early Life Failure Rate, 125C | 8 Hr | - | 3/1197/0 | - |
| ELFR | B2 | Early Life Failure Rate, 125C | 48 Hr | - | 3/1197/0 | - |
| Test Group C - Package Assembly Integrity Tests | | | | | | |
| WBS | C1 | Wire Bond Shear (Ppk > 1.67 and Cpk > 1.33) | 30 bonds/5 devices | 2/28/2015 | - | - |
| WBP | C2 | Wire Bond Pull (Ppk > 1.67 and Cpk > 1.33) | 30 bonds/5 devices | 2/28/2015 | - | - |
| SD | C3 | Solderability >95% Lead Coverage | 8 Hr/steam age | 2/28/2015 | - | - |
| PD | C4 | Physical Dimensions (Cpk>1.33 Ppk>1.67) | | 2/28/2015 | - | - |
| SBS | C5 | Solder Ball Shear (Ppk > 1.67 and Cpk > 1.33) | Post HTSL/Bump | N/A | - | - |
| SBS | C5 | Solder Ball Shear (Ppk > 1.67 and Cpk > 1.33) | Time Zero/Bump | N/A | - | - |
| SBS | C5 | Solder Ball Shear (Ppk > 1.67 and Cpk > 1.33) | Post 500 Temp Cyc/Bump | N/A | - | - |
| LI | C6 | Lead Integrity | | N/A | - | - |
| Test Group E - Electrical Verification | | | | | | |
| HBM | E2 | ESD - HBM - Q100 all pins | 500V | - | 1/3/0 | - |
| CDM | E3 | ESD - CDM - Q100 | 250V, 750V (corner pins) | - | 1/3/0 | - |
| LU | E4 | Latch- Up | Ta(max) | - | | 3/18/0 |
| ED | E5 | Electrical Distributions | | - | 3/30/Pass | - |
| CHAR | E7 | Characterization | | - | 1/30/Pass | - |

- Preconditioning will be performed for Unbiased HAST, unbiased/Biased HAST, Temperature Cycle, and HTSL, as applicable

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

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

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

Green/Pb-free Status:

Qualified Pb-Free(SMT) and Green

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

| Location | E-Mail |
|-----------------|--|
| USA | PCNAmericasContact@list.ti.com |
| Europe | PCNEuropeContact@list.ti.com |
| Asia Pacific | PCNAsiaContact@list.ti.com |
| Japan | PCNJapanContact@list.ti.com |