



Integrated Device Technology, Inc.  
6024 Silver Creek Valley Road, San Jose, CA - 95138

## PRODUCT/PROCESS CHANGE NOTICE (PCN)

|                                                                                                        |                          |                                                                                                                                                                |
|--------------------------------------------------------------------------------------------------------|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PCN #: <b>A1706-01(R1)</b>                                                                             | DATE: <b>25-Oct-2017</b> | MEANS OF DISTINGUISHING CHANGED DEVICES:                                                                                                                       |
| Product Affected: FCCSP and FCBGA<br>Refer to details in this notice for the affected IDT part numbers |                          | <input type="checkbox"/> Product Mark<br><input checked="" type="checkbox"/> Back Mark<br><input type="checkbox"/> Date Code<br><input type="checkbox"/> Other |
| Date Effective: <b>25-Jan-2018</b>                                                                     |                          | Bumping location is traceable through Assembly Lot#.                                                                                                           |

|                                                              |                                                                                                 |
|--------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| Contact: IDT PCN DESK                                        | Samples: Please contact your local sales representative for sample request within next 30 days. |
| E-mail: <a href="mailto:pcndesk@idt.com">pcndesk@idt.com</a> |                                                                                                 |

### DESCRIPTION AND PURPOSE OF CHANGE:

- |                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> Die Technology<br><input type="checkbox"/> Wafer Fabrication Process<br><input type="checkbox"/> Assembly Process<br><input type="checkbox"/> Equipment<br><input type="checkbox"/> Material<br><input type="checkbox"/> Testing<br><input checked="" type="checkbox"/> Manufacturing Site<br><input type="checkbox"/> Data Sheet | <p><b>Revision 1:</b> This revised PCN notice is to update the qualification results and to request customers to respond to this notice within 30 days, with an indication if samples will be required. Samples must be placed within 30 days, if required for qualification and approval to avoid any disruption in supply. In addition, 4DB0124KB1AVG(8) is removed from the affected part number list.</p> <p>This notification to advise our customers that Amkor is discontinuing the 300mm wafer bumping process at Amkor, Taiwan ATT5 and transferring the affected products to Amkor, Taiwan ATT1 wafer bumping by January 5, 2018.</p> <p>There is no change to the equipment, process or materials between these Amkor, Taiwan sites.</p> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### RELIABILITY/QUALIFICATION SUMMARY:

Refer to qualification and comparison data included in this notice. This confirms this is a low risk change.

### CUSTOMER ACKNOWLEDGMENT OF RECEIPT:

IDT records indicate that you require written notification of this change. Please use the acknowledgement below or E-Mail to grant approval or request additional information. If IDT does not receive acknowledgement within 30 days of this notice it will be assumed that this change is acceptable.

IDT reserves the right to ship either version manufactured after the process change effective date until the inventory on the earlier version has been depleted.

|                  |                                                                                 |
|------------------|---------------------------------------------------------------------------------|
| Customer: _____  | <input type="checkbox"/> <b>Approval for shipments prior to effective date.</b> |
| Name/Date: _____ | E-Mail Address: _____                                                           |
| Title: _____     | Phone# /Fax# : _____                                                            |

CUSTOMER COMMENTS: \_\_\_\_\_

### IDT ACKNOWLEDGMENT OF RECEIPT:

RECD. BY: \_\_\_\_\_ DATE: \_\_\_\_\_



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### ATTACHMENT I - PCN # : A1706-01 (R1)

**PCN Type:** Manufacturing Site - Transfer Bumping Location

**Data Sheet Change:** None

**Detail Of Change:**

This notification to advise our customers that Amkor, Taiwan is transferring the wafer bumping process for 300mm wafer size at Amkor, Taiwan T5 (ATT T5) to Amkor, Taiwan T1 (ATT T1) as ATT T5 will discontinue the bumping process by January 5, 2018.

There is no change in form, fit and function of the products including RoHS compliance and MSL rating. In addition, materials, process and equipments are the same at both sites. Refer to details in this notice.

**Qualification Information and Qualification Data:**

**Affected Packages:** FCCSP and FCBGA

**Qual Plan & Results:** Tests are in accordance with JEDEC47 recommended tests.

**Qualification Vehicle:** FCCSP-253

| Test Description                                      | Test Method                 | Test Results (Rej / SS) |       |       |
|-------------------------------------------------------|-----------------------------|-------------------------|-------|-------|
|                                                       |                             | Lot 1                   | Lot 2 | Lot 3 |
| * Temperature Cycling<br>(-55°C to 125°C, 700 cycles) | JESD22-A104                 | 0/25                    | 0/25  | 0/25  |
| * HAST - biased<br>(130 °C/85% RH, 96 Hrs)            | JESD22-A110                 | 0/25                    | 0/25  | 0/25  |
| * HAST - unbiased<br>(130 °C/85% RH, 96 Hrs)          | JESD22-A118                 | 0/25                    | 0/25  | 0/25  |
| High Temperature Storage Bake<br>(150°C, 1000 Hrs)    | JESD22-A103                 | 0/25                    | 0/25  | 0/25  |
| Moisture Sensitivity Level, MSL                       | J-STD-20 /<br>MSL 3, 260 °C | 0/25                    | 0/25  | -     |

\* Tests were subjected to Preconditioning per JESD22-A113 prior to stress test



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### Affected Part Numbers

| Part Number        | Part Number        | Part Number        | Part Number        |
|--------------------|--------------------|--------------------|--------------------|
| 4RCD0124KC0ATG     | 89H24NT24G2ZCHLGI  | 89H32NT8AG2ZBHLG8  | 89H64H16G2ZCBLG    |
| 4RCD0124KC0ATG8    | 89H24NT24G2ZCHLGI8 | 89H32NT8AG2ZBHLGI  | 89H64H16G3YCBLG    |
| 4RCD0124KC0ATG8/M  | 89H24NT6AG2ZAHLG   | 89H32NT8AG2ZCHLG   | 89HAL808G2ZCHLGI   |
| 80HCPS1432CRM/AL   | 89H24NT6AG2ZAHLG8  | 89H32NT8AG2ZCHLG8  | 89HAL808G2ZCHLGI8  |
| 80HCPS1616CHRI     | 89H24NT6AG2ZAHLGI  | 89H32NT8AG2ZCHLGI  | 89HI0524G2PSZCALG  |
| 80HCPS1616RM       | 89H24NT6AG2ZAHLGI8 | 89H32NT8BG2ZBHLGI  | 89HPES16T4AG2ALGI  |
| 80HCPS1616RMI      | 89H24NT6AG2ZBHLG   | 89H32NT8BG2ZCHLG   | 89HPES16T4AG2ZCALG |
| 80HCPS1848CBRI-5   | 89H24NT6AG2ZBHLG8  | 89H32NT8BG2ZCHLGI  | 89HPES24T3G2ZCALG  |
| 80HCPS1848CBRI-L   | 89H24NT6AG2ZCHLG   | 89H32NT8BG2ZCHLGI5 | 89HPES24T3G2ZCALGI |
| 80HCPS1848CRM/AL   | 89H24NT6AG2ZCHLG8  | 89H32T8G2ZCBLG     | 89HPES24T6G2ZCALG  |
| 80HCPS1848CRMI-5   | 89H24NT6AG2ZCHLGI  | 89H32T8G2ZCBLG8    | 89HPES24T6G2ZCALG8 |
| 89H12NT12G2ZCHLG   | 89H32H8G2ZCBLG     | 89H32T8G2ZCBLGI    | 89HPES24T6G2ZCALGI |
| 89H12NT12G2ZCHLGI  | 89H32H8G2ZCBLG8    | 89H34H16G2ZCBLG    | 89HPES34H16ZABLG   |
| 89H12NT12G2ZCHLGI8 | 89H32H8G2ZCBLGI    | 89H48H12AG2ZCBLG   | 89HPES4T4G2ZCALG   |
| 89H16NT16G2ZCHLG   | 89H32H8G2ZCBLGI8   | 89H48H12AG2ZCBLGI  | 89HPES4T4G2ZCALGI  |
| 89H16NT16G2ZCHLG8  | 89H32NT24AG2ZBHLG  | 89H48H12G2ZCBLG    | 89HPES64H16ZABLG   |
| 89H16NT16G2ZCHLGI  | 89H32NT24AG2ZBHLGI | 89H48H12G2ZCBLGI   | 89HPES6T6G2ZCALG   |
| 89H16NT16G2ZCHLGI8 | 89H32NT24AG2ZCHLG  | 89H48H12G2ZDBLG    | 89HPES6T6G2ZCALGI  |
| 89H16T16AG2ZCHLG   | 89H32NT24AG2ZCHLGI | 89H48T12G2ZCBLG    | TSI721-16GCLY      |
| 89H24NT24G2ZBHLG   | 89H32NT24BG2ZCHLG  | 89H48T12G2ZCBLGI   | TSI721-16GILY      |
| 89H24NT24G2ZCHLG   | 89H32NT24BG2ZCHLGI | 89H64H16AG2ZCBLG   |                    |
| 89H24NT24G2ZCHLG8  | 89H32NT8AG2ZBHLG   | 89H64H16AG2ZCBLGI  |                    |



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## PRODUCT/PROCESS CHANGE NOTICE (PCN)

PCN # : A1706-01 (R1)

Comparison between ATT T5 (Existing Site) vs ATT T1 (New Site)

### (i) Equipment/Tools Comparison

| Process Step | Comparison of T5 and T1 Equipment /Tool                      |
|--------------|--------------------------------------------------------------|
| Coating      | ATT5 and ATT1 have the same equipment, same vendor and model |
| Exposure     | ATT5 and ATT1 have the same equipment, same vendor and model |
| Develop      | ATT5 and ATT1 have the same equipment, same vendor and model |
| Cure         | ATT5 and ATT1 have the same equipment, same vendor and model |
| Descum       | ATT5 and ATT1 have the same equipment, same vendor and model |
| Sputter      | ATT5 and ATT1 have the same equipment, same vendor and model |
| Plating      | ATT5 and ATT1 have the same equipment, same vendor and model |
| Etch         | ATT5 and ATT1 have the same equipment, same vendor and model |
| Strip        | ATT5 and ATT1 have the same equipment, same vendor and model |
| Reflow       | ATT5 and ATT1 have the same equipment, same vendor and model |

### (ii) Process Comparison

| Loop                | Operation              | Parameter Settings Comparison   |
|---------------------|------------------------|---------------------------------|
| IQC                 | T1_BP_SP_IQC_BDESCUM   | T1 and T5 settings are the same |
|                     | T1_BP_SP_BINC_CLN      | T1 and T5 settings are the same |
| PI photo            | T1_BP_BCOAT_PI         | T1 and T5 settings are the same |
|                     | T1_BP_SP_BEXPOSURE_25  | T1 and T5 settings are the same |
|                     | T1_BP_BDEVELOP_PI      | T1 and T5 settings are the same |
| UBM sputter         | T1_BP_SP_BCURE_PI      | T1 and T5 settings are the same |
|                     | T1_BP_SP_BUBM_DEP      | T1 and T5 settings are the same |
| PR photo            | T1_BP_SP_BCOAT_4620    | T1 and T5 settings are the same |
|                     | T1_BP_SP_BEXPOSURE_30  | T1 and T5 settings are the same |
|                     | T1_BP_SP_BDEVELOP_4620 | T1 and T5 settings are the same |
| Plating & Strip     | T1_BP_SP_4620_BDESCUM  | T1 and T5 settings are the same |
|                     | T1_BP_SP_BNI_PLT       | T1 and T5 settings are the same |
|                     | T1_BP_SP_BLFC4_PLT     | T1 and T5 settings are the same |
|                     | T1_BP_SP_BPR_STRIP     | T1 and T5 settings are the same |
| UBM etch            | T1_BP_SP_BLFTICU_ETCH  | T1 and T5 settings are the same |
|                     | T1_BP_SP_ETCH_BDESCUM  | T1 and T5 settings are the same |
| Reflow & Flux clean | T1_BP_SP_BFLX_RF       | T1 and T5 settings are the same |
|                     | T1_BP_SP_BFLX_CLN      | T1 and T5 settings are the same |



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### Comparison of ATT T5 (Existing Site) vs ATT T1 (New Site)

#### (iii) Materials Comparison

| Process Step     | Material             | Same type as T5      |                                  |
|------------------|----------------------|----------------------|----------------------------------|
|                  | ATT5                 | ATT1                 | Comment                          |
| Re-Passivation   | HD4100               | HD4100               | T1 uses the same materials as T5 |
| Photo resist     | AZ4620               | AZ4620               | T1 uses the same materials as T5 |
| Sputter          | Ti target            | Ti target            | T1 uses the same materials as T5 |
|                  | Cu target            | Cu target            | T1 uses the same materials as T5 |
| Plating material | Ni                   | Ni                   | T1 uses the same materials as T5 |
|                  | LF                   | LF                   | T1 uses the same materials as T5 |
| Etch             | BOE (HF base) (Ti)   | BOE (HF base) (Ti)   | T1 uses the same materials as T5 |
|                  | Cu etching (Typical) | Cu etching (Typical) | T1 uses the same materials as T5 |
| Strip            | Acetone              | Acetone              | T1 uses the same materials as T5 |
|                  | Solvent              | Solvent              | T1 uses the same materials as T5 |
| Reflow           | 5R (non-soluble)     | 5R (non-soluble)     | T1 uses the same materials as T5 |
| Flux clean       | mestylene, IPA       | mestylene, IPA       | T1 uses the same materials as T5 |