Revision 1.0.0
PCN Issue Date: 06/07/2023

PROCESS CHANGE NOTIFICATION
PCN2314

Alternate Assembly Site for Selected Cyclone® IV & Cyclone® V Devices

Change Description:

Intel® is announcing the addition of Advanced Semiconductor Engineering Inc., Taiwan (ASEK) as an alternate assembly site for selected Cyclone IV and Cyclone V devices.

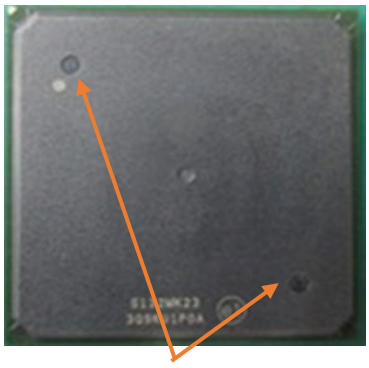
ASEK is a long-time qualified, high-volume assembly site for Cyclone IV and Cyclone V devices.

Table 1: Change Details

	Change From	Change To
Assembly Site	**Site:** Amkor Technology Korea (ATK) **Location:** 100, Amkor-ro, Buk-gu, Gwangju, 61006 Korea	**Site:** Advanced Semiconductor Engineering, Inc (ASEK) **Location:** 26, Chin 3rd Rd, Nanzih Dist, Kaohsiung, 811, Taiwan
Wire Bond Material	PCC wire	Au Flash PCC wire
Die Attach Material	ABLESTIK 2300	ABLESTIK 2100A
Substrate Supplier	Kinsus	ASEMtl
Country of Origin (COO)	Korea	Taiwan

Note: The rest of the Bill of Material (BOM) remains the same

Table 2: Package Appearance

From: ATK	To: ASEK
Top View 	**Top View**  **Two ejector pin marks (See option 2 of POD)**

Note: No appearance changes to the bottom view.

Products Affected:

Table 3

Product Family
Cyclone V SE
Cyclone V E
Cyclone V SX
Cyclone IV E

The list of affected part numbers (OPNs) can be downloaded in Excel form:
https://cdrdv2.intel.com/v1/dl/getContent/780980

Recommended Action

Customers are requested to:

1. Acknowledge receipt of this notification.

2. Review and inform us, at the earliest convenience, of any questions or concerns regarding this change.

Please refer to the "Product Transition Dates" for the key milestones.

Upon implementation, Intel will ship either pre-change or post-change materials.

Product Transition Dates:

Customers are requested to take note of the key dates shown in the table below.

Table 4: Key Dates

Milestone	*Date*
Last date to acknowledge receipt of this notification[1]	July 20, 2023
Earliest change implementation	Dec 1, 2023

Note 1: J-STD-046, section 3.2.3.1b, stipulates that lack of acknowledgement of the PCN within 30 days constitutes acceptance of the change.

Reason for Change:

The qualification of an additional production assembly site for the affected devices supports supply chain risk mitigation.

Impact and Benefit of Change:

There is no impact to fit, function, form, quality, and reliability of the product. The products will meet existing electrical and mechanical specifications.

Qualification has been performed to evaluate the quality and reliability performance of ASEK for the products specific to this PCN (See Qualification Data Section, Table 5A & 5B).

Method to Identify Change Product:

The changed product can be identified by the following:

- COO (Country of Origin) is Taiwan on the top mark and label for ASEK parts.

- Package appearance difference where ASEK site have two ejector pin marks as shown in Table 2 above.

Qualification Data:

Qualification testing was performed to further evaluate the quality and reliability performance of ASEK for the products specific to this PCN.

Table 5A: Reliability Test Data

- **All tests passed with zero failures**
- **Vehicle devices 5CSTD6Y28UC672TN & 5CSTD6Y28UI484TN are of the same technology and package Bill of Materials (BOM).**

Test	Time point	Conditions	Vehicle Device	Results (Fail/Total SS)
Temperature Cycle Test (TCB)	1000 Cycles	-55°C /125°C	5CSTD6Y28UC672TN	0/231
	2000 Cycles		5CSTD6Y28UI484TN	0/212
Temperature Humidity Bias (THB)	1000hrs	85°C/85% RH	5CSTD6Y28UC672TN	0/279
	2000hrs		5CSTD6Y28UI484TN	0/104
Unbiased Highly Accelerated Stress Test (uHAST)	96hrs	130°C / 85%RH	5CSTD6Y28UC672TN	0/231
	192hrs		5CSTD6Y28UI484TN	0/231
High Temp Storage (HTS)	1000hrs	150°C	5CSTD6Y28UC672TN	0/231
	2000hrs		5CSTD6Y28UI484TN	0/224

Note 1: Preconditioning performed according to J-STD-020, MSL3 @ 260C reflow
Note 2: TCB, uHAST and HTS Rel# ASE2101-031, ASE2101-032
Note 3: THB Rel# 19050013, 19050017, 19050018, 19100022, 19100023, 19100024
Note 4: Qualification testing and sample size based on standard J-STD-020 requirements

Table 5B: Reliability Test Data

- **Below is the Reliability result for Cyclone IV E device.**
- **All tests passed with zero failures**

Test	Time point	Conditions	Vehicle Device	Results (Fail/Total SS)

Temperature Cycle Test (TCB)	1000 Cycles	-55°C /125°C	EP3C40T60FC484N	0/231
	2000 Cycles		EP3C120T60FC780N	0/212
Temperature Humidity Bias (THB)	1000hrs	85°C/85% RH	EP3C40T60FC484N	0/231
	2000hrs		EP3C120T60FC780N	0/224
Unbiased Highly Accelerated Stress Test (uHAST)	96hrs	130°C / 85%RH	EP3C40T60FC484N	0/231
	192hrs		EP3C120T60FC780N	0/77
High Temp Storage (HTS)	1000hrs	150°C	EP3C40T60FC484N	0/231
	2000hrs		EP3C120T60FC780N	0/225

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Intel references J-STD-046 guidelines for PCN.
In accordance with J-STD-046, this change is deemed acceptable to the customer if no acknowledgement is received within 30 days from date of notification.

Revision History

Date	Rev	Description
6/7/2023	1.0.0	Initial Release