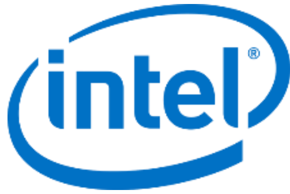

Revision 1.0.0
PCN Issue Date: 11/10/2017

PROCESS CHANGE NOTIFICATION
PCN1717

Mold Compound Change for Selected Cyclone® and Cyclone® II devices in TQFP100/144 and QFP208 Packages

Change Description:

Intel® Programmable Solutions Group ("Intel PSG", formerly Altera) is announcing a change in mold compound for selected Cyclone and Cyclone II devices in TQFP 100/144 and QFP208 packages assembled at Advanced Semiconductor Engineering Inc., Malaysia (ASEM).

This change is aligned with Intel PSG's efforts towards Bill of Materials (BOM) standardization for devices assembled at ASEM.

The replacement mold compound material is already qualified and has been used in other FPGA products for >2 years.

Table 1: Changes to BOM

Product Family	Package-Pin	Affected Material	Change From	Change To
CYCLONE CYCLONE II	TQFP|T100|T144 TQFP|T144	Mold Compound	EME-G700 series	EME-G631 series
CYCLONE II	QFP|Q208	Mold Compound	EME-G700 series	EME-G631 series

Note: The rest of the BOM remain the same.

Products Affected:

Table 2

Product Family	Package – Pin Count
CYCLONE	TQFP – 100/144
CYCLONE II	TQFP – 144; QFP - 208

The list of affected OPNs can be downloaded in Excel form:
https://www.altera.com/content/dam/altera-www/global/en_US/pdfs/literature/pcn/pcn-1717-opn-list.xlsx

Recommended Action

Customers are requested to:

1. Acknowledge receipt of this notification.
2. Review and provide approval of this change at the earliest convenience.

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

Upon implementation, Intel PSG may continue to ship pre-change material until inventory is depleted.

Product Transition Dates:

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

Table 3

Milestone	***Date***
Last date to acknowledge receipt of this notification[1]	December 26, 2017
Estimated earliest shipment date of changed products[2]	March 31, 2018

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.

Note 2: Effective the earliest ship date listed above, Intel PSG may begin the shipment of changed products.

Intel PSG reserves the right to continue shipment of pre-change product after the change implementation date, and customers will receive shipments of either pre-change or post-change product.

Reason for Change:

The change to the EME-G631 mold compound series supports BOM standardization for Cyclone and Cyclone II devices in TQFP 100/144 and QFP208 packages assembled at ASE Malaysia.

Impact and Benefit of Change:

The change will not impact the form, fit, and function of the product. Product datasheet and package specifications remain the same.

Additional qualification has been performed to further evaluate the quality and reliability performance of the replacement mold compound applied to the product-package combination for this specific PCN. (See Qualification Data Section, Table 4)

Method to Identify Change Product:

An earliest datecode of implementation can be identified and shared upon request as reference information related to this change. This earliest datecode of implementation may vary per product and depends on the depletion of existing inventory.

Upon implementation, Intel PSG may continue to ship pre-change material until inventory is depleted.

Qualification Data:

Qualification testing was performed to further evaluate the quality and reliability performance of the replacement mold compound applied to the product-package combination for this specific PCN. (See Table 4)

Table 4: Qualification Data

Test	Time point	Conditions	# of Lots	SS/lot	Results (Fail/Total SS)
High Temperature Storage Test (Bake)	2000hrs	150°C	4	30-77	0/197
Temperature Cycle Test (TCB)	1000X	-55°C /125°C	4	77	0/308
	2000X	-55°C /125°C	4	77	0/308
Highly Accelerated Stress Test (HAST)	192hrs	130°C / 85%RH with bias	4	42-77	0/241
Unbiased Highly Accelerated Stress Test (uHAST)	192hrs	130°C / 85%RH	3	30-45	0/120

Note: Preconditioning (J-STD-020, MSL3 @ 245C/260C) performed on all samples prior to each reliability test.

Table 4a: Vehicle Devices

Product Family	Package	Base Die
Cyclone II	QFP - 208	EP2C8Y90
Cyclone II	TQFP - 144	EP2C8Y90

Note: Qualification vehicles were selected to represent various die and package combinations. The selected vehicle devices have the same top passivation layer as all other affected devices.

Contact

For more information, please contact Sales or Customer Quality Engineering (CQE) in your region, or submit a Service Request at Intel PSG's mySupport website.

Customer Notifications Subscription

Customers that have subscribed to Intel PSG's customer notification mailing list will receive the PCN document automatically via email.

If you would like to receive customer notifications by email, please subscribe to our customer notification mailing list at:
https://www.altera.com/subscriptions/email/signup/eml-index.jsp

Intel PSG 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
11/10/2017	1.0.0	Initial Release

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