Revision 1.1.0
PCN Issue Date: 09/27/2017

PROCESS CHANGE NOTIFICATION

PCN1705

Substrate Material Change for Cyclone® III and MAX® II in FBGA-100/256/324 and UBGA-256 Packages

This is not a new PCN issuance. This is an update to PCN1705; please see the revision history table for information specific to this update

Change Description:

Intel® Programmable Solutions Group ("Intel PSG", formerly Altera) is announcing a change in substrate material for Cyclone III and MAX II products in FBGA-100/256/324 and UBGA-256 packages.

The existing substrate material supplier is discontinuing production of the halogenated core and prepreg materials for laminated substrate by end of 2017.

The replacement material is already qualified and used in high volume on other FPGA products for >5 years.

Table 1: Changes to BOM

	Change From	Change To
Core and Prepreg Material	Mitsubishi HL832	Mitsubishi HL832NX-A
	Mitsubishi HL832EX	Mitsubishi HL832NX-A
	Mitsubishi HL832HS	Mitsubishi HL832NX-A
Solder Mask Material	Taiyo AUS 5	Taiyo AUS 308
	Taiyo AUS303	Taiyo AUS 308

Note: The rest of the Bill of Materials (BOM) remain the same

Products Affected:

Table 2

Product Family	Package
Cyclone III	FBGA – 256 / 324; UBGA - 256
MAX II	FBGA – 100 / 256/ 324

See Appendix 1 for the complete list of affected Ordering Part Numbers (OPN).

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]	July 10, 2017
Estimated earliest shipment date of changed products[2]	November 30, 2017

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 existing substrate material supplier is discontinuing production of the halogenated core and prepreg materials for laminated substrate by end of year 2017. The supplier is no longer able to maintain consistent production efficiency and short lead times of halogenated materials due to decreasing demand.

The halogen-free core, prepreg, and solder mask materials also support corporate and customer green initiatives related to controlled or restricted substances.

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.
The replacement substrate material is already being used on other FPGA products and meets quality and reliability requirements.

Additional qualification testing has been performed to further evaluate the quality and reliability performance of the replacement substrate material applied to the product-package combination for this specific PCN.
(See Qualification Data, 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:

Table 4

Test	Time point	Conditions	AMKOR			ASE		
			# of Lots	SS/lot	Results (Fail/Total SS)	# of Lots	SS/lot	Results (Fail/Total SS)
High Temperature Storage Test (Bake)	1000hrs	150°C	3	76-77	0/230	2	30 - 50	0/80
Temperature Cycle Test (TCB)	1000X	-55°C /125°C	5	77-82	0/393	3	76-77	0/230
Highly Accelerated Stress Test (HAST)	96hrs	130°C / 85%RH with bias	3	75-83	0/253	3	76-77	0/230
Unbiased Highly Accelerated Stress Test (uHAST)	96hrs	130°C / 85%RH	4	76-82	0/312	3	76-77	0/230

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

Vehicle Devices:

Qualification vehicles were selected to represent various die and package combinations, to identify the largest die or package, or largest die-to-package ratio.

Table 5

Assembly Site	Package	Product Family	Device
AMKOR, Korea	FBGA - 484	Cyclone III	EP3CLS200T60
	FBGA – 400	Cyclone	EP1C20Y13
	UBGA – 88	Configuration	EPC16FS35
	PBGA - 672	Stratix®	EP1S25T13/Y13
ASEM, Malaysia	FBGA – 256	MAX II	EPM2210T18

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
05/26/2017	1.0.0	Initial Release
09/27/2017	1.1.0	Qualification Data Update

Appendix 1. Affected Ordering Part Numbers (OPNs)

Affected OPNs
EPM2210F324A5N
EPM570F100A5N
EPM570F100A5NGA
EPM570F100A5NBR
EPM1270F256A5N
EPM2210F256A5
EPM2210F256A5GA
EPM2210F256A5N
EPM2210F256A5NGA
EP3C25U256A7N
EP3C25U256A7NGA
EP3C10U256A7N
EP3C5U256A7N
EP3C16U256A7N
EP3C40F324A7N
EP3C25F324A7AA
EP3C25F324A7N
EP3C25F324A7NGA
EP3C25F324A7NGB
EP3C10F256A7N
EP3C5F256A7N
EP3C25F256A7N
EP3C25F256A7NGA
EP3C25F256A7NGB
EP3C25F256A7NAB
EP3C16F256A7N