

# PROCESS CHANGE NOTIFICATION

## PCN1604

Material Change for Cyclone<sup>®</sup> III, Cyclone IV GX, Cyclone IV E  
Products in BGA Package

### Change Description:

This notification is to announce a change in the Bill of Material (BOM) for Cyclone III, Cyclone IV GX, Cyclone IV E products in BGA packages.

**Table 1:**

Material	Change From	Change To
Epoxy Molding Compound (EMC)	Nitto GE100 series	Sumitomo G750 series
Bond Wire	Bare Copper Wire	Palladium-Coated Copper (PCC) Wire

Note: The rest of the BOM remain the same.

Sumitomo G750 molding compound and PCC bond wire materials are both established and widely used in the industry. These materials are also qualified and already used in other Altera products.

### Recommended Action

Customers are requested to:

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

Please refer to “Product Transition Dates” for key milestones.

Upon implementation, Altera may still 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 2**

<b>Milestone</b>	<b>Date</b>
Last date to acknowledge receipt of this notification <sup>1</sup>	August 29, 2016
Estimated earliest shipment date of changed products (change implementation) <sup>2</sup>	December 30, 2016

Note 1: JESD46D stipulates that a change is deemed acceptable if no response or acknowledgement is received within 30 days from the date of the notification.

Note 2: Effective the first ship date listed in Table 2, Altera will begin the shipment of changed products.

Altera reserves the right to continue the shipment of pre-change product after the change implementation date, and customers will receive shipments of either pre-conversion or changed product.

## Reason for Change:

The change is due to process standardization and continuous process improvement. The combination of the G750 series epoxy molding compound and the PCC wire is already widely used in other products, with excellent process and field performance.

## Impact and Benefit of Change:

The change does not affect the form, fit, and function of the product. There is no impact to the electrical and mechanical specifications. The change has been successfully evaluated to meet or exceed the quality and reliability requirements. (See Qualification Data, Table 3 below).

## Products Affected:

Product Family: Cyclone III, Cyclone IV GX, Cyclone IV E  
Package: FBGA – 169/256/324, MBGA- 164, and UBGA-256, 484

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

## Method to Identify Change Product:

It is important to note that pre-change and post-change products are considered as interchangeable parts / alternates. The shipment of pre-change products may continue until inventory is depleted, and customers may receive shipments of either pre-change or post-change products.

## Qualification Data:

Table 3

Test	Conditions	# of Lots	Sample Size (SS) / Lot	Results (Fail / Total SS)
UFAST	85% RH, 130C 96 hours	4	25 – 45 units	0/150
THB	85% RH, 85C. Vcc, max 1000 hours	4	25 – 45 units	0/118
TCB	-55 C / +125 C 1000 cycles	4	25 – 45 units	0/150
High Temperature Storage	150C 1000 hours	3	25 – 45 units	0/90

## Vehicle Devices:

Cyclone III, IV, V  
FBGA – 780/896 pins

## Contact

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

## Customer Notifications Subscription

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

If you would like to receive automatic customer notifications by email, please subscribe to our customer notification mailing list at:

<https://www.altera.com/subscriptions/email/signup/eml-index.jsp>

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*Altera references JESD46 guidelines for PCN.*

*In accordance with JESD46D, this change is deemed acceptable to the customer if no acknowledgement is received within 30 days from this notification.*

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## Revision History

Date	Rev	Description
07/15/2016	1.0.0	Initial Release

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## Appendix 1 Affected Ordering Part Numbers (OPNs)

<b>Cyclone III</b>			
EP3C10M164C7N	EP3C16U484C6	EP3C25F324C8NSZ	EP3C40U484I7NSZ
EP3C10M164C8N	EP3C16U484C6N	EP3C25F324I7	EP3C55U484C6
EP3C10M164I7N	EP3C16U484C6NSZ	EP3C25F324I7N	EP3C55U484C6N
EP3C10U256C6	EP3C16U484C7	EP3C25U256C6	EP3C55U484C7
EP3C10U256C6N	EP3C16U484C7N	EP3C25U256C6N	EP3C55U484C7N
EP3C10U256C7	EP3C16U484C8	EP3C25U256C7	EP3C55U484C8
EP3C10U256C7N	EP3C16U484C8N	EP3C25U256C7N	EP3C55U484C8N
EP3C10U256C8	EP3C16U484I7	EP3C25U256C8	EP3C55U484I7
EP3C10U256C8N	EP3C16U484I7N	EP3C25U256C8N	EP3C55U484I7N
EP3C10U256I7	EP3C16U484I7NSZ	EP3C25U256I7	EP3C5M164C7N
EP3C10U256I7N	EP3C25F256C6	EP3C25U256I7N	EP3C5M164C8N
EP3C16F256C6	EP3C25F256C6N	EP3C40F324C6	EP3C5M164I7
EP3C16F256C6N	EP3C25F256C7	EP3C40F324C6N	EP3C5M164I7N
EP3C16F256C7	EP3C25F256C7N	EP3C40F324C6NSZ	EP3C5U256C6
EP3C16F256C7N	EP3C25F256C7NGA	EP3C40F324C7	EP3C5U256C6N
EP3C16F256C8	EP3C25F256C7NGB	EP3C40F324C7N	EP3C5U256C7
EP3C16F256C8N	EP3C25F256C8	EP3C40F324C8	EP3C5U256C7N
EP3C16F256I7	EP3C25F256C8N	EP3C40F324C8N	EP3C5U256C8
EP3C16F256I7N	EP3C25F256C8NSZ	EP3C40F324I7	EP3C5U256C8N
EP3C16M164C7N	EP3C25F256C8SZ	EP3C40F324I7GA	EP3C5U256I7
EP3C16M164C8N	EP3C25F256I7	EP3C40F324I7N	EP3C5U256I7N
EP3C16M164I7N	EP3C25F256I7N	EP3C40F324I7NSZ	EP3C80U484C6
EP3C16U256C6	EP3C25F256I7NGA	EP3C40U484C6	EP3C80U484C6N
EP3C16U256C6N	EP3C25F256I7NGB	EP3C40U484C6N	EP3C80U484C7
EP3C16U256C7	EP3C25F324C6	EP3C40U484C7	EP3C80U484C7N
EP3C16U256C7N	EP3C25F324C6N	EP3C40U484C7N	EP3C80U484C8
EP3C16U256C8	EP3C25F324C7	EP3C40U484C8	EP3C80U484C8N
EP3C16U256C8N	EP3C25F324C7N	EP3C40U484C8N	EP3C80U484I7
EP3C16U256I7	EP3C25F324C8	EP3C40U484I7	EP3C80U484I7N
EP3C16U256I7N	EP3C25F324C8N	EP3C40U484I7N	

**Appendix 1 (con't)**  
**Affected Ordering Part Numbers (OPNs)**

<b>Cyclone IV E</b>			
EP4CE10U14I7N	EP4CE15F17I7	EP4CE22F17C7	EP4CE22F17I8LN
EP4CE15F17C6	EP4CE15F17I7N	EP4CE22F17C7N	EP4CE22U14I7N
EP4CE15F17C6N	EP4CE15F17I8L	EP4CE22F17C8	EP4CE40U19I7
EP4CE15F17C7	EP4CE15F17I8LN	EP4CE22F17C8L	EP4CE40U19I7N
EP4CE15F17C7N	EP4CE15M8I7N	EP4CE22F17C8LN	EP4CE55U19I7N
EP4CE15F17C8	EP4CE15M8I7NGA	EP4CE22F17C8N	EP4CE6U14I7N
EP4CE15F17C8L	EP4CE15U14I7N	EP4CE22F17C9L	EP4CE6U14I7NAA
EP4CE15F17C8LN	EP4CE15U19C9LN	EP4CE22F17C9LN	EP4CE75U19I7N
EP4CE15F17C8N	EP4CE15U19C9LNGA	EP4CE22F17I7	EP4CEF17I7NGA
EP4CE15F17C9L	EP4CE22F17C6	EP4CE22F17I7N	EP4CEU19I7NGB
EP4CE15F17C9LN	EP4CE22F17C6N	EP4CE22F17I8L	

<b>Cyclone IV GX</b>			
EP4CGX15BF14C6	EP4CGX22BF14C7	EP4CGX22CF19C8	EP4CGX30BF14I7
EP4CGX15BF14C6N	EP4CGX22BF14C7N	EP4CGX22CF19C8N	EP4CGX30BF14I7N
EP4CGX15BF14C7	EP4CGX22BF14C8	EP4CGX22CF19I7	EP4CGX30CF19C6
EP4CGX15BF14C7N	EP4CGX22BF14C8N	EP4CGX22CF19I7N	EP4CGX30CF19C6N
EP4CGX15BF14C8	EP4CGX22BF14I7	EP4CGX30BF14C6	EP4CGX30CF19C7
EP4CGX15BF14C8N	EP4CGX22BF14I7N	EP4CGX30BF14C6N	EP4CGX30CF19C7N
EP4CGX15BF14I7	EP4CGX22CF19C6	EP4CGX30BF14C7	EP4CGX30CF19C8
EP4CGX15BF14I7N	EP4CGX22CF19C6N	EP4CGX30BF14C7N	EP4CGX30CF19C8N
EP4CGX22BF14C6	EP4CGX22CF19C7	EP4CGX30BF14C8	EP4CGX30CF19I7
EP4CGX22BF14C6N	EP4CGX22CF19C7N	EP4CGX30BF14C8N	EP4CGX30CF19I7N