

## CUSTOMER ADVISORY

### ADV1301

## ADDITIONAL DIMPLES ON PBGA PACKAGE TOP SURFACE

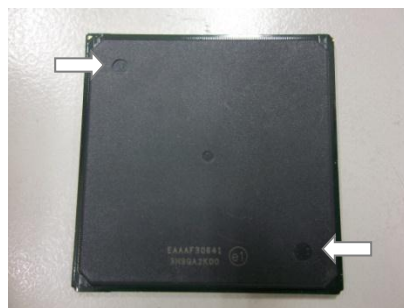
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### Change Description

Altera® announces a minor change to the form of Cyclone® V products offered in U672 and F1152 (PBGA) packages. Effective immediately, the top surface of the packages may carry additional dimples. The dimples (0.1mm maximum depth) are merely a visual characteristic, and sourcing of material with dimples facilitates manufacturing volume optimization between qualified suppliers.

Thermal impedance ( $\theta_{ja}$  and  $\theta_{jc}$ ) values, package warpage characteristics and heat sink mounting procedures should remain unchanged. Note, there is no impact anticipated or changes required to customers' pick and place equipment or processes. In the representative image in figure 1, the white arrows indicate the location of the dimples.

**Figure 1. Representative image of additional dimples on package top surface**



### Recommended Action

No action is recommended as a result of this change.

### Reason for Change

Altera is implementing this change to facilitate a multi-source supply chain model. This strengthens supply-chain risk-mitigation by establishing the capability to produce equivalent product from multiple qualified locations.

## Products Affected

The product lines affected are listed in Table 1. Appendix 1 contains a list of the current ordering codes.

**Table 1: Affected Product Lines**

Product Family	Product Line	Pin Count	Package
Cyclone® V	5CGXC9	1152	F1152
	5CSXFC6	672	U672
	5CSXFC4	672	U672

This change will take effect immediately.

## Contact

For more information, please contact Altera Technical Support by submitting a Service Request at Altera's [mySupport](#) website.

## Customer Notifications Subscription

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

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

## Revision History

Date	Rev	Description
03/07/2013	1.0.0	Initial Release

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## Appendix 1: Affected Ordering Part Numbers

**Cyclone<sup>®</sup> V**

5CGTFD9E5F35C7N	5CSEBA2U19C7S-N	5CSEBA5U19C7-N	5CSEMA6F31I7-N
5CGTFD9E5F35I7N	5CSEBA2U19C8S-N	5CSEBA5U19C8-N	5CSEMA6F31A7-N
5CGXBC9E6F35C7N	5CSEBA2U19I7S-N	5CSEBA5U19I7-N	5CSXFC2C6U23C6-N
5CGXBC9E7F35C8N	5CSEBA2U19C6-N	5CSEBA5U19A7-N	5CSXFC2C6U23C7-N
5CGXFC9E6F35C7N	5CSEBA2U19C7-N	5CSEBA5U23C7S-N	5CSXFC2C6U23C8-N
5CGXFC9E6F35I7	5CSEBA2U19C8-N	5CSEBA5U23C8S-N	5CSXFC2C6U23I7-N
5CGXFC9E6F35I7N	5CSEBA2U19I7-N	5CSEBA5U23I7S-N	5CSXFC2C6U23A7-N
5CGXFC9E7F35C8N	5CSEBA2U19A7-N	5CSEBA5U23C6-N	5CSXFC4C6U23C6-N
5CSEBA5U23A7N	5CSEBA2U23C7S-N	5CSEBA5U23C7-N	5CSXFC4C6U23C7-N
5CSEBA5U23C6N	5CSEBA2U23C8S-N	5CSEBA5U23C8-N	5CSXFC4C6U23C8-N
5CSEBA5U23C7N	5CSEBA2U23I7S-N	5CSEBA5U23I7-N	5CSXFC4C6U23I7-N
5CSEBA5U23C7SN	5CSEBA2U23C6-N	5CSEBA5U23A7-N	5CSXFC4C6U23A7-N
5CSEBA5U23C8N	5CSEBA2U23C7-N	5CSEMA5U23C6-N	5CSXFC5C6U23C6-N
5CSEBA5U23C8SN	5CSEBA2U23C8-N	5CSEMA5U23C7-N	5CSXFC5C6U23C7-N
5CSEBA5U23I7N	5CSEBA2U23I7-N	5CSEMA5U23C8-N	5CSXFC5C6U23C8-N
5CSEBA5U23I7SN	5CSEBA2U23A7-N	5CSEMA5U23I7-N	5CSXFC5C6U23I7-N
5CSEBA6U23A7N	5CSEMA2U23C6-N	5CSEMA5U23A7-N	5CSXFC5C6U23A7-N
5CSEBA6U23C6N	5CSEMA2U23C7-N	5CSEMA5F31C6-N	5CSXFC5D6F31C6-N
5CSEBA6U23C7N	5CSEMA2U23C8-N	5CSEMA5F31C7-N	5CSXFC5D6F31C7-N
5CSEBA6U23C7SN	5CSEMA2U23I7-N	5CSEMA5F31C8-N	5CSXFC5D6F31C8-N
5CSEBA6U23C8N	5CSEMA2U23A7-N	5CSEMA5F31I7-N	5CSXFC5D6F31C8-N
5CSEBA6U23C8SN	5CSEBA4U19C7S-N	5CSEMA5F31A7-N	5CSXFC5D6F31I7-N
5CSEBA6U23I7N	5CSEBA4U19C8S-N	5CSEBA6U19C7S-N	5CSXFC6C6U23C6-N
5CSEBA6U23I7SN	5CSEBA4U19I7S-N	5CSEBA6U19C8S-N	5CSXFC6C6U23C7-N
5CSEMA5U23A7N	5CSEBA4U19C6-N	5CSEBA6U19I7S-N	5CSXFC6C6U23C8-N
5CSEMA5U23C6N	5CSEBA4U19C7-N	5CSEBA6U19C6-N	5CSXFC6C6U23I7-N
5CSEMA5U23C7N	5CSEBA4U19C8-N	5CSEBA6U19C7-N	5CSXFC6C6U23A7-N
5CSEMA5U23C8N	5CSEBA4U19I7-N	5CSEBA6U19C8-N	5CSXFC6D6F31C6-N
5CSEMA5U23I7N	5CSEBA4U19A7-N	5CSEBA6U19I7-N	5CSXFC6D6F31C7-N
5CSEMA6U23A7N	5CSEBA4U23C7S-N	5CSEBA6U19A7-N	5CSXFC6D6F31I7-N
5CSEMA6U23C6N	5CSEBA4U23C8S-N	5CSEBA6U23C7S-N	5CSTFD5D5F31I7-N
5CSEMA6U23C7N	5CSEBA4U23I7S-N	5CSEBA6U23C8S-N	5CSTFD6D5F31I7-N
5CSEMA6U23C8N	5CSEBA4U23C6-N	5CSEBA6U23I7S-N	5CSXFC6C6U23C7N
5CSEMA6U23I7N	5CSEBA4U23C7-N	5CSEBA6U23C6-N	5CSXFC6C6U23C8N
5CSXFC5C6U23A7N	5CSEBA4U23C8-N	5CSEBA6U23C7-N	5CSXFC6C6U23I7N
5CSXFC5C6U23C6N	5CSEBA4U23I7-N	5CSEBA6U23C8-N	5CSXFC6C6U23C6N
5CSXFC5C6U23C7N	5CSEBA4U23A7-N	5CSEBA6U23I7-N	5CSEMA4U23I7-N
5CSXFC5C6U23C8N	5CSEMA4U23C6-N	5CSEBA6U23A7-N	5CSEMA4U23A7-N
5CSXFC5C6U23I7N	5CSEMA4U23C7-N	5CSEMA6U23C6-N	5CSEBA5U19C7S-N
5CSXFC6C6U23A7N	5CSEMA4U23C8-N	5CSEMA6F31C8-N	5CSEBA5U19C8S-N

## Appendix 1: Affected Ordering Part Numbers (continued)

### *Cyclone<sup>®</sup> V*

5CSEBA5U19I7S-N	5CSEMA6F31C6-N
5CSEBA5U19C6-N	5CSEMA6F31C7-N
5CSEMA6U23C7-N	
5CSEMA6U23C8-N	
5CSEMA6U23I7-N	
5CSEMA6U23A7-N	