

PROCESS CHANGE NOTIFICATION

PCN1106

ADDITIONAL BILL OF MATERIALS AND SUPPLIERS FOR ALTERA'S FLIP CHIP AND WIREBOND BGA PACKAGES

Change Description

This is an update to PCN1106; please see the revision history table for information specific to this update.

Altera introduced additional packaging materials and suppliers for selected flip chip and wirebond BGA packages. The affected product families are listed in Tables 1 and 2.

Recommended Action

Customers should review Altera's qualification data (Table 3). Altera's existing internal qualification process for adding second sources will ensure the devices meet or exceed Altera's Quality and Reliability requirements. This change does not affect the form, fit or function as defined in the product data sheets and is backwards compatible with existing devices.

Reason for Change

With the recent events in Japan, a comprehensive assessment was performed with Altera supply-chain partners in order to better understand the broader scope with respect to business and operations. In an attempt to mitigate any potential long term impact to supply continuity, Altera has proactively identified alternative suppliers and bill of materials to improve upon its current sources.

Altera already utilizes multiple sources in order to support its supply-chain risk-mitigation strategy. Altera has established the capability to produce equivalent product from various qualified material sets and manufacturing locations.

Products Affected

The product families affected by this change are listed in the tables below. For inquiries on specific part numbers, submit requests per the "Contact" section below.

Table 1: Affected Product Families, Flip Chip BGA Packages

Affected Product Families	Current Substrate Core Supplier	Additional Substrate Core Supplier	Estimated Earliest Availability
Stratix® / GX Stratix II / GX Stratix III ⁽²⁾ Arria® GX APEX™ 20K / E / C APEX II Excalibur™ HardCopy® APEX HardCopy Stratix HardCopy II / III / IV GX Mercury™	Mitsubishi	Hitachi ⁽¹⁾	July 2011

Notes:

1. The Stratix IV and Arria II GX families (and associated flip chip packages) are not affected by the substrate core change. These products were released for volume shipments (in 2010), based on full qualification using Hitachi core substrates.
2. Selected Stratix III devices are not affected by the substrate core change. These products were released for volume shipments, based on full qualification using Hitachi core substrates. The following Stratix III product lines (EP3SE260, EP3SL50, EP3SL70, EP3SL110, EP3SL150, EP3SL200 and EP3SL340) will add Hitachi as an additional supplier.

Table 2: Affected Product Families, Wirebond BGA Packages

Affected Product Families	Current Substrate Core Supplier	Additional Substrate Core Supplier	Estimated Earliest Availability
ACEX® 1K APEX 20K / E / C Configuration (EPC16) Cyclone® / III / LS ⁽¹⁾ Cyclone IV / GX ⁽¹⁾ Excalibur FLEX® 6000 / A FLEX 8000 FLEX 10K / A / E HardCopy Stratix HardCopy II / III MAX® 7000 / A / B MAX 9000 MAX 3000A MAX V Stratix	Mitsubishi	Hitachi	Aug 2011

Notes:

1. Altera will also be utilizing Kinsus and UMTC as 2nd source substrate suppliers.

Product Traceability and Transition Dates

The earliest availability of product shipments using the additional core substrates are expected to occur in July 2011. Customers may receive affected devices with a date code marking of 1125; refer to Figure 1.

The top side marking can also be used to identify the additional material set. A datecode marking with the letter “T” as the last character represents the new bill of materials; refer to Figure 1.

Figure 1: Date Marking

Altera Date-code Marking Format

A XβZαα1125T

Qualification Data

Altera performed the appropriate reliability evaluations in order to ensure the products meet or exceed the Quality and Reliability requirements. Hitachi is already an industry qualified substrate core supplier. Qualification data is available per the plan in Table 3.

Table 3: Qualification Plan

Affected Devices	Substrate Core Supplier	Supplier Qualification Data	Conditional Qualification Data	Final Qualification Data
Flip Chip Devices	Hitachi	<i>Done, Note 1</i>		
Wire Bond Devices	Hitachi	<i>Done, Note 2</i>	<i>Done, Note 3</i>	<i>Done, Note 3</i>

Notes:

1 - Data collected on existing Altera Arria II and Stratix IV products (qualified to use Hitachi substrates) are shown in Tables 4a and 4b.

2 - Initial data provided by Altera assembly suppliers on the BGA wirebond products are shown in Table 5.

3- Data collected on the EP3C120F780 meets Altera’s quality and reliability requirements and is shown in Table 6. Due to significant improvements in the Mitsubishi core supply availability, Doosan material will no longer be pursued.

Table 4a: Arria II GX Device Qualification Data (flip chip BGA package, Hitachi core substrate)

TEMPERATURE-CYCLING (CONDITION B) (-55°C to 125°C)			
Products	Package	Readout	Results
EP2AGX65	U358	1000 cyc	0/29
EP2AGX65	U358	1000 cyc	0/77
EP2AGX65	M1019	1000 cyc	0/76
EP2AGX125	F1152	1000 cyc	0/27
EP2AGX260	F1152	1000 cyc	0/30
EP2AGX125	F780	1000 cyc	0/25
EP2AGX260	F1152	1000 cyc	0/25
BIASED HUMIDITY TESTING (85°C / 85% RH)			
Device	Package	Readout	Results
EP2AGX65	U358	1000 hrs	0/50
EP2AGX65	U358	1000 hrs	0/30
EP2AGX65	U358	1000 hrs	0/30
EP2AGX125	F1152	1000 hrs	0/26
EP2AGX260	F1152	1000 hrs	0/30
EP2AGX260	F1152	1000 hrs	0/24
UNBIASED-HAST TESTING (130°C / 85% RH)			
Device	Package	Readout	Results
EP2AGX65	U358	96 hrs	0/29
EP2AGX65	M1019	96 hrs	0/50
EP2AGX65	M1019	96 hrs	0/100
EP2AGX125	F1152	96 hrs	0/27
EP2AGX260	F1152	96 hrs	0/30
EP2AGX260	F1152	96 hrs	0/25

Table 4b: Stratix IV Device Qualification Data (flip chip BGA package, Hitachi core substrate)

TEMPERATURE-CYCLING (CONDITION B) (-55°C to 125°C)			
Device	Package	Readout	Results
EP4SGX230	F1152	1000 cyc	0/11
EP4SGX230	F1517	1000 cyc	0/18
EP4SGX530	F1517	1000 cyc	0/30
EP4SGX230	F1517	1000 cyc	0/22
EP4SGX530	F1517	1000 cyc	0/87
EP4SGX230	F1517	1000 cyc	0/43
EP4SGX230	F1517	1000 cyc	0/25
EP4SGX230	F1517	1000 cyc	0/25
EP4SGX230	F1517	1000 cyc	0/25
BIASED HUMIDITY TESTING (85°C / 85% RH)			
Device	Package	Readout	Results
EP4SGX230	F1517	1000 hrs	0/12
EP4SGX230	F1517	1000 hrs	0/30
EP4SGX230	F1517	1000 hrs	0/25
EP4SGX230	F1517	1000 hrs	0/25
EP4SGX230	F1517	1000 hrs	0/25
UNBIASED-HAST TESTING (130°C / 85% RH)			
Device	Package	Readout	Results
EP4SGX530	F1517	96 hrs	0/29
EP4SGX230	F1517	96 hrs	0/25
EP4SGX530	F1517	96 hrs	0/87
EP4SGX230	F1517	96 hrs	0/40
EP4SGX230	F1517	96 hrs	0/25
EP4SGX230	F1517	96 hrs	0/25
EP4SGX230	F1517	96 hrs	0/25

Table 5: Initial qualification data provided by Altera’s assembly suppliers on the BGA wirebond package assembled using Hitachi core substrate.

TEMPERATURE-CYCLING (CONDITION B) (-55°C to 125°C)			
Substrate Core	Package	Readout	Results
Hitachi	F388	1000 cyc	0/228
Hitachi	F839	1000 cyc	0/77
UNBIASED-HAST TESTING (130°C / 85% RH)			
Substrate Core	Package	Readout	Results
Hitachi	F388	96 hrs	0/45
Hitachi	F839	96 hrs	0/77

Table 6: Altera’s product qualification data taken on the BGA wirebond package assembled using Hitachi core substrates.

TEMPERATURE-CYCLING (CONDITION B) (-55°C to 125°C)				
Substrate Core	Device	Package	Readout	Results
Hitachi	EP3C120	F780	1000 cyc	0/25
BIASED HUMIDITY TESTING (85°C / 85% RH)				
Substrate Core	Device	Package	Readout	Results
Hitachi	EP3C120	F780	500 hrs	0/25
UNBIASED-HAST TESTING (130°C / 85% RH)				
Substrate Core	Device	Package	Readout	Results
Hitachi	EP3C120	F780	96 hrs	0/25

Contact

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

Customer Notifications Subscription

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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
04/04/2011	1.0.0	Initial Release
05/31/2011	1.1.0	Updated affected product list in note 2 of Table 1 Updated qualification data schedule in Table 3
10/05/2011	1.2.0	Updated qual data in Table 6, removed Max II and Cyclone II devices, removed Doosan core as a 2 nd source supplier, specify UMTC and Kinsus as dual source substrate suppliers

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