

PROCESS CHANGE NOTIFICATION

(Advance Notification)

PCN1512

Solder Paste (Inductor Attach) Change for Power Products in QFN Package

Change Description:

Altera® announces an upcoming change to the Bill of Materials (BOM), specifically the Solder paste, for the following:

Package: QFN
Product Family: All Power Products

See complete list of part numbers (OPNs) in [Appendix 1](#).

Table 1: Package BOM Change

Material	Change From	Change To
Solder paste (Inductor attach)	Sn95/Sb5	SAC 305

SAC 305 is a widely used, industry standard, Antimony (Sb)-free solder paste.

The rest of the BOM (die, inductor, leadframe, die attach adhesive, wirebond, mold compound and lead finish) remain the same.

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Recommended Action:

Customers are requested to:

1. Acknowledge receipt of this notification.
2. Review the change details and provide feedback to Altera on the acceptance of the change or of any additional requirements to facilitate the customer's evaluation and approval of this change.

Key milestones are listed in the "[Product Transition Dates](#)" Section: Table 2 for reference.

Reason for Change:

The existing solder is Indium Corp NC-SMQ51 material containing Antimony (Sb) that falls under the restricted material list for many customers.

Changing to the SAC305 solder paste will enable compliance to the Antimony restriction, as well as standardization of the material set to a widely used, industry standard type of solder paste.

Impact and Benefit of Change:

This change enables compliance and readiness to customer trend of Antimony-free BOM. There is also the benefit of process standardization by adopting industry standard solder paste SAC305. The current SnSb paste is a non-standard solder paste (NC-SMQ®51SC).

There is no adverse impact to the product electrical and mechanical specification, device performance, and functionality.

Qualification will be performed to ensure that product quality and reliability continue to meet or exceed Altera and Industry requirements.

Products Affected:

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

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Means to Identify Changed Product:

Pre- and post-change products are deemed interchangeable. The product marking and identification will remain the same for both pre and post change products. However, traceability to identify the changed products will be available, and there will be no mixing of pre- and post-change products in the same lot.

Shipment of pre-change products will continue until inventory is depleted.

For customers requiring Antimony-free compliance, the team will review and arrange to set up an exception, and to apply appropriate controls for ensuring correct shipment of changed products.

Product Transition Dates:

Customers are requested to take note of the key dates shown in Table 2.

Table 2: Product Transition Dates

<i>Milestone</i>	<i>Date</i>
Request for customer acknowledgement that the notification was received ¹	Before January 21, 2016
Updated Process Change Notification (PCN) document with the final qualification data	March 31, 2016
Estimated 1 st ship date for the changed products (i.e., date the shipment of new product will start) ²	April, 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 this notification.

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

Earlier shipments of changed products may be exercised as exceptions and with approval from the customer.

Pre- and post-change products are deemed interchangeable.

Altera reserves the right to continue the shipment of pre-change product after the change implementation date until inventory is depleted. Customers without agreed restrictions or exceptions may receive shipments of either pre- or post- change products.

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Qualification Data:

Qualification testing is performed to ensure that the changed product meets or exceeds Altera's quality and reliability requirements.

Table 3: Initial Qualification Data

Vehicle Device: EP53A7HQI (16 QFN, 3x3x1.1mm)

Test	JEDEC Standard and Conditions	Read points	# of Lots	Sample Size / lot	Results (Fail /SS)	Comments
HAST with Pre-conditioning	85% RH, 110C temp @ Vcc max JESD22-A110	264 hrs	1	25	0/25	PASS
Temperature Cycle With Pre-conditioning	-55C to +125C Condition B, Soak Mode 4 JESD22-A104	500 cycles	1	25	0/25	PASS
		700 cycles	1	25	0/25	PASS
		1000 cycles	1	25	0/25	PASS
uHAST	85% RH, 110C temp JESD22-A110	264 hrs	1	25	0/25	PASS

Additional Qualification Test Plan

- Six (6) lots from four (4) different devices will be sampled for additional qualification testing.
- The vehicle devices were selected through similarity and complexity analysis to identify the optimum combination of devices to represent all the Power products in QFN package.
- Test vehicle devices:
 - EN2342QI , 68 Pin, 8x11x3mm QFN (1 lot)
 - EN6337QI , 38 Pin, 4x7x1.85mm QFN (2 lots)
 - EN63A0QI, 76 Pin, 10x11x3mm QFN (2 lots)
 - EP53A7HQI, 16 Pin, 3x3x1.1mm QFN (1 lot)
- See Table 4 below for the details of the additional qualification test plan.

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Table 4: Additional Qualification Tests

Test	JEDEC Standard and Conditions	Read points	# of Lots	Sample Size / lot	Results (Fail /SS)	Comments
HAST with Pre-conditioning	85% RH, 110C temp @ Vcc max JESD22-A110	264 hrs	6	25	(for update) /150	Target completion on March 31, 2016
Temperature Cycle With Pre-conditioning	-55C to +125C Condition B, Soak Mode 4 JESD22-A104	500 cycles	6	25	(for update) /150	
		700 cycles	6	25	(for update) /150	
		1000 cycles	6	25	(for update) /150	
uHAST	85% RH, 110C temp JESD22-A110	264 hrs	6	25	(for update) /150	

Contact:

For more information, please contact the Altera Sales or Customer Quality Engineering (CQE) in your region, or submit 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 customer notifications by email, please subscribe to our customer notification mailing list at: <https://www.altera.com/subscriptions/email/signup/eml-index.jsp>

Altera references JESD46 guidelines for PCN. In accordance with JESD46D, the change is deemed acceptable to the customer if no acknowledgement is received within 30 days from the notification date.

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Revision History:

Date	Rev	Description
12/15/2015	1.0.0	Initial Release. Advance Notification.

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Appendix 1: Affected Ordering Part Numbers

Affected OPNs	
EN2340QI	EN6337QI
EN2342QI	EN6347QI
EN2360QI	EN6360QI
EN2390QI	EN63A0QI
EN2392QI	EP5348UI
EN23F0QI	EP5352QI
EN23F2QI	EP5357HUI
EN5311QI	EP5357LUI
EN5312QI	EP5358HUI
EN5319QI	EP5358LUI
EN5322QI	EP5362QI
EN5329QI	EP5368QI
EN5335QI	EP5382QI
EN5336QI	EP5387HQI
EN5337QI	EP5387LQI
EN5339QI	EP5388QI
EN5364QI	EP53A7HQI
EN5365QI	EP53A7LQI
EN5366QI	EP53A8HQI
EN5367QI	EP53A8LQI
EN5394QI	EP53F8QI
EN5395QI	EV1340QI
EN5396QI	EV1380QI
EN6310QI	EX3AV

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