



# PRODUCT/PROCESS CHANGE NOTIFICATION

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PCN APM/09/4354  
Notification Date 02/06/2009

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**HITACHI CEL9240HF10 molding compound implementation  
for: PowerSSO-24 and PowerSSO-36 in MUAR(Malaysia).**

**Table 1. Change Implementation Schedule**

Forecasted implementation date for change	30-Mar-2009
Forecasted availability date of samples for customer	30-Jan-2009
Forecasted date for <b>STMicroelectronics</b> change Qualification Plan results availability	30-Jan-2009
Estimated date of changed product first shipment	08-May-2009

**Table 2. Change Identification**

Product Identification (Product Family/Commercial Product)	See attached list
Type of change	Package assembly material change
Reason for change	To Substitute the Henkel GR725AG molding compound , no more in production
Description of the change	The change described in this document is the replacement of the Henkel GR725AG molding compound (by phase-out), with the HITACHI CEL9240HF10, which will be used from wk 19 2009 onwards, in the production of PowerSSO-24/36-lead packages at the Muar plant in Malaysia. This change does not impact the electrical, dimensional and thermal parameters of the products, so the information currently published in the relevant datasheets will remain unchanged. There are also no changes in the packing modes and the standard delivery quantities. All test results required to qualify the HITACHI CEL9240HF10 resin, are included in the attached qualification report that is valid for all the Industrial Power Conversion and Voltage Regulators products concerned
Product Line(s) and/or Part Number(s)	See attached
Description of the Qualification Plan	See attached
Change Product Identification	Eco-grade identification, will be ensured by the Q.A. number.
Manufacturing Location(s)	



## DOCUMENT APPROVAL

Name	Function
Di Stefano, Giuseppe	Division Marketing Manager
Riviera, Antonio	Division Marketing Manager
Gattavari, Giuseppe	Division Product Manager
Naso, Lorenzo	Division Product Manager
Calderoni, Michele	Division Q.A. Manager
Motta, Antonino	Division Q.A. Manager



# **A P M**

## **Analog, Power and MEMS Group**

*HITACHI CEL9240HF10 molding compound implementation for:  
PowerSSO-24 and PowerSSO-36 in MUAR(Malaysia).*



PowerSSO-24



PowerSSO-36

**WHY THIS CHANGE:**

The reason for the change is the need to substitute the Henkel GR725AG molding compound, which will no longer be used in production starting in Q2 2009. Henkel will discontinue production of the GR725AG resin currently used in the manufacture of PowerSSO-24 & 36-lead packages at our Muar (Malaysia) facility.

The product families affected are Industrial Power Conversion and Voltage Regulators, while the commercial products involved are specified (by product family) in the attached list. Any other product manufactured by ST in the PowerSSO-24/36 packages, even if not specifically included or partially mentioned in the attached file, will be impacted by this change.

**WHAT IS THE CHANGE:**

The change described in this document is the replacement of the Henkel GR725AG molding compound (by phase-out), with the HITACHI CEL9240HF10, which will be used from wk 19 2009 onwards, in the production of PowerSSO-24/36-lead packages at the Muar plant in Malaysia.

This change does not impact the electrical, dimensional and thermal parameters of the products, so the information currently published in the relevant datasheets will remain unchanged. There are also no changes in the packing modes and the standard delivery quantities.

All test results required to qualify the HITACHI CEL9240HF10 resin, are included in the attached qualification report that is valid for all the ***Industrial Power Conversion and Voltage Regulators*** products concerned .

**Note:** Introducing the Hitachi CEL9240HF10 at the Muar site for the packages mentioned above will enable ST to deliver parts that are compliant with the recently introduced ECOPACK<sup>®</sup>2 grades, which identify “Halogen-Free” products.

**WHEN WILL THE CHANGE BE IMPLEMENTED:**

**Samples availability:**

**Qualification samples** of the devices produced using the new Hitachi CEL9240HF10 resin at the Muar plant are available upon request. Other samples are available if requested within 30 days of the notification.

**Change implementation schedule:**

Production will start and first shipments will be made according to the schedule below:

Product Family	Production Start	1st Shipments
Industrial Power Conversion and Voltage Regulators	From week <b>14-2009</b>	From week <b>19-2009</b>

Lack of acknowledgement of the PCN within 30 days of the release date will constitute formal acceptance of the change, and 90 days after the release date the change will be fully active at the Muar manufacturing site. In any case, first shipments may start prior to the end of 90 day period, by written agreement with the customer.

**Marking and traceability:**

Unless otherwise stated (i.e., due to customer requirements or other agreement with ST), the traceability of the parts assembled using the Hitachi CEL9240HF10 resin at the Muar site and the relevant Eco-grade identification will be ensured by the date-code number.



Q&R Project Code:

RR000707CT6017

## **QUALITY & RELIABILITY EVALUATION REPORT**

### **New Molding Compound (HALOGEN FREE DEVICES) Qualification RESIN HITACHI CEL 9240HF10 D14mm W7.1g PWSSO24/28/36L E-PAD (Pure Tin) UT57ACH-VP01AA3 MUAR B-END**

#### **Abstract:**

According to ECOPACK 7191395 rev. F

a new Halogen free solution is applied in order to standardize ROHS compliant criteria .(GREEN MATERIAL)

see spec. ref.

**JAPAN : JPCA-ES-01**

**IEC standard :61249-2-21**

**JEDEC JIG 101 :**

In this way a qualification exercise it was done, to qualify the new PSSO24/28/36L E-PAD using as test vehicles

**\*UT57AAA assembled in ST MUAR B-END**

#### **Conclusion:**

**On the basis of the already achieved positive results;IQC/ Workability & testing reports (three different lots + mass production study), Reliability evaluation/Construction Analysis We can issued a full qualification for all the I&PC involved lines/products assembled in PSSO24/28/36L E-PAD ST MUAR B-END**

**Products pass JEDEC LEV.@3 260°C**

Issued by

**Francesco Ventura  
(I&PC QA&R B-END)**

Approved by

**Antonino Motta  
(I&PC /QA&R MNG )**

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## Reliability test conditions and results for **B6EH \*UT57ACH**

Test	Test short description					
	Performed on 3# STD assy lots					
	Method	Conditions	Sample /Lots	Number of lots	Duration	Results Fail/SS
<b>PC</b>	<b>Pre-Conditioning: Moisture sensitivity level 3</b>					
	SAM T=0 & AFTER PRECOND	192h 30°C/60% - 3 reflow PBT 260°C	100	#3		0/300 NO-DELAMINATION
<b>E.S :</b>	<b>Preconditioning JL@3 + Pressure pot</b>					
	Conditions:	2atm	50	#3	168hrs	0/150
<b>E.S :</b>	<b>Preconditioning JL@3 + Thermal Cycle</b>					
	Conditions:	Ta=-50°C/+150°C	50	#3	1000Cy	0/150
<b>HTS</b>	<b>High Temperature Storage</b>					
	No bias	Tamb=150°C	50	#3	1000h	0/150
<b>E.S.:</b>	<b>High Temperature Storage+ Thermal Cycle</b>					
		HTS:no bias,Ta=150°C, T.C.>500Cy,air	100	#1	500h	0/100
<b>H.T.R.B</b>	<b>High Temperature Reverse Bias</b>	Vcc=20V; Vboost=Vcc+6V, V5V=6V Tj=150 °C; 1000hrs	30	#3	1000h	0/90 NO REMARKABLE DRIFT



Device construction note \* **B6EH** \***UT57ACH**

DIE FEATURES		PACKAGE FEATURES	
Die Code	: PUT57ACH	Technical code(PKG)	: EH
Diffusion process	: A1 BCD5/BCD5S REV.D	Package name	: PSSO36L E-PAD
Wafer diameter	: 6"	Assembly site	: ST MUAR (MALAYSIA)
Diffusion site	: CARROLLTON	Leadframe / substrate	: PSSO 36L WIDE MTX OPT.C P/N 5FT 55041 Ag plating
Die size	: 2960 X 2700UM	Die attach	: PREFORM Pb/Ag/Sn 97.5/1.5/1 D.76mm SSD
Die Tick.	: 375 ± 20 µm	Wire Bonding	: 1.2 mils Au
Passivation	: PSG +SION-POLY	Solder balls / plating	: Sn100% (Pure Tin)
Back finishing	: CHROMIUM/NICKEL/GOLD	MOLDING COMPOUND	: HITACHI CEL 9240HF10 D14mm W7.1g (HALOGEN FREE)

**Attachments:**

- Reliability tests description (MANDATORY)
- MBD(Mont & Bond Diagram) for both line/pkg



ATTACHMENT 1: RELIABILITY TEST DESCRIPTION

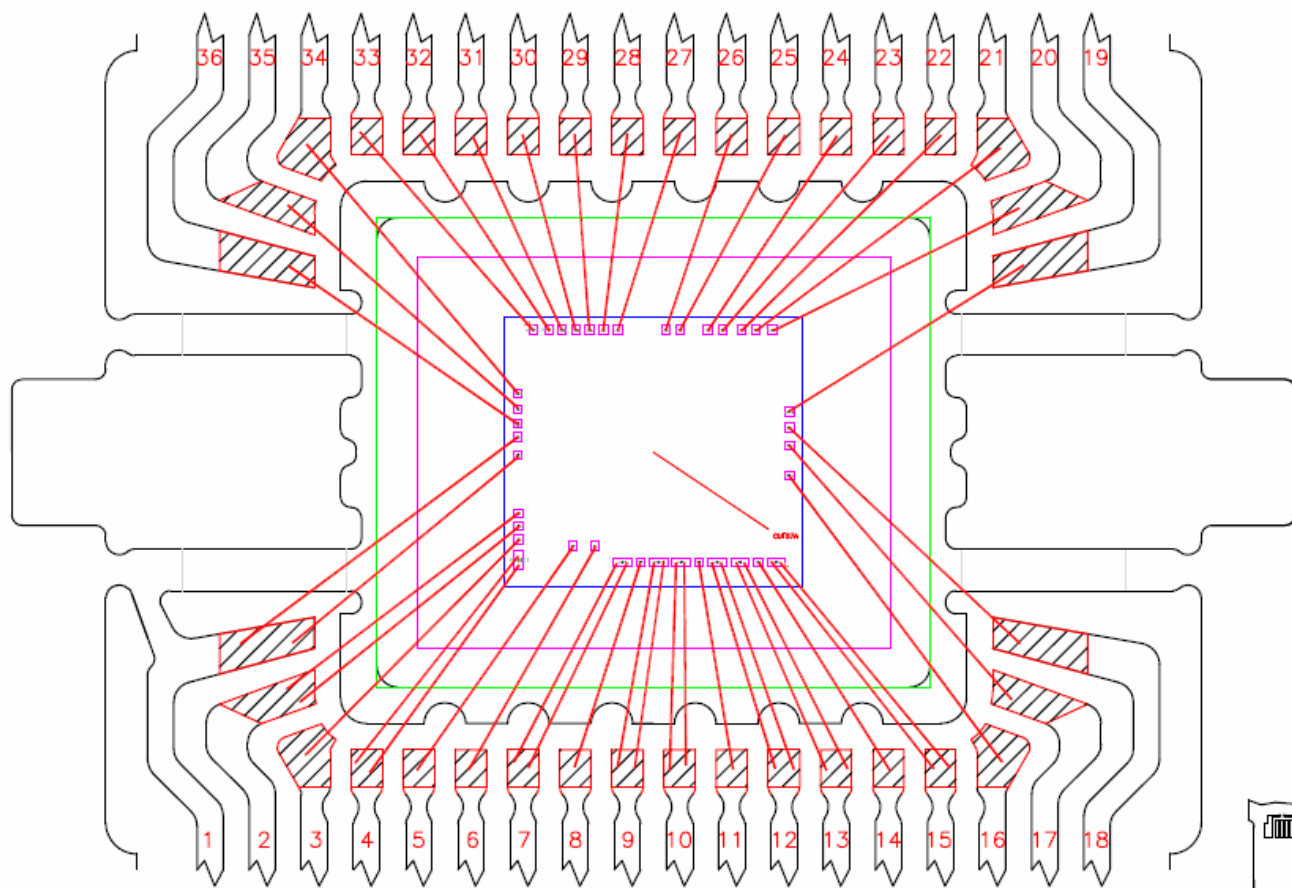
TEST NAME	DESCRIPTION	PURPOSE
<b>JLn:</b> Jedec Level n surface mounting simulation	The device is submitted to a typical temperature profile used for surface mounting, after a controlled moisture absorption.	As stand-alone test: to investigate the level of moisture sensitivity. As preconditioning before other reliability tests: to verify that the surface mounting stress does not impact on the subsequent reliability performance. The typical failure modes are "pop corn" effect and delamination.
<b>TCT:</b> Temperature Cycles Test	The device is submitted to cycled temperature excursions, between a hot and a cold chamber in air atmosphere.	To investigate failure modes related to the thermo-mechanical stress induced by the different thermal expansion of the materials interacting in the die-package system. Typical failure modes are linked to metal displacement, dielectric cracking, moulding compound delamination, wire-bonds failure, die-attach layer degradation.
<b>PPT:</b> Pressure Pot Test	The device is stored in saturated steam, at fixed and controlled conditions of pressure and temperature.	To investigate corrosion phenomena affecting die or package materials, related to chemical contamination and package hermeticity.
<b>HTS:</b> High Temperature Storage	The device is stored in unbiased condition at the max. temperature allowed by the package materials, sometimes higher than the max. operative temperature.	To investigate the failure mechanisms activated by high temperature, typically wire-bonds solder joint ageing, data retention faults, metal stress-voiding.
<b>TST:</b> Thermal Shock Test	The device is submitted to cycled thermal shocks through alternate immersion in a hot and a cold oil bath.	To investigate failure modes related to the thermo-mechanical stress induced by the different thermal expansion of the materials interacting in the die-package system. Typical failure modes are linked to metal displacement, dielectric cracking, moulding compound delamination, wire-bonds failure, die-attach layer degradation.
<b>HTRB:</b> High Temperature Reverse Bias Test	The device is stressed in static configuration, trying to satisfy as much as possible the following conditions: - ) low power dissipation; - ) max. supply voltage compatible with diffusion process and internal circuitry limitations; - ) max. junction temperature.	To maximize the electrical field across either reverse-biased junctions or dielectric layers, in order to investigate the failure modes linked to mobile contamination, oxide ageing, layout sensitivity to surface effects.
<b>THB:</b> Temperature Humidity Bias Test	The device is biased in static configuration minimizing its internal power dissipation, and stored at controlled conditions of ambient temperature and relative humidity.	To investigate failure mechanisms activated in the die-package environment by electrical field and wet conditions. Typical failure mechanisms are electro-chemical corrosion and surface effects related to the moulding compound.



# TITLE : MOUNT AND BOND DIAGRAM FOR B6EH\*UT57AAH

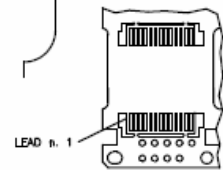
FRAME PAD :  $\frac{177,17 \times 208,67 \text{ mils}}{4,500 \times 5,300 \text{ mm}}$

MAX DIE SIZE :  $\frac{147,17 \times 178,67 \text{ mils}}{3,738 \times 4,538 \text{ mm}}$



SCALE :  $\frac{1 \text{ mm}}{\text{---}}$

E.S.D. PROGRAM IS MANDATORY





**PACKAGE OUTLINE**

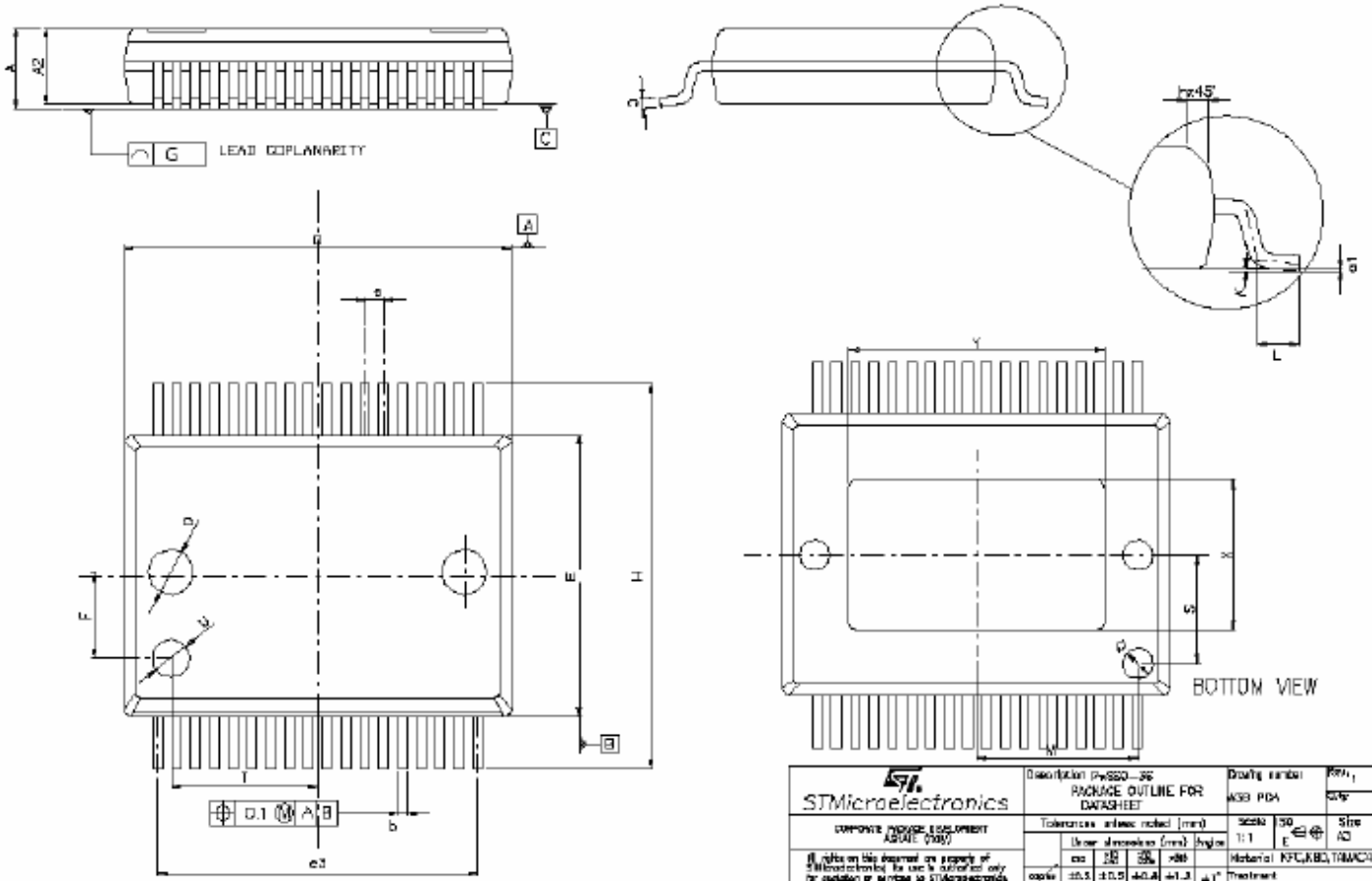
TITLE: PowerSSO-36

PACKAGE CODE: EH



**DIMENSIONS**

Reference Dimension	DATA BOOK mm			DRAWING mm			NOTES
	TYP	MIN	MAX	TYP	MIN	MAX	
A	-	2.15	2.47	-	2.22	2.41	
A2	-	2.15	2.40	2.28	2.23	2.33	
a1	-	0	0.075	-	0.005	0.065	
b	-	0.18	0.36	0.25	0.20	0.30	
c	-	0.23	0.32	-	0.24	0.3	
D	-	10.10	10.50	10.30	10.20	10.40	Note1
E	-	7.4	7.6	7.5	7.45	7.55	Note1
e	0.5	-	-	0.5	0.40	0.60	
e3	8.5	-	-	8.5	-	-	
F	2.3	-	-	2.3	-	-	
G	-	-	0.1	-	-	0.075	
G1	-	-	0.06	-	-	0.04	
H	-	10.1	10.5	10.3	10.22	10.38	
h	-	-	0.4	0.35	-	-	
L	-	0.55	0.85	-	0.6	0.8	
M	4.3	-	-	4.3	-	-	
N	-	-	10 deg	-	-	8 deg	
O	1.2	-	-	1.2	-	-	
Q	0.8	-	-	0.8	-	-	
S	2.9	-	-	2.9	-	-	
T	3.65	-	-	3.65	-	-	
U	1.0	-	-	1.0	-	-	
X	-	4.1	4.7	4.4	4.2	4.6	
Y	-	6.5	7.1	6.8	6.6	7.0	



 <b>STMicroelectronics</b>	Description: PySSO-36 <b>PACKAGE OUTLINE FOR DATASHEET</b>	Drawing number: <b>4333 PDA</b>	Rev: <b>001</b>
	Tolerances unless noted (mm) Drawn: <b>300</b> / <b>300</b> / <b>300</b> / <b>300</b> / <b>300</b> Date: <b>10/10/10</b>	Scale: <b>1:1</b> Material: <b>KFC, KBC, TBMACH</b> Treatment:	Site: <b>AD</b>
Drawn by: <b>D. GONZA</b> / Date: <b>10/10/10</b> Approved by: / Date:	Checked by: <b>E. GONZA</b> / Date: <b>10/10/10</b> Drawn by: <b>D. GONZA</b> / Date: <b>10/10/10</b> Approved by: / Date:		

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