



# PRODUCT/PROCESS CHANGE NOTIFICATION

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PCN APM/08/3839  
Notification Date 07/17/2008

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**IPC & STD LINEAR PRODUCTS assembled in SO14-16L  
packages in ST BOUSKOURA PLANT with MATRIX LEADFRAME IN  
PLACE OF SINGLE LEADFRAME**

**APM - APM**

**Table 1. Change Implementation Schedule**

Forecasted implementation date for change	10-Jul-2008
Forecasted availability date of samples for customer	01-Aug-2008
Forecasted date for <b>STMicroelectronics</b> change Qualification Plan results availability	10-Jul-2008
Estimated date of changed product first shipment	16-Oct-2008

**Table 2. Change Identification**

Product Identification (Product Family/Commercial Product)	as per attachment
Type of change	Package assembly material change
Reason for change	manufacturing rationalization & quality improvement
Description of the change	as per attachment
Product Line(s) and/or Part Number(s)	See attached
Description of the Qualification Plan	See attached
Change Product Identification	by internal finished good codes as per attachment
Manufacturing Location(s)	



## DOCUMENT APPROVAL

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

**IPC & STD LINEAR PRODUCTS**  
assembled in SO14-16L packages in ST BOUSKOURA PLANT  
with MATRIX LEADFRAME IN PLACE OF SINGLE LEADFRAME

### **WHAT:**

Please be informed that for the purpose of expanding our manufacturing capabilities related to the assembly and testing lines for products housed in SO14-16L packages, the single strand leadframe with 94x200um pad size has been replaced by a new matrix leadframe with 94x160um pad size.

### **WHY:**

To rationalize the manufacturing material/equipments/process by using the Matrix Leadframe already in production for the purpose of increasing the capacity..

### **HOW:**

The stand-alone line will work with matrix leadframe.  
This change will not impact the electrical, thermal and dimensional parameters of ST products, maintaining the relevant product datasheets unchanged.  
The table in appendix 1 is providing you the detailed qualification plan that will be used to qualify the affected processes.

### **WHEN:**

The ramp-up and mass production of the new leadframe will be completed by Q3, 2008.

### Qualification program and results availability:

The qualification program mainly consists of comparative electrical characterizations and reliability tests. This qualification program is provided in appendix 1 to this document. The following devices have been used as test vehicles:.

Product Family Code	Product Family Description	Part Number - Test Vehicle
92	Industrial and Power Conv.	TSM102xxx
71	Standard LINEAR	MC33079CD
		TSH74CD

The reliability test report of the qualification program is in attachment.

### **Samples availability:**

Samples of the above test vehicle devices will be available on request starting from Wk 27. Any other sample request will be processed and scheduled by each concerned Product Division upon request.

### Change implementation schedule:

The production start and first shipments will be implemented according to our work in progress and materials availability:

Product Family	Production Start	1st Shipments
Standard Linear IPC	From Week 39-2008	From Week 40-2008

Lack of acknowledgement of the PCN within 30 days will constitute acceptance of the change. After acknowledgement, lack of additional response within the 90 day period will constitute acceptance of the change (Jedec Standard No. 46-C). In any case, first shipments may start earlier with customer's written agreement.

### **Marking and traceability:**

Unless otherwise stated by customer specific requirement, parts assembled in the matrix leadframe will have the same marking as current production:

Assembly location	Assy plant	Seq. nbr	Diffusion plant	Country of origin	Date Code (3 digits)
Bouskoura Morocco					YWW Y = 1 digit indicating the year WW = 2 digits indicating the week number



The full traceability of the parts assembled in this new leadframe will be ensured by the following finished good codes:

Line	Part Number	Finished Good Code
10271	TSM102AID	TSM102AID-MLF/
10271	TSM102AIDT	TSM102AIDT-MLF/
10271	TSM102ID	TSM102ID-MLF/
10271	TSM102IDT	TSM102IDT-MLF/
86401	TS864AID	TS864AID\$DBF
86401	TS864AIDT	TS864AIDT\$DBF
86401	TS864ID	TS864ID\$DBF
86401	TS864IDT	TS864IDT\$DBF
317401	MC33174D	MC33174D\$DFFM
317401	MC33174DT	MC33174DT\$DFFM
307901	MC33079D	MC33079D\$DFF
307901	MC33079DT	MC33079DT\$DFF
307901	MC33079YD	MC33079YD\$DEFM
307901	MC33079YDT	MC33079YDT\$DEFM
307901	TS524ID	TS524ID\$DFF
307901	TS524IDT	TS524IDT\$DFF
327401	TSH24ID	TSH24ID\$DDFM
327401	TSH24IDT	TSH24IDT\$DDFM
H07301	TSH63CD	TSH63CD\$DR
H07301	TSH63CDT	TSH63CDT\$DR
H07301	TSH73CD	TSH73CD\$DR
H07301	TSH73CDT	TSH73CDT\$DR
H07471	TSH64CD	TSH64CD\$DR
H07471	TSH64CD	TSH64CD\$DRG
H07471	TSH64CDT	TSH64CDT\$DR
H07471	TSH64CDT	TSH64CDT\$DRG
H07471	TSH74CD	TSH74CD\$DRE
H07471	TSH74CD	TSH74CD\$DRF
H07471	TSH74CDT	TSH74CDT\$DRE
H07471	TSH74CDT	TSH74CDT\$DRF
L51401	TS514AID	TS514AID\$D1F
L51401	TS514AIDT	TS514AIDT\$D1F
L51401	TS514AIYD	TS514AIYD\$DAF
L51401	TS514AIYDT	TS514AIYDT\$DAF
L51401	TS514ID	TS514ID\$D1F
L51401	TS514IDT	TS514IDT\$D1F
L51401	TS514IYD	TS514IYD\$DAF
L51401	TS514IYDT	TS514IYDT\$DAF

The above finished good code list is not exhaustive and new finished good codes could be created for production management

Please note that ST Team is doing all the best for providing you full visibility about this announced change and to minimize any negative impact it may occurs

While our Marketing and Sales teams are available for additional information when required, we are looking forward to your renewed confidence in STMicroelectronics as the strategic partner of your choice.

- **APPENDIX 1**

## Reliability Report

### *Assembly qualification*

General Information	
<b>Product Line</b>	3079
<b>Product Description</b>	<i>Operational Amplifier</i>
<b>Commercial Product</b>	MC33079CD
<b>Product Group</b>	IMS/APM
<b>Product Division</b>	AMPS
<b>Package Description</b>	SO14
<b>Silicon Process Technology</b>	Bipolar

Locations	
<b>Wafer fabrication location</b>	<i>Ang Mo Kio (Singapore)</i>
<b>Assembly plant location</b>	ST Bouskoura
<b>Final test plant location</b>	ST Bouskoura

General Information	
<b>Product Line</b>	H074
<b>Product Description</b>	<i>Operational Amplifier</i>
<b>Commercial Product</b>	TSH74CD
<b>Product Group</b>	IMS/APM
<b>Product Division</b>	AMPS
<b>Package Description</b>	SO14MTX
<b>Silicon Process Technology</b>	HF2CMOS

Locations	
<b>Wafer fabrication location</b>	<i>Carrollton (USA)</i>
<b>Assembly plant location</b>	ST Bouskoura
<b>Final test plant location</b>	ST Bouskoura

General Information	
<b>Product Line</b>	0102
<b>Product Description</b>	<i>Voltage and current regulator</i> TSM102AID
<b>Commercial Product</b>	& TSM102AIDT & TSM102ID & TSM102IDT
<b>Product Group</b>	IMS/APM
<b>Product Division</b>	IPC
<b>Package Description</b>	SO16L MTX
<b>Silicon Process Technology</b>	Bipolar

Locations	
<b>Wafer fabrication location</b>	<i>Ang Mo Kio (Singapore)</i>
<b>Assembly plant location</b>	ST Bouskoura
<b>Final test plant location</b>	ST Bouskoura



**DOCUMENT HISTORY**

<b>Versio n</b>	<b>Date</b>	<b>Pages</b>	<b>Author</b>	<b>Comment</b>
A	2008-06-19		JM Bugnard IMS/APM QA&R	Approved
A	2008-7-06		Francesco Ventura IMS/APM QA&R	Approved

Note: This report is a summary of the reliability trials performed in good faith by STMicroelectronics in order to evaluate the potential reliability risks during the product life using a set of defined test methods.

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## **1 RELIABILITY EVALUATION OVERVIEW**

### **1.1 Objectives**

This Qualification Report summarizes the reliability trials and results performed to qualify the SO14/16 matrix leadframe pad size 94x160mils, (assembly) in the ST Bouskoura plant.

### **1.2 Conclusion**

Based on the reliability and construction analysis results, the SO14/16 Ni/Pd/Au matrix leadframe with pad size 94x160 mils and assembled in ST Bouskoura plant is qualified for the APM Group.

## **2 DEVICE CHARACTERISTICS**

### **2.1 Device description**

#### **MC33079CD    LINE: 3079**

- Wafer fabrication manufacturing location: ANGMOKIO (SINGAPORE)
- Technology: Bipolar
- Die size: 3230 x 1950  $\mu\text{m}^2$
- Passivation type: Nitride

#### **TSH74CD    LINE: H074**

- Wafer fabrication manufacturing location: Carrollton (USA)
- Technology: HF2CMOS
- Die size: 3260 x 1970  $\mu\text{m}^2$
- Passivation type: Nitride + PSG

#### **TSM102    LINE: 0102**

- Wafer fabrication manufacturing location: ANGMOKIO (SINGAPORE)
- Technology: Bipolar
- Die size: 3400 x 1860  $\mu\text{m}^2$
- Passivation type: Nitride

### **2.2 TRACEABILITY**

#### **2.2.1 Assembly information**

- Assembly site: ST Bouskoura(Morocco)
- Package description: SO14/SO16L
- Frame and lead material:SO14/16L MTX Ni/Pd/Au
- Die attach: Silver filled epoxy glue
- Wires: Au 1 mils
- Molding compound: Epoxy resin NITTO MP8000 CH42A
- Lead coating: Ni/Pd/Au

### 3 RELIABILITY TESTS RESULTS

Herebelow is a general description of the reliability evaluation strategy.

**MC33079CD      LINE: 3079**

Package oriented test

Test	Test short description Method	Conditions	Sample Size	Duration	Results Fail/ Sample Size
<b>THB</b>	<b>Test performed after preconditioning MSL1</b>				
	JEDEC JESD22 A101	T <sub>amb.</sub> : 85°C, Rel. Humidity: 85%, V <sub>cc</sub> : +/- 15V	78	500h 1000h	0/78 0/78
<b>PPT</b>	<b>Test performed after preconditioning MSL1</b>				
	JEDEC JESD22 A102	T <sub>amb.</sub> :121°C, Pressure: 2 atm	78	240h	0/78
<b>TMC</b>	<b>Test performed after preconditioning MSL1</b>				
	JEDEC JESD22 A104C	T <sub>amb.</sub> :-65/+150°C (2 cycles per hour) air to air	78	1000cy	0/78

**TSH74CD      LINE: H074**

Package oriented test

Test	Test short description Method	Conditions	Sample Size	Duration	Results Fail/ Sample Size
<b>PPT</b>	<b>Test performed after preconditioning MSL1</b>				
	JEDEC JESD22 A102	T <sub>amb.</sub> :121°C, Pressure: 2 atm	78	240h	0/78
<b>TMC</b>	<b>Test performed after preconditioning MSL1</b>				
	JEDEC JESD22 A104C	T <sub>amb.</sub> :-65/+150°C (2 cycles per hour) air to air	78	500cy 1000cy	0/78 0/78

**TSM\*0102      LINE: 102**

Package oriented test:

Test	Test short description Method	Conditions	Sample Size	Duration	Results Fail/ Sample Size
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<b>PC</b>	<b>Pre-Conditioning: Moisture sensitivity level 3</b>				
	SAM T=0 & AFTER PRECOND	Drying 24hrs @125°C Store 192hrsh 30°C/60% -I.R. 3 reflow PBT 260°C	160		0/160 NO- DELAMINA TION
<b>PPT</b>	<b>Test performed after preconditioning MSL_3</b>				
	Pressure Pot	T°amb.:121°C, Presure: 2 atm	77	240h	0/77
<b>TMC</b>	<b>Test performed after preconditioning MSL_3</b>				
	Thermal Cycle	T°amb.: -65/+150°C (2 cycles per hour) air to air	77	1000cy	0/77
<b>HTS</b>	<b>Test performed after preconditioning MSL_3</b>				
	High temperature Shortage	No bias T amb=150°C	77	1000hrs	0/77
<b>E.S.</b>	Enviromental Sequence HTS+TC	HTS 500hrs + TC 500Cy	77	500hrs/Cy	0/77

## **4 APPLICABLE AND REFERENCE DOCUMENTS**

<b>Document reference</b>	<b>Short description</b>
<b>AEC-Q100</b>	: Stress test qualification for integrated circuits
<b>SOP 2610</b>	: General product qualification procedure

## **5 ATTACHED DOCS**

<b>Document reference</b>	<b>Short description</b>
<b>SO14/16L matrix frame</b>	Particular of comparison between SO14/16L single strength to SO14/16L Matrix frame
<b>MBD</b>	Mount Bond diagram of SO14/16L Device. Using New and Old l/f vers.

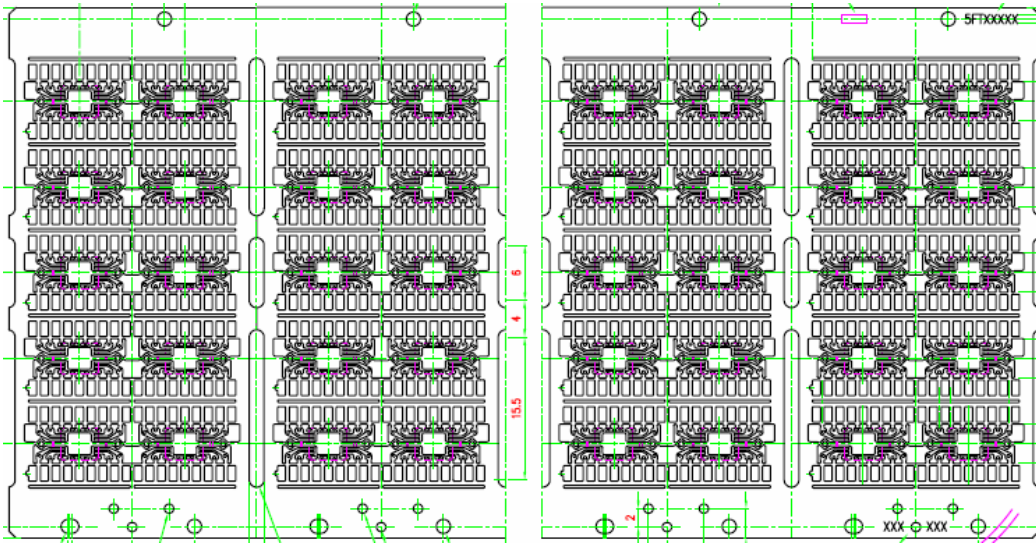
## **6 GLOSSARY**

<b>PC</b>	: Preconditioning
<b>HTB</b>	: High Temperature Bias
<b>THB</b>	: Temperature and Humidity Bias
<b>PPT</b>	: Pressure Pot
<b>TMC</b>	: Thermal Cycling

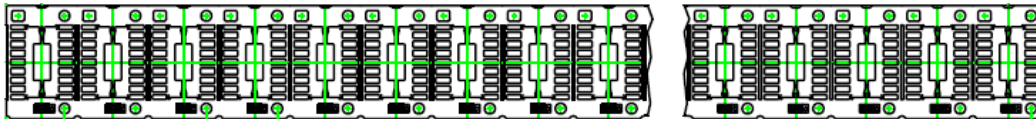
## 7 ATTACHMENT : 1

SO16 frame comparison used for TSM102 products – Matrix frame vs single raw frame

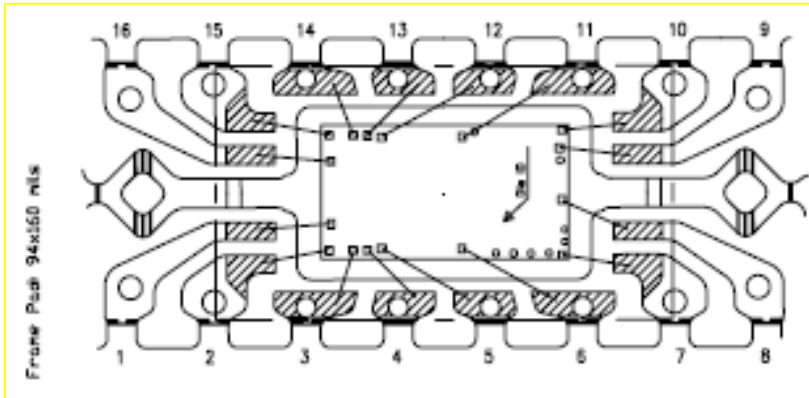
NEW MATRIX L/F:



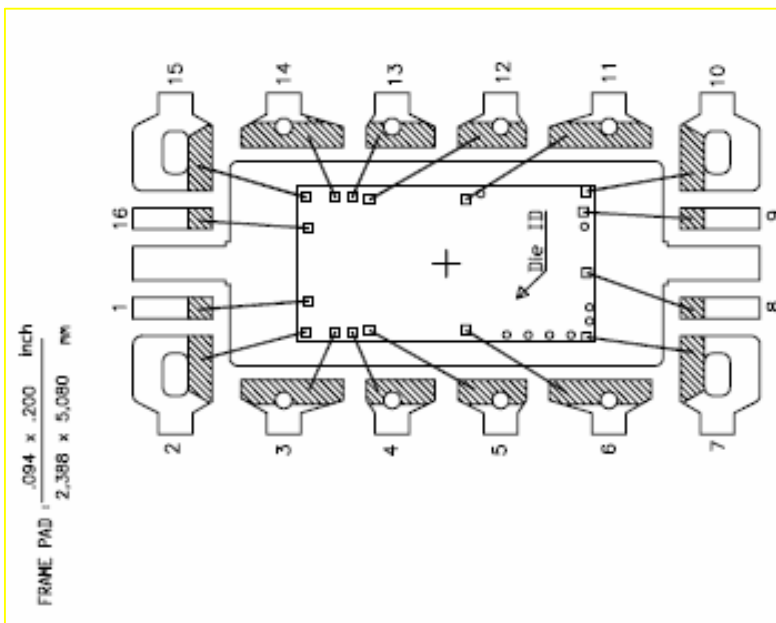
OLD SINGLE L/F



**MBD : NEW SO16I MATRIX L/F 94 X 160 MILS**



**MBD : OLD SO16I SINGLE L/F 94 X 200 MILS**

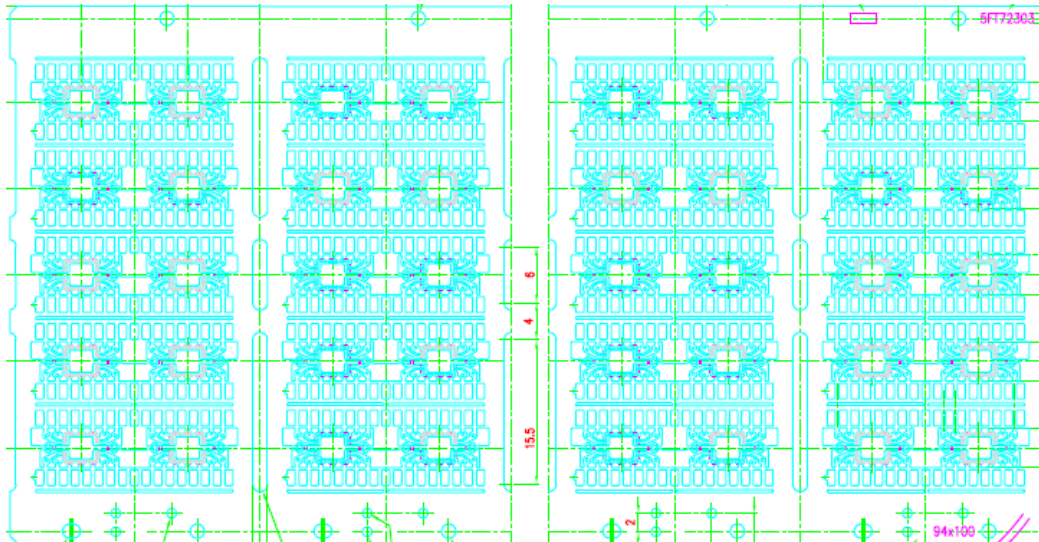




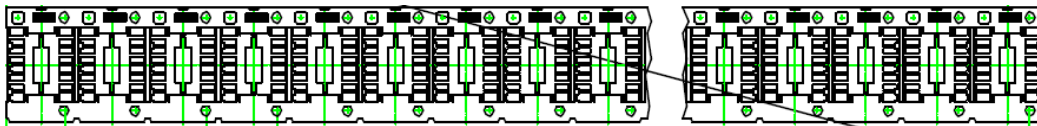
## 8 ATTACHMENT : 2

SO14 frame comparison used for MC33079/TSH74CD products –Matrix frame raw frame vs raw single frame

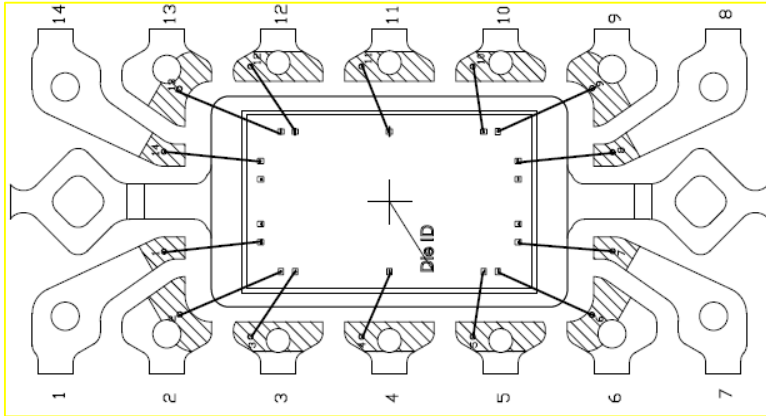
NEW MATRIX L/F:



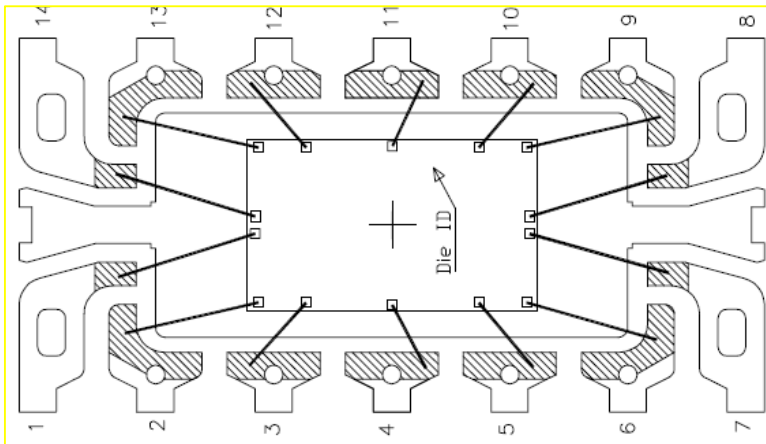
OLD SINGLE L/F



**MBD : NEW SO14I MATRIX L/F 94 X 160 MILS**



**MBD : OLD SO16I SINGLE L/F 94 X 200 MILS**



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