


PRODUCT / PROCESS CHANGE INFORMATION

1. PCI basic data

1.1 Company		STMicroelectronics International N.V
1.2 PCI No.	AMS/23/14193	
1.3 Title of PCI	Implementation of Bare Copper Lead Frame on DPAK package products	
1.4 Product Category	See product list	
1.5 Issue date	2023-06-27	

2. PCI Team

2.1 Contact supplier	
2.1.1 Name	NEMETH KRISZTINA
2.1.2 Phone	+49 89460062210
2.1.3 Email	krisztina.nemeth@st.com
2.2 Change responsibility	
2.2.1 Product Manager	Marcello SAN BIAGIO
2.1.2 Marketing Manager	Salvatore DI VINCENZO
2.1.3 Quality Manager	Giuseppe LISI

3. Change

3.1 Category	3.2 Type of change	3.3 Manufacturing Location
Materials	New direct material part number (same supplier, different supplier or new supplier), Lead frame finishing material / area (internal)	ATXWH

4. Description of change

	Old	New
4.1 Description	DPAK Ag plated Lead frame: - L/F TO-252 Matrix SP T-post Ag - L/F TO-252 Matrix T-post+ Sel.Pad Ag II	DPAK bare copper Lead frame: - L/F TO-252 Matrix Bare Cu
4.2 Anticipated Impact on form,fit, function, quality, reliability or processability?	Minor. L/F design without change, the same vendors use same design (Same drawing with different Ag plating position).	

5. Reason / motivation for change

5.1 Motivation	Quality improvement
5.2 Customer Benefit	QUALITY IMPROVEMENT

6. Marking of parts / traceability of change

6.1 Description	New Finished good codes
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7. Timing / schedule

7.1 Date of qualification results	2023-06-16
7.2 Intended start of delivery	2023-08-31
7.3 Qualification sample available?	Upon Request

8. Qualification / Validation

8.1 Description	14193 RER 6088-1787-W-2023_New Bare Copper Lead-frame TO-252 DPAK in ASE WEIHAI-China.pdf		
8.2 Qualification report and qualification results	Available (see attachment)	Issue Date	2023-06-27

9. Attachments (additional documentations)

14193 Public product.pdf
14193 PCI_2023_New Bare Copper Lead-frame TO-252 DPAK in ASE WEIHAI-China.pdf
14193 RER 6088-1787-W-2023_New Bare Copper Lead-frame TO-252 DPAK in ASE WEIHAI-China.pdf

10. Affected parts

10. 1 Current		10.2 New (if applicable)
10.1.1 Customer Part No	10.1.2 Supplier Part No	10.1.2 Supplier Part No
	L78M09ABDT-TR	
	LD1117DT33CTR	
	LM317MDT-TR	

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**PRODUCT/PROCESS
CHANGE NOTIFICATION**

PCI AMS/23/14193

Analog, MEMS & Sensors Group (AMS)

**Introduction of new Bare Copper Lead-frame for TO-252 DPAK
in ASE WEIHAI-China**

WHAT:

Progressing on the activities related to quality continuous improvement, ST is pleased to announce the release of a new Bare Copper Lead-frame for TO-252 DPAK assembled in ASE WEIHAI China, which will help us to improve the quality and reduce eventual delamination issue.

Please note that this new **bare copper lead-frame will NOT affect the internal structure of the lead-frame** (keeping same form, same fit, same internal design and function), it will only allow us to improve the quality of the product, so it can be considered as a **MINOR change**.

Impacted Product: see excel file

The table here below shows the list of current and new material affected by this change.

Material	Current process	Modified process	Comment
Diffusion location	No change		No change
Assembly location	ASE WEIHAI China	ASE WEIHAI China	No change
Molding compound	Sumitomo EME G600F	Sumitomo EME G600F	No change
Lead-frame	Ag plated Leadframe	Bare copper leadframe	change
Wire	CU 1.5 mil	CU 1.5 mil	No change
MSL	1	1	No change

WHY:

This change will contribute to ST's continuous service improvement and to improve the quality of the product, enhancing adhesion between lead frame surface & molding compound

HOW:

The qualification program consists mainly of comparative electrical characterization and reliability tests.

You will find here after the qualification test plan which summarizes the various test methods and conditions that ST uses for this qualification program.

WHEN:

This new bare copper Lead-frame will be implemented in September 2023 in ASE WEIHAI China

Marking and traceability:

Unless otherwise stated by customer's specific requirement, the traceability of the parts assembled with the new material set will be ensured by new internal sales type, date code and lot number.

The changes here reported will not affect the electrical, dimensional and thermal parameters keeping unchanged all the information reported on the relevant datasheets.

There is -as well- no change in the packing process or in the standard delivery quantities.

APPENDICES:

Final reliability report



Public Products List

Public Products are off the shelf products. They are not dedicated to specific customers, they are available through ST Sales team, or Distributors, and visible on ST.com

PCI Title : Implementation of Bare Copper Lead Frame on DPAK package products

PCI Reference : AMS/23/14193

Subject : Public Products List

Dear Customer,

Please find below the Standard Public Products List impacted by the change.

L78M09CDT-TR	L78M12ABDT-TR	L78M09ABDT-TR
LM317MDT-TR	L78M15ABDT-TR	L78M05ABDT-TR
L78M05CDT-TR	L78M08CDT-TR	L78M15CDT-TR
L78M08ABDT-TR	L78M12CDT-TR	LD1117DT33CTR

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Reliability Evaluation Report

New Bare Copper Lead-frame
TO-252 DPAK in ASE WEIHAI - CHINA

General Information		Location	
Product Line	KS3301, LM1701	Wafer Fab	AM6F-Singapore SG6 6
P/N	LD1117DT33CTR, LM317MDT	Assembly plant	ASE WEIHAI - CHINA
Product Division	AMS		
Package	TO-252 DPAK		
Silicon Process Technology	Bipolar		
Results			
		Reliability Assessment	PASS

DOCUMENT INFORMATION

Version	Date	Pages	Prepared by	Approved by	Comment
1.0	6/13/2023	4	Antonio Russo	Ivan Grasso	Final Report

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 APPLICABLE AND REFERENCE DOCUMENTS

Document reference	Short description
JESD47	Stress-Test-Driven Qualification of Integrated Circuits

2 GLOSSARY

	Short description
T_j	Temperature at junction of the device
T_A	Temperature of ambient air
RH	Relative Humidity
V _{cc max}	Max Operative Voltage

3 RELIABILITY EVALUATION OVERVIEW

3.1 Objectives

This document is intended to provide reliability evaluation report of New Bare Copper Lead-frame for TO-252 DPAK in ASE WEIHAI.

3.2 Conclusion

Qualification requirements have been fulfilled without exception. Reliability tests have shown that the devices behave correctly against environmental tests (no failure). The stability of electrical parameters during the accelerated tests demonstrates the ruggedness of the products and safe operation, which is consequently expected during their lifetime.

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4 TESTS RESULTS SUMMARY

ST refers to the JEDEC standard JESD47 when conducting reliability tests for the qualification of new product.

4.1 Test plan and results summary

Table 1. Package qualification tests

Stress (Abbv.)	Ref.	Conditions	Requirements				Notes
			# Lot	SS	Duration	Pass Criteria (Fails / Tested)	
MSL Preconditioning Must be performed prior to: THB, HAST, TC, AC, & UHAST	JESD22 A113 J-STD-020	Preconditioning: (Test @ Rm) SMD only; Moisture Preconditioning for THB/HAST, AC/UHST, TC, & PTC; Peak Reflow Temp = 260C	MSL1				
High Temperature Storage Life (HTSL)	JESD22 A103	T _A ≥ 150°C	3 Lots	231	168hrs 500hrs 1000hrs	0/231 0/231 0/231	
Unbiased HAST (UHAST)	JESD22 A118	130 °C / 85% RH	3 Lots	231	96hrs	0/231	1
Temperature Cycling (TC)	JESD22 A104	-65°C to +150°C	3 Lots	231	500 cycles	0/231	1

Table 2. Assembly integrity Tests

Stress (Abbv.)	Ref.	Conditions	Requirements			Notes
			# Lot	SS	Pass Criteria (Fails / Tested)	
Solderability	J-STD-002	>95% Lead coverage	3	15 units / All Lead	PASS	
WBP	Mil-STD-883, Method 2011	30 wires, characterization	3	15 units / All bonds	PASS Cpk>1.67	
WBS	JESD22-B116	30 balls, characterization	3	15 units / All bonds	PASS Cpk>1.67	

Notes:

1. Preconditioning with soak per J-STD-020 at rated moisture sensitivity level prior to acceleration stress testing.

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