PRODUCT / PROCESS CHANGE NOTIFICATION

1. PCN basic data	
1.1 Company	STMicroelectronics International N.V
1.2 PCN No.	ADG/21/12838
1.3 Title of PCN	L9680x, L9679x (UAF3, UAI3): Super High Density (SHD) NEAP Lead-Frame Introduction
1.4 Product Category	see list
1.5 Issue date	2021-06-08

2. PCN Team	
2.1 Contact supplier	
2.1.1 Name	ROBERTSON HEATHER
2.1.2 Phone	+1 8475853058
2.1.3 Email	heather.robertson@st.com
2.2 Change responsibility	
2.2.1 Product Manager	Elena Maria PERNIGOTTI
2.1.2 Marketing Manager	Alberto DA DALT
2.1.3 Quality Manager	Marcello Donato MENCHISE

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)	ST Muar (Malaysia)

4. Description of change		
	Old	New
4.1 Description	Standard Lead-Frame (16 units) Finishing RTuPG3 Side mold gate injection Marking without 2D code	Super High Density Lead-Frame (48 units) Finishing NEAP (Non Etching Adhesion Promoter) Center top mold gate injection New Marking with 2D code
4.2 Anticipated Impact on form,fit, function, quality, reliability or processability?	No Impact	

5. Reason / motivation for change	
5.1 Motivation	Service and Quality Improvement. Manufacturing Process Optimization
5.2 Customer Benefit	SERVICE IMPROVEMENT

6. Marking of parts / traceability of change	
6.1 Description	Dedicated Finished Good Codes

7. Timing / schedule	
7.1 Date of qualification results	2021-06-01
7.2 Intended start of delivery	2021-09-01
7.3 Qualification sample available?	Upon Request

8. Qualification / Validation			
8.1 Description	12838 Validation.pdf		
8.2 Qualification report and qualification results	Available (see attachment)	Issue Date	2021-06-08

9. Attachments (additional documentations)
12838 Public product.pdf 12838 Validation.pdf 12838 Details.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
	L9680TR	

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PRODUCT/PROCESS CHANGE NOTIFICATION

TITLE	**L9680x, L9679x (UAF3, UAI3): Super High Density (SHD) NEAP Lead-Frame Introduction**
IMPACTED PRODUCTS	ST silicon lines UAF3 and UAI3 assembled in LQFP-100 Lead 14x14 Exposed Pad Corresponding to L9680x, L9679x part numbers.
MANUFACT. STEP	Assembly
INVOLVED PLANT	ST Muar Plant (Malaysia)
CHANGE REASON	Service and Quality improvement. Manufacturing process optimization
CHANGE DESCRIPTION	Package upgrade through introduction of following changes: - Super High Density (SHD) Lead-Frame introduction from 16 to 48; - Lead-Frame finishing: from current RTuPG3 to NEAP (Non Etching Adhesion Promoter); - Mold injection point: from side corner to center top gate ; - Marking: re-layout linked to central top gate, with 2D marking introduction.
TRACEABILITY	Dedicated Finished Good code (internal part number) and product marking (layout)
VALIDATION	According to ZVEI Delta Qualification Matrix corresponding to following selected items: - SEM-PA-04 Change of lead frame finishing material / area (internal) - SEM-PA-05 Change of lead and heat slug plating material/plating thickness (external) - SEM-PA-13 Change of product marking - SEM-PA-14 Change in process technology (leadframe) - SEM-PA-17 Change of specified assembly process sequence - SEM-EQ-02 Production from a new equipment/tool which uses The same basic technology leading to the following reliability qualification plan:

	

AEC-Q100 Revision H	Temperature Humidity Bias or biased HAST	Autoclave or Unbiased HAST	Temperature Cycling	Power Temperature Cycling	High Temperature Storage Life	Wire Bond Pull	Solderability	Lead Integrity	Lead free	Hermetic Package Test	Die Shear	Parameter-Analysis: Comparison of current with changed device characterization, electrical distribution	For Cu Wire Products: Consider AEC-Q006
	THB	AC	TC	PTC	HTSL	WBP	SD	LI	LF	MECH	DS		
	A2	A3	A4	A5	A6	C2	C3	C6	E12	G1-4	G7		
Stress Test to be considered as per ZVEI guideline	•	•	•	M	•	C	•	•	L	H	H	•	•
Stress Test performed by ST	X	X	X	X	X	X	X	X	X				X

Reason for exception of tests by ST

- **G1-4 and G7**: Not Applicable. Cavity Package Integrity Tests. Applicable to Hermetic Package only.
- **Electrical distribution comparison**: Not Applicable. No deviations in terms of electrical performances are expected due to the change in leadframe finishing.

CURRENT PRODUCTS	Replaced by new version featuring new upgraded package
REPORTS	12838 Validation.pdf

Public Products List

Publict 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

PCN Title : L9680x, L9679x (UAF3, UAI3): Super High Density (SHD) NEAP Lead-Frame Introduction

PCN Reference : ADG/21/12838

Subject : Public Products List

Dear Customer,

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

L9680TR	L9680	L9679P
L9679PTR		

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UAF3/L9680 and UAI3/L9679 TQFP14x14 100L EP in Muar Migration to SHD Line

Change Description

- As part of the overall strategy for QFP14x14, QFP10x10 and QFP7x7, we are progressing with the migration of UAF3/L9680 from current matrix line to Super High Density (SHD) line in Muar Assy Plant

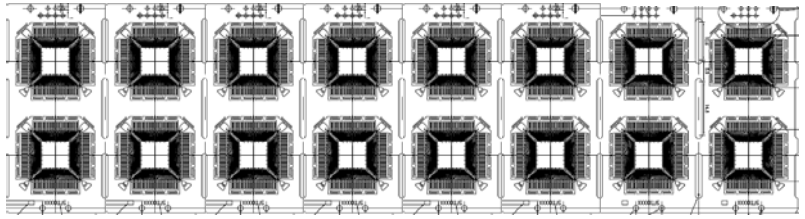
- Element of Changes for UAF3/L9680 and UAI3/L9679 in TQFP14x14 100L EP

Item	Before	After
Strip size	57 x 215mm	85 x 250mm
Density (qty/strip)	16 units	48 units (SHD)
LF Finishing	RTuPG3	NEAP
Die Attach Material	2C2	2C2
Wire	1.0 mils Cu	1.0 mils Cu
Resin	G700LS	G700LS
Mold gate Injection	Side gate	Centre top gate
2D Marking	No	Yes

Bill of Material

Strip size comparison

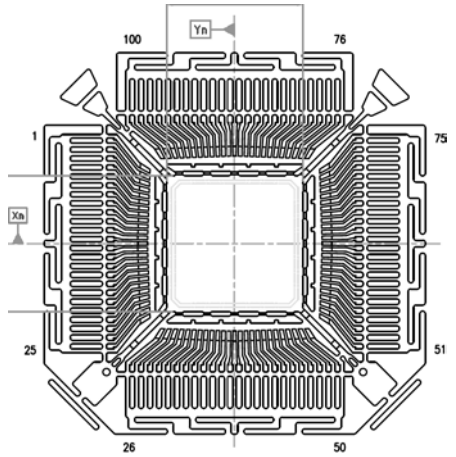
Matrix
2 x 8
16 units



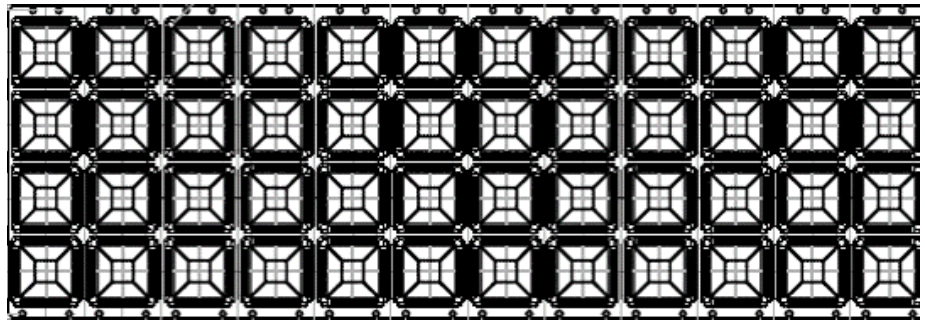
57.6mm

215.7mm

Matrix:
5FT28946



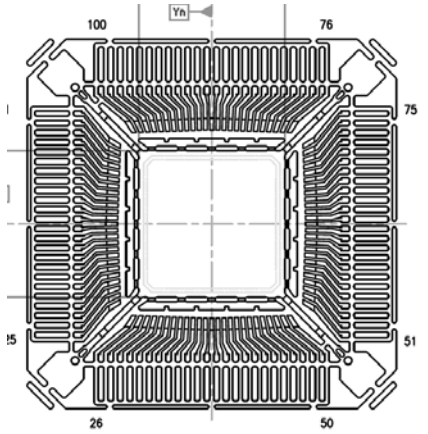
SHD
4 x 12
48 units



85 mm

250 mm

SHD:
5FT90027



Remarks:
No changes in unit geometry. Only change strip size

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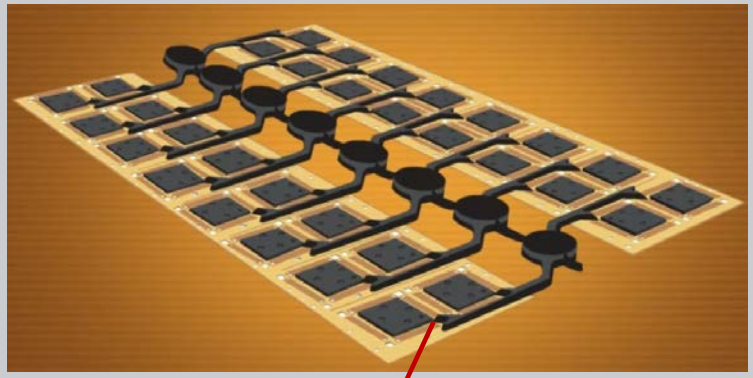
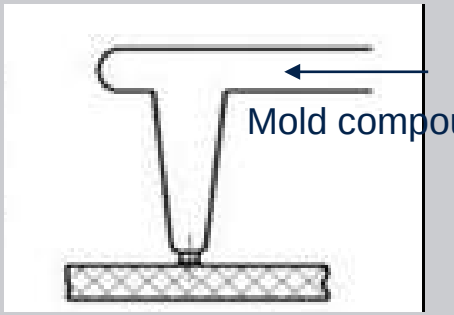
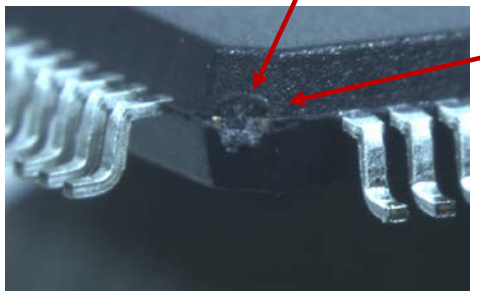
Mold Injection Gates

Same Basic Technology - Transfer Molding

SIDE GATE INJECTION	
	 Package view by side



Gate Injection Notch

Wire sweeping reduction with Top Central Gate

Marking Composition comparison

Current Matrix Line

New SHD Line

2D Code

Gate Injection Notch

ZVEI ID Selection

		PROCESS - ASSEMBLY
X	SEM-PA-04	Change of lead frame finishing material / area (internal)
X	SEM-PA-05	Change of lead and heat slug plating material/plating thickness (external)
X	SEM-PA-13	Change of product marking
X	SEM-PA-14	Change in process technology (e.g. trim and form, leadframe preparation …)
X	SEM-PA-17	Change of specified assembly process sequence (deletion and/or additional process step)
		EQUIPMENT
X	SEM-EQ-02	Production from a new equipment/tool which uses the same basic technology (replacement equipment or extension of existing equipment pool) without change of process.

→ From RTUPG3 to NEAP finishing

→ From Pre-Plated (NiPdAuAg) to Post-Plated (Pure Tin)

→ 2D Marking introduction and central top notch

→ SHD strip leadframe introduction

→ Additional Process (Post-plating with Pure Tin)

→ New Equipment, but same basic technology, transfer molding

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Qualification Plan as per ZVEI guideline

AEC-Q100 Revision H	Temperature Humidity Bias or biased HAST	Autoclave or Unbiased HAST	Temperature Cycling	Power Temperature Cycling	High Temperature Storage Life	Wire Bond Pull	Solderability	Lead Integrity	Lead free	Hermetic Package Test	Die Shear	Parameter-Analysis: Comparison of current with changed device characterization, electrical distribution	For Cu Wire Products: Consider AEC-Q006
	THB	AC	TC	PTC	HTSL	WBP	SD	LI	LF	MECH	DS		
	A2	A3	A4	A5	A6	C2	C3	C6	E12	G1-4	G7		
Stress Test to be considered as per ZVEI guideline	•	•	•	**M**	•	**C**	•	•	**L**	**H**	**H**	•	•
Stress Test performed by ST	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**				**X**

- Reason for exception of tests by ST
- G1-4 and G7: Not Applicable.
  Cavity Package Integrity Tests.
  Applicable to Hermetic Package only.
- Electrical distribution comparison: N.A.
  No deviations in terms of electrical performances are expected due to the change in leadframe finishing.

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ST Qualification Plan

Reliability Test								
No	Test Name	Test method	Test Condition	Steps	Analysis/Comments	Sample size (unit)		
						Qual 1 Catania	Qual 2 Agrate	Qual 3 Catania
1	PC (MSL3)	JEDEC J-STD-020	Peak Reflow Temp = 260°C	Final	MSL 3 will be applied on all the parts submitted to TC, THB, PTC, AC	231 (TC+THB+AC)	253 (TC+THB+PTC+AC)	254 (TC+THB+PTC+AC)
2	TC Thermal Cycle	JESD22-A104	-55°C/+150°C	1000/2000 cycles	ATE Delamination check (SAM) DPA analysis in line with Q006	77	77	77
3	HTS High Temperature Storage	JESD22-A103	150°C	1000/2000 hrs	ATE DPA analysis in line with Q006	45	45	45
4	THB Temperature Humidity Bias	JESD22-A101	85ºC/ 85%RH	1000/2000 hrs	ATE Delamination check (SAM) DPA analysis in line with Q006	77	77	77
5	PTC Power Temperature Cycling	JESD22-A105	TJ -40°C/+150°C With Bias	1000/2000 cycles	ATE		22	23
6	AC Autoclave	JESD22-A102	AC (121ºC/2atm @ 96 hours)	96 hrs	Visual Inspection	77	77	77

Selected TV is UAF3/L9680. UAI3/L9679 is covered by similarity

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