PRODUCT / PROCESS CHANGE NOTIFICATION

1. PCN basic data	
1.1 Company	STMicroelectronics International N.V
1.2 PCN No.	ADG/21/12659
1.3 Title of PCN	L9906TR, L9906CTR, L9907TR (UQ29): High Density Leadframe Introduction
1.4 Product Category	see list
1.5 Issue date	2021-03-09

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	Maurizio GALLINARI
2.1.2 Marketing Manager	Massimo BARNI
2.1.3 Quality Manager	Alberto BIGNAZZI

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 base material	ST Muar (Malaysia)

4. Description of change		
	Old	New
4.1 Description	Standard Leadframe	High Density Leadframe
4.2 Anticipated Impact on form,fit, function, quality, reliability or processability?	No Impact	

5. Reason / motivation for change	
5.1 Motivation	Capacity Increase
5.2 Customer Benefit	CAPACITY INCREASE

6. Marking of parts / traceability of change	
6.1 Description	Internal traceability

7. Timing / schedule	
7.1 Date of qualification results	2021-03-03
7.2 Intended start of delivery	2021-04-30
7.3 Qualification sample available?	Upon Request

8. Qualification / Validation			
8.1 Description	12659 Validation.pdf		
8.2 Qualification report and qualification results	Available (see attachment)	Issue Date	2021-03-09

9. Attachments (additional documentations)

12659 Public product.pdf
12659 Validation.pdf
12659 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
	L9907	
	L9907TR	

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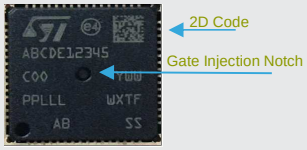
PRODUCT/PROCESS CHANGE NOTIFICATION

TITLE	**L9906TR, L9906CTR, L9907TR (UQ29): High Density Leadframe Introduction**
IMPACTED PRODUCTS	Below Products Housed in TQFP-64 10x10 EP : - L9906TR - L9906CTR - L9907TR
MANUFACT. STEP	Assembly
INVOLVED PLANT	ST Muar Plant (Malaysia)
CHANGE REASON	Capacity Increase
CHANGE DESCRIPTION	Introduction of High Density Leadframe:

Item	Before	After
Strip size	57 x 215mm	70 x 250mm
Density (qty/strip)	30 units	64 units (HD)
Mold gate Injection	Side gate	Centre top gate
2D Marking	No 	Yes 

No change in Bill Of Material (LF Finishing, Die Attach, Wire, Resin)

TRACEABILITY	Internal Traceability
VALIDATION	According to ZVEI Delta Qualification Matrix here below changes selected: • SEM-PA-13 • SEM-PA-14 • SEM-EQ-02
REPORTS	Validation result of new lead frame and additional details included 12659 Validatiom.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 : L9906TR, L9906CTR, L9907TR (UQ29): High Density Leadframe Introduction

PCN Reference : ADG/21/12659

Subject : Public Products List

Dear Customer,

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

L9907	L9907TR	

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UQ29 (L9906TR / L9906CTR / L9907TR) TQFP10x10 64L EP in Muar Migration to HD Line

Change Description

- As part of the overall strategy for QFP14x14, QFP10x10 and QFP7x7, we are progressing with the migration of UQ29 from current matrix line to High Density (HD) line in Muar Assy Plant

- Element of Changes for UQ29 in TQFP10x10 64L EP

Item	Before	After
Strip size	57 x 215mm	70 x 250mm
Density (qty/strip)	30 units	64 units (HD)
LF Finishing	RTUPG	RTUPG
Die Attach Material	2C2	2C2
Wire	Au	Au
Resin	G700LS	G700LS
Mold gate Injection	Side gate	Centre top gate
2D Marking	No	Yes

Bill of Material

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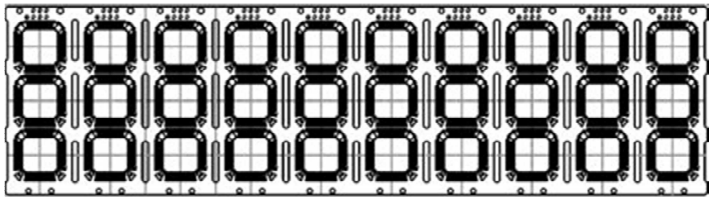
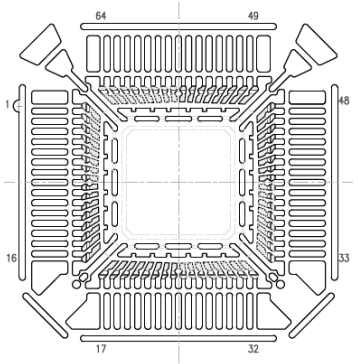
Strip size comparison

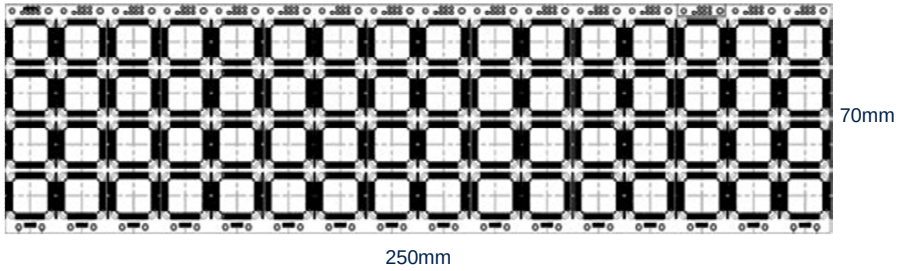
Matrix
3x10
30 units



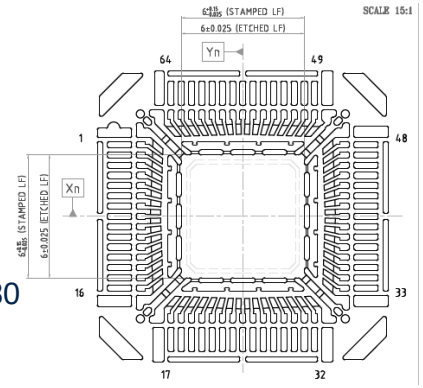
Matrix
UQ29 :
5FT97454



HD
4x16
64 units



Matrix
UQ29 :
5FT00180



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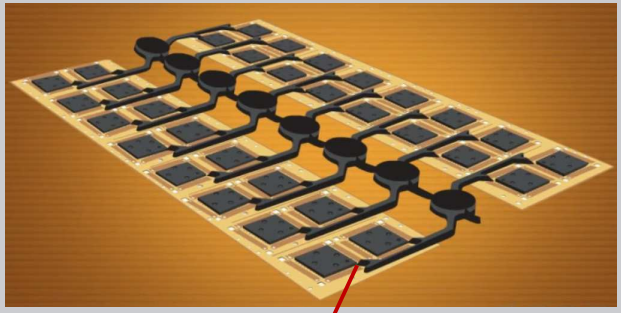
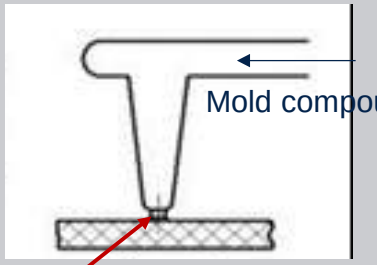
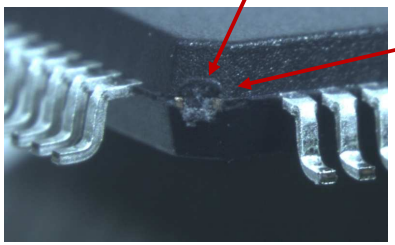
Mold Injection Gates

Same Basic Technology - Transfer Molding

MATRIX LINE - SIDE GATE INJECTION	HIGH DENSITY LINE - TOP GATE INJECTION
	 Package view by side



Gate Injection Notch

Wire sweeping reduction with Top Central Gate

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Marking Composition comparison

Current Matrix Line

New HD Line

2D Code

Gate Injection Notch

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ZVEI ID Selection

		PROCESS - ASSEMBLY	
X	SEM-PA-13	Change of product marking	→ 2D Marking introduction and central top notch
X	SEM-PA-14	Change in process technology (e.g. trim and form, leadframe preparation …)	→ HD strip leadframe introduction
		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.	→ New Equipment, but same basic technology transfer molding

With the above selection, ZVEI recommends to perform:

- ✓ Solderability tests → Done by ST
- ❖ Electrical Distribution Comparison (3T) → Meaningless for such change

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Qualification Plan proposed by ST in next slide

ST Qualification Plan

No	Test Name	Test method	Test Condition/S.S per Lot/# Lots	Steps	#Lots / comments	Sample size		
						Qual 1 (LL)	Qual 2 (NN)	Qual 3 (HH)
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 & AC	159	159	159
2	TC Thermal Cycle	JESD22-A104	-55°C/+150°C ATE	500 cycles	Delamination check (SAM) for all Unit DPA @ 500TC & 1000TC: Wire Bond Pull/ Wire Stitch Pull/Ball Bond Shear on 5 parts each lot	82	82	82
				1000 cycles		82	82	82
3	AC Autoclave	JESD22-A102	2atm, 121°C ATE	96hrs	Delamination check (SAM) for all Unit	77	77	77
4	HTS High Temperature Storage	JESD22-A103	150°C (without bias) ATE	500hrs	Delamination check (SAM) for all Unit Read point after 500hr & 1000hr. DPA @ 500hr & 10000hr Wire Bond Pull/ Wire Stitch Pull/Ball Bond Shear on 5 parts each lot	82	82	82
				1000hrs		77	77	77

Qual lot	Raw Line Code	CP	Lot#	Wire Bonding Parameters
Qual 1 (LL)	HA9I*UQ29CB1	L9906CTR	990380AN01	Low Force, Low Energy
Qual 2 (NN)	HA9I*UQ29CC1	L9906TR	990371MK01	Nominal Force, Nominal Energy
Qual 3 (HH)	HA9I*UQ29CB1	L9906CTR	990380AN02	High Force, High Energy

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HA9I*UQ29CB1/CC1
HD Conversion : TQFP 10x10 64L EP
Reliability Summary

UQ29 – EP HD Conversion

Note: Sampling 159 pcs/lot – taken from tested good units after FT.

Reliability Test Status									
No	Test Name	Prec	Condition/ Method	Steps	Steps	Fails/SS			Notes
						990380AN01 HA9I*UQ29CB1 (LL)	990371MK01 HA9I*UQ29CC1 (NN)	990380AN02 HA9I*UQ29CB1 (HH)	
1	PC (JL3 STD)		Bake 24 hrs @ 125°C Soak 192 hrs @ 30°C / 60% RH Reflow Profile = J-STD-020D (Tmax = 260°C)	Final	TSAM (0hr)	0 delam / 60 pcs	0 delam / 60 pcs	0 delam / 60 pcs	
					CSAM TOP (0hr)	0 delam / 60 pcs	0 delam / 60 pcs	0 delam / 60 pcs	
					ATE	0 def / 159 pcs	0 def / 159 pcs	0 def / 159 pcs	
					TSAM	0 delam / 40 pcs	0 delam / 40 pcs	0 delam / 40 pcs	
					CSAM TOP	0 delam / 40 pcs	0 delam / 40 pcs	0 delam / 40 pcs	
2	TC	Yes	TA = -55°C / +150°C	500 Cycle	ATE	0 def / 82 pcs	0 def / 82 pcs	0 def / 82 pcs	
					TSAM	0 delam / 20 pcs	0 delam / 20 pcs	0 delam / 20 pcs	
					CSAM TOP	0 delam / 20 pcs	0 delam / 20 pcs	0 delam / 20 pcs	
					WPT & BS	Pass	Pass	Pass	
				1000 Cycle	ATE	0 def /77 pcs	0 def /77 pcs	0 def /77 pcs	
					TSAM	0 delam / 20 pcs	0 delam / 20 pcs	0 delam / 20 pcs	
					CSAM TOP	0 delam / 20 pcs	0 delam / 20 pcs	0 delam / 20 pcs	
					WPT & BS	Pass	Pass	Pass	
3	PPT	Yes	TA = PPT 121°C/ 2Atm	96 hrs	ATE	0 def / 77 pcs	0 def / 77 pcs	0 def / 77 pcs	
					TSAM	0 delam / 20 pcs	0 delam / 20 pcs	0 delam / 20 pcs	
					CSAM TOP	0 delam / 20 pcs	0 delam / 20 pcs	0 delam / 20 pcs	

UQ29 – EP HD Conversion

Note: Sampling 159 pcs/lot – taken from tested good units after FT.

Reliability Test Status									
No	Test Name	Prec	Condition/ Method	Steps	Steps	Fails/SS			Notes
						990380AN01 HA9I*UQ29CB1 (LL)	990371MK01 HA9I*UQ29CC1 (NN)	990380AN02 HA9I*UQ29CB1 (HH)	
4	HTS	No	TA = 150°C	500 hrs	ATE	0 def / 82 pcs	0 def / 82 pcs	0 def / 82 pcs	
					TSAM	0 delam / 20 pcs	0 delam / 20 pcs	0 delam / 20 pcs	
					CSAM TOP	0 delam / 20 pcs	0 delam / 20 pcs	0 delam / 20 pcs	
					WPT & BS	Pass	Pass	Pass	
				1000 hrs	ATE	0 def /77 pcs	0 def /77 pcs	0 def /77 pcs	
					TSAM	0 delam / 20 pcs	0 delam / 20 pcs	0 delam / 20 pcs	
					CSAM TOP	0 delam / 20 pcs	0 delam / 20 pcs	0 delam / 20 pcs	
					WPT & BS	Pass	Pass	Pass	

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