


PRODUCT / PROCESS CHANGE NOTIFICATION

1. PCN basic data

1.1 Company		STMicroelectronics International N.V
1.2 PCN No.	ADG/19/11623	
1.3 Title of PCN	LQFP-64 (10x10x1.4): High Density Lead Frame Introduction	
1.4 Product Category	see list	
1.5 Issue date	2019-07-09	

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	Mario ASTUTI,Vito GRAZIANO
2.1.2 Marketing Manager	Giovanni Luca TORRISI
2.1.3 Quality Manager	Francesco MINERVA

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 Lead Frame (30 units x Matrix) Corner Gate Mold	High Density Lead Frame (60 units x Matrix) Top Gate Mold
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	Dedicated Finished Good Codes
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7. Timing / schedule

7.1 Date of qualification results	2019-06-12
7.2 Intended start of delivery	2019-09-12
7.3 Qualification sample available?	Upon Request

8. Qualification / Validation

8.1 Description	11623 Validation.pdf		
8.2 Qualification report and qualification results	Available (see attachment)	Issue Date	2019-07-09

9. Attachments (additional documentations)

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
	L99DZ100GPTR	
	L99DZ100GTR	
	L99DZ120TR	

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PRODUCT/PROCESS CHANGE NOTIFICATION

SUBJECT **LQFP-64 (10x10x1.4): High Density Lead Frame Introduction**

IMPACTED PRODUCTS	Products housed in LQFP-64 (see list for details)
MANUFACTURING STEP	Assembly
INVOLVED PLANT	ST Muar Plant (Malaysia)
CHANGE REASON	Capacity increase
CHANGE DESCRIPTION	<p>Introduction of High Density Lead Frame and New Molding Equipment</p> <ul style="list-style-type: none"> - High Density consists in 60 units x matrix instead of the current standard version with 30 units x matrix - New Molding Equipment (Top Gate) is needed to allow the higher leadframe density <p>No change in frame drawing, dimension, surface...</p> <p>No change in materials used (Wires, Molding Compound, Glue..)</p> <p>See attached details</p>
TRACEABILITY	<p>L99PCU3F-TR, L99PCU2R-TR, L99PCU2F-TR from wk35-2019.</p> <p>Remaining already available on demand</p>
VALIDATION	<p>Validation result and new lead frame details included</p> <p>11623 Validation.pdf</p>
SAMPLES	Available on demand
IMPLEMENTATION	We are ready to implement the change upon Customer agreement



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

PCN Title : LQFP-64 (10x10x1.4): High Density Lead Frame Introduction

PCN Reference : ADG/19/11623

Subject : Public Products List

Dear Customer,

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

L99DZ120TR	L99DZ120	L99DZ100G
L99DZ100GTR	L99DZ100GPTR	L99DZ100GP



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LQFP 10x10 64Leads

- Frame HD qualification

May, 2019

Change Description

Assembly Plant Muar

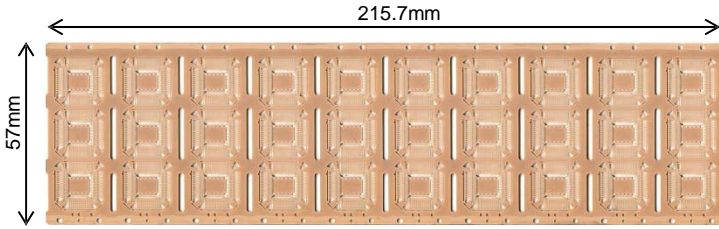
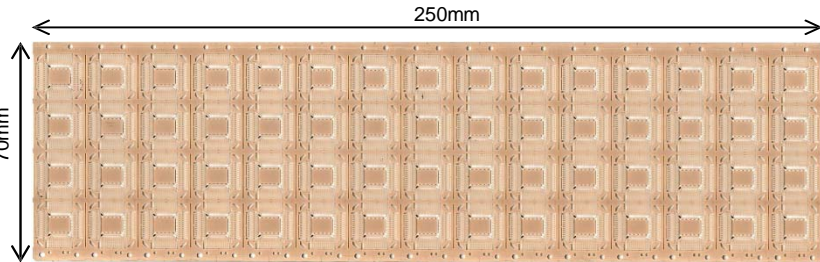
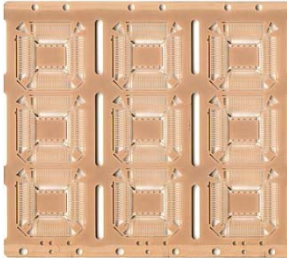
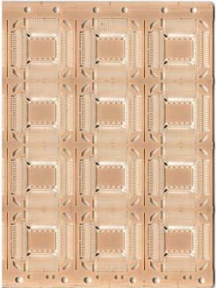
- LQFP 10x10 64leads frame migration from Matrix to High Density
- New Mold Equipment Introduction (Top Gate)
 - The Top Gate mold equipment is needed to allow the higher leadframe density

Additional Information

- Reason for the change: Company Roadmap
- Test Vehicle L99PCU2F-TR (silicon line UAN903)
- No change in the single unit frame drawing
- No change in datasheet, nor on electrical and mechanical parameters
- Dedicated Finished Good will be available. No change in either the commercial product or the marking
- Samples are available on demand

LQFP10x10

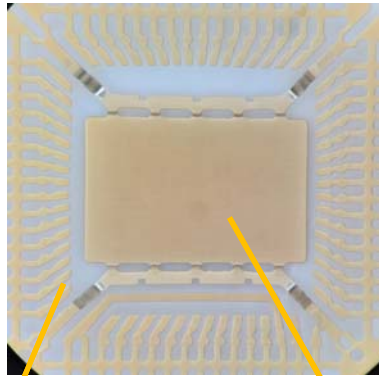
Leadframe comparison

UAN9 Matrix	UAN9 HD
 <p>215.7mm</p> <p>57mm</p>	 <p>250mm</p> <p>70mm</p>
	
<p>Matrix Leadframe 3row x 10columns 30units</p>	<p>HD Leadframe 4row x 15columns 60units</p>

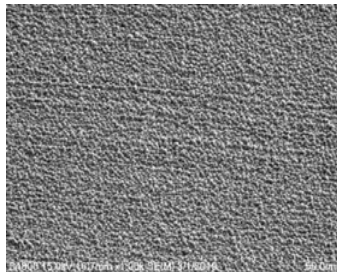
LQFP10x10

Leadframe Surface analysis

UAN9 Matrix



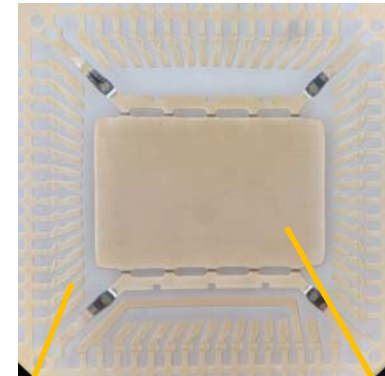
Lead tip



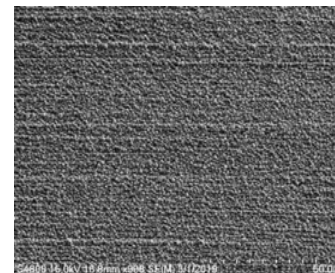
On die pad



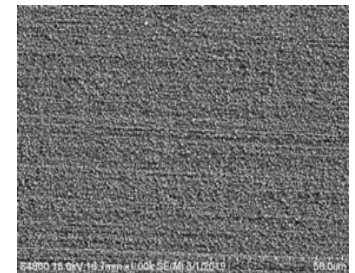
UAN9 HD



Lead tip




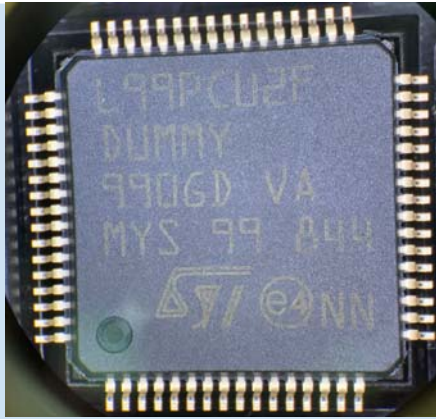
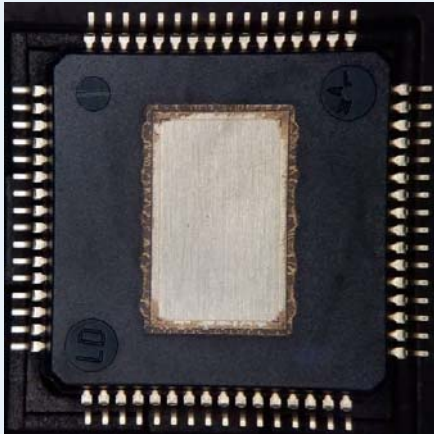
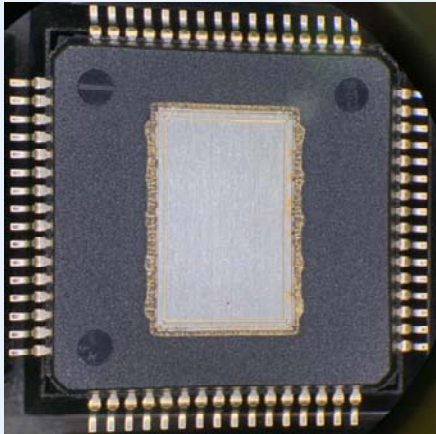
On die pad



SEM images

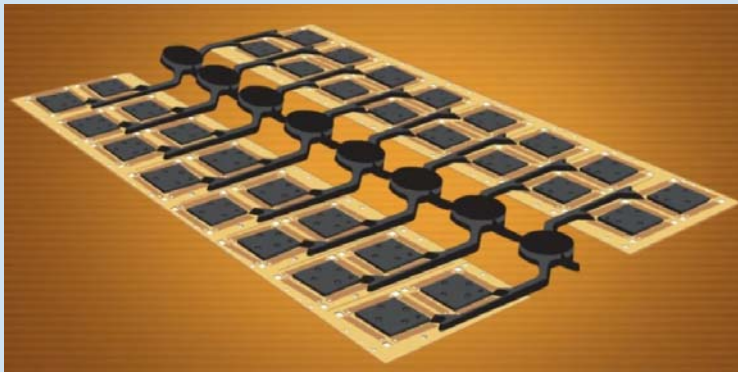
[Note: SEM Mag
1000X]

Physical unit comparison

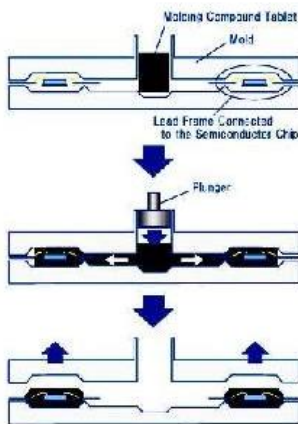
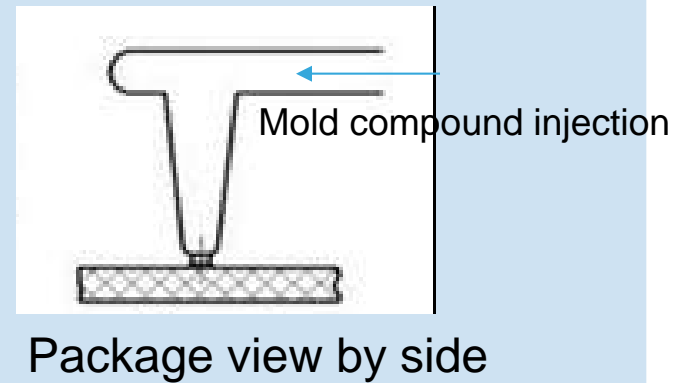
View	LQ10 MTX EP (UAN9)	LQ10 HD EP (UAN9)
Top	 The top view of the LQ10 MTX EP (UAN9) chip shows a square package with gold-plated pins on all four sides. The chip surface is dark with white markings: 'L99PCU2F', 'BB', '990XM VA', 'MYS 99 918', and the STMicroelectronics logo with a circled '24'.	 The top view of the LQ10 HD EP (UAN9) chip shows a square package with gold-plated pins on all four sides. The chip surface is dark with white markings: 'L99PCU2F', 'DUMMY', '990GD VA', 'MYS 99 844', and the STMicroelectronics logo with a circled 'NN'.
Bottom	 The bottom view of the LQ10 MTX EP (UAN9) chip shows the underside of the package, which is dark with a central rectangular area of lighter material. There are four circular solder pads at the corners and gold-plated pins along the edges.	 The bottom view of the LQ10 HD EP (UAN9) chip shows the underside of the package, which is dark with a central rectangular area of lighter material. There are four circular solder pads at the corners and gold-plated pins along the edges.

Mold Injection styles

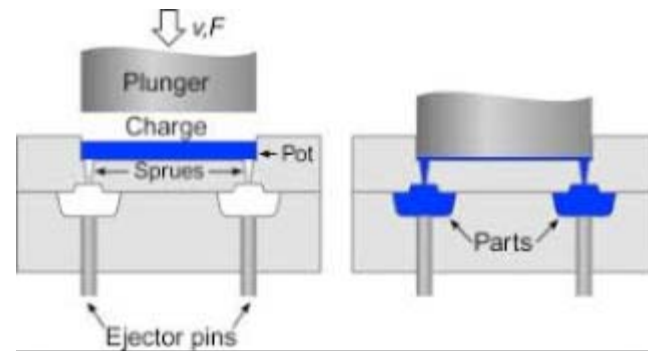
LQ10 MTX EP CORNER GATE



LQ10 HD EP TOP GATE



Example of corner gate injection process



Example of top gate injection process

BOM comparison

Product Line: UAN903

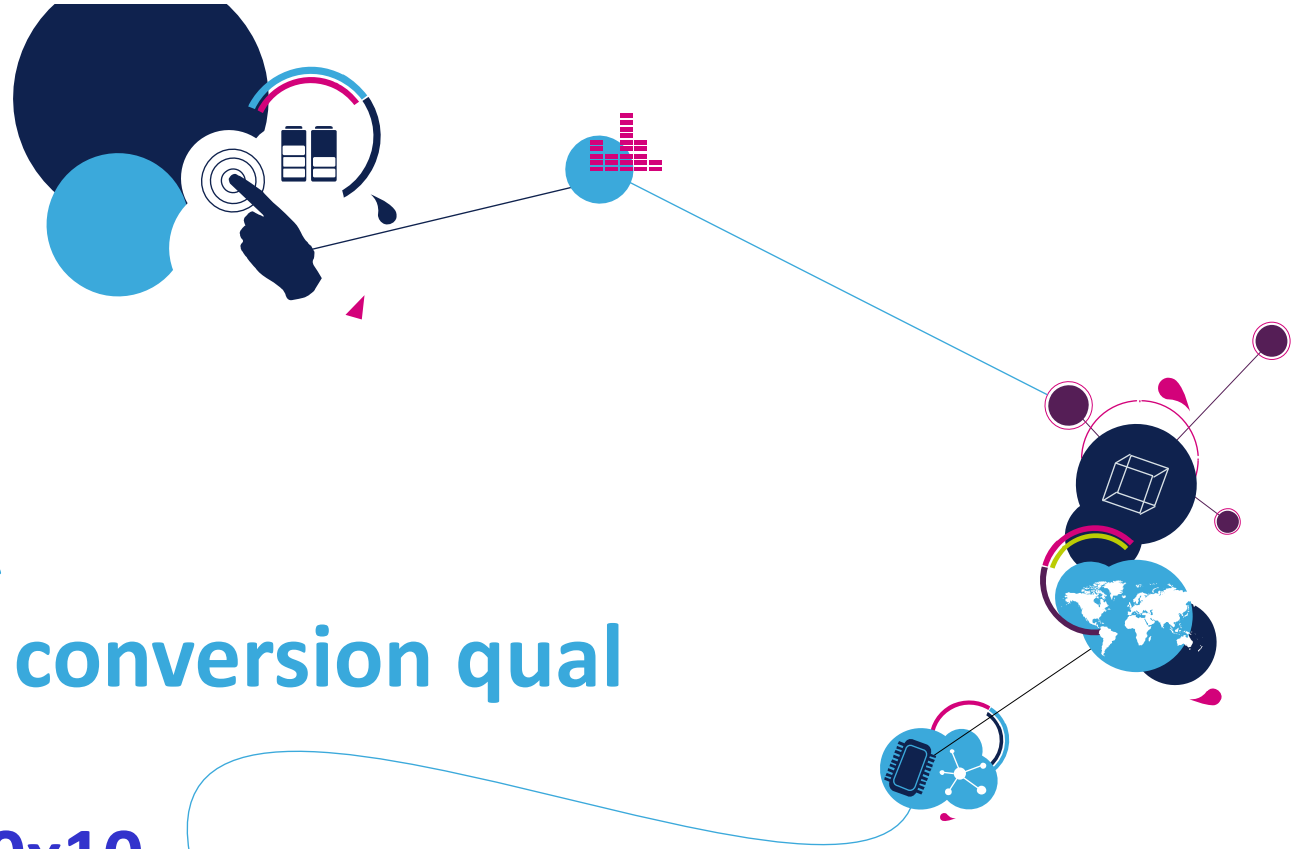
Current Bill of Material	
ITEM	MATERIAL
WIRE	Copper D1.2 Mils
WIRE	Copper D2 Mils
RESIN	SUMITOMO EME G700LS
GLUE	LOCTITE ABLESTIK QMI9507 – 2C2
FRAME	MATRIX FRAME PPF plating



New Bill of Material	
ITEM	MATERIAL
WIRE	Copper D1.2 Mils
WIRE	Copper D2 Mils
RESIN	SUMITOMO EME-G700LS
GLUE	LOCTITE ABLESTIK QMI9507 – 2C2
FRAME	HD FRAME PPF plating

Leadframes Comparison

ITEM	EXISTING	NEW
Frame size	215.7 x 57 mm	250.0 x 70 mm
Units/Strip	30	60
Pad size	6.9 x 4.5	6.9 x 4.5
Inner Lead Plating	RT UPG3uPPF	RT UPG3uPPF
Frame base material	Copper	Copper
Frame process	Stamped	Stamped
Plating	RT UPG3uPPF	RT UPG3uPPF
Leadframe Supplier	HDS	HDS



L99PCU2F-TR

Matrix to HD conversion qual

UAN9 – LQFP 10x10

Updated : 22nd May 2019

Prepared By: Muar BEM&T QA Reliability Laboratory



L99PCU2F-TR

Matrix to HD conversion

Note: Sampling 241 pcs/lot – taken from tested good units after FT.

Reliability Test Status									
No	Test Name	Prec	Condition/ Method	Steps	Steps	Fails/SS			Notes
						998440GD01	998440GDRR	998440GDRQ	
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	1000 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	
				2000 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	



- Sample size at Preconditioning step are split for TC and PPT tests
- Parts used for the CSAM during preconditioning are split for TC, PPT and HTS tests

L99PCU2F-TR

Matrix to HD conversion

Note: Sampling 241 pcs/lot – taken from tested good units after FT.

Reliability Test Status									
No	Test Name	Prec	Condition/ Method	Steps	Steps	Fails/SS			Notes
						998440GD01	998440GD02	998440GD03	
4	HTS	No	TA = 150°C	1000 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	
				2000 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	