


# PRODUCT / PROCESS CHANGE NOTIFICATION

## 1. PCN basic data

1.1 Company		STMicroelectronics International N.V
1.2 PCN No.	ADG/20/12290	
1.3 Title of PCN	PowerFlat™ 8L 5x6: LeadFrame Migration from Etched to Stamped (Auto and Industrial products - replace previous PCN 10736)	
1.4 Product Category	see list	
1.5 Issue date	2020-09-09	

## 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
2.1.2 Marketing Manager	Michele SCUTO
2.1.3 Quality Manager	Vincenzo MILITANO

## 3. Change

3.1 Category	3.2 Type of change	3.3 Manufacturing Location
Materials	New direct material part number r (same supplier, different supplier or new supplier),(Lead frame dimensions)	ST Assembly Plant Shenzhen - China

## 4. Description of change

	Old	New
4.1 Description	Leadframe Etched Supplier manufacturing Location Japan	Leadframe Stamped Supplier manufacturing Location Malaysia
4.2 Anticipated Impact on form,fit, function, quality, reliability or processability?	Form impacted as described in the communication attachment	

## 5. Reason / motivation for change

5.1 Motivation	Malasian Supplier SH Electronics (MSHE) has released a PTN about PowerFlat™ 8L 5x6 matrix frame in order to armonize their production flow
5.2 Customer Benefit	SERVICE CONTINUITY

## 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	2020-08-03
7.2 Intended start of delivery	2020-11-02
7.3 Qualification sample available?	Upon Request

## 8. Qualification / Validation

8.1 Description	12290 Validation.pdf		
8.2 Qualification report and qualification results	Available (see attachment)	Issue Date	2020-09-09

9. Attachments (additional documentations)		
12290 Public product.pdf 12290 Validation.pdf 12290 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
	STL100N10F7	
	STL12P6F6	
	STL20NF06LAG	
	STL30N10F7	
	STL40N75LF3	
	STL45N10F7AG	
	STL45P3LLH6	
	STL58N3LLH5	
	STL60N10F7	
	STL7N6LF3	
	STL86N3LLH6AG	
	STL8N10LF3	
	STL8N6LF6AG	
	STL92N10F7AG	

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## PRODUCT/PROCESS CHANGE NOTIFICATION

**SUBJECT**      **PowerFlat™ 8L 5x6: LeadFrame Migration from Etched to Stamped (Auto and Industrial products - replace previous PCN 10736)**

<b>IMPACTED PRODUCTS</b>	PowerFlat™ 8L 5x6 see list
<b>MANUFACTURING STEP</b>	Assembly
<b>INVOLVED PLANT</b>	ST Shenzhen - China
<b>CHANGE REASON</b>	Malesian Supplier SH Electronics (MSHE) has released a PTN about PowerFlat™ 8L 5x6 matrix frame in order to armonize their production flow
<b>CHANGE DESCRIPTION</b>	Migration of PowerFlat™ 8L 5x6 production from MSHE (Japan) etched matrix frame to MSHE (Malaysia) Stamped one
<b>VALIDATION</b>	Enclosed to this communication
<b>REPORTS</b>	12290 Validation.pdf



## 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 :** PowerFlat™ 8L 5x6: LeadFrame Migration from Etched to Stamped (Auto and Industrial products - replace previous PCN 10736)

**PCN Reference :** ADG/20/12290

**Subject :** Public Products List

Dear Customer,

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

STL12P6F6	STL8N6LF6AG	STL58N3LLH5
STL19N3LLH6AG	STL30N10F7	STL8N10LF3
STL86N3LLH6AG	STL100N10F7	STL60N10F7
STL40N75LF3	STL7N6LF3	STL45N10F7AG
STL45P3LLH6	STL92N10F7AG	



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# Migration from PowerFlat™ 8L 5x6 matrix etched frame to Stamped

Slide 3-4 – Change description

Slide 5-9 – Existing frame Vs new one

Slide 10 – ZVEI Guidelines

Slide 11 – Selected Test Vehicle

Slide 12 – Test vehicle reliability program and qualification data

Slide 13 – Conclusion



## Change description

Malesian SH Electronics (MSHE) has released a PTN about PowerFlat™ 8L 5x6 matrix frame in order to armonize their production flow. Here below are reported the introduced changes :

	CURRENT		NEW	
Supplier	MSHE		MSHE	
Manufacturing process	Plating + Etching	L/F cutting	Plating + Stamping	L/F cutting
Manufacturing location	Japan	Malaysia	Malaysia	Malaysia
Raw material	C194		C194	

- ST assembly production plant : Shenzhen, China

# Change description

Impacted products:

Commercial products :

- STL8N6LF6AG
- STL58N3LLH5
- STL19N3LLH6AG
- STL7N6LF3
- STL8N10LF3
- STL45N10F7AG
- STL92N10F7AG
- STL86N3LLH6AG
- STL20NF06LAG
- STL100N10F7
- STL100N10F7
- STL12P6F6
- STL30N10F7
- STL40N75LF3
- STL45P3LLH6
- STL60N10F7

ST silicon line

7L62A1  
5H3OA1  
6L30A1  
4L62A1  
4L0CA1  
OD0BA1  
OD0EA1  
6L3CA1  
EL6PA1  
OD0F01  
D0F001  
6P6A01  
OD0201  
4L7401  
6B3P01  
OD0C01

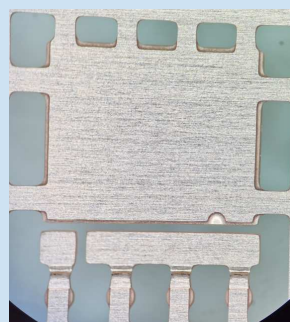
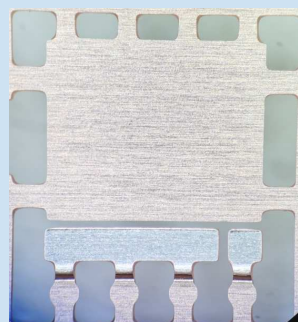
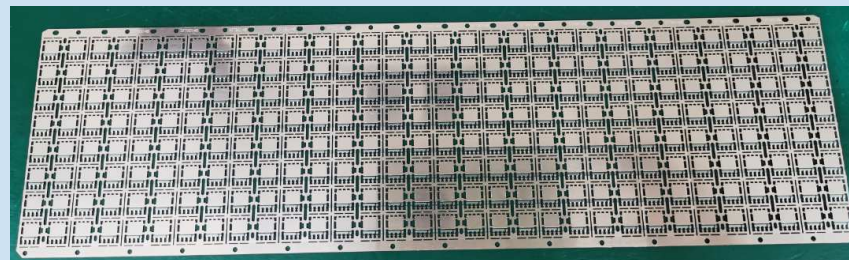
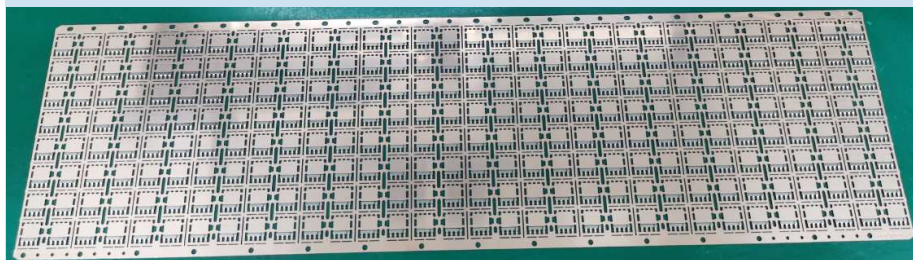
ST Confidential

# FRAME PFLAT 8L 5x6 Ve1 OpAW SeINi/NiP

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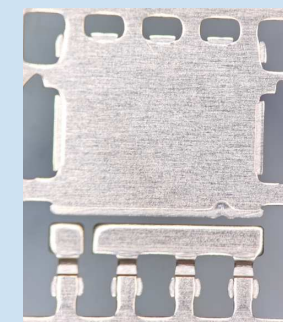
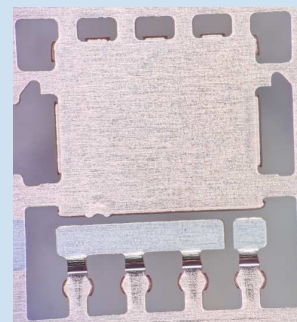
5FT40060 ( etched )

5FT80146 ( stamped )



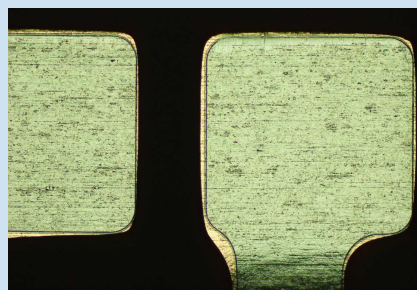
Front side

Back side



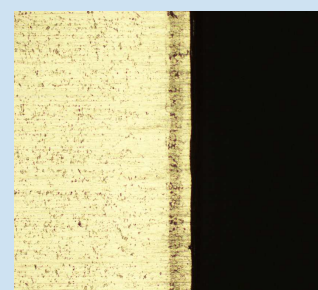
Front side

Back side



Die pad edge

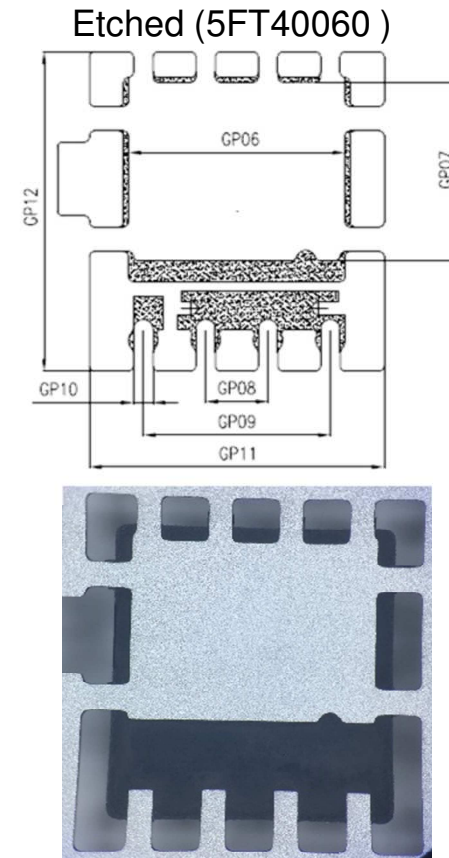
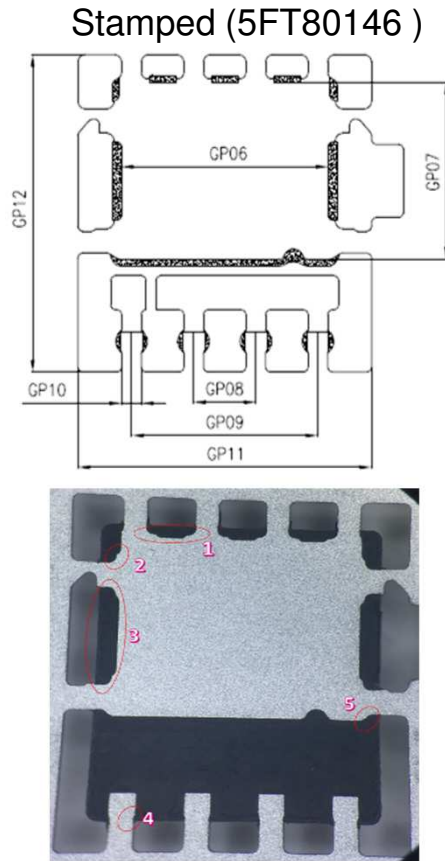
Lead



Die pad edge

Lead

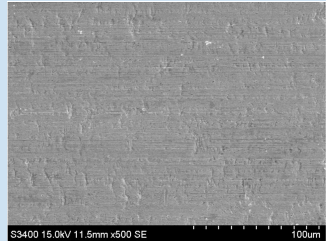
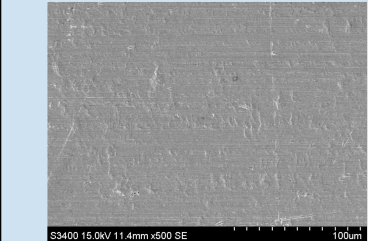
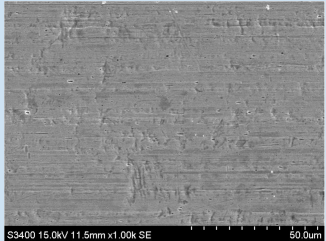
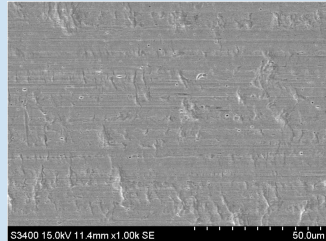
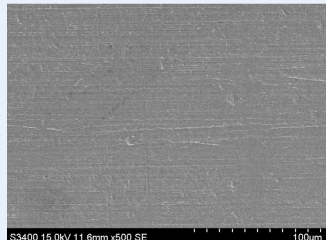
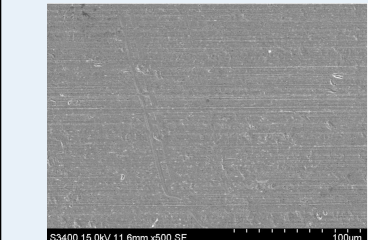
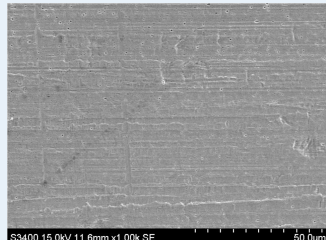
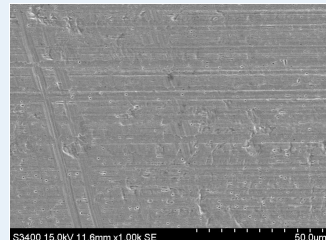
# Stamped vs Etched Leadframe Comparison 6





# Existing frame vs New one 7

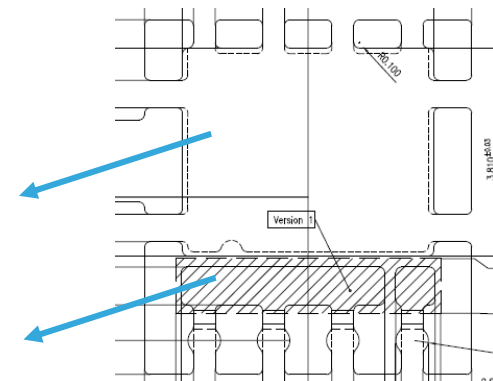
SEM Image

LF	Lead tip 500X	On die pad 500X	Lead tip 1000X	On die pad 1000X
5FT40060 etched				
5FT80146 stamped				

Note:  
Plating Type = Sel Ni/NiP

On die pad

Lead Tip



# Existing frame vs New one

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Lead Frame Comparison			
	Existing Frame	New Frame	Comparison
LEADFRAME SUPPLIER	MSHE	MSHE	Same
LOCATION	JAPAN	MALAYSIA	New
LEADFRAME MATERIAL	Hitachi C194	Hitachi C194	Same
LEADFRAME TYPE	Etched	Stamped	New
PLATING TYPE	Sel Ni/NiP	Sel Ni/NiP	Same
LEADFRAME THICKNESS	0.254 mm	0.254 mm	Same
DIE PAD SIZE	4.41 x 3.63 mm	4.22 X 3.625 mm	Smaller

# BOM comparison

## Product Line: 6L3C

Current Bill of Material	
ITEM	MATERIAL
WIRE	Al D3 Mils
RIBBON	Al 30x4mils
RESIN	SUMITOMO EME-E670CA
PREFORM	Pb/Ag/Sn 95.5/2.5/2
FRAME	PFLAT 8L 5x6 Ve1 SeINi/NiP <b>Etch</b>



New Bill of Material	
ITEM	MATERIAL
WIRE	Al D3 Mils
RIBBON	Al 30x4mils
RESIN	SUMITOMO EME-E670CA
PREFORM	Pb/Ag/Sn 95.5/2.5/2
FRAME	PFLAT 8L 5x6 Ve1 SeINi/NiP <b>Stamp</b>

# Stamped frame on P-FLAT 8L 5x6

## ZVEI Guidelines (AEC-Q101 Rev D)

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- According to ZVEI recommendations, the notification is required.

Assessment of impact on Supply Chain regarding following aspects - contractual agreements - technical interface of processability/manufacturability of customer - form, fit, function, quality performance, reliability		Remaining risks on Supply Chain?	
ID	Type of change	No	Yes
SBM-PA-03	Change in leadframe dimensions	P	P
SBM-PA-14	Change in process technology (e.g. sawing, die attach, bonding, molding, plating, trim and form, lead frame preparation)	--	P

Extract from ZVEI **ZVEI:**  
Die Elektroindustrie



# Selected Test Vehicles

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Lot #	Commercial product	Product line	Wafer fab
1	STL120N4F6AG	6D4F	Catania 8"
2	STL120N4F6AG	6D4F	Catania 8"
3	STL86N3LLH6AG	6L3C	HHGrace

# Qualification program and Reliability results

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Stress (Abrv)	Std ref.	Conditions	Sample Size (S.S)	Steps	Failure/SS		
					Lot 1	Lot 2	Lot 3
<b>TEST</b>	User specification	All qualification parts tested per the requirements of the appropriate device specification.			462	462	462
<b>External visual</b>	JESD22 B-101	All devices submitted for testing			462	462	462
<b>Package oriented tests</b>							
<b>Pre-conditioning</b>	JESD22 A-113	Dryng 24H @ 125°C Store 168H @ TA=85°C,RH=85% IR Reflow @ 260°C 3 times	All devices to be subjected to H3TRB, TC, AC, IOL	FINAL	Pass	Pass	Pass
<b>TC</b>	JESD22 A-104	TA=-55°C TO 150°C	231	1000cy	0/77	0/77	0/77
<b>TCHT</b>	JESD22 A-104 Appendix 6	125°C TEST after TC	231		0/77	0/77	0/77
<b>TCDT</b>		decap and wire pull for parts with internal bond wire sizes 5 mil diameter and less	15		0/5	0/5	0/5
		100% C-SAM inspection after TC	231		pass	pass	pass
<b>AC</b>	JESD22 A-102	TA=121°C ; PA=2ATM	231	96H	0/77	0/77	0/77
<b>H3TRB</b>	JESD22 A-101	TA=85°C ; RH=85% BIAS= 32V	154	1000H	0/77	0/77	
		TA=85°C ; RH=85% BIAS= 24V	77				0/77
<b>IOL</b>	MIL-STD-750 Method 1037	$\Delta T_j \geq 100^\circ\text{C}$	231	15Kcy	0/77	0/77	0/77
<b>D.P.A.</b>	AEC-Q101-004 Section 4	Devices after H3TRB - TC	8		0/2 0/2		0/2 0/2
<b>Solderability</b>	JESD22B-102		20		0/10		0/10
<b>Physical Dimension</b>	JESD22 B-100		60		0/30		0/30
<b>Thermal Resistance</b>	JESD24-3, 24-4, 24-6 as appropriate		20		0/10		0/10
<b>Die Shear</b>	MIL-STD-750 Method 2017		10		0/5		0/5

- The whole Qualification program was completed and all reliability stress tests shown positive results. Neither functional nor parametric rejects were detected at final electrical testing.
- Parameter drift analysis, performed on samples submitted to die and package oriented test showed a good stability on the main electrical monitored parameters. Package oriented tests have not put in evidence any critical area.

The migration of PowerFlat™ 8L 5x6 production from MSHE (Japan) etched matrix frame to MSHE (Malaysia) Stamped one will assure :

- The same previous package performances, as demonstrated by the qualification data provided in the previous pages.