PRODUCT / PROCESS CHANGE NOTIFICATION

1. PCN basic data	
1.1 Company	STMicroelectronics International N.V
1.2 PCN No.	ADG/22/13681
1.3 Title of PCN	HPAK 7L (VIPower): New Leadframe Introduction (MITSUI)
1.4 Product Category	see list
1.5 Issue date	2022-09-23

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,Stello Matteo BILLE'
2.1.2 Marketing Manager	Leonardo Agatino MICCOLI
2.1.3 Quality Manager	Daniela FAZIO

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 Shenzhen - China

4. Description of change		
	Old	New
4.1 Description	Shuen Der Industry (SDI) with SelNi/Au spot on leads	Mitsui (MHT) with SelNi-NiP/Ag spot on leads
4.2 Anticipated Impact on form,fit, function, quality, reliability or processability?	No Impact	

5. Reason / motivation for change	
5.1 Motivation	Service Continuity
5.2 Customer Benefit	SERVICE CONTINUITY

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

7. Timing / schedule	
7.1 Date of qualification results	2022-09-21
7.2 Intended start of delivery	2023-01-01
7.3 Qualification sample available?	Upon Request

8. Qualification / Validation			
8.1 Description	13681 Validation.pdf		
8.2 Qualification report and qualification results	Available (see attachment)	Issue Date	2022-09-23

9. Attachments (additional documentations)

13681 Public product.pdf
13681 Validation.pdf
13681 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
	VN5E010AHTR-E	
	VN5E010MHTR-E	
	VN5E016AFHTR-E	
	VN5E016AHTR-E	
	VN5R003HTR-E	
	VN5T016AHTR-E	

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PRODUCT/PROCESS CHANGE NOTIFICATION

TITLE	**HPAK 7L (VIPower): New Leadframe Introduction (MITSUI)**
IMPACTED PRODUCTS	VIPower Products housed in HPAK 7L frame option with SelNi/Au spot on leads See below list
MANUFACT. STEP	Assembly
INVOLVED PLANT	ST Shenzhen Plant (China)
CHANGE REASON	Service Continuity
CHANGE DESCRIPTION	Current lead frame from **S**huen **D**er **I**ndustry (SDI) 7 leads HPAK, frame options with **SelNi/Au** spot on leads, will be replaced by Mitsui (MHT) 7 leads HPAK frame option with **SelNi-NiP/Ag** spot on leads Additional details below
TRACEABILITY	Dedicated Finished Good Codes (internal part number)
VALIDATION	Enclosed to this communication 13681 Validation.pdf

HPAK 7L (VIPower): MITSUI Leadframe Qualification

Agenda

3 Change Description

4 ZVEI Guidelines

5 Bill Of Material Comparison

6/10 Raw Material Change

11 Selected Test Vehicles

12 Impacted products list

13 Conclusions

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Change description

- Aim of this document is to describe the qualification activity performed to convert the Shuen Der Industry (namely SDI) 7 leads HPak frame options with SelNi/Au spot on leads to Mitsui 7L HPak (mentioned as MHT) ones with SelNi-NiP/Ag spot on leads.
- The HPak package is assembled in Shenzhen plant.
- Detailed qualification activity has been performed in order to qualify the new Mitsui HPak lead frame with SelNi-NiP/Ag spot on leads.
- This report shows the positive results achieved. The new materials are ensuring the same quality and electrical characteristics as the current products.
- All reliability tests have been completed with positive results.

ZVEI Guidelines

- According to ZVEI recommendations, the notification is required.

	ID	Type of change	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 within Supply Chain?		Understanding of semiconductors experts	Examples to explain	A: Application level B: Boardlevel C: Component level *: Not relevant for qualification matrix
				No	Yes			
x	SEM-PA-04	Change of lead frame finishing material / area (internal)		P	P	Change of surface material of die attach pad and second bond area (e.g. influence in adhesion to mold compound, wedge bond reliability)	e. g. change from Ag flash to NiP protection layer e. g. change from Ag spot to Au spot e. g. increase of silver plating area	C
x	SEM-PA-16	Change of direct material supplier		--	P	Change of suppliers for direct materials which are used in assembly process (BOM). **(--):** If change does not influence the integrity of the final product. **(P):** If impact on product integrity is anticipated.	**(--):** e.g. change of wire material supplier. **(P):** e.g. change to new mold compound supplier e.g. additional leadframe supplier with specific leadframe manufacturing technology	C

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Bill Of Material Comparison

Actual Bill of Material	
ITEM	**MATERIAL**
WIRE	1.3 MILS Au
WIRE	10 MILS Al
FRAME	FRAME HPAK 7L SelNi/Au spot on leads
DIE ATTACH	TAPE ADWILL LE-5000
DIE ATTACH	PREFORM Pb/Ag/Sn 95.5/2.5/2
MOLD COMPOUND	RESIN SUMITOMO EME7026

New Bill of Material	
ITEM	**MATERIAL**
WIRE	1.3 MILS Au
WIRE	10 MILS Al
FRAME	FRAME HPAK 7L SelNi-NiP/Ag spot on leads
DIE ATTACH	TAPE ADWILL LE-5000
DIE ATTACH	PREFORM Pb/Ag/Sn 95.5/2.5/2
MOLD COMPOUND	RESIN SUMITOMO EME7026

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Raw Material Change

- Same copper type with different copper suppliers
- Similar properties
- Both already qualified in ST Shenzhen

	Mass Production		New
Lead Frame Supplier	Shuen Der Industry (namely SDI)		Mitsui (namely MHT)
Lead Frame Configuration	Options A&B lead frames		Options A&B lead frames
Raw Material Type	K80	HCL-02Z	HCL-02Z
Copper Supplier	Wieland	Hitachi	Hitachi
Expansion Coefficient 10-6/°C	17	17.7	17.7
Thermal conductivity W/(m.K)	350	373	373
Electrical conductivity %IACS	91	90 Minimum	90 Minimum
Tensile strength N/mm²	360~440	315 Minimum	315 Minimum
Vicker Hardness	100~130	110~130	110~130

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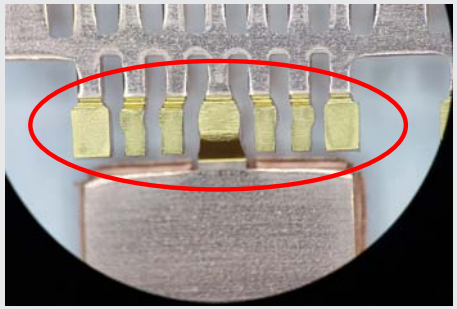
Frame Option A - Current Leadframe vs new one

SDI (CURRENT)	Mitsui (NEW)
Matrix view 	Matrix view 
Leads detail 	Leads detail 
SelNi-Au spot plating	**SelNi-NiP/Ag spot post-plating**

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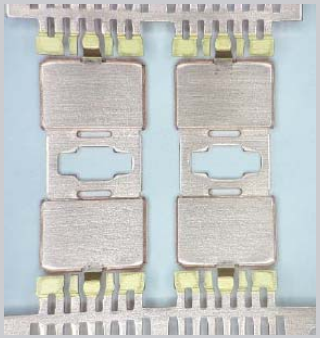
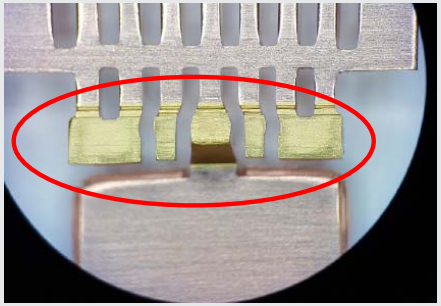
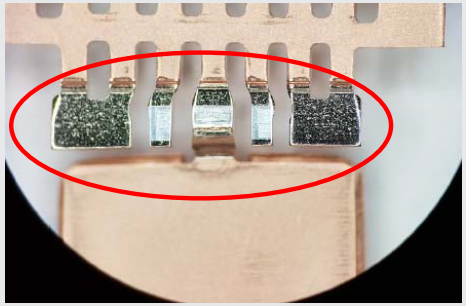
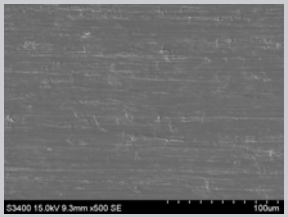
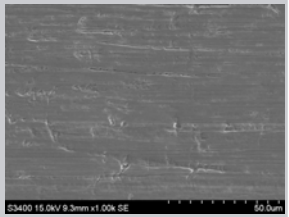
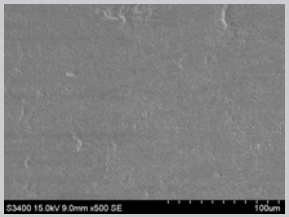
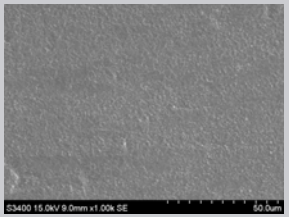
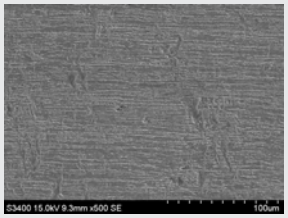
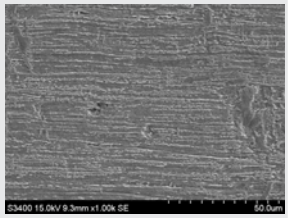
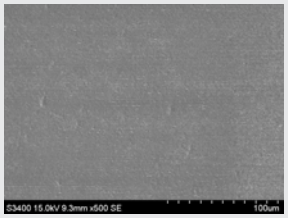
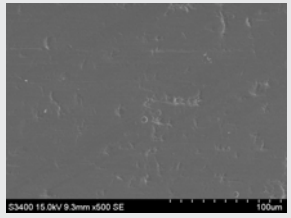
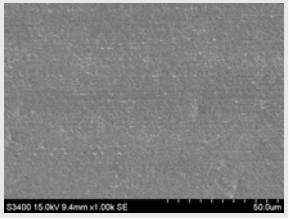
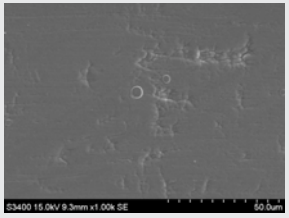
Frame Option B - Current Leadframe vs new one

SDI (CURRENT)	Mitsui (NEW)
Matrix view 	Matrix view 
Leads detail 	Leads detail 
SelNi-Au spot plating	SelNi-NiP/Ag spot post-plating

Option A Leadframe (for TV VH12)

LF PN	Die Pad 500x	Die Pad 1000x	Lead tip 500x		Lead tip 1000x	
SDI						
Mitsui (new)			 SelNiAg	 SelNi-NiP	 SelNiAg	 SelNi-NiP

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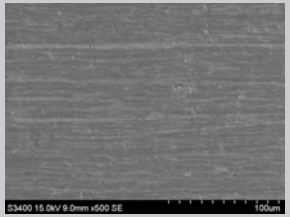
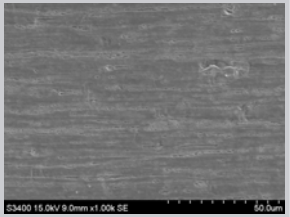
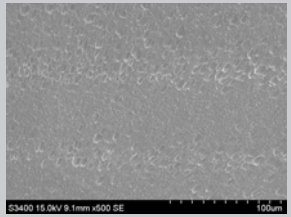
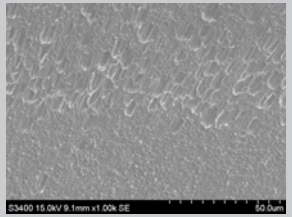
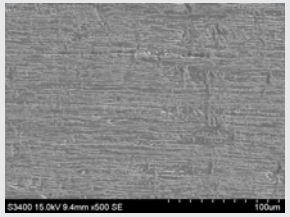
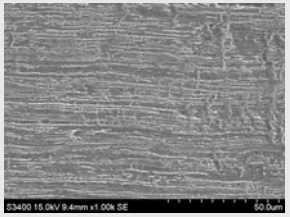
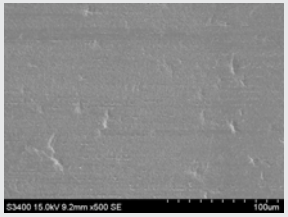
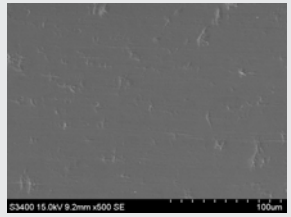
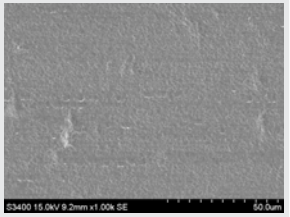
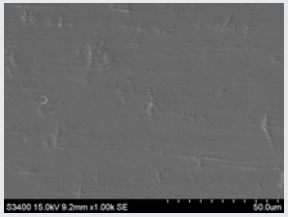
Option B Leadframe (for TV VH31)

LF PN	Die Pad 500x	Die Pad 1000x	Lead tip 500x		Lead tip 1000x	
SDI						
Mitsui (new)			 SelNiAg	 SelNi-NiP	 SelNiAg	 SelNi-NiP

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Selected Test Vehicles

- VN5E010AFHTR-E (Silicon Line VH1203)
- VN5R003HTR-E (Silicon Line VH3103)

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Impacted product list

Commercial products:	ST silicon line
- VN5E010AFHTR-E	VH1203
- VN5E010AHTR-E	VH1203
- VN5E010MHTR-E	VH2703
- VN5E010NAHTR-E	VH2703
- VN5E016AFHTR-E	VNR803
- VN5E016AHTR-E	VNR803
- VN5E016LKHTR-E	VNR803
- VN5R003HTR-E	VH3103
- VN5T016AHTR-E	VH3603

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Conclusions

- Detailed qualification activity has been performed in order to qualify the 7L HPak frame with SelNi-NiP/Ag spot on leads.
- All reliability tests (AEC-Q100 requirement) have been completed with positive results.
- Neither functional nor parametric rejects were detected at final electrical test.
- This report shows the positive results achieved. The new materials are ensuring the same quality and electrical characteristics as the current products assembled in HPak 7L.

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 : HPAK 7L (VIPower): New Leadframe Introduction (MITSUI)

PCN Reference : ADG/22/13681

Subject : Public Products List

Dear Customer,

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

VN5E016AFHTR-E	VN5E010AHTR-E	VN5E010MHTR-E
VN5E010AFHTR-E	VN5R003HTR-E	VN5E016AHTR-E
VN5T016AHTR-E		

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