

PRODUCT / PROCESS CHANGE NOTIFICATION

1. PCN basic data

1.1 Company	 STMicroelectronics International N.V
1.2 PCN No.	ADG/22/13815
1.3 Title of PCN	VIpower Products (SO-8): Assembly and Final Test Transfer to Bouskoura
1.4 Product Category	see list
1.5 Issue date	2022-12-21

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',Carmelo PISTRITTO
2.1.2 Marketing Manager	Leonardo Agatino MICCOLI,Rosario RUGGERI
2.1.3 Quality Manager	Daniela FAZIO

3. Change

3.1 Category	3.2 Type of change	3.3 Manufacturing Location
Transfer	Line transfer for a full process or process brick (process step, control plan, recipes) from one site to another site: Assembly site (SOP 2617)	ST Bouskoura - Morocco receiving Plant

4. Description of change

	Old	New
4.1 Description	Assembly and Final Test in Shenzhen	Assembly and Final Test in Bouskoura
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
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7. Timing / schedule

7.1 Date of qualification results	2022-12-05
7.2 Intended start of delivery	2023-03-31
7.3 Qualification sample available?	Upon Request

8. Qualification / Validation

8.1 Description	13815 Validation.pdf		
8.2 Qualification report and qualification results	Available (see attachment)	Issue Date	2022-12-21

9. Attachments (additional documentations)

13815 Public product.pdf 13815 Validation.pdf 13815 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
	VN5160STR-E	
	VN5E160ASTR-E	
	VN5E160MSTR-E	
	VN5E160STR-E	
	VN7040ASTR	
	VN7050ASTR	
	VN7140ASTR	
	VNS1NV04DPTR-E	
	VNS1NV04PTR-E	
	VNS3NV04DPTR-E	
	VNS3NV04PTR-E	
	VNS7NV04PTR-E	
	VNL5030S5TR-E	
	VNL5050S5TR-E	
	VNL5090S5TR-E	
	VNL5160S5TR-E	
	VNL5300S5TR-E	
	VNLD5090TR-E	
	VNLD5160TR-E	
	VNLD5300TR-E	
	VNS14NV04PTR-E	

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PRODUCT/PROCESS CHANGE NOTIFICATION

TITLE	VIPower Products (SO-8): Assembly and Final Test Transfer to Bouskoura
IMPACTED PRODUCTS	VIPower products housed in SO-8 package. See enclosed list.
MANUFACT. STEP	Assembly and Final Testing.
INVOLVED PLANT	Recipient: ST Shenzhen Plant (China) Destination: ST Bouskoura Plant (Morocco)
CHANGE REASON	ST Shenzhen SO8 package line closure June 30, 2023: Service and Capacity improvement for business continuity. Manufacturing process optimization.
CHANGE DESCRIPTION	Transfer of package assembly and Final testing from current Shenzhen (China) to Bouskoura (Morocco) Plant. Package Bill of Material is subject to upgrade as described in the following document.
TRACEABILITY	Dedicated Finished Good code (internal part number).
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-18 Move all or parts of production to a different assembly site  SEM-TF-01 Move of all or part of electrical wafer test and/or final test to a different test site See following document for details and attached qualification report.
CURRENT PRODUCTS	Replaced by new version featuring new Plant and upgraded package
REPORTS	Qualification performed on Test Vehicles enclosed to this communication



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VIPower® products in SO-8 package: Assembly and Final Test Transfer to Bouskoura

Agenda

3 Change Description

16 Product lines impacted

5 Lead Frame Options

18 Conclusions

10 Bill Of Material Comparison

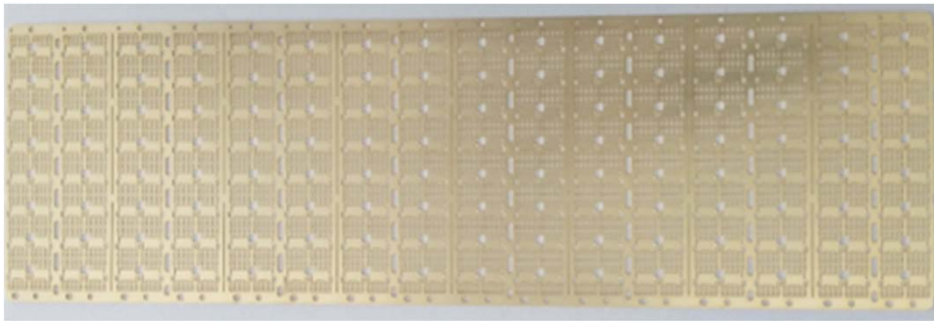
15 ZVEI Guidelines

Change description

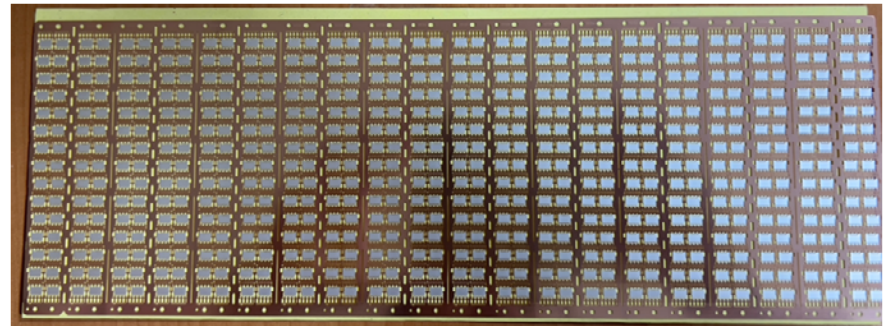
- Aim of this document is to describe the activity performed to qualify the VIPower® products assembled in SO-8 package with the **SuperSuperHighDensity** Lead Frame in Bouskoura ST plant.
- The new Lead Frame material **SuperSuperHighDensity** ensure the same quality and electrical characteristics the current products processed in Shenzhen ST plant with the **HighDensity** Lead Frame.
- All reliability tests have been completed with positive results.

SO8 Lead Frame Density comparison: **High Density** vs **Super Super High Density**

- **256** Units (8 rows, 32 columns) for each Leed Frame **High Density** in Shenzhen plant

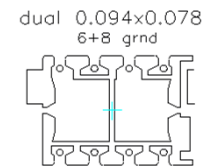
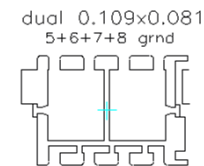
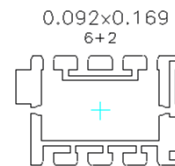
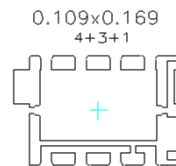


- **600** Units (15 rows, 40 columns) for each Leed Frame **Super Super High Density** in Bouskoura ST plant.



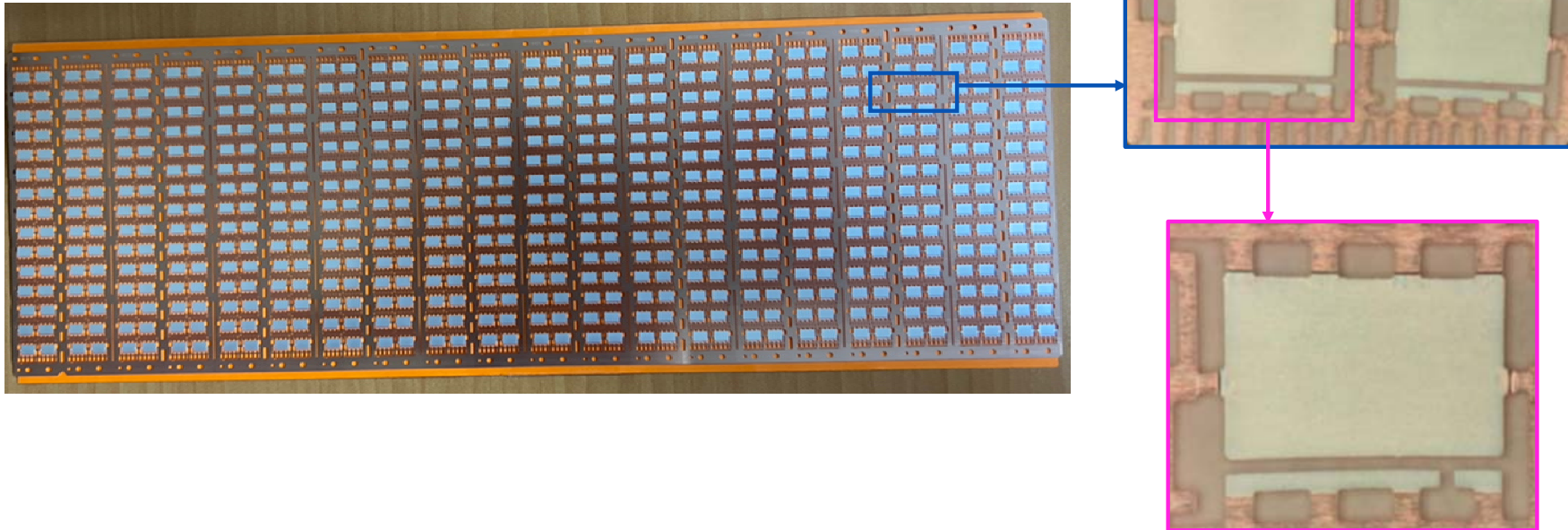
SO8 SSHD Lead Frame option

SO8 Lead Frame Options

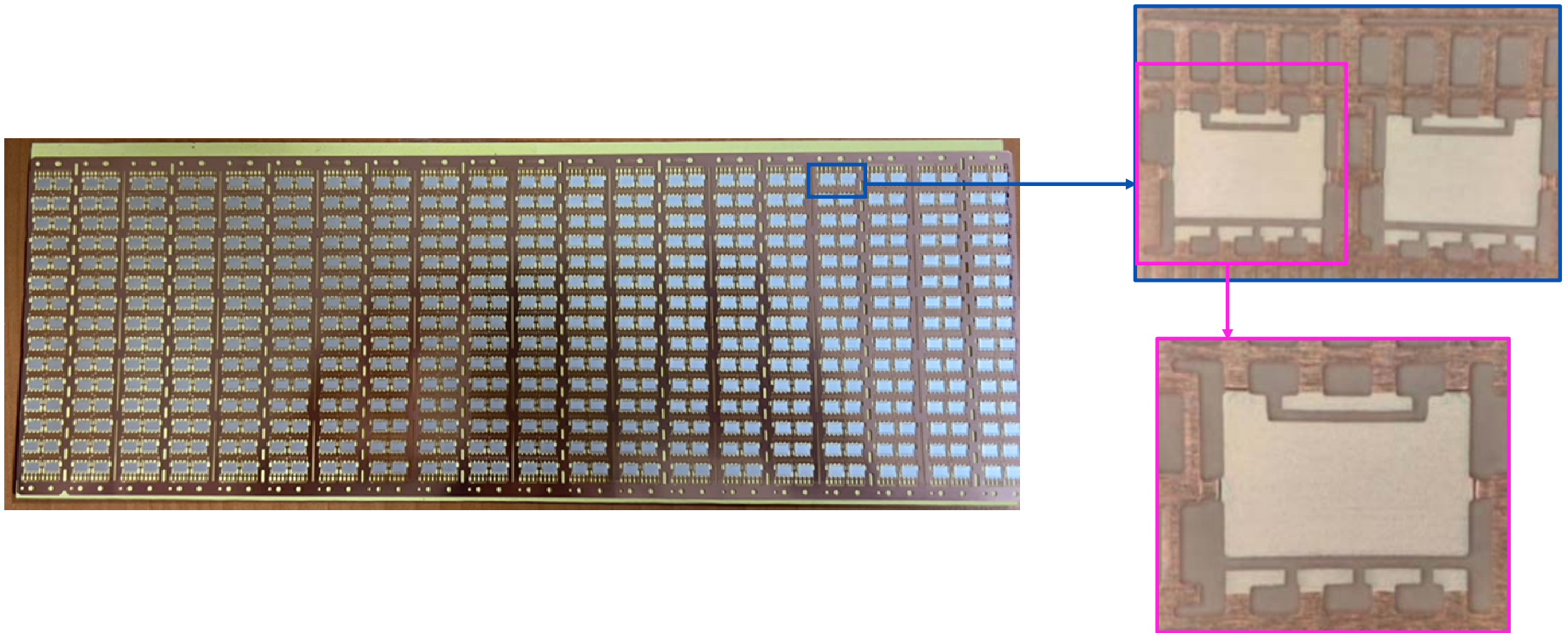


Leadframe PN	FRAME SO 8L 109x169 SSHD 600u OpH SpAg	FRAME SO 8L 92x169 6+2 SSHD 600uOpK SpAg	FRAME SO 8L 2x81x109 SSHD 600u OpJ SpAg	FRAME SO 8L 2x78x94 SSHD 600u OpI SpAg
High Density in Shenzhen ST plant	OPT H	OPT K	OPT J	OPT I
	PPF	PPF	PPF	PPF
Super Super High Density in Bouskoura ST plant	OPT H	OPT K	OPT J	OPT I
	Spag	Spag	Spag	Spag

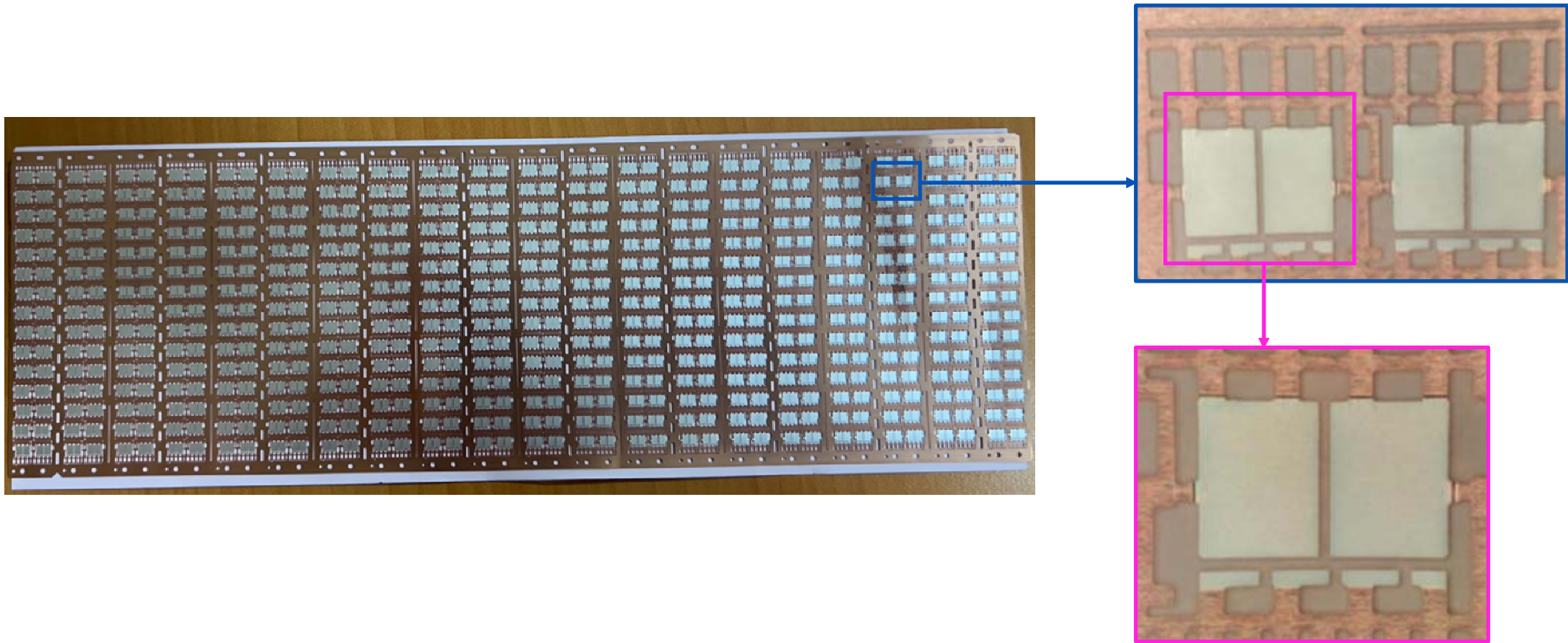
FRAME SO 8L 109x169 SSHD 600u OpH SpAg



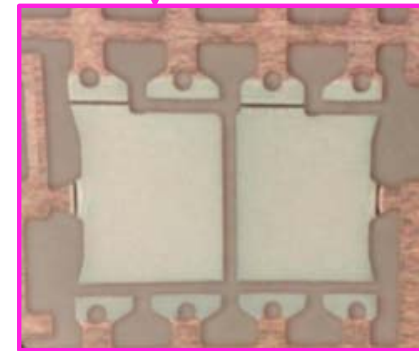
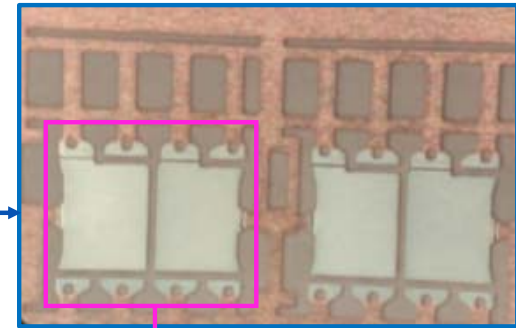
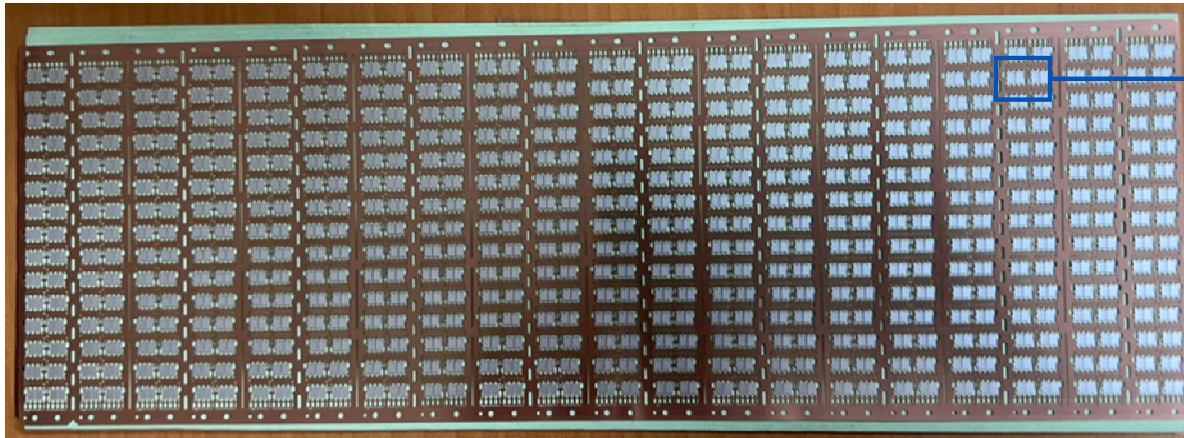
FRAME SO 8L 92x169 6+2 SSHD 600uOpK SpAg



FRAME SO 8L 2x81x109 SSHD 600u OpJ SpAg



FRAME SO 8L 2x78x94 SSHD 600u OpI SpAg



Test Vehicle Product VN7040ASTR (XV14 product line)

Bill Of Material Comparison

- Test Vehicle Product
 - SO 08 STRIP SINGLE ISLAND package CP: VN7040ASTR (Silicon Line XV1403)

Actual Bill of Material in SHENZHEN plant	
ITEM	MATERIAL
WIRE	WIRE Cu D2 BL40-55g EL15-25%
WIRE	WIRE Cu TCA1 D1.0 B6.8-14.5 E6-18
FRAME	SO 8L 169x92 Mtx HD OpK NiThPdAgAu
DIE ATTACH	GLUE LOCTITE ABLESTIK QMI95072A1
MOLD COMPOUND	RESIN SUMITOMO EME-G700KC



Actual Bill of Material in BOUSKOURA plant	
ITEM	MATERIAL
WIRE	WIRE Cu D2 BL40-55g EL15-25%
WIRE	WIRE Cu D1.0 BL6-12g EL8-16% Sp2x1
FRAME	SO 8L 92x169 6+2 SSHD 600uOpK SpAg
DIE ATTACH	GLUE LOCTITE ABLESTIK QMI95072A1
MOLD COMPOUND	RESIN SUMITOMO EME-G700KC

Test Vehicle Product VN5160STR-E (VNJ5 product line)

Bill Of Material Comparison

- Test Vehicle Product
 - SO 08 STRIP SINGLE ISLAND package CP: VN5160STR-E (Silicon Line VNJ503)

Actual Bill of Material in SHENZHEN plant	
ITEM	MATERIAL
WIRE	WIRE Cu D2 BL40-55g EL15-25%
WIRE	WIRE Au D1.3 BL>12g EL4-8% spF
FRAME	SO 8L 169x92 Mtx HD OpK NiThPdAgAu
DIE ATTACH	GLUE LOCTITE ABLESTIK QMI95072A1
MOLD COMPOUND	RESIN SUMITOMO EME-G700KC



Actual Bill of Material in BOUSKOURA plant	
ITEM	MATERIAL
WIRE	WIRE Cu D2 BL40-55g EL15-25%
WIRE	* WIRE Cu D1.0 BL6-12g EL8-16% Sp2x1
FRAME	SO 8L 92x169 6+2 SSHD 600uOpK SpAg
DIE ATTACH	GLUE LOCTITE ABLESTIK QMI95072A1
MOLD COMPOUND	RESIN SUMITOMO EME-G700KC

- Only for this test vehicle have been requested the additional performance tests for wire change material ,from Au to Cu, according to ZVEI (SAM-PA-08, Change of wire bonding).

Test Vehicle Product VNS14NV04PTR-E (VNT8 product line)

Bill Of Material Comparison

- Test Vehicle Product
 - SO 08 STRIP SINGLE ISLAND package CP: VNS3NV04DPTR-E (Silicon Line VNT803)

Actual Bill of Material in SHENZHEN plant	
ITEM	MATERIAL
WIRE	WIRE Cu D2 BL40-55g EL15-25%
FRAME	SO 8L 169x109 Mt HD OpH NiThPdAgAu
DIE ATTACH	GLUE LOCTITE ABLESTIK QMI95072A1
MOLD COMPOUND	RESIN SUMITOMO EME-G700KC



Actual Bill of Material in BOUSKOURA plant	
ITEM	MATERIAL
WIRE	WIRE Cu D2 BL40-55g EL15-25%
FRAME	SO 8L 109x169 SSHD 600u OpH SpAg
DIE ATTACH	GLUE LOCTITE ABLESTIK QMI95072A1
MOLD COMPOUND	RESIN SUMITOMO EME-G700KC

Test Vehicle Product VNS3NV04DPTR-E (VNS6 product line) Bill Of Material Comparison

- Test Vehicle Product
 - SO 08 STRIP DUAL ISLAND package CP: VNS3NV04DPTR-E (Silicon Line VNS603)

Actual Bill of Material in SHENZHEN plant	
ITEM	MATERIAL
WIRE	WIRE Cu D2 BL40-55g EL15-25%
FRAME	SO 8L 2x81x109 MtHD OpJ NiThPdAgAu
DIE ATTACH	GLUE LOCTITE ABLESTIK QMI95072A1
MOLD COMPOUND	RESIN SUMITOMO EME-G700KC



Actual Bill of Material in BOUSKOURA plant	
ITEM	MATERIAL
WIRE	WIRE Cu D2 BL40-55g EL15-25%
FRAME	SO 8L 2x81x109 SSHD 600u OpJ SpAg
DIE ATTACH	GLUE LOCTITE ABLESTIK QMI95072A1
MOLD COMPOUND	RESIN SUMITOMO EME-G700KC

Test Vehicle Product VNLD5090TR-E (VNY9 product line) Bill Of Material Comparison

- Test Vehicle Product
 - SO 08 STRIP DUAL ISLAND package CP: VNLD5090TR-E (Silicon Line VNY903)

Actual Bill of Material in SHENZHEN plant	
ITEM	MATERIAL
WIRE	WIRE Cu D2 BL40-55g EL15-25%
FRAME	SO 8L 2x78x94 Mt HD Opl NiThPdAgAu
DIE ATTACH	GLUE LOCTITE ABLESTIK QMI95072A1
MOLD COMPOUND	RESIN SUMITOMO EME-G700KC



Actual Bill of Material in BOUSKOURA plant	
ITEM	MATERIAL
WIRE	WIRE Cu D2 BL40-55g EL15-25%
FRAME	SO 8L 2x78x94 SSHD 600u Opl SpAg
DIE ATTACH	GLUE LOCTITE ABLESTIK QMI95072A1
MOLD COMPOUND	RESIN SUMITOMO EME-G700KC

ZVEI Guidelines

- 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 within Supply Chain?		Understanding of semiconductors experts	Examples to explain
	ID	Type of change	No	Yes		
		ANY				
		DATA SHEET				
		DESIGN				
		PROCESS - WAFER PRODUCTION				
		BARE DIE				
		PROCESS - ASSEMBLY				
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
x	SEM-PA-18	Move all or parts of production to a different assembly site.	P	P	Assembly transfer or relocation. Includes transfer as well as additional site.	e.g. dual source / fab strategy
		PACKING/SHIPPING				
		EQUIPMENT				
		TEST FLOW				
x	SEM-TF-01	Move of all or part of electrical wafer test and/or final test to a different test site.	P	P	Tester transfer or relocation. Check impact on SEM-AN-01 Includes transfer as well as additional site.	Dual source strategy

VIPower® Product lines impacted (1/2)

VIPower® Product lines (M07 Technology) in SO 08 STRIP SINGLE ISLAND package

- Commercial Product: VN7040ASTR (Silicon Line XV1403) → Test Vehicle
- Commercial Product : VN7050ASTR (Silicon Line XV1003)
- Commercial Product : VN7140ASTR (Silicon Line XV1603)
- Commercial Product : VN7140AS12TR (Silicon Line XV1603)

VIPower® Product lines (M05 Technology) in SO 08 STRIP SINGLE ISLAND package

- Commercial Product : VN5160STR-E (Silicon Line VNJ503) → Test Vehicle
- Commercial Product : VN5E160STR-E (Silicon Line VNQ903)
- Commercial Product : VN5E160ASTR-E (Silicon Line VNT103)
- Commercial Product : VN5E160MSTR-E (Silicon Line VNW103)
- Commercial Product : VNL5160S5TR-E (Silicon Line VNL203)
- Commercial Product : VNL5090S5TR-E (Silicon Line VNY903)
- Commercial Product : VNL5300S5TR-E (Silicon Line VNZ403)
- Commercial Product : VNL5050S5TR-E (Silicon Line VNR103)
- Commercial Product : VNL5030S5TR-E (Silicon Line VNY703)

VIPower® Product lines impacted (2/2)

VIPower® Product lines (M05 Technology) in SO 08 STRIP DUAL ISLAND package

- Commercial Product : VNLD5090TR-E (Silicon Line VNY903) → Test Vehicle
- Commercial Product : VNLD5300TR-E (Silicon Line VNZ403)
- Commercial Product : VNLD5160TR-E (Silicon Line VNL203)

VIPower® Product lines (M03 Technology) in SO 08 STRIP DUAL ISLAND package

- Commercial Product: VNS3NV04DPTR-E (Silicon Line VNS603) → Test Vehicle
- Commercial Product: VNS1NV04DPTR-E (Silicon Line VNL603)

VIPower® Product lines (M03 Technology) in SO 08 STRIP SINGLE ISLAND package

- Commercial Product: VNS14NV04PTR-E (Silicon Line VNT803) → Test Vehicle
- Commercial Product: VNS3NV04PTR-E (Silicon Line VNS603)
- Commercial Product: VNS7NV04PTR-E (Silicon Line VNS203)
- Commercial Product: VNS1NV04PTR-E (Silicon Line VNL603)

Conclusions

- Detailed qualification activity has been performed in order to qualify the VIPower® products assembled in SO-8 package with the **SuperSuperHighDensity** Lead Frame in Bouskoura ST plant.
- All reliability tests have been completed with positive results;
- This report shows the positive results achieved processing the VIPower® products assembled in SO-8 package and the **SuperSuperHighDensity** Lead Frame, ensuring the same quality and electrical characteristics as the current production in Shenzhen ST plant.



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 : VIPower Products (SO-8): Assembly and Final Test Transfer to Bouskoura

PCN Reference : ADG/22/13815

Subject : Public Products List

Dear Customer,

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

VN5E160STR-E	VNS7NV04PTR-E	VNS3NV04PTR-E
VNS3NV04DPTR-E	VNS1NV04PTR-E	VN7040ASTR
VN7140AS12TR	VN7050ASTR	VN7140ASTR
VN5E160MSTR-E	VN5E160ASTR-E	VN5160STR-E
VNS1NV04DPTR-E	VNL5050S5TR-E	VNL5030S5TR-E
VNL5090S5TR-E	VNL5300S5TR-E	VNL5160S5TR-E
VNS14NV04PTR-E	VNLD5160TR-E	VNLD5300TR-E
VNLD5090TR-E		

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