


PRODUCT / PROCESS CHANGE NOTIFICATION

1. PCN basic data

1.1 Company		STMicroelectronics International N.V
1.2 PCN No.	ADG/22/13244	
1.3 Title of PCN	PowerSO-10: Aluminum 10 mils Soft Wire Implementation (ViPower Products)	
1.4 Product Category	see list	
1.5 Issue date	2022-03-09	

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	Mario ASTUTI,Nicola LIPORACE
2.1.2 Marketing Manager	Stello Matteo BILLE',Carmelo PISTRITTO
2.1.3 Quality Manager	Vincenzo MILITANO

3. Change

3.1 Category	3.2 Type of change	3.3 Manufacturing Location
Materials	Same part number of direct materials, same supplier but qualified and used in other ST plant	ST Bouskoura - Morocco

4. Description of change

	Old	New
4.1 Description	10 mils Al wire standard	10 mils Al soft wire
4.2 Anticipated Impact on form,fit, function, quality, reliability or processability?	No Impact	

5. Reason / motivation for change

5.1 Motivation	Quality improvement: the usage of a softer wire ultimately results in a less stressed bonding pad. Material standardization inside the ST assembly plants
5.2 Customer Benefit	QUALITY IMPROVEMENT

6. Marking of parts / traceability of change

6.1 Description	Date Code - Internal Traceability
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7. Timing / schedule

7.1 Date of qualification results	2022-01-28
7.2 Intended start of delivery	2022-05-02
7.3 Qualification sample available?	Upon Request

8. Qualification / Validation

8.1 Description	13244 Validation.pdf		
8.2 Qualification report and qualification results	Available (see attachment)	Issue Date	2022-03-09

9. Attachments (additional documentations)

13244 Public product.pdf
13244 Validation.pdf
13244 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
	VN920SPTR-E	
	VND600SPTR-E	
	VND830SPTR-E	
	VNQ660SPTR-E	
	VNV35N07TR-E	

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PRODUCT/PROCESS CHANGE NOTIFICATION

TITLE	PowerSO-10: Aluminum 10 mils Soft Wire Implementation (ViPower Products)
IMPACTED PRODUCTS	See list
MANUFACTURING STEP	Assembly
INVOLVED PLANT	ST Bouskoura – Morocco
CHANGE REASON	Product optimization
CHANGE DESCRIPTION	<p>Quality improvement.</p> <p>The usage of a softer wire ultimately results in a less stressed bonding pad.</p> <p>Material standardization inside the ST assembly plants</p>
TRACEABILITY	Dated Code – Internal Traceability
REPORTS	13244 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 : PowerSO-10: Aluminum 10 mils Soft Wire Implementation (ViPower Products)

PCN Reference : ADG/22/13244

Subject : Public Products List

Dear Customer,

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

VND600SPTR-E	VNQ660SPTR-E	VN920SPTR-E
VND830SPTR-E	VNV35N07TR-E	



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Aluminum 10mils Soft Wire qualification for VIPower® in PowerSO-10 package in Bouskoura plant

Agenda

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4 AI 10mils wire comparison

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Change description

- Aim of this document is to describe the activity performed to qualify the Aluminum 10 mils soft wire for the VIPower® products in PowerSO-10 package;
- The main advantages to use the Aluminum 10mils soft wire compared to Aluminum 10mils hard wires are two:
 - Quality improvement: the usage of a softer wire ultimately results in a less stressed bonding pad;
 - Material standardization inside the ST assembly plants;
 - Same wire already used in mass production in Muar and Shenzhen plants
- This report shows the positive results achieved. The new material ensure the same quality and electrical characteristics as the current products assembled in PowerSO-10 package.
- All reliability tests have been completed with positive results.

Aluminum 10mils wire comparison

Item	Existing	New
Diameter	10mils	10mils
Break load	450-550g	210-300g
Elongation	10 – 18%	10 – 30%
Spool Wire length	400 meters	400 meters
Material	Al 99.99%	Al 99.99%

Bill Of Material Comparison

- Products
 - PowerSO-10 package CP: VN380SPTR-E (Silicon Line VN3801)
 - PowerSO-10 package CP: VN920SPTR-E (Silicon Line VN9201)
 - PowerSO-10 package CP: VND830SPTR-E (Silicon Line VN8301)

Actual Bill of Material in Bouskoura	
ITEM	MATERIAL
WIRE	WIRE Au D1.3
WIRE	WIRE Al D10 BL450-550g EL10-18%
FRAME	PSO-10 Mon Ve3 OpAl 16u Ni/NiP Ag
DIE ATTACH	PREFORM Pb/Ag/Sn 95.5/2.5/2
MOLD COMPOUND	RESIN SUMITOMO EME-6650RL1L



New Bill of Material in Bouskoura	
ITEM	MATERIAL
WIRE	WIRE Au D1.3
WIRE	WIRE Al D10 BL210-300g EL10-30%
FRAME	PSO-10 Mon Ve3 OpAl 16u Ni/NiP Ag
DIE ATTACH	PREFORM Pb/Ag/Sn 95.5/2.5/2
MOLD COMPOUND	RESIN SUMITOMO EME-6650RL1L

Bill Of Material Comparison

- Products

- PowerSO-10 package

CP: VND600SPTR-E

(Silicon Line VN6001)

Actual Bill of Material in Bouskoura	
ITEM	MATERIAL
WIRE	WIRE Au D1.3
WIRE	WIRE Al D10 BL450-550g EL10-18%
FRAME	PSO-10 Mon Ve3 OpA/G 16u PINi/NiP
DIE ATTACH	PREFORM Pb/Ag/Sn 95.5/2.5/2
MOLD COMPOUND	RESIN SUMITOMO EME-6650RL1L



New Bill of Material in Bouskoura	
ITEM	MATERIAL
WIRE	WIRE Au D1.3
WIRE	WIRE Al D10 BL210-300g EL10-30%
FRAME	PSO-10 Mon Ve3 OpA/G 16u PINi/NiP
DIE ATTACH	PREFORM Pb/Ag/Sn 95.5/2.5/2
MOLD COMPOUND	RESIN SUMITOMO EME-6650RL1L

Bill Of Material Comparison

- Products

- PowerSO-10 package

CP: VNQ660SPTR-E

(Silicon Line VN6601)

Actual Bill of Material in Bouskoura	
ITEM	MATERIAL
WIRE	WIRE Au D1.3
WIRE	WIRE Al D10 BL450-550g EL10-18%
FRAME	PSO-10 Mon Ve6 OpA/G 16u PINi SpAu
DIE ATTACH	PREFORM Pb/Ag/Sn 95.5/2.5/2
MOLD COMPOUND	RESIN SUMITOMO EME-6650RL1L



New Bill of Material in Bouskoura	
ITEM	MATERIAL
WIRE	WIRE Au D1.3
WIRE	WIRE Al D10 BL210-300g EL10-30%
FRAME	PSO-10 Mon Ve6 OpA/G 16u PINi SpAu
DIE ATTACH	PREFORM Pb/Ag/Sn 95.5/2.5/2
MOLD COMPOUND	RESIN SUMITOMO EME-6650RL1L

Bill Of Material Comparison

- Products
 - PowerSO-10 package CP: VNV35N07TR-E (Silicon Line VN1901)

Actual Bill of Material in Bouskoura	
ITEM	MATERIAL
WIRE	WIRE Au D1.3
WIRE	WIRE Al D10 BL450-550g EL10-18%
FRAME	PSO-10 Mon Ve3 OpA/R 16u Ni/NiP Ag
DIE ATTACH	PREFORM Pb/Ag/Sn 95.5/2.5/2
MOLD COMPOUND	RESIN SUMITOMO EME-6650RL1L



New Bill of Material in Bouskoura	
ITEM	MATERIAL
WIRE	WIRE Au D1.3
WIRE	WIRE Al D10 BL210-300g EL10-30%
FRAME	PSO-10 Mon Ve3 OpA/R 16u Ni/NiP Ag
DIE ATTACH	PREFORM Pb/Ag/Sn 95.5/2.5/2
MOLD COMPOUND	RESIN SUMITOMO EME-6650RL1L

ZVEI Guidelines

- According to ZVEI recommendations, the notification is not 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-14	Change in process technology (e.g. trim and form, leadframe preparation ...)	--	P	(-): If the change in process technology does not influence the integrity of the final product. (P): If the change in process technology can influence the integrity of the final product.	(P): e.g. change from punched to sawn QFN
	PACKING/SHIPPING					
	EQUIPMENT					
	TEST FLOW					
	Q-GATE					

Mark change with an "x"

VIpower® Product lines impacted

- VIpower® Product lines:

- PowerSO-10 package
- PowerSO-10 package
- PowerSO-10 package
- PowerSO-10 package
- PowerSO-10 package
- PowerSO-10 package

CP: VN380SPTR-E (Silicon Line VN3801)

CP: VNV35N07TR-E (Silicon Line VN1901)

CP: VN920SPTR-E (Silicon Line VN9201)

CP: VND600SPTR-E (Silicon Line VN6001)

CP: VNQ660SPTR-E (Silicon Line VN6601)

CP: VND830SPTR-E (Silicon Line VN8301)

Selected Test Vehicles

- VIPower® Product lines:
 - PowerSO-10 package

CP: VNV35N07TR-E (Silicon Line VN1901)

VNV35N07TR-E: Aluminum 10mils wire Qualification plan & data collection

Qualification plan & data collection									
No	Test Name	Prec	Condition/ Method	Steps	Steps	Fails/SS			Notes
						CZ808003RE Qualification lot LL	CZ808003RH Qualification lot NN	CZ808003RJ Qualification lot HH	
1	PC (JL3 STD)		Bake 24 hrs @ 125°C Soak 192 hrs @ 30°C / 60% RH Reflow Profile = J-STD-020D (Tmax = 250°C)	Final	CSAM TOP T0	0 delam /40 pcs	0 delam /40 pcs	0 delam /40 pcs	Pass
					ATE	0 defect / 200 pcs	0 defect / 200 pcs	0 defect / 200 pcs	Pass
					CSAM TOP	0 delam /40 pcs	0 delam /40 pcs	0 delam /40 pcs	Pass
2	TC	Yes	TA = -55°C / +150°C	1000 cycle	ATE	0 defect / 100 pcs	0 defect / 100 pcs	0 defect / 100 pcs	Pass
					CSAM TOP	0 delam / 20 pcs	0 delam / 20 pcs	0 delam / 20 pcs	Pass
					WPT (30 wires/5units) & BS (30wires/5units)	Pass	Pass	Pass	Pass
3	Env Seq	Yes	TA = -65°C / +150°C PPT 121°C/ 2Atm	100 cycle + 96 hrs	ATE	0 defect / 100 pcs	0 defect / 100 pcs	0 defect / 100 pcs	Pass
					CSAM TOP	0 delam / 20 pcs	0 delam / 20 pcs	0 delam / 20 pcs	Pass
					VI corrosion check	Pass	Pass	Pass	Pass
4	HTS	No	TA = 150°C	1000 hrs	ATE	0 defect / 100 pcs	0 defect / 100 pcs	0 defect / 100 pcs	Pass
					WPT (30 wires/5units) & BS (30wires/5units)	Pass	Pass	Pass	Pass

Note: Sampling 240 pcs/lot – taken from tested good units after FT.

VNV35N07TR-E: DPA monitoring results

Wire Pull test after TMC 1000Cycle								
No	Qualification lot	Wire	Lower Spec Limit	MAX	MIN	AVG	STD	Failure mode
1	CZ808003RE	AL 10mils	180 gf	448.0	324.3	390.2	36.7	WIRE BREAK
2	CZ808003RH			433.8	342.6	392.5	32.0	WIRE BREAK
3	CZ808003RJ			475.0	324.1	384.8	55.6	WEDGE NECK BREAK

Wire Wedge –Shear test after TMC 1000Cycle								
1	CZ808003RE	AL 10mils	360 gf	982.8	683.4	885.4	92.2	Aluminum Shear
2	CZ808003RH			956.3	740.5	849.9	57.4	Aluminum Shear
3	CZ808003RJ			1025.0	818.9	913.5	69.8	Aluminum Shear

ALL MEASUREMENTS ARE WITHIN SPEC LIMIT THE FAILURE MODE IS ACCEPTED

VNV35N07TR-E: DPA monitoring results

Wire Pull test after HTS 1000hrs								
No	Qualification lot	Wire	Lower Spec Limit	MAX	MIN	AVG	STD	Failure mode
1	CZ808003RE	AL 10mils	180 gf	455.6	315.9	402.6	34.5	WIRE BREAK
2	CZ808003RH			495.3	311.2	422.7	36.9	WIRE BREAK
3	CZ808003RJ			468.3	289.5	375.1	47.8	WIRE BREAK
Wire Wedge –Shear test after HTS 1000hrs								
1	CZ808003RE	AL 10mils	360 gf	879.9	713.4	806.3	41.8	Aluminium Shear
2	CZ808003RH			863.1	694.4	796.2	42.5	Aluminium Shear
3	CZ808003RJ			887.4	517.9	699.9	84.2	Aluminium Shear

ALL MEASUREMENTS ARE WITHIN SPEC LIMIT THE FAILURE MODE IS ACCEPTED

Conclusions

- Detailed qualification activity has been performed in order to qualify the Aluminum 10mils soft wire for the VIPower® products in PowerSO-10 package;
- All reliability tests have been completed with positive results;
- This report shows the positive results achieved processing the VIPower® products in PowerSO-10 package with the Aluminum 10mils soft wire, ensuring the same quality and electrical characteristics as the current production in Bouskoura plant.