



Public Products List

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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

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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.

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