PRODUCT / PROCESS CHANGE INFORMATION

1. PCI basic data	
1.1 Company	STMicroelectronics International N.V
1.2 PCI No.	CRP/24/14798
1.3 Title of PCI	Semi-sintering die attach ATROX 850HT1 qualification for diodes and powermos (seam sealing only)
1.4 Product Category	Diodes and powermos - refer to product list
1.5 Issue date	2024-06-11

2. PCI 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 Process Owner	Gerard PETIT
2.1.2 Corporate Quality Manager	Chiara ZACCHERINI

3. Change		
3.1 Category	3.2 Type of change	3.3 Manufacturing Location
Materials	Direct Material: Die Attach Material - Chemistry/ Raw material	Rennes Plant - ASSY

4. Description of change		
	Old	New
4.1 Description	Diodes and powermos are assembled using soft solder die attach process with Sn/Pb preform alloy.	Diodes and powermos are assembled using ATROX 850HT1 which is a semi-sintering adhesive filled with silver microparticles
4.2 Anticipated Impact on form,fit, function, quality, reliability or processability?	no	

5. Reason / motivation for change	
5.1 Motivation	Safety: switch to a lead free process Quality: Increase yield and die placement accuracy Productivity: increase UPH (automatic process)
5.2 Customer Benefit	ENVIRONMENT FOOTPRINT

6. Marking of parts / traceability of change	
6.1 Description	refer to PCI content

7. Timing / schedule	
7.1 Date of qualification results	2024-06-03
7.2 Intended start of delivery	2024-06-03
7.3 Qualification sample available?	Upon Request

8. Qualification / Validation			
8.1 Description			
8.2 Qualification report and qualification results	In progress	Issue Date	

9. Attachments (additional documentations)
14798 Public product.pdf 14798 PCI - diodes and power MOSFET Semi Sintering rev4.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
	1N5819UB1	
	1N5822UB1	
	STPS60A150CS1	

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PRODUCT/PROCESS CHANGE INFORMATION

PCI SUMMARY	
Sales type / Product Family	*All versions of diodes and power MOSFET in packages.*
Customers	*All*
Type of change	*Die-attach process change*
Reason of change	*Assembly line modernization*
Description of the change	*Switch from soft-solder die-attach to pressure-less sintering process*
Forecasted date of change	*Change start: 4Q2023* *Change completion:* few years
Availability date of samples for Customer	*See below "What is the schedule of the change"*
Forecasted date for internal STMicroelectronics change qualification report availability	*June 2023*
Marking to identify changed product (ex: Date Code change)	*See below "How the change can be traced"*
Description of the evaluation and qualification program	*See below "What is the change"*
Product Lines and/or Part Numbers	*See below "which products are concerned by the change"*
Manufacturing location	*Rennes (FR)*
Estimated date of first shipment	*October 2023*

Rennes Internal Validation	
Rennes Product engineering Manager	Géraldine CHAUMONT
Division Product Marketing Managers	Thierry CASTAGNET / Giuseppe CAMONITA
Rennes quality Manager	Sylvie PERON

WHICH PRODUCTS ARE CONCERNED BY THE CHANGE?

All ESCC related and packaged versions of Power Rectifier, Signal diodes and power MOSFET are concerned by this change, whatever their quality level, radiation specification, lead finish and packing. A detailed list of the part number available at the date this PCI is provided in appendix 1.

WHAT IS THE CHANGE?

The concerned products have originally been qualified with a soft-solder die attach process. They have now been qualified with a pressure-less sintering die attach process (sometimes referred to as “semi-sintering”).

The die-attach material is a compound with submicrometric and micrometric silver particles in organic resin.

The implementation of the new process is similar to a standard glue die attach process, with a specific curing after the die-attach and a specific thermal treatment before the sealing.

WHY IS THERE A CHANGE?

The change is a modernization of the assembly flow allowing to increase the capacity, reduce the lead times and ensure high robustness.

WHO IS IMPACTED BY THE CHANGE?

The change is applicable to all ST Customers of the concerned products (also see “how the change will be handled”)

WHAT IS THE IMPACT OF THE CHANGE?

The change has no technical impact: The tests performed show the absence of impact on the parametric and thermal performances and the reliability of the products.

The order entry is not impacted: neither the ST nor the ESCC part numbers are changed.

HOW THE CHANGE HAS BEEN QUALIFIED?

The change is classified as major. It is qualified, in agreement with CNES/ESA, with a full ESCC qualification with die-attach dedicated additional test. The complete plan therefore includes (in bold, the tests coming in addition to the ESCC qualification)

- Chart F3 with reinforced die shear sampling
- Chart F4, including RGA
- Thermal impedance characterization
- Intermittent Operating Life
- High Temperature Storage (168 hour at 300°C) followed by RGA
- Resistance to soldering heat

The qualification has been successfully performed and has been approved by CNES/ESA.

WHAT IS THE SCHEDULE OF THE CHANGE?

Samples of packaged parts using the new process can be ordered upon request to ST sales representatives.

The first production assembly batches of the concerned products with the new process have already been started. During a transition period expected to last some months, each part number will be assembled using either process. At the end of this period, all assembly batches of all the concerned parts will be manufactured with the new pressure-less sintering process.

Consequently, unless otherwise separately guaranteed by ST, orders for the concerned products will be delivered with parts manufactured with either process for up to 5 years after the switch is completed, until the stock of parts manufactured with the legacy process is fully depleted.

However, ST guarantees that all assembly batches, identifiable by their unique part number x date code couple, will use a unique die attach version.

During the transition period, customers will be able to order parts with a specific manufacturing process, possibly with specific sales conditions, by contacting ST sales representative.

HOW CAN THE CHANGE BE SEEN AND TRACED?

The change is made as transparent as possible for all actors, including design, procurement, and supply chain teams. Furthermore, ST quality assurance allows full traceability of the die attach process for the manufacturing of any part, whatever its quality level, Engineering Model or Flight Model.

The detail of what can be seen at each step and how to trace it is described here below:

Data sheet: the change is neither traceable nor visible in the datasheet.

Radiation Report: the change is neither traceable nor visible in radiation reports.

Order entry: By default, the change is not visible at order entry, as neither the ST nor the ESCC part numbers are changed. Customer requiring a specific die attach process must contact ST sales representative for a specific order entry process.

Order confirmation and backlog management: Orders are confirmed using an ST internal Part Number visible in ST systems. The internal Part Number of parts manufactured with the new die attach process is different from the one manufactured with the legacy process, allowing ST to identify the specific die attach process of the parts allocated to any order.

In warehouses: The shipment number, written on the label of the outer boxes, allows to trace ST internal Part Number, from which ST can provide the die attach process of the parts. ST internal Part Numbers are also written on the inner box labels, similarly, allowing ST to provide the detail of the box content.

For Customer Quality Department: The Certificate of Conformance of both Engineering Models and Flight Models indicates the Part Number and date code, allowing to ST to trace the die attach process used for the manufacturing of any parts.

On the parts: ST guarantees that all assembly batches, identifiable by their unique part number x date code couple, use a unique die attach process. Consequently, the part marking allows ST to trace the die attach process used for the manufacturing of any part. The change can also be seen on X-ray pictures and during Destructive Part Analysis.

HOW THE CHANGE WILL BE HANDLED?

Assembled parts from the date of the change onwards will possibly be manufactured using the new die attach process. The ramp up of the new process will be spread over a transition period that will last some months.

ST guarantees that all assembly batches, identifiable by their unique part number x date code couple, use a unique die attach version.

By default, ST will confirm orders of the concerned part numbers with parts manufactured with either die attach process. Order line items without Single Lot Date Code (SLDC) requests might therefore include parts manufactured with two different die attached processes.

ST will be in position to support customer requests to ST sales representative for parts manufactured with a specific assembly process during the whole transition period. Specific sales conditions may apply.

At the end of the transition period, ST will obsolete the legacy die attach process.

Parts manufactured with the legacy process will be delivered until their stock is depleted. Parts with the concerned part number may therefore be delivered with parts manufactured with either process up to 5 years after the end of the transition period.

Appendix 1

Most common part numbers impacted by the change

Part Number	Detail specification	Quality level	Other features	Package	Finishing	Packing
BYW81-200S1	-	Engineering Model	Single Die	SMD.5	Gold	Strip Pack
BYW81-200SG	510302905	ESCC	Single Die	SMD.5	Gold	Strip Pack
STPS1045C2S1	-	Engineering Model	Double Die - Common Cathode	SMD.5	Gold	Strip Pack
STPS1045C2SG	510601702	ESCC	Double Die - Common Cathode	SMD.5	Gold	Strip Pack
STPS1045SG	510601701	ESCC	Single Die	SMD.5	Gold	Strip Pack
STPS20100S1	-	Engineering Model	Single Die	SMD.5	Gold	Strip Pack
STPS20100SG	510601605	ESCC	Single Die	SMD.5	Gold	Strip Pack
STPS20100C2FY1	-	Engineering Model	Double Die - Common Cathode	TO-254	Gold	Strip Pack
STPS20100C2FYT	510601611	ESCC	Double Die - Common Cathode	TO-254	Solder Dip	Strip Pack
STPS20100FYT	510601601	ESCC	Single Die	TO-254	Solder Dip	Strip Pack
STPS20100S2FYT	510601604	ESCC	Double Die - Serial	TO-254	Solder Dip	Strip Pack
STPS40100C2FY1	-	Engineering Model	Double Die - Common Cathode Pin 2	TO-254	Gold	Strip Pack
STPS40100C2FYT	510601905	ESCC	Double Die - Common Cathode Pin 2	TO-254	Solder Dip	Strip Pack
STPS40A150CHY1	-	Engineering Model	RHA - dV/dt max - Tj 175°C max	TO-254AA	Gold	Strip Pack
STPS40A150CHYG	510602303	ESCC	RHA - dV/dt max - Tj 175°C max	TO-254AA	Gold	Strip Pack
STPS40A150CHYT	510602304	ESCC	RHA - dV/dt max - Tj 175°C max	TO-254AA	Solder Dip	Strip Pack
STPS40A45CHY1	-	Engineering Model	RHA - dV/dt max - Tj 175°C max	TO-254AA	Gold	Strip Pack
STPS40A45CHYG	510602402	ESCC	RHA - dV/dt max - Tj 175°C max	TO-254AA	Gold	Strip Pack
STPS40A45CHYT	510602403	ESCC	RHA - dV/dt max - Tj 175°C max	TO-254AA	Solder Dip	Strip Pack
STPS60A150CS1	-	Engineering Model	RHA - dV/dt max - Tj 175°C max	SMD.5	Gold	Strip Pack
STPS60A150CSG	510602302	ESCC	RHA - dV/dt max - Tj 175°C max	SMD.5	Gold	Strip Pack
STPS60A150CST	510602306	ESCC	RHA - dV/dt max - Tj 175°C max	SMD.5	Solder Dip	Strip Pack
STPS80A150CS1	-	Engineering Model	RHA - dV/dt max - Tj 175°C max	SMD.5	Gold	Strip Pack
STPS80A150CSG	510602301	ESCC	RHA - dV/dt max - Tj 175°C max	SMD.5	Gold	Strip Pack
STPS80A150CST	510602305	ESCC	RHA - dV/dt max - Tj 175°C max	SMD.5	Solder Dip	Strip Pack

Part Number	Detail specification	Quality level	Other features	Package	Finishing	Packing
STPS80A45CS1	-	Engineering Model	RHA - dV/dt max - Tj 175°C max	SMD.5	Gold	Strip Pack
STPS80A45CSG	510602401	ESCC	RHA - dV/dt max - Tj 175°C max	SMD.5	Gold	Strip Pack
STPS80A45CST	510602404	ESCC	RHA - dV/dt max - Tj 175°C max	SMD.5	Solder Dip	Strip Pack
STRH100N10HY1	-	Engineering Model		TO-254AA	Gold	Strip Pack
STRH100N10HYG	520502101F	ESCC		TO-254AA	Gold	Strip Pack
STRH100N10HYT	520502102F	ESCC		TO-254AA	Solder Dip	Strip Pack
STRH100N6HY1	-	Engineering Model		TO-254AA	Gold	Strip Pack
STRH100N6HYG	520502201F	ESCC		TO-254AA	Gold	Strip Pack
STRH100N6HYT	520502202F	ESCC		TO-254AA	Solder Dip	Strip Pack
STRH12P10GY1	-	Engineering Model		TO-257AA	Gold	Strip Pack
STRH12P10GYG	520502901R	ESCC		TO-257AA	Gold	Strip Pack
STRH12P10GYT	520502902R	ESCC		TO-257AA	Solder Dip	Strip Pack
STRH40N6S1	-	Engineering Model		SMD.5	Gold	Strip Pack
STRH40N6SG	520502401F	ESCC		SMD.5	Gold	Strip Pack
STRH40N6ST	520502402F	ESCC		SMD.5	Solder Dip	Strip Pack
STRH40P10HY1	-	Engineering Model		TO-254AA	Gold	Strip Pack
STRH40P10HYG	520502501R	ESCC		TO-254AA	Gold	Strip Pack
STRH40P10HYT	520502502R	ESCC		TO-254AA	Solder Dip	Strip Pack
STRH8N10S1	-	Engineering Model		SMD.5	Gold	Strip Pack
STRH8N10SG	520502301F	ESCC		SMD.5	Gold	Strip Pack
STRH8N10ST	520502302F	ESCC		SMD.5	Solder Dip	Strip Pack
STRHMF16N20S1	-	Engineering Model		SMD.5	Gold	Strip Pack
STTH40200CHY1	0	Engineering Model	RHA - 175°C max	TO-254AA	Gold	Strip Pack
STTH40200CHYG	510303301	ESCC	RHA - 175°C max	TO-254AA	Gold	Strip Pack
STTH40200CHYT	510303302	ESCC	RHA - 175°C max	TO-254AA	Solder Dip	Strip Pack
STTH60200CSA1	0	Engineering Model	RHA - 175°C max	SMD1	Gold	Strip Pack
STTH60200CSAG	510303303	ESCC	RHA - 175°C max	SMD1	Gold	Strip Pack
STTH60200CSAT	510303304	ESCC	RHA - 175°C max	SMD1	Solder Dip	Strip Pack
STTH60400SA1	-	Engineering Model	Single Die - RHA - 175°C max	SMD1	Gold	Strip Pack
STTH60400SAG	510303201	ESCC	Single Die - RHA - 175°C max	SMD1	Gold	Strip Pack
STTH60400SAT	510303202	ESCC	Single Die - RHA - 175°C max	SMD1	Solder Dip	Strip Pack

Part Number	Detail specification	Quality level	Other features	Package	Finishing	Packing
1N5806U01A	510101413	ESCC		LCC-2A	Gold	Waffle Pack
1N5806U02A	510101414	ESCC		LCC-2A	Solder Dip	Waffle Pack
1N5806UA1	-	Engineering Model		LCC-2A	Gold	Waffle Pack
1N5811U01B	510101311	ESCC		LCC-2B	Gold	Waffle Pack
1N5811U02B	510101312	ESCC		LCC-2B	Solder Dip	Waffle Pack
1N5811UB1	-	Engineering Model		LCC-2B	Gold	Waffle Pack
1N5819U01B	510602102	ESCC		LCC-2B	Gold	Waffle Pack
1N5819U02B	510602103	ESCC		LCC-2B	Solder Dip	Waffle Pack
1N5819UB1	-	Engineering Model		LCC-2B	Gold	Waffle Pack
1N5822U01B	510602001	ESCC		LCC-2B	Gold	Waffle Pack
1N5822U02B	510602002	ESCC		LCC-2B	Solder Dip	Waffle Pack
1N5822UB1	-	Engineering Model		LCC-2B	Gold	Waffle Pack
1N6640U01D	510102707	ESCC		LCC-2D	Gold	Waffle Pack
1N6640U02D	510102708	ESCC		LCC-2D	Solder Dip	Waffle Pack
1N6640UD1	-	Engineering Model		LCC-2D	Gold	Waffle Pack
1N6642U01D	510102607	ESCC		LCC-2D	Gold	Waffle Pack
1N6642U02D	510102608	ESCC		LCC-2D	Solder Dip	Waffle Pack
1N6642UD1	-	Engineering Model		LCC-2D	Gold	Waffle Pack

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

PCI Title : Semi-sintering die attach ATROX 850HT1 qualification for diodes and powermos (seam sealing only)

PCI Reference : CRP/24/14798

Subject : Public Products List

Dear Customer,

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

STPS40100C2FY1	STRH100N10HYT	1N5811U02B
1N5819U02B	STPS60A150CSG	STPS40A150CHY1
STRHMF16N20S1	STTH40200CHY1	1N5822UB1
1N5806U01A	STPS60A150CST	STTH60200CSA1
STRH40P10HYG	STPS1045C2SG	STRH40P10HY1
STRH12P10GYG	STPS40A45CHYG	STRH100N10HYG
1N5822U01B	STTH60400SA1	STPS80A45CSG
STRH40N6SG	1N6640U01D	STRH12P10GYT
STPS1045C2S1	1N6642U01D	STRH100N6HYG
STTH60200CSAT	STPS80A45CST	STRH100N6HY1
STPS80A150CSG	STPS40A45CHY1	STPS60A150CS1
1N5811U01B	STPS40A150CHYG	1N5806U02A
STTH40200CHYG	STTH60400SAT	STPS80A45CS1
STRH8N10SG	STRH100N6HYT	STTH60400SAG
1N5819UB1	1N5806UA1	1N6642U02D
1N6640U02D	STPS40A150CHYT	STRH40P10HYT
STRH100N10HY1	1N5819U01B	1N5811UB1
STTH40200CHYT	STPS80A150CS1	STRH40N6S1
STPS80A150CST	1N5822U02B	STRH8N10S1
STPS40A45CHYT	STRHMF16N20SG	STRH12P10GY1
1N6642UD1	STTH60200CSAG	1N6640UD1

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