PRODUCT / PROCESS CHANGE NOTIFICATION

1. PCN basic data		
1.1 Company		STMicroelectronics International N.V
1.2 PCN No.		MDG/22/13417
1.3 Title of PCN		ULA resin- TPM VFQFPN32 – Package upgrade to support
1.4 Product Category		ST33TPHF20, ST33TPHF2E, ST33TPHF2X
1.5 Issue date		2022-05-05

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	Marie-France FLORENTIN
2.1.2 Marketing Manager	Denis FARISON
2.1.3 Quality Manager	Mickael DENAIS-ALLICHON

3. Change		
3.1 Category	3.2 Type of change	3.3 Manufacturing Location
General Product & Design	(Not Defined)	Amkor ATP3

4. Description of change		
	Old	New
4.1 Description	This PCN replaces PCN 13025. Molding resin change for ST33TPHF20, ST33TPHF2E, ST33TPHF2X	Molding resin change for ST33TPHF20, ST33TPHF2E, ST33TPHF2X to Ultra Low Alpha moding resin to improve Soft Error Rate. The scope of the changes is no more limited to molding resin. The list of changes is updated in this PCN (see detailed description)
4.2 Anticipated Impact on form,fit, function, quality, reliability or processability?	- Form: impact o Marking: second level interconnect modification (“e4” changed by “e3”) o surface finish: Matte Sn finishing instead of Nickel/Palladium/Gold - Fit: no impact (no change for external dimensions and tolerances) - Function: no impact (no change for electrical, environmental, mechanical, thermal performance characteristics)	

5. Reason / motivation for change	
5.1 Motivation	The FIT (failure in time) related to alpha particle will be decreased by a factor 10 with the ULA resin.
5.2 Customer Benefit	QUALITY IMPROVEMENT

6. Marking of parts / traceability of change	
6.1 Description	For each Commercial Product impacted by the change, a new Finished Good codification will be created. This Finished Good codification is present on the label. See detailed description

7. Timing / schedule	
7.1 Date of qualification results	2022-11-07
7.2 Intended start of delivery	2023-01-02
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)
13417 Public product.pdf 13417 PCN TPM VFQFPN32 - Package upgrade to support ULA resin v1.0.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
	ST33HTPH2032AHD1	
	ST33HTPH2X32AHD4	

PRODUCT CHANGE NOTIFICATION
PCN MDG/SMD

TPM VFQFPN32 – Package upgrade to support ULA resin

VFQFPN32 – Package upgrade for ST33TPHF20, ST33TPHF2E, ST33TPHF2X to support Ultra Low Alpha moding resin to improve Soft Error Rate.

Warning: This PCN replaces **PCN 13025** - Molding resin change for ST33TPHF20, ST33TPHF2E, ST33TPHF2X to Ultra Low Alpha moding resin to improve Soft Error Rate. The scope of the changes is no more limited to molding resin. The list of changes is updated in this PCN.

Scope

Electronic devices may be exposed to various types of radiations (electrons, protons, neutrons and ions). The radiation may produce effects in the electronics ranging from temporary data loss to more important failure. A soft error occurs when a radiation event causes enough of a charge disturbance to reverse or flip the data state of a memory cell, register, latch or flip-flop. The error is “soft” because the circuit/device itself is not permanently damaged by the radiation.
Usually, the soft-error rate (SER) is measured in FIT units (failure in time), where 1 FIT denotes one failure per billion devices hours.
The exposition to alpha radiation can be drastically reduced with the selection of specific materials in the package manufacturing and specific package manufacturing process.
In order to meet reliability requirements for industrial and communication equipments, the resin used in the VFQFPN32 package for product lines ST33TPHF20, ST33TPHF2E, ST33TPHF2X will be modified to include a ULA resin. An Ultra-Low-Alpha resin supports an alpha particle control of maximum 0.002 cph/cm² (count/hour-cm²).
In order to support ULA resin, the package bill of material will be also modified for the lead frame finishing type.

What are the changes?

	Current VFQFPN32	**New VFQFPN32**
Package description	VFQFPN32	No change
Assembly plant	Amkor ATP3	No change
Die attachment material Type (Glue/film) Supplier	DEXTER 1234 Glue DEXTER	No change No change No change
Lead frame material L/F finishing type Die paddle size	Cu alloy C19400FH Nickel/Palladium/Gold 3.6 mm x 3.6 mm	No change Matte Sn No change
Wire bonding Diameter	GOLD 1 mil	No change No change
Molding compound Type/Supplier	CEL 9220 HF13 Green resin/ Hitachi	EME-G700SY ULA/ Sumitomo
Package moisture sensitivity level (JEDEC J-STD020D)	MSL1	No change
Second level interconnect	e4	e3

Why?
The FIT (failure in time) related to alpha particle will be decreased by a factor 10 with the ULA resin.

When?
The change will be implemented by **Jan/23**.

How will the change be qualified?
The package with the new resin will be qualified by **Nov/22**.

What is the impact of the change?

- **Form**: impact
    - Marking: second level interconnect modification (“e4” changed by “e3”)
    - surface finish: Matte Sn finishing instead of Nickel/Palladium/Gold
- **Fit**: no impact (no change for external dimensions and tolerances)
- **Function**: no impact (no change for electrical, environmental, mechanical, thermal performance characteristics)

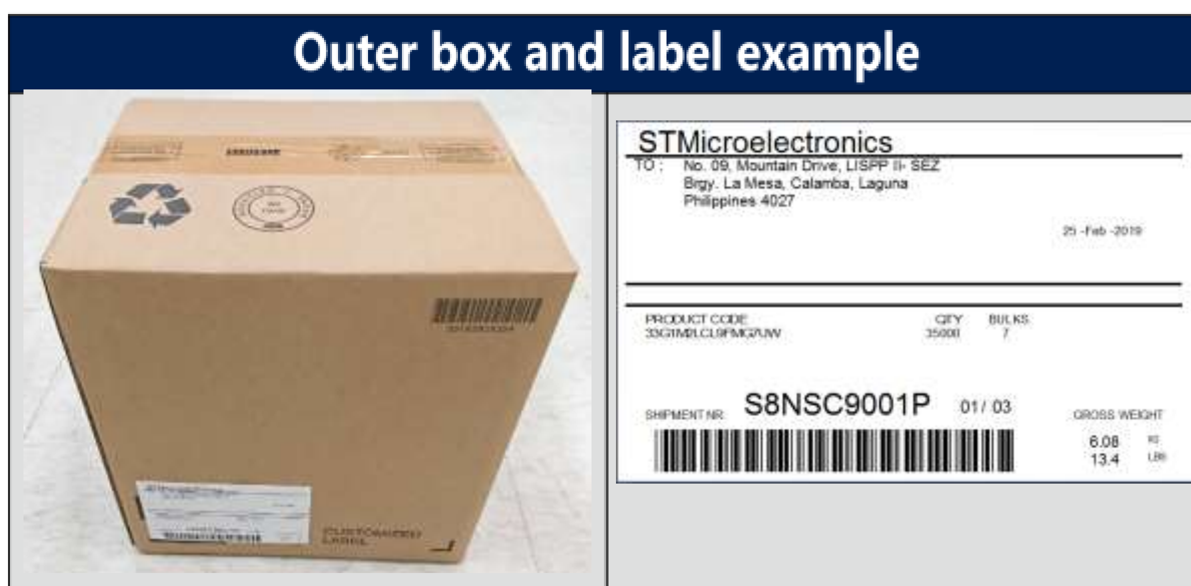
How can the change be seen?

For each Commercial Product impacted by the change, a new Finished Good codification will be created. This Finished Good codification is present on the label.

The following Commercial products will be impacted. The table below provides the list of current Finished Good codifications with standard resin and future codifications with ULA resin

Commercial Product	Finished Good BOM with standard resin	Finished Good BOM with ULA resin
ST33HTPH2E32AHA5	33HTPH2E32CHB2CT	33HTPH2E32CHB2CU
ST33HTPH2032AAF3	33HTPH2032CHA3CT	33HTPH2032CHA3CU
ST33HTPH2032GAF3	OIMMY8K42P00875	TBD
ST33HTPH2E32AHB4	33HTPH2E32CHB4CT	33HTPH2E32CHB4CU
ST33HTPH2E32AHC2	33HTPH32CHD2CT	33HTPH32CHD2CU
ST33HTPH2032AHC3	33HTPH32CHD3CT	33HTPH32CHD3CU
ST33HTPH2E32AHD0	33HTPH32CHD0CT	33HTPH32CHD0CU
ST33HTPH2032AHD1	33HTPH32CHD1CT	33HTPH32CHD1CU
ST33HTPH2X32AHD4	33HTPH32CHD4CT	33HTPH32CHD4CU
ST33HTPH2X32AHD5	33HTPH32CHD5CT	33HTPH32CHD5CU
ST33HTPH2E32AHD6	33HTPH32CHD6CT	33HTPH32CHD6CU
ST33HTPH2032AHD7	33HTPH32CHD7CT	33HTPH32CHD7CU
ST33HTPH2X32AHD8	33HTPH32CHD8CT	33HTPH32CHD8CU
ST33HTPH2X32AHE0	33HTPH32CHE0CT	33HTPH32CHE0CU
ST33HTPH2X32AHE1	33HTPH32CHE1CT	33HTPH32CHE1CU
ST33HTPH2X32AHE4	33HTPH32CHE4CT	33HTPH32CHE4CU

The Finished Good is provided on the labels of the packing
Example of the outer box with PRODUCT CODE providing the Finished Good codification.



Field	Field Type
To	Customer address
Product code	**Finished good codification**
QTY	Total good dice quantity
Bulk	inner box quantity
Shipment NR.	Shipping number
BAR CODE	Bar code area

Appendix A- Product Change Notification

Product family / Commercial products:	ST33TPHF2ESPI • ST33HTPH2E32AHA5 • ST33HTPH2E32AHB4 • ST33HTPH2E32AHD0 • ST33HTPH2E32AHD6 ST33TPHF2EI2C • ST33HTPH2E32AHC2 ST33TPHF20SPI • ST33HTPH2032AAF3 • ST33HTPH2032AHD1 • ST33HTPH2032AHD7 ST33TPHF20I2C • ST33HTPH2032AHC3 ST33TPHF2XSPI • ST33HTPH2X32AHD4 • ST33HTPH2X32AHD8 • ST33HTPH2X32AHE0 • ST33HTPH2X32AHE4 ST33TPHF2XI2C • ST33HTPH2X32AHD5 • ST33HTPH2X32AHE1 ST33TPHF20SPI-G1 • ST33HTPH2032GAF3
Type of change:	Package bill of material change
Reason for the change:	Soft Error Rate improvement due to alpha radiations
Description of the change:	Resin model and plating change
Date of notification to the customer:	Apr/22
Forecast date of Qualification samples availability for customer(s):	Jul/22
Forecast date for the internal STMicroelectronics change, Qualification Report availability:	Nov/22
Description of the qualification program	Package qualification over 3 lots. New reliability report release by Nov/22.
Manufacturing location:	Amkor ATP3
Estimated date of first shipment:	Jan/23

Document Revision History		
Date	Rev.	Description of the Revision
27/Apr/2022	1.0	First official release