PRODUCT / PROCESS CHANGE NOTIFICATION

1. PCN basic data

1.1 Company	STMicroelectronics International N.V
1.2 PCN No.	ADG/19/11835
1.3 Title of PCN	SPC570S40E1xx (FE50): Assembly and Final Testing Activation in Muar
1.4 Product Category	see list
1.5 Issue date	2019-11-05

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	Luca RODESCHINI
2.1.2 Marketing Manager	Paul KINOWSKI
2.1.3 Quality Manager	Alberto MERVIC

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 Muar (Malaysia)

4. Description of change

	Old	New
4.1 Description	Assy and Final Test in ST Malta	Assy and Final Test in ST Muar
4.2 Anticipated Impact on form,fit, function, quality, reliability or processability?	No Impact	

5. Reason / motivation for change

5.1 Motivation	Capacity increase
5.2 Customer Benefit	CAPACITY INCREASE

6. Marking of parts / traceability of change

6.1 Description	Dedicated Finished Good Codes

7. Timing / schedule

7.1 Date of qualification results	2020-06-30
7.2 Intended start of delivery	2020-07-31
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)

11835 Public product.pdf
11835 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
	SPC570S40E1CEFAY	
	SPC570S50E1CEFAR	

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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

PCN Title : SPC570S40E1xx (FE50): Assembly and Final Testing Activation in Muar

PCN Reference : ADG/19/11835

Subject : Public Products List

Dear Customer,

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

SPC570S40E1CEFAR	**SPC570S40E1CEFAY**	**SPC570S50E1CEFAR**
SPC570S50E1CEFAY	**SPC570S50E1DEFAY**	**SPC570S50E3CEFAY**

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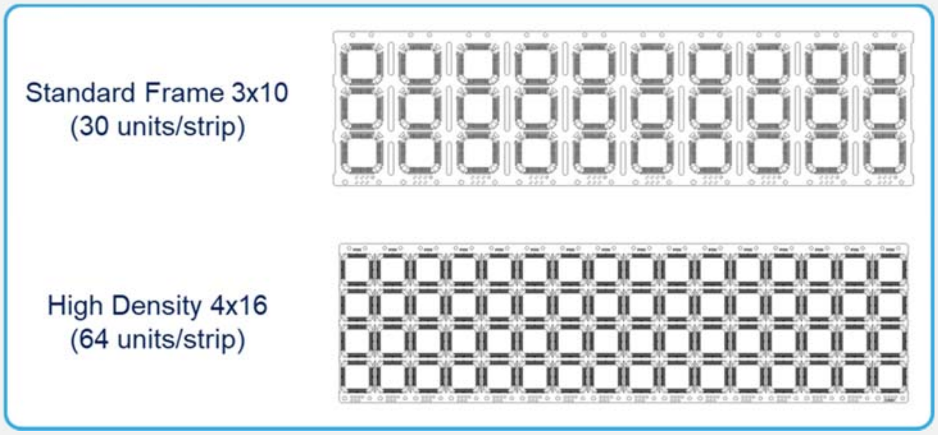
PRODUCT/PROCESS CHANGE NOTIFICATION

SUBJECT **SPC570S40E1xx (FE50): Assembly and Final Testing Activation in Muar**

IMPACTED PRODUCTS	ST silicon line FE50 assembled in TQFP 64 10x10x1.0 Exposed Pad Package: ✚ SPC570S40E1CEFAR ✚ SPC570S40E1CEFAY ✚ SPC570S40E1CEFBR ✚ SPC570S40E1CEFBY ✚ SPC570S50E1CE1AR ✚ SPC570S50E1CEFAR ✚ SPC570S50E1CEFAY ✚ SPC570S50E1DEFAR ✚ SPC570S50E1DEFAY
MANUFACT. STEP	Assembly and Electrical Final Test
INVOLVED PLANT	ST Muar Plant (Malaysia)
CHANGE REASON	Service – Capacity Improvement.
CHANGE DESCRIPTION	Transfer of Back End related activities from ST Malta to ST Muar plant, including both assembly and electrical final test. Assembly transfer includeds specific product's improvements linked to new solutions and processes avaliability, such as: ✚ Package Bill of Material: o move to High Density (HD) leadframe (different supplier) o move to 0.7mil wires diameter ✚ Molding Process: move to central top gate resin injection ✚ Marking: re-layout and addition of 2D identifier. Final Test transfer does not concern changes in test flow or equipment.

As far as assembly is concerned, additional details are here below provided.

<u>High Density (HD) Leadframe</u>: increased number of units per strip, from 30 to 64 units/strip.

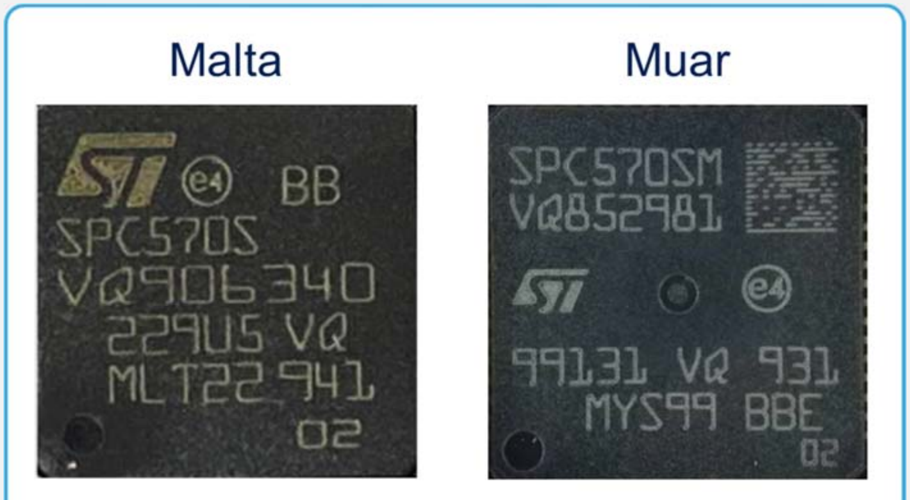


Unit level drawing (pad size, etc.) remains unchanged.

<u>Central Top Gate Mold Injection</u>: reduces stress and possible wire sweeping during molding process.

<u>2D Marking</u>: improves product’s internal traceability.

Both changes are visible on package as shown:



Muar: Central Top Gate is visible at package’s center.
2D Marking positioned at right top corner.

TRACEABILITY

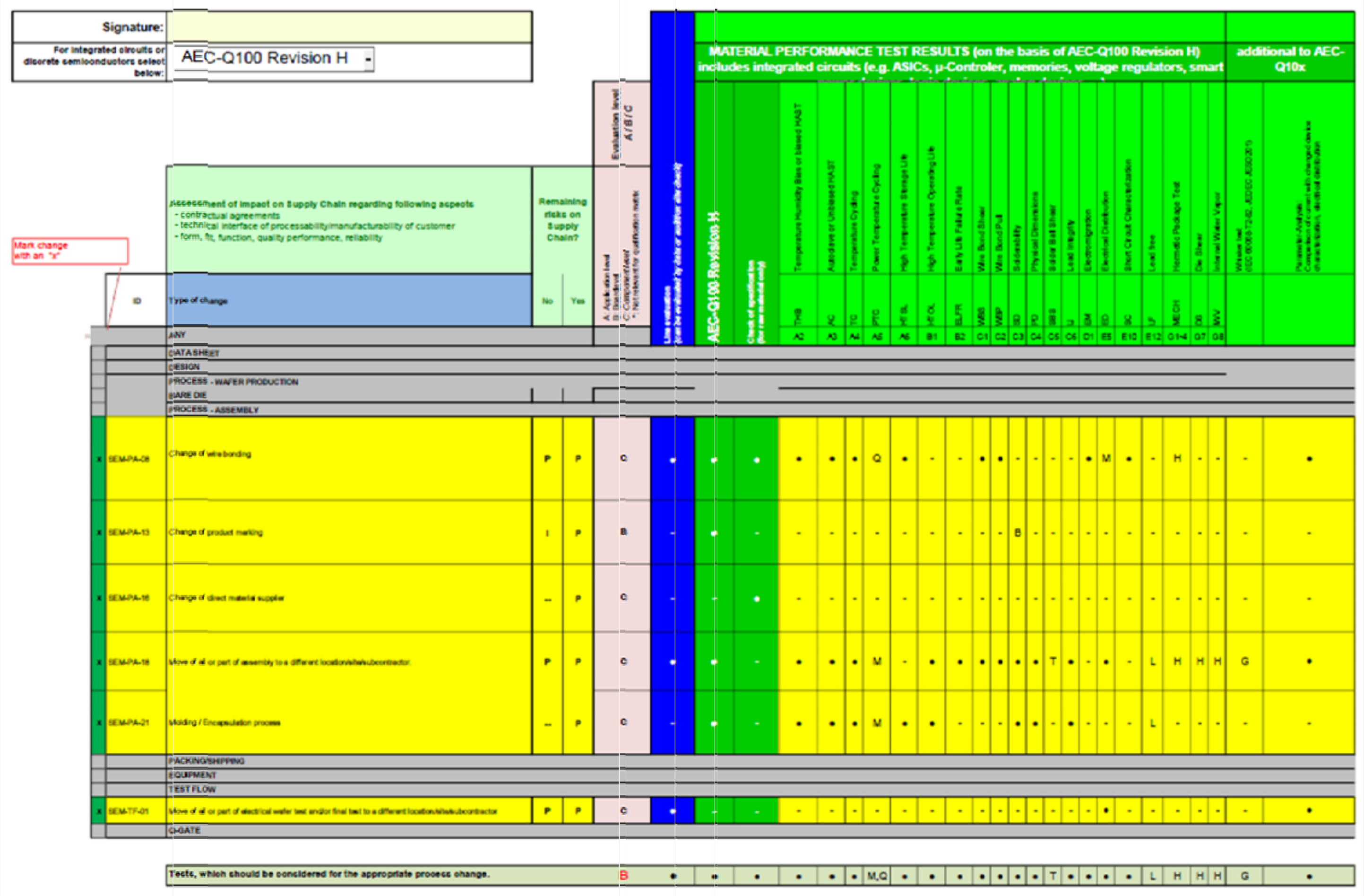
New Finished Good (internal part number) code and Date Code.

VALIDATION

A preliminary validation exercise has been performed with positive results to verify Muar’s BOM and process suitability for assembly transfer; results are below summarized:

Reliability Test - (Velvety)		WB parameters			
Step		NN	LL	HH	HH+10%
MSL3 + TC -55/+150°C	1000cy / AEC Q100	PASSED	PASSED	PASSED	PASSED
	2000cy / AEC Q006	PASSED	PASSED	PASSED	PASSED
MSL3 + 100cy + PPT 121°C/ 2Atm	96h / AEC Q100/006	PASSED	PASSED	PASSED	PASSED
	168h / Extended	PASSED	PASSED	PASSED	PASSED
HTS 175°C	160h / AEC Q100	PASSED	PASSED	PASSED	PASSED
	320h / AEC Q006	PASSED	PASSED	PASSED	PASSED
	800h / Extended	PASSED	PASSED	PASSED	PASSED

Full validation is in progress, based on ZVEI (AEC-Q100/Q006) recommendations reported in the following table:



Signature:	
For integrated circuits or discrete semiconductors select below:	AEC-Q100 Revision H

Mark change with an "x"

MATERIAL PERFORMANCE TEST RESULTS (on the basis of AEC-Q100 Revision H) includes integrated circuits (e.g. ASICs, µ-Controler, memories, voltage regulators, smart

additional to AEC-Q10x

	ID	Type of change	Remaining risks on Supply Chain? No	Remaining risks on Supply Chain? Yes	Evaluation level A / B / C A: Application level B: Boardlevel C: Component level *: Not relevant for qualification matrix	Line evaluation (can be evaluated by data or audit/on site check)	AEC-Q100 Revision H	Check of specification (for raw material only)	A2 THB Temperature Humidity Bias or biased HAST	A3 AC Autoclave or Unbiased HAST	A4 TC Temperature Cycling	A5 PTC Power Temperature Cycling	A6 HTSL High Temperature Storage Life	B1 HTOL High Temperature Operating Life	B2 ELFR Early Life Failure Rate	C1 WBS Wire Bond Shear	C2 WBP Wire Bond Pull	C3 SD Solderability	C4 PD Physical Dimensions	C5 SBS Solder Ball Shear	C6 LI Lead Integrity	D1 EM Electromigration	E5 ED Electrical Distribution	E10 SC Short Circuit Characterization	E12 LF Lead free	G1-4 MECH Hermetic Package Test	G7 DS Die Shear	G8 IWV Internal Water Vapor	Whisker test (IEC 60068-2-82, JEDEC JESD201)	Parameter-Analysis: Comparison of current with changed device characterization, electrical distribution
		ANY																												
		DATASHEET																												
		DESIGN																												
		PROCESS - WAFER PRODUCTION																												
		BARE DIE																												
		PROCESS - ASSEMBLY																												
x	SEM-PA-08	Change of wire bonding	P	P	C	●	●	●	●	●	●	Q	●	-	-	●	●	-	-	-	-	●	M	●	-	H	-	-	-	●
x	SEM-PA-13	Change of product marking	I	P	B	-	●	-	-	-	-	-	-	-	-	-	-	B	-	-	-	-	-	-	-	-	-	-	-	-
x	SEM-PA-16	Change of direct material supplier	–	P	C	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
x	SEM-PA-18	Move of all or part of assembly to a different location/site/subcontractor	P	P	C	●	●	-	●	●	●	M	-	●	●	●	●	●	●	T	●	-	●	-	L	H	H	H	G	●
x	SEM-PA-21	Molding / Encapsulation process	–	P	C	-	●	-	●	●	●	M	●	●	-	-	-	●	●	-	●	-	-	-	L	-	-	-	-	-
		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 location/site/subcontractor	P	P	C	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	●	-	-	-	-	-	-	●
		Q-GATE																												
		Tests, which should be considered for the appropriate process change.			B	●	●	●	●	●	●	M,Q	●	●	●	●	●	●	●	T	●	●	●	●	L	H	H	H	G	●

With reference to the above qualification plan, following trials are not performed:

	- ELFR: silicon related, not applicable to assembly changes; - EM: silicon related, not applicable to assembly changes; - LI: not applicable to surface mount packages; - SC: not applicable to microcontrollers. <u>Electrical Final Test transfer</u> validation is based on standard correlation exercise (data comparison).
CURRENT PRODUCTS	Upon completion of the transition phase, products will be produced in Muar Plant only.
REPORTS	Transfer validation is presently in progress. Complete set of qualification reports will be provided upon activity completion, foreseen early 2020/Q2

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