PRODUCT / PROCESS CHANGE INFORMATION

1. PCI basic data	
1.1 Company	STMicroelectronics International N.V
1.2 PCI No.	AMS/23/14024
1.3 Title of PCI	CPAK Cover Tape Conversion in UTAC Thailand
1.4 Product Category	See product list
1.5 Issue date	2023-04-04

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 Product Manager	Marcello SAN BIAGIO
2.1.2 Marketing Manager	Salvatore DI VINCENZO
2.1.3 Quality Manager	Jean-Marc BUGNARD

3. Change		
3.1 Category	3.2 Type of change	3.3 Manufacturing Location
Materials	New Indirect material part number (same supplier or different supplier): Boxes, trays, carriers, back grinding tape, wafer mounting tape, mold tape, etc..	UTAC Thailand

4. Description of change		
	Old	New
4.1 Description	C-PAK Cover tape material : - CP99 from USA Cover tape	C-PAK Cover tape material : - CP25A from Japan
4.2 Anticipated Impact on form,fit, function, quality, reliability or processability?	no impact	

5. Reason / motivation for change	
5.1 Motivation	The cover tape material CP25A from Japan is already a qualified material for ST and currently in production in UTAC Thailand. This source will ensure reliable supply and service continuity.
5.2 Customer Benefit	SERVICE CONTINUITY

6. Marking of parts / traceability of change	
6.1 Description	Date code - Internal traceability

7. Timing / schedule	
7.1 Date of qualification results	2023-03-21
7.2 Intended start of delivery	2023-04-30
7.3 Qualification sample available?	Not Applicable

8. Qualification / Validation			
8.1 Description	14024 CPAK-covertape-concertion-fromCP99-USA-to-CP25A-Japan.pdf		
8.2 Qualification report and qualification results	Available (see attachment)	Issue Date	2023-04-04

9. Attachments (additional documentations)
14024 Public product.pdf 14024 CPAK-covertape-concertion-fromCP99-USA-to-CP25A-Japan.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
	STEF01FTR	
	STG3856QTR	

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C_PAK Cover tape conversion from CP99 USA to CP25A Japan UTAC

March 2023

Objectif/ background

- C-PAK USA supplier who provides cover tape was notified of their intent to discontinuity the materials that use for cover tape of CP99. Therefore, a new material source is CP25A will be proposed for reliable supply from C-PAK Japan.
- Cover tape material CP25A was qualified and currently in UTL production use for certain products.

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Description of the change

Change from : Cover tape raw material CP99 from C-PAK (USA)

Change to : Cover tape raw material CP25A from C-PAK (Japan).

Remark: Cover tape raw material CP99 will no longer be used for impacted device per last time buy period.

4. Current vs Proposed Details:

Current Situation	New / Proposed situation
Cover tape using raw material CP99 Affected Stock#: 26027001 26027002	Cover tape using raw material CP25A Affected Stock#: 26027009 26027026
Cover tape using raw material CP99 manufacturing and slitting in USA.	Cover tape using raw material CP25A manufacturing in Japan and slitting in Singapore.

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Side by Side Comparison(1)

Description	Current CP99 raw material	New/Proposed CP25A raw material	Same/ Different?	Comment
Man	CP99 is existing production manpower in USA sub supplier.	CP25A is existing production manpower in Japan and Singapore.	Different	Low risk. CP25A is currently qualified material for STMicro.
Machine	CP99 is existing production machine in USA sub supplier. (Both manufacturing and slitting facility in USA)	CP25A is existing production machine in Japan and Singapore sub supplier. (Manufacturing in Japan and slitting facility in Singapore)	Different	Low risk. CP25A is currently qualified material for STMicro.
Material	CP99 cover tape material from USA.	CP25A cover tape material from Japan.	Different	Low risk. CP25A is currently qualified material for STMicro.
Method	- Process flow of CP99 : Manufacturing and slitting in USA –> C-PAK –> end customer - Measurement control	- Process flow CP25A : Manufacturing in Japan - slitting in Singapore –> C-PAK –> end customer - Same Measurement control	Different	Low risk. CP25A is currently qualified material for STMicro.
Measurement	Same measurement equipment	Same measurement equipment	Same	No risk. Same measurement equipment.
Environment	No change	No change	Same	No risk. Same environment.

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Side by Side Comparison(2)

Properties	Current CP99 raw material	New/Proposed CP25A raw material	Performance	Comment
Dimension	26027001 (width=5.4mm; length=500m)	26027009 (width=5.4mm; length=500m)	Same	Same width and length dimension.
	26027002 (width=9.2mm; length=500m)	26027026 (width=9.2mm; length=500m)	Same	Same width and length dimension.
Base material	Polyester	Polyester	Same	Same base material.
Haze	27%	15%	Better	CP25A is more transparent than CP99.
Surface Resistance	Top side 10^{10} ohms	Top side 10^{10} ohms	Better	CP25A has a lower SR value than CP99 on the adhesive side. So, CP25A would be highly conductive and better in static charge dissipation than CP99.
	Adhesive side 10^{10} ohms	Adhesive side 10^{8} ohms		
Surface Resistivity	Top side 10^{11} ohms	Top side 10^{11} ohms		
	Adhesive side 10^{11} ohms	Adhesive side 10^{9} ohms		
Peel Strength limit	50 +/- 30 (20-80 g)	50 +/- 30 (20-80 g)	Same	Same peel back force limit.
Colour	Pink film	Natural	Different	CP99 has color pigment added. CP25A has no color pigment added.
Shelf life	24 months	24 months	Same	Same shelf life.

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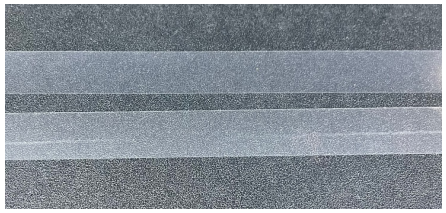
Side by Side Comparison(3)

Properties	Current CP99 raw material	New/Proposed CP25A raw material	Same/Different?	Comment
Colour	Pink Film	Natural	Different	CP99 has color pigment (pink color) added while CP25A has no color pigment added.
	 	 		
Shelf life	24 months	24 months	Same	Same shelf life.

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Aging test comparison between cover tape using raw material CP99 and CP25A

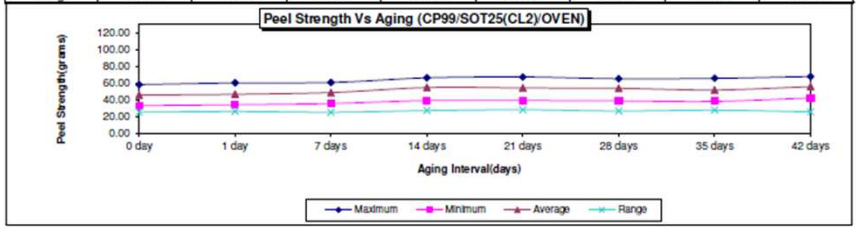
Current CP99 raw material	New/Proposed CP25A raw material
Stock# 26027001 (width=5.4mm; length=500m)	**Stock# 26027009** (width=5.4mm; length=500m)

BC1051(CL) VS CP99

PARAMETERS			
Material Type	Cover Tape = CP99 Carrier Tape = BC1051(CL2)	Sealing Shoe	0.45mm x L32 x D4
Sealing Machine	Ismeca NT-16	Sealing Mode	Reciprocating
		Pressure	2.3 bar
		Sealing Temperature	140°C
Peeling Machine	GPD Model 856VS	Seal Time	80ms
Package Type	SOT25	Feed Length	4 mm
Carrier Width	8 mm	Peeling Speed	300mm/min
Cover Tape Width	5.4 mm		

(a) Aging test in an oven @ 55°C /80%RH

Duration	0 day	1 day	7 days	14 days	21 days	28 days	35 days	42 days
Maximum	58.00	60.00	60.50	66.00	67.00	65.00	65.50	67.50
Minimum	33.00	34.00	35.50	39.00	39.00	38.50	38.00	42.00
Average	45.50	46.50	48.50	54.50	54.00	53.50	51.50	55.50
Range	25.00	26.00	25.00	27.00	28.00	26.50	27.50	25.50

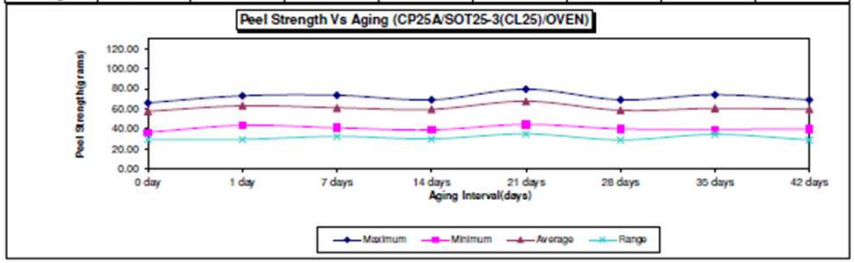


BC1051(CL) VS CP25A

PARAMETERS			
Material Type	Cover Tape = CP25A Carrier Tape = BC1051(CL)	Sealing Shoe	0.45x4.0xL32
Sealing Machine	Ismeca NT16	Sealing Mode	Reciprocating
		Pressure	2.5 bar
		Sealing Temperature	150°C
Peeling Machine	Cato PT20	Seal Time	80ms
Package Type	SOT25-3	Feed Length	4 mm
Carrier Width	8 mm	Peeling Speed	300mm/min
Cover Tape Width	5.4 mm		

(a) Aging test in an oven @ 55°C / 80% Relative Humidity

Duration	0 day	1 day	7 days	14 days	21 days	28 days	35 days	42 days
Maximum	66.00	73.00	73.50	69.00	79.50	69.00	74.00	69.00
Minimum	36.50	43.50	41.00	39.00	44.50	40.00	39.50	40.00
Average	57.50	63.00	61.00	59.50	67.50	58.50	60.50	59.50
Range	29.50	29.50	32.50	30.00	35.00	29.00	34.50	29.00



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Aging test comparison between cover tape using raw material CP99 and CP25A

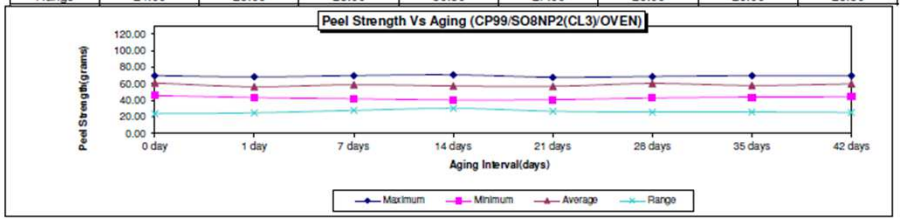
Current CP99 raw material	New/Proposed CP25A raw material
Stock# 26027002 (width=9.2mm; length=500m)	**Stock# 26027026** (width=9.2mm; length=500m)

BC1051(CL) VS CP99

PARAMETERS	
Material Type : Cover Tape = CP99 Carrier Tape = BC1051(CL3)	Sealing Shoe : 18 milsx1.9 Sealing Mode : Reciprocating
Sealing Machine : Systemation MT-30 (With SMD-400 Mode)	Pressure : 30 psi Sealing Temperature : 160°C
Peeling Machine : Cato PT20	Seal Time : 0.3s
Package Type : SO8NP2	Feed Length : 12 mm
Carrier Width : 12 mm	Peeling Speed : 300mm/min
Cover Tape Width : 9.2 mm	

(a) Aging test in an oven @ 55°C / 80% Relative Humidity

Duration	0 day	1 day	7 days	14 days	21 days	28 days	35 days	42 days
Maximum	70.00	68.50	70.00	71.00	68.00	69.00	70.00	70.00
Minimum	46.00	43.50	42.00	40.50	41.00	43.00	44.00	44.50
Average	61.00	56.50	59.00	57.50	57.00	60.50	58.00	60.00
Range	24.00	25.00	28.00	30.50	27.00	26.00	26.00	25.50

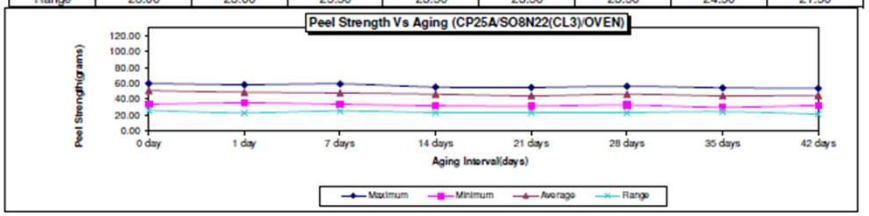


BC1051(CL) VS CP25A

PARAMETERS	
Material Type : Cover Tape = CP25A Carrier Tape = BC1051(CL3)	Sealing Shoe : 18 milsx1.9 Sealing Mode : Reciprocating
Sealing Machine : Systemation MT-30 (With SMD-400 Mode)	Pressure : 30 psi Sealing Temperature : 170°C
Peeling Machine : Cato PT20	Seal Time : 0.3s
Package Type : SO8N22	Feed Length : 12 mm
Carrier Width : 12 mm	Peeling Speed : 300mm/min
Cover Tape Width : 9.2 mm	

(a) Aging test in an oven @ 55°C / 80% Relative Humidity

Duration	0 day	1 day	7 days	14 days	21 days	28 days	35 days	42 days
Maximum	60.00	58.50	59.50	55.50	55.00	56.50	54.50	54.00
Minimum	34.00	35.50	34.00	32.00	31.50	33.00	30.00	32.50
Average	51.00	49.00	48.00	46.50	44.50	46.50	44.50	45.00
Range	26.00	23.00	25.50	23.50	23.50	23.50	24.50	21.50



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Workability test (1)

Visual Inspection	Yes	No	Remark
❑ Contain stain or foreign material		No	
❑ Damage		No	
❑ Burr		No	
❑ The component does not protrude above the top surface of the cover tape	Yes		
❑ The component can be removed from the cavity in a vertical direction without mechanical restriction after the top cover tape has been removed	Yes		
❑ HA Cover tape has no delaminating of cover tape after seal at 230 °C	Yes		
❑ Cover tape width tolerance (± 0.1mm)	Yes		Refer drawing
❑ Thickness of HA (0.04 - 0.07 mm)	Yes		0.048 (Refer TDS data)
❑ Cover tape dimension	Yes		Refer drawing
❑ Color (Transparent or milky)	Yes		Refer TDS data
❑ Presence of hole		No	

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Workability test(2)

Description	Result	Remarks
Sealing line thickness	Passed	Sealing is within 0.3-0.6mm width.
Drop test	Passed	
Check if device stuck-up on pocket	Passed	
Check sticking on cover tape/metal	Passed	
Check colour/surface impact during vision scanning	Passed	
Embossed on tape	Passed	
Check if has double device on tape	Passed	
Material response using Current machine parameter check	Passed	
Different taping machine PBFT verification	N/A	
ESD Check	Passed	Refer to FAI report
Carrier tape bending test. Carrier tape bent 180 degrees 10 times	Passed	No cracks seen on the bent area. 

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Conclusion

Based on above material qualification, the cover tape CP25A passed the tape and reel processing requirements

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PCI Title : CPAK Cover Tape Conversion in UTAC Thailand

PCI Reference : AMS/23/14024

Subject : Public Products List

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