PRODUCT / PROCESS CHANGE NOTIFICATION

1. PCN basic data	
1.1 Company	STMicroelectronics International N.V
1.2 PCN No.	ADG/19/11644
1.3 Title of PCN	HiQuad-64: Assembly Flow Improvement
1.4 Product Category	see list
1.5 Issue date	2019-07-24

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	Elena Maria PERNIGOTTI,Fabrizio CASSANI,Giovanni FOLETTO
2.1.2 Marketing Manager	Alberto DA DALT,Alberto CAROLI
2.1.3 Quality Manager	Marcello Donato MENCHISE

3. Change		
3.1 Category	3.2 Type of change	3.3 Manufacturing Location
Methods	Process flow chart: Revision change in Process like addition, deletion of process step	ST Muar (Malaysia)

4. Description of change		
	Old	New
4.1 Description	1st Crop after Plating	1st Crop before Deflash and Plating
4.2 Anticipated Impact on form,fit, function, quality, reliability or processability?	No impact	

5. Reason / motivation for change	
5.1 Motivation	Quality Improvement. Minimization of solder residue
5.2 Customer Benefit	QUALITY IMPROVEMENT

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

7. Timing / schedule	
7.1 Date of qualification results	2019-06-24
7.2 Intended start of delivery	2020-01-01
7.3 Qualification sample available?	Upon Request

8. Qualification / Validation			
8.1 Description	11644 Validation.pdf		
8.2 Qualification report and qualification results	Available (see attachment)	Issue Date	2019-07-24

9. Attachments (additional documentations)
11644 Public product.pdf 11644 Validation.pdf 11644 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
	E-TDA7570	
	L9779WD-SPI	
	L9779WD-SPI-TR	

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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 : HiQuad-64: Assembly Flow Improvement

PCN Reference : ADG/19/11644

Subject : Public Products List

Dear Customer,

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

L9779WD-TR	L9805E	L9779WD
L9779WD-SPI-TR	L9779WD-SPI	

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PRODUCT/PROCESS CHANGE NOTIFICATION

SUBJECT	**HI-QUAD 64: Assembly Flow Improvement**
IMPACTED PRODUCTS	All products housed in HI-QUAD 64 Leads 14x14
MANUFACTURING STEP	Assembly
INVOLVED PLANT	ST Muar Plant (Malaysia)
CHANGE REASON	Quality Improvement
CHANGE DESCRIPTION	Optimization of process flow will be implemented as per below. New flow will minimize solder residue 
TRACEABILITY	Internal traceability

VALIDATION

Change as per ZVEI is classified as SEMPA-17.

	ID	Type of change	No	Yes		
		ANY				
		DATA SHEET				
		DESIGN				
		PROCESS - WAFER PRODUCTION				
		BARE DIE				
		PROCESS - ASSEMBLY				
x	SEMI-PA-17	Change of specified assembly process sequence (deletion and/or additional process step)	--	P	(--): no influence in final product integrity or *specified sequence* (P): influence in final product integrity or *specified sequence*	(--): e.g. additional cleaning step e.g. deletion of optical inspection (P): e.g. change lead finishing pre trim & form to post trim & form
		PACKING/SHIPPING				
		EQUIPMENT				
		TEST FLOW				
		Q-GATE				

Trials have been executed according to AEC-Q100 see enclosed report

REPORTS

11644 Validation.pdf

IMPLEMENTATION

We are ready to implement the change upon Customer agreement from January 2020

A99M*UG30AD1
G99M*UA412BC1
A69M*UT60CB1
PCMS 2 step crop

UG30 – Hiquad 64L
UA41 – Hiquad 64L
UT60 – Hiquad 64L

Updated : 27th June 2018

Prepared By: Muar BEM&T QA Reliability Laboratory

life.augmented

Note: Sampling 154 pcs/lot – taken from tested good units after FT.

Reliability Test Status								
No	Test Name	Prec	Condition/ Method	Steps	Steps	Fails/SS		Notes
						UG30 998041MFRR	UT60 9980417YRR	
1	PC (JL3 STD)		Bake 24 hrs @ 125°C Soak 192 hrs @ 30°C / 60% RH Reflow Profile = J-STD-020D (Tmax = 260°C)	Final	TSAM (0hr)	0 delam / 40 pcs	0 delam / 40 pcs	
					CSAM TOP (0hr)	0 delam / 40 pcs	0 delam / 40 pcs	
					ATE	0 def / 154 pcs	0 def / 154 pcs	
					TSAM	0 delam / 40 pcs	0 delam / 40 pcs	
					CSAM TOP	0 delam / 40 pcs	0 delam / 40 pcs	
2	TC	Yes	TA = -65°C / +150°C	1000 Cycle	ATE	0 def /77 pcs	0 def /77 pcs	
					TSAM	0 delam / 20 pcs	0 delam / 20 pcs	
					CSAM TOP	0 delam / 20 pcs	0 delam / 20 pcs	
3	Env Seq	Yes	TA = -65°C / +150°C PPT 121°C/ 2Atm	100TC 96 hrs	ATE	0 def / 77 pcs	0 def / 77 pcs	
					TSAM	0 delam / 20 pcs	0 delam / 20 pcs	
					CSAM TOP	0 delam / 20 pcs	0 delam / 20 pcs	

Note: Sampling 154 pcs/lot – taken from tested good units after FT.

Reliability Test Status									
No	Test Name	Prec	Condition/ Method	Steps	Steps	Fails/SS			Notes
						UA41 998041DMRQ	UA41 998041DMRN	UA41 998041DMRR	
1	PC (JL3 STD)		Bake 24 hrs @ 125°C Soak 192 hrs @ 30°C / 60% RH Reflow Profile = J-STD-020D (Tmax = 260°C)	Final	TSAM (0hr)	0 delam / 40 pcs	0 delam / 40 pcs	0 delam / 40 pcs	
					CSAM TOP (0hr)	0 delam / 40 pcs	0 delam / 40 pcs	0 delam / 40 pcs	
					ATE	0 def / 154 pcs	0 def / 154 pcs	0 def / 154 pcs	
					TSAM	0 delam / 40 pcs	0 delam / 40 pcs	0 delam / 40 pcs	
					CSAM TOP	0 delam / 40 pcs	0 delam / 40 pcs	0 delam / 40 pcs	
2	TC	Yes	TA = -65°C / +150°C	1000 Cycle	ATE	0 def /77 pcs	0 def /77 pcs	0 def /77 pcs	
					TSAM	0 delam / 20 pcs	0 delam / 20 pcs	0 delam / 20 pcs	
					CSAM TOP	0 delam / 20 pcs	0 delam / 20 pcs	0 delam / 20 pcs	
3	Env Seq	Yes	TA = -65°C / +150°C PPT 121°C/ 2Atm	100TC 96 hrs	ATE	0 def / 77 pcs	0 def / 77 pcs	0 def / 77 pcs	
					TSAM	0 delam / 20 pcs	0 delam / 20 pcs	0 delam / 20 pcs	
					CSAM TOP	0 delam / 20 pcs	0 delam / 20 pcs	0 delam / 20 pcs	

SAM Analysis Picture

A99M*UG30AD1 : Lot ID 998041MFRR

TSAM (Thru Scan) CSAM (Die Top) @ T0

TSAM

CSAM Top

Unit Position From 1 - 60

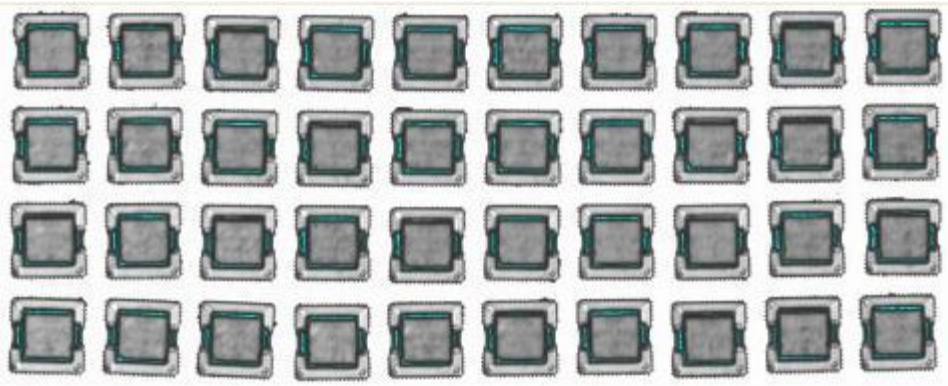
Delamination interface	Spec 7512807
Die / molding compound	Pass
Die Attach Material	Pass
Die-pad / molding compound (front side)	Pass
Die-pad / molding compound (back side)	Pass

life.augmented

SAM Analysis Picture

A99M*UG30AD1 : Lot ID 998041MFRR

TSAM (Thru Scan) CSAM (Die Top) @ after JL3



TSAM

CSAM Top

Unit Position From 1 - 40

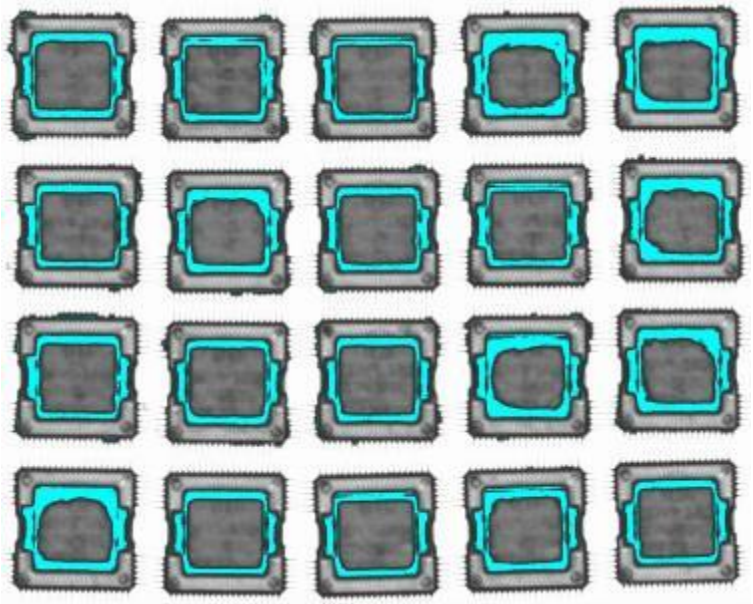
Delamination interface	Spec 7512807
Die / molding compound	Pass
Die Attach Material	Pass
Die-pad / molding compound (front side)	Pass
Die-pad / molding compound (back side)	Pass

life.augmented

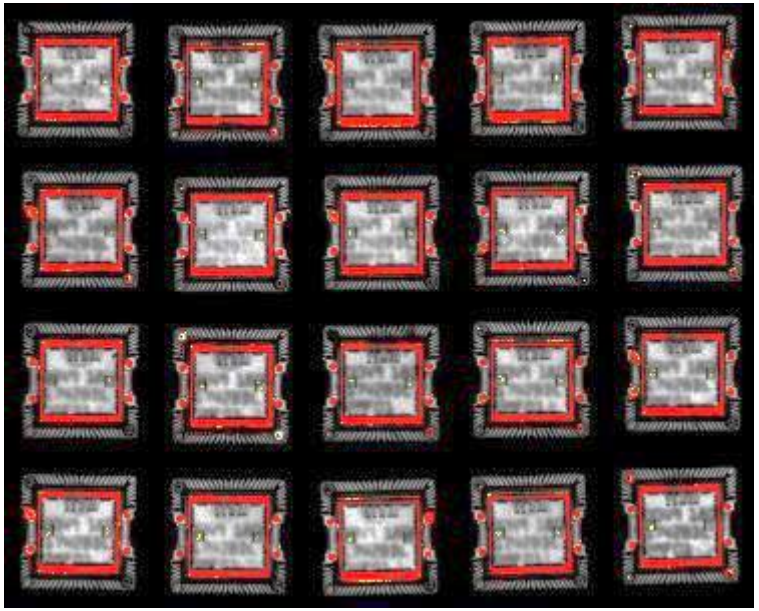
SAM Analysis Picture

A99M*UG30AD1 : Lot ID 998041MFRR

TSAM (Thru Scan) CSAM (Die Top) @ after JL3 + 1000TC



TSAM



CSAM Top

Unit Position From 1 - 20

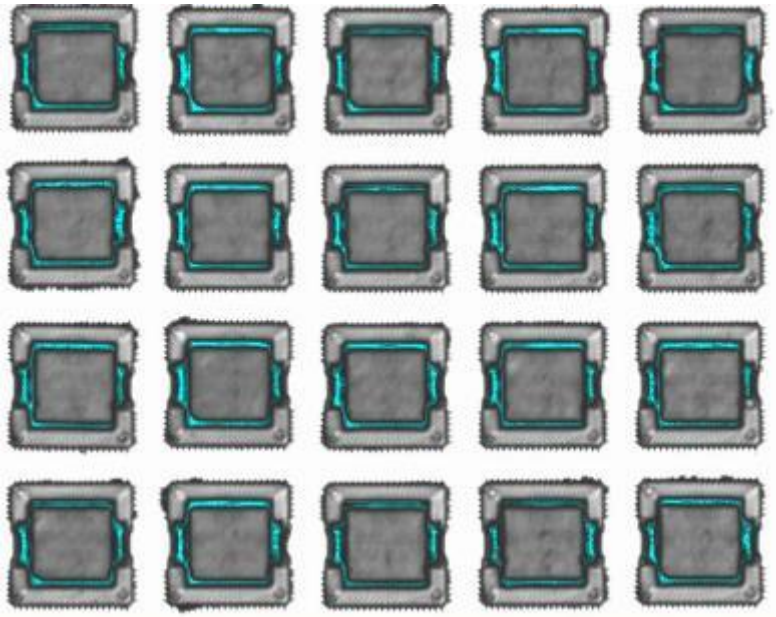
Delamination interface	Spec 7512807
Die / molding compound	Pass
Die Attach Material	Pass
Die-pad / molding compound (front side)	Pass
Die-pad / molding compound (back side)	Pass

life.augmented

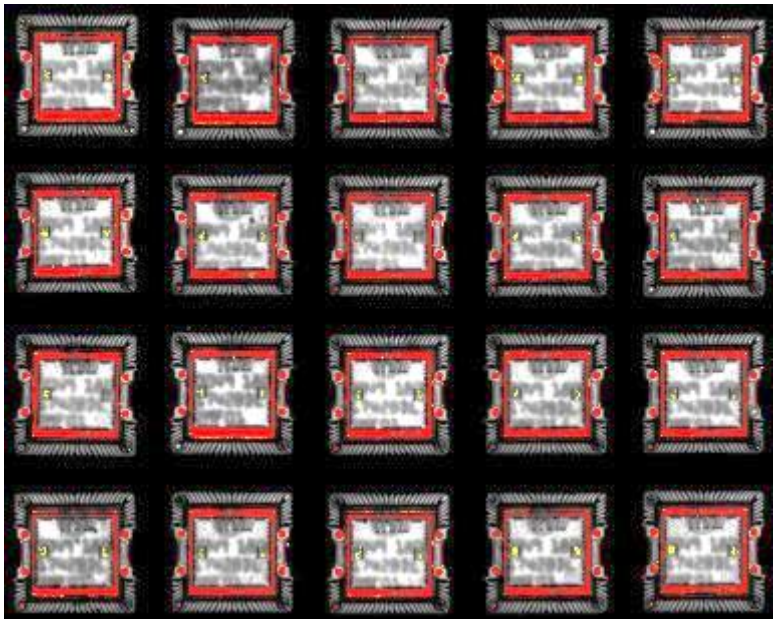
SAM Analysis Picture

A99M*UG30AD1 : Lot ID 998041MFRR

TSAM (Thru Scan) CSAM (Die Top) @ after JL3 + 100TC + PPT 96 hrs



TSAM



CSAM Top

Unit Position From 21 - 40

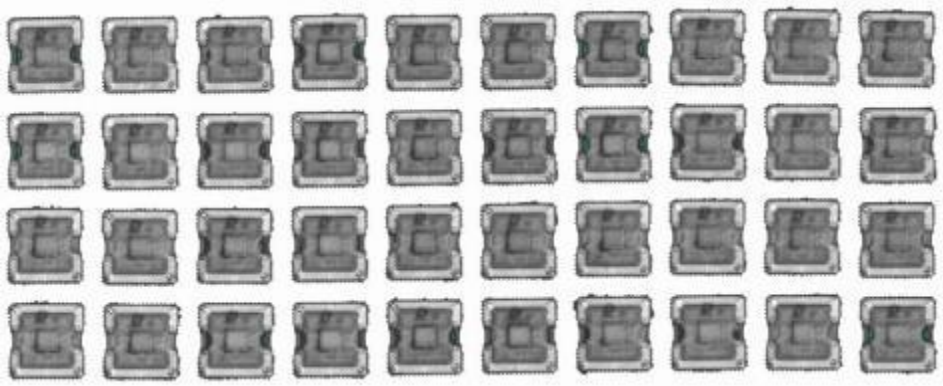
Delamination interface	Spec 7512807
Die / molding compound	Pass
Die Attach Material	Pass
Die-pad / molding compound (front side)	Pass
Die-pad / molding compound (back side)	Pass

life.augmented

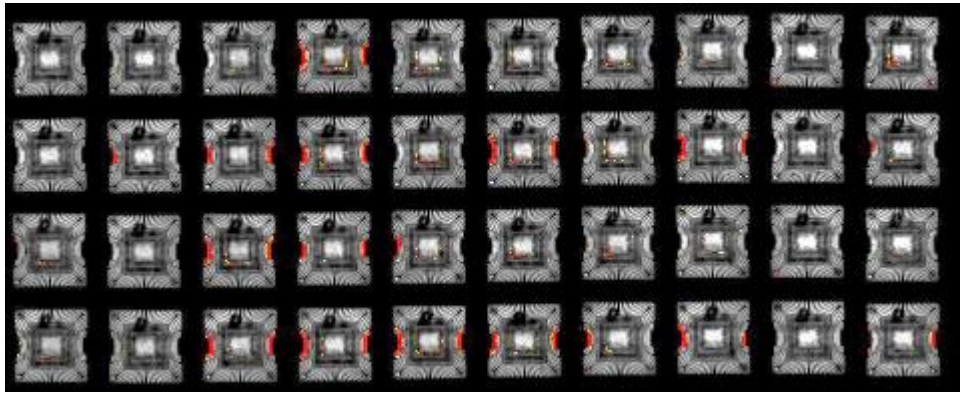
SAM Analysis Picture

A69M*UT60CB1 : Lot ID 9980417YRR

TSAM (Thru Scan) CSAM (Die Top) @ T0



TSAM



CSAM Top

Unit Position From 1 - 60

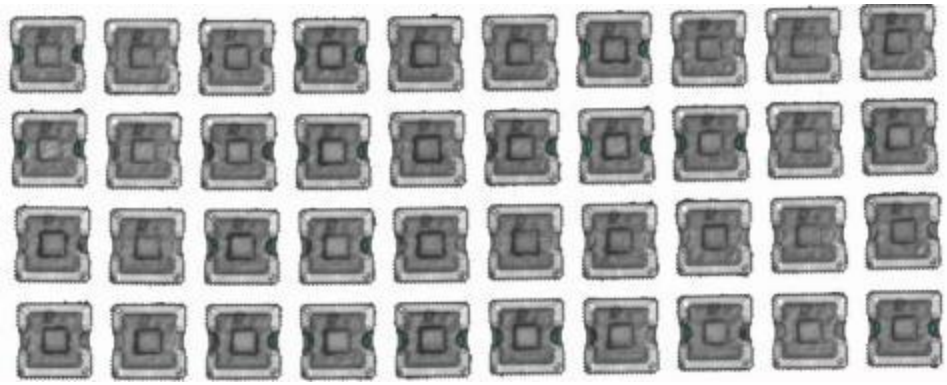
Delamination interface	Spec 7512807
Die / molding compound	Pass
Die Attach Material	Pass
Die-pad / molding compound (front side)	Pass
Die-pad / molding compound (back side)	Pass

life.augmented

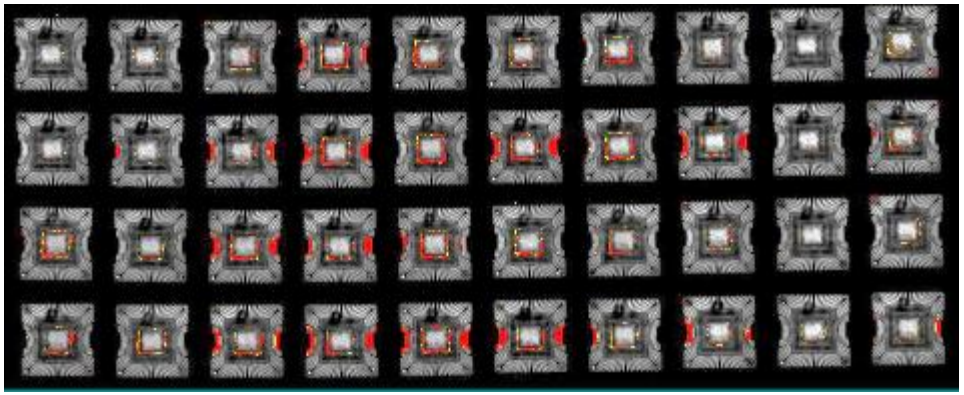
SAM Analysis Picture

A69M*UT60CB1 : Lot ID 9980417YRR

TSAM (Thru Scan) CSAM (Die Top) @ after JL3



TSAM



CSAM Top

Unit Position From 1 - 40

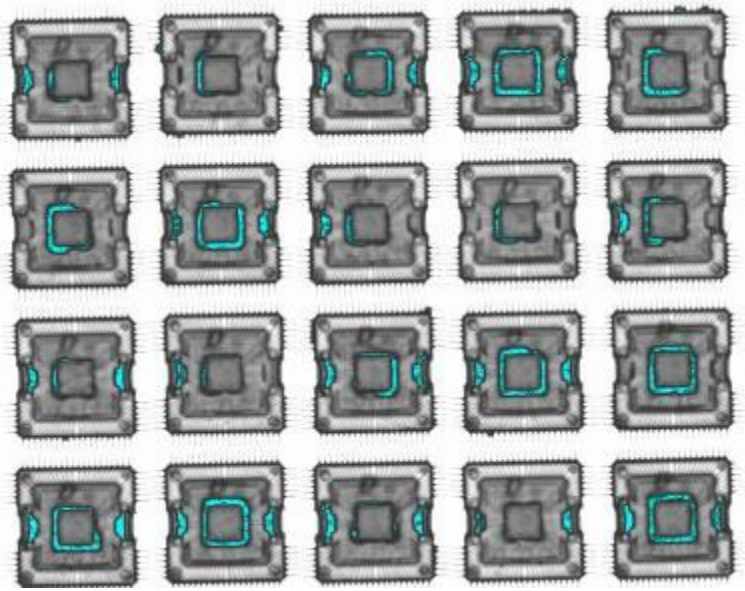
Delamination interface	Spec 7512807
Die / molding compound	Pass
Die Attach Material	Pass
Die-pad / molding compound (front side)	Pass
Die-pad / molding compound (back side)	Pass

life.augmented

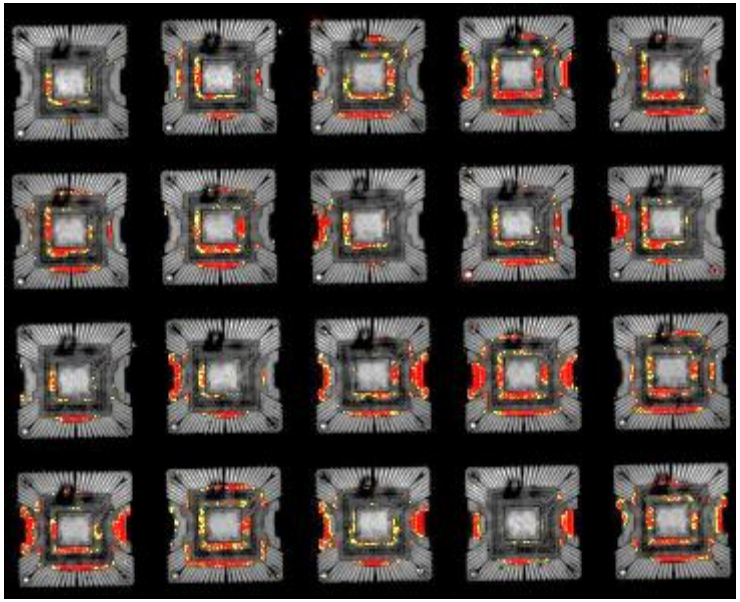
SAM Analysis Picture

A69M*UT60CB1 : Lot ID 9980417YRR

TSAM (Thru Scan) CSAM (Die Top) @ after JL3 + 1000TC



TSAM



CSAM Top

Unit Position From 1 - 20

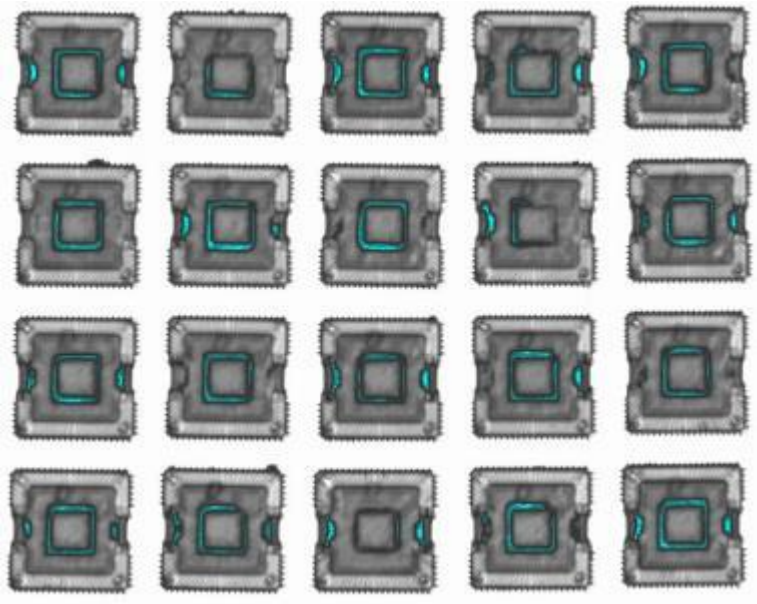
Delamination interface	Spec 7512807
Die / molding compound	Pass
Die Attach Material	Pass
Die-pad / molding compound (front side)	Pass
Die-pad / molding compound (back side)	Pass

life.augmented

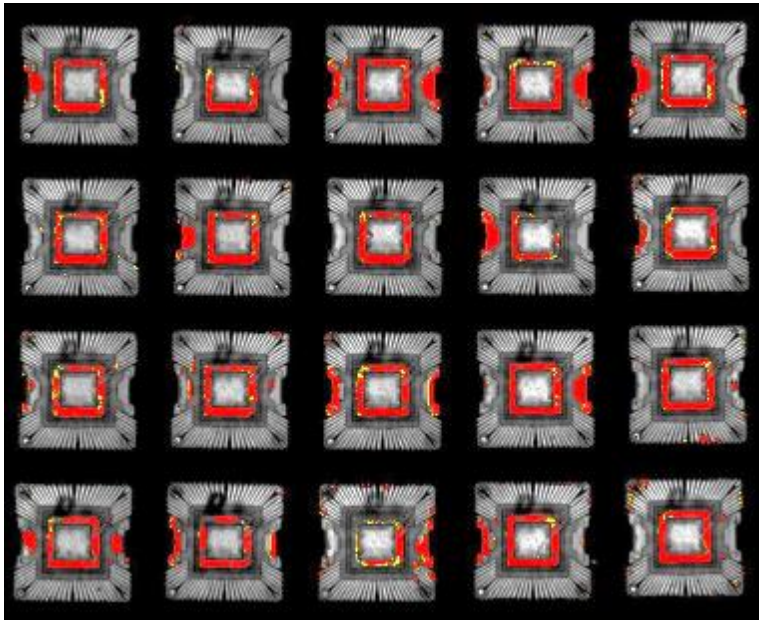
SAM Analysis Picture

A69M*UT60CB1 : Lot ID 9980417YRR

TSAM (Thru Scan) CSAM (Die Top) @ after JL3 + 100TC + PPT 96 hrs



TSAM



CSAM Top

Unit Position From 21 - 40

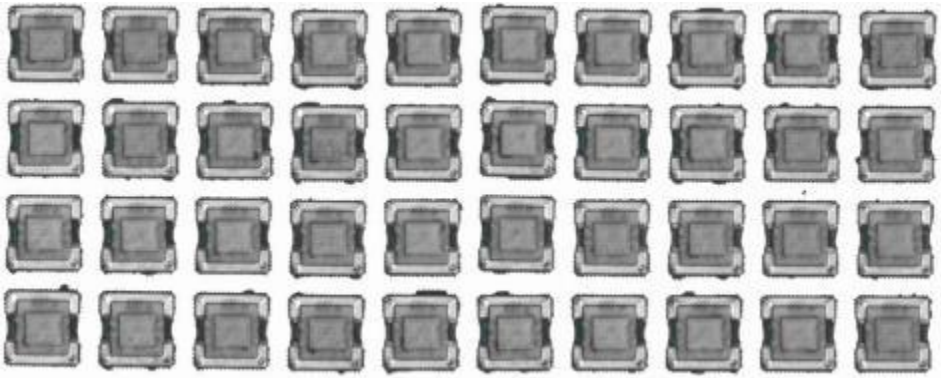
Delamination interface	Spec 7512807
Die / molding compound	Pass
Die Attach Material	Pass
Die-pad / molding compound (front side)	Pass
Die-pad / molding compound (back side)	Pass

life.augmented

SAM Analysis Picture

G99M*UA412BC1 : Lot ID 998041DMRQ

TSAM (Thru Scan) CSAM (Die Top) @ T0



TSAM

CSAM Top

Unit Position From 1 - 60

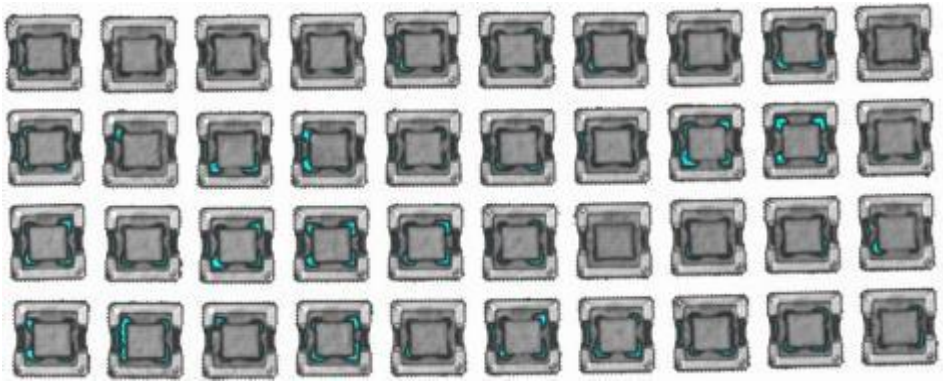
Delamination interface	Spec 7512807
Die / molding compound	Pass
Die Attach Material	Pass
Die-pad / molding compound (front side)	Pass
Die-pad / molding compound (back side)	Pass

life.augmented

SAM Analysis Picture

G99M*UA412BC1 : Lot ID 998041DMRQ

TSAM (Thru Scan) CSAM (Die Top) @ after JL3



TSAM

CSAM Top

Unit Position From 1 - 40

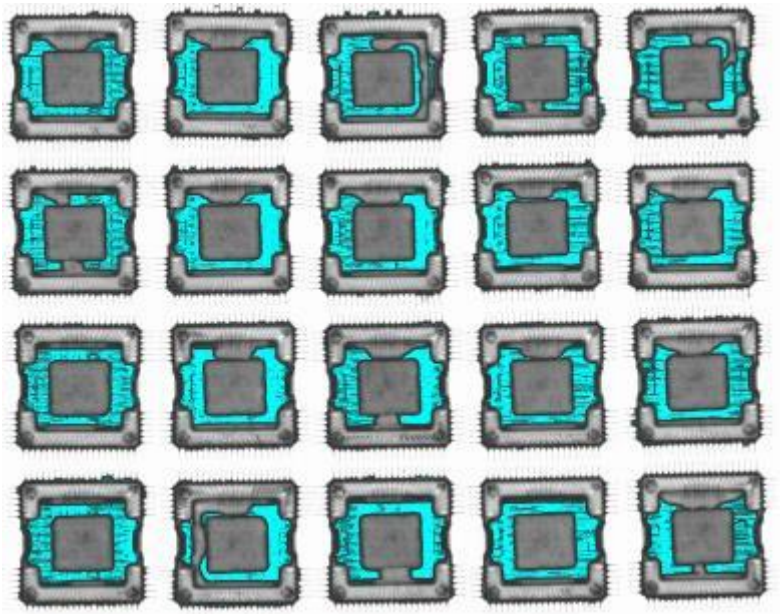
Delamination interface	Spec 7512807
Die / molding compound	Pass
Die Attach Material	Pass
Die-pad / molding compound (front side)	Pass
Die-pad / molding compound (back side)	Pass

life.augmented

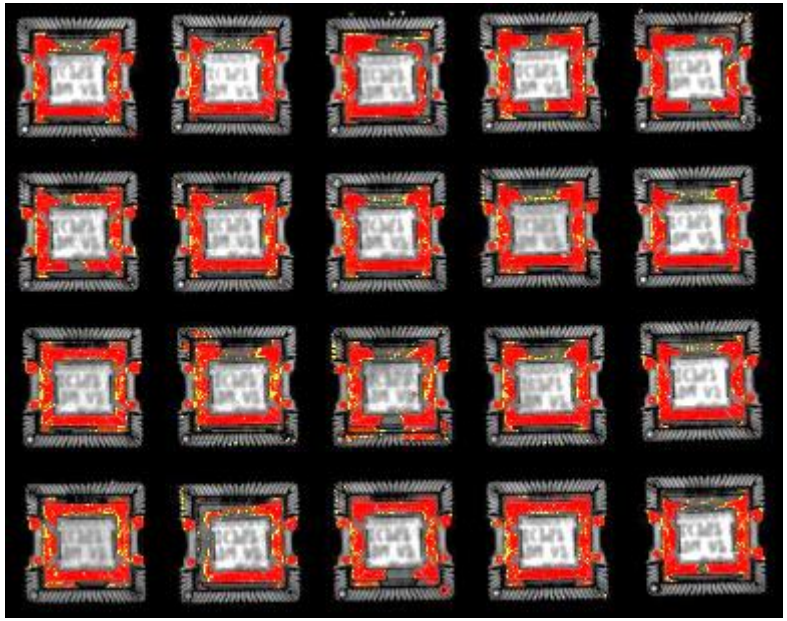
SAM Analysis Picture

G99M*UA412BC1 : Lot ID 998041DMRQ

TSAM (Thru Scan) CSAM (Die Top) @ after JL3 + 1000TC



TSAM



CSAM Top

Unit Position From 1 - 20

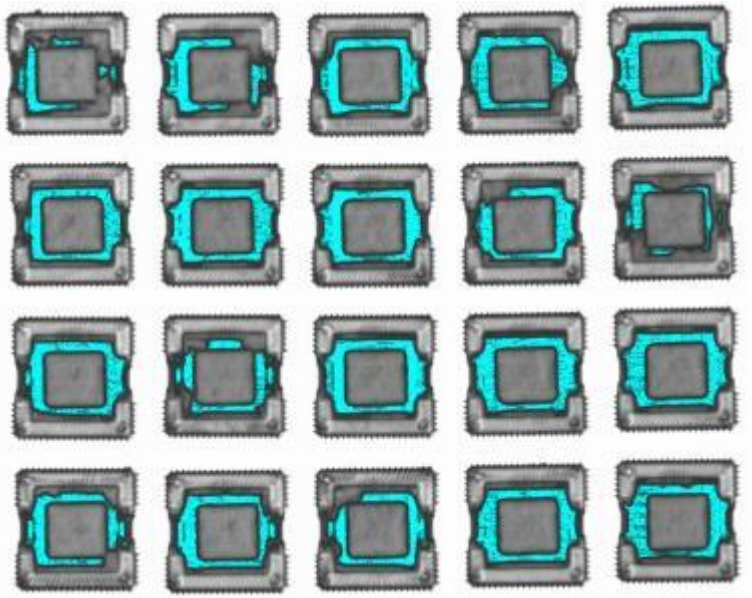
Delamination interface	Spec 7512807
Die / molding compound	Pass
Die Attach Material	Pass
Die-pad / molding compound (front side)	Pass
Die-pad / molding compound (back side)	Pass

life.augmented

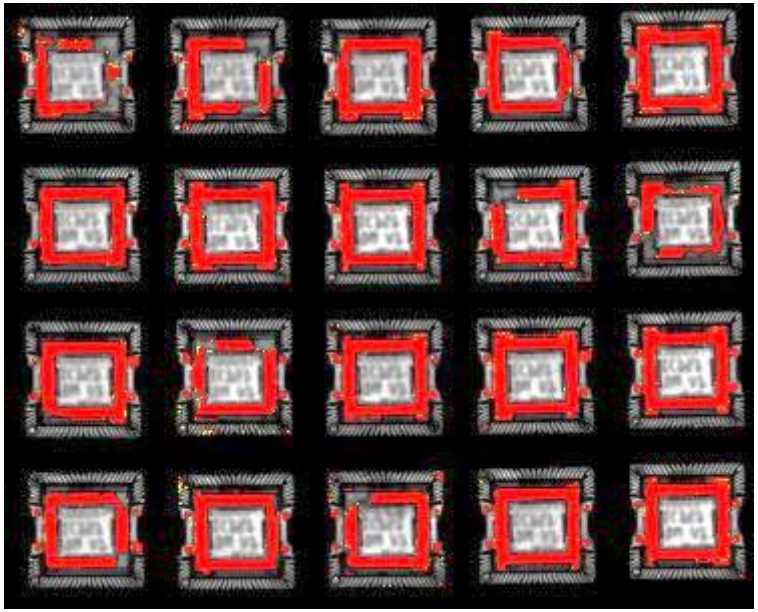
SAM Analysis Picture

G99M*UA412BC1 : Lot ID 998041DMRQ

TSAM (Thru Scan) CSAM (Die Top) @ after JL3 + 100TC + PPT 96 hrs



TSAM



CSAM Top

Unit Position From 21 - 40

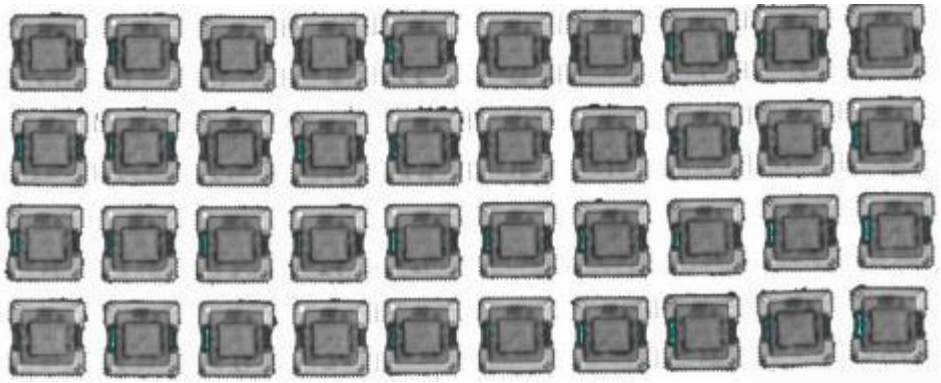
Delamination interface	Spec 7512807
Die / molding compound	Pass
Die Attach Material	Pass
Die-pad / molding compound (front side)	Pass
Die-pad / molding compound (back side)	Pass

life.augmented

SAM Analysis Picture

G99M*UA412BC1 : Lot ID 998041DMRN

TSAM (Thru Scan) CSAM (Die Top) @ T0



TSAM

CSAM Top

Unit Position From 1 - 60

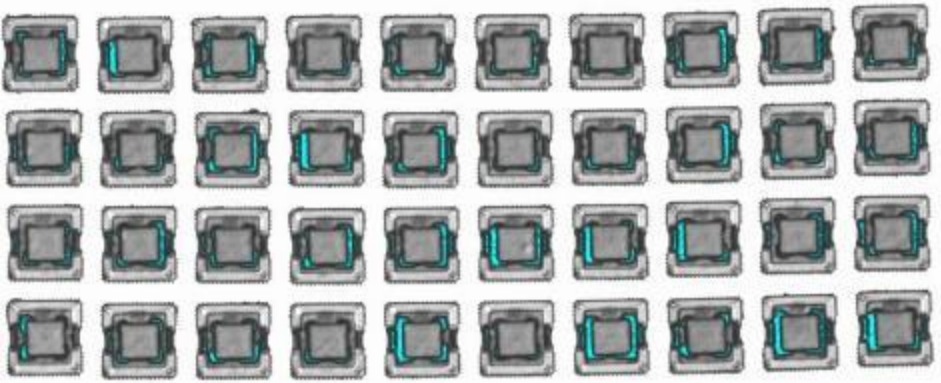
Delamination interface	Spec 7512807
Die / molding compound	Pass
Die Attach Material	Pass
Die-pad / molding compound (front side)	Pass
Die-pad / molding compound (back side)	Pass

life.augmented

SAM Analysis Picture

G99M*UA412BC1 : Lot ID 998041DMRN

TSAM (Thru Scan) CSAM (Die Top) @ after JL3



TSAM

CSAM Top

Unit Position From 1 - 40

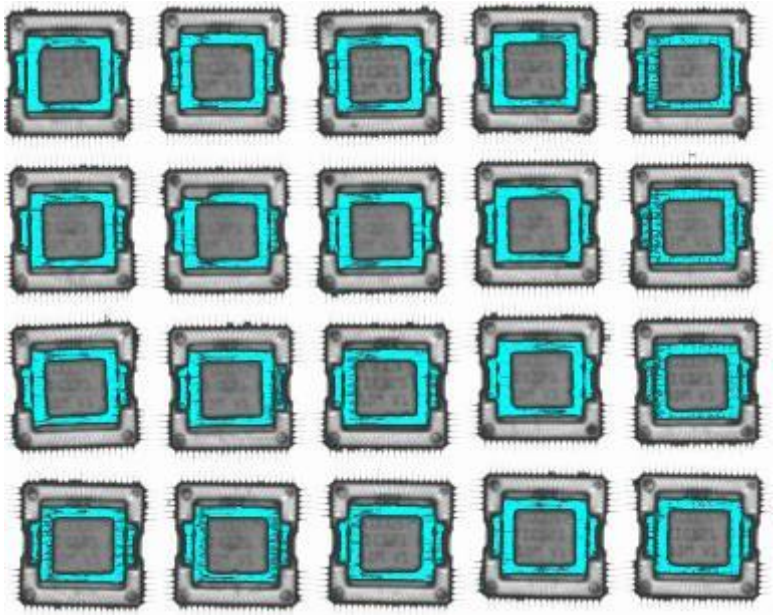
Delamination interface	Spec 7512807
Die / molding compound	Pass
Die Attach Material	Pass
Die-pad / molding compound (front side)	Pass
Die-pad / molding compound (back side)	Pass

life.augmented

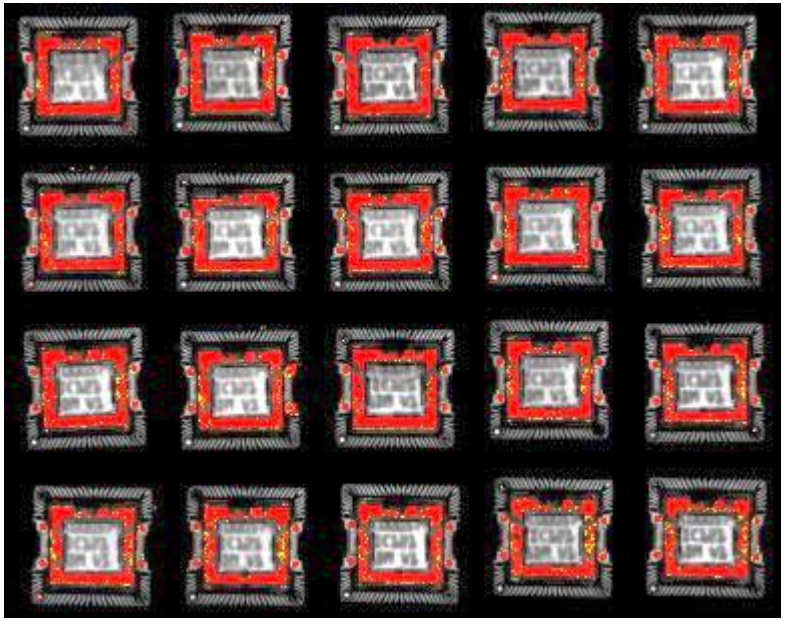
SAM Analysis Picture

G99M*UA412BC1 : Lot ID 998041DMRN

TSAM (Thru Scan) CSAM (Die Top) @ after JL3 + 1000TC



TSAM



CSAM Top

Unit Position From 1 - 20

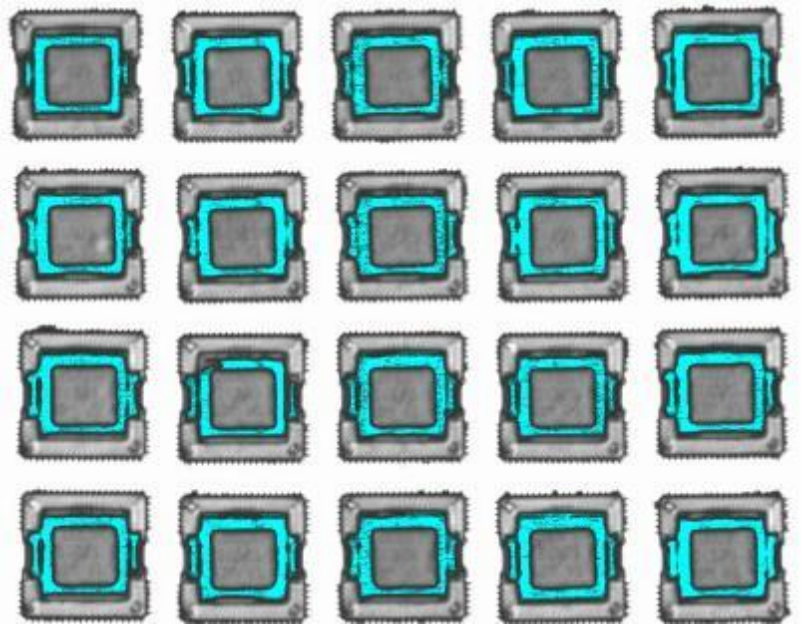
Delamination interface	Spec 7512807
Die / molding compound	Pass
Die Attach Material	Pass
Die-pad / molding compound (front side)	Pass
Die-pad / molding compound (back side)	Pass

life.augmented

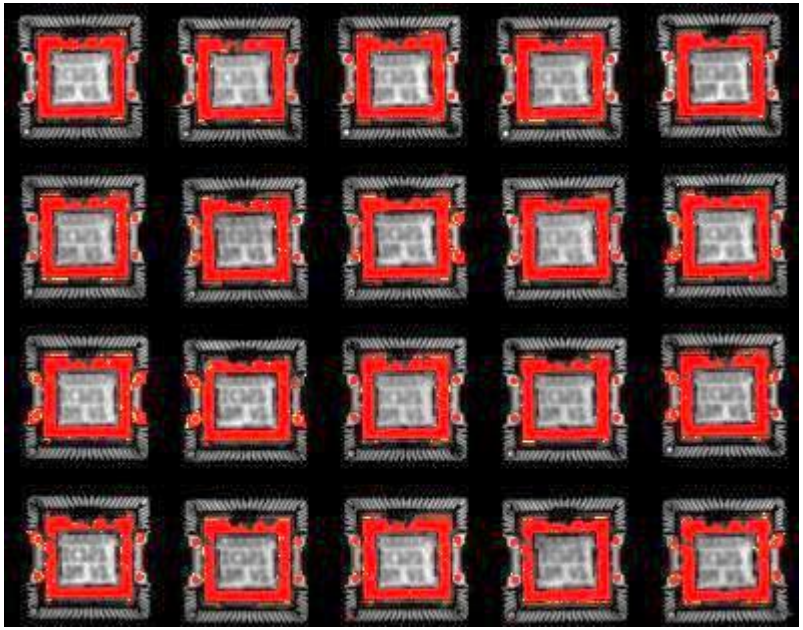
SAM Analysis Picture

G99M*UA412BC1 : Lot ID 998041DMRN

TSAM (Thru Scan) CSAM (Die Top) @ after JL3 + 100TC + PPT 96 hrs



TSAM



CSAM Top

Unit Position From 21 - 40

Delamination interface	Spec 7512807
Die / molding compound	Pass
Die Attach Material	Pass
Die-pad / molding compound (front side)	Pass
Die-pad / molding compound (back side)	Pass

life.augmented

SAM Analysis Picture

G99M*UA412BC1 : Lot ID 998041DMRR

TSAM (Thru Scan) CSAM (Die Top) @ T0

TSAM

CSAM Top

Unit Position From 1 - 60

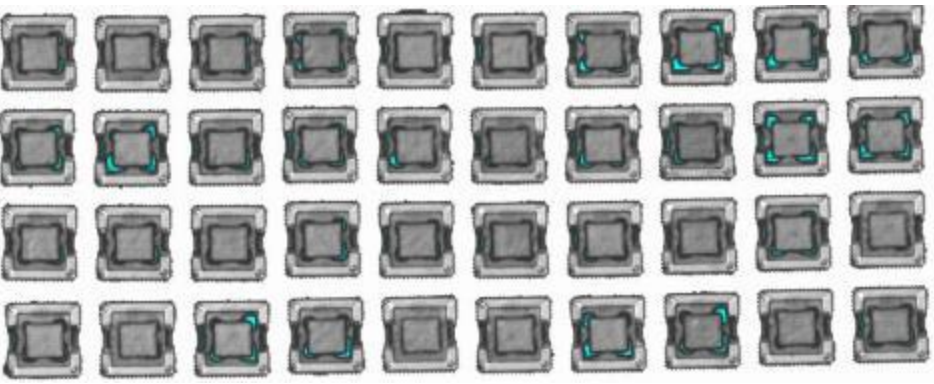
Delamination interface	Spec 7512807
Die / molding compound	Pass
Die Attach Material	Pass
Die-pad / molding compound (front side)	Pass
Die-pad / molding compound (back side)	Pass

life.augmented

SAM Analysis Picture

G99M*UA412BC1 : Lot ID 998041DMRR

TSAM (Thru Scan) CSAM (Die Top) @ after JL3



TSAM

CSAM Top

Unit Position From 1 - 40

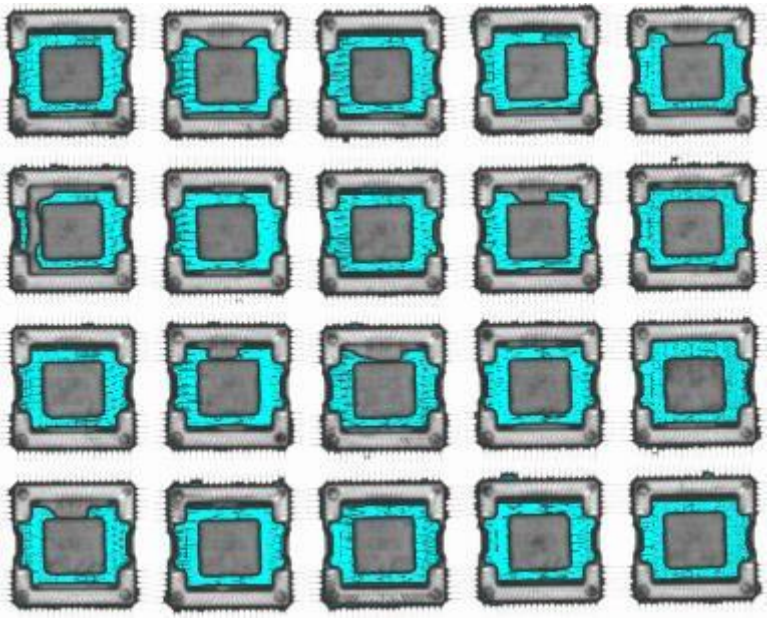
Delamination interface	Spec 7512807
Die / molding compound	Pass
Die Attach Material	Pass
Die-pad / molding compound (front side)	Pass
Die-pad / molding compound (back side)	Pass

life.augmented

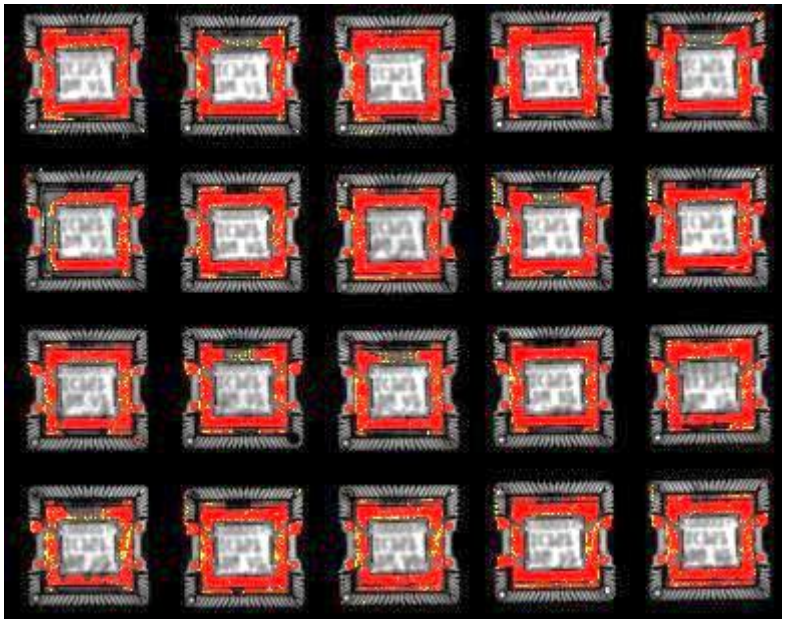
SAM Analysis Picture

G99M*UA412BC1 : Lot ID 998041DMRR

TSAM (Thru Scan) CSAM (Die Top) @ after JL3 + 1000TC



TSAM



CSAM Top

Unit Position From 1 - 20

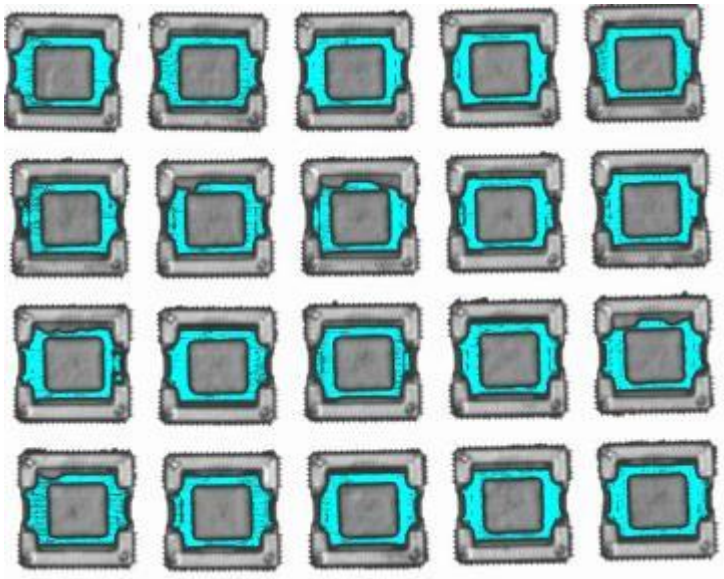
Delamination interface	Spec 7512807
Die / molding compound	Pass
Die Attach Material	Pass
Die-pad / molding compound (front side)	Pass
Die-pad / molding compound (back side)	Pass

life.augmented

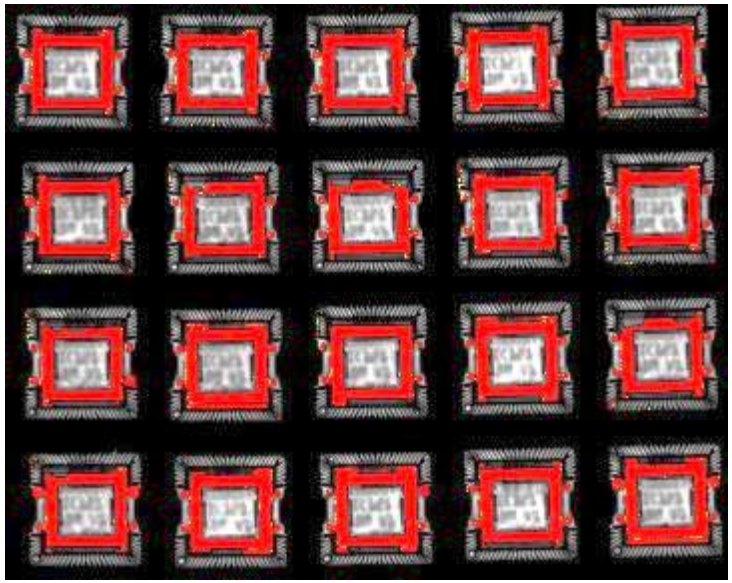
SAM Analysis Picture

G99M*UA412BC1 : Lot ID 998041DMRR

TSAM (Thru Scan) CSAM (Die Top) @ after JL3 + 100TC + PPT 96 hrs



TSAM



CSAM Top

Unit Position From 21 - 40

Delamination interface	Spec 7512807
Die / molding compound	Pass
Die Attach Material	Pass
Die-pad / molding compound (front side)	Pass
Die-pad / molding compound (back side)	Pass

life.augmented

Qualification Summary:

Automatic Electrical Test (ATE):

a. No any electrical failure detection after following reliability test steps (100% All Pass).

- a.1. after preconditioning MSL3 (3X Reflow)
- a.2. after 1000TC
- a.3. after env seq Test (100TC + 96 hours PPT)

Scanning Accoustic Microscopy (SAM):

a. No Delamination on Die Attach Material (Glue Interface) at

- a.1 Time-0
- a.2 after MSL3 (3X Reflow).
- a.3 after 1000TC
- a.4 after env seq

b. Die-pad front side / molding compound delam presence at Time-0 and start to propagates after MSL3 (3X reflow) & TC1000 cycles & env seq. Since UG30 / UA41 Hiquad 64L package with no ground bond, the delamination still acceptable as per ST Specs 7512807.