

CAPA of UTL audit report (2019-4-29)

Item 1:

Description: IQC / Need check FET thickness for BG from other factories.

Root cause: UTL propose to waive wafer thickness measurement and refer C of C from fab site because UTL would like to decrease wafer handling tooling which there is potential of broken wafer, damaged wafer

VERIFIED BY	VERIFIED DATE	STATUS (OPEN/CLOSED)
Jidapa V.	May 30'19	Closed

Item 2:

Description: IQC : Lead frame no surface roughness check

Root cause: Surface roughness measurement is not performed at IQC because UTL has surface roughening process at STL (Special treated leadframe) refer to attached file

STL roughness measurement

Purpose of STL: To increase rough surface of copper lead frame to enhance adhesion between compound and copper L/F.

CHARACTERISTIC	SAMPLE SIZE	FREQUENCY
PRODUCT	SURFACE ROUGHNESS	15 POINTS
		1X/MC/SHIFT

Method: Measurement 15 points with roughness measure machine OLYMPUS LEXT.



Roughness measurement machine

RESPONSIBLE	COMMIT DATE	VERIFIED BY	VERIFIED DATE	STATUS (OPEN/CLOSED)
K.Penmanee / K.Loedchai	N/A	Jidapa V.	May 30'19	Closed

Item3: IQC : Molding compound no viscosity check.

Root cause: For IQC we have check viscosity refer CofC data from supplier that provide to UTL every batch refer to attached file

Quality Report

TO: UTAC/THAI

COMMODITY: [REDACTED]

NAME: CEL-9220HF10(14mm x 7.1g)

LOT NO: 992295

LOT SIZE: [450 KG]

TEST ITEM	UNITS	RESULTS	PROG	STATUS
Lot Weight	kg	450.0	30.2	A OK
Lot Price	USD	18,111	11	A OK
Lot Size	kg	450.0		

ISSUE DATE: 21 May 2019
Mfg Date: 14 May 2019
Expiry Date: 13 Nov 2019

CHECKED: [Signature]
Name: L.I. ONG

ISSUED: [Signature]
Name: MAZNI RIZA

RESPONSIBLE	COMMIT DATE	VERIFIED BY	VERIFIED DATE	STATUS (OPEN/CLOSED)
K.Penmanee	N/A	Jidapa V.	May 30'19	Closed

Item 4: Wafer storage management: N2 cabinet has no real time humidity monitoring, and no alarm to alert when gate open long time

Root cause: UTL have experimented for wafer quality impact in case of no N2 supplied to cabinet at 0 - 36 hr. (Humidity increase). Regarding the results of the experiment, it has been proven that the material remains good even in the absence of N2 for 36 hours. So the current procedure for monitoring N2 flow by daily (24hrs.) should be considered sufficient for checking refer to attached file.

Evaluation background

To validate wafer storage without N2 condition, UTL evaluated by keep 4 wafers in without N2 and take out after 0 (Normal Condition), 12, 24 and 36 hours respectively to see if there is any effect to bonding pad and perform bond ability testing

Monitoring criteria

- Visual inspection on die surface
- Bond-ability

Evaluation Legs

Leg#	Shaping time without N2 (hour)	Method
1	0	Perform assembly until finish wire bonding and perform bond ability testing
2	12	Perform assembly until finish wire bonding and perform bond ability testing
3	24	Perform assembly until finish wire bonding and perform bond ability testing
4	36	Perform assembly until finish wire bonding and perform bond ability testing

Visual inspection on Die Surface

Leg#	Shaping time without N2 (hour)	Picture
		1 2 3
1	0	  
2	12	  
3	24	  
4	36	  

Confirm bond ability

1. Ball shear result

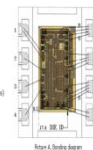
Count	Min	Max	Avg
1 30 data	6.06	7.96	59.02
2 30 data	5.24	7.57	63.46
3 30 data	6.02	7.96	59.98
4 30 data	5.59	7.67	44.32

Ball shear strength (minimum spec: 2.00 grams)

2. Wire pull result

Count	Min	Max	Avg
1 30 data	24.07	15.98	25.55
2 30 data	12.58	17.54	25.45
3 30 data	15.75	15.98	25.25
4 30 data	12.58	16.96	25.23

Wire pull strength (minimum spec: 2.40 grams)



3. Stitch pull result

Count	Min	Max	Avg
1 30 data	8.02	13.31	9.98
2 30 data	6.42	9.01	8.38
3 30 data	9.13	13.61	11.45
4 30 data	7.59	12.47	10.22

Stitch pull strength (minimum spec: 2.40 grams)

Conclusion:

Based on visual inspection on die surface and bond ability result, we can conclude that the result show pass specification when keep wafers in without N2 and take out after 0 (Normal Condition), 12, 24 and 36 hours so UTL would like to maintain our current method to daily check N2.

K.Raweeporn	N/A	Jidapa V.	May 30'19	Closed
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Item 5: Wafer mount: No total void check, UTL provide check criteria(single void 10mil now).

Root cause explanation: 1. Revisit current mounting quality about total void problem.

Cu clip : Monitoring result

Lot#	Device	Void size (Spec: <10 mils)	Total void	Picture
9097449	CSD95480RWJ-ASY	Accept	No any void	
8304034	CSD95480RWJ-ASY	Accept	No any void	
9097431	CSD95480RWJ-ASY	Accept	No any void	
9096408	CSD95480RWJ-ASY	Accept	No any void	
9097419	CSD95480RWJ-ASY	Accept	No any void	

Conclusion

From monitoring result, we not found any void after mounting with both of QFN and Cuclip

So, we will comply requirement spec to reject any void after wafer mount process.

RESPONSIBLE	COMMIT DATE	VERIFIED BY	VERIFIED DATE	STATUS (OPEN/CLOSED)
1. K.Kanisa	1. Jun 14'19	1. Jidapa V.	1. Jun 17'19	1.Closed

Item 6: W/B: ball thickness target: 0.35 ± 0.2 , spec limit is too large

Action Plan: Tighten ball thickness buyoff yearly portability in MS-L/B-012/P (Pd 0.8 wire change from 0.35 ± 0.20 (0.15-0.55) mils to 0.40 ± 0.15 (0.25 - 0.55) mils)

K. Anucha	May 30'19	Jidapa V.	May 30'19	Closed Evidence : Refer to machine release form that defined ball thickness 0.40 ± 0.15 (0.25 - 0.55) mils in MS-L/B-012/P
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Item 7: D/A: bonding force for clip attach:

1. 300+/-10g by monthly, but 10, Mar set-up checklist shows 315g, no record abnormal, no OCAP
2. Check by monthly is too long, need by line shift, M/C setup. etc.

Root cause:

1. UTL consider this case as normal due to machine spec limit of Bond spring force is 300+/-30g and record the value before and after calibration in checklist but no clearly define machine spec limit and OCAP in specification
2. UTL perform PM by monthly for bonding force refer to machine maker recommendation

Action plan:

- Re-define machine spec limit and add machine OCAP for bond spring force out of spec control in MS-C/A-001
- 2.1 Validate bond spring force every set up
- 2.2. Implement new maintenance frequency for bond force spring in spec MS-C/A-001 (If any)

1. K.Witoon	1. Jun14'19	1. Jidapa V.	1. Jun 17'19	Closed
2.1 K.Witoon 2.2 K.Witoon	2.1 Jun14'19 2.2 Jun14'19	2.1 Jidapa V. 2.2 Jidapa V.	2.1 Jun 17'19 2.2 Jun 17'19	1. Refer to PM checklist that defined machine spec limit 300+/- 30 g. and calibration spec limit 300+/- 10 g. for Bond spring force and OCAP for Bond spring force out of spec control in MS-C/A-001 2. Refer to Weekly PM checklist for bond force spring in spec MS-C/A-001

Item 8: Plasma: rework now allow 2 times, Customer requirement is only one time rework, cause of wire corrosion risk.

Action plan: Update special requirement for customer to control replasma only one time in SR-TII-001

6.21.3.1 Allow to do re-plasma cleaning for device only 1 time.

K.Apichat	Jun 07'19	Jidapa V.	Jun 14'19	Closed
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Action plan: Update contact angle special requirement for customer device in AS-WET-001

- The storage area
 - UTL must keep the tooling in the package with barcode for identified tooling number.
 - Currently, the size box for keep the expired tooling before scrap at UTL = $0.2 \times 0.2 \text{ m}$. ($W \times L$) = 0.04 m^2 which can keep tooling 100 ea.
 - If keep tooling for 6 months, UTL need 550 boxes for keeping the expired tooling and UTL need area for keeping greater than 22 m^2 .
 - Based on limitation of storage space, UTL cannot implement this requirement per customer request.

Item 11: Pepper pot(顶针帽) should be changed as PM checklist and recorded by trace No. link to DA machine.

Action Plan: Revise PM weekly checklist to add record the pepper pot number in spec#MS-D/A-009/P

Check, Clean, Record the Pepper pot type and number.

ตรวจสอบ, ทำความสะอาด, บันทึกชนิดของแปปเปอร์พอร์ทและหมายเลข



K.Phumipat	Jun14'19	Jidapa V.	Jun 25'19	Closed
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Item 12: Singulation: now not keep blade after over life time, please keep 6 months at least.

Action plan:

- Feasibility study of storage for singulation blade after over life time
- Implement taking a picture on the blade scrap and collect data 6 months

Blade scrap storage

- Current UTL blade scrap area = $0.6 \times 0.6 \times 0.25$ m. (WxLxH) (0.36 m^2) which can put 100 blades.
- If keep blade 6 months, UTL need area about 80 m^2 . Based on limitation of storage space so UTL can not implement this requirement.

However, UTL propose to take a picture on the blade scrap and collect data 6 months.

1. K.Kongkiate	1. Jun14'19	Jidapa V.	Jun 17'19	1. Closed
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Action Plan: Install additional alarm system at BG area.

Install additional alarm system at BG area



K.Jirachote	Jul 19'19	Jidapa V.	Jul 12'19	Closed
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Root cause: Based on calibration history of TC wire for 3 years and current procedure (Daily and every 24 weeks PM), UTL propose to maintain current UTL procedure to perform yearly PM for TC wire in PMC oven.

K.Thaweekiate	N/A	Jidapa V.	May 30'19	Closed
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Action Plan: Add functional reject into correlation units and update spec#TS-COR-001

[illegible]

K.Saranyu	Jun 7'19	Jidapa V.	Jun 14'19	Closed
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Item 16: Reprint label: need reprint label by supervisor or specific opt with IT system foolproof for all customers' supplier.

Root cause: N/A, only qualified staffs who were registered with TI system are allowed to reprint label.

For all new hired who need to work on TI system, UTL Customer Service will contact TI to grant permission.

K.Sasiprapha	N/A	Jidapa V.	May 30'19	Closed
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