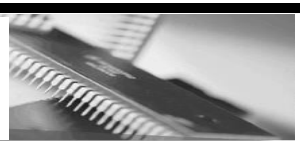
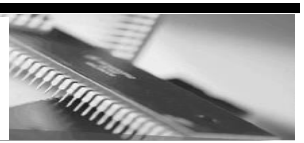
Die Attach Film(Fingerprint)

2018. 1.



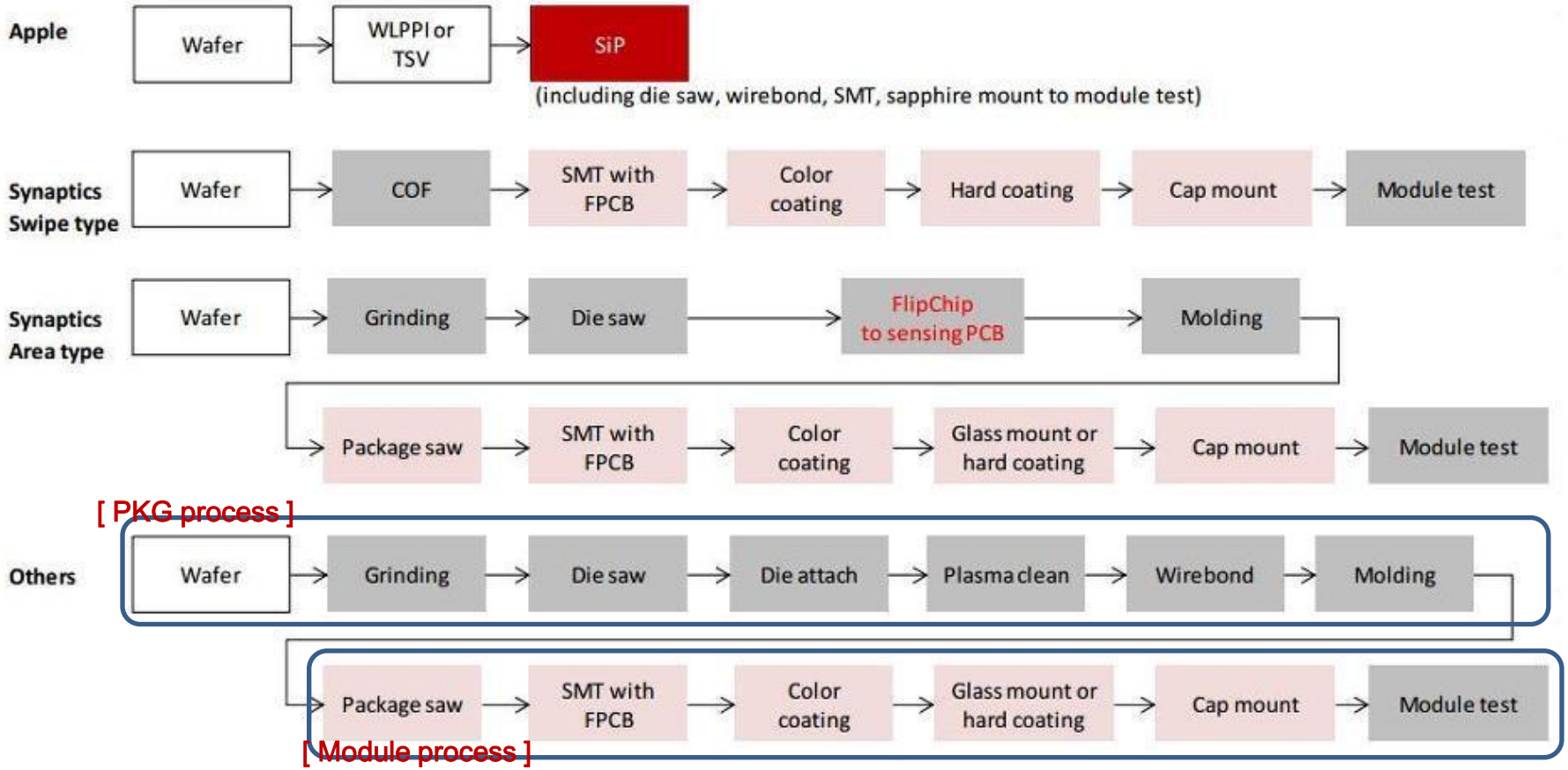
Application



The Process of Fingerprint Sensor

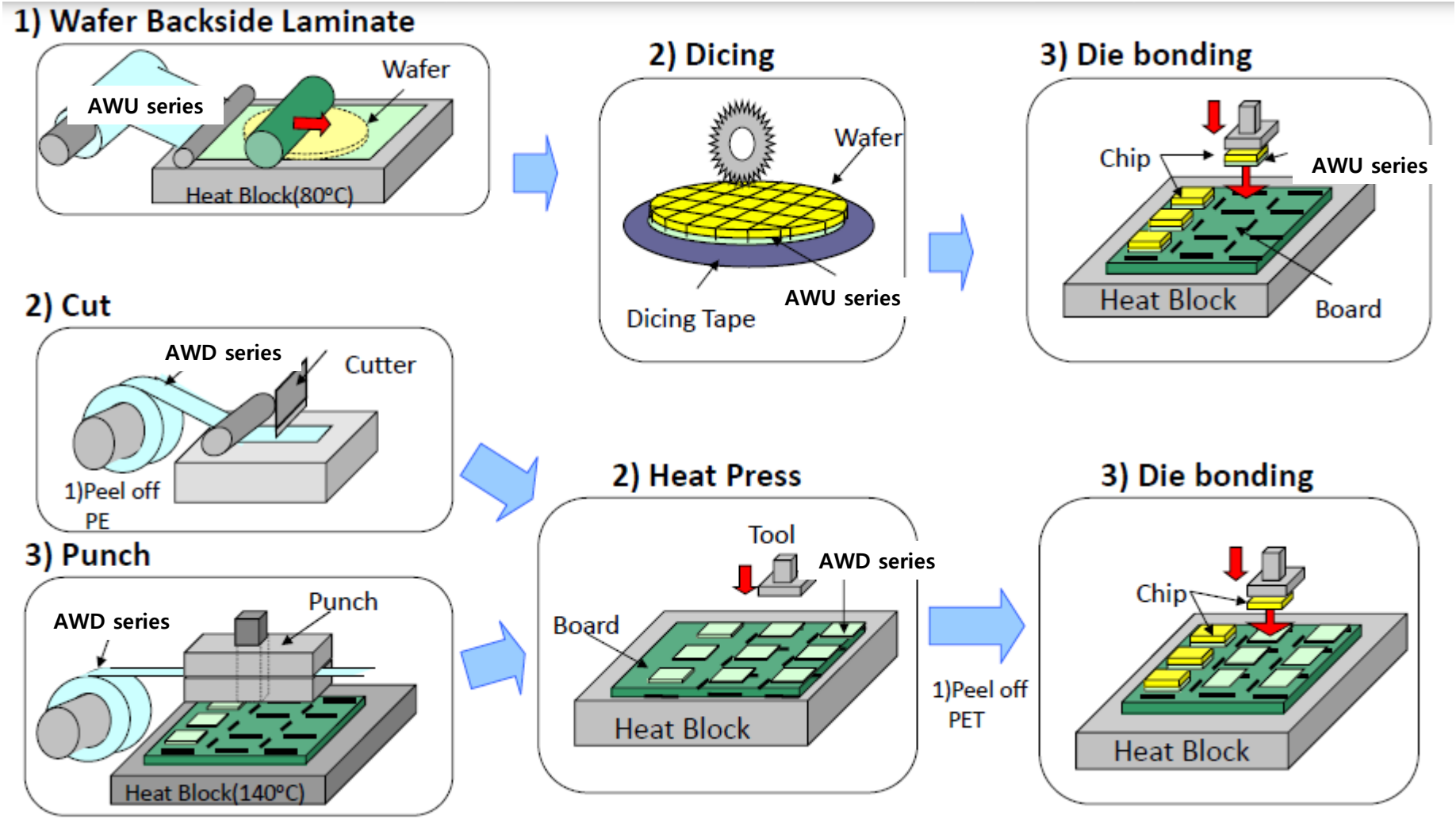
Fig. 42: The process of fingerprint sensor

White box means the process is made in foundry, grey box is made in OSAT companies, pink box is made in module companies and red box is made by ASE and Sharp.



Source: Nomura research

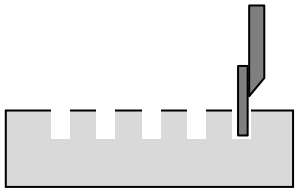
Application



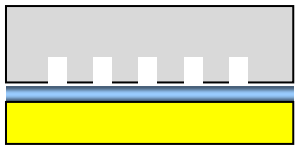
1 Structure

2 DBG PKG Process Flow with AWU series

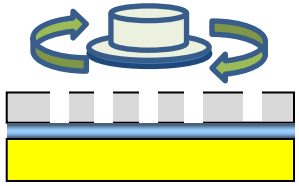
AWU Series is suitable for not only thin die but also DBG PKG Process(Ultra-thin Die PKG Process) requiring laser dicing process



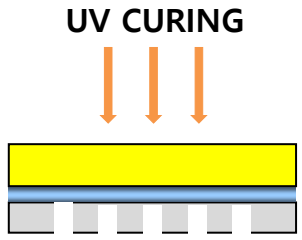
< Wafer partial-cut Dicing>



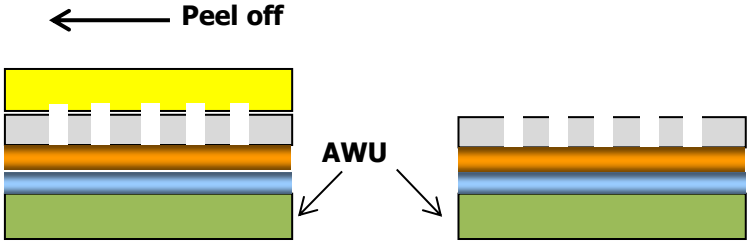
< BG Tape Lamination>



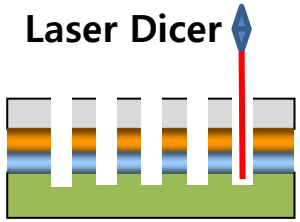
< Back Grinding >



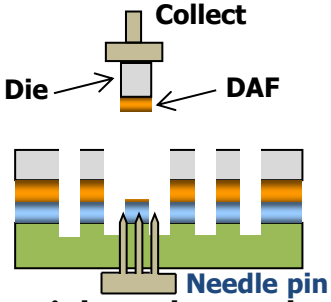
< BG Tape UV Exposure>



< AWU series Mounting > < BG Tape Removal>

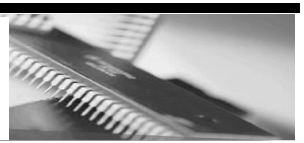


< Laser Dicing>



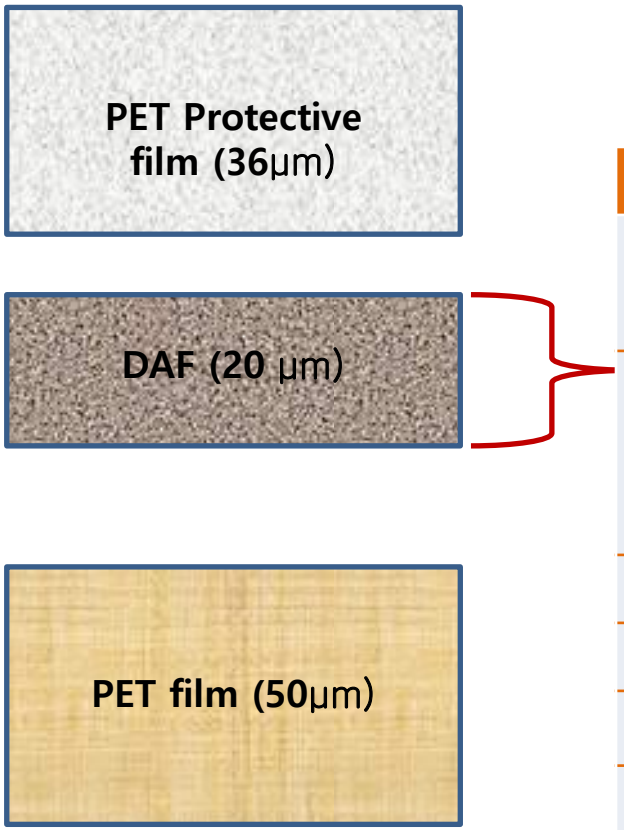
< Pick and Attach>

This process is as a kind of ultra-thin die fabrication process, it needs laser dicing process when DAF is diced during fabrication process.
In this case, AWU series also shows excellent pick-up workability as well as laser dicing of thin die.



1 Structure

1 AWD series

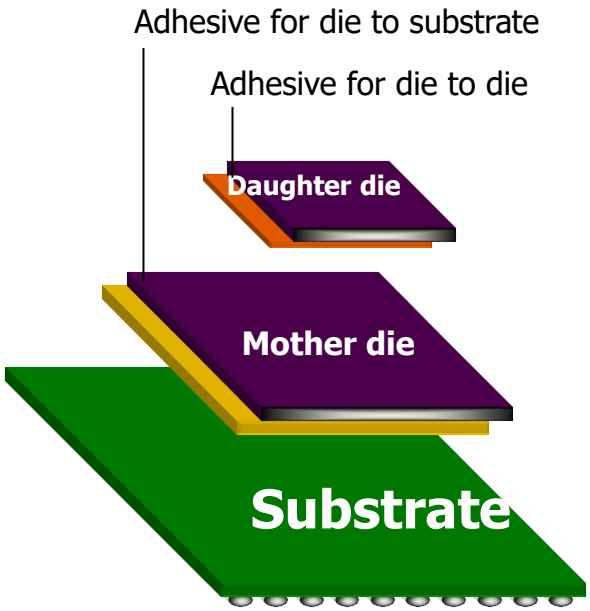


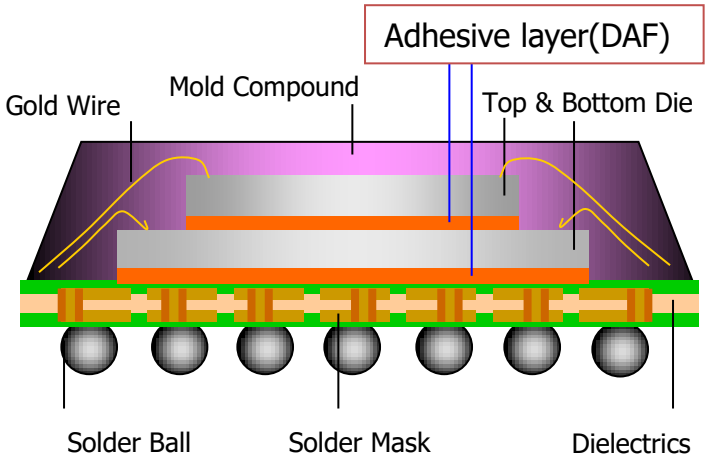
- AWD1, AWD2..... : DAF model
- AWD1-5, AWD1-10..... : DAF thickness

ITEM	CONDITION	MEASURE	AWD4
Tg	After full cure	℃	≥170
Storage Modulus	@150℃	Mpa	≤160
	@200℃	Mpa	≤100
	@250℃	Mpa	≤60
CTE	5℃/min 5mN	ppm/℃	≤250
Enthalpy	10K/min	J/g	35±10
On-set	10K/min	℃	180±10
Residual solvent	@150℃	%	≤2
Adhension Strength	PI, 50mm/min, full cure	N/10mm	≥1

1 Structure

3 General Applications



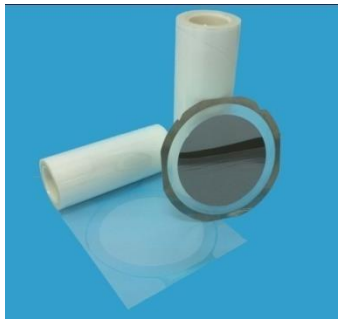


Stacked CSP

A purpose of adhesive film is between die and die or die and PCB board to be fixed in the semiconductor package.

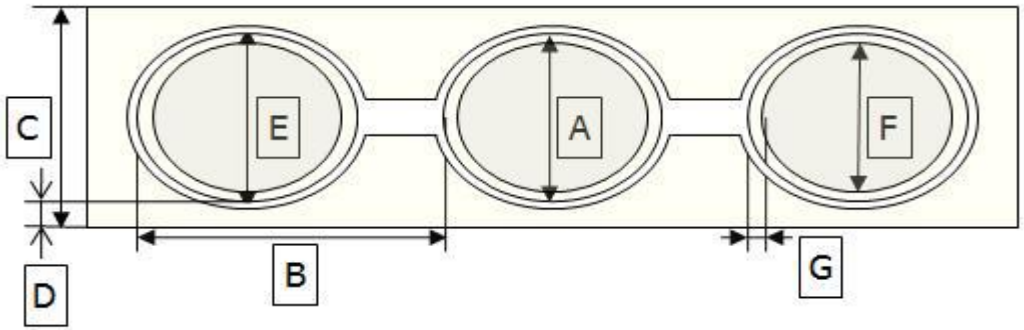
2 Feature of Production(AWU series)

1 Feature



- Functional material for both dicing and die bonding
- Excellent dicing and pick-up performance
- Low lamination temperature to a wafer
- Excellent reflow crack resistance
- Strong resistance against humid circumstance

Pre-cut style and Dimension



	A	B	C	D	E	F	G
AWU series (8″)	270±1	279.4±1.5	290±2	10±2	277±1	220±1	25±5
AWU series(12″)	370±1	378.5±1.5	390±2	10±2	377±1	320±1	25±5

3 Customer evaluation Results(AWU series)

1 Inspection Result(2nd dicing sample at S corp.)

TEST Product Model

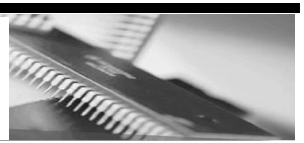
POP A***

TEST Parameter

Spindle RPM		Feed Speed	Blade Height	Dicing Blade	Cut Method
Z1	45,000	50 mm/s	155 um	ZH05-SD3500-N1-50-CC	Step Cut
Z2	45,000	50 mm/s	70 um	ZH05-SD4800-N1-50-BB	

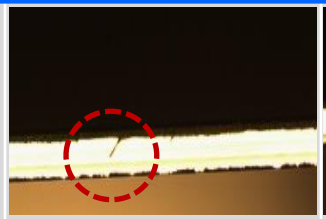
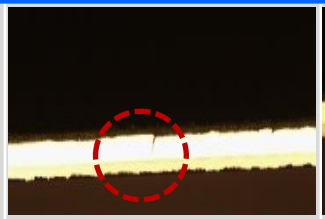
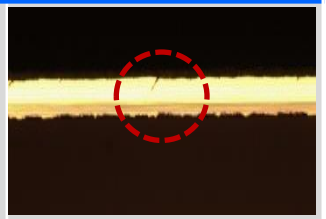
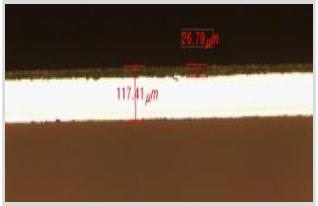
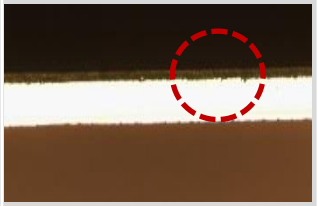
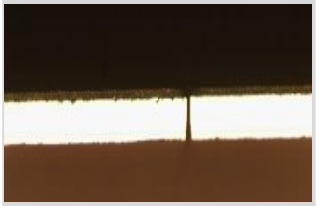
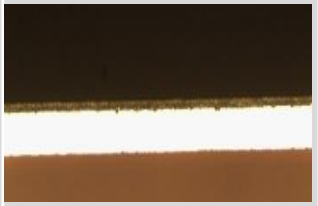
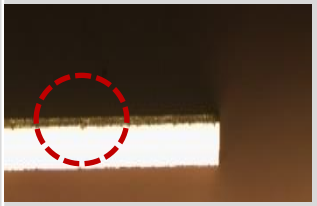
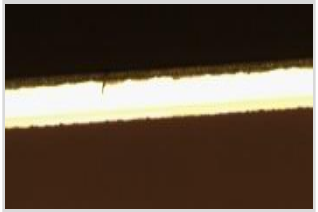
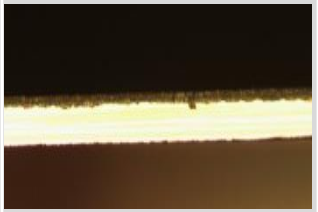
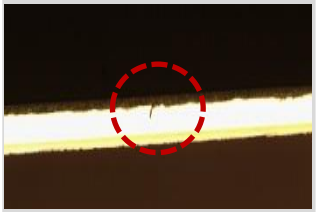
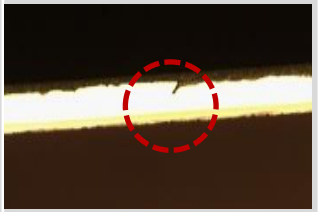
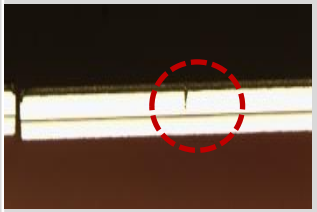
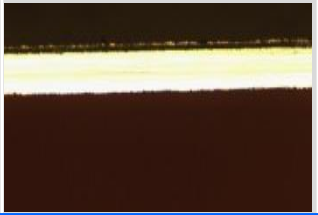
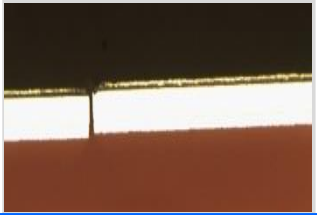
TEST Result

Sample	Wafer Thick.	Corner burr(%)	Side burr(%)	Bleed(%)
AWU220	90㎛	0.0	5.1	1.7
A corp.(A-1 model)	90㎛	**0.0**	**25.8**	10.3
A corp.(A-2 model)	90㎛	**22.4**	**31.0**	36.2
B corp.	90㎛	**3.4**	**29.3**	18.9

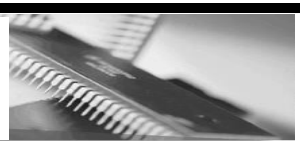


3 Customer evaluation Results(AWU series)

1 Inspection Result(2nd dicing sample at S corp.)

	1	2	3	4	5
B corp.					
A corp. (A-1 model)					
A corp. (A-2 model)					
AWU220					

Test Condition : After UV



4 Internal evaluation Results(AWU series)

1 Inspection Result

TEST Product Model

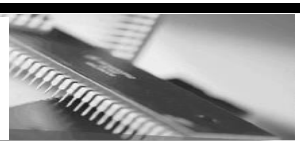
Dummy wafer

TEST Parameter

Spindle RPM		Feed Speed	Blade Height	Dicing Blade	Cut Method
Z1	45,000	80 mm/s	155 um	ZH05-SD3500-N1-50-CC	Step Cut
Z2	45,000	80 mm/s	70 um	ZH05-SD3500-N1-50-BB	

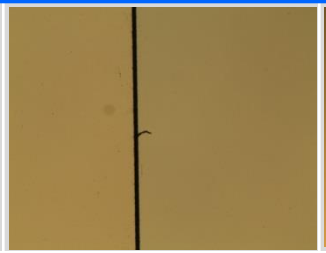
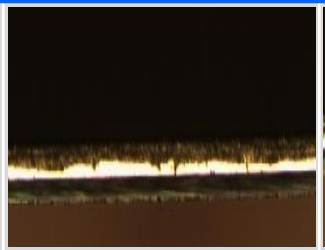
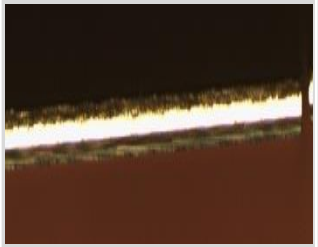
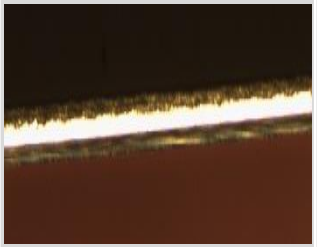
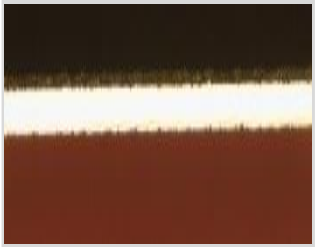
TEST Result

Sample	Wafer Thick.	Corner burr(%)	Side burr(%)	Bleed(%)
AWU220	50㎛	0.0	2.7	2.7
A corp.(A-1 model)	50㎛	**0.0**	**42.4**	36.3

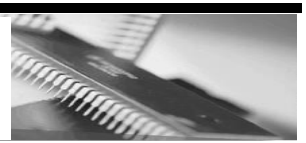


4 Internal evaluation Results(AWU series)

1 Inspection Result

	Top	Corner	Side	Bleed
A corp.(A-1 model)				
AWU220				

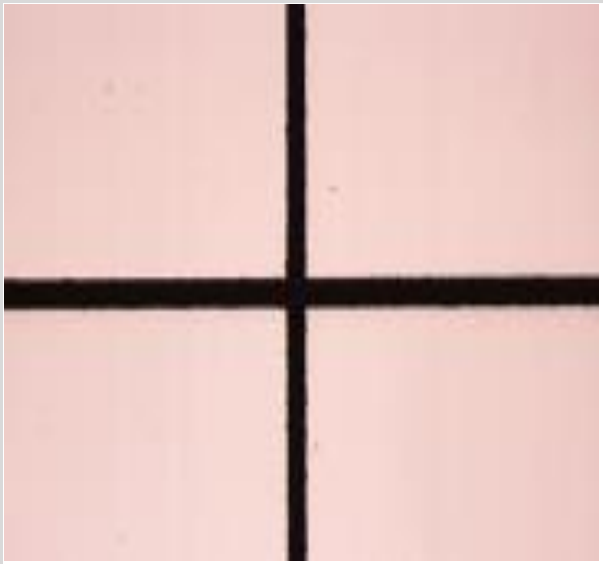
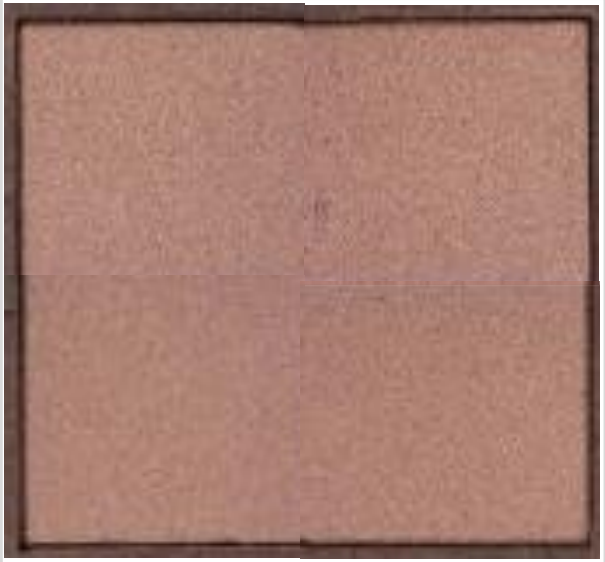
Test Condition : After UV



5 Reliability test Results(AWU series)

B/G~W/S Process Quality Control Data

Item	S/S	Spec.	1	2	3	4	5	6	7	8	9	10	Min.	Max.	Avg.	Result
Kerf Width	Z1 : 8Line	Max 60um	32	35	32	36	34	35	37	32	32	33	32.0	37.0	33.80	Accept
	Z2 : 8Line		30	32	31	32	31	33	31	35	36	35	30.0	36.0	32.60	Accept

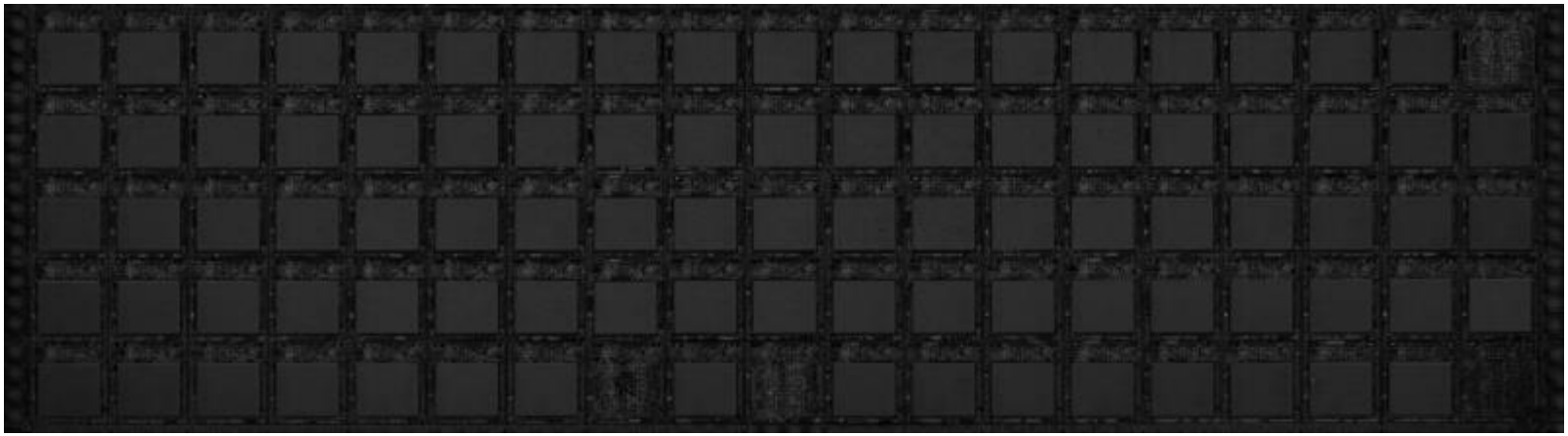
Top	Bottom	Side
		
Chipping Size : Max 3um	Chipping Size : Max 10um	Chipping Size : Max 5um

5 Reliability test Results(AWU series)

Die Attach Process Quality Control Data

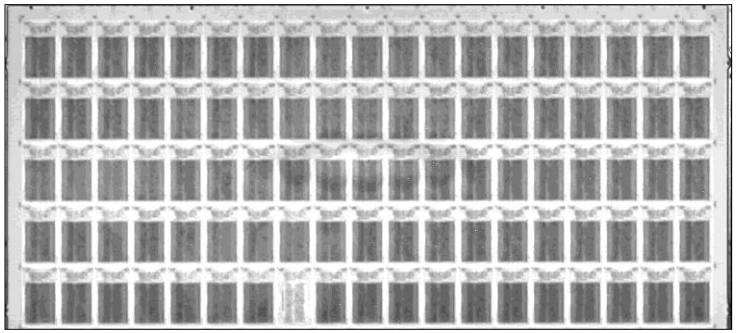
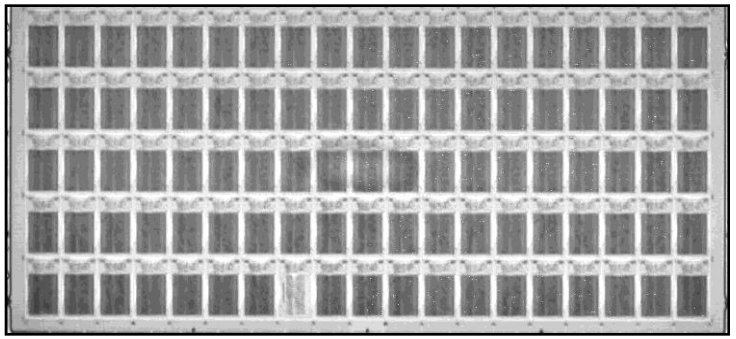
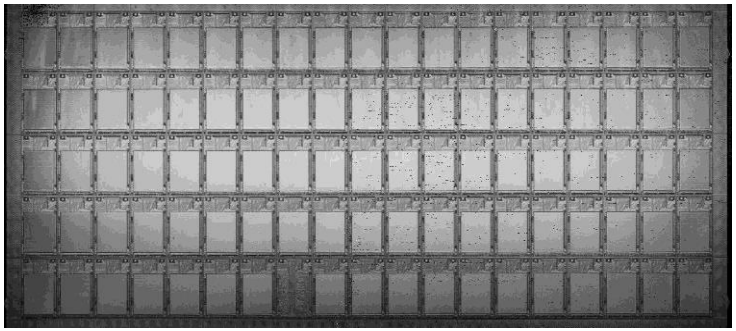
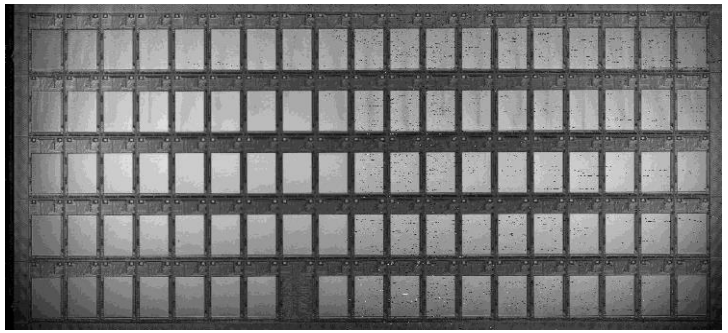
Item	Die	S/S	Spec.	1	2	3	4	5	6	7	8	9	10	Min.	Max.	Avg.	Result
Die Position	1'st Die	X : 10Unit	± 50um	13	16	18	10	16	11	10	15	13	13	10	18	14	Accept
		Y : 10Unit		8	13	10	13	11	11	13	14	13	12	8	14	12	Accept
	2'nd Die	X : 10Unit		11	8	8	10	6	11	10	11	11	13	6	13	10	Accept
		Y : 10Unit		13	11	12	10	11	14	15	17	13	11	10	17	13	Accept

Chip to Chip Void

C-Scan	Result
	Accept

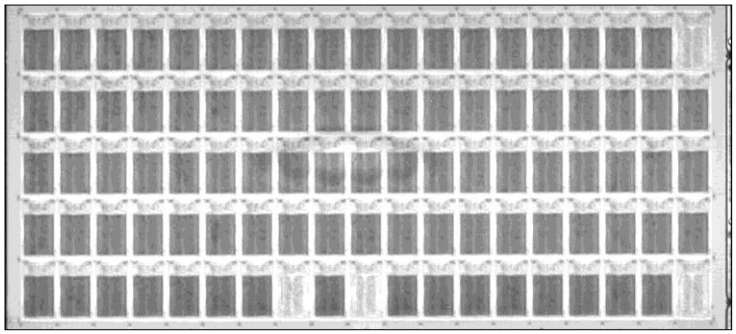
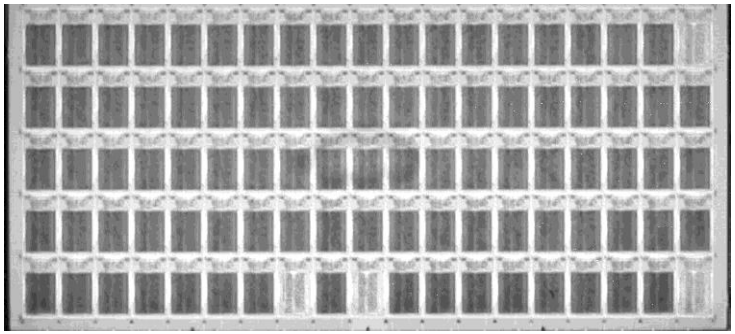
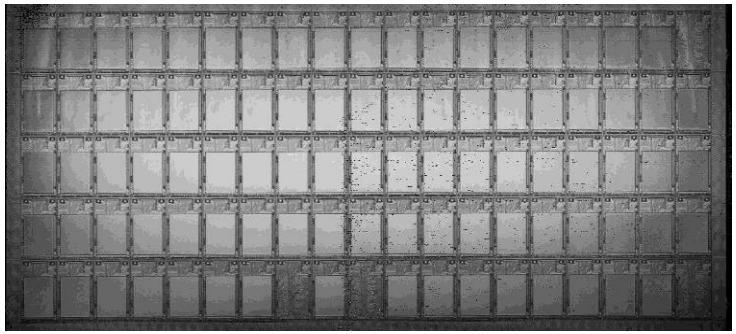
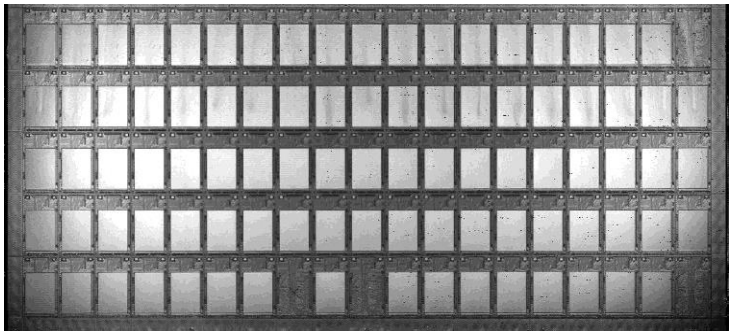
5 Reliability test Results(AWU series)

■ Precondition

Condition	Pre SAT	After SAT	Result
85/85 24hrs			Accept
			Accept

T/C	-55℃ (65℃) ~125℃, 5 cycle
Bake	125℃ 24Hrs
T/H	85℃/85% 24hrs
Reflow	Peak 260℃, 3 Cycle

5 Reliability test Results(AWU series)

Condition	Pre SAT	After SAT	Result
85/85 48hrs			Accept
			Accept

T/C	-55℃ (65℃) ~125℃, 5 cycle
Bake	125℃ 24Hrs
T/H	85℃/85% 48hrs
Reflow	Peak 260℃, 3 Cycle