

KOREA 2021

DISCOVERY SUMMIT

EXPLORING DATA
INSPIRING INNOVATION



JMP를 활용한 공정 이상점 파악 및 수율 개선



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 - About Optical Solution business
 - What is the 3D sensing module?
- Case In Using JMP
 - Understanding abnormal process
 - Improving yield
- Lesson and Learn

About Optical Solution business



- Manufacturing optical components in mobile-phones

- : camera module
 - 3D sensing module

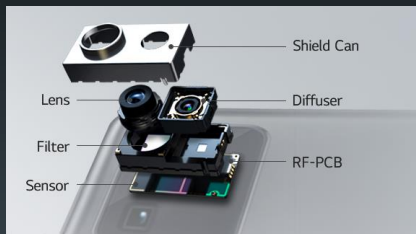
- Various processes and machines in manufacturing line

- : Quick understanding of abnormal feature between processes and equipment

What is the 3D sensing module?



LiDAR: ToF(Time of Flight) sensing module



Face ID : Structured Light sensing module

Providing professional-class camera quality for mobile-phones and providing virtual reality space construction functions

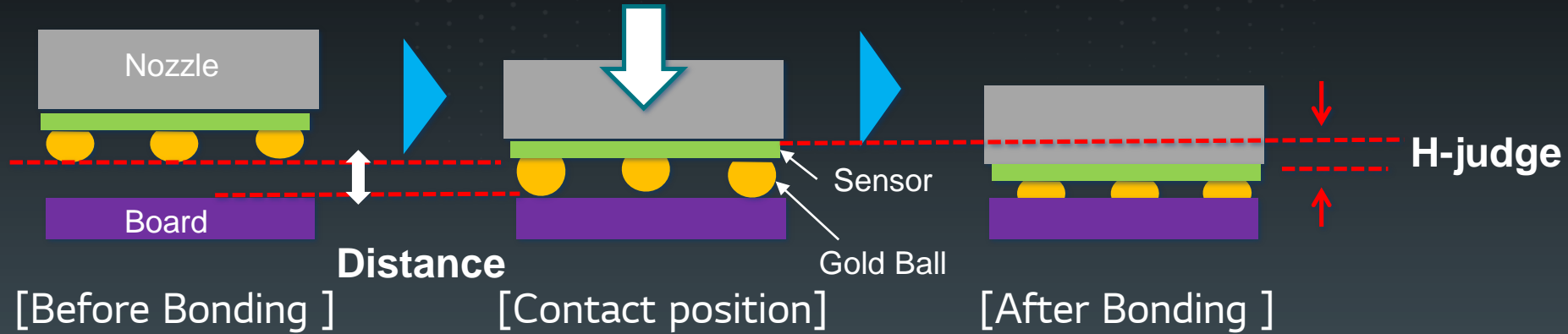
CASE In Using JMP



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Case.1 abnormal sensor bonding position

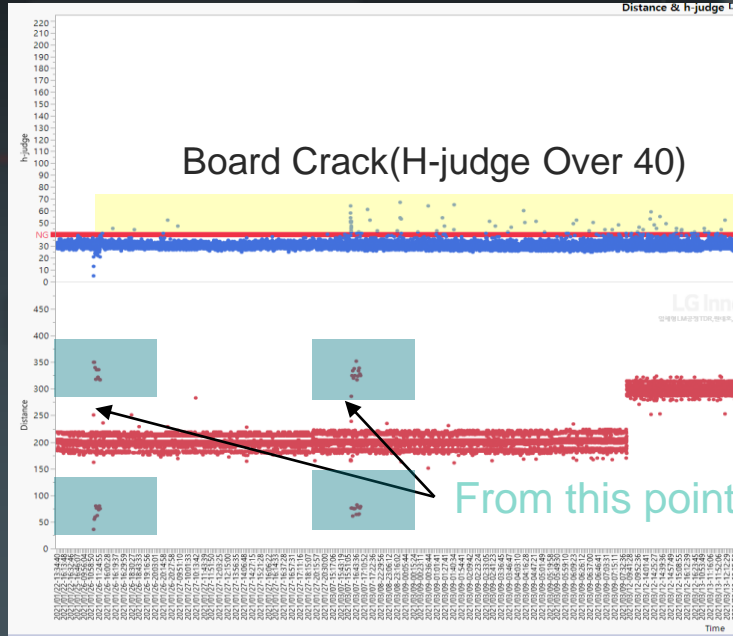
Using JMP at bonding process - #Graph Builder



H-judge > 40, Board is cracked. We monitored and analyzed machine log

Case.1 abnormal sensor bonding position

Using JMP at bonding process - #Graph Builder



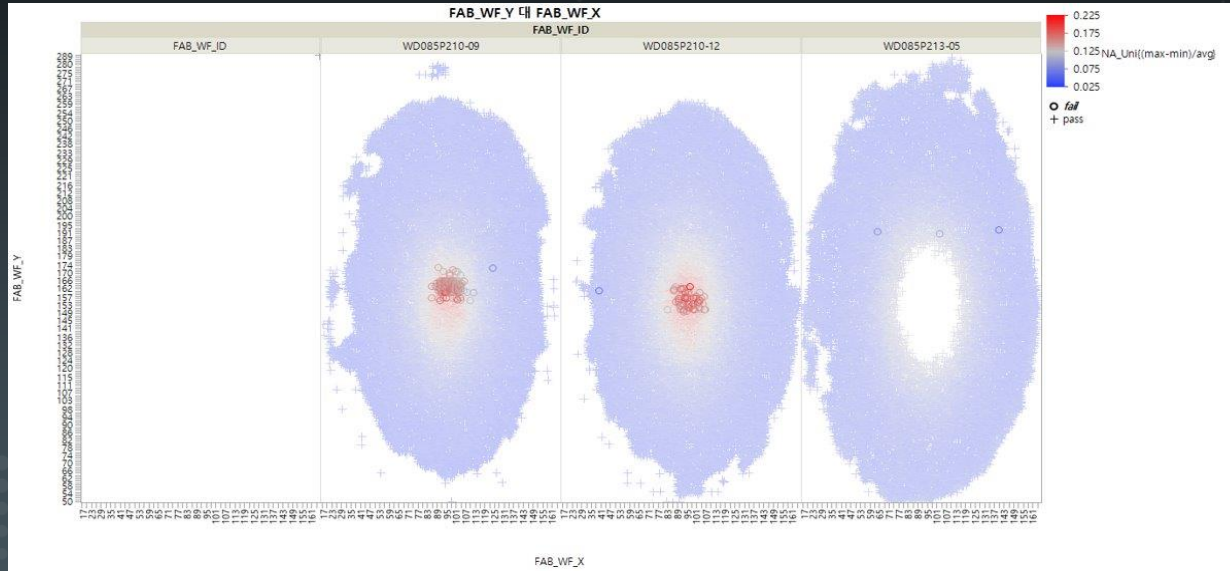
H-judge value Outlier Found that the cause is a Distance outlier.
Can be caused by material strain

Easily find process abnormal point with MP

From this point, substrate cracks began to increase.

Case.2 Improving yield – notice raw material

Using JMP at bonding process - #Graph Builder, Data Concatenate



Shows a tendency for defective modules(**RED**) to appear in the center of the wafer

Case.3 Improving yield – notice machine problem

Using JMP at bonding process - #Graph Builder, Data Concatenate



It can be seen that defects occur specifically in the para in a specific facility.

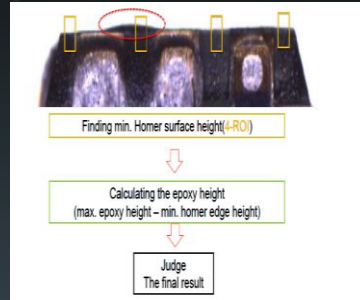
Case.4 Correlation parameter with JMP

Using JMP at Vision machine- #Graph Builder, Gauge R&R, Linear Fit



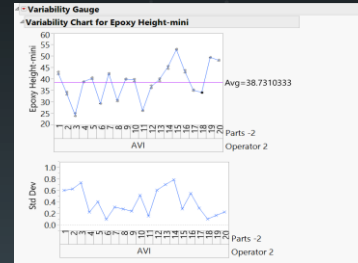
Measuring Instrument
(Nexiv)

VS.



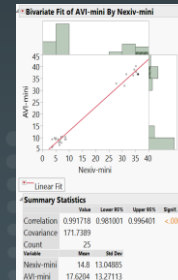
Vision machine
(measuring height)

1. Gage RnR



Source	SS	DF	MS	F Ratio	Prob > F
Operator 2	0.00000	0.00	0.00	0.00	<.0001*
Part Variation	43.26262	10.00	4.32626	10.00	<.0001*
Total Variation	43.26262	10.00	4.32626		

2. Correlation



Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Model	1	4157.2291	4157.23	1371.397	<.0001*
Error	23	69.7218	3.03		
C. Total	24	4226.9509			

JMP Can be used for verification of comparing measuring instrument and Vision machine.

Lesson and Learn



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Lesson and Learn

1. Speed

2. Easy

3. Visible

Lesson and Learn

1. Speed

- ◆ Analysis is fast

2. Easy

- ◆ Many parameters and large files can be analyzed

3. Visible

Lesson and Learn

1. Speed

2. Easy

3. Visible

◆ Click and drop, can get graph

◆ Many parameters and large files can be graphed easily

Lesson and Learn

1. Speed

2. Easy

3. Visible

◆ Easy to visually identify problems about machine

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