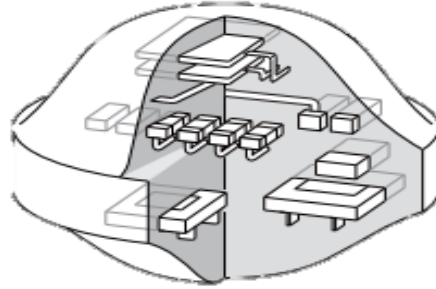# The New 3D Inkjet Printing System for Forming Electric Devices on Demand

Fuji Machine Mfg. Co., Ltd.

Development Center

Jun 1st , 2017

Concept ~Synergy of "3" Key Technologies~

3D Freeform Electronic Device

Resin Printing **Parts Mounting** **Circuit Printing**

3D Printer Technology

Key Words
- ✓ Customization
- ✓ On demand manufacturing
- ✓ Material Extentability
- ✓ Scalability
- ✓ On-site production
- ✓ Supply chain renovation
- ✓ Main function is "Structure"

Parts Mounting Technology

Key Words
- ✓ Market TOP Share (FUJI)
- ✓ Small and High density
- ✓ High Speed and High accuracy
- ✓ For SMT and Embedded

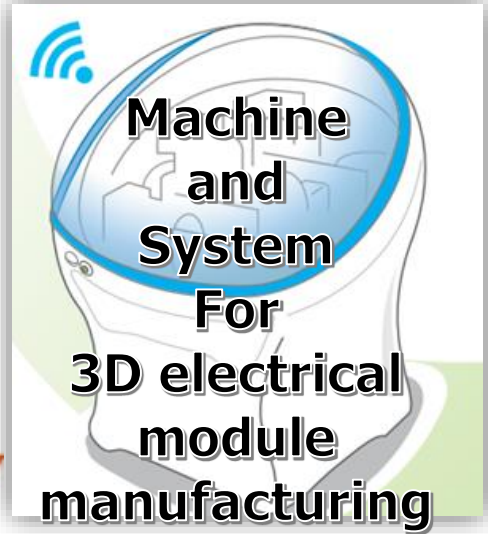### Printed Electronics Technology

Key Words
- ✓ Full-additive patterning ➔ECO
- ✓ Printable electrical function
- ✓ Rigid and Flex, Thin and Soft
- ✓ Freeform 2D, 3D Packaging
- ✓ Structural limitation because of "2D"

FUJI
innovative spirit

Development Activities

Software Development (@ supplier)

Process Development (in-house)

Future Products

Machine and System For 3D electrical module manufacturing

Prototype 3D electrical module manufacturing

Machine enabling technologies (FUJI core competence)

3D inkjet printing system

Continuous Collaboration Works
- ➤ Material Suppliers
- ➤ Key Hardware Unit Suppliers

FUJI
innovative spirit

Machine : in-house Prototype Equipment

Machine can provide all the process required for manufacturing.
XYZ stage moves back and forth between 3 process units.

Mount robot

Parts Mount Unit

Parts Supply

Resin Mold Area

Circuit Form Area

UV light Source

Laser Light Source

Resin Printer

Metal Printer

XYZ stage

Parts Mount

Circuit Form

Resin Mold

3D inkjet printing system

FUJI innovative spirit
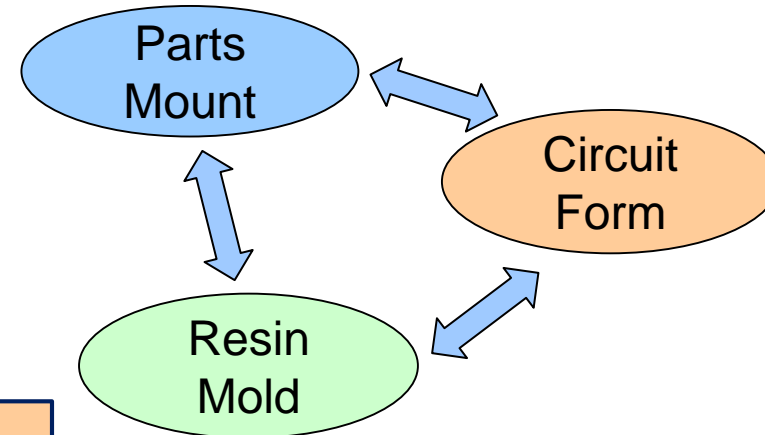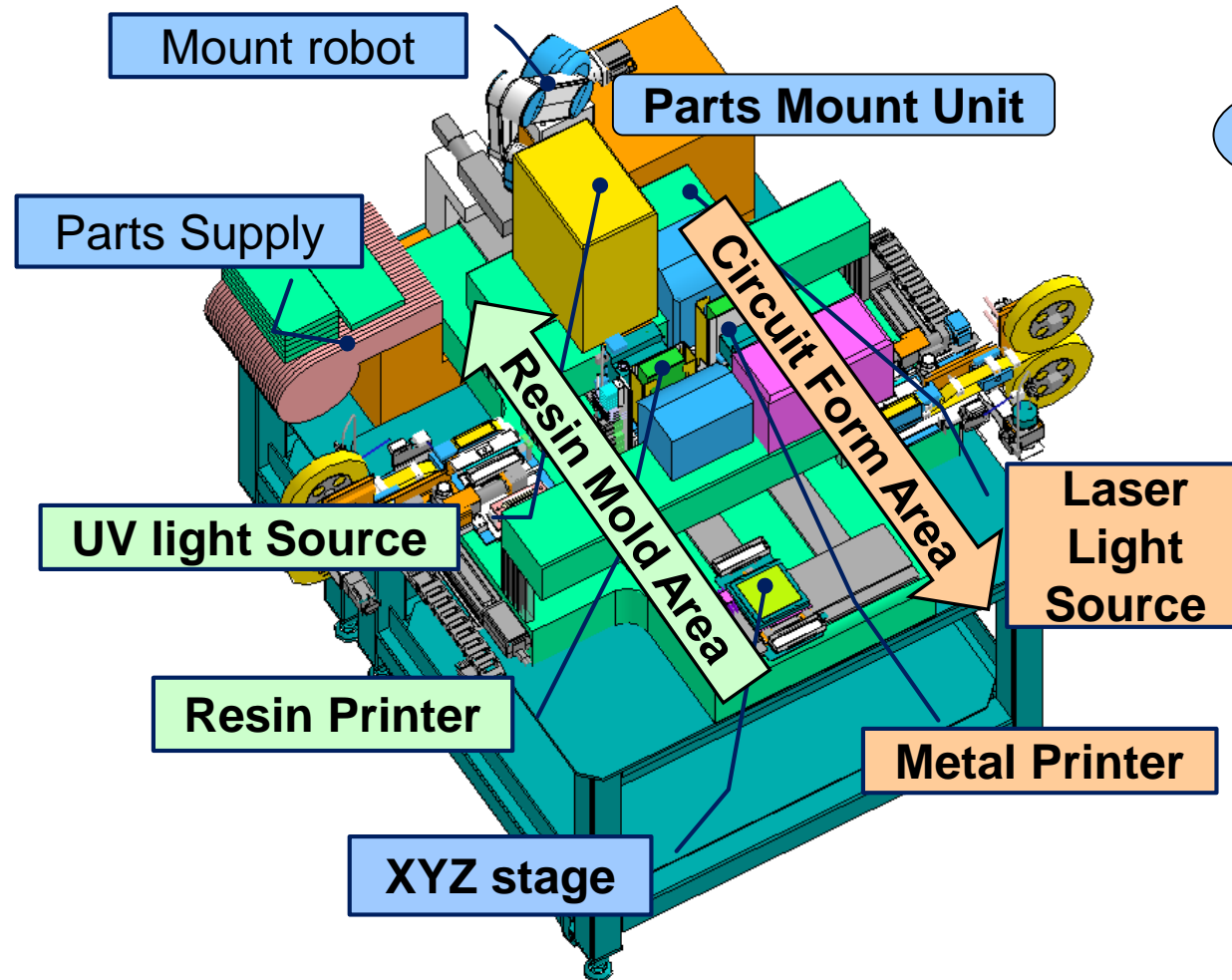
Software : for designing and Production
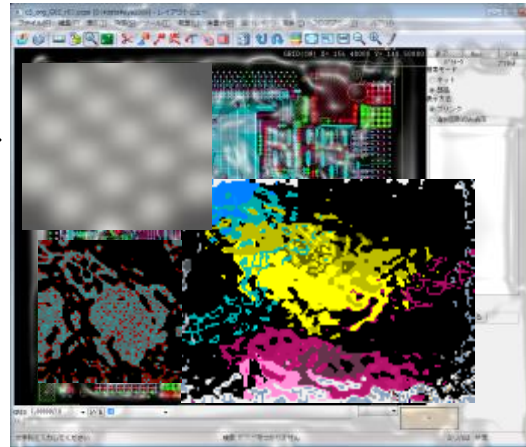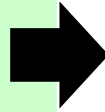
Input data

Electronic CAD
 -components data
 -connection data
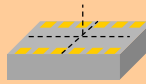Mechanical CAD
 -structure data
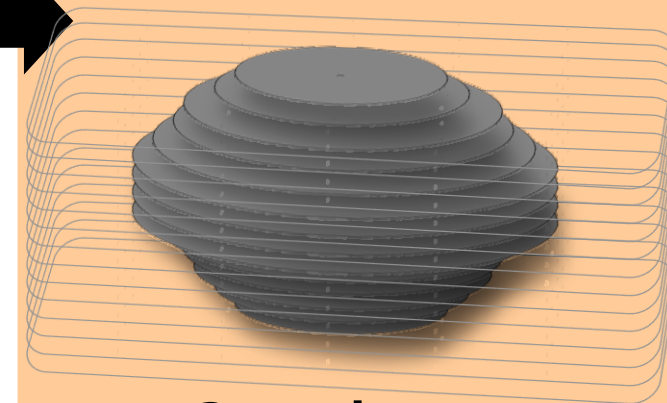Machine parameter
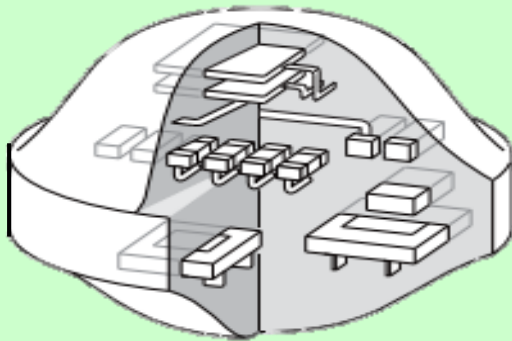
3D data

Output data

Production recipe
 -print image data
 -component position

P_1 (x_1, y_1, z_1)=(35.3, 21.2, 1.4)
P_2 (x_2, y_2, z_2)=(33.7, 18.5, 1.4)
P_3 (x_3, y_3, z_3)=(30.9, 17.2, 1.4)
⋮   ⋮   ⋮

2D data accumulation

software

FUJI innovative spirit
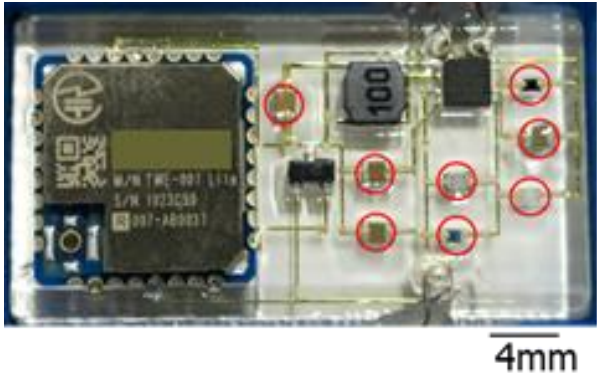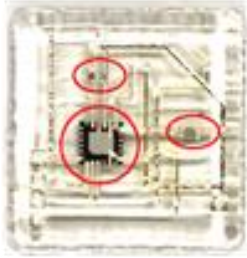
Trial Samples

Trial Samples Examples

◯ Embedded

	Thermal Sensor	Gyro Senor	Light Sensor
Samples photo image	 4mm		
Function	Thermal Sensing + Wireless data transportation + Solar power generation	Gyro Sensing	Light Sensing
# of components — Embedded	8	0	1
# of components — SMT	4	4	1
Circuit Layer Count	2	2	1
Operation	Confirmed	Confirmed	Confirmed

Applications idea

- IoT Sensors on-demand manufacturing

- Wearable device prototype manufacturing

- Customized personal devise or Toys, etc,..

- Other new applications (Now finding Idea & Partners)

Let's Work Together for Market Expansion!