

# OUR VISIN

The history of “Solder” dates back to Bronze Age  
When mankind began using metal.

And now it became a technology that is commonly used in manufacturing.

We, WFC, create “Manufacturing Infrastructure” in the next generation  
“Mouting Infastructure” in the next generation “Mounting Technology”.

Innovative products created by WFC’s “Manufacturing Infrastructure” will  
cause a paradigm shift in the world of manufacturing.

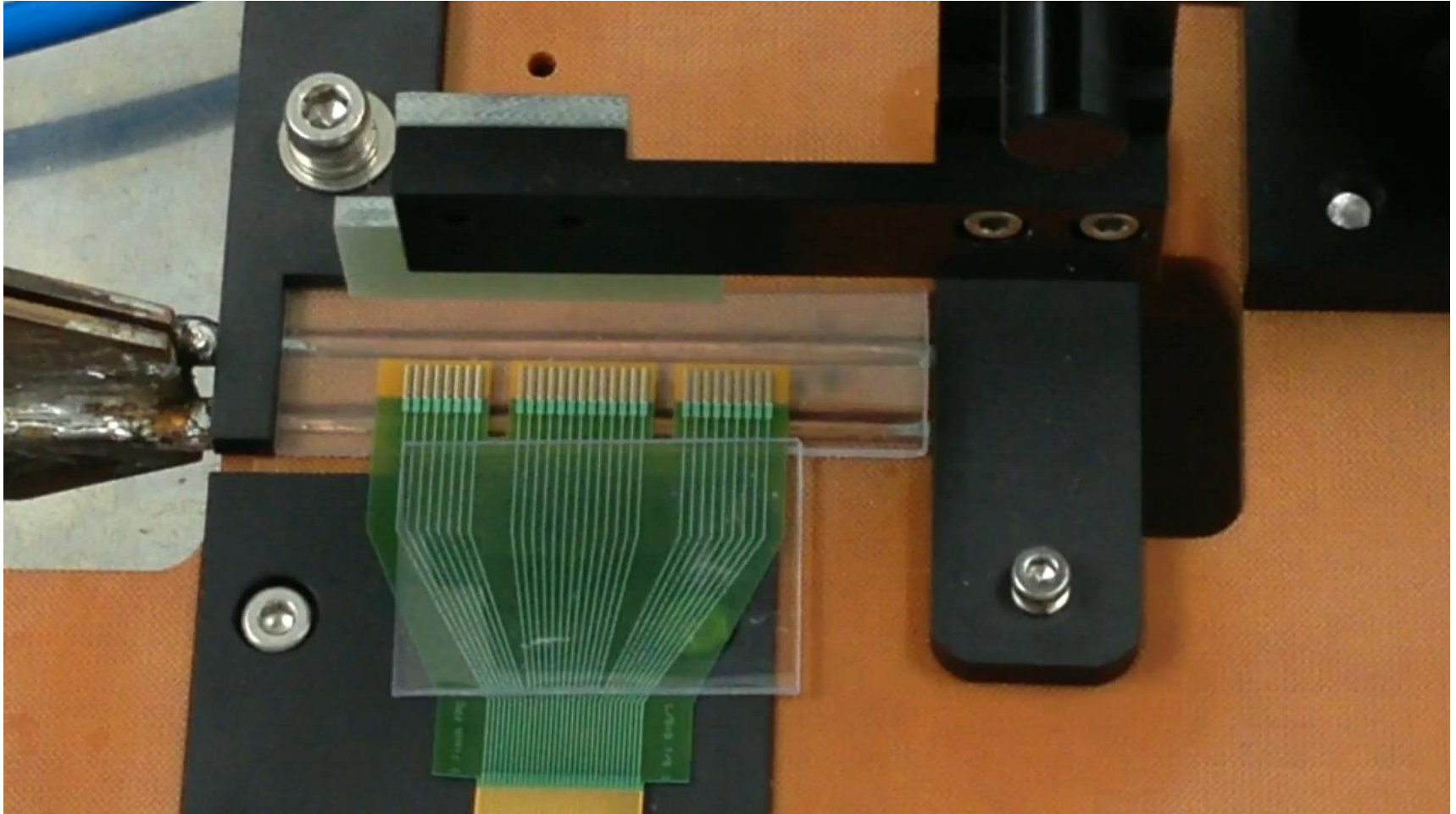
3D Plastic Touch panel

Proposal of Human Friendly Device

More natural and intuitine

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<http://www.wonderf-c.com>

# This is IH Spot Reflow



# Wonder Future Corporation



Nov. 26<sup>th</sup> 2017



- WFC was founded in April, 2013 by engineers of LCD Display, Touch Panel and Semiconductor for the purpose of developing 3D Plastic Touch Panel.
- New Capacitive Plastic Touch Panel was developed in May, 2013. (JP#5347096 and more)
- “IH Spot Reflow” was developed for the connection between Touch Panel and FPCB.
- Now this technology applied to the parts connection on Non-heat resisting material.

# WFC Business

## 3D Plastic Touch Panel

### OTP(Outer Touch Panel)

- Sheet insert Injection molding

### OTP-β(Outer Touch Panel – β)

- Lamination & Injection



## IH Spot reflow machine

### IH Spot reflow machine

### Contract Manufacturing

### LEDCAP (Parts business)



# Development Outcome ~2018



OTP-3.7 :W Insert Molding

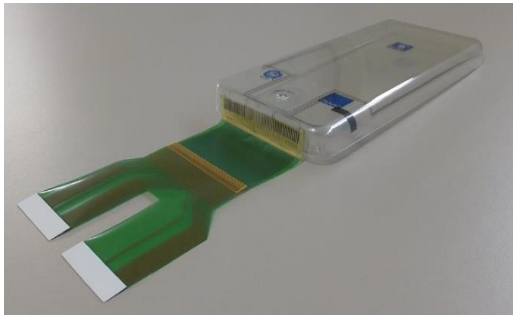


OTP : small T/P sensor SW



OTP-β: High rigidity, narrow frame, integral molding

Driving  
Project for  
Product  
Launch



OTP-5.3:W Insert Molding



OTP—Commander Insert Molding



CLAO: Plastic integral T/P sensor



OTP : 3D Vehicle console panel

# What is "Induction Heating Reflow"?

## Heating system

Electric current flows through the coil



Magnetic field generated



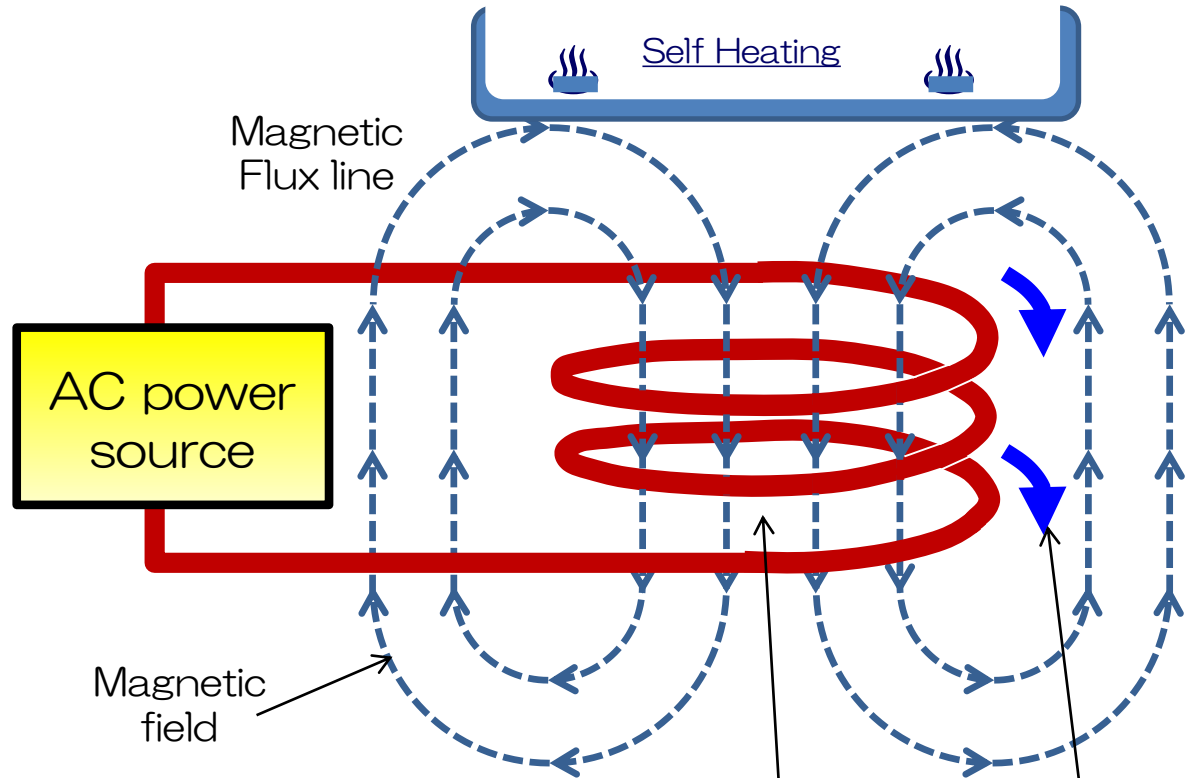
Induced current generated in electrode pads



Pads heat up (by Joule heat)



Solder melted

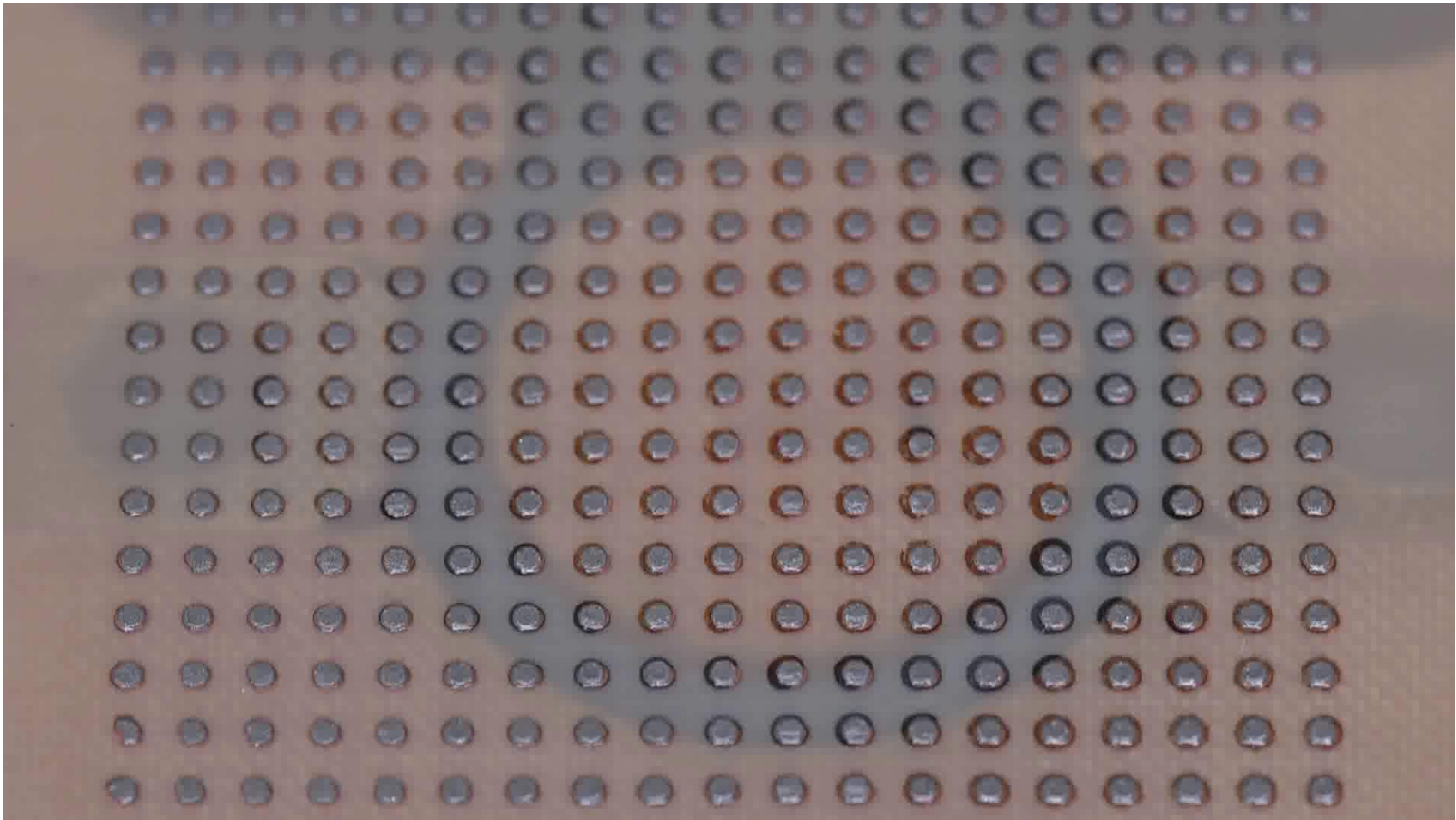


$$Q = IVt = I^2Rt = \frac{V^2}{R}t$$

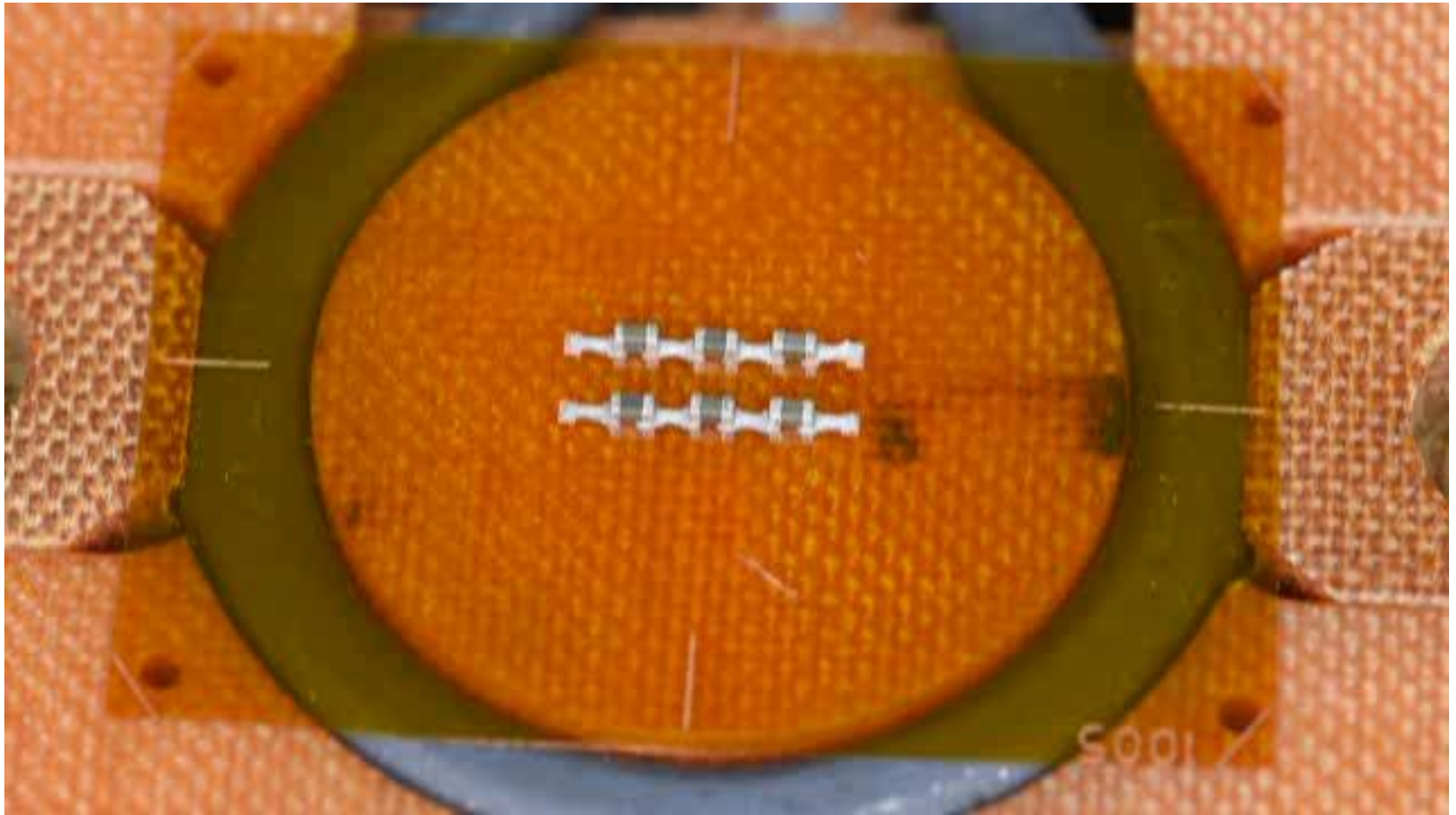
$Q$	: Joule heat	[J]
$R$	: Resistance	[ $\Omega$ ]
$V$	: Voltage	[V]
$I$	: Current	[A]
$t$	: Application time	[s]

Heating depends on the area of electrode

# Basic IH movie1

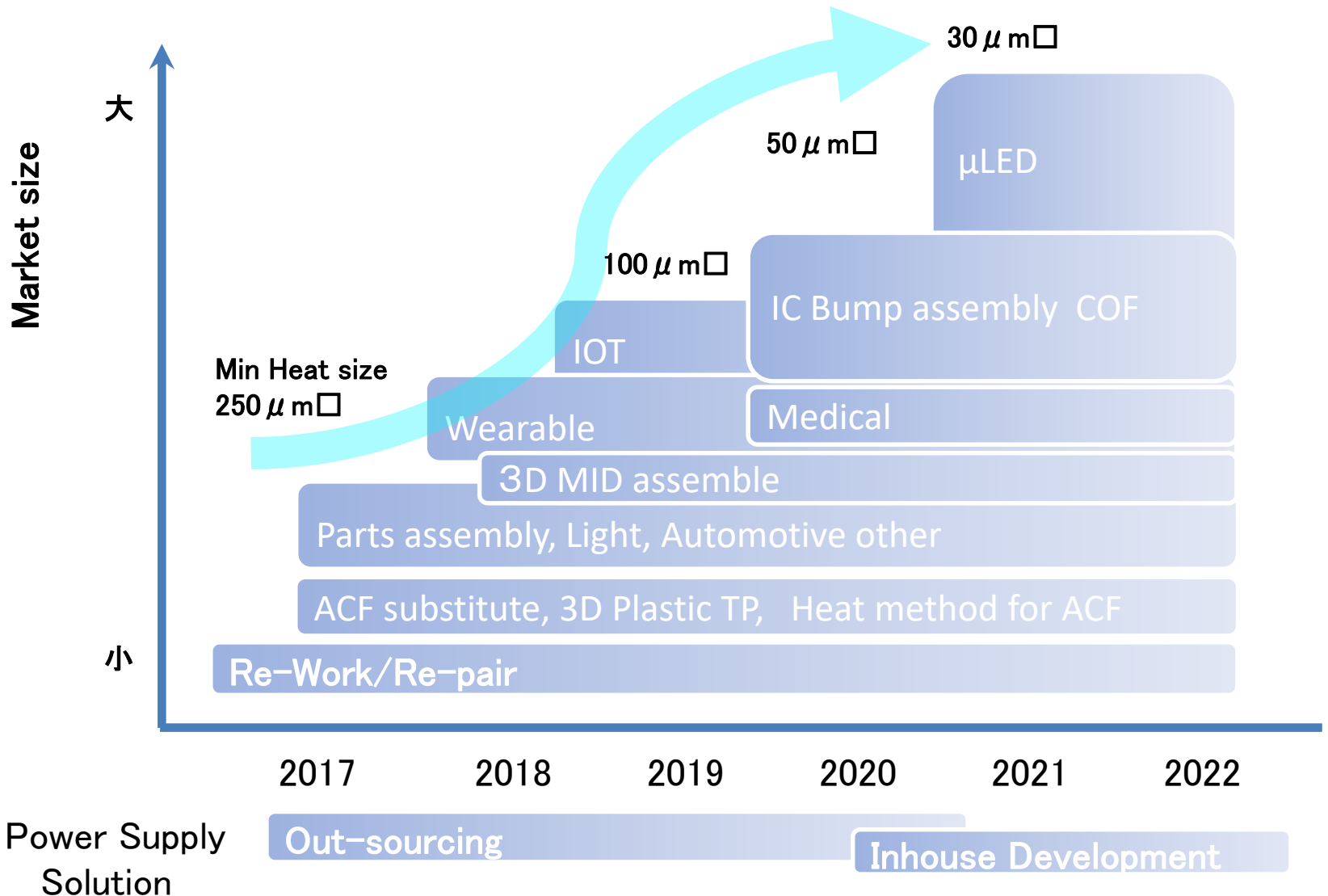


## Component mounting on PI Chip Capacitor (1005)



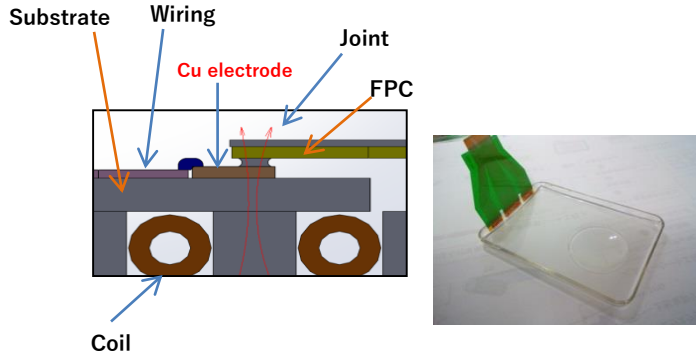


# IH Spot Reflow Technical trend & Markets

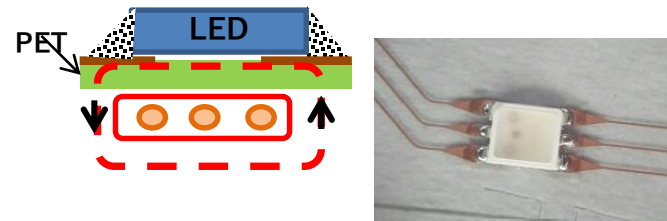


# Applications for IH Spot Reflow

## ★ Connecting FPC to Plastics (FPC connect)



## ★ Soldering to PET substrate (e.g. LED)

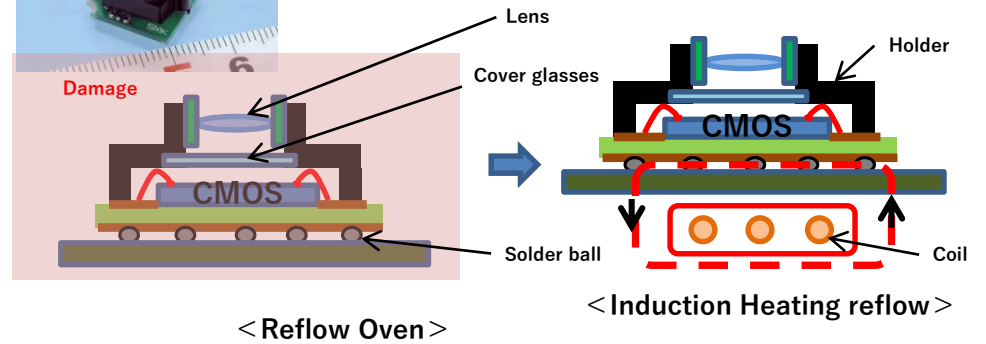


## ★ Soldering to textiles



## Camera module

## ★ SMT of optical components (e.g. Camera module)



## ★ 3D soldering

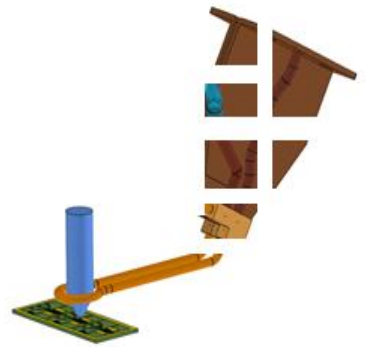


# COMPARISON with other connection method

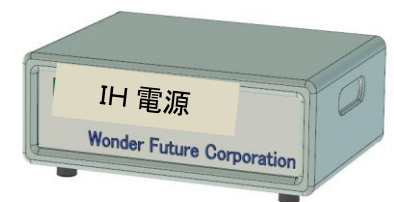
		The said electromagnetic Induction type technology	ACF	Reflow	Laser
1) For FPC connection on plastic housing / plastic film	Heat-resistant material	◎	◎	Not applicable	Not applicable
	Non-heat-resistant material	◎	×	Not applicable	Not applicable
2) For Component (chip resister, capacitor, LCD etc.)	Heat-resistant material	◎	Not applicable	◎	△ Possibly solder scattering
	Non-heat-resistant material	◎	Not applicable	×	△ Possibly solder scattering
< General articles >					
Machine size		◎	△	×	×
Processing Speed		◎	×	×	△
Power Consumption		◎	○	×	△
Repair Function		◎	Not applicable	Not applicable	Not applicable
		◎ : Very Good, ○:good, △:?, ×:Bad			



# Heating head for chip components



IH Power Supply

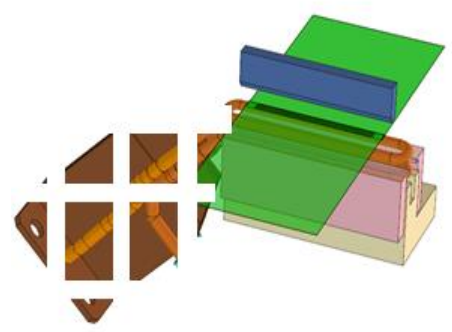


Controller(Sequencer)



# System Configuration of N7 model

## Heating head for FPC

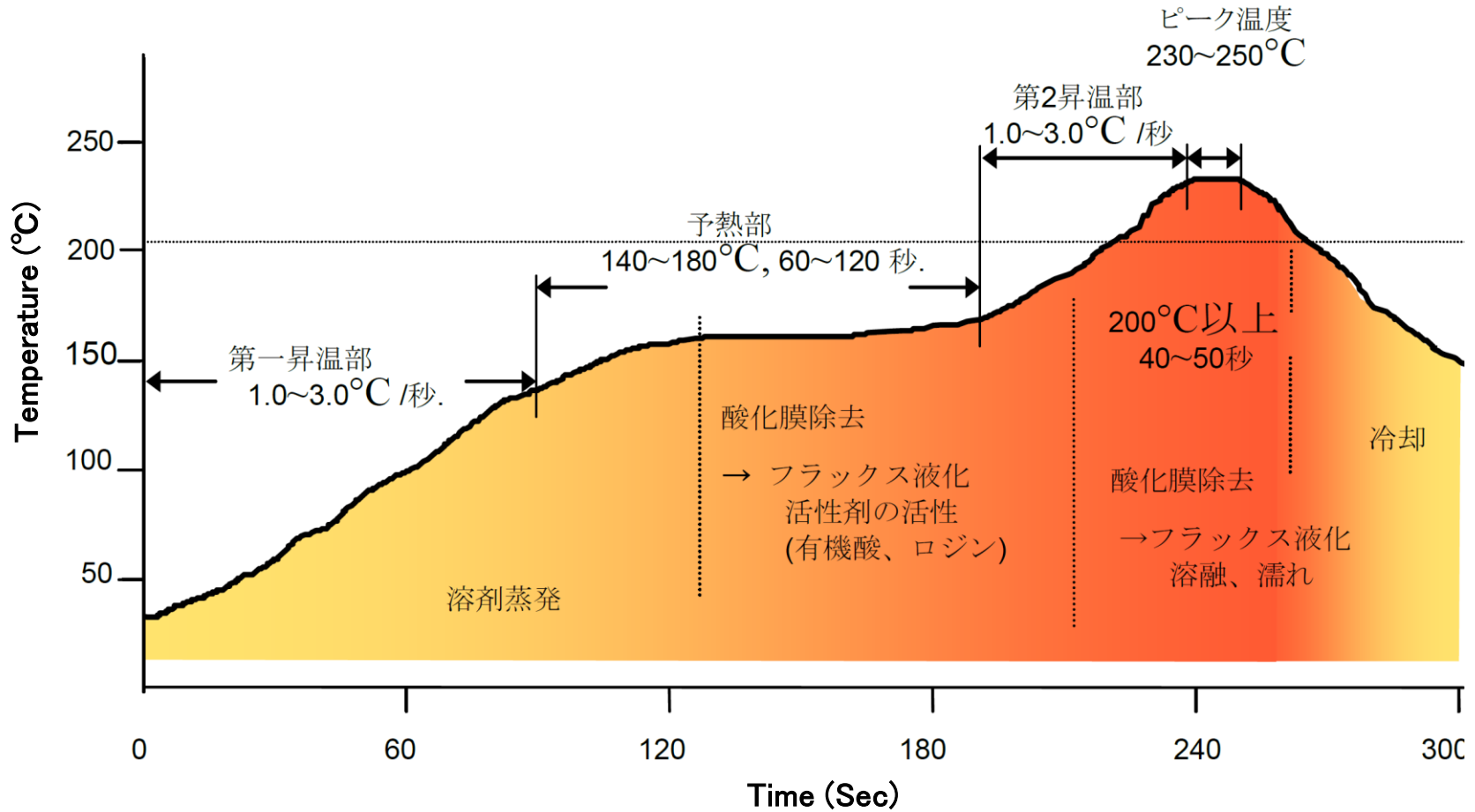


Main Body (W1200 x D1000 x H1800)



Water-Cooling apparatus

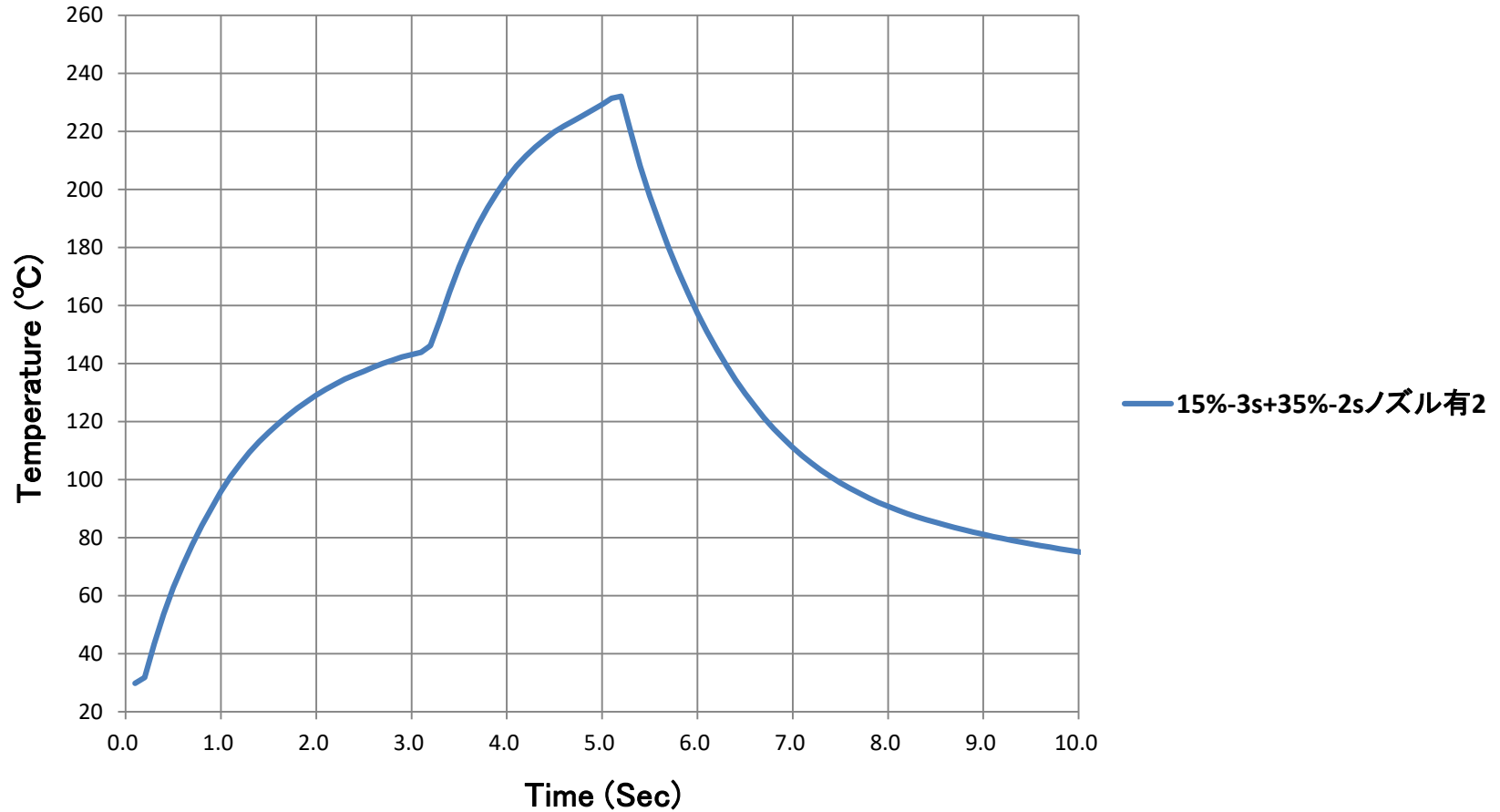
# Temp. profile for Solder Reflow



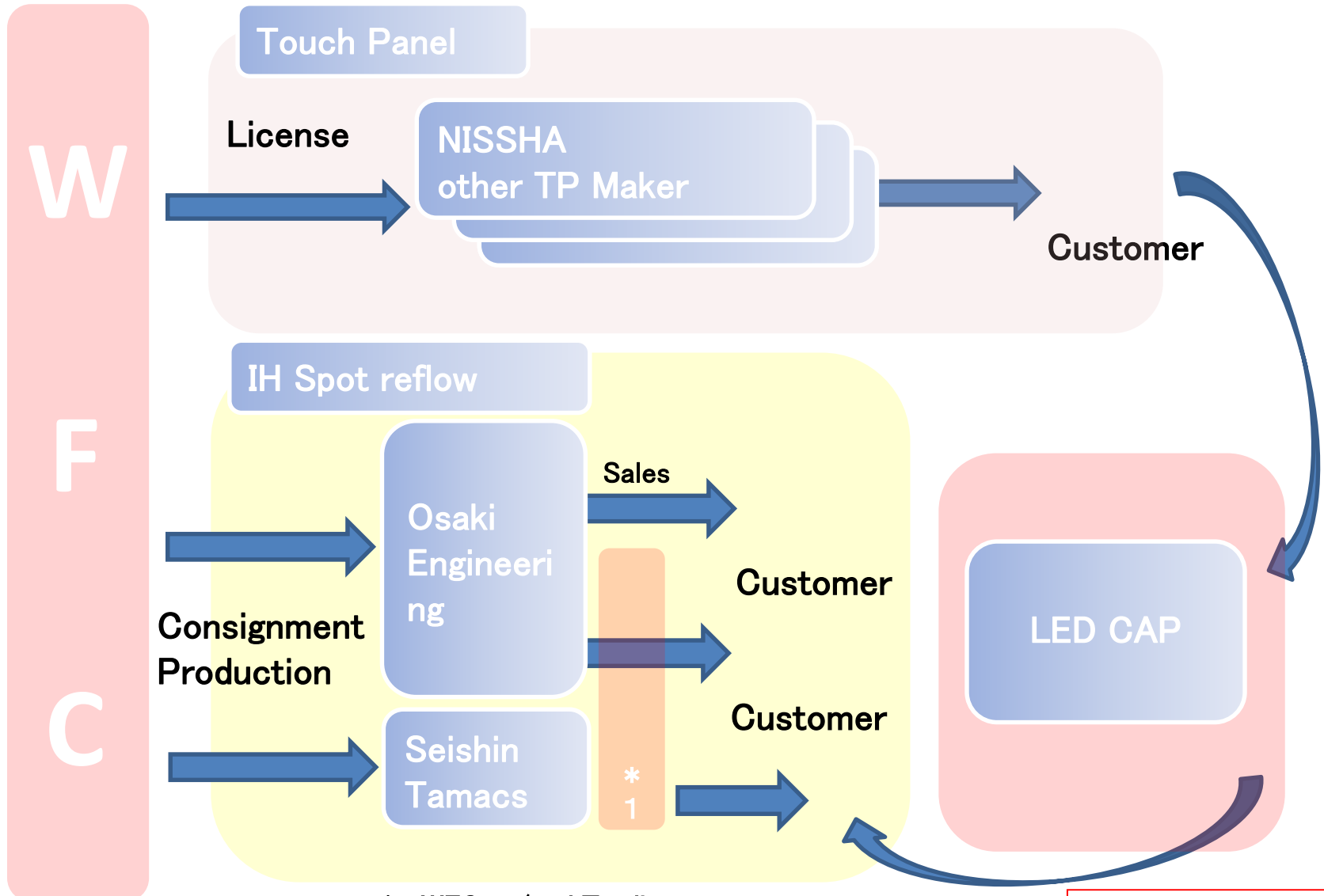
# Temp. profile for IH Spot Reflow



15%-3s+35%-2sNozzle



# WFC Business Models



# LED CAP

Membrane switch->Touch button  
LED reaction will be required in many home applications.



Washing machine

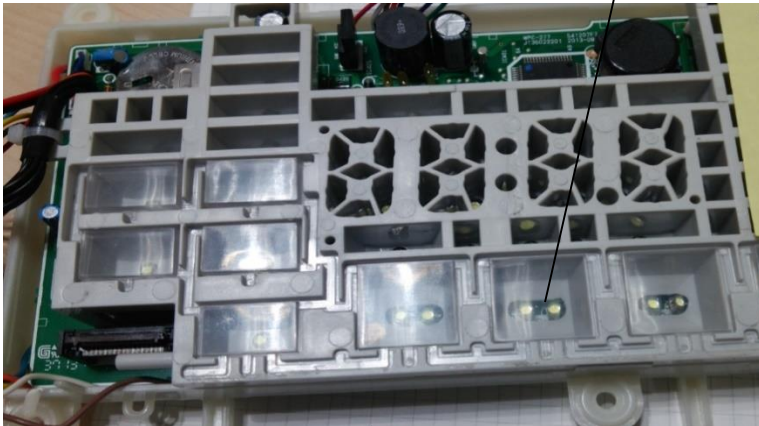
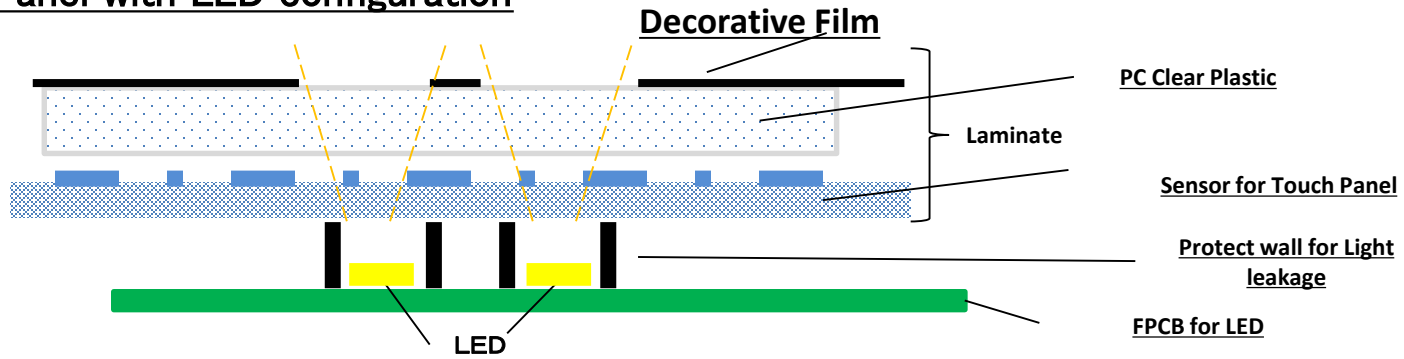


Air cleaner



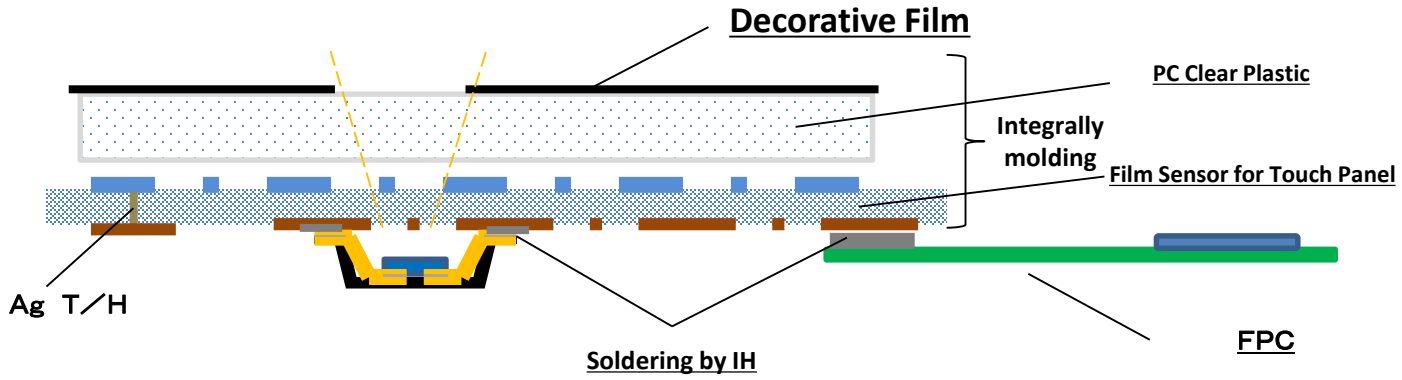
# LED CAP\_2

## Touch Panel with LED configuration

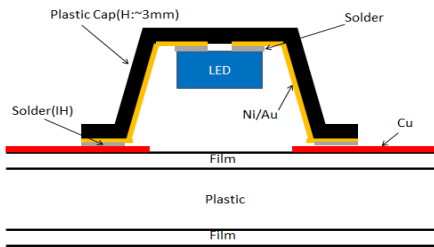


## Display for existing wash machine

# LED CAP\_3



## LED Cap by MID



シート外形 (納入形状)

個片外形 (切断形状)



## 3D MID production Process image

Injection Molding



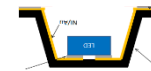
LDS (MID)

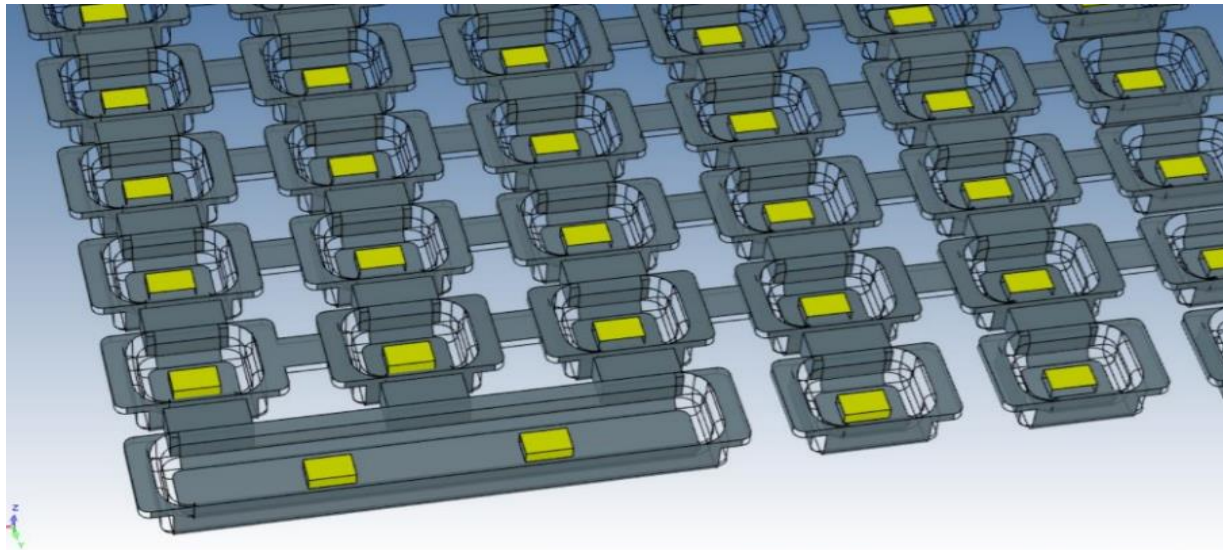
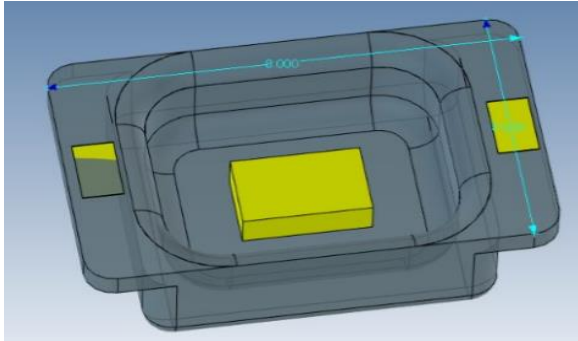


LED Assemble



Cut





## Conclusion

- ◎ Spot reflow system can minimize damage to components / substrate!!
- ◎ Soldering on Non-Heat Resisting material  
PET, plastics , textiles and Paper.
- ◎ "Heat generating" is controllable.
- ◎ Easy to apply to "Roll to Roll mass-producing"
- ◎ Energy-saving

**We make drastic cost down of your PCB!!**

# IH SPOT REFLOW SYSTEM WIS Series

## Simplified Table –type Test Machine – Single Head

<Enabling soldering non-heat resisting materials and upper part of 3D MID

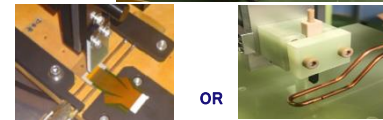
### Characteristics

- Heating only metal by IH (Electromagnetic Induction principle) – multistage heats possible
- Furnishing head for either joining FPCB or parts (selectable when ordering)
- Soldering on the non-heat resisting materials is possible. PET, PBT, Textiles ,3D MID etc.  
 Replacing ACF Pressure is not required  
 Replacing laser No solder scattering, No sharp temperature rise, Automating hand soldering
- Energy saving, Space saving ● Possible to use usual solder
- Possible to solder on 3D MID and curved surface
- Applicable to heat-cure-type resin other than soldering



### Application

- Film touch panel ● RF-ID
- 3D-MID ● Wearable
- LCD backlight (Soldering LED) ● Rework



Head for FPCB

Head for parts

### Soldered samples

- Connecting FPCB to film touch panel, 3D, curved surface available
- Soldering LED on PET, textile and paper
- 3D MID



Body size	W340 x D830 x H560mm
Body Weight	60Kg no chiller included
Heating Area	W4 x L50mm / W10 x L25mm
Heating Power	2.8kw / 3.5kw
Head	Option (Components for FPC)
Work Size (reference)	FPCB :50 x 50mm Components :1005 Chip
Heating circuit (reference)	Mouth shape : Min. □ 0.5mm Circuit width : Min. W=0.3mm
Heating method	5 steps Step cure

### Multi stage heating: Step cure Temp profile



### Demonstration Moving images

- IH basic Demo <https://youtu.be/7M5Xnr7x8UM>
- IH\_37FPCB Demo <https://youtu.be/V8TxEsp3p4>
- IH\_1800\_025Demo <https://youtu.be/UM56pP53Kis>
- IH SPOT <https://youtu.be/JiJvGy3POf8>
- IH\_Demo171013 <https://youtu.be/EplyR2tb0bj>

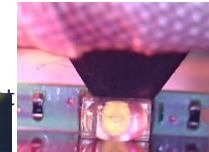
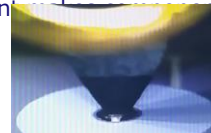
# IH SPOT REFLOW SYSTEM WIS Series

## Reworking electronic components : Manual Type

<Realizing Spot Repair with out no effect to peripheral components >

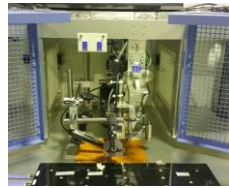
### ■ Characteristics

- Heating only metal by IH (Electromagnetic Induction principle) – multistage heat possible
- IH heating method realize to rework parts which is not done by manual heat radiating circuits
- Possible to rework with special metal nozzle without no effect peripheral components. Applicable to high-density mounting circuits (1005 possible)
- Combination of solder dispenser and element placement packaging possible (Optional)
- Free temperature setting (from high to low) possible
- Realizing energy saving and space saving
- Possible to solder on 3D MID and curved surface



Nozzle Pick-Up

### ■ Machine Specification



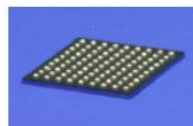
Body Size	W1000x D1100 x H1700mm
Body Weight	250Kg Chiller not included
Heating Area	W4 x L50mm / W10 x L25mm
Heating Power	2.8kw / 3.5kw
Head	Option (Components for FPC)
Work Size (reference)	Tray size :500 x 400mm Components : 1005 Chip
Heating circuit (reference)	Mouth shape : Min. □ 0.3mm Circuit width : Min. W=0.1mm
Heating method	5 steps Step cure

### ■ Application

- Digital Signage LED Panel
- WL-CSP
- LCD backlight (Soldering LED)
- Wearable



LED Panel : Signage



WL-CSP

### ■ Multi stage heating: Rework flow by step cure

