

# Introduction

## Mosfets Assembly Process



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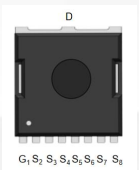


The package can be said to be the shell for installing semiconductor integrated circuit chips, which not only plays the role of protecting the chip and enhancing thermal conductivity, but also plays the role of communicating bridge with external circuit and ensuring versatility.



# Packages

GOFORD



G<sub>1</sub> S<sub>1</sub> S<sub>2</sub> S<sub>3</sub> S<sub>4</sub> S<sub>5</sub> S<sub>6</sub> S<sub>7</sub> S<sub>8</sub>

TOLL



SOT-23



SOT-23-6



SOT-223



TO-220



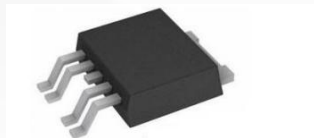
TO-220F



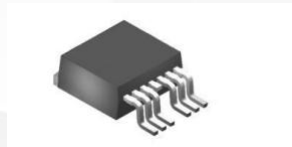
TO-92



TO-252



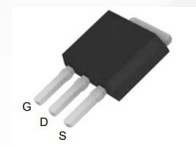
TO-252-4



TO-263-6



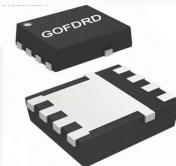
TO-263



TO-251



SOP-8



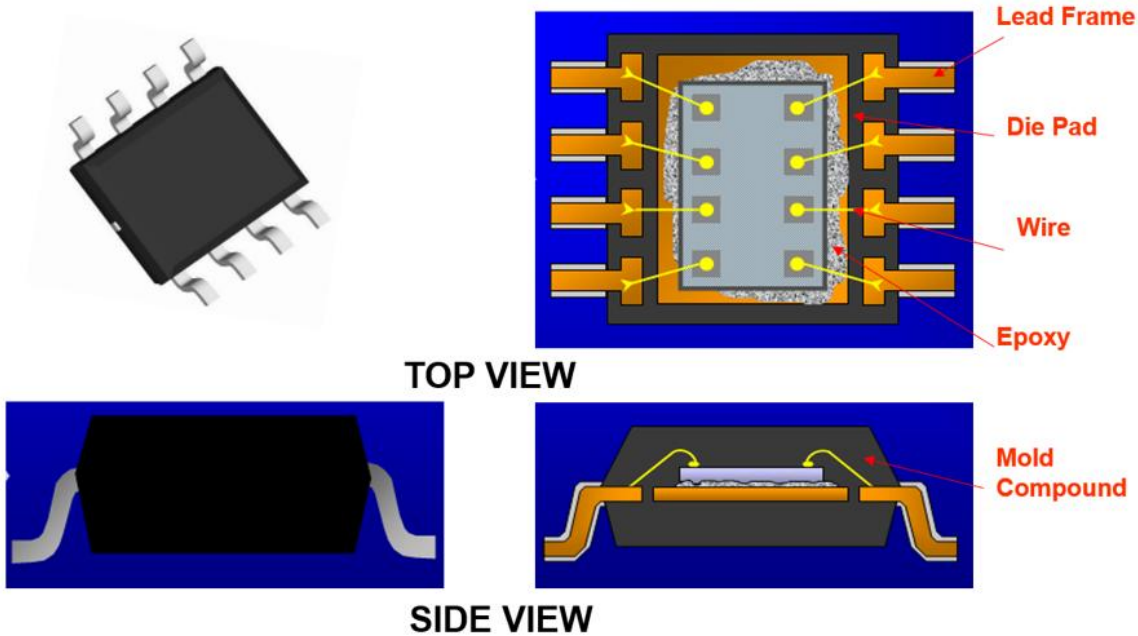
DFN



TO-247



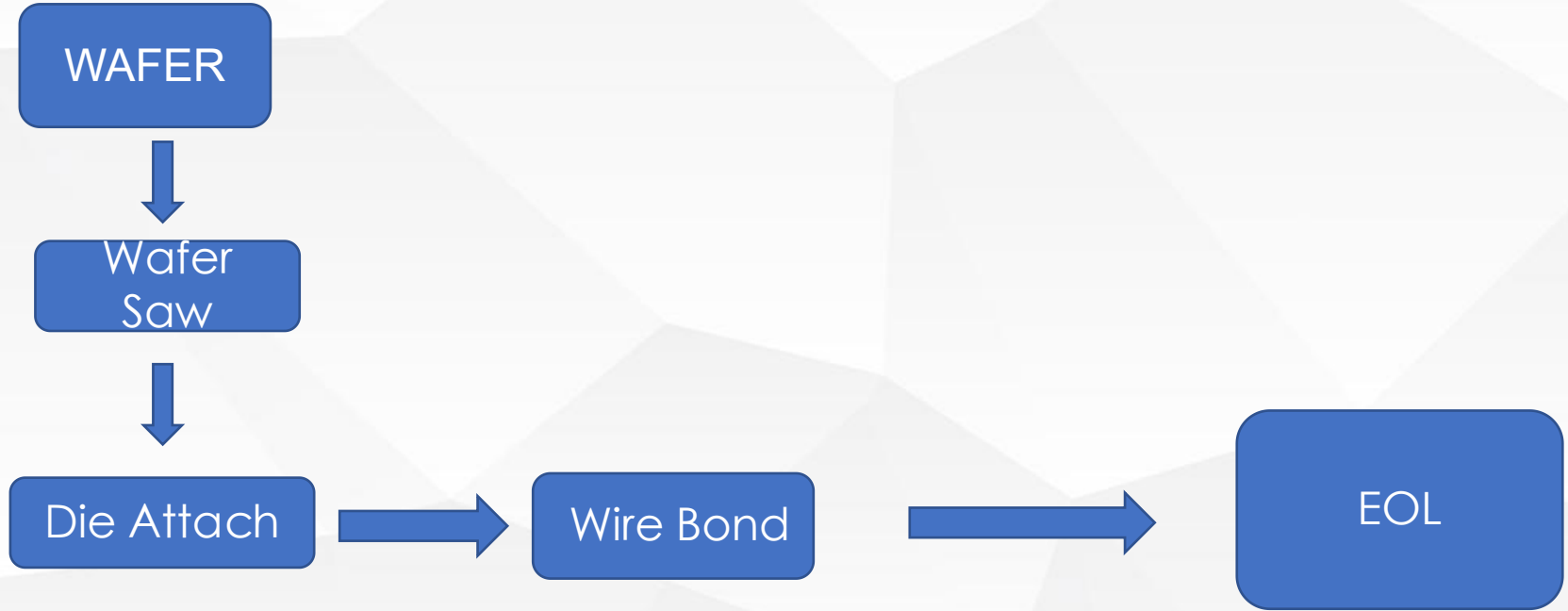
## Internal Structure (SOP-8)





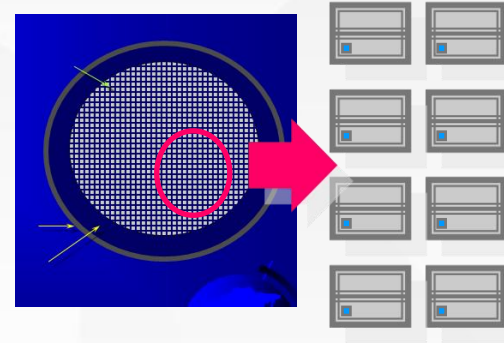
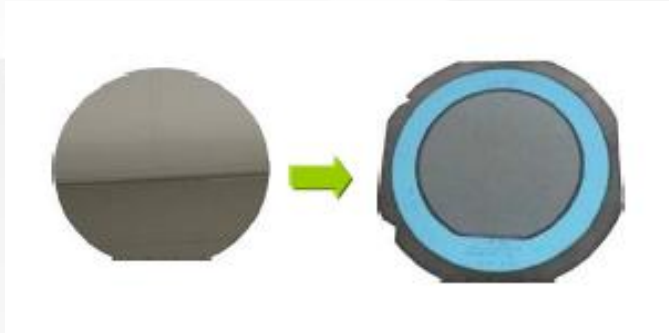
# Assembly Process

FOL– Front of Line





## FOL—Wafer Saw



Wafer mount, the wafer will be pasted on the blue film (Mylar).  
Wafer Saw, cut the entire Wafer into independent dies through Saw Blade which is convenient for Die Attach and other processes.  
Wafer Wash ,mainly cleans all kinds of dust generated during the process.



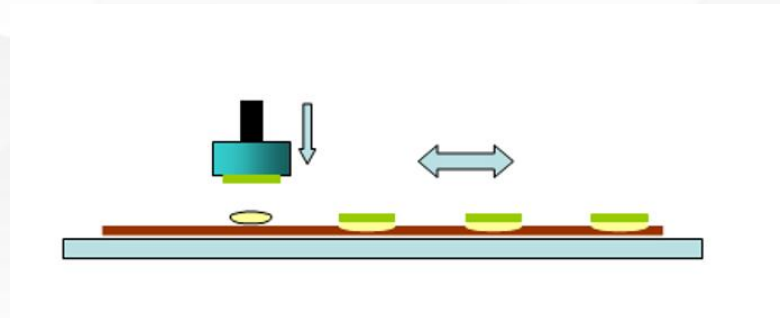
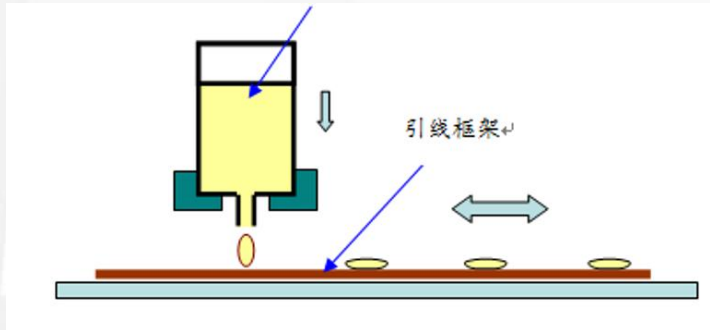
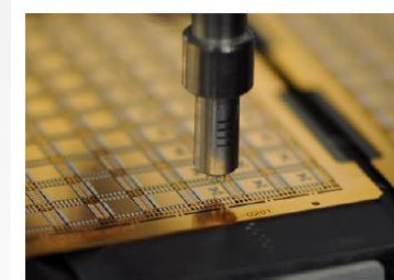
# Assembly Process

FOL—Die Attach

Write Epoxy



Die Attach

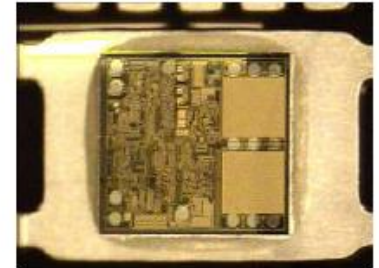
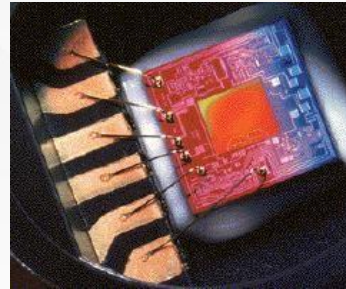




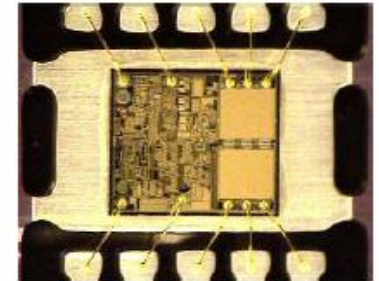


# Assembly Process

## FOL—Wire Bonding



Before



After

High-purity gold wire (Au), copper wire (Cu) or aluminum wire (Al) are used to connect Pad with Lead by welding.

The pad is the external contact point of the circuit on the chip, and the lead is the connection point on the lead frame.



# Assembly Process

EOL– End of Line





## EOL—Molding



Material: Mold Compound

Molding is to preheat the frame, and then place the frame on the encapsulation mold on the die-casting machine, and then squeeze the semi-dissolved resin (Compound) into the mold.

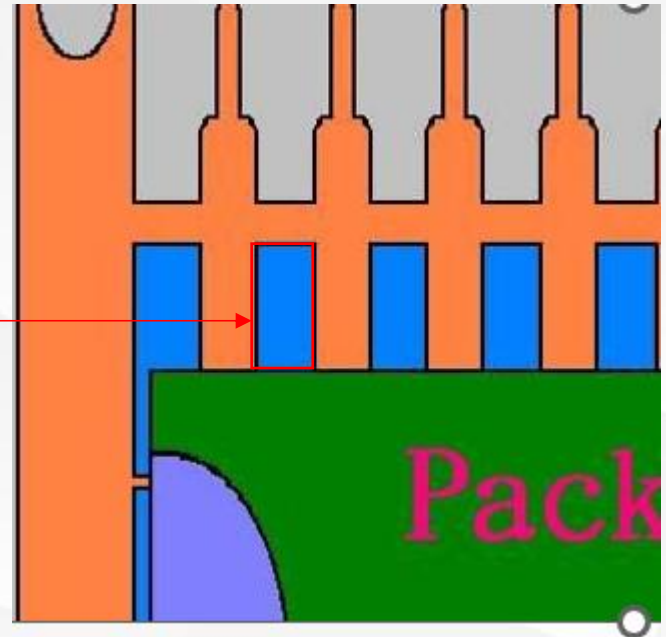
After the resin hardens, the mold can be opened to take out the finished product.



# Assembly Process

## EOL—Deflashing

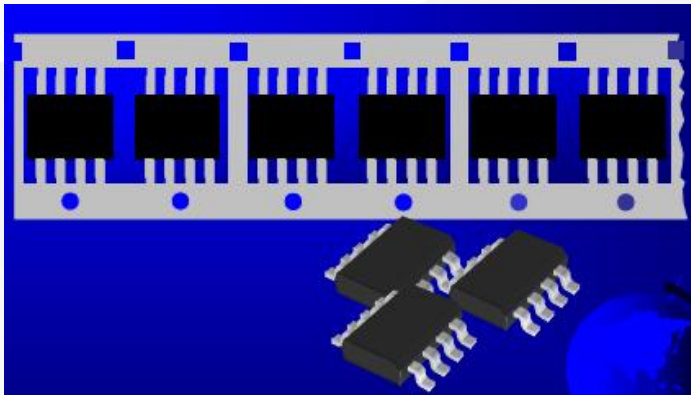
Deflashing:  
remove epoxy  
spillage between  
the package and  
the Dam Bar (the  
blue parts).



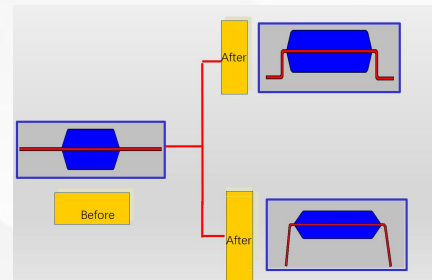
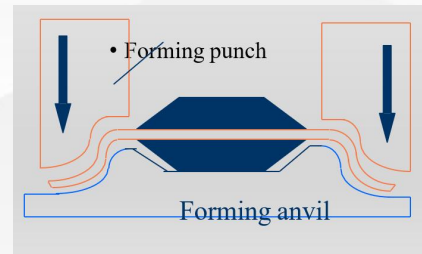


# Assembly Process

## EOL-- Trimming and forming



Trim: Cuts the lead frame into separate units.



Forming: pin molding to achieve the shape as desired



## EOL-- Inspection



After Forming, products have to pass final test to be qualified ones.

During the manufacturing process, in order to ensure the quality of the product, testing (In-Process Quality Control) will be required as well.

For example, the destructive test will be carried out after the completion of Wire Bonding, and after molding, X-Ray (X-ray) is used to see whether the metal wire inside the colloid is displaced or broken, etc.



## EOL-- Inspection



GOFORD SEMICONDUCTOR CO. , LTD.  
Reliability Test Report

Part Number: MOSFET SMD Series  
Yearly Reliability monitoring: 2023  
Based on similar Structural  
Test Results: PASS

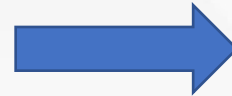
Test Item		MSL3, TCT, PCT, THT, HTST, SD, HTRB, HTGB			
Test No.	Test Item	Test Condition	Test Standard	Qty (pcs)	Rej/ Acc
1	MSL3 Preconditioning	BAKE: 125± 5 °C 24 H Soak:30°C 60%RH,192H Reflow: 260°C ,3cycles	JESD22 - A113	190	0/190
2	TCT Temperature Cycle Test	- 65°C - 150 °C,500cycles	JESD22 - A104	45	0/45
3	PCT Pressure Cooker Test	T= 121°C , RH=100% PA =2atm,48 H	JESD22 - A102	45	0/45
4	THT Temperature & Humidity Test	85 °C , 85%RH ,500H	JESD22 - A101	45	0/45
5	HTST High Temperature Storage Test	150°C,500 H	JESD22-A103	45	0/45
6	SD Solderability	245± 5 °C ,5± 1S	J- STD-002	10	0/10
7	HTRB	Tj=150°C . Bias= 80%VDS 168/500/1000H	JESD22 - A108	77	1/77
8	HTGB	Tj= 150°C Bias= 100%VGS 168/500/1000H	JESD22-A108	77	1/77

In addition to pass all electrical function test in the manufacturing process ,we have to ensure that the MOSFET can pass reliability tests, such as High Temperature Reverse Bias Test (HTRB), High Temperature Gate Bias Test (HTGB), Pressure Cooker Test (PCT), Thermal Shock Test (TST), Thermal Cycle Test (TCT), Permanent Seal Test, Foot Fatigue Test and so on.

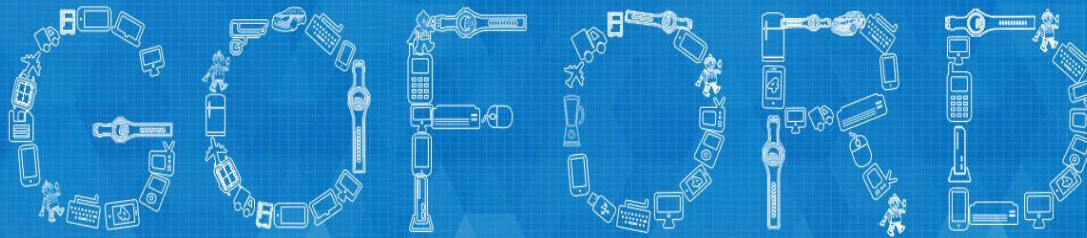


# Assembly Process

## EOL--Packing







THANKS