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ENGINEERING SPECIFICATION

LGA 2011 SOCKET-R APPLICATION

SPECIFICATION

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
D	EC No: **111901** DATE: **2016 / 12 / 28**	**LGA 2011 SOCKET-R Application Specification**	**1** of **48**

DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
AS-105142-001	**DBFAN**	**JKACHLIC**	**JKACHLIC**

Revision History:

Revision	List of Changes	Date
1	Initial Release	05/12/11
2	ILM Rev. updated	05/24/11
3	Updated assembly ILM drive type	08/04/11
A	HVM released	05/21/12
B	New format updated	12/12/20
C	Revised format	04/17/13
D	Revised shelf life	12/28/16

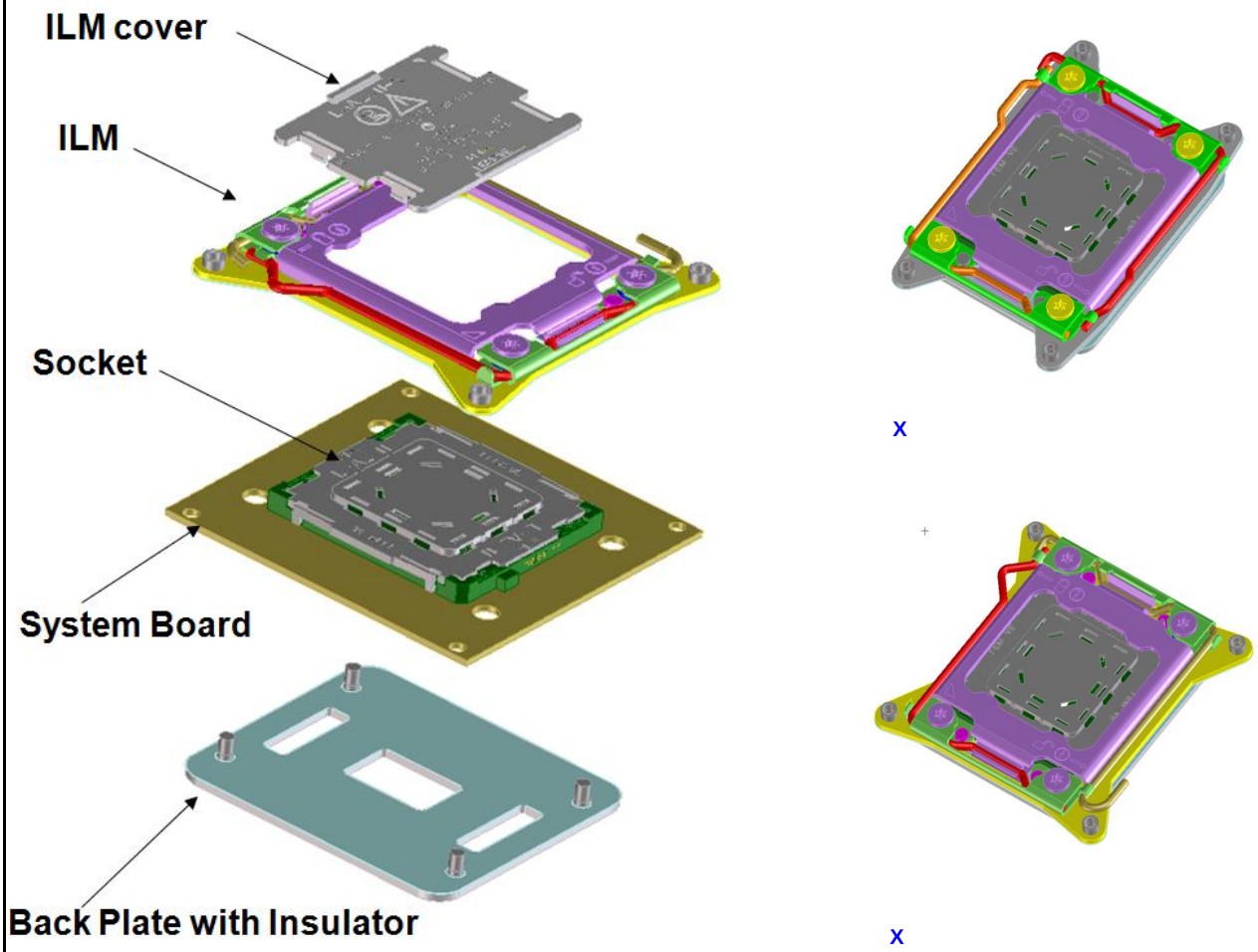
Content:

Terminal Damage Prevention Appendix:

- **Date code**
- **Shelf Life**
-

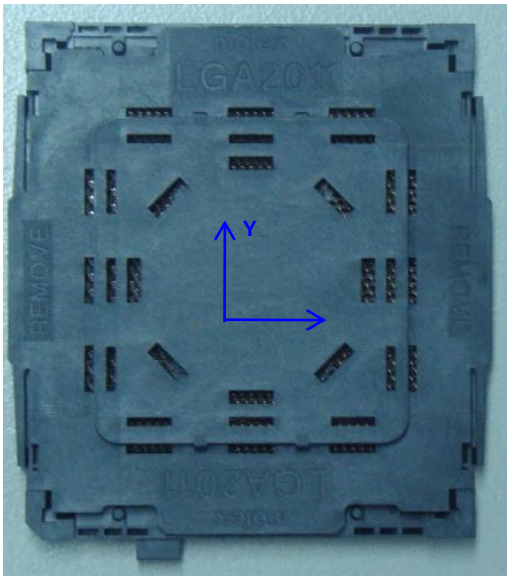
Socket R and ILM Introduction

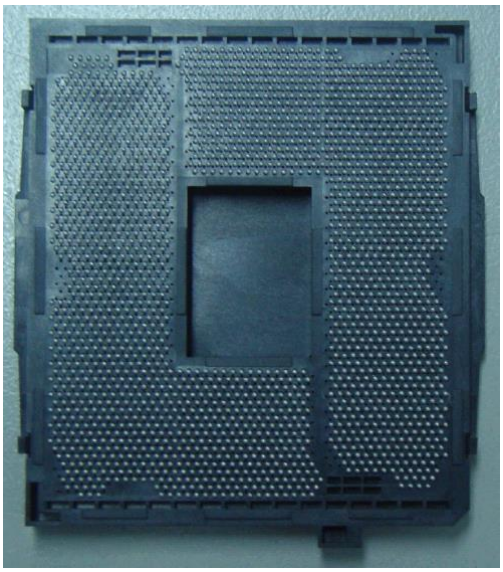
Socket R and ILM Exploded View



Socket R Introduction

- **Pin count :** 2011
- **Terminal pitch :** 1.016mm×0.8814mm (X x Y)
- **Terminal array arrangement :** 58×43 grid array with 24×16 grid depopulation in the center of the array.
- **Socket height :** 3.4 mm ± 0.2 mm after SMT process
- **Plating thickness :** 30/15u" min. Au plating at contact area



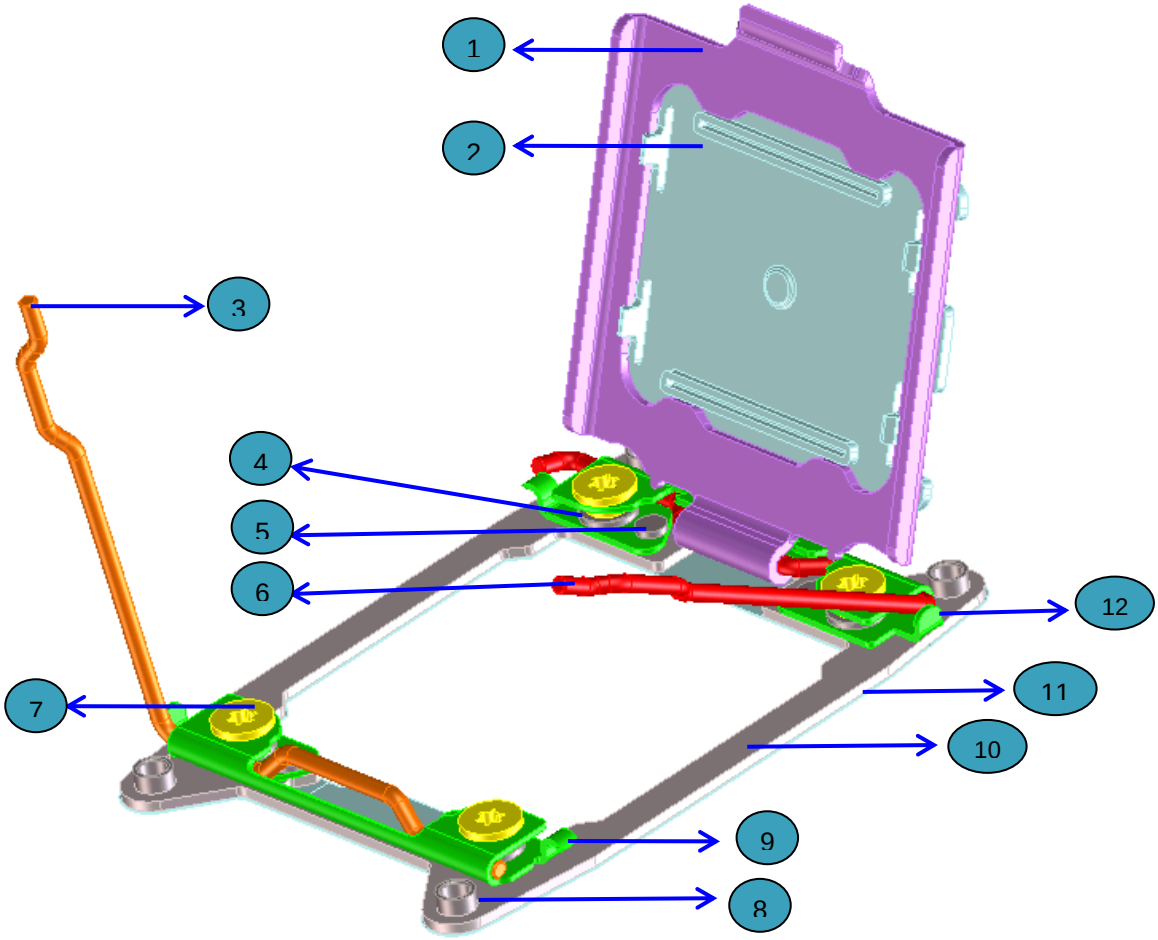


Socket R ILM (Narrow) Introduction

1 Load Plate 2 ILM Cover 3 Active lever(Load lever) 4 Nut collar, Shoulder

5 Rivet 6 Hinge Lever 7 Nut . Shoulder 8 HS Stud 9 Clevis. Active

10 Frame 11 Frame insulator 12 Clevis. Hinge

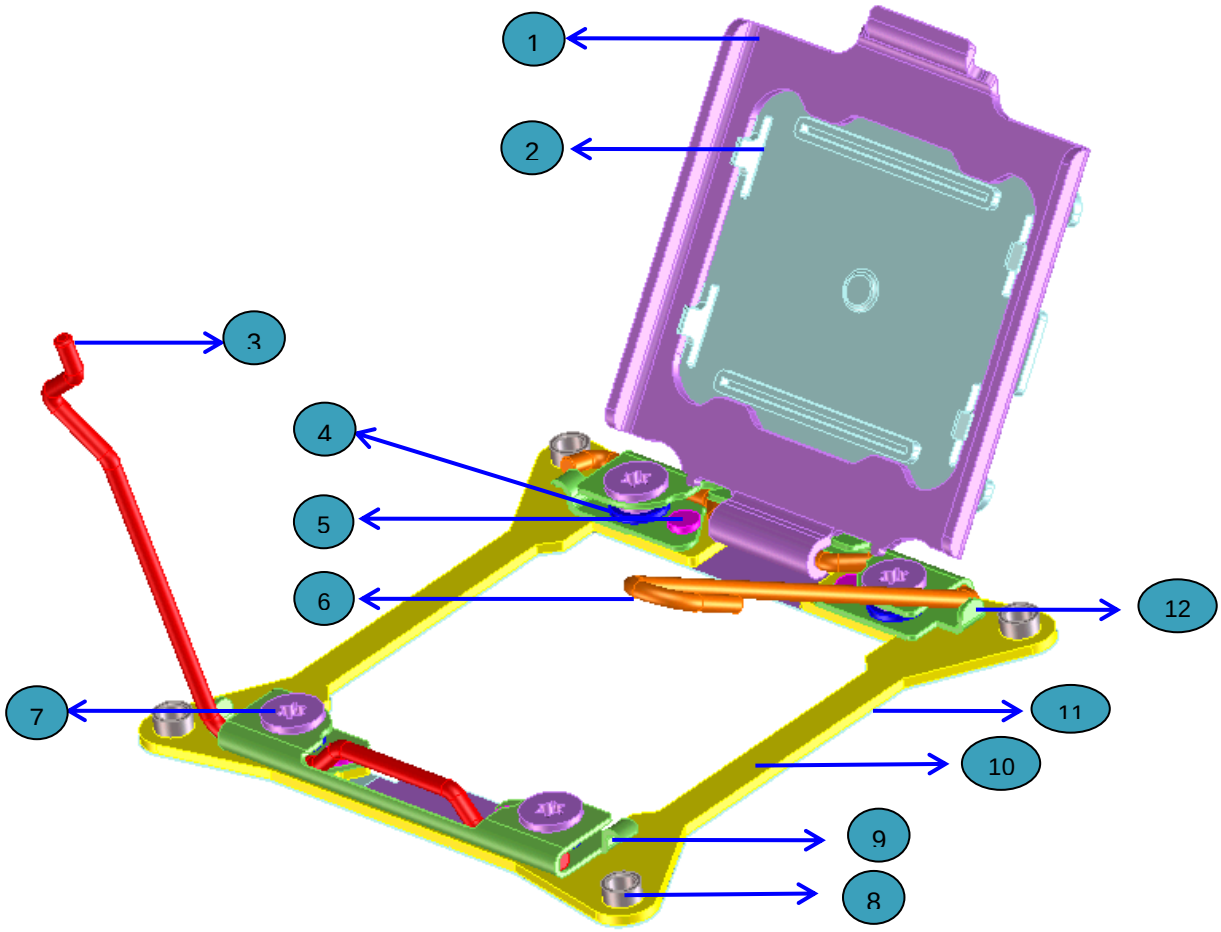


Socket R ILM (Square) Introduction

1 Load Plate 2 ILM Cover 3 Active lever(Load lever 4 Nut collar, Shoulder

5 Rivet 6 Hinge Lever 7 Nut . Shoulder 8 HS Stud 9 Clevis. Active

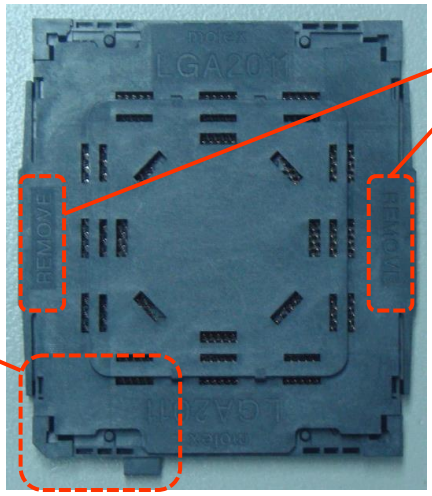
10 Frame 11 Frame insulator 12 Clevis. Hinge



Socket R and ILM Character Introduction

Socket R

Pin 1 indicator

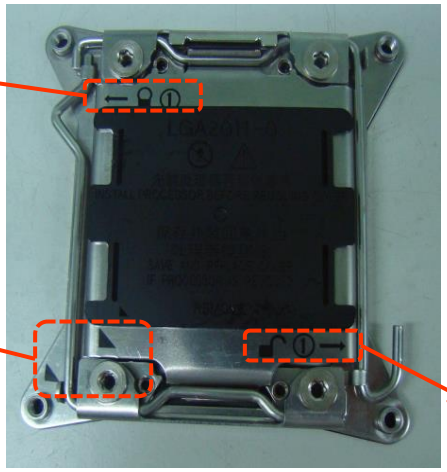


Pick up

IL

Close first

Pin 1 indicator



Open first

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Customer Application

(Unpacking Guide)

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Customer Application (Unpacking Guide)

(1) Place the package and open it with knife .
(2) Take out the packing foams.
(3) Lift up and put the sockets on the table, make sure the label is on the upside.
(4) Rip the vacuum bag gently without shaking the tray.
(5) Remove the rubber band and soft foams, take out the hard tray package .

* **Handling socket refer to Operation Guide.**

Declare !

- Do not handle sockets by hand before SMT.
- If it is out of hard tray before assembly, terminal and solder ball could be easily damaged by careless pick and place.
- Any inspection requires manual handling before SMT (such as IQC inspection), those sockets can not be put back for production.

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Customer Application

(SMT process)

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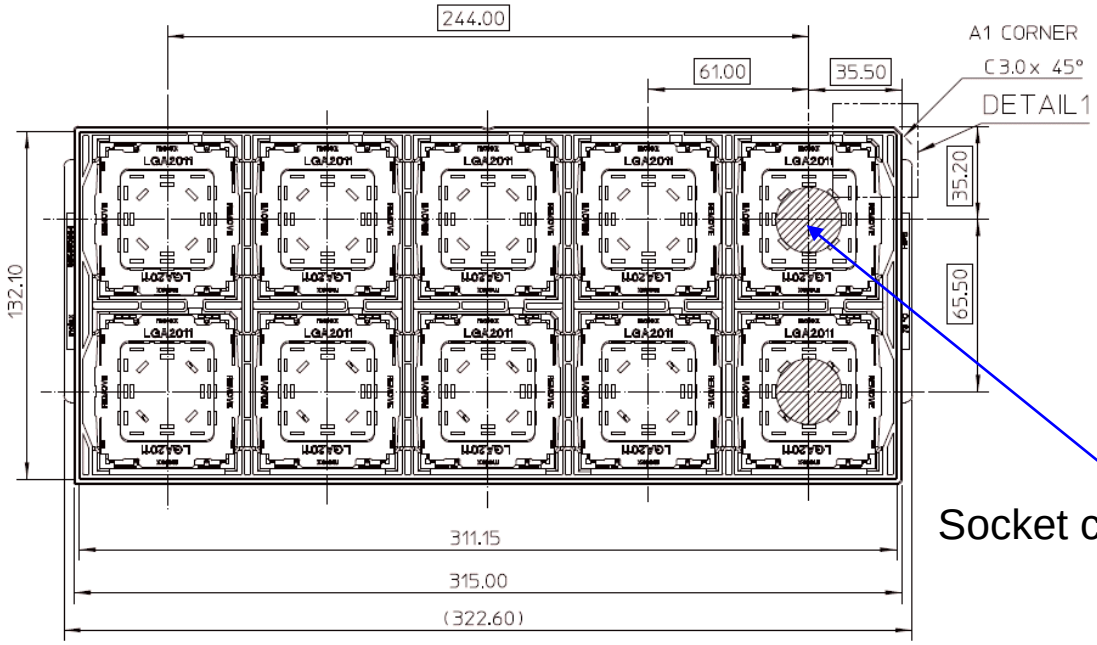
Customer Application(SMT process)

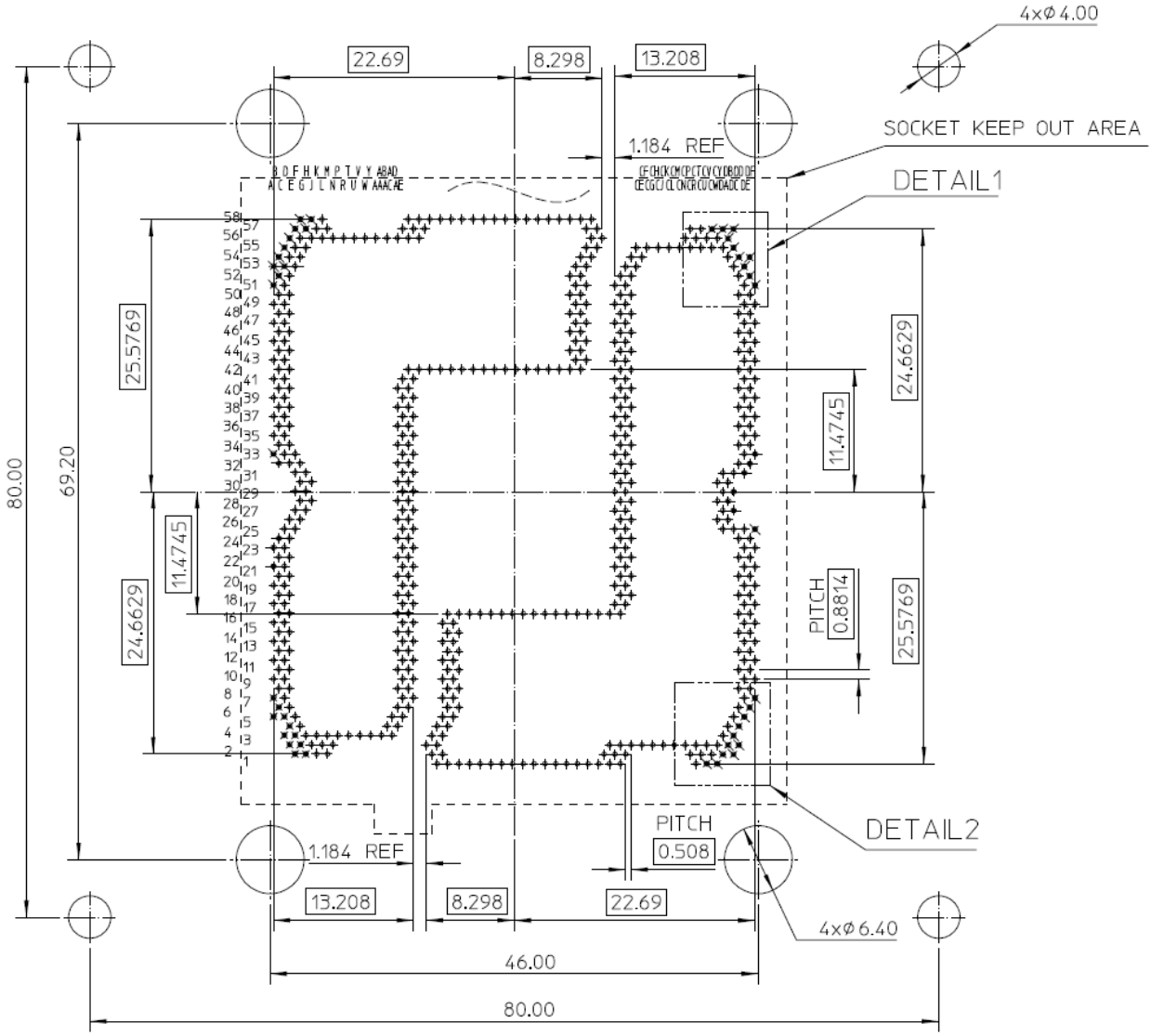
Socket R Pick & Place Design



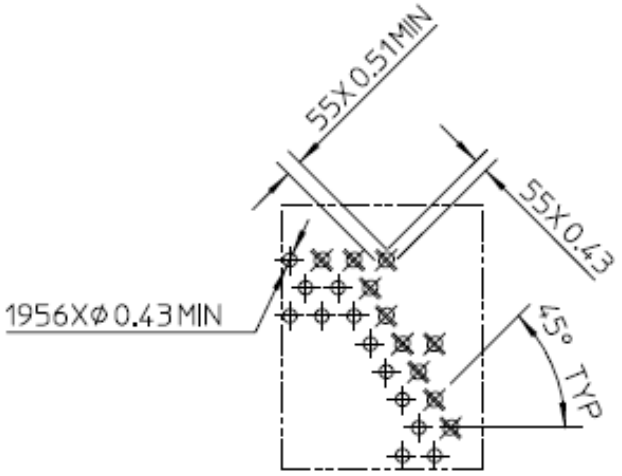
Relation of tray and socket

Customer Application(SMT process)

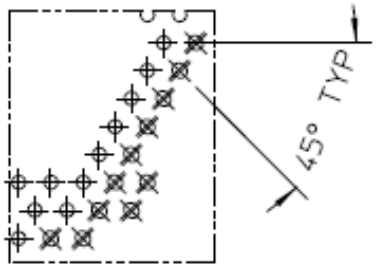
Recommended PCB layout (normal ILM)



RECOMMENDED PCB LAYOUT
FOR NORMAL FRAME



DETAIL3

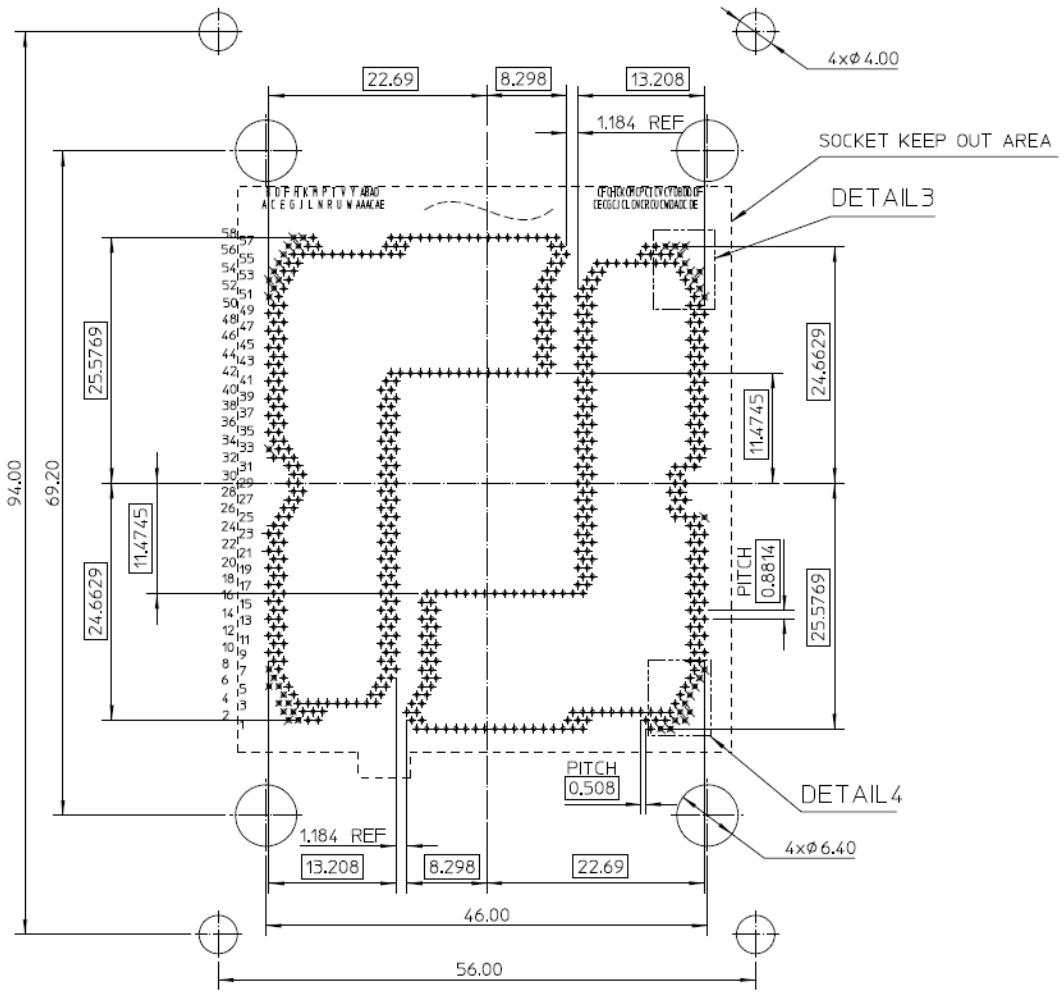


DETAIL4

Detail see sales drawing：SD-105142-001

Customer Application(SMT process)

Recommended PCB layout (Narrow ILM)



RECOMMENDED PCB LAYOUT
FOR NARROW FRAME

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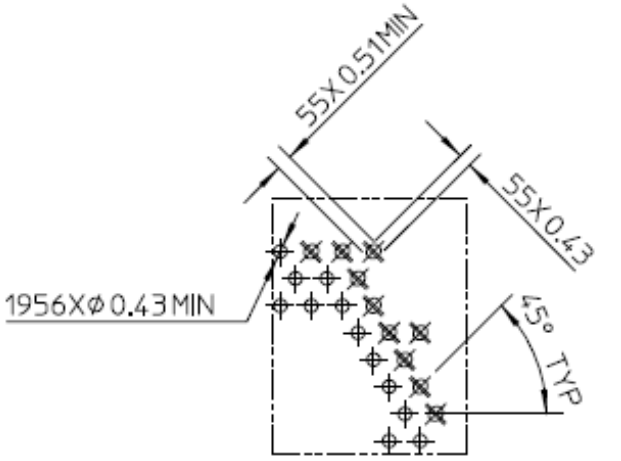
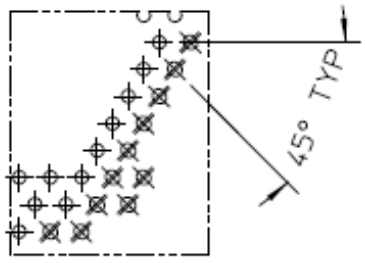


DETAIL3



DETAIL4

Detail see sales drawing：SD-105142-001

Customer Application(SMT process)

SMT Process Recommendations*

SOLDER PASTE FLUX SELECTION

- **Solder** pastes with higher activity levels have shown help for SMT yield.
- Molex recommends customers work with paste vendor to optimize flux chemistry.

Customer Application(SMT process)
Reference SMT Process Parameters

Process Parameter	Reference Guidelines (N2) – Preferred Option	Reference Guidelines (Air)
Reflow Environment	N_2 (O_2<3000 PPM)	Air
Solder Paste	Lead-free : (SnAgCu)	
Stencil thickness	5 mils ~6mils	
Stencil Aperture	18 to 24 mils	22 to 24 mils
Ramp Rate	< 3 °C/sec	
Soak time (150 °C - 217 °C)	Paste dependant; consult paste manufacturer	
Time Above Liquids (TAL) (> 217 °C)	60 sec to 120 sec	
Peak Temperature	235 °C to 250 °C	

Remark :

1. To prevent socket from shifting, please place the socket as the last component in PnP process.

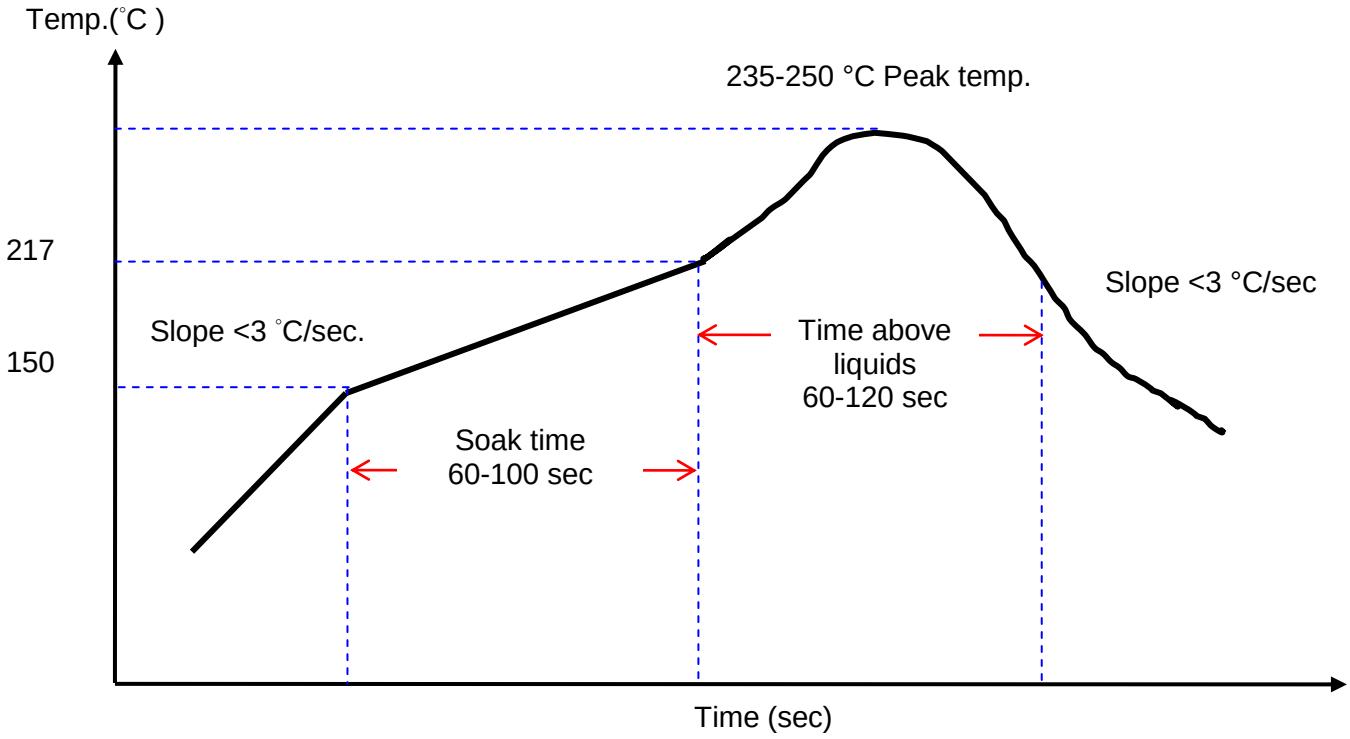
2. Do NOT perform rinsing/wash after SMT process. (Use NO-clean flux only.)

3. Do NOT perform preconditioning process (baking etc) for socket before SMT.

4. Implement N2 purge in the SMT process can reduce the SMT problem.

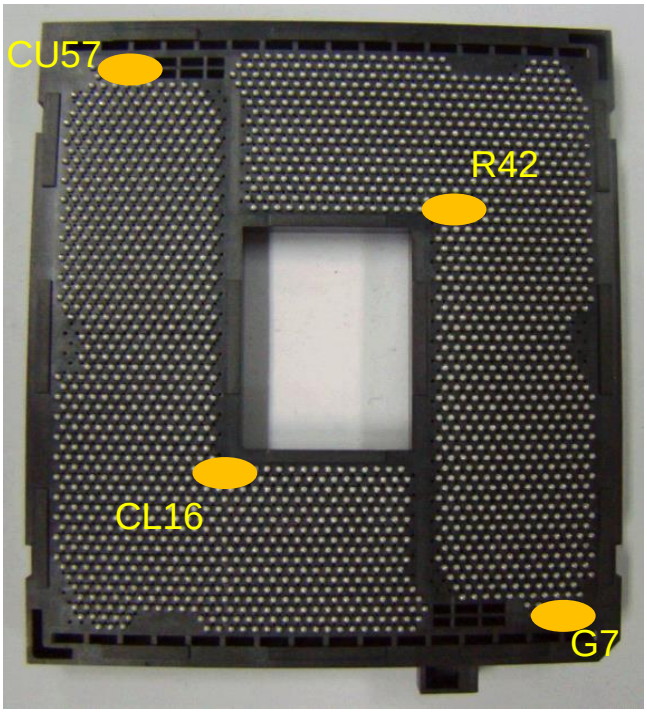
Customer Application(SMT process)

Reference SMT Solder ball temperature profile



Customer Application(SMT process)

Reference SMT Profile Measurement Locations
Recommended SMT profile measurement points at solder ball pad surface, location are recommended as following Fig.



Recommended SMT thermocouple locations

*Note :
(1) Use fully populated board which is the same thermal mass as production board. DO NOT used the thin board w/o any component for tuning profile.
(2) Tune the profile with PnP cover assembled to the socket.
(3) Insert thermocouples into the board. The measurement points are at solder ball pad interface.
(4) Recommended to use Molex socket and PnP cover to check temp.
Recommended inner side location temperature is 235 °C minimum, and the Max temp. difference between thermocouples <10℃.

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Operation Guide

(Socket handling operation)

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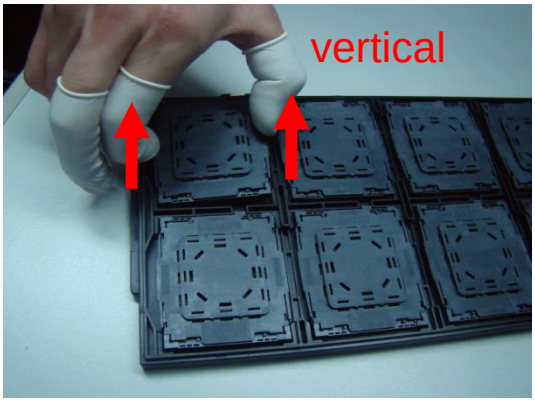
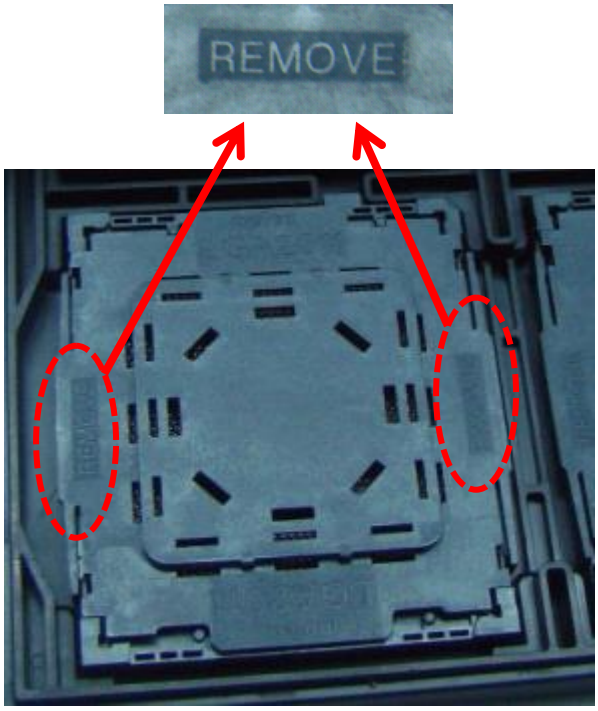
Customer Application (Socket handling operation)

Step 1: Take socket from hard tray for input inspection





Pick up the sockets on the remove latch with two fingers

*** It is not recommended to install or remove the PnP cover before the socket solder to PCB. Don't touch the solder ball.**

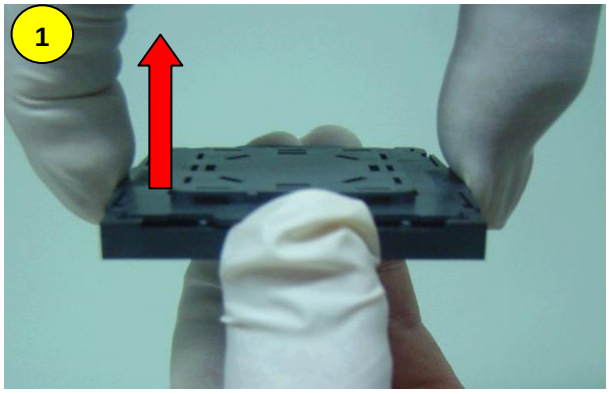
*** Any inspection requires manual handling before SMT (such as IQC I nspection), those socketscan not be put back for production.**

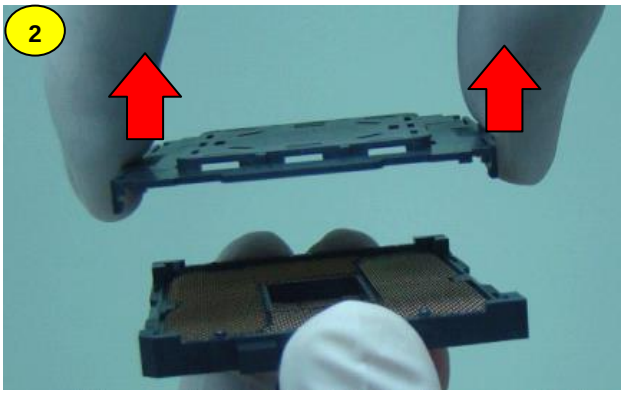
Customer Application (Socket handling operation)

Step 2: PnP cover remove operation Guide

(1) Place the socket and let “molex” logo faces you, and make sure it is in horizontal.

(2) Pull the PnP cover out in vertical.





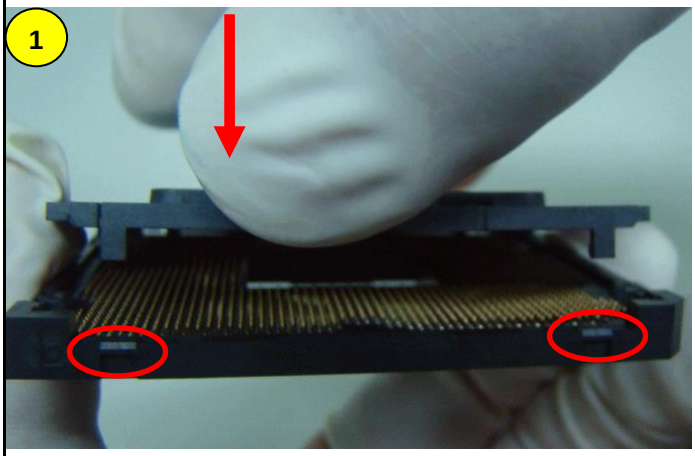
*** It is not recommended to install or remove the PnP cover before the socket solder to PCB. Don’t touch the solder ball.**

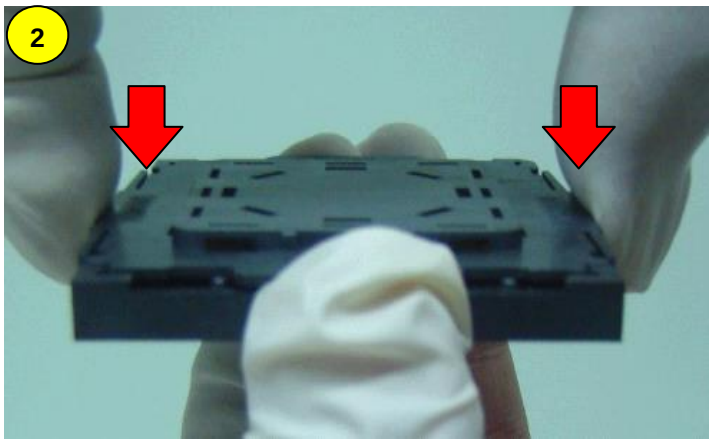
*** Any inspection requires manual handling before SMT (such as IQC inspection), those sockets can not be put back for production.**

Customer Application (Socket handling operation)

Step 3: PnP cover insertion operation Guide

(1) Place the socket and let “molex” logo faces you, and make sure the keys are alignment .
(2) Push the PnP cover from both side to housing.





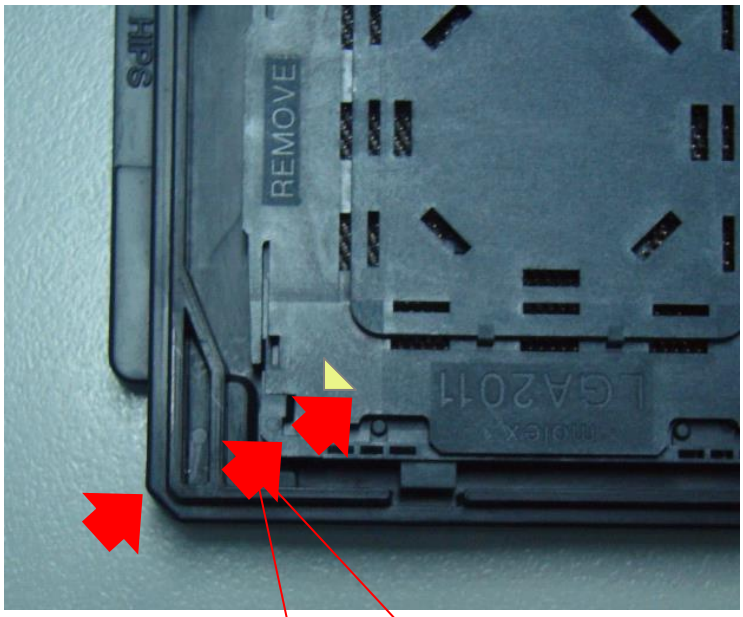
*** It is not recommended to install or remove the PnP cover before the socket solder to PCB. Don’t touch the solder ball.**

*** Any inspection requires manual handling before SMT (such as IQC inspection), those sockets can not be put back for production.**

Customer Application (Socket handling operation)

Step 4: Put socket into hard tray

Put the socket into hard tray. Make sure the direction is right. Take care not to hit the solder ball.



Make sure this mark point to the hard tray's cut corner

*** It is not recommended to install or remove the PnP cover before the socket solder to PCB. Don't touch the solder ball.**

*** Any inspection requires manual handling before SMT (such as IQC inspection), those sockets can not be put back for production.**

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Operation Guide

(Assembly of ILM and Back Plate)

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
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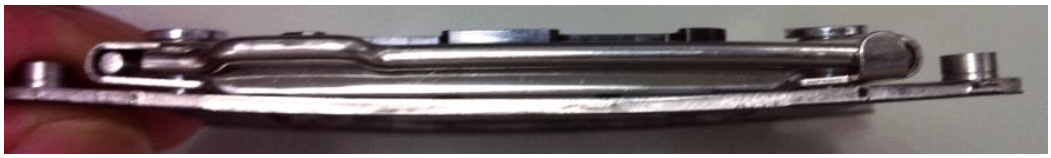
NOTICE !

ILM is closed during shipment to prevent load plate swing and convenient to pack .

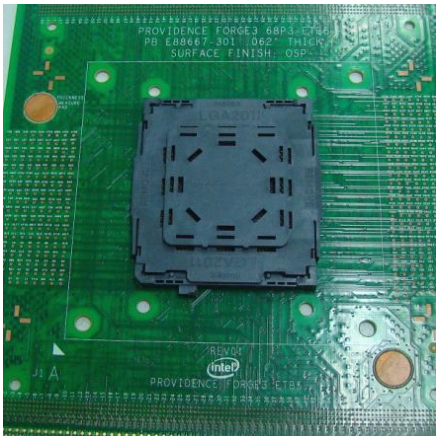


It is normal state for ILM curved when lever is closed. The reason is lever will provide a closing force on load plate and a hook-up force on frame.

Operation Guide (Assembly of ILM and Back Plate)

Step 1: Reflow the Socket on to board

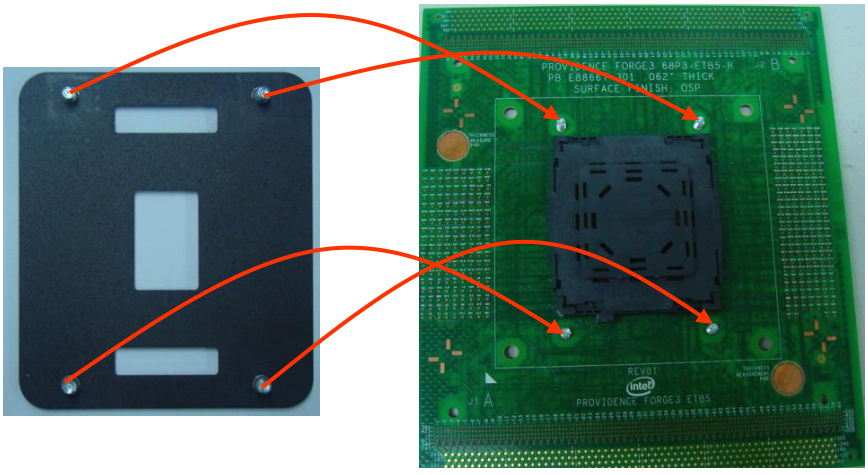
Please refer to SMT Process Section for detailed SMT parameters. Implement SMT process.



Step 2: Assemble Back Plate

(1) Align the nuts on the back plate to the holes on the reverse side of the PCB.

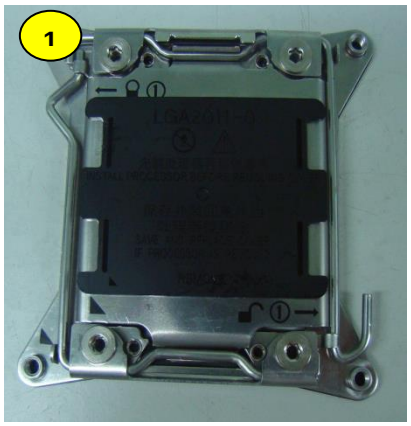
(2) Insert nuts through the PCB holes. The four nuts should automatically fit the 4 PCB holes.

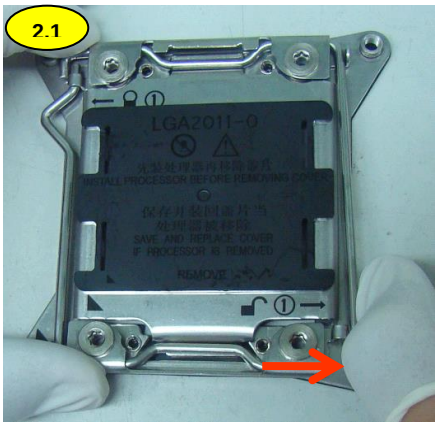


Operation Guide (Assembly of ILM and Back Plate)

Step 3: Open Lever

(1) Place the ILM such that the ILM cover side faces you. Make sure the lever handle is on your top-left side.
(2) As the mark on load plate open the right lever first and then open the left lever .
(3) When loading released ,press down the right lever to Grab load plate and flick it open.
(4) Load plate at loading fully released position.

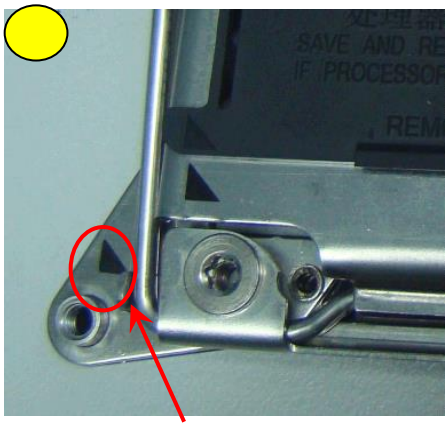




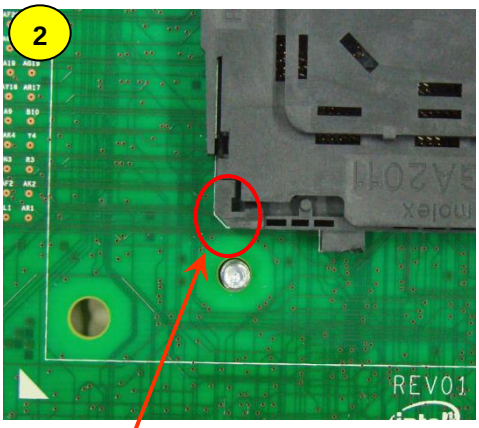
Operation Guide (Assembly of ILM and Back Plate)

Step 4: Locate the ILM on Socket

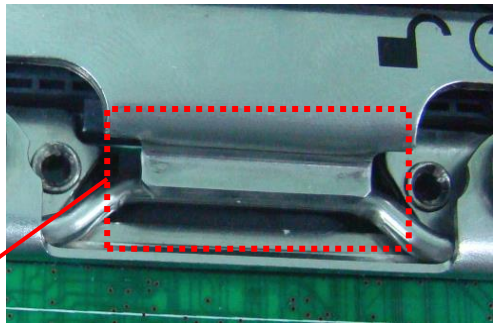
(1) Ensure the pin 1 indicator of ILM is at the left bottom side of ILM.
(2) Ensure the pin 1 indicators of socket are at the left bottom side of socket.
(3) Locate the ILM on socket. The screw holes of ILM should align with screw holes on board.



Pin 1 indicator of ILM



Pin 1 indicators of socket



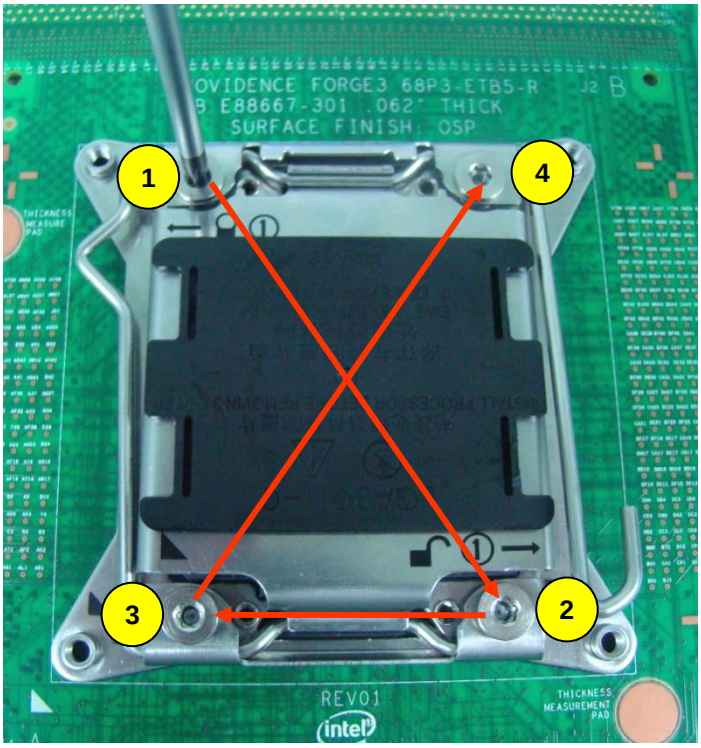
*** Ensure the load plate tab rests over the load lever cam.**

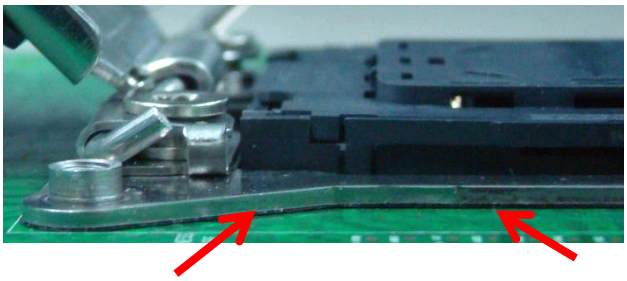
Operation Guide (Assembly of ILM and Back Plate)

Step 5: Screw Mount ILM on to the PCB

Tighten the 4 screws on ILM, screw ordering as below:
Top-left ➔ Bottom-right ➔ Bottom-left ➔ Top-right

1 2 3 4





*** Ensure no gap between ILM Assembly and PCB**

Pre-tighten screws first then use 8-10 in-lbs torque tighten.
*** Drive type: 6 point T-20 drive feature 2.1mm ±0.25**

Operation Guide (Assembly of ILM and BP)

Step 6: Pick up the PnP cover

(1) Press down the right lever to grab load plate and flick it open

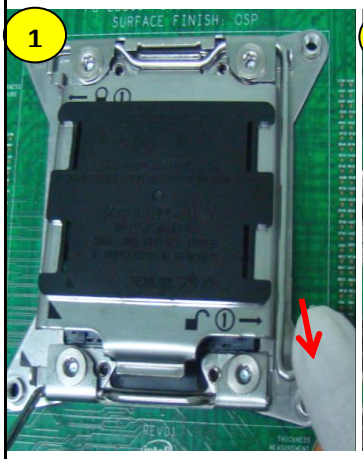
(2) Align tool tips with PnP cover removal features on left and right sides, and centered top and bottom sides of the PnP cover . Push down gently until the tool tips engage with the PnP cover

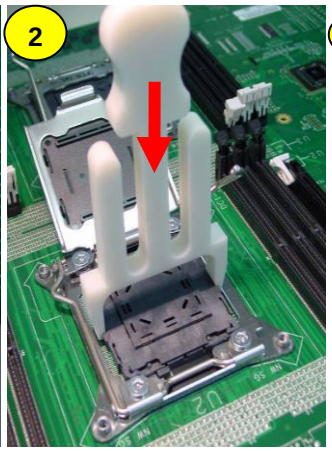
(3) Remove PnP cover from the Socket

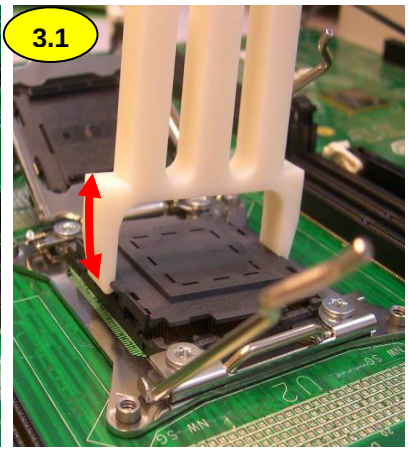
(3.1). Tilt tool slightly to unlatch one side of the PnP cover (lift PnP cover side 1-2 mm only)

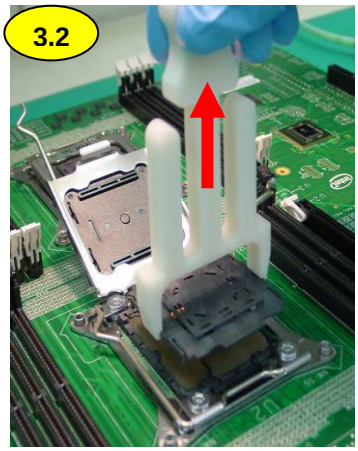
(3.2). Grip tool and lift PnP cover vertically away from the socket

(4) Save PnP cap, for potential future use.







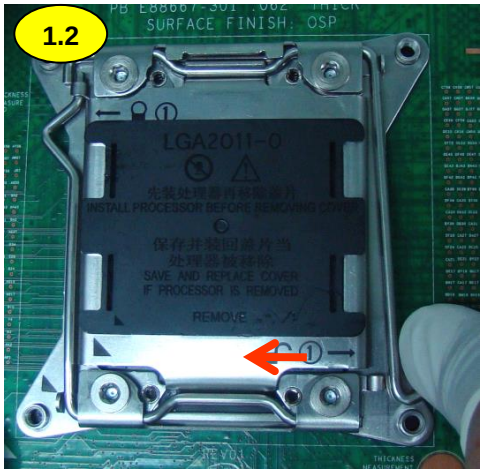


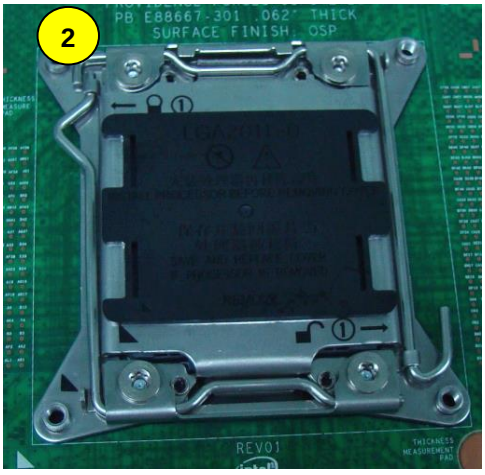
Operation Guide (Assembly of ILM and BP)

Step 7: Close the ILM

(1) As the load plate mark, close the left lever first and then close the right lever ,

(2) ILM fully closed position





molex®

ENGINEERING SPECIFICATION

Operation Guide

(Package Insertion)

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
D	EC No: **111901** DATE: **2016 / 12 / 28**	**LGA 2011 SOCKET-R Application Specification**	**34** of **48**

DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
AS-105142-001	**DBFAN**	**JKACHLIC**	**JKACHLIC**

Operation Guide (package insertion)

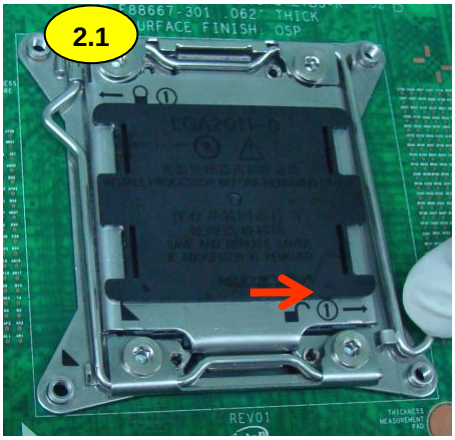
Step 1: Open the load plate.

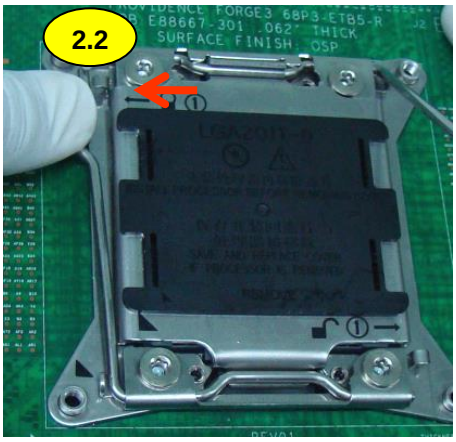
(1). Place the ILM such that the ILM cover side faces you. Make sure the lever handle is on your top-left side.

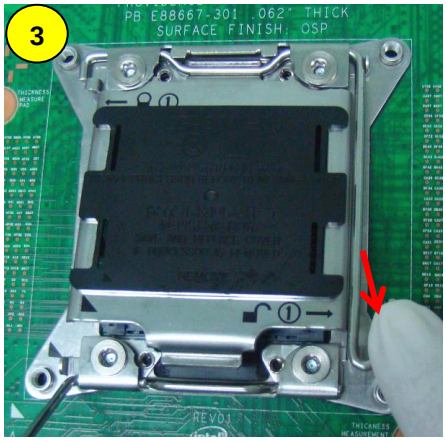
(2). As the load plate mark, open the right lever first and then open the left lever.

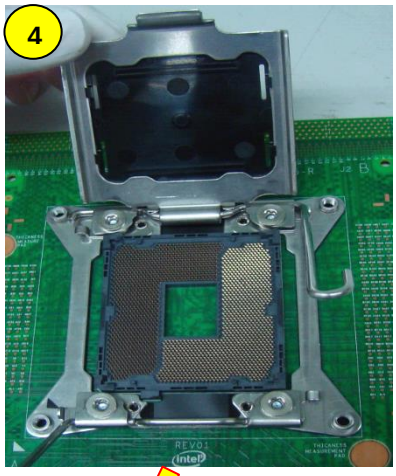
(3). When loading released ,press down the right lever to grab load plate and flick it open.

(4). Load plate at fully opened position.





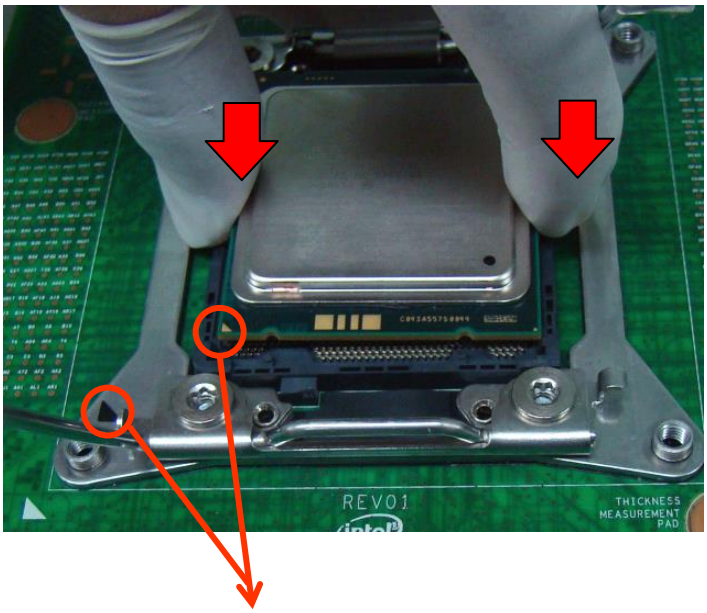




WARNING: High risk of bent pins, don't touch terminal side
Install Processor Before Removing Cover.

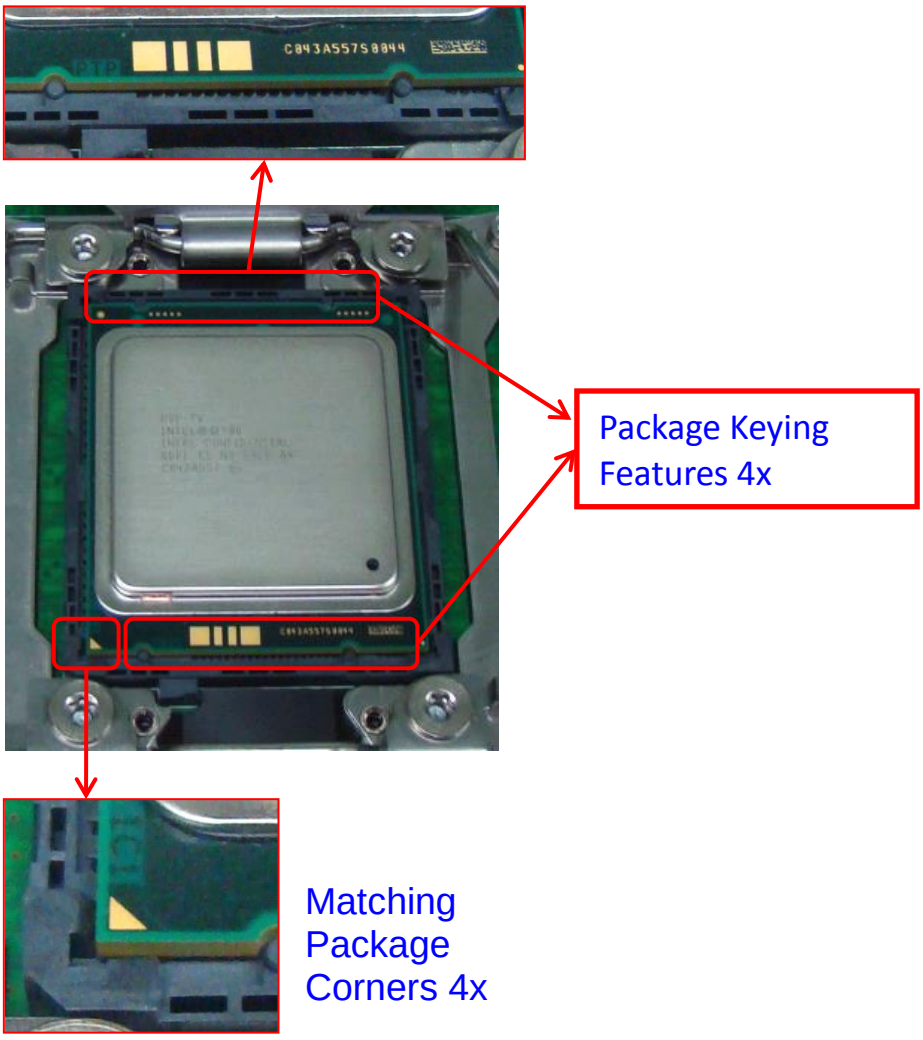
Operation Guide (package insertion)

Step 2: Install the package.



Pin 1

Make sure install the package in vertical


Package Keying Features 4x
Matching Package Corners 4x

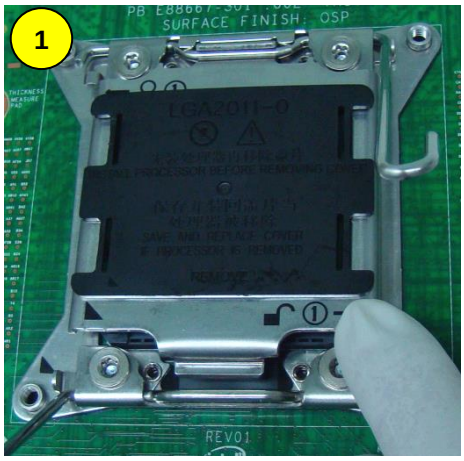
peration Guide (package insertion)

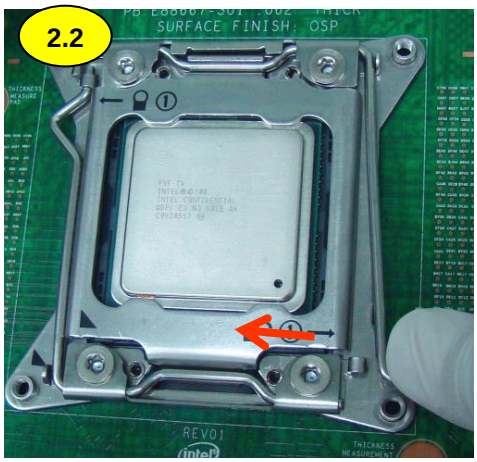
Step 3.Close the ILM.

(1). Close the load plate gently.

(2). As the load plate mark, close the left lever first and then close the right lever.

(3). Closed ILM with package position.





*** Close the lever will flick off the ILM cover**

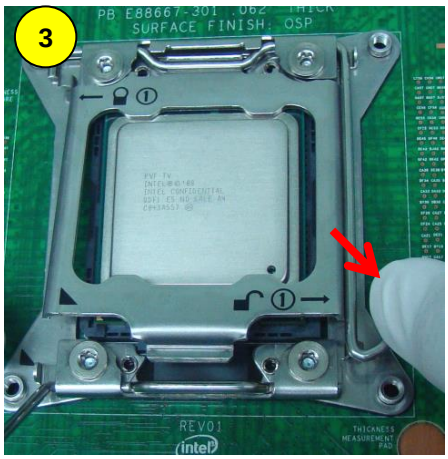
Operation Guide (Package Removal)

Step 1: Open the Lever and Load Plate

(1). Place the ILM such that the ILM cover side faces you. Make sure the lever handle is on your top-left side.

(2). As the load plate mark, open the right lever first and then open the left lever .

(3). When loading released ,press down the right lever to grab load plate and flick it open



Disengage the lever slowly with one hand while holding the load plate with other hand (finger)

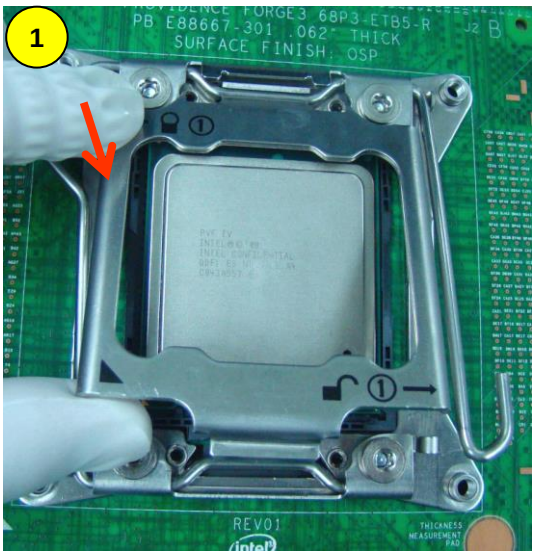
DO NOT release the lever abruptly ,it may cause package ejection , damage terminal and hurt operators.

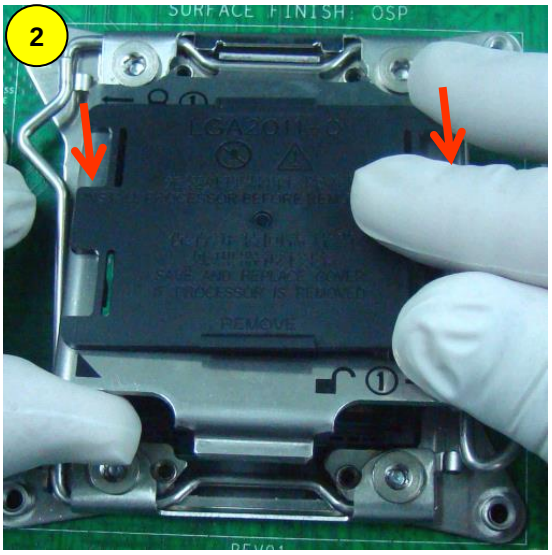
Operation Guide (Package Removal)

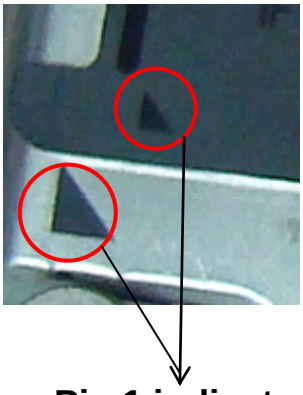
Step 2: ILM cover Closed

(1) Hold the load plate with fingers.

(2) Carefully engage the ILM cover ,make sure the pin 1 indicators are matched.







Pin 1 indicators

*** Save and Replace Cover if Package is Removed**

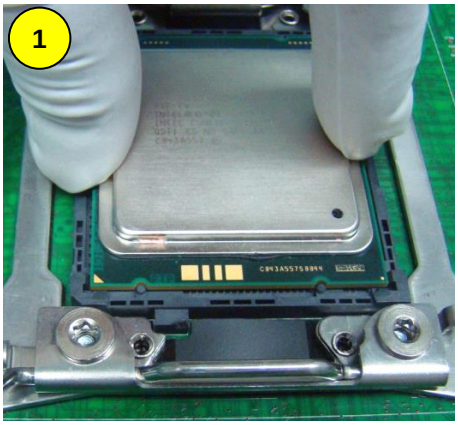
Operation Guide (Package Removal)

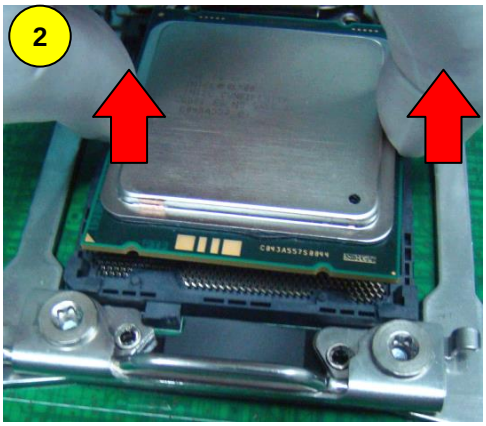
Step 3: Package Removal

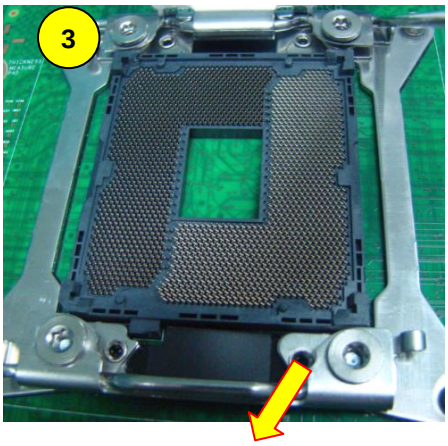
(1) Hold the package on the core out side, please make sure hold the package on the edges of the substrate.

(2) Carefully lift up the package with only vertical motion.

(3) After removing the package, the socket should appear.







WARNING:High risk of bent pins, don't touch terminal side

Save and Replace Cover if Processor is Removed

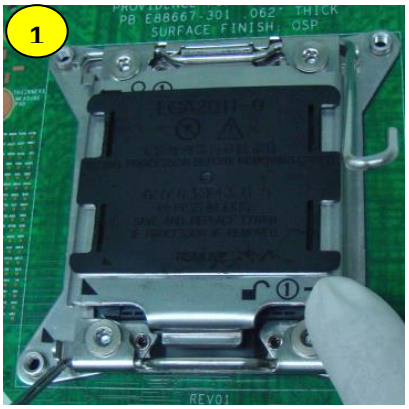
Operation Guide (Package Removal)

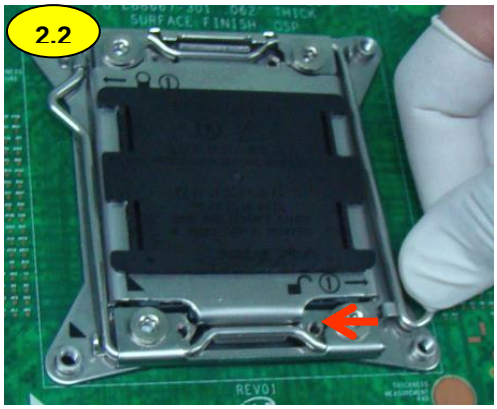
Step 4: Close The ILM

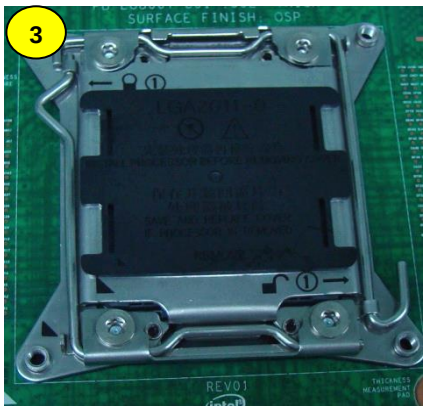
(1) Close the load plate gently.

(2) As the load plate mark, close the left lever first and then close the right lever.

(3) ILM at fully closed position







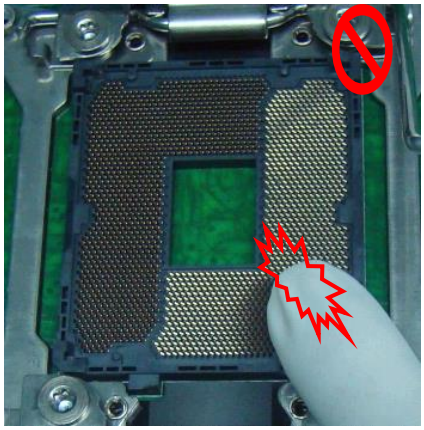
*** Save and Replace Cover if Processor is Removed**

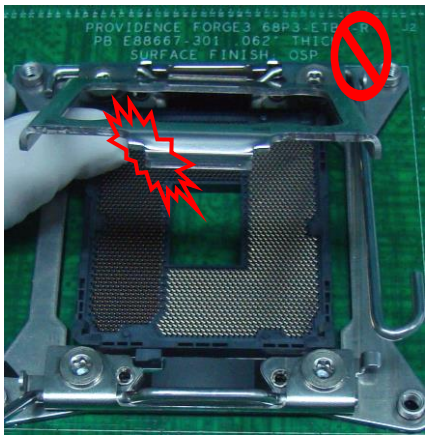
Terminal Damage Prevention

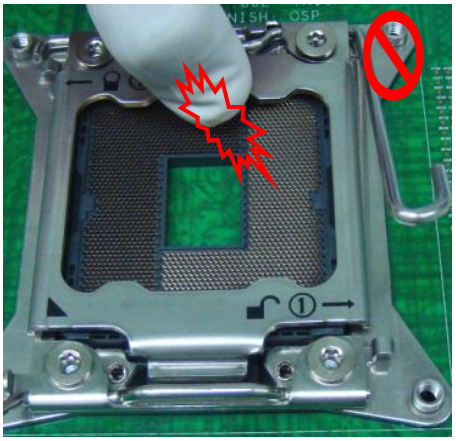
Terminal Damage Prevention

Terminal damage could be caused by incorrect operations:

1. When the load plate is in the open position ,following operations are not allowed.

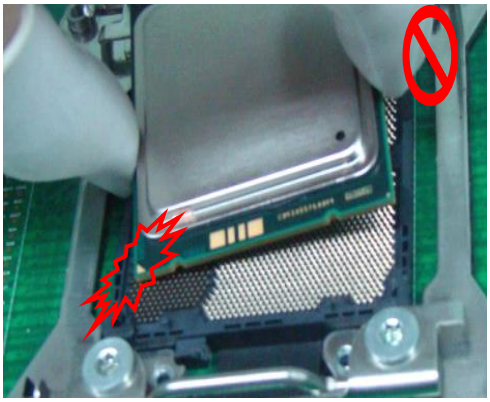


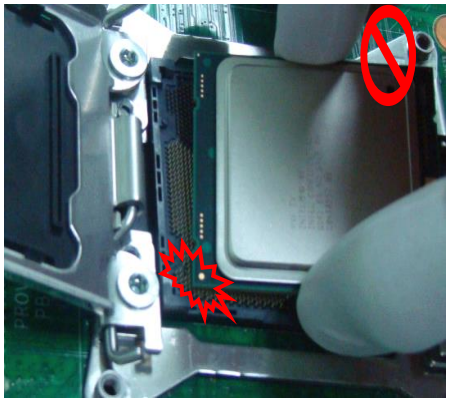


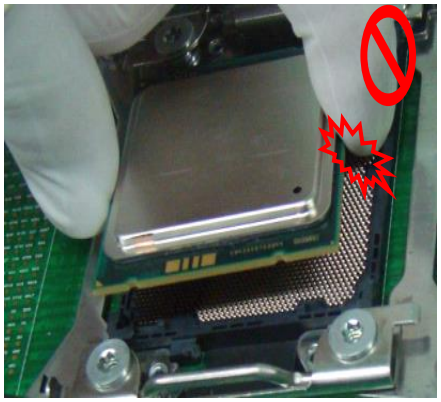


* Don't touch the terminal side when assembled, inspection.ect. Save and replace the ILM cover when Package removed.

2. When inserting / removing package, following operations are not allowed



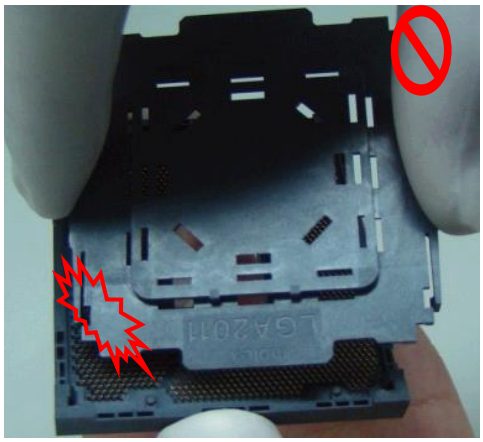


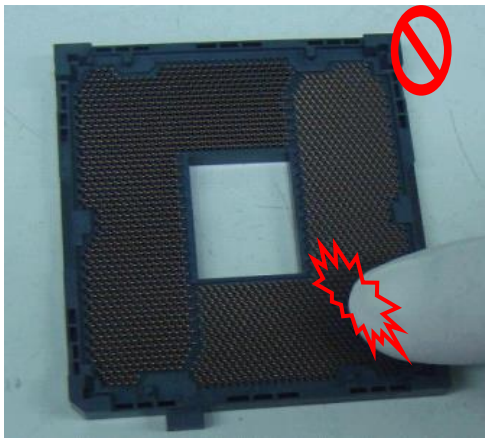


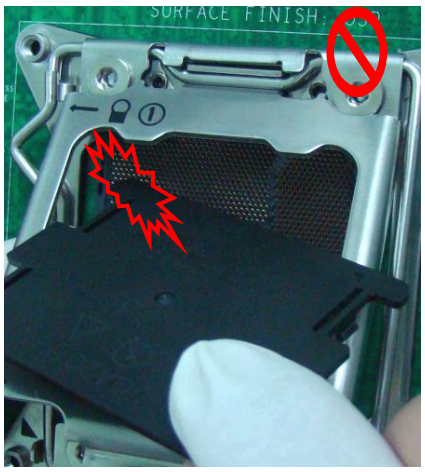
* Use vertical motion only during package insertion / removal.

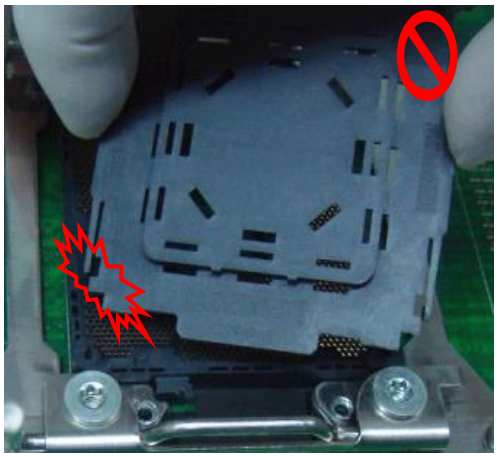
Terminal Damage Prevention

3. Open or re-engage the PnP cover and ILM cover following operations are not allowed.



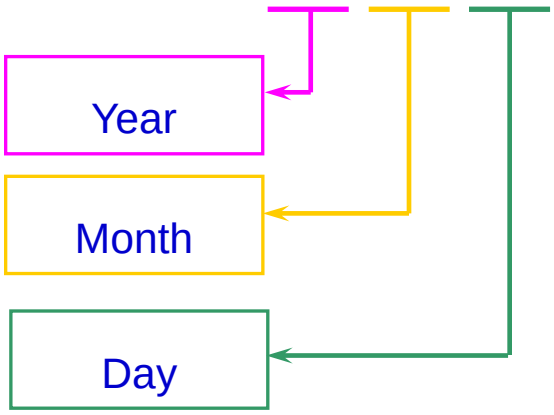






Appendix

Date Code of Socket R and ILM



Year	Y-code	Month	M-code	Day	D-code
2001	1	1	1	1	1
2002	2	2	2	2	2
2003	3	3	3	3	3
2004	4	4	4	4	4
2005	5	5	5	5	5
2006	6	6	6	6	6
2007	7	7	7	7	7
2008	8	8	8	8	8
2009	9	9	9	9	9
2010	A	10	A	10	A
2011	B	11	B	11	B
2012	C	12	C	12	C
2013	D			13	D
2014	E			14	E
2015	F			15	F
2016	G			16	G
2017	H			17	H
2018	J			18	J
2019	K			19	K
2020	L			20	L
No use "I,O,V,X"				21	M
				22	N
				23	P
				24	Q
				25	R
				26	S
				27	T
				28	U
				29	W
				30	Y
				31	Z

Shelf Life

1) Sockets in unopened vacuum sealed bags – 2 years from date received.

2) Sockets in resealed bags – 6 months* (see Molex instructions for repackaging requirements)
    - Re-sealing does not extend the socket's shelf life beyond their original expiration date, resealed product should be consumed prior to opening any additional packages.

Repackaging

1) Put remaining sockets into their hard trays and place into a waterproof bag.
2) Vacuum seal the bag with a desiccant or moisture sensitive label inside.
    - Maintain the resealed package under the following conditions:
        Humidity: <60%
        Temperature: 22-50°C

Before unpacking (W/ Vacuum Packaging)
Shelf Life: 2 years