MITSUBISHI ELECTRIC CORPORATION

Technical Note.										
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	DATE	'08-4/28								

Recommended assembling method and general notes for MGF4941AL

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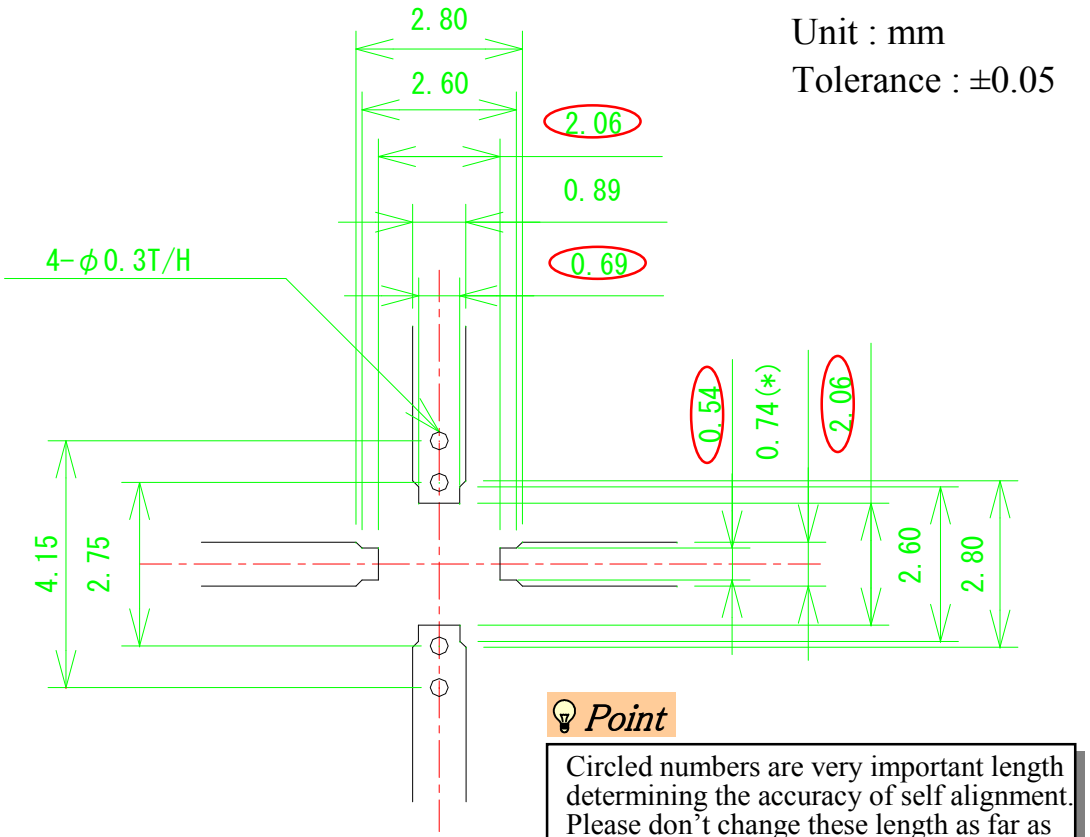
1. Recommended foot pattern



Unit : mm
Tolerance : ±0.05

Point

Circled numbers are very important length determining the accuracy of self alignment. Please don't change these length as far as circumstances permit.

(*) This dimension could be changed by following conditions.
a. characteristic impedance
b. substrate characteristics (material,thickness,and so on)
0.74mm is the width of 50-ohm micro strip line for teflon (εr=2.2,t=0.254mm) substrate.

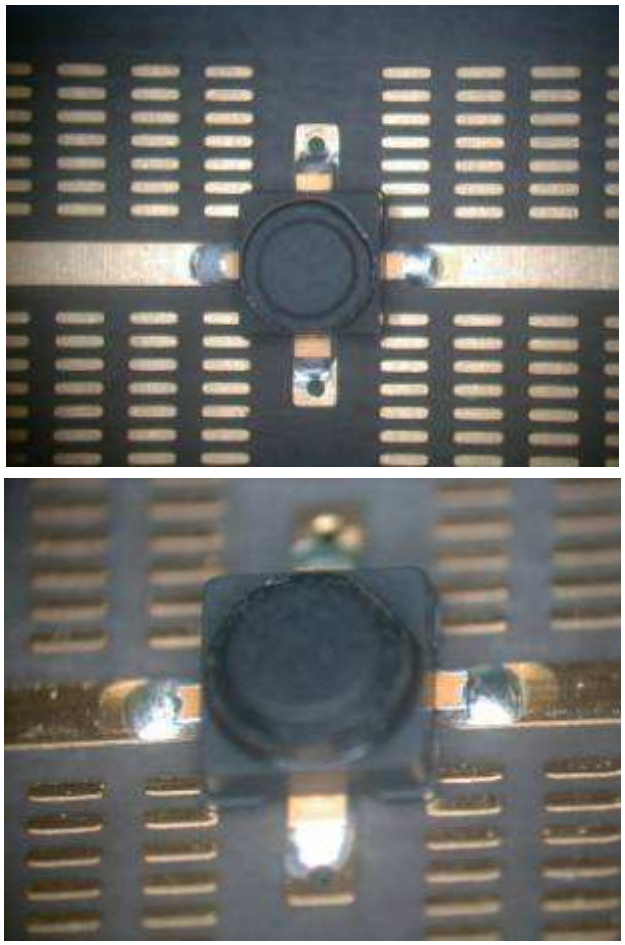


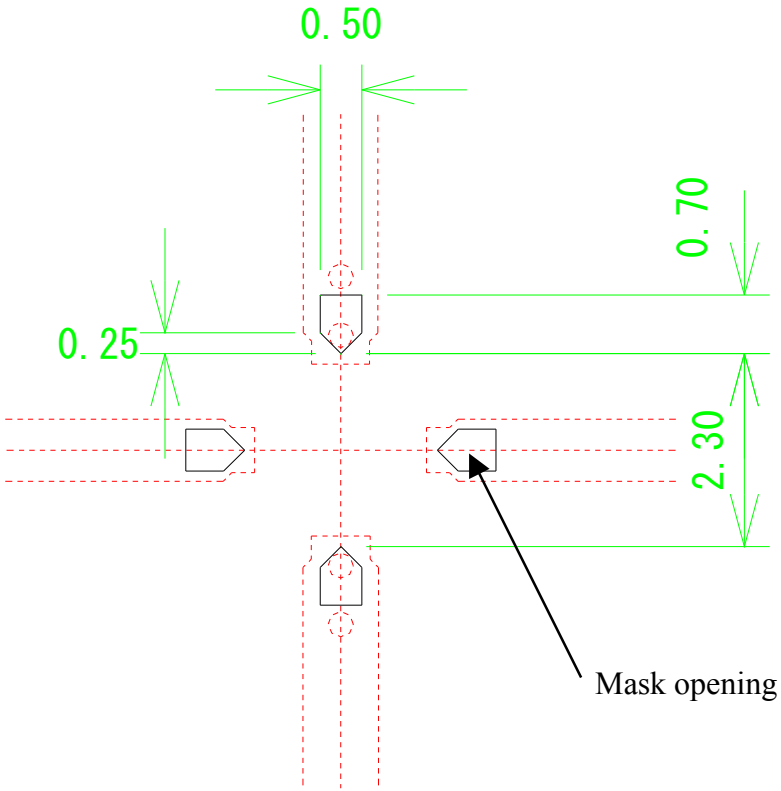
Fig.1 After reflow in case of the recommended foot pattern

It shows good accuracy of position and good solderability.

2. Recommended Metal Mask pattern

Metal Mask Thickness = 0.15mm

Unit : mm
Tolerance : ±0.05



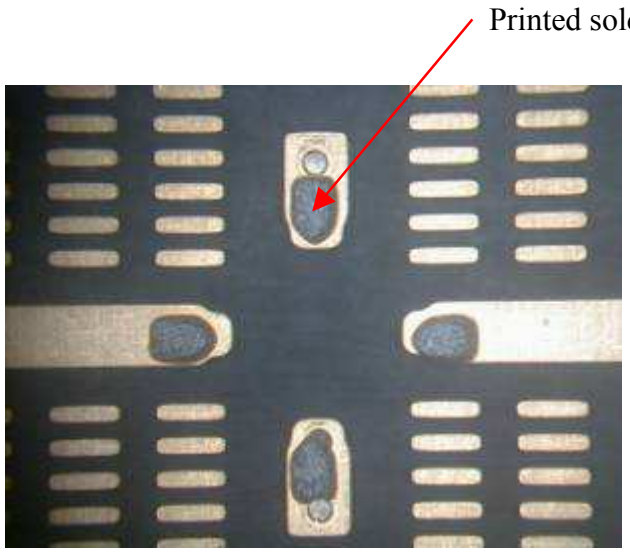


Fig.2 After solder printing

3. Recommended soldering methods and general notes

3-1) General Notes

Adding high temperature to MGF4941AL can cause deformation of the package outline or degradation of the electric characteristics. Please follow the recommended soldering methods below.

Although we have made sure there aren't any problems with these soldering conditions, please evaluate preliminary yourself with your own condition.

Table 1; Recommended soldering methods

Soldering methods	Judge	Recommended condition	Remarks
IR reflow soldering	◎	Pre-heat : 160-190degC/110sec, Main-heat : Max 260degC, x3 times max	See 3-2)
Wave soldering	×	*We don't recommend any wave soldering methods !*	
By hot-gun	△	Cap Temp.: Max 450degC (recommend under 380degC), Time period: Max 5sec	
By soldering iron	○	Lead terminal Temp.: Max 380degC, Time period: Max 3sec/lead Note) Do not touch the package head with a soldering iron !	See 3-3)

Point

-We strongly recommend the IR reflow soldering method as far as circumstances permit.
-Please keep under 260degC at the surface of the package in case of any soldering methods, otherwise the quality or reliability of the device would be damaged.
-Please proceed as quickly as possible while high temperature is added to the device, otherwise it could be likely to have an adverse impact on the reliability of the device.

3-2) Recommended IR reflow soldering (Lead free Solder) condition

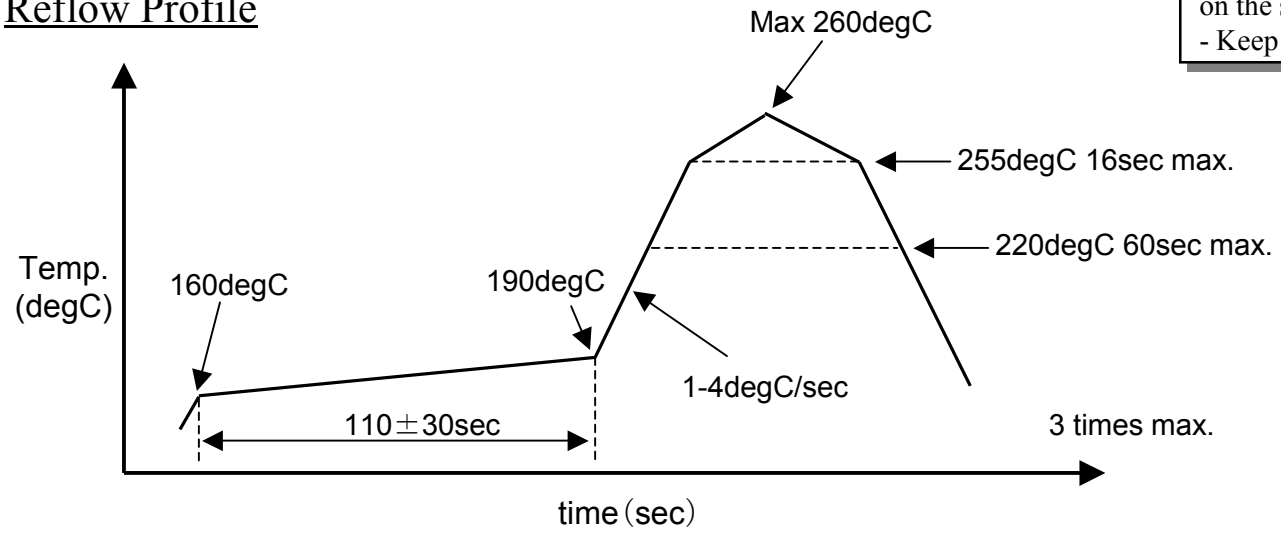
Recommended Solder type

-. Alloy : Sn-Ag-Cu series
-. Content of Halide in flux : Under 0.1wt%

Point

- Number of reflow : 3 times max
- content of Halide in flux : under 0.1wt%
- indicated temperature means the temperature on the surface of package.
- Keep under 260degC

Reflow Profile



Caution !

**** Do not heat the device over 260degC, otherwise the device could be degraded.***

****Please proceed as quickly as possible while high temperature is added to the device, otherwise it could be likely to have an adverse impact on the reliability of the device.***

3-3) Recommended soldering condition in case of using a soldering iron

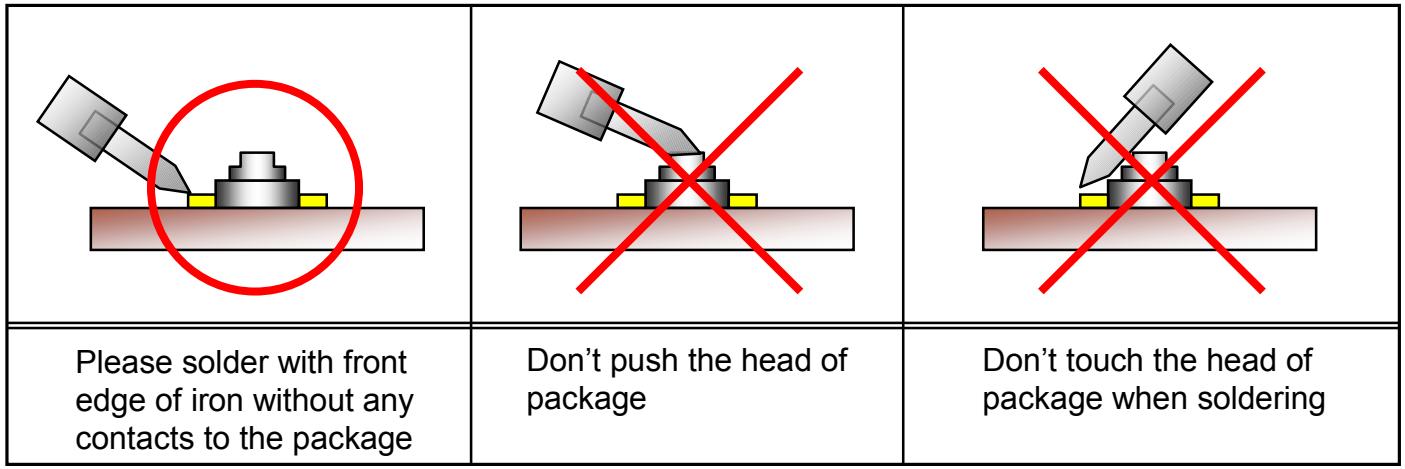
Condition

Temperature at a lead terminal : under 380degC / lead
Heating time period : 3sec max / lead
Content of Halide in solder flux : under 0.1wt%

Point

-Please solder in the shortest possible time.
-Please connect the front edge of soldering iron to the ground.
-Please make sure that operators put earth bands on.

How to use a soldering iron



Please solder with front edge of iron without any contacts to the package	Don't push the head of package	Don't touch the head of package when soldering

Caution !

** Do not push or touch the head of package with front edge of soldering iron, otherwise the package outline could be deformed.*

**Please connect the front edge of soldering iron to the ground and make sure that operators are connected to the ground to protect the devices from ESD.*

4. Recommended storage condition

It is very important for maintaining quality and performances of a devise to manage safekeeping condition and to meet storage limitation.
Mold package is applied for MGF4941AL, which may absorb moisture depending on storage conditions. In the case of applying reflow soldering to the package with absorption , moisture would expand and might cause breaking up adhesions between lead frame and mold resin or might cause a package crack.
Please keep the recommended storage condition shown as below, after opening moisture-proof container.

Item	Recommended condition	Remark
Storage temperature after opening	< 40 degC	
Storage humidity after opening	< 80%	
Storage limitation after opening	< 12 months	

5. Recommended rework process

5-1) Hot plate

We recommend the following soldering rework method if needed.

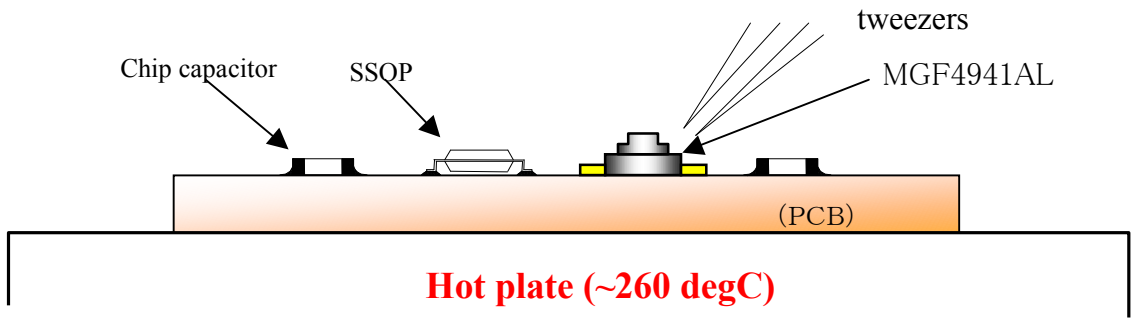


Fig.5 : Hot plate

Soldering rework method with Hot plate

1. Set a PCB on the hot plate shown as fig. 5 and keep the temperature of PCB surface under 260 degC.
2. Remove the target device and solder from the PCB, and apply new soldering paste to the electrode where the device used to be.
3. Set a new device on the soldered electrode of the PCB with tweezers or something.
4. Set and heat the PCB with new device on the hot plate indicated in the procedure 1.
5. Put off the PCB from the hot plate within 10 seconds after melting solder.

(Please reconfirm the time to melt the soldering yourselves because it's depended on the thickness of the PCB.)

Attention

1. Please put on a wrist wrap in order to protect the other devices from ESD.
2. Mitsubishi does NOT recommended, also NOT guarantee to use the removed device.

Point

DO NOT push the cap while heating, otherwise it may cause breaking up or deformation of the cap.

5-2) Hot gun

We recommend the following soldering rework method if needed.

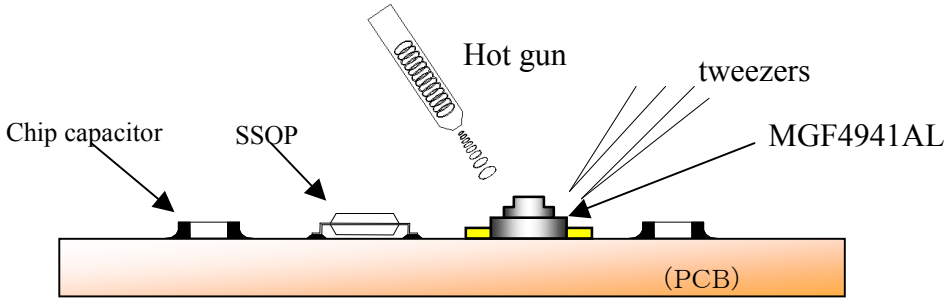


Fig.6 : Hot gun nozzle
(diameter of front edge : about 3mm)

Soldering rework method with Hot gun

1. Remove the target device and solder from the PCB, and apply new soldering paste to the electrode where the device used to be.
2. Prepare spot heater such as hot gun with slim front edge nozzle shown as Fig.6 (narrower is better) and find the condition (temperature, air volume, air angle, and so on) to keep the temperature of package surface under 380 degC. (max. 450 degC)
3. Apply a front edge of hot gun to the lead of a new device and melt the solder.
4. Finish the rework within 5 seconds while the surface temperature of package is kept under 380 degC.

Attention

1. Please be careful so that other adjacent components does not receive any thermal or mechanical influences.
   Especially in the case of using hot gun with strong air blow, the adjacent component might be flied apart.
2. Please put on a wrist wrap in order to protect the other devices from ESD.
3. Mitsubishi does NOT recommended, also NOT guarantee to use the removed device.

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Rev.	Change Record	Drawn	Date
*	Newly prepared based on CSTG-11525	T. Ishida	'08-4/28