Recommended assembling method and general notes
for plastic μ-X package GaAs FET

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1. Outline Drawing

Micro-X type plastic packaged device (MGF4941AL/CL, MGF4941AL/CL, MGF4964BL/63BL) : GD-32

Unit : mm

Top

Bottom

Side

① Gate
② Source
③ Drain
### 2. Marking Manner

#### Top View

Electrodes direction:
1. Gate
2. Source
3. Drain

#### Type

<table>
<thead>
<tr>
<th>Letter</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>MGF4941AL</td>
</tr>
<tr>
<td>B</td>
<td>MGF4963BL</td>
</tr>
<tr>
<td>E</td>
<td>MGF4941CL-01</td>
</tr>
<tr>
<td>H</td>
<td>MGF4964BL</td>
</tr>
<tr>
<td>J</td>
<td>MGF1941AL</td>
</tr>
<tr>
<td>P</td>
<td>MGF4841CL-01</td>
</tr>
<tr>
<td>T</td>
<td>MGF4841AL</td>
</tr>
</tbody>
</table>

#### The production year and month

Production year and month are indicated using numbers and alphabet. Right side character rounds once 4 years.
3. Recommended Metal Mask Pattern

Metal Mask Thickness = 0.15mm
Unit: mm
Tolerance: ±0.05

Fig.1 After solder printing

Printed solder

Fig.2 After reflow in case of the recommended foot pattern
It shows good accuracy of position and good solderability.

Remark
Please refer to the application note for recommended foot pattern of each type number.
4-1) General Notes

Adding high temperature to plastic μ−x package GaAs FET 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

<table>
<thead>
<tr>
<th>Soldering methods</th>
<th>Judge</th>
<th>Recommended condition</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>IR reflow soldering</td>
<td>✔</td>
<td>Pre-heat: 160-190degC/110sec, Main-heat: Max 260degC, x3 times max</td>
<td>See 3-2)</td>
</tr>
<tr>
<td>Wave soldering</td>
<td>✗</td>
<td></td>
<td></td>
</tr>
<tr>
<td>By hot-gun</td>
<td>△</td>
<td>Cap Temp.: Max 450degC (recommend under 380degC), Time period: Max 5sec</td>
<td></td>
</tr>
<tr>
<td>By soldering iron</td>
<td>✗</td>
<td>Lead terminal Temp.: Max 380degC, Time period: Max 3sec/lead Note) Do not touch the package head with a soldering iron !</td>
<td>See 3-3)</td>
</tr>
</tbody>
</table>

**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.
4. Recommended soldering methods and general notes

4-2) Recommended IR reflow soldering (Lead free Solder) condition

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

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.
4. Recommended soldering methods and general notes

4-3) 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%

- 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**

<table>
<thead>
<tr>
<th>Please solder with front edge of iron without any contacts to the package</th>
<th>Don’t push a lead terminal without back supports</th>
<th>Don’t push the head of package</th>
<th>Don’t touch the head of package when soldering</th>
</tr>
</thead>
</table>

**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.
5. **Recommended storage condition**

It is very important for maintaining quality and performances of a devise to manage safekeeping condition and to meet storage limitation. Plastic package 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.

<table>
<thead>
<tr>
<th>Item</th>
<th>Recommended condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage temperature after opening</td>
<td>&lt; 40 deg.C</td>
</tr>
<tr>
<td>Storage humidity after opening</td>
<td>&lt; 80%RH</td>
</tr>
<tr>
<td>Storage limitation after opening</td>
<td>&lt; 12 months</td>
</tr>
</tbody>
</table>
6. Recommended Rework Process

Hot plate

We recommend the following soldering rework method if needed.

![Diagram of Hot plate](image)

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.
3. Apply new soldering paste to the electrode and 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. **Do not use Hot gun for reworking.**
   
   There is a risk that solder can enter in the package and make the device performance worse.
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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**Point**

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

These conditions which is shown on this technical note is not guaranteed condition, but our recommended conditions.

Please confirm the assembly conditions at customer side before using our device.