

RECOMMENDED SOLDERING CONDITIONS & STORAGE CONDITIONS

CAUTION

1. This document shows the referential examples of recommended soldering conditions and storage condition of the DRAM products provided by Elpida Memory, Inc. Since examples of conditions that appear in this document are strictly illustrative, and does not indicate individual conditions. In the case of purchase, please confirm individual specification to Elpida sales office.
2. This recommended profile is based on the heat resistance of the parts, so it does not necessarily assure the mounting reliability. Please set the appropriate profile fits your substrate and solder paste in order to assure the mounting reliability.
3. For baking components, it is necessary to use heat-proof type container. Plastic magazines, emboss tape/reels and some of trays are not heat-proof type, so if the packing container is not heat-proof type, please transfer them to a heat-proof type container.
4. When devices are stored in a moisture-proof pack, place a desiccant that has not absorbed yet (the indicator card is blue) in the pack. Then seal it with, for example, tape. If more than seven days or a longer period has elapsed after unpacking, bake the device in the same way as described above. (Preferably, bake only the device to be used.)

1. Recommended Soldering Conditions (referential example)

The following is recommended soldering conditions of infrared reflow (including convection, infrared / convection).

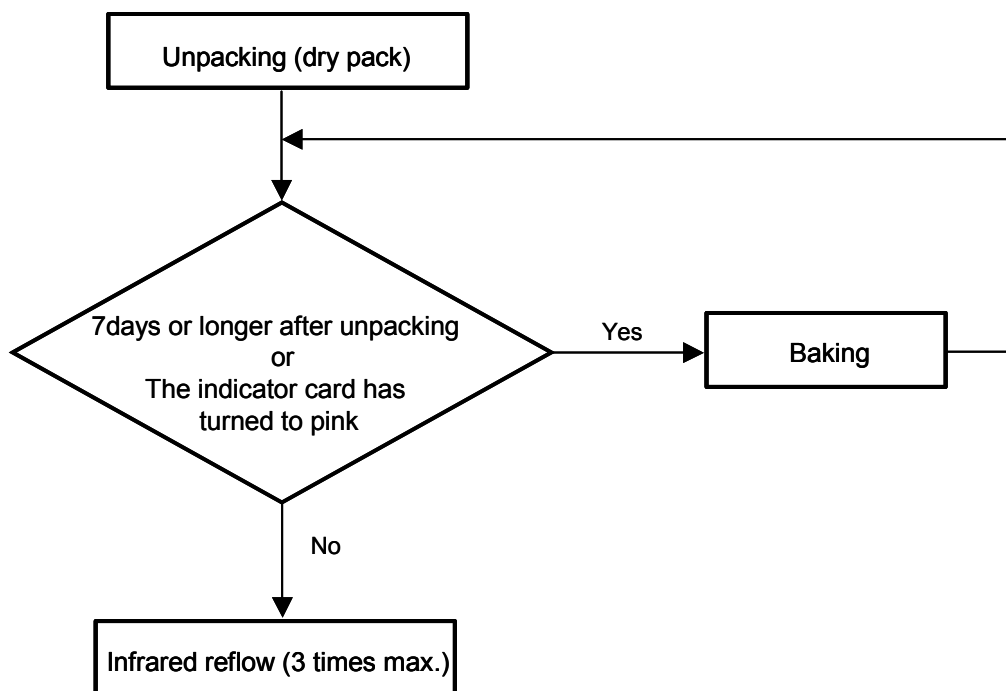


Figure 1-1 Soldering Flow Chart (referential example)

Table 1-1 Recommended Soldering Conditions (referential example)

Items	Lead-free solder	Conventional solder
Maximum temperature (Package's surface temperature)	260°C max.	235°C max.
Preheating rate	1 to 5°C/s	
Preheating temperature	150 to 180°C	100 to 160°C
Preheating time	60 to 120s	60 to 120s
Reflow heating rate	1 to 4°C/s	1 to 4°C/s
Reflow temperature	230°C min.	210°C min.
Reflow temperature hold time	30 to 50s	30s max.
Maximum number of reflow processes	3 times max.	
Maximum chlorine content of rosin flux	0.2% (wt.) max	

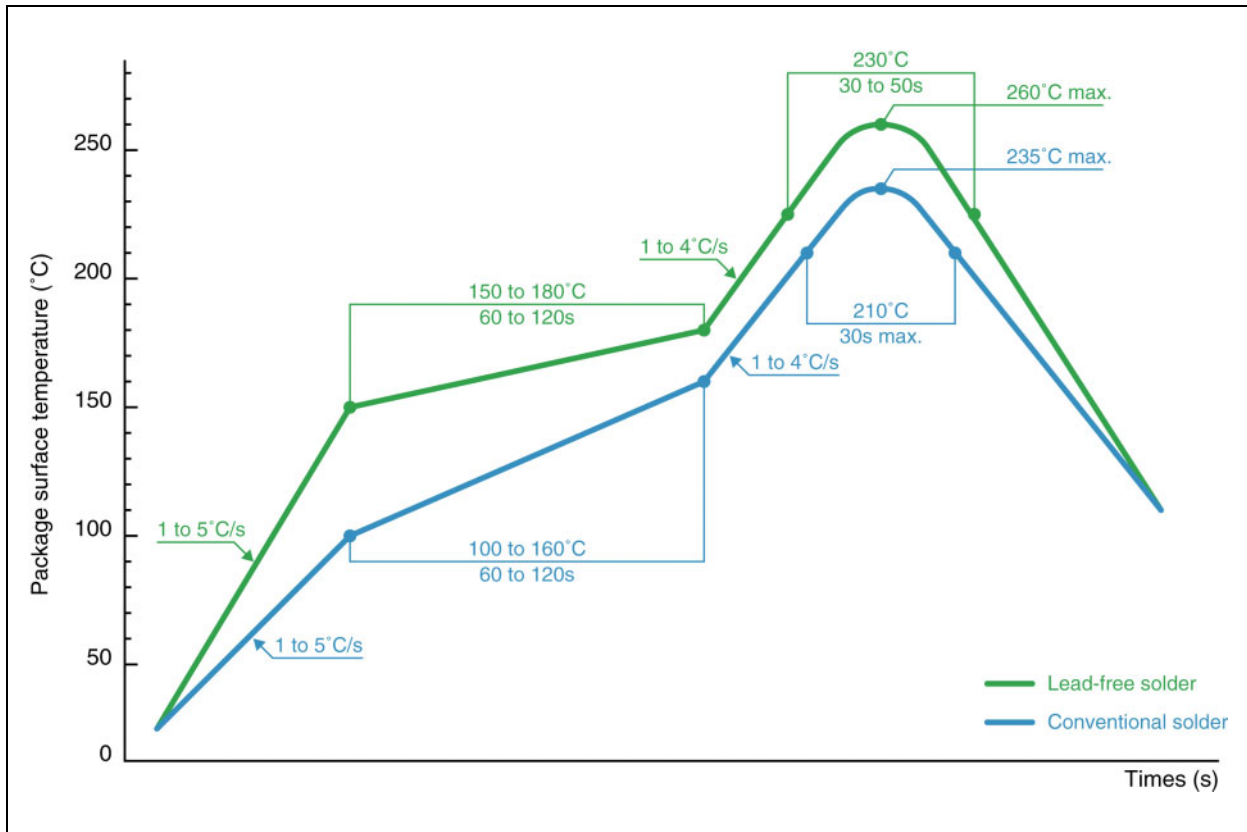


Figure 1-2 Recommended reflow heating profile (referential example)

2. Storage Conditions (referential example)

After the aluminum dry pack has been opened, please store under the conditions shown in Table 2-1 until the final reflow process starts.

When a storage restriction period is passed, please bake under the conditions shown in Table 2-2.

Table 2-1 Recommended Storage Conditions (referential example)

Items	Conditions
Temperature	5°C to 30°C
Humidity	60% (RH) max.
Exposure limit (Store until the final reflow process starts)	7days (168h) or less

Table 2-2 Recommended Baking Conditions (referential example)

Items	Conditions
Baking temperature	125°C
Baking time	10 to 24h (within cumulative 72h)

The information in this document is current as February, 2008. The information is subject to change without notice.

— NOTES FOR CMOS DEVICES —

① **PRECAUTION AGAINST ESD FOR MOS DEVICES**

Exposing the MOS devices to a strong electric field can cause destruction of the gate oxide and ultimately degrade the MOS devices operation. Steps must be taken to stop generation of static electricity as much as possible, and quickly dissipate it, when once it has occurred. Environmental control must be adequate. When it is dry, humidifier should be used. It is recommended to avoid using insulators that easily build static electricity. MOS devices must be stored and transported in an anti-static container, static shielding bag or conductive material. All test and measurement tools including work bench and floor should be grounded. The operator should be grounded using wrist strap. MOS devices must not be touched with bare hands. Similar precautions need to be taken for PW boards with semiconductor MOS devices on it.

② **HANDLING OF UNUSED INPUT PINS FOR CMOS DEVICES**

No connection for CMOS devices input pins can be a cause of malfunction. If no connection is provided to the input pins, it is possible that an internal input level may be generated due to noise, etc., hence causing malfunction. CMOS devices behave differently than Bipolar or NMOS devices. Input levels of CMOS devices must be fixed high or low by using a pull-up or pull-down circuitry. Each unused pin should be connected to V_{DD} or GND with a resistor, if it is considered to have a possibility of being an output pin. The unused pins must be handled in accordance with the related specifications.

③ **STATUS BEFORE INITIALIZATION OF MOS DEVICES**

Power-on does not necessarily define initial status of MOS devices. Production process of MOS does not define the initial operation status of the device. Immediately after the power source is turned ON, the MOS devices with reset function have not yet been initialized. Hence, power-on does not guarantee output pin levels, I/O settings or contents of registers. MOS devices are not initialized until the reset signal is received. Reset operation must be executed immediately after power-on for MOS devices having reset function.

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[Product applications]

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[Product usage]

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[Usage environment]

Usage in environments with special characteristics as listed below was not considered in the design. Accordingly, our company assumes no responsibility for loss of a customer or a third party when used in environments with the special characteristics listed below.

Example:

- 1) Usage in liquids, including water, oils, chemicals and organic solvents.
- 2) Usage in exposure to direct sunlight or the outdoors, or in dusty places.
- 3) Usage involving exposure to significant amounts of corrosive gas, including sea air, CL_2 , H_2S , NH_3 , SO_2 , and NO_x .
- 4) Usage in environments with static electricity, or strong electromagnetic waves or radiation.
- 5) Usage in places where dew forms.
- 6) Usage in environments with mechanical vibration, impact, or stress.
- 7) Usage near heating elements, igniters, or flammable items.

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