

RZ/G2L, RZ/G2LC, RZ/V2L, RZ/G2UL, RZ/Five, RZ/A3UL, RZ/G2E,
RZ/G2H, RZ/G2M, RZ/G2N, RZ/G3S, RZ/A3M, RZ/G3E

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Mount Conditions Reflow Soldering Conditions

Summary

This application note is intended to provide Renesas customers with a profile for solder reflow mounting.

Target Device

- RZ/G2L 15mmsq and 21mmsq PKG
- RZ/G2LC 13mmsq PKG
- RZ/V2L 15mmsq and 21mmsq PKG
- RZ/G2UL 13mmsq PKG
- RZ/Five 13mmsq and 11mmsq PKG
- RZ/A3UL 13mmsq PKG
- RZ/G2E 21mmsq PKG
- RZ/G2H 29mmsq PKG
- RZ/G2M 29mmsq PKG
- RZ/G2N 29mmsq PKG
- RZ/G3S 13mmsq and 14mmsq PKG
- RZ/A3M 17mmsq PKG
- RZ/G3E 15mmsq and 21mmsq PKG

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1. Reflow Soldering Method (IR Reflow Air Reflow IR+Air Reflow)

Reflow under the following conditions within the prescribed storage time after opening the moisture-proof package in order not to make products be re-moisturized.

If the time after opening the moisture-proof package exceeds the prescribed storage conditions, prescribed baking is required.

1.1 Reflowing Conditions and Profiles

Table 1.1 Solder Reflow Profile Requirements

In case of the RZ/G2L, RZ/G2LC, RZ/V2L, RZ/G2UL, RZ/Five, RZ/A3UL, RZ/A3M, and RZ/G3E 21mmsq PKG

Profile Feature	Condition
Maximum temperature (Package surface temperature)	Maximum 250°C
Time above 245°C	≤ 30 seconds
Time of temperature higher than 217°C	60 – 150 seconds
Preheating time at 150°C to 200°C	60 – 120 seconds

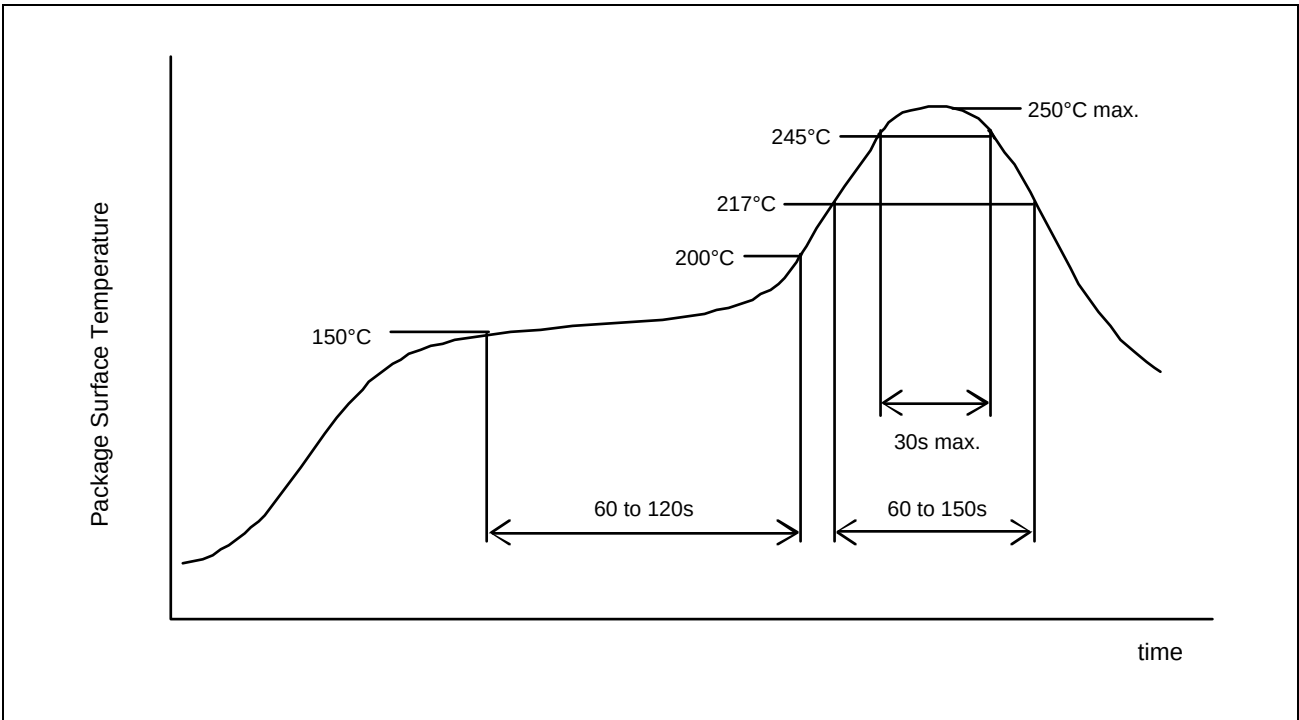


Figure 1.1 Reflow Soldering Profile

Table 1.2 Solder Reflow Profile Requirements

In case of the RZ/G3S and RZ/G3E 15mmsq PKG

Profile Feature	Condition
Maximum temperature (Package surface temperature)	Maximum 260°C
Time above 255°C	≤ 30 seconds
Time of temperature higher than 217°C	60 – 150 seconds
Preheating time at 150°C to 200°C	60 – 120 seconds

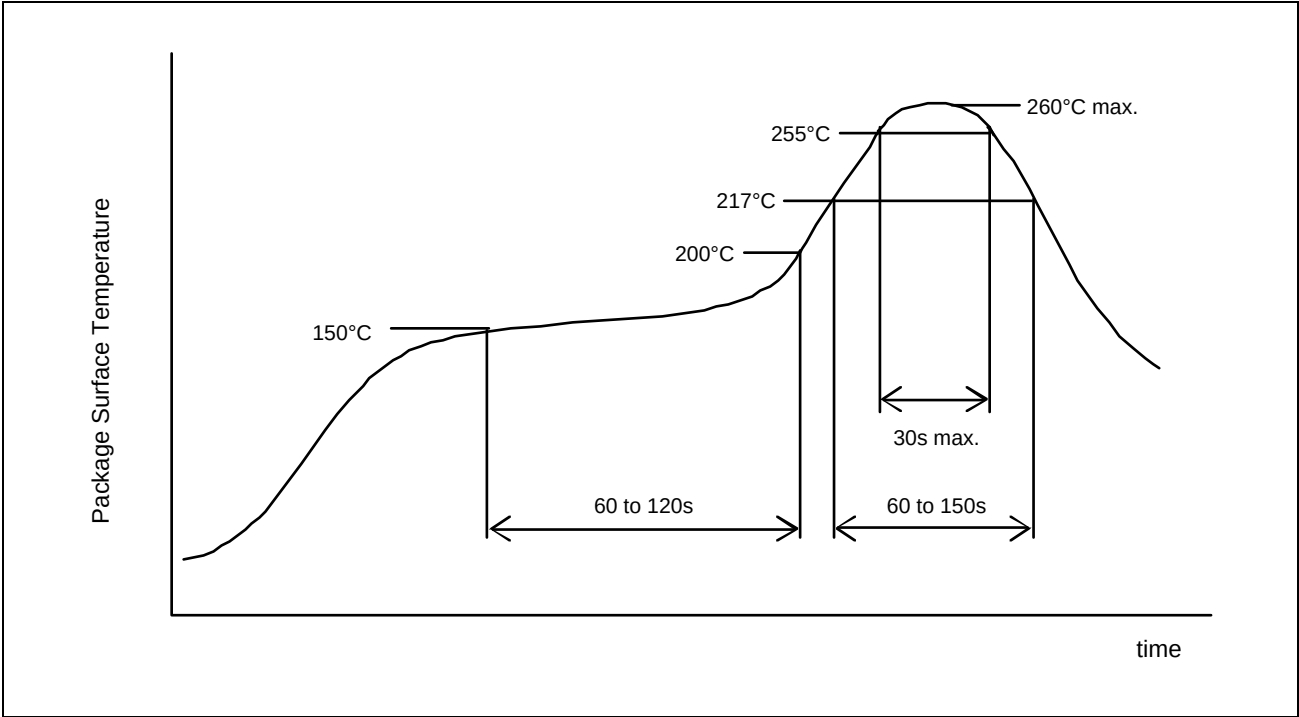


Figure 1.2 Reflow Soldering Profile

1.2 Reflowing Times

Maximum 3 times (within the prescribed time after opening the moisture-proof package)

1.3 Reflowing Atmosphere

Air or nitrogen in atmosphere (N₂)

REVISION HISTORY	RZ/G2L, RZ/G2LC, RZ/V2L, RZ/G2UL, RZ/Five, RZ/A3UL, RZ/G2E, RZ/G2H, RZ/G2M, RZ/G2N, RZ/G3S, RZ/A3M, RZ/G3E Mount Conditions Reflow Soldering Conditions
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Rev.	Date	Description	
		Page	Summary
1.00	Oct. 29, 2021	—	First edition issued
1.01	Jan. 07, 2022	—	RZ/Five product is added.
1.02	Apr. 15, 2022	—	RZ/A3UL product is added.
1.03	Nov. 27, 2023	—	RZ/G2E, RZ/G2H, RZ/G2M, and RZ/G2N products are added
1.04	Dec. 01, 2023	—	RZ/G3S product is added.
1.10	Aug. 02, 2024	4	Table1.2 "Solder Reflow Profile Requirements" is added
		4	Figure1.2 "Reflow Soldering Profile" is added
1.15	Mar. 17, 2025	—	RZ/A3M product is added.
1.20	Mar. 17, 2025	—	RZ/G3E product is added.

General Precautions in the Handling of Microprocessing Unit and Microcontroller Unit Products

The following usage notes are applicable to all Microprocessing unit and Microcontroller unit products from Renesas. For detailed usage notes on the products covered by this document, refer to the relevant sections of the document as well as any technical updates that have been issued for the products.

1. Precaution against Electrostatic Discharge (ESD)

A strong electrical field, when exposed to a CMOS device, can cause destruction of the gate oxide and ultimately degrade the device operation. Steps must be taken to stop the generation of static electricity as much as possible, and quickly dissipate it when it occurs. Environmental control must be adequate. When it is dry, a humidifier should be used. This is recommended to avoid using insulators that can easily build up static electricity. Semiconductor devices must be stored and transported in an anti-static container, static shielding bag or conductive material. All test and measurement tools including work benches and floors must be grounded. The operator must also be grounded using a wrist strap. Semiconductor devices must not be touched with bare hands. Similar precautions must be taken for printed circuit boards with mounted semiconductor devices.

2. Processing at power-on

The state of the product is undefined at the time when power is supplied. The states of internal circuits in the LSI are indeterminate and the states of register settings and pins are undefined at the time when power is supplied. In a finished product where the reset signal is applied to the external reset pin, the states of pins are not guaranteed from the time when power is supplied until the reset process is completed. In a similar way, the states of pins in a product that is reset by an on-chip power-on reset function are not guaranteed from the time when power is supplied until the power reaches the level at which resetting is specified.

3. Input of signal during power-off state

Do not input signals or an I/O pull-up power supply while the device is powered off. The current injection that results from input of such a signal or I/O pull-up power supply may cause malfunction and the abnormal current that passes in the device at this time may cause degradation of internal elements. Follow the guideline for input signal during power-off state as described in your product documentation.

4. Handling of unused pins

Handle unused pins in accordance with the directions given under handling of unused pins in the manual. The input pins of CMOS products are generally in the high-impedance state. In operation with an unused pin in the open-circuit state, extra electromagnetic noise is induced in the vicinity of the LSI, an associated shoot-through current flows internally, and malfunctions occur due to the false recognition of the pin state as an input signal become possible.

5. Clock signals

After applying a reset, only release the reset line after the operating clock signal becomes stable. When switching the clock signal during program execution, wait until the target clock signal is stabilized. When the clock signal is generated with an external resonator or from an external oscillator during a reset, ensure that the reset line is only released after full stabilization of the clock signal. Additionally, when switching to a clock signal produced with an external resonator or by an external oscillator while program execution is in progress, wait until the target clock signal is stable.

6. Voltage application waveform at input pin

Waveform distortion due to input noise or a reflected wave may cause malfunction. If the input of the CMOS device stays in the area between V_{IL} (Max.) and V_{IH} (Min.) due to noise, for example, the device may malfunction. Take care to prevent chattering noise from entering the device when the input level is fixed, and also in the transition period when the input level passes through the area between V_{IL} (Max.) and V_{IH} (Min.).

7. Prohibition of access to reserved addresses

Access to reserved addresses is prohibited. The reserved addresses are provided for possible future expansion of functions. Do not access these addresses as the correct operation of the LSI is not guaranteed.

8. Differences between products

Before changing from one product to another, for example to a product with a different part number, confirm that the change will not lead to problems. The characteristics of a microprocessing unit or microcontroller unit products in the same group but having a different part number might differ in terms of internal memory capacity, layout pattern, and other factors, which can affect the ranges of electrical characteristics, such as characteristic values, operating margins, immunity to noise, and amount of radiated noise. When changing to a product with a different part number, implement a system-evaluation test for the given product.

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