PCN#:[MCP-AC-22-0030]

# Product Change Notice (PCN)

**Subject:** Wafer-fabrication and chip-assembly factories addition for RA2E1 32pin QFN and 32pin LQFP package products.
**Publication Date:** 10/4/2022
**Effective Date:** 4/30/2023

**Revision Description:** Initial release

**Description of Change:**

| | Current fab | | | Additional fabs (parallel production) | | |
|---|---|---|---|---|---|---|
| | Wafer fab | Assembly | Sort | Wafer fab | Assembly | Sort |
| Case1 | Kawashiri | Greatek | KYEC | Kawashiri<br>**PSMC** | Greatek | KYEC |
| Case2 | Kawashiri | RSB | RSB | Kawashiri<br>**PSMC** | RSB<br>**Greatek** | RSB<br>**KYEC** |

[#1] Factory names indicated as **BOLD** letters, will be added on the parallel production path.

1)Case1: 32pin QFN package products
Wafer fab: Powerchip Semiconductor Manufacturing Corporation (PSMC) addition

2)Case2: 32pin LQFP package products
Wafer fab: Powerchip Semiconductor Manufacturing Corporation (PSMC) addition
Assembly: Greatek Electronics Inc.（Greatek）addition
Sort: King Yuan Electronics Corp. (KYEC) addition
(other details shown in “MCP-AB-22-0086_RA2E1_LQFP32pin_fab-addition_differences” )
(Remark for Case2: Greatek products to be shipped only via full-carton or T&R.)

**Affected product list:**

| Product P/N | Package | | Product P/N | Package |
|---|---|---|---|---|
| R7FA2E1A93CNH#HA0 | 32pin QFN | | R7FA2E1A93CFJ#HA0 | 32pin LQFP |
| R7FA2E1A93CNH#BA0 | 32pin QFN | | R7FA2E1A93CFJ#BA0 | 32pin LQFP |
| R7FA2E1A93CNH#AA0 | 32pin QFN | | R7FA2E1A92DFJ#HA0 | 32pin LQFP |
| R7FA2E1A92DNH#HA0 | 32pin QFN | | R7FA2E1A92DFJ#BA0 | 32pin LQFP |
| R7FA2E1A92DNH#BA0 | 32pin QFN | | R7FA2E1A73CFJ#HA0 | 32pin LQFP |
| R7FA2E1A92DNH#AA0 | 32pin QFN | | R7FA2E1A73CFJ#BA0 | 32pin LQFP |
| R7FA2E1A73CNH#HA0 | 32pin QFN | | R7FA2E1A72DFJ#HA0 | 32pin LQFP |
| R7FA2E1A73CNH#BA0 | 32pin QFN | | R7FA2E1A72DFJ#BA0 | 32pin LQFP |
| R7FA2E1A73CNH#AA0 | 32pin QFN | | R7FA2E1A53CFJ#HA0 | 32pin LQFP |
| R7FA2E1A72DNH#HA0 | 32pin QFN | | R7FA2E1A53CFJ#BA0 | 32pin LQFP |
| R7FA2E1A72DNH#BA0 | 32pin QFN | | R7FA2E1A52DFJ#HA0 | 32pin LQFP |
| R7FA2E1A72DNH#AA0 | 32pin QFN | | R7FA2E1A52DFJ#BA0 | 32pin LQFP |

|  |  |  |  |  |
|---|---|---|---|---|
| R7FA2E1A53CNH#HA0 | 32pin QFN |  |  |  |
| R7FA2E1A53CNH#BA0 | 32pin QFN |  |  |  |
| R7FA2E1A53CNH#AA0 | 32pin QFN |  |  |  |
| R7FA2E1A52DNH#HA0 | 32pin QFN |  |  |  |
| R7FA2E1A52DNH#BA0 | 32pin QFN |  |  |  |
| R7FA2E1A52DNH#AA0 | 32pin QFN |  |  |  |

**Reason for Change:**

Stable production supply for RA2E1 QFN/LQFP products.

**Impact on specifications, characteristics, quality & reliability:**

No impact.

**Product Identification:**

Enable via the production history data on the packing label or of the trace code.

Please contact our sales staff.

**Qualification Status:** to be provided by 3/31/2023

**Sample availability:** 1/31/2023
ES samples will be provided for functionality check where there is no functionality difference between ES sample and MP version.

**Device Material Declaration:** Contact Renesas sales, distributor, or agency.

Note:

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3. If customer cannot accept the PCN then customer must provide Renesas with a last time buy demand and purchase order.

**For additional information regarding this notice, please contact your Renesas sales representative.**

# RA2E1 32pin LQFP product fabrication factory addition: different points

## Wafer-process factory addition: PSMC

## Chip-assembly factory addition: Greatek

Sep/30/2022

MCU product marketing department
MCU device solution business division
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MCP-AB-22-0086

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(Rev. 5.0-1 October 2020)

# Outline of Changes

1) Object: RA2E1
   Wafer-fabrication: Renesas Semiconductor Manufacturing Co., Ltd., Kawashiri factory
   Chip-assembly: Renesas Semiconductor (Beijing) Co., Ltd (RSB)
   Package types: 7x7mm 32pin LQFP

2) Wafer fabrication factory addition: Powerchip Semiconductor Manufacturing Corporation (PSMC)
   Assembly factory addition: Greatek Electronics Inc.（Greatek）

3) Specification differences:
   Wafer process: sufficiently equivalent process was ported from Kawashiri factory.
   Assembly materials:
   Lead-frame, Die-mount paste, and Mold-resin are certificated at each facility.

4) Package outline:
   No change on the foot-print geometry
   Please refer the package outline drawings and the geometry comparison tables.

# Outline of Changes

5) Marking:

Marking characters appears slightly different in the font type.

■ Product specification/characteristics

No change

■ Product qualification/reliability

No impact

# PKG LIST

| PKG | size [mm] | pins | Pin-pitch [mm] | thickness [mm] | Fab addition (this time) | | | Current fabs | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | WP | Assembly | Sort | WP | Assembly | Sort |
| LQFP | 07x07 | 32 | 0.8 | 1.4 | PSMC | Greatek | KYEC | Kawashiri | RSB | RSB |

Kawashiri : Renesas Semiconductor Manufacturing Company Co., Ltd. Kawashiri Factory
PSMC: Powerchip Semiconductor Manufacturing Corporation
RSB: Renesas Semiconductor (Beijing) Co.. Ltd
KYEC: King Yuan Electronics Co., Ltd
Greatek: Greatek Electronics Inc.

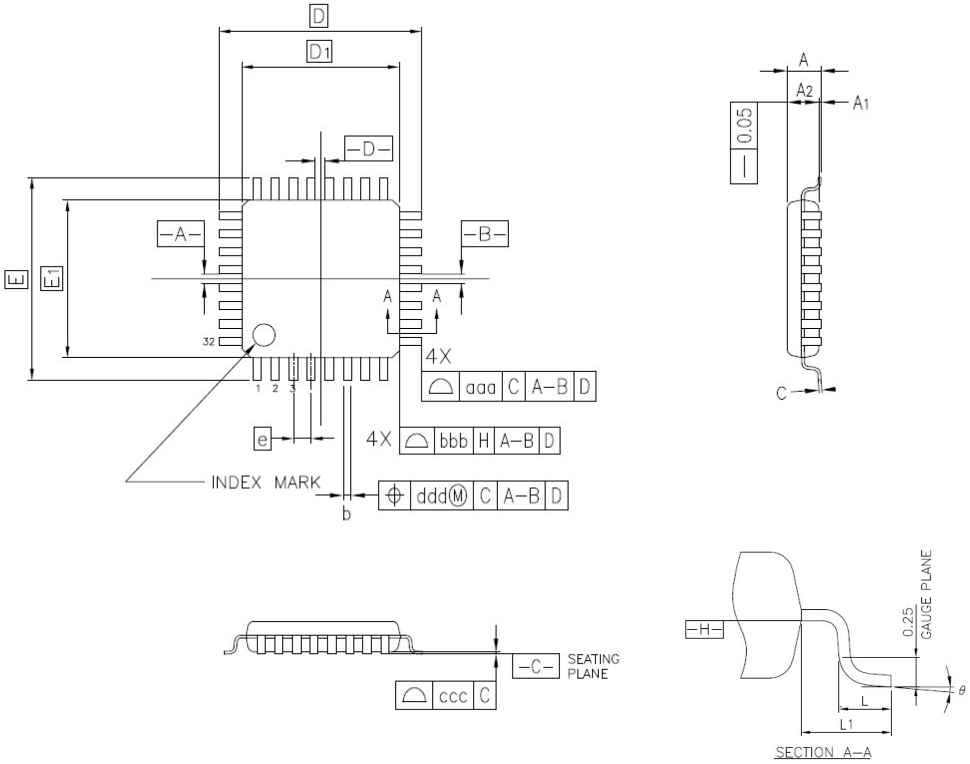
# Differences

| Items | | This time | Current |
|---|---|---|---|
| Wafer process | | Kawashiri, PSMC | Kawashiri |
| Assembly | | Greatek | RSB |
| Sort | | KYEC | RSB |
| Package | Outline | Slight differences (see p.7~p.9) | |
| Lead frame | Material | No difference | |
| | Inner lead shape | Shape difference (see p.10) | |
| Die mount | Material | Ag epoxy paste D * | Ag epoxy paste A * |
| Bonding wire | Material | No difference: Cu (Pd coating) | |
| Mold resin | Material | Epoxy resin D * (halogen-free) | Epoxy resin A * (halogen-free) |
| Plating | Material | No difference | |
| Marking | Font | Font type difference (see p.11) | |
| | Digit number | No difference | |
| Packing | Tray / T&R | No difference | |
| Storage conditions | after opening | No difference | |

* Factory certified materials, there are differences however no impact on reliability or characteristics.

# 7mm×7mm 0.8mm pitch 32pin LQFP package outline (Greatek)

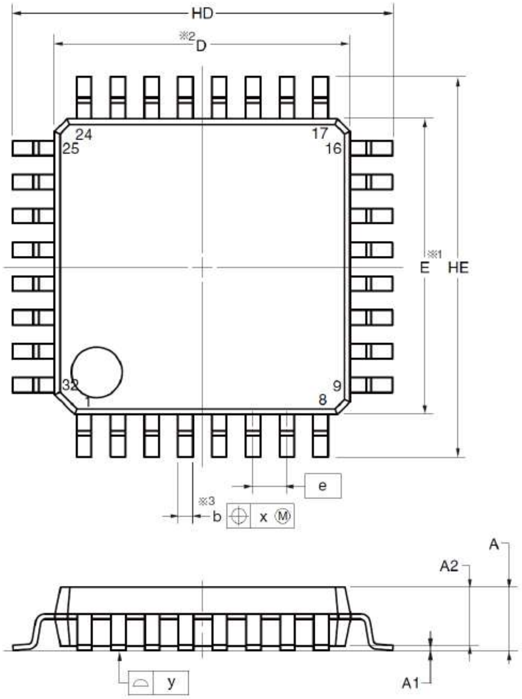
RENESAS Code : PLQP0032GE-A



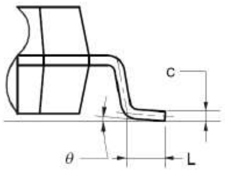
| Reference Symbol | Dimension in Millimeters | | |
|---|---|---|---|
| | Min. | Nom. | Max. |
| A | – | – | 1.60 |
| $A_1$ | 0.05 | – | 0.15 |
| $A_2$ | 1.35 | 1.40 | 1.45 |
| D | – | 9.00 | – |
| D1 | – | 7.00 | – |
| E | – | 9.00 | – |
| $E_1$ | – | 7.00 | – |
| N | – | 32 | – |
| e | – | 0.80 | – |
| b | 0.30 | 0.37 | 0.45 |
| c | 0.09 | – | 0.20 |
| θ | 0° | 3.5° | 7° |
| L | 0.45 | 0.60 | 0.75 |
| $L_1$ | – | 1.00 | – |
| aaa | – | – | 0.20 |
| bbb | – | – | 0.20 |
| ccc | – | – | 0.10 |
| ddd | – | – | 0.20 |

# 7mm×7mm 0.8mm pitch 32pin LQFP package outline (RSB)

RENESAS Code : PLQP0032GB-A



detail of lead end



(UNIT:mm)

| ITEM | DIMENSIONS |
|---|---|
| D | 7.00±0.10 |
| E | 7.00±0.10 |
| HD | 9.00±0.20 |
| HE | 9.00±0.20 |
| A | 1.70 MAX. |
| A1 | 0.10±0.10 |
| A2 | 1.40 |
| b | 0.37±0.05 |
| c | 0.145±0.055 |
| L | 0.50±0.20 |
| θ | 0° to 8° |
| e | 0.80 |
| x | 0.20 |
| y | 0.10 |

# Comparison: 7mm×7mm 0.8mm pitch 32pin LQFP package outline

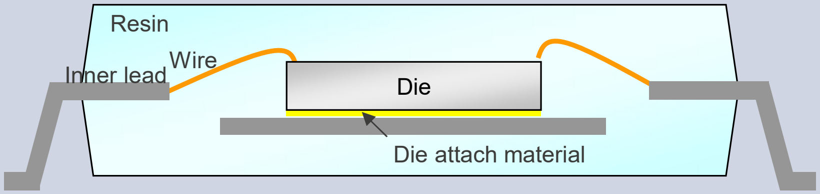
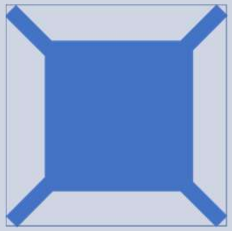
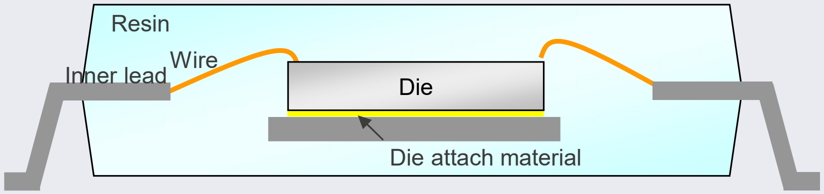
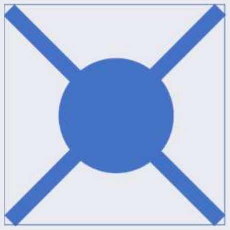
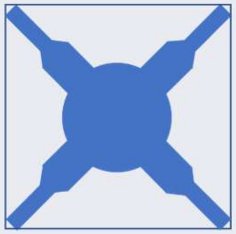
Greatek package symbols comply JEDEC standard.

| Greatek Symbol | 7x7mm 32pin LQFP PLQP0032GE-A | | | RSB Symbol | 7x7mm 32pin LQFP PLQP0032GB-A | | |
|---|---|---|---|---|---|---|---|
| | Dimension in Millimeters | | | | Dimension in Millimeters | | |
| | Min | Nom | Max | | Min | Nom | Max |
| A | - | - | 1.60 | A | - | - | 1.70 |
| A1 | 0.05 | - | 0.15 | A1 | 0.00 | 0.10 | 0.20 |
| A2 | 1.35 | 1.40 | 1.45 | A2 | - | 1.40 | - |
| D | - | 9.00 | - | HD | 8.80 | 9.00 | 9.20 |
| D1 | - | 7.00 | - | D | 6.90 | 7.00 | 7.10 |
| E | - | 9.00 | - | HE | 8.80 | 9.00 | 9.20 |
| E1 | - | 7.00 | - | E | 6.90 | 7.00 | 7.10 |
| N | - | 32 | - | - | - | - | - |
| e | - | 0.80 | - | e | - | 0.80 | - |
| b | 0.30 | 0.37 | 0.45 | b | 0.32 | 0.37 | 0.42 |
| c | 0.09 | - | 0.20 | c | 0.09 | 0.145 | 0.20 |
| θ | 0° | 3.5° | 7° | θ | 0° | - | 8° |
| L | 0.45 | 0.60 | 0.75 | L | 0.30 | 0.50 | 0.70 |
| L1 | - | 1.00 | - | - | - | - | - |
| aaa | - | - | 0.20 | - | - | - | - |
| bbb | - | - | 0.20 | - | - | - | - |
| ccc | - | - | 0.10 | y | - | 0.10 | - |
| ddd | - | - | 0.20 | x | - | 0.20 | - |

←different measurement points

# Package structure image

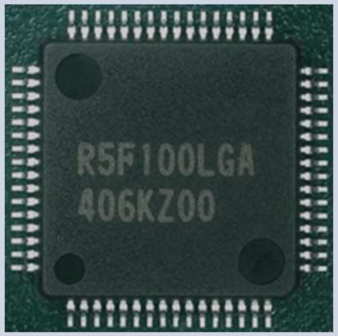
* Package cross-section and die pad shape are reference example.

| Assembly Line | PKG cross section | Die pad shape |
|---|---|---|
| Additional factory |  |  Greatek |
| Current factory |  |  RSB<br> RSB |

※ There is no impact on the reliability with these die pad shapes

# Marking visibility

※Characters are reference example

| Assembly Line | Greatek<br>(Additional factory) | RSB<br>(Existing factory) |
|---|---|---|
| Overall photo |  |  |
| Enlarged photo |  |  |

# 4M changing points (Wafer process facility addition)

Full chip-design compatible wafer-fabrication-process was ported from Kawashiri factory.

| Item | Check Result | Judgement |
|---|---|---|
| **Machine** | Sufficiently compatible to produce the equivalent wafer-level structure and electrical characteristics | **No risk** |
| **Method** | Sufficiently compatible to produce the equivalent wafer-level structure and electrical characteristics | **No risk** |
| **Man** | Using operator certification system. Only certificated operator can work for the production. | **No risk** |
| **Material** | Sufficiently compatible to produce the equivalent wafer-level structure and electrical characteristics | **No risk** |

# 4M changing points (Additional assembly factory)

| Item | Check Result | Judgement |
|---|---|---|
| **Machine** | Despite some differences, the machines are equivalent to current fabrication machines.<br>As well as similar existing products which show sufficient MP records, no problem found for the additional products. | **No risk** |
| **Method** | The same as the existing products. | **No risk** |
| **Operator** | Adopting operator certification system, only certificated operators are allowed for performing the production work. | **No risk** |
| **Material** | Only certificated materials are used.<br>The products were certificated by specific reliability test as well as the existing products, no risk to be seen. | **No risk** |

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