

Product Change Notice

(PCN Tracking Number: EE-QR-221211-01)

Version: 1

| | | | |
|-------------------------------|--|------------------------------|--|
| Customer: | ALL Customers | | |
| Renesas Product Type: | RX/RA series with LQFP package products (refer to last page for complete Product list) | | |
| Description of Change: | Addition of back-end factories and corresponding material (please refer to pages 3 - 7 for more details) | | |
| Reason for Change: | To ensure stable supply | | |
| Identification: | Identifiable via production history data from the packing label or trace code | | |
| Schedules: | Sample order deadline: | e/o Jan. 2023 | |
| | Sample delivery: | b/o Apr. 2023 (upon request) | |
| | Reliability report: | b/o Feb. 2023 (upon request) | |
| | Requested approval: | b/o Mar. 2023 | |
| | Change Implementation: | b/o Apr. 2023 onwards | |
| Anticipated Impact: | Fit & Form: | Slight changes in dimension | |
| | Function: | No change | |
| | Quality & Reliability: | No impact | |
| Doc. No.: | EE-QC-PCN-CR-22-0233 | | |
| Internal Reference: | IMO-AB-22-0139 | | |

In case of any question, please contact:

| INITIATOR | TITLE | E-mail | PHONE No. |
|--------------------|----------------|--------------------------------|-------------------|
| Farhad Banihashemi | Staff Engineer | farhad.banihashemi@renesas.com | +49-211-6503-1844 |

Düsseldorf, 13.12.2022

Customer Response:

(please fill in and return by e-mail, fax or mail)

| | |
|--|------------------------|
| <input type="checkbox"/> acknowledge | Company: _____ |
| <input type="checkbox"/> acceptable | |
| <input type="checkbox"/> unacceptable (pls. comment) | Name & Position: _____ |
| <input type="checkbox"/> not applicable | |
| | Phone / Fax No.: _____ |

Note: Acknowledgement must be received by Renesas within 30 days or Renesas will consider the change as approved. If timely acknowledgement is provided by Customer, then Customer shall have 90 days from the date of receipt of this PCN in which to make any objections to the PCN. If Customer fails to make objections to this PCN within 90 days of the receipt of the PCN then Renesas will consider the PCN changes as approved. If customer cannot accept the PCN, they must provide Renesas with a last time buy demand and purchase order.

Comments:

(Signature)

Details of Change:

1) Add Back-End factories:

1.1 Add the assembly factory

Current: Renesas Semiconductor (Beijing) Co., Ltd (RSB)

Additional: Greatek Electronics Inc., (Greatek)

1.2 Add the final test factory

Current: Renesas Semiconductor (Beijing) Co., Ltd (RSB)

Additional: King Yuan Electronics Co., Ltd. (KYTEC)

2) Add materials of Back-end factories:

When comparing with RSB products, there are some changes as described below because of using the standard material and manufacturing equipment which are currently using in the Greatek factory.

2.1 Material:

Lead frame, die mount, mold resin and chip thickness.

2.2 Package outline and marking on package:

Some differences in external dimensions. However is **no change in footprint** for Greatek products. Marking font.

2.3 Packing material:

Addition of bundling band color (Black)

3) Storage condition after opening:

The storage conditions after opening the moisture proof bag of the Greatek product comply with JEDEC standards.

Current : 30°C /70%RH/within 168hr

After Change : 30°C /60%RH/within 168hr (JEDEC compliant)

1. DIFFERENCE OF SPECIFICATION'S OUTLINE

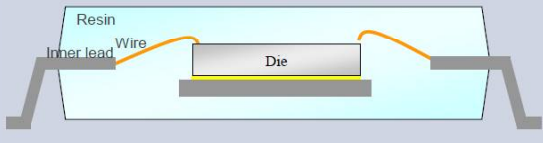

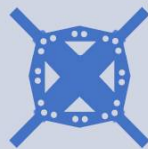
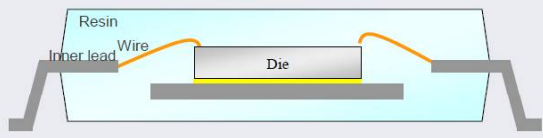

| Item | | Current | Addition |
|-------------------|---------------------|---|--|
| Assembly factory | | Renesas Semiconductor (Beijing) Co., Ltd | Greatek Electronics Inc. |
| Sorting factory | | | King Yuan Electronics Co., Ltd |
| Parts | Lead frame | — | Change to standard material used in new factory. The structure not changed. |
| | Die mount | — | Change to standard material used in new factory. The structure not changed. |
| | Mould resin | — | Change to standard material used in new factory. The structure not changed. |
| | Chip thickness | 280μm | 305μm (12mil) |
| Package | Outline | — | There are changes in some of dimensions |
| Marking | Font | — | Font changed |
| Packing | Bundling band color | — | Add black |
| Storage condition | After opening | Within 30°C/ 70%RH/ 168h | Within 30°C/ 60%RH/ 168h |

※ There is no impact on reliability and specification

2. DIFFERENCE OF SPECIFICATION'S DETAIL (1)

PACKAGE STRUCTURE(IMAGE)

※PKG cross section and die pad shape are reference examples

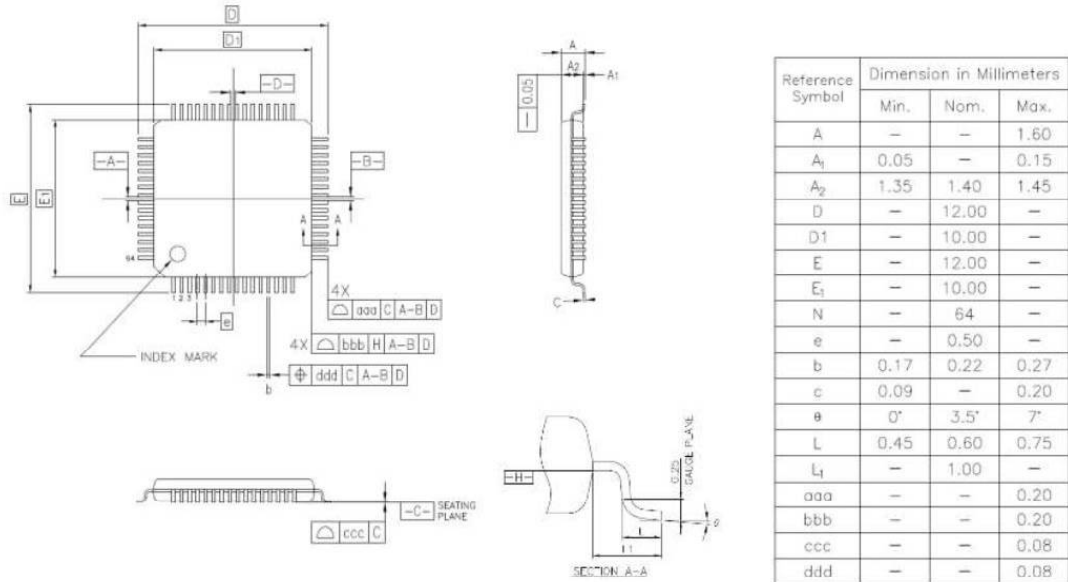
| Assembly Line | PKG cross section | Die pad shape |
|---------------|--|---|
| Current |  |   <p>excluding R5F566TxxxFP</p> <p>R5F566TxxxFP</p> |
| Addition |  |  |

※ There is no impact on the reliability by die pad shape

2. DIFFERENCE OF SPECIFICATION'S DETAIL (2)

10x10mm 64pin LQFP package drawing (Addition)

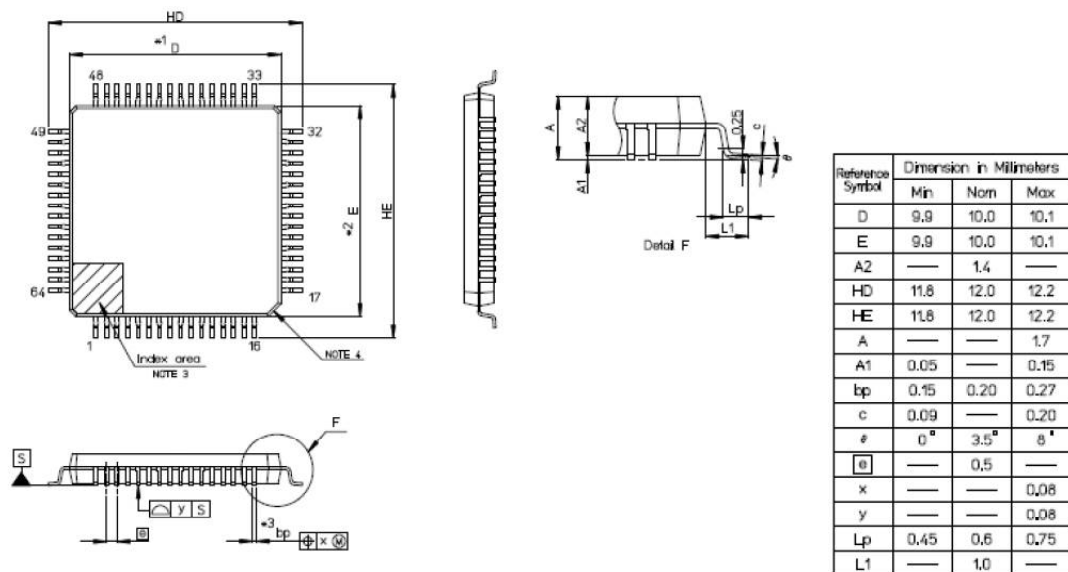
RENESAS Code : PLQP0064KL-A



2. DIFFERENCE OF SPECIFICATION'S DETAIL (3)

10x10mm 64pin LQFP package drawing (Current)

RENESAS Code : PLQP0064KB-C



2. DIFFERENCE OF SPECIFICATION'S DETAIL (4)

Dimension comparison: 10x10mm 64pin LQFP package

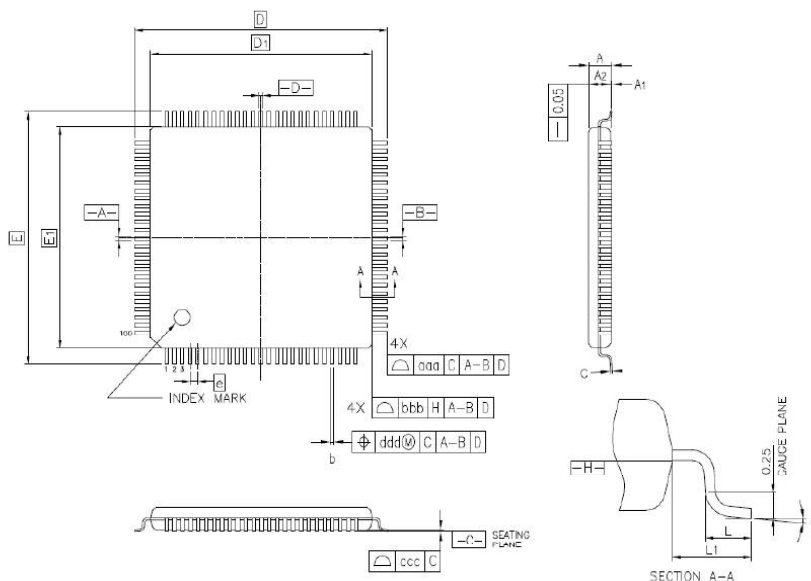
Greatesk symbol is the same as the JEDEC standard.

| Addition Greatek Symbol | 10x10mm 64pin LQFP PLQP0064KL-A | | | Current RSB Symbol | 10x10mm 64pin LQFP PLQP0064KB-C | | |
|-----------------------------------|------------------------------------|-------|------|------------------------------|------------------------------------|-------|-------|
| | Dimension in Millimeters | | | | Dimension in Millimeters | | |
| | Min | Nom | Max | | Min | Nom | Max |
| A | - | - | 1.60 | A | - | - | 1.70 |
| A1 | 0.05 | - | 0.15 | A1 | 0.05 | - | 0.15 |
| A2 | 1.35 | 1.40 | 1.45 | A2 | - | 1.40 | - |
| D | - | 12.00 | - | HD | 11.80 | 12.00 | 12.20 |
| D1 | - | 10.00 | - | D | 9.90 | 10.00 | 10.10 |
| E | - | 12.00 | - | HE | 11.80 | 12.00 | 12.20 |
| E1 | - | 10.00 | - | E | 9.90 | 10.00 | 10.10 |
| N | - | 64 | - | - | - | - | - |
| e | - | 0.50 | - | e | - | 0.50 | - |
| b | 0.17 | 0.22 | 0.27 | bp | 0.15 | 0.20 | 0.27 |
| c | 0.09 | - | 0.20 | c | 0.09 | - | 0.20 |
| θ | 0° | 3.5° | 7° | θ | 0° | 3.5° | 8° |
| L | 0.45 | 0.60 | 0.75 | Lp | 0.45 | 0.60 | 0.75 |
| L1 | - | 1.00 | - | L1 | - | 1.000 | - |
| aaa | - | - | 0.20 | - | - | - | - |
| bbb | - | - | 0.20 | - | - | - | - |
| ccc | - | - | 0.08 | y | - | - | 0.08 |
| ddd | - | - | 0.08 | x | - | - | 0.08 |

2. DIFFERENCE OF SPECIFICATION'S DETAIL (5)

14x14mm 100pin LQFP package drawing (Addition)

RENESAS Code : PLQP0100KP-A

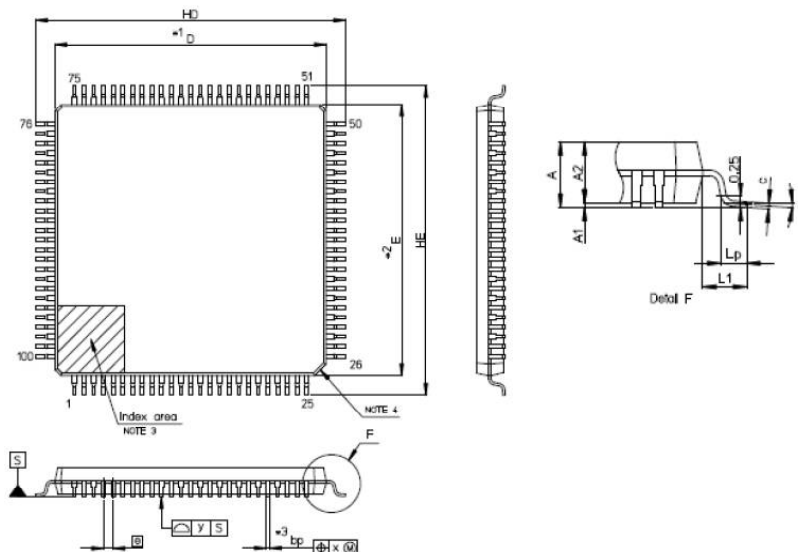


| Reference Symbol | Dimension in Millimeters | | |
|---------------------|--------------------------|-------|------|
| | Min. | Nom. | Max. |
| A | — | — | 1.60 |
| A ₁ | 0.05 | — | 0.15 |
| A ₂ | 1.35 | 1.40 | 1.45 |
| D | — | 16.00 | — |
| D ₁ | — | 14.00 | — |
| E | — | 16.00 | — |
| E ₁ | — | 14.00 | — |
| N | — | 100 | — |
| e | — | 0.50 | — |
| b | 0.17 | 0.22 | 0.27 |
| 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 | — | — | 0.08 |
| ddd | — | — | 0.08 |

2. DIFFERENCE OF SPECIFICATION'S DETAIL (6)

14x14mm 100pin LQFP package drawing (Current)

RENESAS Code : PLQP0100KB-B



| Reference Symbol | Dimension in Millimeters | | |
|------------------|--------------------------|------|------|
| | Min | Nom | Max |
| D | 13.9 | 14.0 | 14.1 |
| E | 13.9 | 14.0 | 14.1 |
| A2 | — | 1.4 | — |
| HD | 15.8 | 16.0 | 16.2 |
| HE | 15.8 | 16.0 | 16.2 |
| A | — | — | 1.7 |
| A1 | 0.05 | — | 0.15 |
| bp | 0.15 | 0.20 | 0.27 |
| c | 0.09 | — | 0.20 |
| # | 0° | 3.5° | 8° |
| θ | — | 0.5 | — |
| x | — | — | 0.08 |
| y | — | — | 0.08 |
| Lp | 0.45 | 0.6 | 0.75 |
| L1 | — | 1.0 | — |

2. DIFFERENCE OF SPECIFICATION'S DETAIL (7)

Dimension comparison: 14x14mm 100pin LQFP package


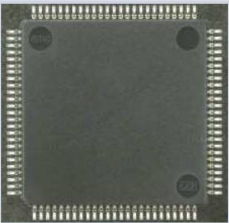


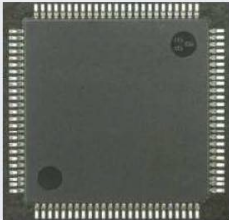

Greatesk symbol is the same as the JEDEC standard.

| Addition Greatek Symbol | 14x14mm 100pin LQFP PLQP0100KP-A | | | Current RSB Symbol | 14x14mm 100pin LQFP PLQP0100KB-B | | |
|-----------------------------------|-------------------------------------|-------|------|------------------------------|-------------------------------------|-------|-------|
| | Dimension in Millimeters | | | | Dimension in Millimeters | | |
| | Min | Nom | Max | | Min | Nom | Max |
| A | - | - | 1.60 | A | - | - | 1.70 |
| A1 | 0.05 | - | 0.15 | A1 | 0.05 | - | 0.15 |
| A2 | 1.35 | 1.40 | 1.45 | A2 | - | 1.40 | - |
| D | - | 16.00 | - | HD | 15.80 | 16.00 | 16.20 |
| D1 | - | 14.00 | - | D | 13.90 | 14.00 | 14.10 |
| E | - | 16.00 | - | HE | 15.80 | 16.00 | 16.20 |
| E1 | - | 14.00 | - | E | 13.90 | 14.00 | 14.10 |
| N | - | 100 | - | - | - | - | - |
| e | - | 0.50 | - | e | - | 0.50 | - |
| b | 0.17 | 0.22 | 0.27 | bp | 0.15 | 0.20 | 0.27 |
| c | 0.09 | - | 0.20 | c | 0.09 | - | 0.20 |
| θ | 0° | 3.5° | 7° | θ | 0° | 3.5° | 8° |
| L | 0.45 | 0.60 | 0.75 | Lp | 0.45 | 0.60 | 0.75 |
| L1 | - | 1.00 | - | L1 | - | 1.000 | - |
| aaa | - | - | 0.20 | - | - | - | - |
| bbb | - | - | 0.20 | - | - | - | - |
| ccc | - | - | 0.08 | y | - | - | 0.08 |
| ddd | - | - | 0.08 | x | - | - | 0.08 |

2. DIFFERENCE OF SPECIFICATION'S DETAIL (8)

Appearance: 14x14mm 100pin LQFP package

※Marked character is reference example





| | Package surface | Package back | Worked Leads shape |
|----------|---|---|---|
| Current |  |  |  |
| Addition |  |  |  |

* There is no WS notation in the actual product

2. DIFFERENCE OF SPECIFICATION'S DETAIL (9)

Marking Font

※Marked character is reference example

| Assembly Line | Current | Addition |
|---------------|---|---|
| Whole Photo |  |  |
| Detail Photo |  |  |

* There is no WS notation in the actual product

3. 4M changing points (Add the assembly factory and materials)

| Item | Check result | Judgement |
|-----------------|---|----------------|
| Machine | Changing at assembly. The machines are equivalent to present machines. There are production of similar copper wire products and we have already checked the additional products have no risk on the production. | No risk |
| Method | The same as current products. | No risk |
| Man | Adopt operator certification system. Only certificated operator can work for the production. | No risk |
| Material | Only use certificated materials. The products has been certificated by reliability test same as present products and have no risk. | No risk |

Affected Products:

| Product group | Package |
|---------------|----------------|
| RX651 | 14x14mm 100pin |
| RX66T | 14x14mm 100pin |
| RA4M2 | 14x14mm 100pin |
| RA4M2 | 10x10mm 64pin |
| RA4E1 | 10x10mm 64pin |

Product List:

| Affected P/N list | Package | Group |
|-------------------|--------------------|-------|
| R5F56514ADFP#10 | 14mm x 14mm 100pin | RX651 |
| R5F56514BDFP#10 | 14mm x 14mm 100pin | RX651 |
| R5F56514EDFP#10 | 14mm x 14mm 100pin | RX651 |
| R5F56514FDFP#10 | 14mm x 14mm 100pin | RX651 |
| R5F56517ADFP#10 | 14mm x 14mm 100pin | RX651 |
| R5F56517BDFP#10 | 14mm x 14mm 100pin | RX651 |
| R5F56517EDFP#10 | 14mm x 14mm 100pin | RX651 |
| R5F56517FDFP#10 | 14mm x 14mm 100pin | RX651 |
| R5F56519ADFP#10 | 14mm x 14mm 100pin | RX651 |
| R5F56519BDFP#10 | 14mm x 14mm 100pin | RX651 |
| R5F56519EDFP#10 | 14mm x 14mm 100pin | RX651 |
| R5F56519FDFP#10 | 14mm x 14mm 100pin | RX651 |
| R5F56514AGFP#10 | 14mm x 14mm 100pin | RX651 |
| R5F56514BGFP#10 | 14mm x 14mm 100pin | RX651 |
| R5F56514EGFP#10 | 14mm x 14mm 100pin | RX651 |
| R5F56514FGFP#10 | 14mm x 14mm 100pin | RX651 |
| R5F56517AGFP#10 | 14mm x 14mm 100pin | RX651 |
| R5F56517BGFP#10 | 14mm x 14mm 100pin | RX651 |
| R5F56517EGFP#10 | 14mm x 14mm 100pin | RX651 |
| R5F56517FGFP#10 | 14mm x 14mm 100pin | RX651 |
| R5F56519AGFP#10 | 14mm x 14mm 100pin | RX651 |
| R5F56519BGFP#10 | 14mm x 14mm 100pin | RX651 |
| R5F56519EGFP#10 | 14mm x 14mm 100pin | RX651 |
| R5F56519FGFP#10 | 14mm x 14mm 100pin | RX651 |
| R5F566TAADFP#10 | 14mm x 14mm 100pin | RX66T |
| R5F566TABDFP#10 | 14mm x 14mm 100pin | RX66T |
| R5F566TAEDFP#10 | 14mm x 14mm 100pin | RX66T |
| R5F566TAFDFP#10 | 14mm x 14mm 100pin | RX66T |
| R5F566TEADFP#10 | 14mm x 14mm 100pin | RX66T |
| R5F566TEBDFP#10 | 14mm x 14mm 100pin | RX66T |
| R5F566TEEDFP#10 | 14mm x 14mm 100pin | RX66T |
| R5F566TEFDFP#10 | 14mm x 14mm 100pin | RX66T |
| R5F566TAAGFP#10 | 14mm x 14mm 100pin | RX66T |
| R5F566TABGFP#10 | 14mm x 14mm 100pin | RX66T |
| R5F566TAEGFP#10 | 14mm x 14mm 100pin | RX66T |
| R5F566TAFGFP#10 | 14mm x 14mm 100pin | RX66T |
| R5F566TEAGFP#10 | 14mm x 14mm 100pin | RX66T |
| R5F566TEBGFP#10 | 14mm x 14mm 100pin | RX66T |
| R5F566TEEGFP#10 | 14mm x 14mm 100pin | RX66T |
| R5F566TEFGFP#10 | 14mm x 14mm 100pin | RX66T |
| R7FA4E10B2CFM#AA0 | 10mm x 10mm 64pin | RA4E1 |

| | | |
|-------------------|--------------------|-------|
| R7FA4E10D2CFM#AA0 | 10mm x 10mm 64pin | RA4E1 |
| R7FA4M2AB3CFM#AA0 | 10mm x 10mm 64pin | RA4M2 |
| R7FA4M2AC3CFM#AA0 | 10mm x 10mm 64pin | RA4M2 |
| R7FA4M2AD3CFM#AA0 | 10mm x 10mm 64pin | RA4M2 |
| R7FA4E10B2CFM#HA0 | 10mm x 10mm 64pin | RA4E1 |
| R7FA4M2AD3CFM#HA0 | 10mm x 10mm 64pin | RA4M2 |
| R7FA4M2AB3CFP#AA0 | 14mm x 14mm 100pin | RA4M2 |
| R7FA4M2AC3CFP#AA0 | 14mm x 14mm 100pin | RA4M2 |
| R7FA4M2AD3CFP#AA0 | 14mm x 14mm 100pin | RA4M2 |
| R7FA4M2AB3CFM#BA0 | 10mm x 10mm 64pin | RA4M2 |
| R7FA4M2AD3CFM#BA0 | 10mm x 10mm 64pin | RA4M2 |
| R7FA4E10B2CFM#BA0 | 10mm x 10mm 64pin | RA4E1 |
| R7FA4E10D2CFM#BA0 | 10mm x 10mm 64pin | RA4E1 |
| R7FA4M2AC3CFM#BA0 | 10mm x 10mm 64pin | RA4M2 |
| R7FA4M2AB3CFP#BA0 | 14mm x 14mm 100pin | RA4M2 |
| R7FA4M2AC3CFP#BA0 | 14mm x 14mm 100pin | RA4M2 |
| R7FA4M2AD3CFP#BA0 | 14mm x 14mm 100pin | RA4M2 |