# Product Change Notice (PCN)

**Subject:** Addition of production sites and material changes for RH850/F1K Series
**Publication Date:** 12/9/2024
**Effective Date:** 7/1/2025
**Revision Description:** Initial Release
**Description of Change:**

**Renesas plans to add the following production sites for RH850/F1K Series.**

1.Wafer Process (WP) and Wafer Test (WT): Naka Factory
For both Suzhou Factory and Nishiki Factory, ϕ 20umCu-wire and mold resin for ϕ 20um Cu-wire will be used for Assembly Process of products whose Wafer Process is produced at Naka.
2.Back Grind (BG) and Dicing (DC): Oita Factory
3.Assembly and Final Test (FT): Nishiki Factory
The package types of additional Oita-Nishiki products are only LQFP144pin and 100pin.
The production site of 176pin is only Suzhou.

Related items depending on addition of production sites and material changes are as follows:

| Item | Current | Additional Production Site | | | |
|---|---|---|---|---|---|
| WP Site | TSMC | Naka | Naka | Naka | Naka |
| WT Site | TeraPower | Naka | TeraPower | Naka | TeraPower |
| BG/DC Site | Suzhou | Suzhou | Suzhou | Oita | Oita |
| Assembly /FT Site | Suzhou | Suzhou | Suzhou | Nishiki | Nishiki |
| Wire | ϕ 23um Cu-wire | ϕ 20um Cu-wire | | | |
| Mold Resin | Mold Resin for ϕ 23um Cu-wire | Mold Resin for ϕ 20um Cu-wire | | | |
| Applicable PKG | 176, 144 and 100pin | 176, 144 and 100pin | | 144 and 100pin | |

Renesas will determine allocations of production sites based on each production capacity.

**Affected Product List:**
Refer to “Product List” in “Appendix”.

**Reason for Change:**
For the stable supply of products.

**Impact on Fit, Form, Function, Quality & Reliability:**
The change will have no impact on the form, fit, function, quality and reliability of the devices.

**Product Identification:**
You can identify each product by checking Mark or Label and refer to “Appendix” for details.

**Qualification Status:**
Refer to "Q100 Qualification Test Results” in "Appendix".

**Sample Availability Date:**
3/1/2025

**Device Material Declaration:**
Please contact Renesas' sales representatives.

Note:

1. Acknowledgement must be received by Renesas within 30 days or Renesas will consider the change as approved.

2. If timely acknowledgement is provided by Customer, then Customer shall have 90 days from the date of receipt of this PCN to make any objections to this 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.

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.

## Appendix
## Product List
### RH850/F1K Series (LQFP144 and 100pin)

| | | | |
|---|---|---|---|
| R7F7015423AFP-C#AA3 | R7F7015633AFP-C#KA3 | R7F7016023AFP-C#BA3 | R7F7016133AFP-C#AA3 |
| R7F7015423AFP-C#KA3 | R7F7015633AFP-C#BA3 | R7F7016024AFP-C#AA3 | R7F7016133AFP-C#KA3 |
| R7F7015423AFP-C#BA3 | R7F7015634AFP-C#AA3 | R7F7016024AFP-C#KA3 | R7F7016133AFP-C#BA3 |
| R7F7015424AFP-C#AA3 | R7F7015634AFP-C#KA3 | R7F7016024AFP-C#BA3 | R7F7016134AFP-C#AA3 |
| R7F7015424AFP-C#KA3 | R7F7015634AFP-C#BA3 | R7F7016033AFP-C#AA3 | R7F7016134AFP-C#KA3 |
| R7F7015424AFP-C#BA3 | R7F7015803AFP-C#AA3 | R7F7016033AFP-C#KA3 | R7F7016134AFP-C#BA3 |
| R7F7015433AFP-C#AA3 | R7F7015803AFP-C#KA3 | R7F7016033AFP-C#BA3 | R7F7016203AFP-C#AA3 |
| R7F7015433AFP-C#KA3 | R7F7015803AFP-C#BA3 | R7F7016034AFP-C#AA3 | R7F7016203AFP-C#KA3 |
| R7F7015433AFP-C#BA3 | R7F7015804AFP-C#AA3 | R7F7016034AFP-C#KA3 | R7F7016203AFP-C#BA3 |
| R7F7015434AFP-C#AA3 | R7F7015804AFP-C#KA3 | R7F7016034AFP-C#BA3 | R7F7016204AFP-C#AA3 |
| R7F7015434AFP-C#KA3 | R7F7015804AFP-C#BA3 | R7F7016103AFP-C#AA3 | R7F7016204AFP-C#KA3 |
| R7F7015434AFP-C#BA3 | R7F7015813AFP-C#AA3 | R7F7016103AFP-C#KA3 | R7F7016204AFP-C#BA3 |
| R7F7015603AFP-C#AA3 | R7F7015813AFP-C#KA3 | R7F7016103AFP-C#BA3 | R7F7016213AFP-C#AA3 |
| R7F7015603AFP-C#KA3 | R7F7015813AFP-C#BA3 | R7F7016104AFP-C#AA3 | R7F7016213AFP-C#KA3 |
| R7F7015603AFP-C#BA3 | R7F7015814AFP-C#AA3 | R7F7016104AFP-C#KA3 | R7F7016213AFP-C#BA3 |
| R7F7015604AFP-C#AA3 | R7F7015814AFP-C#KA3 | R7F7016104AFP-C#BA3 | R7F7016214AFP-C#AA3 |
| R7F7015604AFP-C#KA3 | R7F7015814AFP-C#BA3 | R7F7016113AFP-C#AA3 | R7F7016214AFP-C#KA3 |
| R7F7015604AFP-C#BA3 | R7F7015823AFP-C#AA3 | R7F7016113AFP-C#KA3 | R7F7016214AFP-C#BA3 |
| R7F7015613AFP-C#AA3 | R7F7015823AFP-C#KA3 | R7F7016113AFP-C#BA3 | R7F7016223AFP-C#AA3 |
| R7F7015613AFP-C#KA3 | R7F7015823AFP-C#BA3 | R7F7016114AFP-C#AA3 | R7F7016223AFP-C#KA3 |
| R7F7015613AFP-C#BA3 | R7F7015824AFP-C#AA3 | R7F7016114AFP-C#KA3 | R7F7016223AFP-C#BA3 |
| R7F7015614AFP-C#AA3 | R7F7015824AFP-C#KA3 | R7F7016114AFP-C#AAT | R7F7016224AFP-C#AA3 |
| R7F7015614AFP-C#KA3 | R7F7015824AFP-C#BA3 | R7F7016114AFP-C#KAT | R7F7016224AFP-C#KA3 |
| R7F7015614AFP-C#BA3 | R7F7015833AFP-C#AA3 | R7F7016114AFP-C#BA3 | R7F7016224AFP-C#BA3 |
| R7F7015623AFP-C#AA3 | R7F7015833AFP-C#KA3 | R7F7016114AFP-C#BAT | R7F7016233AFP-C#AA3 |
| R7F7015623AFP-C#KA3 | R7F7015833AFP-C#BA3 | R7F7016123AFP-C#AA3 | R7F7016233AFP-C#KA3 |
| R7F7015623AFP-C#BA3 | R7F7015834AFP-C#AA3 | R7F7016123AFP-C#KA3 | R7F7016233AFP-C#BA3 |
| R7F7015624AFP-C#AA3 | R7F7015834AFP-C#KA3 | R7F7016123AFP-C#BA3 | R7F7016234AFP-C#AA3 |
| R7F7015624AFP-C#KA3 | R7F7015834AFP-C#BA3 | R7F7016124AFP-C#AA3 | R7F7016234AFP-C#KA3 |
| R7F7015624AFP-C#BA3 | R7F7016023AFP-C#AA3 | R7F7016124AFP-C#KA3 | R7F7016234AFP-C#BA3 |
| R7F7015633AFP-C#AA3 | R7F7016023AFP-C#KA3 | R7F7016124AFP-C#BA3 | |

### RH850/F1K Series (LQFP176pin)

| | | | |
|---|---|---|---|
| R7F7015463AFP-C#AA3 | R7F7015573AFP-C#TA3 | R7F7015674AFP-C#BA3 | R7F7015873AFP-C#AA3 |
| R7F7015463AFP-C#BA3 | R7F7015574AFP-C#AA3 | R7F7015674AFP-C#TA3 | R7F7015873AFP-C#BA3 |
| R7F7015463AFP-C#TA3 | R7F7015574AFP-C#BA3 | R7F7015773AFP-C#AA3 | R7F7015873AFP-C#TA3 |

| | | | |
|---|---|---|---|
| R7F7015464AFP-C#AA3 | R7F7015574AFP-C#TA3 | R7F7015773AFP-C#BA3 | R7F7015874AFP-C#AA3 |
| R7F7015464AFP-C#BA3 | R7F7015663AFP-C#AA3 | R7F7015773AFP-C#TA3 | R7F7015874AFP-C#BA3 |
| R7F7015464AFP-C#TA3 | R7F7015663AFP-C#BA3 | R7F7015774AFP-C#AA3 | R7F7015874AFP-C#TA3 |
| R7F7015473AFP-C#AA3 | R7F7015663AFP-C#TA3 | R7F7015774AFP-C#BA3 | R7F7015973AFP-C#AA3 |
| R7F7015473AFP-C#BA3 | R7F7015664AFP-C#AA3 | R7F7015774AFP-C#TA3 | R7F7015973AFP-C#BA3 |
| R7F7015473AFP-C#TA3 | R7F7015664AFP-C#BA3 | R7F7015863AFP-C#AA3 | R7F7015973AFP-C#TA3 |
| R7F7015474AFP-C#AA3 | R7F7015664AFP-C#TA3 | R7F7015863AFP-C#BA3 | R7F7015974AFP-C#AA3 |
| R7F7015474AFP-C#BA3 | R7F7015673AFP-C#AA3 | R7F7015863AFP-C#TA3 | R7F7015974AFP-C#BA3 |
| R7F7015474AFP-C#TA3 | R7F7015673AFP-C#BA3 | R7F7015864AFP-C#AA3 | R7F7015974AFP-C#TA3 |
| R7F7015573AFP-C#AA3 | R7F7015673AFP-C#TA3 | R7F7015864AFP-C#BA3 | |
| R7F7015573AFP-C#BA3 | R7F7015674AFP-C#AA3 | R7F7015864AFP-C#TA3 | |

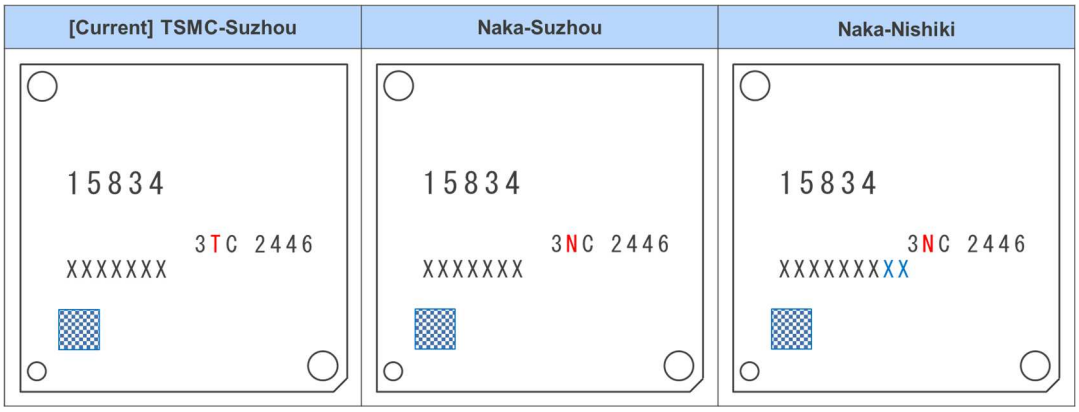
## Mark Specification:

Mark Example: R7F7015834AFP-C#BA3 (F1K 144pin)

The red character is different between TSMC and Naka products (TSMC: T, Naka: N).

The digit number of Trace Code is different between Suzhou and Nishiki products (Suzhou: 7digits, Nishiki: 9digits).

(The blue characters)



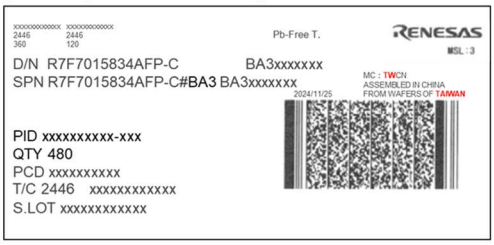

## Label Specification:

Label Example: R7F7015834AFP-C#BA3 (F1K 144pin)

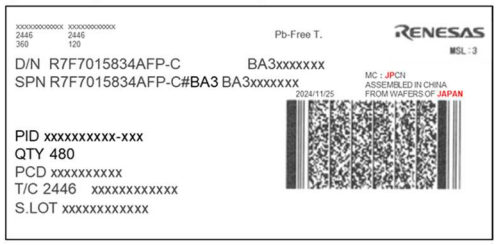
The red characters are different between TSMC and Naka products.

The blue characters are different between Suzhou and Nishiki products.

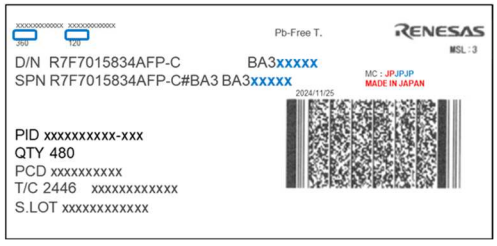
[Current] WP : TSMC, Assy/FT : Suzhou




[Addition] WP : Naka, Assy/FT : Suzhou




[Addition] WP : Naka, Assy/FT : Nishiki




Naka : Renesas Semiconductor Manufacturing Co., Ltd. (Naka Factory)
Oita : Renesas Electronics Co., Ltd. (Oita Factory)
Nishiki : Renesas Electronics Co., Ltd. (Nishiki Factory)
Suzhou : Renesas Semiconductor (Suzhou) Co., Ltd.
TSMC : Taiwan Semiconductor Manufacturing Company Limited
TeraPower : TeraPower Technology Inc.

# Q100 Qualification Test Results

AEC-Q100-REV-H

[Note : Qualification tests were performed using a representative product with the same wafer process and the same package structure, and also using generic data.]

| Test | # | Reference | Test Conditions | | Lots | S.S. | Total | Results (Fail of Total) | Comments: (N/A =Not Applicable) |
|---|---|---|---|---|---|---|---|---|---|
| **TEST GROUP A – ACCELERATED ENVIRONMENT STRESS TESTS** | | | | | | | | | |
| PC | A1 | JESD22 A113<br>J-STD-020 | Preconditioning: (Test @ Rm)<br>SMD only; Moisture Preconditioning for THB/HAST, AC/UHST, TC, &PTC ; Peak Reflow Temp=260°C | | Min.MSL=3 | | | MSL=3 | - |
| THB ~~or HAST~~ | A2 | JESD22 A101 | Temperature Humidity Bias: (Test @ Rm/Hot)<br>Ta=85°C, RH=85%, 1000hrs | | 3 | 77 | 231 | 0 of 231 | - |
| ~~AC or~~ UHST ~~or TH~~ | A3 | JESD22 A118 | Unbiased Highly Accelerated Stree Test: (Test @ Rm)<br>Ta=110°C, 85% RH, 264h | | 3 | 77 | 231 | 0 of 231 | - |
| TC | A4 | JESD22 A104 | Temperature Cycle: (Test @ Hot)<br>Ta=-55°C to 150°C, 1000cyc | | 3 | 77 | 231 | 0 of 231<br>0 Fails after TC (WBP) | - |
| PTC | A5 | JESD22 A105 | Power Temperature Cycle: (Test @ Rm/Hot)<br>- | | - | - | - | - | N/A |
| HTSL | A6 | JESD22 A103 | High Temperature Storage Life: (Test @ Rm/Hot)<br>Ta=175°C, 500hrs | | 1 | 45 | 45 | 0 of 45 | - |
| **TEST GROUP B – ACCELERATED LIFETIME SIMULATION TESTS** | | | | | | | | | |
| HTOL | B1 | JESD22 A108 | High Temp Operating Life: (Test @ Rm/Cold/Hot)<br>Ta=150°C, 1000hrs | | 3 | 77 | 231 | 0 of 231 | - |
| ELFR | B2 | AEC-Q100-008 | Early Life Failure Rate: (Test @ Rm/Hot)<br>Ta=125°C, 48hrs | | 3 | 800 | 2400 | 0 of 2400 | - |
| EDR | B3 | AEC-Q100-005 | NVM Endurance & Data Retention Test: (Test @ Rm/Hot) | For HTOL | 3 | 77 | 231 | 0 of 231 | - |
| | | | | For HTSL | 1 | 45 | 45 | 0 of 45 | - |
| **TEST GROUP C – PACKAGE ASSEMBLY INTEGRITY TESTS** | | | | | | | | | |
| WBS | C1 | AEC-Q100-001<br>AEC-Q003 | Wire Bond Shear Test: (Cpk > 1.67) | | 30 bonds | 5 parts Min. | 30 bonds | 0 of 30bonds | Cpk>1.67 |
| WBP | C2 | Mil-STD-883 Method 2011<br>AEC-Q003 | Wire Bond Pull: (Cpk > 1.67); Each bonder used | | 30 bonds | 5 parts Min. | 30 bonds | 0 of 30bonds | Cpk>1.67 |
| SD | C3 | JESD22 B102<br>JSTD-002D | Solderability: (>95% coverage)<br>8 hr steam aging prior to testing | | 1 | 15 | 15 | 0 of 15 | - |
| PD | C4 | JESD22 B100,<br>JESD22 B108<br>AEC-Q003 | Physical Dimensions: (Cpk > 1.67) | | 3 | 10 | 30 | 0 of 30 | Cpk>1.67 |
| SBS | C5 | AEC-Q100-010<br>AEC-Q003 | Solder Ball Shear: (Cpk > 1.67); 5 balls from min. of 10 devices | | - | - | - | - | N/A |
| LI | C6 | JESD22 B105 | Lead Integrity: (No lead cracking or breaking); Through-hole only; 10 leads from each of 5 devices | | - | - | - | - | N/A |
| **TEST GROUP D – DIE FABRICATION RELIABILITY TESTS** | | | | | | | | | |
| EM | D1 | JESD61 | Electromigration: | | - | - | - | Pass | Confirmed by process TEG |
| TDDB | D2 | JESD35 | Time Dependant Dielectric Breakdown: | | - | - | - | Pass | Confirmed by process TEG |
| HCI | D3 | JESD60 & 28 | Hot Carrier Injection: | | - | - | - | Pass | Confirmed by process TEG |
| NBTI | D4 | JESD90 | Negative Bias Temperature Instability: | | - | - | - | Pass | Confirmed by process TEG |
| SM | D5 | JESD61,87 & 202 | Stress Migration: | | - | - | - | Pass | Confirmed by process TEG |

| Test | # | Reference | Test Conditions | Lots | S.S. | Total | Results (Fail of Total) | Comments: (N/A =Not Applicable) |
|---|---|---|---|---|---|---|---|---|
| **TEST GROUP E- ELECTRICAL VERIFICATION** | | | | | | | | |
| TEST | E1 | User/Supplier Specification | Pre and Post Stress Electrical Test: | All | All | All | 0 of All | - |
| HBM | E2 | AEC-Q100-002 | Electrostatic Discharge, Human Body Model: (Test @ Rm/Hot); (2KV HBM / Class 2 or better) | 1 | 3 | 3 | 0 of 3 ESD Level= HBM:2 | HBM>2KV |
| CDM | E3 | AEC-Q100-011 | Electrostatic Discharge, Charged Device Model: (Test @ Rm/Hot); (750V corner leads, 500V all other leads / Class C4B or better) | 1 | 3 | 3 | 0 of 3 ESD Level= CDM:C4B | Corner leads: 750V Pass<br>All other leads:500V Pass |
| LU | E4 | AEC-Q100-004 | Latch-Up: (Test @ Rm/Hot) | 1 | 6 | 6 | 0 of 6 | - |
| ED | E5 | AEC-Q100-009<br>AEC-Q003 | Electrical Distributions: (Test @ Rm/Hot/Cold) (where applicable, Cpk>1.67) | 3 | 30 | 90 | Cpk>1.67 | - |
| FG | E6 | AEC-Q100-007 | Fault Grading: | - | - | - | >98% | - |
| CHAR | E7 | AEC-Q003 | Characterization: (Test @ Rm/Hot/Cold) | - | - | - | Pass | According to Renesas standard procedure |
| EMC | E9 | SAE J1752/3 | Electromagnetic Compatibility (Radiated Emissions) | 1 | 1 | 1 | 0 of 1 | - |
| SC | E10 | AEC Q100-012 | Short Circuit Characterization | - | - | - | - | N/A |
| SER | E11 | JESD89-1<br>JESD89-2<br>JESD89-3 | Soft Error Rate | 1 | 3 | 3 | Pass | - |
| LF | E12 | AEC-Q005 | Lead (Pb) Free: (see AEC-Q005) | - | - | - | Pass | Solderability: See SD (C3) result. Solder heat resistance: N/A (Wave Solder is Not recommended.) Whisker: Performed on product TEG with test method based on JESD201. |
| **TEST GROUP F – DEFECT SCREENING TESTS** | | | | | | | | |
| PAT | F1 | AEC-Q001 | Process Average Testing: (see AEC-Q001) | All | All | All | Reject units outside PAT limits | Apply to mass production according to Renesas standard procedure |
| SBA | F2 | AEC-Q002 | Statistical Bin/Yield Analysis: (see AEC-Q002) | All | All | All | Reject units outside criteria | Apply to mass production according to Renesas standard procedure |
| **TEST GROUP G – CAVITY PACKAGE INTEGRITY TESTS (for Ceramic Package testing only)** | | | | | | | | |
| MS | G1 | JESD22 B104 | Mechanical Shock: (Test @ Rm) | - | - | - | - | N/A |
| VFV | G2 | JESD22 B103 | Variable Frequency Vibration: (Test @ Rm) | - | - | - | - | N/A |
| CA | G3 | MIL-STD-883 Method 2001 | Constant Acceleration: (Test @ Rm) | - | - | - | - | N/A |
| GFL | G4 | MIL-STD-883 Method 1014 | Gross and Fine Leak: | - | - | - | - | N/A |
| DROP | G5 | ---------- | Drop Test: (Test @ Rm)<br>MEMS cavity parts only. Drop part on each of 6 axes once from a height of 1.2m onto a concrete surface. | - | - | - | - | N/A |
| LT | G6 | MIL-STD-883 Method 2004 | Lid Torque: | - | - | - | - | N/A |
| DS | G7 | MIL-STD-883 Method 2019 | Die Shear: | - | - | - | - | N/A |
| IWV | G8 | MIL-STD-883 Method 1018 | Internal Water Vapor: | - | - | - | - | N/A |