Report No. MCR-25-0257-B
October 01,2026

# RELIABILITY REPORT

GROUP : RA4C1

DEVICE : R7FA4C1XXX

QUALITY GRADE : Standard

Quality Assurance Div.
Renesas Electronics Corporation

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Summary of Reliability Test Results for QFP Package (MSL3)

| Test Item | Reference | Test Conditions | Results Failure/Size | Comment |
|---|---|---|---|---|
| High Temperature Operating Life (HTOL) | JESD22-A108 | Ta=125 ℃, Vccmax, 1000 hrs | 0/231 | 3 lots or more |
| High Temperature Storage Life (HTSL) | JESD22-A103 | Ta=150 ℃, 1000 hrs | 0/75 | 3 lots or more |
| Temperature Humidity bias (THB) (*1) | JESD22-A101 | Ta=85 ℃, RH=85 %, Vccmax, 1000 hrs | 0/75 | 3 lots or more |
| Temperature Humidity bias (HAST) (*1) | JESD22-A110 | Ta=110 ℃, RH=85 %, Vccmax, 264 hrs | 0/75 | 3 lots or more |
| Temperature Cycling (TC) (*1) | JESD22-A104 | Ta=-65 ℃ to 150 ℃ , 500 cycles | 0/75 | 3 lots or more |
| Latch-Up (LU) | JESD78 | Pulse Current Injection, I=+/-150 mA | 0/3 | |
| Electrostatic discharge (ESD-HBM) | JS-001 | 1.5 kΩ, 100 pF, +/-2000 V, 1 time | 0/3 | Class: 2 |
| Electrostatic discharge (ESD-CDM) | JS-002 | +/-500 V,1 time | 0/3 | Class: C2a |
| Solderability (SD) | J-STD-002 | 245 ℃, 5 s, Solder coverage ≥95 % | 0/5 | |
| Resistance to Soldering Heat (MSL3) | JESD22-A113, J-STD-020 | MSL3(Moisture Sensitivity Level 3)<br>Peak Reflow Temp=260 °C | Pass | Verified after MSL preconditioning; applied to applicable reliability tests (*1). |

Note :
- (*1) With preconditioning per JESD22-A113, MSL 3
- It is tested to confirm that all the samples are satisfied with an individual product specification.
- Basically qualification tests were performed using a representative product with the same wafer process and the same package structure .

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The failure rate of the device in an actual use condition can be estimated by the below procedure.

**・Equation for the failure rate estimation (λ)**

$$\lambda = \lambda b \times \pi T \ (FIT)$$

①Unique failure rate (λb)

λb= 4.1 FIT

Unique failure rate at Ta=55 ℃ using 60 % confidence level.

②Temperature term (πT)

$$\pi T = exp\{11600 \times Ea \times (1/(273+55) - 1/(273+Ta))\}$$

Ea： Activation energy（eV)
Ta： Ambient temperature（℃)

| πT simplified chart as Ea=0.7 eV | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ta (℃) | 40 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 100 | 110 |
| πT | 0.31 | 0.68 | 1 | 1.45 | 2.08 | 2.95 | 4.15 | 5.77 | 7.96 | 10.88 | 19.82 | 34.99 |

**・MTTF ( Mean Time To Failure )**

$$MTTF = 1/\lambda$$

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Reference about Renesas package code

| Package type | | Package code *1 |
|---|---|---|
| Lead type plastic package | QFP | PxQP |
| | SOP | PxSP |
| Non-lead type plastic package | QFN | PxQN |
| Grid array type plastic package | BGA | PxBG |
| | LGA | PxLG |
| Wafer level chip scale package | WLCSP | SxBG |

*1. First four digit

Table. Product list

| No | Product part number | Package code | MSL | No | Product part number | Package code | MSL |
|---|---|---|---|---|---|---|---|
| 1 | R7FA4C1BB3CFM | PLQP0064K* | MSL3 | 51 | | | |
| 2 | R7FA4C1BD3CFM | PLQP0064K* | MSL3 | 52 | | | |
| 3 | R7FA4C1BB3CFP | PLQP0100K* | MSL3 | 53 | | | |
| 4 | R7FA4C1BD3CFP | PLQP0100K* | MSL3 | 54 | | | |
| 5 | | | | 55 | | | |
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| 50 | | | | 100 | | | |

Note: MSL stands for Moisture Sensitivity Level.

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