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# RENESAS SEMICONDUCTOR RELIABILITY REPORT 

DEVICE: R1RW0416DSB-2PR\#D1 R1RW0416DSB-2PR\#S1

APPLICATION: Standard

Quality Assurance Div.
Renesas Electronics Corporation

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Reliability test result

| Test Items | Reference | Test Conditions | Results Reject/Size |
| :---: | :---: | :---: | :---: |
| High Temperature Operating Life | JESD22-A108 | $\mathrm{Ta}=125^{\circ} \mathrm{C}, \mathrm{Vcc}$ max, 1000 h | 0/231 |
| Low Temperature Operating Life | JESD22-A108 | $\mathrm{Tj}=-40^{\circ} \mathrm{C}, \mathrm{Vcc}$ max, 1000 h | 0/32 |
| High Temperature Storage Life | JESD22-A103 | $\mathrm{Ta}=150^{\circ} \mathrm{C}, 1000 \mathrm{~h}$ | 0/75 |
| Temperature Humidity Bias (HAST) | JESD22-A110 | $\mathrm{Ta}=130^{\circ} \mathrm{C}, 85 \% \mathrm{RH}, \mathrm{Vcc}$ max, 96 h | 0/75 |
| Temperature Cycling | JESD22-A104 | $\mathrm{Ta}=-65^{\circ} \mathrm{C}$ to $+150{ }^{\circ} \mathrm{C}, 300$ cycles | 0/75 |
| Unbiased Temperature Humidity <br> (Unbiased HAST) | JESD22-A118 | $\mathrm{Ta}=130^{\circ} \mathrm{C}, 85 \% \mathrm{RH}, 96 \mathrm{~h}$ | 0/75 |
| Resistance to Soldering Heat | JESD22-A113, J-STD-020 | Bake: $125^{\circ} \mathrm{C}, 24 \mathrm{~h}$ <br> Moisture Soak: $30^{\circ} \mathrm{C} 70 \% \mathrm{RH}, 192 \mathrm{~h}$ (JEDEC-MSL3 Equivalent) <br> Reflow: $260^{\circ} \mathrm{C}$ peak, $255^{\circ} \mathrm{C} 30 \mathrm{~s}, 3$ times | 0/33 |
| Solderability | J-STD-002 | $\begin{aligned} & 245^{\circ} \mathrm{C}, 5 \mathrm{~s} \\ & 95 \% \text { solder coverage minimum } \end{aligned}$ | 0/5 |
| Electrostatic discharge (HBM Method) | JS-001 | $\mathrm{C}=100 \mathrm{pF}, \mathrm{R}=1.5 \mathrm{k} \Omega, \pm 1000 \mathrm{~V}$ | 0/3 |
| Electrostatic discharge (CDM Method) | JESD22-C101 | $\pm 500 \mathrm{~V}$ | 0/3 |
| Latch-up <br> (I-Test) | JESD78 | $\pm 150 \mathrm{~mA}$ | 0/3 |
| Tin Whisker Acceptance (Temperature Humidity Storage) | JESD22-A121 | $\mathrm{Ta}=30^{\circ} \mathrm{C}, 60 \% \mathrm{RH}, 4000 \mathrm{~h}$ | 0/3 |
| Tin Whisker Acceptance (High Temperature Humidity Storage) | JESD22-A121 | $\mathrm{Ta}=55^{\circ} \mathrm{C}, 85 \% \mathrm{RH}, 4000 \mathrm{~h}$ | 0/3 |
| Tin Whisker Acceptance (Temperature Cycling) | JESD22-A121 | $\mathrm{Ta}=-40 / 85^{\circ} \mathrm{C}, 1500$ cycles | 0/3 |
| Estimated Failure Rate | - | 8.1 FIT or less Prerequisites: $\mathrm{Ta}=55^{\circ} \mathrm{C}$, Ea $=0.5 \mathrm{eV}$, C.L. |  |
| System Soft Error Testing (SSER) | JESD89-1 | 218 FIT/Mbit or less (no error) <br> Prerequisites: C.L. $=60 \%$ |  |

Reliability test results may include data from family representative products. MSL Preconditioning was performed prior to HAST, Temperature Cycling and Unbiased HAST.

The Criteria shall follow the electrical characteristics in Specifications, except for Solderability and SSER.

Preconditioning Details: Bake ( $125^{\circ} \mathrm{C}$, 24 h ) -> Moisture Soak ( $30^{\circ} \mathrm{C} 70 \% \mathrm{RH}, 192 \mathrm{~h}$ ) -> Reflow $\left(260^{\circ} \mathrm{C}\right.$ peak, 3 times)

