Report No. MCR-25-0203-B
October 01,2026

RELIABILITY REPORT

GROUP : RA8P1

DEVICE : R7KA8P1XXX

QUALITY GRADE : Standard

Quality Assurance Div.
Renesas Electronics Corporation

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Summary of Reliability Test Results for BGA Package (MSL3)

Test Item	Reference	Test Conditions	Results Failure/Size	Comment
High Temperature Operating Life (HTOL)	JESD22-A108	Tj=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 (HAST) (*1)	JESD22-A110	Ta=110 ℃, RH=85 %, Vccmax, 264 hrs	0/75	3 lots or more
Temperature Cycling (TC) (*1)	JESD22-A104	Ta=-55 ℃ to 125 ℃ , 700 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
Resistance to Soldering Heat (MSL3)	JESD22-A113, J-STD-020	MSL3(Moisture Sensitivity Level 3) 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= 0.2 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	R7KA8P1ADDCAB	PLBG0224J*	MSL3	51			
2	R7KA8P1ADLCAB	PLBG0224J*	MSL3	52			
3	R7KA8P1AFDCAB	PLBG0224J*	MSL3	53			
4	R7KA8P1AFLCAB	PLBG0224J*	MSL3	54			
5	R7KA8P1BDDCAB	PLBG0224J*	MSL3	55			
6	R7KA8P1BDLCAB	PLBG0224J*	MSL3	56			
7	R7KA8P1BFDCAB	PLBG0224J*	MSL3	57			
8	R7KA8P1BFLCAB	PLBG0224J*	MSL3	58			
9	R7KA8P1JFDCAB	PLBG0224J*	MSL3	59			
10	R7KA8P1JFLCAB	PLBG0224J*	MSL3	60			
11	R7KA8P1KFDCAB	PLBG0224J*	MSL3	61			
12	R7KA8P1KFLCAB	PLBG0224J*	MSL3	62			
13	R7KA8P1ADDCAC	PLBG0289J*	MSL3	63			
14	R7KA8P1ADLCAC	PLBG0289J*	MSL3	64			
15	R7KA8P1AFDCAC	PLBG0289J*	MSL3	65			
16	R7KA8P1AFLCAC	PLBG0289J*	MSL3	66			
17	R7KA8P1BDDCAC	PLBG0289J*	MSL3	67			
18	R7KA8P1BDLCAC	PLBG0289J*	MSL3	68			
19	R7KA8P1BFDCAC	PLBG0289J*	MSL3	69			
20	R7KA8P1BFLCAC	PLBG0289J*	MSL3	70			
21	R7KA8P1JFDCAC	PLBG0289J*	MSL3	71			
22	R7KA8P1JFLCAC	PLBG0289J*	MSL3	72			
23	R7KA8P1KFDCAC	PLBG0289J*	MSL3	73			
24	R7KA8P1KFLCAC	PLBG0289J*	MSL3	74			
25				75			
26				76			
27				77			
28				78			
29				79			
30				80			
31				81			
32				82			
33				83			
34				84			
35				85			
36				86			
37				87			
38				88			
39				89			
40				90			
41				91			
42				92			
43				93			
44				94			
45				95			
46				96			
47				97			
48				98			
49				99			
50				100			

Note: MSL stands for Moisture Sensitivity Level.

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