Report No. MCR-22-0317-A
June 11,2026

RENESAS SEMICONDUCTOR RELIABILITY REPORT

GROUP : RX65N

DEVICE : R5F565NXXX

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)	JESD22-C101	+/-500 V,1 time	0/3	Class: C2
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) Peak Reflow Temp=260 ℃	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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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	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	0/25	
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)	JESD22-C101	+/-500 V,1 time	0/3	Class: C2
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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Summary of Reliability Test Results for LGA 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	0/25	
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)	JESD22-C101	+/-500 V,1 time	0/3	Class: C2
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= 0.007 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
1	R5F565NCDDBG	PLBG0176G*	MSL3
2	R5F565NCDGBG	PLBG0176G*	MSL3
3	R5F565NCHDBG	PLBG0176G*	MSL3
4	R5F565NCHGBG	PLBG0176G*	MSL3
5	R5F565NEDDBG	PLBG0176G*	MSL3
6	R5F565NEDGBG	PLBG0176G*	MSL3
7	R5F565NEHDBG	PLBG0176G*	MSL3
8	R5F565NEHGBG	PLBG0176G*	MSL3
9	R5F565N4ADFB	PLQP0144K*	MSL3
10	R5F565N4AGFB	PLQP0144K*	MSL3
11	R5F565N4BDFB	PLQP0144K*	MSL3
12	R5F565N4BGFB	PLQP0144K*	MSL3
13	R5F565N4EDFB	PLQP0144K*	MSL3
14	R5F565N4EGFB	PLQP0144K*	MSL3
15	R5F565N4FDFB	PLQP0144K*	MSL3
16	R5F565N4FGFB	PLQP0144K*	MSL3
17	R5F565N7ADFB	PLQP0144K*	MSL3
18	R5F565N7AGFB	PLQP0144K*	MSL3
19	R5F565N7BDFB	PLQP0144K*	MSL3
20	R5F565N7BGFB	PLQP0144K*	MSL3
21	R5F565N7EDFB	PLQP0144K*	MSL3
22	R5F565N7EGFB	PLQP0144K*	MSL3
23	R5F565N7FDFB	PLQP0144K*	MSL3
24	R5F565N7FGFB	PLQP0144K*	MSL3
25	R5F565N9ADFB	PLQP0144K*	MSL3
26	R5F565N9AGFB	PLQP0144K*	MSL3
27	R5F565N9BDFB	PLQP0144K*	MSL3
28	R5F565N9BGFB	PLQP0144K*	MSL3
29	R5F565N9EDFB	PLQP0144K*	MSL3
30	R5F565N9EGFB	PLQP0144K*	MSL3
31	R5F565N9FDFB	PLQP0144K*	MSL3
32	R5F565N9FGFB	PLQP0144K*	MSL3
33	R5F565NCDDFB	PLQP0144K*	MSL3
34	R5F565NCDGFB	PLQP0144K*	MSL3
35	R5F565NCHDFB	PLQP0144K*	MSL3
36	R5F565NCHGFB	PLQP0144K*	MSL3
37	R5F565NEDDFB	PLQP0144K*	MSL3
38	R5F565NEDGFB	PLQP0144K*	MSL3
39	R5F565NEHDFB	PLQP0144K*	MSL3
40	R5F565NEHGFB	PLQP0144K*	MSL3
41	R5F565NCDDFC	PLQP0176K*	MSL3
42	R5F565NCDGFC	PLQP0176K*	MSL3
43	R5F565NCHDFC	PLQP0176K*	MSL3
44	R5F565NCHGFC	PLQP0176K*	MSL3
45	R5F565NEDDFC	PLQP0176K*	MSL3
46	R5F565NEDGFC	PLQP0176K*	MSL3
47	R5F565NEHDFC	PLQP0176K*	MSL3
48	R5F565NEHGFC	PLQP0176K*	MSL3
49	R5F565N4ADFP	PLQP0100K*	MSL3
50	R5F565N4AGFP	PLQP0100K*	MSL3
51	R5F565N4BDFP	PLQP0100K*	MSL3
52	R5F565N4BGFP	PLQP0100K*	MSL3
53	R5F565N4EDFP	PLQP0100K*	MSL3
54	R5F565N4EGFP	PLQP0100K*	MSL3
55	R5F565N4FDFP	PLQP0100K*	MSL3
56	R5F565N4FGFP	PLQP0100K*	MSL3
57	R5F565N7ADFP	PLQP0100K*	MSL3
58	R5F565N7AGFP	PLQP0100K*	MSL3
59	R5F565N7BDFP	PLQP0100K*	MSL3
60	R5F565N7BGFP	PLQP0100K*	MSL3
61	R5F565N7EDFP	PLQP0100K*	MSL3
62	R5F565N7EGFP	PLQP0100K*	MSL3
63	R5F565N7FDFP	PLQP0100K*	MSL3
64	R5F565N7FGFP	PLQP0100K*	MSL3
65	R5F565N9ADFP	PLQP0100K*	MSL3
66	R5F565N9AGFP	PLQP0100K*	MSL3
67	R5F565N9BDFP	PLQP0100K*	MSL3
68	R5F565N9BGFP	PLQP0100K*	MSL3
69	R5F565N9EDFP	PLQP0100K*	MSL3
70	R5F565N9EGFP	PLQP0100K*	MSL3
71	R5F565N9FDFP	PLQP0100K*	MSL3
72	R5F565N9FGFP	PLQP0100K*	MSL3
73	R5F565NCDDFP	PLQP0100K*	MSL3
74	R5F565NCDGFP	PLQP0100K*	MSL3
75	R5F565NCHDFP	PLQP0100K*	MSL3
76	R5F565NCHGFP	PLQP0100K*	MSL3
77	R5F565NEDDFP	PLQP0100K*	MSL3
78	R5F565NEDGFP	PLQP0100K*	MSL3
79	R5F565NEHDFP	PLQP0100K*	MSL3
80	R5F565NEHGFP	PLQP0100K*	MSL3
81	R5F565NCDDLC	PTLG0177K*	MSL3
82	R5F565NCDGLC	PTLG0177K*	MSL3
83	R5F565NCHDLC	PTLG0177K*	MSL3
84	R5F565NCHGLC	PTLG0177K*	MSL3
85	R5F565NEDDLC	PTLG0177K*	MSL3
86	R5F565NEDGLC	PTLG0177K*	MSL3
87	R5F565NEHDLC	PTLG0177K*	MSL3
88	R5F565NEHGLC	PTLG0177K*	MSL3
89	R5F565N4ADLJ	PTLG0100J*	MSL3
90	R5F565N4AGLJ	PTLG0100J*	MSL3
91	R5F565N4BDLJ	PTLG0100J*	MSL3
92	R5F565N4BGLJ	PTLG0100J*	MSL3
93	R5F565N4EDLJ	PTLG0100J*	MSL3
94	R5F565N4EGLJ	PTLG0100J*	MSL3
95	R5F565N4FDLJ	PTLG0100J*	MSL3
96	R5F565N4FGLJ	PTLG0100J*	MSL3
97	R5F565N7ADLJ	PTLG0100J*	MSL3
98	R5F565N7AGLJ	PTLG0100J*	MSL3
99	R5F565N7BDLJ	PTLG0100J*	MSL3
100	R5F565N7BGLJ	PTLG0100J*	MSL3

Note: MSL stands for Moisture Sensitivity Level.

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Table. Product list

No	Product part number	Package code	MSL	No	Product part number	Package code	MSL
101	R5F565N7EDLJ	PTLG0100J*	MSL3	161			
102	R5F565N7EGLJ	PTLG0100J*	MSL3	162			
103	R5F565N7FDLJ	PTLG0100J*	MSL3	163			
104	R5F565N7FGLJ	PTLG0100J*	MSL3	164			
105	R5F565N9ADLJ	PTLG0100J*	MSL3	165			
106	R5F565N9AGLJ	PTLG0100J*	MSL3	166			
107	R5F565N9BDLJ	PTLG0100J*	MSL3	167			
108	R5F565N9BGLJ	PTLG0100J*	MSL3	168			
109	R5F565N9EDLJ	PTLG0100J*	MSL3	169			
110	R5F565N9EGLJ	PTLG0100J*	MSL3	170			
111	R5F565N9FDLJ	PTLG0100J*	MSL3	171			
112	R5F565N9FGLJ	PTLG0100J*	MSL3	172			
113	R5F565NCDDLJ	PTLG0100J*	MSL3	173			
114	R5F565NCDGLJ	PTLG0100J*	MSL3	174			
115	R5F565NCHDLJ	PTLG0100J*	MSL3	175			
116	R5F565NCHGLJ	PTLG0100J*	MSL3	176			
117	R5F565NEDDLJ	PTLG0100J*	MSL3	177			
118	R5F565NEDGLJ	PTLG0100J*	MSL3	178			
119	R5F565NEHDLJ	PTLG0100J*	MSL3	179			
120	R5F565NEHGLJ	PTLG0100J*	MSL3	180			
121	R5F565N4ADLK	PTLG0145K*	MSL3	181			
122	R5F565N4AGLK	PTLG0145K*	MSL3	182			
123	R5F565N4BDLK	PTLG0145K*	MSL3	183			
124	R5F565N4BGLK	PTLG0145K*	MSL3	184			
125	R5F565N4EDLK	PTLG0145K*	MSL3	185			
126	R5F565N4EGLK	PTLG0145K*	MSL3	186			
127	R5F565N4FDLK	PTLG0145K*	MSL3	187			
128	R5F565N4FGLK	PTLG0145K*	MSL3	188			
129	R5F565N7ADLK	PTLG0145K*	MSL3	189			
130	R5F565N7AGLK	PTLG0145K*	MSL3	190			
131	R5F565N7BDLK	PTLG0145K*	MSL3	191			
132	R5F565N7BGLK	PTLG0145K*	MSL3	192			
133	R5F565N7EDLK	PTLG0145K*	MSL3	193			
134	R5F565N7EGLK	PTLG0145K*	MSL3	194			
135	R5F565N7FDLK	PTLG0145K*	MSL3	195			
136	R5F565N7FGLK	PTLG0145K*	MSL3	196			
137	R5F565N9ADLK	PTLG0145K*	MSL3	197			
138	R5F565N9AGLK	PTLG0145K*	MSL3	198			
139	R5F565N9BDLK	PTLG0145K*	MSL3	199			
140	R5F565N9BGLK	PTLG0145K*	MSL3	200			
141	R5F565N9EDLK	PTLG0145K*	MSL3	201			
142	R5F565N9EGLK	PTLG0145K*	MSL3	202			
143	R5F565N9FDLK	PTLG0145K*	MSL3	203			
144	R5F565N9FGLK	PTLG0145K*	MSL3	204			
145	R5F565NCDDLK	PTLG0145K*	MSL3	205			
146	R5F565NCDGLK	PTLG0145K*	MSL3	206			
147	R5F565NCHDLK	PTLG0145K*	MSL3	207			
148	R5F565NCHGLK	PTLG0145K*	MSL3	208			
149	R5F565NEDDLK	PTLG0145K*	MSL3	209			
150	R5F565NEDGLK	PTLG0145K*	MSL3	210			
151	R5F565NEHDLK	PTLG0145K*	MSL3	211			
152	R5F565NEHGLK	PTLG0145K*	MSL3	212			
153				213			
154				214			
155				215			
156				216			
157				217			
158				218			
159				219			
160				220			

Note: MSL stands for Moisture Sensitivity Level.

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