

RENESAS SEMICONDUCTOR RELIABILITY REPORT

GROUP : RX26T
DEVICE : R5F526TXXX
APPLICATION : Consumer / Industry

Quality Assurance Div.
Renesas Electronics Corporation

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(Rev.5.0-2 October 2020)

Table. Reliability test results (QFP)

Test Items	Reference	Test Conditions	Results Failure/Size	Comment
High Temperature Operating Life (HTOL)	JESD22-A108	Ta=125 °C, Vccmax, 1000 hrs	0/22	
High Temperature Storage Life (HTSL)	JESD22-A103	Ta=150 °C, 1000 hrs	0/22	
Temperature Humidity bias (THB) (*1)	JESD22-A101	Ta=85 °C, RH=85 %, Vccmax, 1000 hrs	0/22	
Temperature Cycling (TC) (*1)	JESD22-A104	Ta=-65 °C to 150 °C , 300 cycles	0/22	
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	+/-500V,1time	0/3	Class: C2
Solderability (SD)	J-STD-002	245 °C, 5 s, Solder coverage ≥95 %	0/5	
Resistance to Soldering Heat (PC)	JESD22-A113, J-STD-020	MSL3(Moisture Sensitivity Level 3)	0/22	

*1) With preconditioning per JESD22-A113, MSL 3

•It is tested to confirm that all the samples are satisfied with an individual product specification.

Note :

Basically qualification tests were performed using a representative product with the same wafer process and the same package structure .

Table. Reliability test results (QFN)

Test Items	Reference	Test Conditions	Results Failure/Size	Comment
High Temperature Operating Life (HTOL)	JESD22-A108	Ta=125 °C, Vccmax, 1000 hrs	0/22	
High Temperature Storage Life (HTSL)	JESD22-A103	Ta=150 °C, 1000 hrs	0/22	
Temperature Humidity bias (THB) (*1)	JESD22-A101	Ta=85 °C, RH=85 %, Vccmax, 1000 hrs	0/22	
Temperature Cycling (TC) (*1)	JESD22-A104	Ta=-65 °C to 150 °C , 300 cycles	0/22	
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	+/-500V,1time	0/3	Class: C2
Solderability (SD)	J-STD-002	245 °C, 5 s, Solder coverage ≥95 %	0/5	
Resistance to Soldering Heat (PC)	JESD22-A113, J-STD-020	MSL3(Moisture Sensitivity Level 3)	0/22	

*1) With preconditioning per JESD22-A113, MSL 3

•It is tested to confirm that all the samples are satisfied with an individual product specification.

Note :

Basically qualification tests were performed using a representative product with the same wafer process and the same package structure .

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)

$$\lambda = \lambda_b \times \pi T \text{ (FIT)}$$

①Unique failure rate (λ_b)

$$\lambda_b = 0.04 \text{ FIT}$$

Unique failure rate at $T_a=55^\circ\text{C}$ using 60 % confidence level.

②Temperature term (πT)

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

E_a : Activation energy (eV)

T_a : Ambient temperature ($^\circ\text{C}$)

πT simplified chart as $E_a=0.7 \text{ eV}$

T_a ($^\circ\text{C}$)	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)

$$MTTF = 1/\lambda$$

Reference about Renesas package code

Package type		Package code *1
Lead type plastic package	QFP	PxQP
Non-lead type plastic package	QFN	PxQN
Grid array type plastic package	BGA	PxBG
	LGA	PxLG

*1. First four digit

Table. Product list

No	Group	Product part number	Package code	No	Group	Product part number	Package code
1	RX26T	R5F526T8ADFL	PLQP0048K*	51	RX26T	R5F526TFDDFM	PLQP0064K*
2	RX26T	R5F526T8AGFL	PLQP0048K*	52	RX26T	R5F526TFDGM	PLQP0064K*
3	RX26T	R5F526T9ADFL	PLQP0048K*	53	RX26T	R5F526T9ADFN	PLQP0080K*
4	RX26T	R5F526T9AGFL	PLQP0048K*	54	RX26T	R5F526T9AGFN	PLQP0080K*
5	RX26T	R5F526T9BDFL	PLQP0048K*	55	RX26T	R5F526T9BDFN	PLQP0080K*
6	RX26T	R5F526T9BGFL	PLQP0048K*	56	RX26T	R5F526T9BGFN	PLQP0080K*
7	RX26T	R5F526TAADFL	PLQP0048K*	57	RX26T	R5F526TBADFN	PLQP0080K*
8	RX26T	R5F526TAAGFL	PLQP0048K*	58	RX26T	R5F526TBAGFN	PLQP0080K*
9	RX26T	R5F526TACDFL	PLQP0048K*	59	RX26T	R5F526TBBDFN	PLQP0080K*
10	RX26T	R5F526TACGFL	PLQP0048K*	60	RX26T	R5F526TBBGFN	PLQP0080K*
11	RX26T	R5F526TBADFL	PLQP0048K*	61	RX26T	R5F526TBCDFN	PLQP0080K*
12	RX26T	R5F526TBAGFL	PLQP0048K*	62	RX26T	R5F526TBCGFN	PLQP0080K*
13	RX26T	R5F526TBBDFL	PLQP0048K*	63	RX26T	R5F526TBDGFN	PLQP0080K*
14	RX26T	R5F526TBBGFL	PLQP0048K*	64	RX26T	R5F526TBDGFN	PLQP0080K*
15	RX26T	R5F526TBCDFL	PLQP0048K*	65	RX26T	R5F526TFADFN	PLQP0080K*
16	RX26T	R5F526TBCGFL	PLQP0048K*	66	RX26T	R5F526TFAGFN	PLQP0080K*
17	RX26T	R5F526TBDDFL	PLQP0048K*	67	RX26T	R5F526TFBDFN	PLQP0080K*
18	RX26T	R5F526TBDGFL	PLQP0048K*	68	RX26T	R5F526TFBGFN	PLQP0080K*
19	RX26T	R5F526TFADFL	PLQP0048K*	69	RX26T	R5F526TFCDFN	PLQP0080K*
20	RX26T	R5F526TFAGFL	PLQP0048K*	70	RX26T	R5F526TFCGFN	PLQP0080K*
21	RX26T	R5F526TFBDFL	PLQP0048K*	71	RX26T	R5F526TFDDFN	PLQP0080K*
22	RX26T	R5F526TFBGFL	PLQP0048K*	72	RX26T	R5F526TFDGFN	PLQP0080K*
23	RX26T	R5F526TFCDL	PLQP0048K*	73	RX26T	R5F526T9ADFP	PLQP0100K*
24	RX26T	R5F526TFCGFL	PLQP0048K*	74	RX26T	R5F526T9AGFP	PLQP0100K*
25	RX26T	R5F526TFDDFL	PLQP0048K*	75	RX26T	R5F526T9BDFP	PLQP0100K*
26	RX26T	R5F526TFDGFL	PLQP0048K*	76	RX26T	R5F526T9BGFP	PLQP0100K*
27	RX26T	R5F526T8ADFM	PLQP0064K*	77	RX26T	R5F526TBADFP	PLQP0100K*
28	RX26T	R5F526T8AGFM	PLQP0064K*	78	RX26T	R5F526TBAGFP	PLQP0100K*
29	RX26T	R5F526T9ADFM	PLQP0064K*	79	RX26T	R5F526TBBDFP	PLQP0100K*
30	RX26T	R5F526T9AGFM	PLQP0064K*	80	RX26T	R5F526TBBGFP	PLQP0100K*
31	RX26T	R5F526T9BDFM	PLQP0064K*	81	RX26T	R5F526TBCDFP	PLQP0100K*
32	RX26T	R5F526T9BGFM	PLQP0064K*	82	RX26T	R5F526TBCGFP	PLQP0100K*
33	RX26T	R5F526TAADFM	PLQP0064K*	83	RX26T	R5F526TBDDFP	PLQP0100K*
34	RX26T	R5F526TAAGFM	PLQP0064K*	84	RX26T	R5F526TBDGFP	PLQP0100K*
35	RX26T	R5F526TACDFM	PLQP0064K*	85	RX26T	R5F526TFADFP	PLQP0100K*
36	RX26T	R5F526TACGFM	PLQP0064K*	86	RX26T	R5F526TFAGFP	PLQP0100K*
37	RX26T	R5F526TBADFM	PLQP0064K*	87	RX26T	R5F526TFBDFP	PLQP0100K*
38	RX26T	R5F526TBAGFM	PLQP0064K*	88	RX26T	R5F526TFBGFP	PLQP0100K*
39	RX26T	R5F526TBBDFM	PLQP0064K*	89	RX26T	R5F526TFCDFP	PLQP0100K*
40	RX26T	R5F526TBBGFM	PLQP0064K*	90	RX26T	R5F526TFCGFP	PLQP0100K*
41	RX26T	R5F526TBCDFM	PLQP0064K*	91	RX26T	R5F526TFDDFP	PLQP0100K*
42	RX26T	R5F526TBCGFM	PLQP0064K*	92	RX26T	R5F526TFDGFP	PLQP0100K*
43	RX26T	R5F526TBDDFM	PLQP0064K*	93	RX26T	R5F526T9ADND	PWQN0064K*
44	RX26T	R5F526TBDGFM	PLQP0064K*	94	RX26T	R5F526T9AGND	PWQN0064K*
45	RX26T	R5F526TFADFM	PLQP0064K*	95	RX26T	R5F526T9BDND	PWQN0064K*
46	RX26T	R5F526TFAGFM	PLQP0064K*	96	RX26T	R5F526T9BGND	PWQN0064K*
47	RX26T	R5F526TFBDFM	PLQP0064K*	97	RX26T	R5F526TBADND	PWQN0064K*
48	RX26T	R5F526TFBGFM	PLQP0064K*	98	RX26T	R5F526TBAGND	PWQN0064K*
49	RX26T	R5F526TFCDFM	PLQP0064K*	99	RX26T	R5F526TBBND	PWQN0064K*
50	RX26T	R5F526TFCGFM	PLQP0064K*	100	RX26T	R5F526TBBGND	PWQN0064K*

Table. Product list

MCR-23-0450

No	Group	Product part number	Package code	No	Group	Product part number	Package code
101	RX26T	R5F526TBCDND	PWQN0064K*	161			
102	RX26T	R5F526TBCGND	PWQN0064K*	162			
103	RX26T	R5F526TBDDND	PWQN0064K*	163			
104	RX26T	R5F526TBDGND	PWQN0064K*	164			
105	RX26T	R5F526TFADND	PWQN0064K*	165			
106	RX26T	R5F526TFAGND	PWQN0064K*	166			
107	RX26T	R5F526TFBDND	PWQN0064K*	167			
108	RX26T	R5F526TFBGND	PWQN0064K*	168			
109	RX26T	R5F526TFCDND	PWQN0064K*	169			
110	RX26T	R5F526TFCGND	PWQN0064K*	170			
111	RX26T	R5F526TFDDND	PWQN0064K*	171			
112	RX26T	R5F526TFDGND	PWQN0064K*	172			
113	RX26T	R5F526T9ADNE	PWQN0048K*	173			
114	RX26T	R5F526T9AGNE	PWQN0048K*	174			
115	RX26T	R5F526T9BDNE	PWQN0048K*	175			
116	RX26T	R5F526T9BGNE	PWQN0048K*	176			
117	RX26T	R5F526TBADNE	PWQN0048K*	177			
118	RX26T	R5F526TBAGNE	PWQN0048K*	178			
119	RX26T	R5F526TBBDNE	PWQN0048K*	179			
120	RX26T	R5F526TBBGNE	PWQN0048K*	180			
121	RX26T	R5F526TBCDNE	PWQN0048K*	181			
122	RX26T	R5F526TBCGNE	PWQN0048K*	182			
123	RX26T	R5F526TBDDNE	PWQN0048K*	183			
124	RX26T	R5F526TBDGNE	PWQN0048K*	184			
125	RX26T	R5F526TFADNE	PWQN0048K*	185			
126	RX26T	R5F526TFAGNE	PWQN0048K*	186			
127	RX26T	R5F526TFBDNE	PWQN0048K*	187			
128	RX26T	R5F526TFBGNE	PWQN0048K*	188			
129	RX26T	R5F526TFCDNE	PWQN0048K*	189			
130	RX26T	R5F526TFCGNE	PWQN0048K*	190			
131	RX26T	R5F526TFDDNE	PWQN0048K*	191			
132	RX26T	R5F526TFDGNE	PWQN0048K*	192			
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