

# RENESAS SEMICONDUCTOR RELIABILITY REPORT

GROUP : RX62T

DEVICE : R5F562TXXX

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 °C, Vccmax, 1000 hrs	0/231	3 lots or more
High Temperature Storage Life (HTSL)	JESD22-A103	Ta=150 °C, 1000 hrs	0/75	3 lots or more
Temperature Humidity bias (THB) (*1)	JESD22-A101	Ta=85 °C, RH=85 %, Vccmax, 1000 hrs	0/75	3 lots or more
Temperature Cycling (TC) (*1)	JESD22-A104	Ta=-65 °C to 150 °C , 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)	JEITA ED-4701/302	+/-1000 V,1 time	0/3	Class: Equivalent to C2b
Solderability (SD)	J-STD-002	245 °C, 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 °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 .

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

**• Equation for the failure rate estimation ( $\lambda$ )**

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

① Unique failure rate ( $\lambda_b$ )

$$\lambda_b = 0.006 \text{ FIT}$$

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

② Temperature term ( $\pi T$ )

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

$E_a$  : Activation energy (eV)

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

$\pi T$ 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
$\pi T$	0.31	0.68	1	1.45	2.08	2.95	4.15	5.77	7.96	10.88	19.82	34.99

**• MTF ( Mean Time To Failure )**

$$MTTF = 1/\lambda$$

## 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	R5F562T6ADFF	PLQP0080J*	MSL3	51	R5F562T7BDFK	PLQP0064G*	MSL3
2	R5F562T6AGFF	PLQP0080J*	MSL3	52	R5F562T7BGFK	PLQP0064G*	MSL3
3	R5F562T6BDFF	PLQP0080J*	MSL3	53	R5F562T7DDFK	PLQP0064G*	MSL3
4	R5F562T6BGFF	PLQP0080J*	MSL3	54	R5F562T7EDFK	PLQP0064G*	MSL3
5	R5F562T6DDFF	PLQP0080J*	MSL3	55	R5F562TAADFK	PLQP0064G*	MSL3
6	R5F562T6EDFF	PLQP0080J*	MSL3	56	R5F562TAAGFK	PLQP0064G*	MSL3
7	R5F562T6GDFF	PLQP0080J*	MSL3	57	R5F562TABDFK	PLQP0064G*	MSL3
8	R5F562T6GGFF	PLQP0080J*	MSL3	58	R5F562TABGFK	PLQP0064G*	MSL3
9	R5F562T6HDFF	PLQP0080J*	MSL3	59	R5F562TADDFK	PLQP0064G*	MSL3
10	R5F562T6HGFF	PLQP0080J*	MSL3	60	R5F562TAEDFK	PLQP0064G*	MSL3
11	R5F562T7ADFF	PLQP0080J*	MSL3	61	R5F562T6ADFM	PLQP0064K*	MSL3
12	R5F562T7AGFF	PLQP0080J*	MSL3	62	R5F562T6AGFM	PLQP0064K*	MSL3
13	R5F562T7BDFF	PLQP0080J*	MSL3	63	R5F562T6BDFM	PLQP0064K*	MSL3
14	R5F562T7BGFF	PLQP0080J*	MSL3	64	R5F562T6BGFM	PLQP0064K*	MSL3
15	R5F562T7DDFF	PLQP0080J*	MSL3	65	R5F562T6DDFM	PLQP0064K*	MSL3
16	R5F562T7EDFF	PLQP0080J*	MSL3	66	R5F562T6EDFM	PLQP0064K*	MSL3
17	R5F562T7GDFF	PLQP0080J*	MSL3	67	R5F562T7ADFM	PLQP0064K*	MSL3
18	R5F562T7GGFF	PLQP0080J*	MSL3	68	R5F562T7AGFM	PLQP0064K*	MSL3
19	R5F562T7HDFF	PLQP0080J*	MSL3	69	R5F562T7BDFM	PLQP0064K*	MSL3
20	R5F562T7HGFF	PLQP0080J*	MSL3	70	R5F562T7BGFM	PLQP0064K*	MSL3
21	R5F562TAADFF	PLQP0080J*	MSL3	71	R5F562T7DDFM	PLQP0064K*	MSL3
22	R5F562TAAGFF	PLQP0080J*	MSL3	72	R5F562T7EDFM	PLQP0064K*	MSL3
23	R5F562TABDFF	PLQP0080J*	MSL3	73	R5F562TAADFM	PLQP0064K*	MSL3
24	R5F562TABGFF	PLQP0080J*	MSL3	74	R5F562TAAGFM	PLQP0064K*	MSL3
25	R5F562TADDFF	PLQP0080J*	MSL3	75	R5F562TABDFM	PLQP0064K*	MSL3
26	R5F562TAEDFF	PLQP0080J*	MSL3	76	R5F562TABGFM	PLQP0064K*	MSL3
27	R5F562TAGDFF	PLQP0080J*	MSL3	77	R5F562TADDFM	PLQP0064K*	MSL3
28	R5F562TAGGFF	PLQP0080J*	MSL3	78	R5F562TAEDFM	PLQP0064K*	MSL3
29	R5F562TAHDFF	PLQP0080J*	MSL3	79	R5F562T7ADFP	PLQP0100K*	MSL3
30	R5F562TAHGFF	PLQP0080J*	MSL3	80	R5F562T7AGFP	PLQP0100K*	MSL3
31	R5F562T7ADFH	PLQP0112J*	MSL3	81	R5F562T7BDFP	PLQP0100K*	MSL3
32	R5F562T7AGFH	PLQP0112J*	MSL3	82	R5F562T7BGFP	PLQP0100K*	MSL3
33	R5F562T7BDFH	PLQP0112J*	MSL3	83	R5F562T7DDFP	PLQP0100K*	MSL3
34	R5F562T7BGFH	PLQP0112J*	MSL3	84	R5F562T7EDFP	PLQP0100K*	MSL3
35	R5F562T7DDFH	PLQP0112J*	MSL3	85	R5F562TAADFP	PLQP0100K*	MSL3
36	R5F562T7EDFH	PLQP0112J*	MSL3	86	R5F562TAAGFP	PLQP0100K*	MSL3
37	R5F562TAADFH	PLQP0112J*	MSL3	87	R5F562TABDFP	PLQP0100K*	MSL3
38	R5F562TAAGFH	PLQP0112J*	MSL3	88	R5F562TABGFP	PLQP0100K*	MSL3
39	R5F562TABDFH	PLQP0112J*	MSL3	89	R5F562TADDFP	PLQP0100K*	MSL3
40	R5F562TABGFH	PLQP0112J*	MSL3	90	R5F562TAEDFP	PLQP0100K*	MSL3
41	R5F562TADDFH	PLQP0112J*	MSL3	91			
42	R5F562TAEDFH	PLQP0112J*	MSL3	92			
43	R5F562T6ADFK	PLQP0064G*	MSL3	93			
44	R5F562T6AGFK	PLQP0064G*	MSL3	94			
45	R5F562T6BDFK	PLQP0064G*	MSL3	95			
46	R5F562T6BGFK	PLQP0064G*	MSL3	96			
47	R5F562T6DDFK	PLQP0064G*	MSL3	97			
48	R5F562T6EDFK	PLQP0064G*	MSL3	98			
49	R5F562T7ADFK	PLQP0064G*	MSL3	99			
50	R5F562T7AGFK	PLQP0064G*	MSL3	100			

Note: MSL stands for Moisture Sensitivity Level.