

RENESAS SEMICONDUCTOR RELIABILITY REPORT

GROUP : 78K0RKx3-L
DEVICE : Refer to Product List
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 (BGA)

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=-55 °C to 125 °C , 500 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
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)

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

① Unique failure rate (λ_b)

$$\lambda_b = 8.19 \text{ FIT}$$

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

② Temperature 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
	SOP	PxSP
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	78K0RKx3-L	UPD78F1001GA(R)-HAA-AX	PTQP0048*	51	78K0RKx3-L	UPD78F1007GA-HAB-AX	PTQP0064*
2	78K0RKx3-L	UPD78F1001GA(R)-XXX-HAA-AX	PTQP0048*	52	78K0RKx3-L	UPD78F1007GA-XXX-HAB-AX	PTQP0064*
3	78K0RKx3-L	UPD78F1001GA(S)-HAA-AX	PTQP0048*	53	78K0RKx3-L	UPD78F1008GA(R)-XXX-HAB-AX	PTQP0064*
4	78K0RKx3-L	UPD78F1001GA(S)-XXX-HAA-AX	PTQP0048*	54	78K0RKx3-L	UPD78F1008GA(S)-XXX-HAB-AX	PTQP0064*
5	78K0RKx3-L	UPD78F1001GA-HAA-AX	PTQP0048*	55	78K0RKx3-L	UPD78F1008GA-HAB-AX	PTQP0064*
6	78K0RKx3-L	UPD78F1001GA-XXX-HAA-AX	PTQP0048*	56	78K0RKx3-L	UPD78F1008GA-XXX-HAB-AX	PTQP0064*
7	78K0RKx3-L	UPD78F1002GA(R)-HAA-AX	PTQP0048*	57	78K0RKx3-L	UPD78F1009GA(R)-XXX-HAB-AX	PTQP0064*
8	78K0RKx3-L	UPD78F1002GA(R)-XXX-HAA-AX	PTQP0048*	58	78K0RKx3-L	UPD78F1009GA(S)-HAB-AX	PTQP0064*
9	78K0RKx3-L	UPD78F1002GA(S)-XXX-HAA-AX	PTQP0048*	59	78K0RKx3-L	UPD78F1009GA(S)-XXX-HAB-AX	PTQP0064*
10	78K0RKx3-L	UPD78F1002GA-HAA-AX	PTQP0048*	60	78K0RKx3-L	UPD78F1009GA(S)-XXX-HAB-E1-AX	PTQP0064*
11	78K0RKx3-L	UPD78F1002GA-XXX-HAA-AX	PTQP0048*	61	78K0RKx3-L	UPD78F1009GA(S)-XXX-HAB-E2-AX	PTQP0064*
12	78K0RKx3-L	UPD78F1003GA(R)-HAA-AX	PTQP0048*	62	78K0RKx3-L	UPD78F1009GA(S)-XXX-HAB-E3-AX	PTQP0064*
13	78K0RKx3-L	UPD78F1003GA(R)-XXX-HAA-AX	PTQP0048*	63	78K0RKx3-L	UPD78F1009GA(S)-XXX-HAB-E4-AX	PTQP0064*
14	78K0RKx3-L	UPD78F1003GA(S)-HAA-AX	PTQP0048*	64	78K0RKx3-L	UPD78F1009GA-HAB-AX	PTQP0064*
15	78K0RKx3-L	UPD78F1003GA(S)-XXX-HAA-AX	PTQP0048*	65	78K0RKx3-L	UPD78F1009GA-XXX-HAB-AX	PTQP0064*
16	78K0RKx3-L	UPD78F1003GA-HAA-AX	PTQP0048*	66	78K0RKx3-L	UPD78F1007F1(R)-XXX-AN1-A	PVBG0064*
17	78K0RKx3-L	UPD78F1003GA-XXX-HAA-AX	PTQP0048*	67	78K0RKx3-L	UPD78F1007F1(S)-XXX-AN1-A	PVBG0064*
18	78K0RKx3-L	UPD78F1003GA-XXX-HAA-E2-AX	PTQP0048*	68	78K0RKx3-L	UPD78F1007F1-AN1-A	PVBG0064*
19	78K0RKx3-L	UPD78F1000GB(R)-GAF-AX	PLQP0044*	69	78K0RKx3-L	UPD78F1007F1-XXX-AN1-A	PVBG0064*
20	78K0RKx3-L	UPD78F1000GB(R)-XXX-GAF-AX	PLQP0044*	70	78K0RKx3-L	UPD78F1008F1(R)-XXX-AN1-A	PVBG0064*
21	78K0RKx3-L	UPD78F1000GB-GAF-AX	PLQP0044*	71	78K0RKx3-L	UPD78F1008F1(S)-XXX-AN1-A	PVBG0064*
22	78K0RKx3-L	UPD78F1001GB(R)-XXX-GAF-AX	PLQP0044*	72	78K0RKx3-L	UPD78F1008F1-AN1-A	PVBG0064*
23	78K0RKx3-L	UPD78F1001GB(S)-XXX-GAF-AX	PLQP0044*	73	78K0RKx3-L	UPD78F1008F1-XXX-AN1-A	PVBG0064*
24	78K0RKx3-L	UPD78F1001GB-GAF-AX	PLQP0044*	74	78K0RKx3-L	UPD78F1009F1(R)-XXX-AN1-A	PVBG0064*
25	78K0RKx3-L	UPD78F1001GB-XXX-GAF-AX	PLQP0044*	75	78K0RKx3-L	UPD78F1009F1(S)-AN1-A	PVBG0064*
26	78K0RKx3-L	UPD78F1002GB(R)-XXX-GAF-AX	PLQP0044*	76	78K0RKx3-L	UPD78F1009F1(S)-XXX-AN1-A	PVBG0064*
27	78K0RKx3-L	UPD78F1002GB(S)-XXX-GAF-AX	PLQP0044*	77	78K0RKx3-L	UPD78F1009F1-AN1-A	PVBG0064*
28	78K0RKx3-L	UPD78F1002GB-GAF-AX	PLQP0044*	78	78K0RKx3-L	UPD78F1009F1-XXX-AN1-A	PVBG0064*
29	78K0RKx3-L	UPD78F1002GB-XXX-GAF-AX	PLQP0044*	79	78K0RKx3-L	UPD78F1007F1(R)-XXX-AA2-A	PVBG0064*
30	78K0RKx3-L	UPD78F1003GB(R)-GAF-AX	PLQP0044*	80	78K0RKx3-L	UPD78F1007F1(S)-AA2-A	PVBG0064*
31	78K0RKx3-L	UPD78F1003GB(R)-GAF-E1-AX	PLQP0044*	81	78K0RKx3-L	UPD78F1007F1(S)-XXX-AA2-A	PVBG0064*
32	78K0RKx3-L	UPD78F1003GB(R)-XXX-GAF-AX	PLQP0044*	82	78K0RKx3-L	UPD78F1007F1-XXX-AA2-A	PVBG0064*
33	78K0RKx3-L	UPD78F1003GB(S)-XXX-GAF-AX	PLQP0044*	83	78K0RKx3-L	UPD78F1008F1(R)-XXX-AA2-A	PVBG0064*
34	78K0RKx3-L	UPD78F1003GB-GAF-AX	PLQP0044*	84	78K0RKx3-L	UPD78F1008F1(S)-XXX-AA2-A	PVBG0064*
35	78K0RKx3-L	UPD78F1003GB-XXX-GAF-AX	PLQP0044*	85	78K0RKx3-L	UPD78F1008F1-AA2-A	PVBG0064*
36	78K0RKx3-L	UPD78F1004GB(R)-XXX-GAG-AX	PLQP0052*	86	78K0RKx3-L	UPD78F1008F1-XXX-AA2-A	PVBG0064*
37	78K0RKx3-L	UPD78F1004GB(S)-XXX-GAG-AX	PLQP0052*	87	78K0RKx3-L	UPD78F1009F1(R)-XXX-AA2-A	PVBG0064*
38	78K0RKx3-L	UPD78F1004GB-GAG-AX	PLQP0052*	88	78K0RKx3-L	UPD78F1009F1(S)-AA2-A	PVBG0064*
39	78K0RKx3-L	UPD78F1004GB-XXX-GAG-AX	PLQP0052*	89	78K0RKx3-L	UPD78F1009F1(S)-XXX-AA2-A	PVBG0064*
40	78K0RKx3-L	UPD78F1005GB(R)-XXX-GAG-AX	PLQP0052*	90	78K0RKx3-L	UPD78F1009F1-AA2-A	PVBG0064*
41	78K0RKx3-L	UPD78F1005GB(S)-XXX-GAG-AX	PLQP0052*	91	78K0RKx3-L	UPD78F1009F1-XXX-AA2-A	PLQP0064*
42	78K0RKx3-L	UPD78F1005GB-GAG-AX	PLQP0052*	92	78K0RKx3-L	UPD78F1007GK(R)-XXX-GAJ-AX	PLQP0064*
43	78K0RKx3-L	UPD78F1005GB-XXX-GAG-AX	PLQP0052*	93	78K0RKx3-L	UPD78F1007GK(S)-XXX-GAJ-AX	PLQP0064*
44	78K0RKx3-L	UPD78F1006GB(R)-XXX-GAG-AX	PLQP0052*	94	78K0RKx3-L	UPD78F1007GK-GAJ-AX	PLQP0064*
45	78K0RKx3-L	UPD78F1006GB(S)-GAG-AX	PLQP0052*	95	78K0RKx3-L	UPD78F1007GK-XXX-GAJ-AX	PLQP0064*
46	78K0RKx3-L	UPD78F1006GB(S)-XXX-GAG-AX	PLQP0052*	96	78K0RKx3-L	UPD78F1008GK(R)-XXX-GAJ-AX	PLQP0064*
47	78K0RKx3-L	UPD78F1006GB-GAG-AX	PLQP0052*	97	78K0RKx3-L	UPD78F1008GK(S)-XXX-GAJ-AX	PLQP0064*
48	78K0RKx3-L	UPD78F1006GB-XXX-GAG-AX	PLQP0052*	98	78K0RKx3-L	UPD78F1008GK-GAJ-AX	PLQP0064*
49	78K0RKx3-L	UPD78F1007GA(R)-XXX-HAB-AX	PTQP0064*	99	78K0RKx3-L	UPD78F1008GK-XXX-GAJ-AX	PLQP0064*
50	78K0RKx3-L	UPD78F1007GA(S)-XXX-HAB-AX	PTQP0064*	100	78K0RKx3-L	UPD78F1009GK(R)-XXX-GAJ-AX	PLQP0064*

Table. Product list

No	Group	Product part number	Package code	No	Group	Product part number	Package code
101	78KORKx3-L	UPD78F1009GK(S)-XXX-GAJ-AX	PLQP0064*	161	78KORKx3-L	UPD78F1027GK-GAK-AX	PLQP0080*
102	78KORKx3-L	UPD78F1009GK-GAJ-AX	PLQP0064*	162	78KORKx3-L	UPD78F1028GK(R)-GAK-AX	PLQP0080*
103	78KORKx3-L	UPD78F1009GK-XXX-GAJ-AX	PLQP0064*	163	78KORKx3-L	UPD78F1028GK(S)-GAK-AX	PLQP0080*
104	78KORKx3-L	UPD78F1007GB(R)-XXX-GAH-AX	PLQP0064*	164	78KORKx3-L	UPD78F1028GK-GAK-AX	PLQP0080*
105	78KORKx3-L	UPD78F1007GB(S)-XXX-GAH-AX	PLQP0064*	165	78KORKx3-L	UPD78F1013F1(S)-BAK-A	PTBG0100*
106	78KORKx3-L	UPD78F1007GB-GAH-AX	PLQP0064*	166	78KORKx3-L	UPD78F1013F1(S)-XXX-BAK-A	PTBG0100*
107	78KORKx3-L	UPD78F1007GB-XXX-GAH-AX	PLQP0064*	167	78KORKx3-L	UPD78F1013F1-BAK-A	PTBG0100*
108	78KORKx3-L	UPD78F1008GB(R)-GAH-AX	PLQP0064*	168	78KORKx3-L	UPD78F1013F1-XXX-BAK-A	PTBG0100*
109	78KORKx3-L	UPD78F1008GB(S)-XXX-GAH-AX	PLQP0064*	169	78KORKx3-L	UPD78F1014F1(S)-BAK-A	PTBG0100*
110	78KORKx3-L	UPD78F1008GB(S)-XXX-GAH-AX	PLQP0064*	170	78KORKx3-L	UPD78F1014F1(S)-XXX-BAK-A	PTBG0100*
111	78KORKx3-L	UPD78F1008GB-XXX-GAH-AX	PLQP0064*	171	78KORKx3-L	UPD78F1014F1-BAK-A	PTBG0100*
112	78KORKx3-L	UPD78F1009GB(R)-GAH-AX	PLQP0064*	172	78KORKx3-L	UPD78F1014F1-XXX-BAK-A	PTBG0100*
113	78KORKx3-L	UPD78F1009GB(R)-XXX-GAH-AX	PLQP0064*	173	78KORKx3-L	UPD78F1013GF(R)-GAS-AX	PLQP0100*
114	78KORKx3-L	UPD78F1009GB(S)-XXX-GAH-AX	PLQP0064*	174	78KORKx3-L	UPD78F1013GF(R)-XXX-GAS-AX	PLQP0100*
115	78KORKx3-L	UPD78F1009GB-GAH-AX	PLQP0064*	175	78KORKx3-L	UPD78F1013GF(S)-GAS-AX	PLQP0100*
116	78KORKx3-L	UPD78F1009GB-XXX-GAH-AX	PLQP0064*	176	78KORKx3-L	UPD78F1013GF(S)-XXX-GAS-AX	PLQP0100*
117	78KORKx3-L	UPD78F1010GC(R)-GAD-AX	PLQP0080*	177	78KORKx3-L	UPD78F1013GF-GAS-AX	PLQP0100*
118	78KORKx3-L	UPD78F1010GC(R)-XXX-GAD-AX	PLQP0080*	178	78KORKx3-L	UPD78F1013GF-XXX-GAS-AX	PLQP0100*
119	78KORKx3-L	UPD78F1010GC(S)-GAD-AX	PLQP0080*	179	78KORKx3-L	UPD78F1014GF(R)-GAS-AX	PLQP0100*
120	78KORKx3-L	UPD78F1010GC(S)-XXX-GAD-AX	PLQP0080*	180	78KORKx3-L	UPD78F1014GF(R)-XXX-GAS-AX	PLQP0100*
121	78KORKx3-L	UPD78F1010GC-GAD-AX	PLQP0080*	181	78KORKx3-L	UPD78F1014GF(S)-GAS-AX	PLQP0100*
122	78KORKx3-L	UPD78F1010GC-XXX-GAD-AX	PLQP0080*	182	78KORKx3-L	UPD78F1014GF(S)-XXX-GAS-AX	PLQP0100*
123	78KORKx3-L	UPD78F1011GC(R)-GAD-AX	PLQP0080*	183	78KORKx3-L	UPD78F1014GF-GAS-AX	PLQP0100*
124	78KORKx3-L	UPD78F1011GC(R)-XXX-GAD-AX	PLQP0080*	184	78KORKx3-L	UPD78F1014GF-XXX-GAS-AX	PLQP0100*
125	78KORKx3-L	UPD78F1011GC(S)-GAD-AX	PLQP0080*	185	78KORKx3-L	UPD78F1029GF(R)-GAS-AX	PLQP0100*
126	78KORKx3-L	UPD78F1011GC(S)-XXX-GAD-AX	PLQP0080*	186	78KORKx3-L	UPD78F1029GF(S)-GAS-AX	PLQP0100*
127	78KORKx3-L	UPD78F1011GC-GAD-AX	PLQP0080*	187	78KORKx3-L	UPD78F1029GF-GAS-AX	PLQP0100*
128	78KORKx3-L	UPD78F1011GC-XXX-GAD-AX	PLQP0080*	188	78KORKx3-L	UPD78F1030GF(R)-GAS-AX	PLQP0100*
129	78KORKx3-L	UPD78F1012GC(R)-GAD-AX	PLQP0080*	189	78KORKx3-L	UPD78F1030GF(S)-GAS-AX	PLQP0100*
130	78KORKx3-L	UPD78F1012GC(R)-XXX-GAD-AX	PLQP0080*	190	78KORKx3-L	UPD78F1030GF-GAS-AX	PLQP0100*
131	78KORKx3-L	UPD78F1012GC(S)-GAD-AX	PLQP0080*	191	78KORKx3-L	UPD78F1013GC(R)-UEU-AX	PLQP0100*
132	78KORKx3-L	UPD78F1012GC(S)-XXX-GAD-AX	PLQP0080*	192	78KORKx3-L	UPD78F1013GC(R)-XXX-UEU-AX	PLQP0100*
133	78KORKx3-L	UPD78F1012GC-GAD-AX	PLQP0080*	193	78KORKx3-L	UPD78F1013GC(S)-UEU-AX	PLQP0100*
134	78KORKx3-L	UPD78F1012GC-XXX-GAD-AX	PLQP0080*	194	78KORKx3-L	UPD78F1013GC(S)-XXX-UEU-AX	PLQP0100*
135	78KORKx3-L	UPD78F1027GC(R)-GAD-AX	PLQP0080*	195	78KORKx3-L	UPD78F1013GC-UEU-AX	PLQP0100*
136	78KORKx3-L	UPD78F1027GC(S)-GAD-AX	PLQP0080*	196	78KORKx3-L	UPD78F1013GC-XXX-UEU-AX	PLQP0100*
137	78KORKx3-L	UPD78F1027GC-GAD-AX	PLQP0080*	197	78KORKx3-L	UPD78F1014GC(R)-UEU-AX	PLQP0100*
138	78KORKx3-L	UPD78F1028GC(R)-GAD-AX	PLQP0080*	198	78KORKx3-L	UPD78F1014GC(R)-XXX-UEU-AX	PLQP0100*
139	78KORKx3-L	UPD78F1028GC(S)-GAD-AX	PLQP0080*	199	78KORKx3-L	UPD78F1014GC(S)-XXX-UEU-AX	PLQP0100*
140	78KORKx3-L	UPD78F1028GC-GAD-AX	PLQP0080*	200	78KORKx3-L	UPD78F1014GC-UEU-AX	PLQP0100*
141	78KORKx3-L	UPD78F1010GK(R)-GAK-AX	PLQP0080*	201	78KORKx3-L	UPD78F1014GC-XXX-UEU-AX	PLQP0100*
142	78KORKx3-L	UPD78F1010GK(R)-XXX-GAK-AX	PLQP0080*	202	78KORKx3-L	UPD78F1029GC(R)-UEU-AX	PLQP0100*
143	78KORKx3-L	UPD78F1010GK(S)-GAK-AX	PLQP0080*	203	78KORKx3-L	UPD78F1029GC(S)-UEU-AX	PLQP0100*
144	78KORKx3-L	UPD78F1010GK(S)-XXX-GAK-AX	PLQP0080*	204	78KORKx3-L	UPD78F1029GC-UEU-AX	PLQP0100*
145	78KORKx3-L	UPD78F1010GK-GAK-AX	PLQP0080*	205	78KORKx3-L	UPD78F1030GC(R)-UEU-AX	PLQP0100*
146	78KORKx3-L	UPD78F1010GK-XXX-GAK-AX	PLQP0080*	206	78KORKx3-L	UPD78F1030GC(S)-UEU-AX	PLQP0100*
147	78KORKx3-L	UPD78F1011GK(R)-GAK-AX	PLQP0080*	207	78KORKx3-L	UPD78F1030GC-UEU-AX	PLQP0100*
148	78KORKx3-L	UPD78F1011GK(R)-XXX-GAK-AX	PLQP0080*	208			
149	78KORKx3-L	UPD78F1011GK(S)-GAK-AX	PLQP0080*	209			
150	78KORKx3-L	UPD78F1011GK(S)-XXX-GAK-AX	PLQP0080*	210			
151	78KORKx3-L	UPD78F1011GK-GAK-AX	PLQP0080*	211			
152	78KORKx3-L	UPD78F1011GK-XXX-GAK-AX	PLQP0080*	212			
153	78KORKx3-L	UPD78F1012GK(R)-GAK-AX	PLQP0080*	213			
154	78KORKx3-L	UPD78F1012GK(R)-XXX-GAK-AX	PLQP0080*	214			
155	78KORKx3-L	UPD78F1012GK(S)-GAK-AX	PLQP0080*	215			
156	78KORKx3-L	UPD78F1012GK(S)-XXX-GAK-AX	PLQP0080*	216			
157	78KORKx3-L	UPD78F1012GK-GAK-AX	PLQP0080*	217			
158	78KORKx3-L	UPD78F1012GK-XXX-GAK-AX	PLQP0080*	218			
159	78KORKx3-L	UPD78F1027GK(R)-GAK-AX	PLQP0080*	219			
160	78KORKx3-L	UPD78F1027GK(S)-GAK-AX	PLQP0080*	220			