Report No. APR-25-H0153
Date: Mar. 31, 2026

RENESAS SEMICONDUCTOR RELIABILITY REPORT

SERIES: REXFET-1 150V

DEVICE: Refer to Product List

QUALITY GRADE: High Quality

Quality Assurance Div.
Renesas Electronics Corporation

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Q101 Qualification Test Results for Product List

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

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Test	#	Reference	Test Conditions	Lots	S.S.	Total	Results (Fail of Total)	Comments: (N/A =Not Applicable)
TEST GROUP A – ACCELERATED ENVIRONMENT STRESS TESTS								
PC	A1	JESD22-A113 J-STD-020	SMD only; Moisture Preconditioning for HAST/H3TRB, UHAST/AC, TC, IOL/PTC.	3	308	924	0 of 924	MSL1
HAST	A2	JESD22-A110	Ta=130C, RH=85%, VDSS Maximum rating, 96h	3	77	231	0 of 231	-
H3TRB	A2 alt	JESD22-A101	Ta=85C, RH=85%, VDSS Maximum rating, 1000h	-	-	-	-	See HAST.
UHAST	A3	JESD22-A118 or A101	Ta=130C, RH=85%, 96h	3	77	231	0 of 231	-
AC	A3 alt	JESD22-A102	Ta=121C, RH=100%, 96h	-	-	-	-	See UHAST.
TC	A4	JESD22-A104 Appendix 6	Ta=-55C to 150C, 1000cycles	3	77	231	0 of 231	-
TCHT	A4a	JESD22-A104 Appendix 6	TC Hot Test.	-	-	-	-	See TCDT.
TCDT	A4a alt	JESD22-A104 Appendix 6 J-STD-035	TC Delamination Test.	3	77	231	0 of 231	-
IOL	A5	MIL-STD-750 Method 1037	ΔTc=100C, 15000cycles	3	77	231	0 of 231	-
PTC	A5 alt	JESD22-A105	Power Temperature Cycling.	-	-	-	-	See IOL.
TEST GROUP B – ACCELERATED LIFETIME SIMULATION TESTS								
HTRB	B1	MIL-STD-750-1 M1039	Tj(Tch)＝175C, VDSS Maximum rating, 1000h	3	77	231	0 of 231	-
ACBV	B1a	MIL-STD-750-1 M1040 Test condition A	AC blocking voltage.	-	-	-	-	N/A Thyristors Only.
SSOP	B1b	MIL-STD-750-1 M1038 condition B (Zeners)	Steady State Operational.	-	-	-	-	N/A Voltage Regulators (Zeners) Only.
HTGB	B2	JESD22-A108	Tj(Tch)＝175C, VGSS=+20V, 1000h	3	77	231	0 of 231	-

Test	#	Reference	Test Conditions	Lots	S.S.	Total	Results (Fail of Total)	Comments: (N/A =Not Applicable)
TEST GROUP C – PACKAGE ASSEMBLY INTEGRITY TESTS								
DPA	C1	AEC Q101-004 Section4	Random sample of parts that have successfully completed H3TRB or HAST and TC.	3	4	12	0 of 12	-
PD	C2	JEDEC JESD22-B100	Physical Dimensions.	1	30	30	0 of 30	-
WBP	C3	MIL-STD-750-2 Method 2037	Wire Bond Pull.	1bond	10parts	10bonds	0 of 10bonds	-
WBS	C4	AEC Q101-003 JESD22-B116	Wire Bond Shear Test.	1bond	10parts	10bonds	0 of 10bonds	-
DS	C5	MIL-STD-750-2 Method 2017	Die Shear.	1	5	5	0 of 5	-
TS	C6	MIL-STD-750-2 Method 2036	Terminal Strength.	-	-	-	-	N/A Through-hole leaded parts only.
RTS	C7	JESD22-B107	Resistance to Solvents.	-	-	-	-	N/A Not required for laser etched parts.
RSH	C8	JESD22-A111 (SMD)	Resistance to Solder Heat.	-	-	-	-	N/A Wave solder deprecated.
TR	C9	JESD24-3, 24-4, 24-6 as appropriate	Thermal Resistance.	1	10	10	0 of 10	-
SD	C10	JEDEC J-STD-002	Solderability: (>95% coverage)	3	10	30	0 of 30	-
WG	C11	AEC Q005	see AEC-Q005	-	-	-	Pass	Performed on product TEG with test method based on JESD201.
CA	C12	MIL-STD-750-2 Method 2006	Constant Acceleration.	-	-	-	-	N/A Hermetic packaged devices only.
VVF	C13	JESD22-B103	Vibration Variable Frequency.	-	-	-	-	N/A Hermetic packaged devices only.
MS	C14	JESD22-B104	Mechanical Shock.	-	-	-	-	N/A Hermetic packaged devices only.
HER	C15	JEDEC JESD22-A109	Hermeticity.	-	-	-	-	N/A Hermetic packaged devices only.

Test	#	Reference	Test Conditions	Lots	S.S.	Total	Results (Fail of Total)	Comments: (N/A =Not Applicable)
TEST GROUP D – DIE FABRICATION RELIABILITY TESTS								
DI	D1	AEC Q101-004 Section3	Dielectric Integrity.	1	5	5	0 of 5	Verified by process TEG
TEST GROUP E – ELECTRICAL VERIFICATION TESTS								
EV	E0	JESD22-B101	External Visual.	All	All	All	0 of All	-
TEST	E1	User/Supplier Specification	Pre and Post Stress Electrical Test.	All	All	All	0 of All	-
PV	E2	Individual AEC user specification	Parametric Verification.	3	25	75	0 of 75	-
ESDH	E3	AEC Q101-001	Electrostatic Discharge, Human Body Model.	1	30	30	0 of 30	HBM: C=100pF, R=1.5kΩ, See product list for withstand voltage.
ESDC	E4	AEC Q101-005	Electrostatic Discharge, Charged Device Model.	1	30	30	0 of 30	CDM: Over 1000V
UIS	E5	AEC Q101-004 Section2	UNCLAMPED INDUCTIVE SWITCHING.	1	5	5	0 of 5	-
SC	E6	AEC Q101-006	Short Circuit Characterization.	-	-	-	-	N/A Smart power parts only.

Calculation method of standard failure rate

Operating reliability is decided by inherent reliability of device and environment condition of use (See below).

・Calculation method of standard failure rate (λ)

$$\lambda = \lambda b \times \pi T \times \pi V \quad (\mathrm{FIT})$$

(3)Power source voltage parameter
(This parameter apply to Si series transistor product and FET only. In case of other product, πV=1)

(2)Temperature parameter

(1)Basic failure rate

(1)Basic failure rate(λb)

λb : 1.07 Fit

(2)Temperature parameter(πT)

$$\pi T = \exp \{ 11600 \times Ea \times (1/(273+55) - 1/(273+Tj(Tch))) \}$$

Ea : Activation energy
Tj(Tch) : Junction temperature

πT simplified chart											
Ea(eV)	Tj(Tch) (°C)	40	55	60	65	70	75	80	90	100	110
0.8	πT	0.26	1.00	1.53	2.31	3.45	5.08	7.42	15.30	30.37	58.14

(3)Power source voltage parameter(πV) (Si series transistor products,FET only)

S = supply voltage (VCE or VDS) / absolute maximum voltage (VCES or VDSS)

S > 0.2 πV = exp(2.86×S-2.29)
S ≤ 0.2 πV = 0.18

(4)MTTF (Mean Time To Failure)

MTTF = 1 / λ

Calculation standard

Confidence level	60 %
Standard temperature (Tj(Tch))	55 °C
Use within recommended conditions	

Table. Product list APR-25-H0153

No	Product part number	Package Type	HBM withstand voltage
1	RBA190N15YAPF-6UA04#KB0	TOLT	2000V to ≦4000V
2	RBA200N15YAPF-6UA03#KB0	TOLT	2000V to ≦4000V
3	RBA190N15YANS-3UA04#GB0	TOLL	2000V to ≦4000V
4	RBA200N15YANS-3UA03#GB0	TOLL	2000V to ≦4000V
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