



Report No. APR-25-H0154
Date: Mar. 31, 2026

RENESAS SEMICONDUCTOR RELIABILITY REPORT

SERIES: REXFET-1 150V

DEVICE: Refer to Product List

QUALITY GRADE: Standard

Quality Assurance Div.
Renesas Electronics Corporation

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Table. Reliability test results

Test Items	Reference	Test Conditions	Number of Lots	Number of Samples	Results Failure/Size	Comments
MSL Preconditioning (PC)	JESD22 -A113	MSL1(Moisture Sensitivity Level 1)	3	231	0/693	-
High Temperature Reverse Bias (HTRB)	JESD22-A108	Tj(Tch) = 175C, VDSS Maximum rating, 1000h	3	77	0/231	-
High Temperature Storage Life (HTSL)	JESD22-A103	Ta=175C, 1000h	3	77	0/231	-
Temperature Humidity bias (THB)	JESD22-A101	Ta=85C, RH=85%, VDSS Maximum rating, 1000h	3	77	0/231	*1
Temperature Cycling (TC)	JESD22-A104	Ta=-55C to 150C, 1000cycles	3	77	0/231	*1
Power Cycling (IOL)	JESD22-A122	$\Delta T_c=100C$, 15000cycles	3	77	0/231	*1
Human Body Model ESD (HBM)	JS-001	C=100pF, R=1.5k Ω , See product list for withstand voltage.	1	3	0/3	-
Charged Device Model ESD (CDM)	JS-002	Over 1000V	1	3	0/3	-
Solderability (SD)	M2003 J-STD-002	245C, 5s, Solder coverage $\geq 95\%$	3	10	0/30	-

*1 With preconditioning per JESD22-A113, MSL 1

• 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 .

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)

$$\lambda = \lambda_b \times \pi_T \times \pi_V \quad (\text{FIT})$$

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

(2)Temperature parameter

(1)Basic failure rate

(1)Basic failure rate(λ_b)
 $\lambda_b : 1.07 \text{ Fit}$

(2)Temperature parameter(π_T)

$$\pi_T = \exp \{ 11600 \times E_a \times (1/(273 + 55) - 1/(273 + T_j(T_{ch}))) \}$$

E_a : Activation energy
 $T_j(T_{ch})$: Junction temperature

π_T simplified chart											
$E_a(\text{eV})$	$T_j(T_{ch}) (\text{°C})$	40	55	60	65	70	75	80	90	100	110
0.8	π_T	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(π_V) (Si series transistor products,FET only)

$S = \text{supply voltage (VCE or VDS)} / \text{absolute maximum voltage (VCES or VDSS)}$

$S > 0.2 \quad \pi_V = \exp(2.86 \times S - 2.29)$
 $S \leq 0.2 \quad \pi_V = 0.18$

(4)MTTF (Mean Time To Failure)

$$\text{MTTF} = 1 / \lambda$$

Calculation standard

Confidence level 60 %

Standard temperature ($T_j(T_{ch})$) 55 °C

Use within recommended conditions

Table. Product list

APR-25-H0154

No	Product part number	Package Type	HBM withstand voltage
1	RBE034N15R1SZPW#KB0	TOLT	2000V to \leq 4000V
2	RBE039N15R1SZPW#KB0	TOLT	2000V to \leq 4000V
3	RBE034N15R1SZQ4#GB0	TOLL	2000V to \leq 4000V
4	RBE039N15R1SZQ4#GB0	TOLL	2000V to \leq 4000V
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