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Date: March 28, 2025

# RENESAS SEMICONDUCTOR RELIABILITY REPORT

DEVICE: RAJ2930004AGM#HA1

APPLICATION: Automotive

Quality Assurance Div.  
Renesas Electronics Corporation

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**Q100 Qualification Test Results for RAJ2930004AGM # HA1**

Test	#	Reference	Test Conditions	Lots	S.S.	Total	Results Fail of Total	Comments: (N/A =Not Applicable)
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**TEST GROUP A – ACCELERATED ENVIRONMENT STRESS TESTS**

PC	A1	JESD22 A113 J-STD-020	Preconditioning: (Test @ Rm) SMD only; Moisture Preconditioning for HAST, UHST, TC and PTC ; Peak Reflow Temp=260°C	Min.MSL=3			MSL=3	
HAST	A2	JESD22 A101	Highly Accelerated Stress Test: (Test @ Rm/Hot) Ta=110°C, RH=85%, specified voltage, 264h	3	77	231	0 of 231	
UHST	A3	JESD22 A102	Unbiased Highly Accelerated Stress Test: (Test @ Rm) Ta=110°C, RH=85%, 264h	3	77	231	0 of 231	
TC	A4	JESD22 A104	Temperature Cycle: (Test @ Hot) Ta=-55°C to 150°C, 1000cycles	3	77	231	0 of 231	
PTC	A5	JESD22 A105	Power Temperature Cycle: (Test @ Rm/Hot) Ta=-40°C to 125°C, specified voltage, 1000cycles	1	45	45	0 of 45	
HTSL	A6	JESD22 A103	High Temperature Storage Life: (Test @ Rm/Hot) Ta=150°C, 1000h	1	45	45	0 of 45	

Test	#	Reference	Test Conditions	Lots	S.S.	Total	Results Fail of Total	Comments: (N/A =Not Applicable)
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**TEST GROUP B – ACCELERATED LIFETIME SIMULATION TESTS**

HTOL	B1	JESD22 A108	High Temp Operating Life: (Test @ Rm/Cold/Hot) Ta=125°C, specified voltage, 1000hrs	3	77	77	0 of 231	
ELFR	B2	AEC-Q100-008	Early Life Failure Rate: (Test @ Rm/Hot) Ta=125°C, specified voltage, 48hrs	3	800	2400	0 of 2400	
EDR	B3	AEC-Q100-005	NVM Endurance & Data Retention Test: (Test @ Rm/Hot)	---	---	---	---	N/A Nonvolatile memory only.

**TEST GROUP C – PACKAGE ASSEMBLY INTEGRITY TESTS**

WBS	C1	AEC-Q100-001 AEC-Q003	Wire Bond Shear Test: (Cpk > 1.67)	30 bonds	5 parts	30 bonds	Pass	Cpk > 1.67
WBP	C2	Mil-STD-883 Method 2011 AEC-Q003	Wire Bond Pull: (Cpk > 1.67)	30 bonds	5 parts	30 bonds	Pass	Cpk > 1.67
SD	C3	JESD22 B102 JSTD-002D	Solderability: (>95% coverage)	1	15	15	Pass	>95% coverage
PD	C4	JESD22 B100, JESD22 B108 AEC-Q003	Physical Dimensions: (Cpk > 1.67)	3	10	30	Pass	Cpk > 1.67
SBS	C5	AEC-Q100-010 AEC-Q003	Solder Ball Shear: (Cpk > 1.67); 5 balls from min. of 10 devices	---	---	---	---	N/A BGA Package only.
LI	C6	JESD22 B105	Lead Integrity: (No lead cracking or breaking); Through-hole only; 10 leads from each of 5 devices	---	---	---	---	N/A Through-hole device only.

Test	#	Reference	Test Conditions	Lots	S.S.	Total	Results Fail of Total	Comments: (N/A =Not Applicable)
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**TEST GROUP D – DIE FABRICATION RELIABILITY TESTS**

EM	D1	JESD61	Electromigration:	---	---	---	Pass	
TDDB	D2	JESD35	Time Dependant Dielectric Breakdown:	---	---	---	Pass	
HCI	D3	JESD60 & 28	Hot Carrier Injection:	---	---	---	Pass	
NBTI	D4	JESD90	Negative Bias Temperature Instability:	---	---	---	Pass	
SM	D5	JESD61,87 & 202	Stress Migration:	---	---	---	Pass	

Test	#	Reference	Test Conditions	Lots	S.S.	Total	Results Fail of Total	Comments: (N/A =Not Applicable)
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**TEST GROUP E- ELECTRICAL VERIFICATION**

TEST	E1	User/Supplier Specification	Pre and Post Stress Electrical Test:	All	All	All	0 of All	
HBM	E2	AEC-Q100-002	Electrostatic Discharge, Human Body Model: (Test @ Rm/Hot); (2KV HBM)	1	3	3	0 of 3 ESD Level= HBM: 2	HBM target: High-voltage pin >8KV, all other pin >2KV HBM Classification follows ANSI/ESDA/JEDEC JS-001-2017
CDM	E3	AEC-Q100-011	Electrostatic Discharge, Charged Device Model: (Test @ Rm/Hot); (750V corner leads, 500V all other leads)	1	3	3	0 of 3 ESD Level= CDM: C2a	Target: Corner pin: 750V Pass, All other pin: 500V Pass CDM Classification follows AEC-Q100-011 Rev. D
LU	E4	AEC-Q100-004	Latch-Up: (Test @ Rm/Hot)	1	6	6	0 of 6	
ED	E5	AEC-Q100-009 AEC-Q003	Electrical Distributions: (Test @ Rm/Hot/Cold) (where applicable, Cpk>1.67)	3	30	90	PASS	
FG	E6	AEC-Q100-007	Fault Grading:	—	—	—	PASS	Fault Grading Target >98%
CHAR	E7	AEC-Q003	Characterization: (Test @ Rm/Hot/Cold)	—	—	—	PASS	According to Renesas standard procedure.
EMC	E9	SAE J1752/3	Electromagnetic Compatibility (Radiated Emissions)	—	—	—	—	N/A
SC	E10	AEC Q100-012	Short Circuit Characterization	—	—	—	—	N/A Not required for the specifications of this device.
SER	E11	JESD89-1 JESD89-2 JESD89-3	Soft Error Rate	—	—	—	—	N/A Device with >1Mbit SRAM or DRAM only.
LF	E12	AEC-Q005	Lead (Pb) Free: (see AEC-Q005)	—	—	—	—	Solderability: See SD (C3) result. Solder heat resistance: N/A (Wave Solder is Not recommended.) Whisker: Performed on product TEG with test method based on JESD201.

Test	#	Reference	Test Conditions	Lots	S.S.	Total	Results Fail of Total	Comments: (N/A =Not Applicable)
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**TEST GROUP F – DEFECT SCREENING TESTS**

PAT	F1	AEC-Q001	See AEC-Q001. This is highly recommended by Automotive Electronic Council to institute.	All	All	All	Reject units outside Avg	Apply to mass production according to Renesas standard procedure.
SBA	F2	AEC-Q002	See AEC-Q002. This is highly recommended by Automotive Electronic Council to institute.	All	All	All	Reject units outside criteria	Apply to mass production according to Renesas standard procedure.