Reliability Qualification Report
for
AS4C1G8MD3LA-xxBxN
AS4C512M16D3LA-xxBxN
(25nm 8Gb DDR3L SDRAM)

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1. Information

Product	8Gb DDR3L SDRAM
Device	AS4C1G8D3LA-xxBCN AS4C1G8D3LA-xxBIN AS4C512M16D3LA-xxBCN AS4C512M16D3LA-xxBIN
Technology	25nm
Function	1G*8 DDR3L 512M*16 DDR3L

Package Type	78B FBGA 96B FBGA
Substrate	BT
Solder Ball	Sn-Ag-Cu solder ball
Molding Compound	Sumitomo G771
Package Size	9x10.6 mm^2 9x13.5 mm^2

2. Life Test

Test Items	Test Conditions	Sample Size	Stress Hours	Results (Number of failures)
2.1 High Temperature Operation Life Test *	Ta = 125 ℃; array VDD =1.6V	231	1000hrs	0/231
2.2 Low Temperature Operation Life Test *	Ta = -50 ℃; array VDD =1.6V	77	1000hrs	0/77

Remark:

*. Pre-conditioning: J-STD-020 (MSL-2)
Temperature Cycling: -65~150, 20cycles
Baking @ 125℃, 24 hours. => Soaking @ 85℃ / 60% R.H., 168 hours
Infrared re-flow 260, 10sec, 3 times

Test Items	Test Conditions	Sample Size	Stress Hours	Results (Number of failures)
2.3 Early Failure Rate	Ta = 125 ℃; array VDD = 1.6V	12,329	48hrs	0 failures 35 FIT (60% CL)

3. Environmental Test

Test Items	Test Conditions	Sample Size	Stress Hours	Results (Number of failures)
3.1 High Temperature Storage Life Test *	Ta. = 150℃	231	1000hrs	0/231
3.2 Temperature Cycle Test *	Ta. = -65℃ / +150℃,	231	500cycs	0/231
3.3 Highly Accelerated Stress Test *	Ta. = 110℃/ 85%RH; Vdd = 1.6V, Bias (VccMax)	231	264hrs	0/231

Remark:

*. Pre-conditioning: J-STD-020 (MSL-2)
Temperature Cycling: -65~150, 20cycles
Baking @ 125℃, 24 hours. => Soaking @ 85℃ / 60% R.H., 168 hours
Infrared re-flow 260, 10sec, 3 times

4. ESD Sensitivity

Test Items	Reference	Test Criteria	Test Results	Pass/ Fail
4.1 Human Body Model (HBM)	HBM: JESD22-A114-B	> ±2000V	> ±2000V	Pass
4.2 Charge Device Model (CDM)	CDM: ANSI/ ESD SP 5.3.2	> ±500V	> ±500V	Pass

4.3 Judgment Criteria : Pass QC Final Test, Leakage, standby current and functionality tests at both high and low temperature.

5. Latch-up Test

Test Items	Reference	Test Criteria	Sample Size	Pass/ Fail
5.1 I-test (Positive and Negative)	EIA/JESD 78	±200mA	3ea	Pass
5.2 V-supply over voltage test	EIA/JESD 78	2.36V	3ea	Pass

5.3 Judgment Criteria : Pass Leakage, standby current and functionality tests at both high and low temperature.