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## 1. Information

<b>Product</b>	8Gb DDR4 SDRAM
<b>Device</b>	AS4C1G8D4* AS4C512M16D4*
<b>Technology</b>	20nm
<b>Function</b>	1G*8 DDR4 512M*16 DDR4

<b>Package Type</b>	78B FBGA 96B FBGA
<b>Substrate</b>	BT
<b>Solder Ball</b>	Sn-Ag-Cu solder ball
<b>Molding Compound</b>	Hitachi Compound
<b>Package Size</b>	7.5*12 mm <sup>2</sup> 7.5*13 mm <sup>2</sup>

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## 2. Life Test

Test Items	Test Conditions	Sample Size	Stress Hours	Results (Number of failures)
2.1 High Temperature Operation Life Test *	Ta = 125 °C ; array VDD =1.3V	600	168hrs 500hrs 1000hrs	0/600 0/600 0/600
2.2 Low Temperature Operation Life Test *	Ta = -40 °C ; array VDD =1.3V	130	168hrs 500hrs 1000hrs	0/130 0/130 0/130

Remark:

\* Preconditioning:

TC @ -40~60°C, 10 cycles => Baking @ 125°C , 24 hours. => Soaking @ 30°C / 60% R.H., 192 hours => IR : 3 times.

Test Items	Test Conditions	Sample Size	Stress Hours	Results (Number of failures)
2.3 Early Failure Rate	Ta = 125 °C ; array VDD = 1.3V	12,540	36hrs	0/12540

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### 3. Environmental Test

Test Items	Test Conditions	Sample Size	Stress Hours	Results (Number of failures)
3.1 High Temperature Storage Life Test *	Ta. = 150°C	231	500hrs 1000hrs	0/231 0/231
3.2 Temperature Cycle Test *	Ta.= -55°C / +125°C, 2 cycs/ Hr	231	500cycs 1000cycs	0/231 0/231
3.3 Highly Accelerated Stress Test *	Ta. = 130°C/ 85%RH;	231	144hrs	0/231

Remark:

\*. Preconditioning (J-STD-020, MSL3)

TC @ -40~60°C, 10 cycles => Baking @ 125°C , 24 hours. => Soaking @ 30°C / 60% R.H., 192 hours => IR : 3 times.

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#### 4. ESD Sensitivity

Test Items	Reference	Test Criteria	Test Results	Pass/ Fail
4.1 Human Body Model (HBM)	HBM: JESD22-A114-B	> $\pm 2000V$	> $\pm 3000V$	Pass
4.2 Charge Device Model (CDM)	CDM: ANSI/ ESD SP 5.3.2	> $\pm 500V$	> $\pm 750V$	Pass

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

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## 5. Latch-up Test

Test Items	Reference	Test Criteria	Test Results	Pass/ Fail
5.1 I-test (Positive and Negative)	EIA/JESD 78	$> \pm 150\text{mA}$	$> \pm 200\text{mA}$	Pass
5.2 V-supply over voltage test	EIA/JESD 78	$> \pm 1.5 \text{ max. } V_{\text{supply}}$	$> \pm 1.5 \text{ max. } V_{\text{supply}}$	Pass

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

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