

Reliability Qualification Report

for

DDRII SDRAM with Pb/Halogen Free

(128M×16, 63nm SDRAM AS4C128M16D2-25BCN/BIN)

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1. Information

Product	2Gb DDRII SDRAM
Device	AS4C128M16D2-25BCN AS4C128M16D2-25BIN
Technology	63nm
Function	128M*16 DDRII

Package Type	84B FBGA
Substrate	BT
Solder Ball	Sn/3.0Ag/0.5Cu
Molding Compound	HITACHI CEL-9740HF
Package Size	10.5*13.5 mm²

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; VDD = 2V	396	168hrs	0/396
			500hrs	0/396
			1000hrs	0/396
2.2 Low Temperature Operation Life Test *	Ta = -40 °C; VDD = 2V	44	500hrs	0/44
			1000hrs	0/44

Remark:

*. Preconditioning

T/C@ -65/150°C, 5cycs. => 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 Life Test	Ta = 125 °C; VDD = 2V	10,182	48hrs	0/10182

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	150	500hrs 1000hrs	0/150 0/150
3.2 Temperature Cycle Test *	Ta.= -65°C / +150°C	300	500cycs 1000cycs	0/300 0/300
3.3 Highly Accelerated Temperature and Humidity Stress*	Ta. = 110°C/ 85%RH; VDD = 1.9V	231	168hrs 264hrs	0/231 0/231
3.4 Unbiased Highly Accelerated Temperature and Humidity Stress*	Ta. = 110°C/85%RH	231	168hrs 264hrs	0/231 0/231

Remark:

*. Preconditioning

T/C@ -65/150°C, 5cycs. => Baking @ 125°C, 24 hours. => Soaking @ 30°C / 60% R.H., 192 hours => IR : 3 times

4. ESD & Latch-Up Stress Test

Test Items	Test Reference	Stress Voltage	Sample Size	Results
ESD - Human Body Model (HBM)	JESD22-A114	+/-4KV	3 lots / 3ea	Pass
ESD - Machine Model (MM)	EIA/JESD22-A115	+/-400V	3 lots / 3ea	Pass
ESD – Charge Discharge Model (CDM)	JESD22-C101	+/-1000V	3 lots / 3ea	Pass
Latch-Up I-Test	JESD78	$\geq 200\text{mA}$	3 lots / 3ea	Pass
Latch-Up Over Voltage Test	JESD78	$\geq 1.5 * V_{dd}$	3 lots / 3ea	Pass