



ATMEL CORPORATION

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AT-45DB081B DATA FLASH RELIABILITY DATA*

- 150°C RETENTION BAKE (PLASTIC)
- 125°C DYNAMIC OPERATING LIFETEST (PLASTIC)
- EXTENDED TEMPERATURE CYCLE (PLASTIC)
- 121°C/15PSG PRESSURE POT TEST
- 131°/85% RELATIVE HUMIDITY HAST TEST

JULY 2004

2325 Orchard Parkway San Jose CA. 95131



AT-45DB081B

PLASTIC PACKAGE

150°C RETENTION BAKE

<u>LOT NUMBER</u>	<u>DATE CODE</u>	<u>SAMPLE SIZE</u>	<u>TOTAL CKT-HRS(K)</u>	<u>NUMBER OF FAILURES AT INDICATED HOURS</u>			
				(48)	(168)	(500)	(1000)
0S1955A	0S0051	200	200.0	0	0	0	0
1W0370	1W0117	294	294.0	0	0	0	0
0ZC336-1	0Z0117	299	299.0	0	0	0	0
0T1973-1	0T0118	200	200.0	0	0	0	0
1P0629-1	1P0118	200	200.0	0	0	0	0
1P1720	1P0120	200	200.0	0	0	0	0
1P1144A	1P0122	200	200.0	0	0	0	0
0ZC316	0Z0126	100	100.0	0	0	0	0
1W0359	1W0126	100	100.0	0	0	0	0
1W0254	1W0126	100	100.0	0	0	0	0
1P2298C	1P0130	200	200.0	0	0	0	0
1P1717	1P0131	400	400.0	0	0	0	0
1R2664D	1R0134	199	199.0	0	0	0	0
1S4532	1S0134	600	600.0	0	0	0	0
2P0740-2	2P0247	184	184.0	0	0	0	0
2R1752-3	2R0247	100	100.0	0	0	0	0
1T6007	1T0249	50	50.0	0	0	0	0
3H0396A	3H0334	100	100.0	0	0	0	0
3R3559-1	3R0337	300	300.0	0	0	0	0
3J1930	3J0402	50	50.0	0	0	0	0

FAILURE RATE

TOTAL DEVICE HOURS

4,076,000 DEVICE HOURS

BEST ESTIMATE

λ = 0.02% PER 1,000 HOURS

50°C AMBIENT

EXTRAPOLATION TO 50°C VIA ARRHENNIUS EQUATION AND ACTIVATION ENERGY OF 0.5eV

λ = 0.0003% PER 1,000 HOURS (3 FITS)

CONFIDENCE ESTIMATE

λ 60 = 0.0003% PER 1,000 HOURS
60% CONFIDENCE (3 FITS)

λ 90 = 0.0008% PER 1,000 HOURS
90% CONFIDENCE (8 FITS)

AT-45DB081B
 PLASTIC PACKAGE
125°C OPERATING LIFE TEST

<u>LOT NUMBER</u>	<u>DATE CODE</u>	<u>SAMPLE SIZE</u>	<u>TOTAL CKT-HRS (K)</u>	<u>NUMBER OF FAILURES</u>
0T0280-4	0T0108	100	100.0	0
0S1954-11	0S0104	100	100.0	0
0S1955-1	0S0051	200	200.0	0
1W0370	1W0117	100	100.0	0
0ZC336-1	0Z0117	100	100.0	0
0T0814-1	0T0116	300	300.0	0
0ZG316	0Z0126	100	100.0	0
1W0359	1W0126	100	100.0	0
1W0354	1W0126	90	90.0	0
1T6007	1T0249	100	100.0	0
3H0396A	3H0334	90	90.0	0

FAILURE RATE

<u>TOTAL DEVICE HOURS</u>		1,380,000 DEVICE HOURS
<u>BEST ESTIMATE</u>	λ	= 0.05% PER 1,000 HOURS
<u>50°C AMBIENT</u>		EXTRAPOLATION TO 50°C VIA ARRHENNIUS EQUATION AND ACTIVATION ENERGY OF 0.5eV
	λ	= 0.002% PER 1,000 HOURS (17 FITS)
<u>CONFIDENCE ESTIMATE</u>	λ	60 = 0.002% PER 1,000 HOURS 60% CONFIDENCE (23 FITS)
	λ	90 = 0.006% PER 1,000 HOURS 90% CONFIDENCE (57 FITS)

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PLASTIC PACKAGE

EXTENDED TEMPERATURE CYCLE

-65°C to +150°C PLCC/TSOP/SOIC/PDIP
-55°C to +125°C CBGA

<u>DATE CODE</u>	<u>PACKAGE TYPE</u>	<u>SAMPLE SIZE</u>	<u>NUMBER OF CYCLES</u>	<u>NUMBER OF FAILURES</u>
0T0109	14 CBGA	100	1000	0
0T0110	28 SOIC	55	1000	0
Z0116	28 TSOP	50	1000	0
1W0117	28 TSOP	50	1000	0
0Z0117	28 TSOP	50	1000	0
1P0121	28 TSOP	50	1000	0
2P0247	8 CASON	50	1000	0
1T0249	8 CASON	50	1000	0
2R0247	8 CASON	100	1000	0
3R0337	14 CBGA	200	1000	0
3J0402	14 CBGA	50	1000	0

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PLASTIC PACKAGE

121°C/15PSG PRESSURE POT TEST

<u>DATE</u> <u>CODE</u>	<u>PACKAGE</u> <u>TYPE</u>	<u>SAMPLE</u> <u>SIZE</u>	<u>NUMBER OF FAILURES</u> <u>AT INDICATED HOURS</u>			
			(24)	(48)	(72)	(96)
0T0109	14 CBGA	98	0	0	0	0
0Z0116	28 TSOP	50	0	0	0	0
0Z0117	28 TSOP	50	0	0	0	0
1W0117	28 TSOP	50	0	0	0	0
2P0247	8 CASON	50	0	0	0	0
1T0249	28 SOIC	50	0	0	0	0
3R0337	14 CBGA	200	0	0	0	0
3J0402	14 CBGA	50	0	0	0	0

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PLASTIC PACKAGE

131°C/85% RELATIVE HUMIDITY HAST TEST

<u>DATE</u> <u>CODE</u>	<u>PACKAGE</u> <u>TYPE</u>	<u>SAMPLE</u> <u>SIZE</u>	<u>NUMBER OF FAILURES</u> <u>AT INDICATED HOURS</u>
			(100)
0Z0016	28 TSOP	48	0
0Z0117	28 TSOP	48	0
1W0117	28 TSOP	48	0
1T0249	28 SOIC	50	0