



ATMEL CORPORATION

Tel:(408)441-0311

Fax:(408)436-4200

AT-89S8252 FLASH RELIABILITY DATA

- 125°C DYNAMIC LIFETEST (PLASTIC)
- 150°C RETENTION BAKE (PLASTIC)
- 121°C/15PSG PRESSURE POT TEST
- EXTENDED TEMPERATURE CYCLE

JULY 2003

2325 Orchard Parkway San Jose CA. 95131

AT-89S8252

PLASTIC PACKAGE

125°C DYNAMIC LIFETEST

| <u>LOT NUMBER</u> | <u>DATE CODE</u> | <u>SAMPLE SIZE</u> | <u>TOTAL NUMBER HOURS (K)</u> | <u>NUMBER OF FAILURES</u> |
|-------------------|------------------|--------------------|-------------------------------|---------------------------|
| 8A1867-1 | 8A9841 | 100 | 100.0 | 0 |
| 9B0070 | 9B9925 | 100 | 100.0 | 0 |

FAILURE RATETOTAL DEVICE HOURS

200,000 DEVICE HOURS

BEST ESTIMATE λ = 0.4% PER 1,000 HOURS50°C AMBIENT

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

 λ = 0.01% PER 1,000 HOURS (111 FITS)CONFIDENCE ESTIMATE λ 60 = 0.01% PER 1,000 HOURS

60% CONFIDENCE (154 FITS)

 λ 90 = 0.04% PER 1,000 HOURS

90% CONFIDENCE (390 FITS)

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PLASTIC PACKAGE

150°C RETENTION BAKE

| <u>LOT NUMBER</u> | <u>DATE CODE</u> | <u>SAMPLE SIZE</u> | <u>TOTAL NUMBER HOURS (K)</u> | <u>NUMBER OF FAILURES</u> |
|-----------------------|----------------------|------------------------|-----------------------------------|-------------------------------|
| 8A1867-1 | 8A9841 | 100 | 100.0 | 0 |
| 9B0070 | 9B9925 | 50 | 50.0 | 0 |

FAILURE RATETOTAL DEVICE HOURS

150,000 DEVICE HOURS

BEST ESTIMATE $\lambda = 0.7\%$ PER 1,000 HOURS50°C AMBIENTEXTRAPOLATION TO 50°C VIA ARRHENNIUS
EQUATION AND ACTIVATION ENERGY OF
0.5eV $\lambda = 0.01\%$ PER 1,000 HOURS (98 FITS)CONFIDENCE ESTIMATE
 λ 60 = 0.01% PER 1,000 HOURS
60% CONFIDENCE (131 FITS)
 λ 90 = 0.03% PER 1,000 HOURS
90% CONFIDENCE (326 FITS)

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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) |
| 9B9925 | 44 PLCC | 50 | 0 | 0 | 0 | 0 |

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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</u> <u>CODE</u> | <u>PACKAGE</u> <u>TYPE</u> | <u>SAMPLE</u> <u>SIZE</u> | <u>NUMBER OF</u> <u>CYCLES</u> | <u>NUMBER OF</u> <u>FAILURES</u> |
|----------------------------|-------------------------------|------------------------------|-----------------------------------|-------------------------------------|
| 8A9841 | 44 PLCC | 50 | 1000 | 0 |
| 9A9925 | 44 PLCC | 50 | 1000 | 0 |