

MIL-STD-883G

METHOD 1008.2

STABILIZATION BAKE

1. PURPOSE. The purpose of this test is to determine the effect on microelectronic devices of storage at elevated temperatures without electrical stress applied. This method may also be used in a screening sequence or as a preconditioning treatment prior to the conduct of other tests. This test shall not be used to determine device failure rates for other than storage conditions. It may be desirable to make end point and, where applicable, intermediate measurements on a serialized device basis or on the basis of a histogram distribution by total sample in order to increase the sensitivity of the test to parameter degradation or the progression of specific failure mechanisms with time and temperature.

2. APPARATUS. The apparatus required for this test shall consist of a controlled temperature chamber capable of maintaining the specified temperature and suitable electrical equipment to make the specified end point measurements.

3. PROCEDURE. The device shall be stored at the specified ambient conditions for the specified time. The time at high temperature shall be sufficient to allow the total mass of each device under test to reach the specified temperature before the specified time duration begins. Within the time interval of 24 hours before (0 hours before test durations less than 250 hours) to 72 hours after the specified duration of the test, the device shall be removed from the specified ambient test condition and allowed to reach standard test conditions. When specified, end-point measurements shall be completed within 96 hours after removal of device from the specified ambient test condition. When specified (or at the manufacturer's discretion, if not specified) intermediate measurements shall be made at intermediate points.

3.1 Test condition. The ambient test temperature shall be indicated by specifying a test condition letter from the following table. The specified test temperature is the minimum actual ambient temperature to which all devices in the working area of the chamber are exposed. This shall be assured by making whatever adjustments are necessary in the chamber profile, loading, location of control or monitoring instruments, and the flow of air or other chamber atmosphere. Therefore, calibration, shall be accomplished on the chamber in a fully, loaded, unpowered configuration, and the indicator sensor located at, or adjusted to reflect, the coldest point in the working area. Unless otherwise specified, test condition C minimum, with a minimum time duration and temperature as specified in table I, shall apply. Unless otherwise specified, the test duration for all other test conditions shall be 24 hours minimum.

| <u>Test condition</u> | <u>Temperature (minimum)</u> |
|-----------------------|------------------------------|
| A | 75°C |
| B | 125°C |
| C | See table I |
| D | 200°C |
| E | 250°C |
| F | 300°C |
| G | 350°C |
| H | 400°C |

TABLE I. Stabilization bake time temperature regression.

| Minimum temperature | Minimum time (hours) |
|---------------------|--|
| °C | Equivalent test condition C duration <u>1/</u> |
| 100 <u>2/</u> | 1,000 |
| 125 <u>2/</u> | 168 |
| 150 | 24 |
| 155 | 20 |
| 160 | 16 |
| 165 | 12 |
| 170 | 8 |
| 175 | 6 |
| 200 | 6 |

1/ The only allowed conditions are as stated above.

2/ These time-temperature combinations may be used for hybrid microcircuits only.

4. SUMMARY. The following details shall be specified in the applicable acquisition document:

- a. Test condition letter if other than test condition C (see 3.1).
- b. Test duration if other than 24 hours (see 3.1).
- c. End point measurements, if applicable (see 3).
- d. Intermediate measurements, if applicable (see 3).
- e. Maximum test temperature rating, if applicable.