

### Recommendations For Long -Term Transistor Storage

Rev. 1

#### INTRODUCTION

The purpose of this document is to provide users with recommendations for storing transistors when the user shelf life will exceed 12 months (from receipt of parts).

#### LONG-TERM STORAGE

When long-term storage is necessary, the following techniques should be considered:

**Dry Atmosphere Cabinets.** Storage cabinets which maintain low humidity by purging with dry air or nitrogen at  $25 \pm 5^{\circ}\text{C}$  and  $<5\%$  relative humidity (RH).

- The cabinets should be capable of recovering to their stated humidity rating within one hour from routine excursions such as door opening/closing.

**Moisture Barrier Bags (MBB).** These bags are designed to restrict the transmission of water vapor and used to pack moisture sensitive devices.

- The moisture barrier bag should meet MIL-PRF-81705, TYPE I requirements for flexibility, ESD protection, mechanical strength, and puncture resistance. The bags must be heat sealable. The Water Vapor Transmission Rate (WVTR) should be  $\leq 0.002$  gm/100 in<sup>2</sup> in 24 hrs at  $40^{\circ}\text{C}$  after flex testing per condition "E" ASTM F 392. The WVTR is measured using ASTM F 1249.

**Desiccant.** Desiccant is an absorbent material used to maintain a low relative humidity.

- The desiccant material should meet MIL-D-3464, TYPE II. Desiccant should be dustless, noncorrosive, and absorbent to amounts specified in the standard. The desiccant should be packaged in moisture permeable bags or pouches. The amount of desiccant used, per moisture barrier bag, should be based on the bag surface area and WVTR in order to limit the interior relative humidity in the MBB to less than 10% at  $25^{\circ}\text{C}$ .

**Humidity Indicator Card (HIC).** This is a card on which a moisture-sensitive chemical is applied such that it will make a significant, perceptible change in color (hue), typically from blue (dry) to pink (wet) when the indicated relative humidity is exceeded.

- The HIC is packed inside the moisture-barrier bag, to aid in determining the level of moisture to which the moisture-sensitive devices have been subjected. At minimum, the HIC should have three (3) color spots with sensitivity values of 5%, 10% and 60% RH.

#### SUMMARY

These recommendations are intended to be general in nature, as user storeroom / factory floor environments, and applications vary greatly.

When it is known or anticipated that received parts will have a shelf life exceeding 12 months, use of the techniques, or combination of techniques described provide uniform methods to protect transistors during long-term storage.

As always, proper ESD precautions should be observed during handling and assembly.