



CYPRESS

Moisture-Sensitive Devices Handling Information

Cypress Dry Bag Policy

In order to insure against moisture damage, Cypress carries out dry bake and dry packing on all devices that are moisture sensitive in surface mount applications. These devices are shipped in sealed Moisture Barrier Bags (MBBs) with caution labels similar to *Figure 1*. Cypress recommends that all PLCCs with pin counts of 44 and higher, all Plastic Quad Flat Packs (PQFPs), and Thin Quad Flat Packs (TQFPs) be used dry in surface mount applications. **NOTE: A package is considered dry if it has been baked for 24 continuous hours at $125 \pm 5^\circ\text{C}$ and has been stored at or below 20% Relative Humidity (RH) prior to the reflow-soldering process.**

Moisture-Sensitivity

The extremely high temperatures and steep temperature gradients that are present during the reflow-soldering processes used in attaching surface mount devices to circuit boards could damage to moisture-sensitive devices if they have absorbed excessive moisture. The moisture trapped in such a device vaporizes during the reflow-soldering processes and may generate significant hydrostatic pressure within the package. In the worst case, this pressure may cause an internal or external crack in the overmold that allows flux and other contaminants to reach the die area. The final result is a cracked device that will suffer an early failure.

Cypress Dry-Packing Process

The Cypress dry-packing process starts with baking the moisture sensitive devices at $125 \pm 5^\circ\text{C}$ for 24 continuous hours in bakeable carrier trays (for TSOP, TQFP, PQFP devices) or aluminum tubes (for SOIC, SOJ, and PLCC devices). Baked devices are then vacuum sealed and dry packed in MBBs within the 24 hour factory-floor-life limit under controlled environment.

In each of the vacuum sealed MBBs, appropriate amount of desiccant packs are enclosed to keep the enclosed devices at less than 20% RH for up to 12 months from the date of seal as stated on the caution label on the bag. A reversible humidity indicator card (HIC) that has indicator grades, is also enclosed to monitor the internal humidity level. On the outside of each sealed bag a caution label similar to the one shown is attached to inform and alert the customers of the seal date information and the need for special handling precautions.

Dry-Packed Part Handling Procedures

Package Inspection

Upon receiving the package, check the seal date and make sure that the package has no holes, tears, or openings that may endanger the enclosed devices to humidity. Cypress rec-

ommends that the bag stay sealed until the enclosed devices are ready for use.

Storage Condition

In line with the warning stated on the caution label, the sealed MBBs should be stored unopened in a relatively dry environment or one of no more than 90% relative humidity and 40°C .

Expiration Date: First Seal Date Plus 12 Months

The expiration date of a sealed MBB is 12 months from the original seal date if it has been stored in an environment of less than 40°C and 90% humidity. If the expiration date has been exceeded, or if upon opening a bag within its stated expiration period, the HIC display a humidity level of over 30%, the enclosed devices "may still be used with the addition of a bake of 192 hours at 40°C with less than 5% humidity, or a bake of 24 hours at 125°C with less than 5% humidity." After the baking, any of the following options may apply:

- Use the parts within 48 hours
- Reseal the devices in a MBB within 12 hours after baking with fresh desiccant packs and HIC
- Store the devices in a controlled cabinet with less than 20% RH.

Opening a Sealed Bag

When parts are ready to be used, open the MBB by cutting across the top within one inch of the seal area. Use the dry parts following the guide line under the factory-floor-life section to ensure they are maintained below critical moisture levels. Opened bags must be resealed immediately (the factory-floor-life is cumulative and has a maximum of 24 hours) and the information on the date the bag is opened and resealed must be filled out on the caution label. If the opened bag is not resealed immediately, and provided that the factory-floor-life has not been exceeded, or in the case of splitting the devices of a bag, and new desiccant, the same packing and sealing procedure must also be applied.

Factory Floor Life

Cypress recommends the maximum cumulative time that devices can be exposed to the open air without requiring re-bake and resulting in moisture-related damages to be 24 hours with environment condition not worse than 40°C and 85% RH. (This includes processing time after bake but prior to seal at Cypress and any time the bag is re-opened after seal.) If the floor life is exceeded, it is recommended that the devices be dry baked as if the storage period has expired.

If at any time, the recommended storage and factory floor conditions, or handling guidelines might be violated, please consult Cypress for more information.

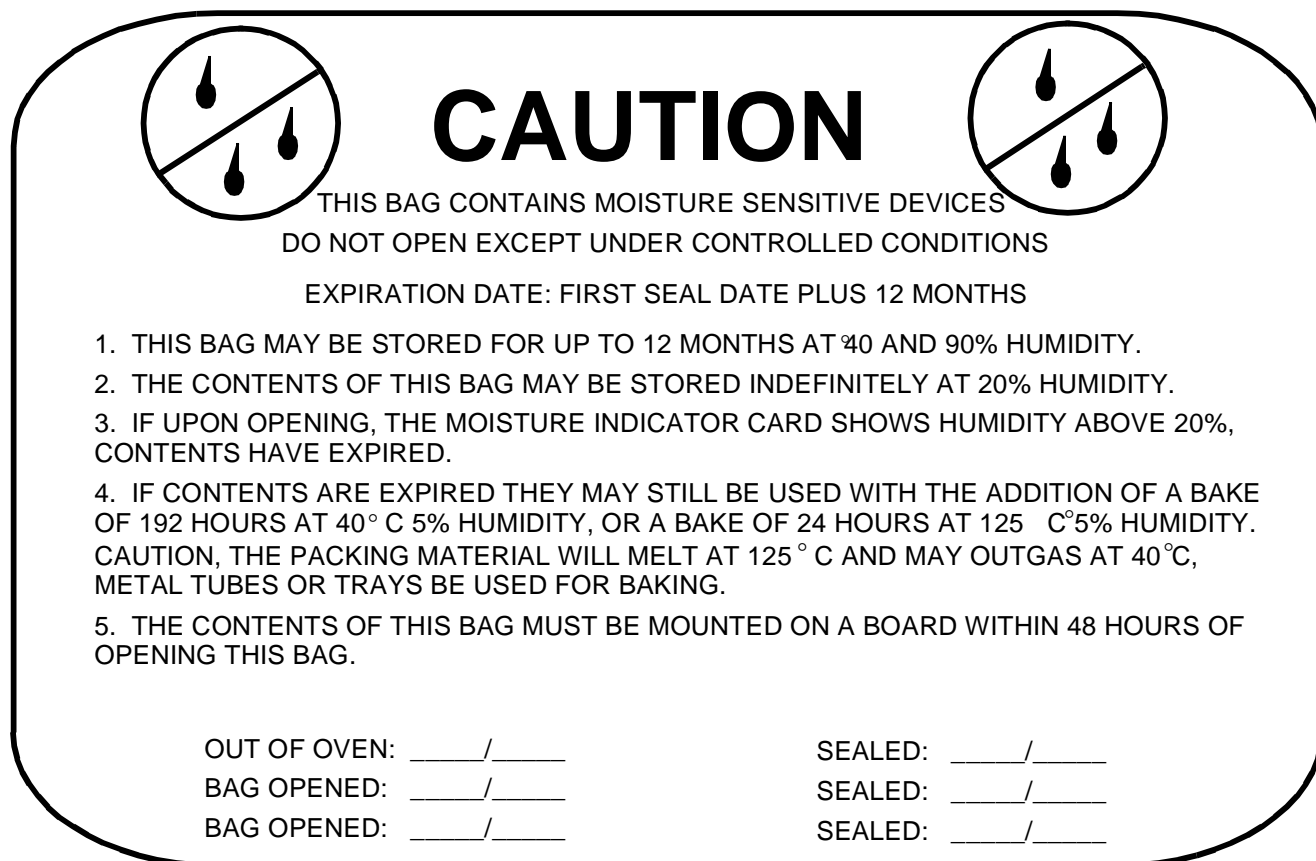


Figure 1. Caution Label

Document #: 38-00501