

Product Storage Life

Application Note 65



Summary

pSemi Corporation controls its stock of products to ensure that they are manufacturable when required and reliable throughout the operational life of the product. This document identifies the allowable storage life of product prior to manufacturing.

Introduction

Semiconductor devices can be subject to environmental degradation due to the nature of some of the materials used during manufacturing. While most materials are stable over the long term, some of the materials used are subject to storage time limitations prior to final manufacturing in the customer's assembly environment. To ensure that products are ready for manufacturing by the customer, storage life durations have been established for all pSemi products.

Product Storage Conditions

It is imperative that semiconductor products are stored in a manner that does not compromise either the product or the packing material of the product. The following sections identify the proper storage conditions for pSemi's products.

ESD Protection

pSemi devices are sensitive to *electrostatic discharge (ESD)* and must be handled in accordance with *JESD625—Requirements for Handling Electrostatic Discharge Sensitive (ESDS) Devices*.

Temperature Control

The recommended storage temperature is from $-10\text{ }^{\circ}\text{C}$ to $+35\text{ }^{\circ}\text{C}$. This temperature recommendation does not supersede the datasheet specification for absolute maximum storage temperature range.

Humidity Control

The recommended storage humidity is from 20%RH to 70%RH.

Storage Life Durations

The following sections identify the storage life durations for pSemi products.

Plastic Encapsulated Devices

The storage life of MSL-1 plastic encapsulated devices is a total of seven years (six-year shelf life at a pSemi warehouse and one-year shelf life at a customer's facility).

MSL 2–6 plastic encapsulated devices that are moisture sensitive (i.e., MSL2–6) require annual maintenance and have a total shelf life of five years (four-year shelf life at a pSemi warehouse and one-year shelf life at a customer's facility). After each year, the desiccant must be changed and after every two years the humidity indicator card must be changed. Plastic encapsulated devices must be protected in accordance with IPC/JEDEC J-STD-033—*Handling, Packing, Shipping and Use of Moisture/Reflow Sensitive Surface Mount Devices*.

Hermetically Sealed Devices

Hermetically sealed devices have a total storage life of 15 years from the assembly date code (14-year shelf life at a pSemi warehouse and one-year shelf life at a customer's facility).

Unbumped Wafers or Die

Unbumped wafers or die do not have a storage life duration limit based on the nature of the materials. However, wafers that are stored on film frame have a storage life limitation due to the film frame tape. The storage life for wafers on film frame is one year from the date of taping. This allows an additional one year of storage at the customer's facility for a total storage life of two years.

Bumped Wafers or Die

Bumped wafers or die (in tape and reel or waffle pack) have a total nine-year storage life from the date of bumping (eight-year shelf life at a pSemi warehouse and one-year shelf life at a customer's facility). Wafers or die that are stored on film frame have a storage life limitation due to the film frame tape. The storage life for wafers or die on film frame is one year from the date of taping. This allows an additional one year of storage at the customer's facility for a total storage life of two years.

Extension of Storage Life

The storage life of some products that have reached the storage life limitation can be extended through sample verification testing. Successful completion of the verification can allow additional storage life as identified in pSemi's *Product Storage and Shelf-Life* specification.

Conclusion

Proper handling and storage of pSemi devices ensures that product is manufacturable at the customer's facility and reliable throughout the guaranteed life of the product.

Sales Contact

For additional information, contact Sales at sales@psemi.com.

Disclaimers

The information in this document is believed to be reliable. However, pSemi assumes no liability for the use of this information. Use shall be entirely at the user's own risk. No patent rights or licenses to any circuits described in this document are implied or granted to any third party. pSemi's products are not designed or intended for use in devices or systems intended for surgical implant, or in other applications intended to support or sustain life, or in any application in which the failure of the pSemi product could create a situation in which personal injury or death might occur. pSemi assumes no liability for damages, including consequential or incidental damages, arising out of the use of its products in such applications.

Patent Statement

pSemi products are protected under one or more of the following U.S. patents: patents.psemi.com

Copyright and Trademark

©2016–2021, pSemi Corporation. All rights reserved. The Peregrine Semiconductor name, Peregrine Semiconductor logo and UltraCMOS are registered trademarks and the pSemi name, pSemi logo, HaRP and DuNE are trademarks of pSemi Corporation in the U.S. and other countries.