Storage of Products Supplied by Infineon Technologies

About this document

Mission

This guideline gives recommendations for the storage of Infineon products.

Such recommendations are subject to storage time and storage conditions (temperature, relative humidity, packing medium and environmental conditions).

Scope and purpose

This guideline applies to all products supplied by Infineon Technologies.

Infineon products are technologically advanced, mass-produced semiconductors. A product is a wafer, a device or a module made ready for delivery. It is tested or untested, identified (marked), and packed in intimate and proximity packing materials. Examples of products are:

- Devices packed (dry as well as non-dry) in tubes, trays, tapes, and reels
- Sawn wafers packed in frame shippers or PE-bags
- Unsawn wafer packed in wafer shippers

Specific storage conditions (e.g. storage time) of products or a product family may be subject to a product specification for the specific product or product family.

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1 Abbreviations / Terminology

Term	Definition
BIP Module	Bipolar Module
BPL	Barcode Product Label on the outer Infineon packing.
Component	Component is a collective term used as synonym for discrete and integrated semiconductor products.
Device	A Device is a microcircuit that normally contains one chip within a package.
Die	A die, (plural: dice) is an unpackaged semiconductor device with terminals for electrical interconnects, sawn from a wafer.
Dry pack	Packing system consisting of moisture barrier bag, desiccant and humidity indicator card; according JEDEC J-STD-033
Film frame	The preferred term for packing material for mounted diced wafers.
IGBT Module	Insulated Gate Bipolar Transistor Module
Module	Combines several chips or devices in one package
Package	That part of the device that encloses the chip or chips.
System	A System consists of two or more products that work together at an optimum in an application. The System description specifies the features, the interaction of the products, and the interface to the user application.
TIM	Thermal Interface Material
Wafer	A Wafer is flat disk of semiconductor material in which similar chips are simultaneously processed.

2 References

- IEC TR 62258-3 Edition 2 Part 3: Recommendation for good practice in handling, packing and storage
- MIL PRF-131K Aug 2005, Performance Specification: Barrier Materials, Watervaporproof, Greaseproof, Flexible, Heat-Sealable
- JEDEC J-STD-033 Revision D, April 2018: Handling, Packing, Shipping and Use of Moisture, Reflow, and Process Sensitive Devices

3 Storage Requirements

The storage requirements differ among product types. They are defined in:

- Chapter 3.1. Storage requirements for Wafers and Dies
- Chapter 3.2. Storage requirements for Devices and Modules

3.1 Wafer and Dies

- The usage of humidity indicator cards is not allowed for the packing of wafers and dies
- By reducing contamination sources (e.g. hazardous gases) corrosion risks are significantly reduced
- Products shall be processed before reaching the maximum allowed storage time
- Processing beyond the maximum allowed storage time may increase the risk of reduced process ability, malfunction or non-function

Table 1 Wafer/Sawn Wafer/Singulated Chips

Stored Delivery Form		Ambient Atmosph.	Ambient Conditions	Maximum Storage Time
Unsawn Wafer, unsawn bumped Wafer	Packed in Wafer Shipper and Moisture Barrier Bag[1)] with desiccant[2)], evacuated, nitrogen purged[3)] and sealed	Air	15°C-30°C	36 months
	Stored in Nitrogen Cabinet[3)]	Nitrogen	15°C-30°C	36 months
Sawn Wafer on Film Frame	Packed in Frame Shipper and Moisture Barrier Bag[1)] with desiccant[2)], evacuated, nitrogen purged[3)] and sealed	Air	17°C-25°C	6 months[4)]
	Sealed in Polyetelene Bags[5)]	Air	17°C-25°C	6 months[4)]
	Stored in Nitrogen Cabinet[3)]	Nitrogen	17°C-25°C	6 months[4)]
Singulated Chips	In Waffle Pack (Chip Tray) packed in Moisture Barrier Bag[1)] with desiccant[2)], evacuated, nitrogen purged and sealed	Air	17°C-25°C	36 months[6)]
	In Waffle Pack stored in Nitrogen Cabinet[3)]	Nitrogen	17°C-25°C	36 months[6)]
Singulated Chips	In Blister Tape on Reel protected by cover tape packed in Moisture Barrier Bag[1)] with desiccant[2)], evacuated, nitrogen purged[3)] and sealed	Air	17°C-25°C	12 months[6)]
	In Blister Tape stored in Nitrogen Cabinet[3)]	Nitrogen	17°C-25°C	12 months[6)]

(table continues...)

1 Acc. to MIL PRF-131K
2 Number of desiccant units to be calculated acc. JEDEC J-STD-033 Revision D
3 Environmental conditions, considering IEC TR 62258-3 (item 9.4 long-term storage environment): Atmosphere: >99% nitrogen or inert gas
4 The storage time starts with laminating of the wafer on foil. Usually indicated by the Date Code on Label (BPL). 18 months max storage time for security and smart card solutions.
5 Polyetelene Bbags are used sometimes for single wafer packing
6 The storage time starts with the packing process (transfer of dies to adhesive punched carrier tape/waffle pack or blister (carrier) tape)

3 Storage Requirements

Table 1 (continued) Wafer/Sawn Wafer/Singulated Chips

Stored Delivery Form		Ambient Atmosph.	Ambient Conditions	Maximum Storage Time
	On adhesive-backed punched carrier tape on reel packed in Moisture Barrier Bag[1)] with desiccant[2)], evacuated, nitrogen purged[3)] and sealed	Air	17°C-25°C	6 months[6)]
	On adhesive punched carrier tape stored in Nitrogen Cabinet[3)]	Nitrogen	17°C-25°C	6 months[6)]

1 Acc. to MIL PRF-131K
2 Number of desiccant units to be calculated acc. JEDEC J-STD-033 Revision D
3 Environmental conditions, considering IEC TR 62258-3 (item 9.4 long-term storage environment): Atmosphere: >99% nitrogen or inert gas
6 The storage time starts with the packing process (transfer of dies to adhesive punched carrier tape/waffle pack or blister (carrier) tape)

3.2 Devices, Modules, Inlays

Products shall be processed before the end of the maximum allowed storage time.

Processing beyond the maximum allowed storage time may increase the risk of reduced process ability, malfunction or non-function

Table 2 Requirements for devices, modules and inlays

Stored Package Types/Product Types	Storage Measures	Ambient Atmosphere	Ambient Conditions[7]	Maximum Storage Time[8]
Packages with Moisture Sensitive Level 1 (MSL)[9] and packages without Moisture Sensitive Level[10] (except packages belonging to package classes mentioned in next row)	Original packing	Air	5°C -40°C/10%rRH - 75%RH[11]	36 months 60 months[12]
Packages belonging to following classes: PDSOF_STS, UFWLP, VLGA, WDSON, WLB, WLB-16-3, WLB-5, WLL, WLP_HS	Original packing	Air	5°C -40°C/10%RH - 75%RH[11]	24 months 60 months[12]
Packages with Moisture Sensitive Level (MSL)[9][13] 2,3,4 and 5	Original packing Dry pack (packed in Moisture Barrier Bag with Desiccant[14] and Humidity Indicator Card, evacuated and sealed)	Air	5°C -40°C/ <90%RH[11]	36 months 60 months[12][13]
IGBT Modules with solder terminals, IGBT and BIP Modules with TIM 1.0 pre-applied	Original packing	Air	5°C -40°C/10RH% - 75%RH[11]	24 months
IGBT Modules with solder terminals,IGBT and BIP modules with TIM 2.0 pre-applied	Original packing	Air	5°C -40°C / 10RH% - 75%RH[11]	12 months
IGBT Modules with PressFIT terminals[15]; IGBT and BIP Modules with screw terminals	Original packing	Air	5°C -40°C/10%RH - 75%RH[11]	60 months
Pressure contact discs - hermetically sealed	Original packing	Air	5°C -40°C/10%RH - 75%RH[11]	60 months
ChipCard Inlay/Inlam/eCover (Paper)	Original packing	Air	16°C-27°C/10%RH – 75%RH[11]	24 months

(table continues...)

7 According to EN-IEC 61760-2 clause 6 Storage Conditions (also valid for modules)

8 The storage time starts with the date code. Products shall be processed before the end of the maximum storage time defined. Processing beyond the maximum allowed storage time may increase the risk of reduced processability, malfunction or non-function

9 Moisture Sensitive Level as defined in J-STD-020

10 For example: Through-Hole packages

11 Condensation and bedewing shall be avoided

12 Storage time is 60 months for non-Automotive Microcontrollers, Security and smart card solutions and Universal Serial Bus (USB) products in SMD packages (PG-SMD and SG-WLB) in trays and TnR. Link to deviating maximum storage times: Dry packed products with deviating max. storage times

13 For some of the dry packed products integrated from Cypress the maximum storage time is 24 months. A complete list can be found under: Dry packed products with deviating max. storage times

14 Number of units of desiccant units calculated acc. JEDEC J-STD-033

15 For soldering of PressFIT terminals, storage type “IGBT Modules with solder terminals” applies

3 Storage Requirements

Table 2 (continued) Requirements for devices, modules and inlays

Stored Package Types/Product Types	Storage Measures	Ambient Atmosphere	Ambient Conditions[7)]	Maximum Storage Time[8)]
ChipCard Inlay/ Inlam/eCover (PVC)	Original packing	Air	16°C-27°C/ 10%RH – 75%RH[11)]	48 months
ChipCard Inlay/Inlam/eCover (Textile)	Original packing	Air	16°C-27°C/10%RH – 75%RH[11)]	15 months
ChipCard Modules	Original packing	Air	5°C -40°C/10%RH - 75%RH[11)]	36 months

7 According to EN-IEC 61760-2 clause 6 Storage Conditions (also valid for modules)

8 The storage time starts with the date code. Products shall be processed before the end of the maximum storage time defined. Processing beyond the maximum allowed storage time may increase the risk of reduced processability, malfunction or non-function

11 Condensation and bedewing shall be avoided

Revision history

Major changes since previous revision

Revision history

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V 10.0; 2023-05-10	Edited Table 1
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V4.0; 2016-11-24	Editorial revision
V3.0; 2016-11-22	Editorial revision
V2.0; 2016-11-15	Regular revision
V1.0; 2009-06-22	New edition

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