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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 42706.1-2023

Electronic components - Long-term storage of electronic semiconductor devices - Part 1: General

电子元器件 半导体器件长期贮存 第1部分：总则

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Standardization Administration of the PRC

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Foreword

This document is in accordance with the provisions of GB/T 1:1-2020 "Guidelines for Standardization Work Part 1: Structure and Drafting Rules for Standardization Documents" drafting: This document is part 1 of GB/T 42706 "Long-term Storage of Electronic Components and Semiconductor Devices": GB/T 42706 has been issued the following sections:

--- Part 1: General;

--- Part 2: Degradation mechanism;

--- Part 5: Chips and wafers: This document is equivalent to IEC 62435-1:2017 "Long-term storage of electronic components and semiconductor devices - Part 1: General rules": The following minimal editorial changes have been made to this document:

a) "VP" in Table D:1 is changed to "V";

b) "Reference", "Text" and "Auditresponse" in Table B:1 do not match the content of the table header, have no specific meaning, and have been deleted;

c) Adjusted some references: Please note that some contents of this document may refer to patents: The issuing agency of this document assumes no responsibility for identifying patents: This document is proposed by the Ministry of Industry and Information Technology of the People's Republic of China: This document is under the jurisdiction of the National Semiconductor Device Standardization Technical Committee (SAC/TC78): This document is

drafted by: The Thirteenth Research Institute of China Electronics Technology Group Corporation, Guangdong Tiange Acoustic Technology Co:, Ltd:, Industry and Information Technology The Fifth Research Institute of Electronics of the Ministry of Chemical Industry, the Military Representative Office of the Military Representative Bureau of the Ministry of Equipment Development in Wuhan, Zhuhai Zicheng Electronic Technology Co:, Ltd:, Huizhou Techuang Electronic Technology Co:, Ltd:, Qingdao Jinhuiyuan Electronics Co:, Ltd:, Shenzhen Lishengmei Semiconductor Co:, Ltd:, Jiangxi Sujiejie Microelectronics Co:, Ltd:, Ningbo Jiangfeng Electronic Materials Co:, Ltd:, Foshan Yifeng Electric Industrial Co:, Ltd:, Hebei North Core Semiconductor Technology Co:, Ltd:, Shenzhen Hexin Valley Microelectronics Co:, Ltd:, Tailong (Fujian) Commercial Lighting Co:, Ltd:, Foshan Weiaoyun Biotechnology Co:, Ltd:, Guangdong Powell Electronic Technology Co:, Ltd: The main drafters of this document: Zhang Xin, Huang Xiaogang, Yang Shaohua, Qiu Yu, Jin Lihua, Shi Dongsheng, Yan Meng, Liu Wei, Huang Xian, Chen Jinxing, Li Depeng, Lin Xinchun, Huang Jian, Bian Yijun, Wu Weibin, Xian Qing, Zhang Kui, Shen Ye, Hu Zhixing, Liu Xiaozhu, Yin Lijing, Wang Zhao:

This document describes an implementation method for long-term storage: Long-term storage refers to electronic components that are expected to be stored for more than 12 months storage: In recent years, the elimination of electronic components, especially integrated circuits, has become more and more serious: With the development of science and technology, and used in aviation, railway or energy Compared with industrial equipment in the source field, the life cycle of components is very short: Therefore, systematic storage of components is the solution to the elimination problem: main method: Long-term storage requires good implementation of storage procedures, especially the storage environment: It is recommended that all transportation, maintenance and care, storage and testing operations: This document proposes a method to delay obsolescence to the greatest extent, but it does not guarantee that the components and parts will be in good working condition after storage: operating status: Because some systems are very old, some as long as 40 years or more, how to perform repairs and obtain spare parts has become a problem for users: and maintenance organizations need to solve the problem: For example, some components required to service these systems cannot be recovered from the original Spare parts obtained from suppliers or used for assembly are produced at the beginning of production but require long-term storage: The purpose of this document is to It is to provide guidance for long-term storage of components: GB/T 42706 "Long-term storage of electronic components and semiconductor devices" aims to ensure that after long-term storage of components, there is sufficient reliability: Encourage users to ask suppliers to provide technical parameters of related products to demonstrate the storage process that meets user needs: These labels The standard aims to provide relevant guidance for electronic components that require long-term storage: GB/T 42706 "Long-term storage of electronic components and semiconductor devices" is divided into 9 parts: Part 1~Part 4 applies to All long-term storage, and contains general requirements and guidance: Parts 5

to 9 apply to the storage of several specific product types: exist While meeting the general requirements of Parts 1 to 4, the requirements for specific product types must also be met: Beginning with Part 5, it deals with electronic components that require different storage conditions: GB/T 42706 "Long-term Storage of Electronic Components and Semiconductor Devices" corresponds to the IEC 62435 series of standards and is proposed to consist of 9 parts composition:

--- Part 1: General: The purpose is to specify the relevant terms, definitions and principles of long-term storage, and to provide effective long-term storage of components: Storage concepts, good working practices and general methods:

--- Part 2: Degradation mechanism: The purpose is to specify the degradation mechanisms and Mode of degradation, and guidance on test methods for assessing general degradation mechanisms:

--- Part 3: Data: The purpose is to specify the requirements for all aspects of data storage during the long-term storage of electronic components, and to maintain traceability: traceability or data link integrity:

--- Part 4: Storage: The purpose is to specify the long-term storage method of electronic components, as well as related recommended conditions, including transportation, control control and storage facilities:

--- Part 5: Chips and wafers: The purpose is to specify single chips, parts of wafers or entire wafers, as well as metallized structures (introduced storage conditions and rules for chips, as well as general-purpose and special-purpose packaging products containing chips or wafers Provide operational guidance:

--- Part 6: Packaged or coated components: The purpose is to specify the long-term storage methods and recommended conditions for packaged or coated components, including including transport, containment, and storage facility security:

1 Scope

GB/T 42706.1-2023 is Part 1 of the Chinese series on the long-term storage of semiconductor devices. Equipment with a service life of twenty or thirty years - aerospace, rail, defence, industrial control - outlives the components inside it by a wide margin, and when a part goes obsolete the owner either redesigns the board or buys enough devices now to last the programme. That second choice creates a storage problem: semiconductors degrade in the drawer through solderability loss, oxidation, moisture uptake and, in plastic packages, the ageing of the mould compound. Part 1 sets the general provisions: the purpose of long-term storage, the basis for the decision, the causes and methods, the market situation, risk control and insurance and the delaying of obsolescence, then the logistics covering purchasing requirements, the basic storage unit, inventory management and redundancy. It took effect on 1 September 2023.

This document defines terms, definitions and principles related to the long-term storage of semiconductor devices: Long-term storage as a strategy to delay obsolescence, It refers to the storage where the product is expected to be stored for more than 12 months: This document provides concepts, good work Habits and general methods:

2 Normative references

The contents of the following documents constitute the essential provisions of this document through normative references in the text: Among them, dated references For documents, only the version corresponding to the date is applicable to this document; for undated reference documents, the latest version (including all amendments) is applicable to this document: IEC 60749-20-

1 Mechanical and climatic test methods for semiconductor devices Part 20-1: Sensitivity to the combined effects of moisture and soldering heat

GB/T 4937:201-2018 Mechanical and climatic test methods for semiconductor devices Part 20-1: Tables sensitive to the combined effects of humidity and soldering heat Handling, packaging, marking and transportation of surface mount devices (

IEC 60749-20-1:2009, IDT)

3 Terms, Definitions and Abbreviations 3:

1 Terms and Definitions The following terms and definitions apply to this document: 3:1:1 storage environment storage environment The storage area where the temperature, humidity, atmospheric environment and other conditions are controlled according to the requirements of the product: 3:1:

2 Long-term storage long-termstorage; LTS In order to prolong the life cycle of products and meet the needs of later use, planned component storage is carried out:

Note: The storage duration is adjusted according to the shape and structure of the components (for example, packaging materials, shape, etc:) and storage conditions: In general, long-term storage for more than 12 months: 3:1:

3 Electronic deviceelectronicdevice Encapsulated electrical, electronic, electromechanical components, or electronic products assembled using these components: 3:1:4 moisture barrier bag; MBB Storage bags with a flexible laminated vapor barrier film to limit the transmission of water vapor: