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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/Z 41275.4-2023

**Process management for avionics - Aerospace and defence
electronic systems containing lead-free solder - Part 4: Ball grid
array(BGA) re-balling**

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Foreword

This document complies with the provisions of GB/T 1:1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents"

Drafting:

This document is Part 4 of GB/T (Z) 41275 "Aviation Electronics Process Management Aerospace and Defense Electronic Systems Containing Lead-Free Solder"

point: GB/T (Z)41275 has released the following parts:

---Part 2: Reducing the harmful effects of tin;

---Part 3: System performance test methods containing lead-free solder and lead-free pins;

---Part 4: Ball Grid Array Ball Planting;

---Part 21: Transition Guide to Lead-Free Electronics;

---Part 22: Technical Guidelines;

---Part 23: Guidelines for rework/repair of lead-free and mixed electronic products:

This document is equivalent to IEC TS62647-4:2018 "Aviation electronics process management containing lead-free solder for aerospace and defense electronics systems"

System Part 4: Ball Grid Array Ball Planting", the file type is adjusted from IEC 's technical specifications to my country's national standardization guiding technology

document:

This document has made the following minimal editorial changes:

---Deleted IPCJ-STD-002 and IPC/JEDECJ-STD- in the "Normative Reference Documents" that are not normatively cited later:

035, 2:3:25 in IPC-TM-650, JEDECJESD22-A101, JEDECJESD22-B101, JEDECJESD22-B117, JEDECJESD213, MIL-STD-883, and write "References":

Please note that some content in this document may be subject to patents: The publisher of this document assumes no responsibility for identifying patents:

Introduction

GB/T (Z) 41275 specifies the management and technical requirements for lead-free aerospace, national defense and high-performance electronic systems:

Consists of 7 parts:

---Part 1: Preparation of lead-free control plan: The purpose is to provide for lead-free control of programming of aerospace, defense and high-performance electronic systems:

plan goals and requirements:

---Part 2: Reducing the harmful effects of tin: The purpose is to regulate aerospace, defense and high-performance electronic systems to reduce the harmful effects of tin:

The technical methods adopted for the impact:

---Part 3: System performance test methods containing lead-free solder and lead-free pins: The purpose is to regulate lead-free solder and lead-free tubing

Performance test methods and test procedures for aerospace, defense, and high-performance electronic systems:

---Part 4: Ball Grid Array Ball Planting: The purpose is to regulate aerospace, defense and high-performance electrical products containing lead-free solder and lead-free leads:

Requirements for subsystem replacement of ball grid array (BGA) component solder balls:

---Part 21: Transition Guide to Lead-Free Electronics: The purpose is to provide for aerospace and defense electronic system project management or system

A guide for engineering management to manage the transition to lead-free electronics:

---Part 22: Technical Guidelines: The purpose is to provide for aerospace, defense and high-performance electronic systems to ensure continued performance, quality,

Technical guidance for reliability, safety, airworthiness, configuration control, affordability, maintainability, and supportability:

---Part 23: Guidelines for rework/repair of lead-free and mixed electronic products: The purpose is to specify aerospace, defense and high performance electronics

Technical guidelines for disassembly and replacement of parts (including components) during system rework/repair:

As a result of the RoHS directive, soldering assembly processes have shifted primarily from tin-lead to lead-free, and most BGA component manufacturing

Manufacturers have switched from tin-lead solder balls to lead-free solder balls: This will introduce recordable reliability issues: In the case of lead-containing soldering processes, a

The solution is to replace the lead-free solder balls on BGA components with tin-lead solder balls, which prevents mixing of solder alloys:

This document is intended to standardize the requirements and guidelines for solder ball replacement on applicable BGA components: The requirements in this document are derived from existing lines

industry standards and collaboration documents between service providers and customers (usually avionics original equipment manufacturers):

This document is intended for use by bulbing manufacturers and customers to incorporate these requirements into their operations to provide consistent and well-controlled

process, or create a debulking/bulking management plan to enhance their existing process:

There are two main reasons for removing/reballing BGA components: alloy compatibility and replacing damaged solder balls:

Customers need to understand the potential risks during the deballing/balling process of