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

GB/T 45713.4-2025

**Electronics assembly technology - Part 4: Endurance test
methods for solder joint of area array type package surface
mount devices**

电子装联技术 第4部分：阵列型封装表面安装器件焊点的耐久性试验方法
(English Translation)

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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 4 of GB/T 45713 Electronic Assembly Technology. GB/T 45713 has been published in the following parts.

--- Part 4: Durability test method for solder joints of array type package surface mount devices.

This document is modified to adopt IEC 62137-4:2014 "Electronic assembly technology Part 4: Resistance to corrosion of solder joints of array-type package surface mount devices" Durability Test Methods.

This document has made the following structural adjustments compared to IEC 62137-4:2014.

---Appendix A, Appendix B, Appendix C, Appendix D, Appendix E, Appendix F, Appendix G, Appendix H correspond to IEC 62137-4:2014 Appendix B, Appendix C, Appendix D, Appendix E, Appendix F, Appendix G, Appendix H, Appendix A.

The technical differences between this document and IEC 62137-4:2014 and their reasons

are as follows.

--- The normative reference GB/T 2423.22 replaces IEC 60068-2-14 (see 5.3, 7.3) to adapt to my country's technical conditions.

Increase operability;

--- Deleted IEC 60194 (see 3.1 of IEC 62137-4:2014) because the standard has been abolished;

--- The abbreviation "CGA" (see 3.2 of IEC 62137-4:2014) has been deleted because the term is not mentioned in the text;

--- Replace the "instantaneous interruption detector" (see 7.2, 7.3, 7.6) with the "resistance recorder" and supplement the measurement method of the equipment;

--- Added "The daisy chain circuit is recommended to be placed on the top layer of the breadboard, and it is recommended to place a Multiple measurement pads are drawn between different nodes in the circuit" [see 5.5c)] to facilitate the rapid location of solder joint failure;

---In "Sample Preparation", "and use a stainless steel template with a thickness of 120μm to 150μm to print solder paste onto the test board pads " and use a stainless steel template of appropriate thickness (suitable for reflow soldering process) to print the solder paste onto the pads of the test board" [See 6a)] to adapt to solder paste printing of smaller pitch array packaging devices.

The following editorial changes were made to this document.

--- Added defect inspection item "Solder voids exceeding product specification requirements" in "Re-inspection" (see F.3.6) to avoid interference from solder voids Fatigue life.

Introduction

Array-type package surface mount devices are widely used in modern electronic devices, from high-performance computers to portable smart terminals.

The durability of electronic devices is crucial to their reliability and service life. Electronic assembly technology covers the process of assembling electronic components to printing.

A series of processes and methods on circuit boards, and related standards are of great significance to ensure product quality. GB/T 45713 "Electronic Assembly Technology" is proposed by it consists of two parts.

--- Part 3: Guidance for the selection of soldering environment and durability test methods. The purpose is to guide surface mount devices (SMD), Selection of reliability test methods for solder joints of array devices, pin devices and plug-in devices with different solder alloys.

--- Part 4: Durability test method for solder joints of array type package surface mount devices. It is intended for use in industrial and consumer fields.

Array package devices (FBGA, BGA, FLGA and LGA) and leadless Evaluation and testing of solder joint durability of type package devices (SON, QFN).

This document deals with the specific requirements for the durability test method of solder joints of array type package surface mount devices.

The durability performance in actual use provides a basis to ensure the stable operation of electronic equipment under complex working conditions.

Electronic assembly technology Part 4: Array packaging Durability test method for solder joints of surface mounted devices

1 Scope

This document specifies the durability test method for solder joints of array-type packaged devices mounted on printed boards to evaluate the resistance of solder joints to thermal mechanical stress.

Durability of force.

This document applies to array-type package devices (FBGA, Evaluation and testing of solder joint durability of BGA, FLGA and LGA) and leadless package devices (SON, QFN), not applicable to semiconductor Evaluation and testing of the device's own performance.

2 Normative references

The contents of the following documents constitute essential clauses of this document through normative references in this document.

For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to this document.

GB/T 2423.22 Environmental testing Part 2: Test method Test N. Temperature change (GB/T 2423.22-2012, IEC 60068-2-14:2009, IDT) IEC 60191-6-2 Mechanical standardization of semiconductor devices Part 6-2.Surface mount semiconductor device package outline drawing General Rules Design Guidelines for 1.50mm, 1.27mm, and 1.00mm Pitch Ball and Post Terminal Packages (Mechanicalstand-IEC 60191-6-5 Mechanical standardization of semiconductor devices Part 6-5.Drawing of the outline of the package of surface mount semiconductor devices IEC 61190-1-3 Auxiliary materials for electronic assemblies Part 1-3.Electronic grade brazing alloys and fluxed and solderless brazing alloys for electronic soldering IEC 61249-2-7 Materials for printed boards and other interconnect structures Part 2-7.Coated and uncoated reinforced substrates specifies the