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GB/T 19247.6-2024

**Printed board assemblies - Part 6: Evaluation criteria for voids
in soldered joints of BGA and LGA and measurement method**

印制板组装 第6部分:球栅阵列 (BGA) 和盘栅阵列 (LGA) 焊点空洞的评估要求
及测试方法

(English Translation)

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Table of Contents

Preface	
Introduction	
1 Scope	
2 Normative references	
3 Terms and Definitions	
4 Solder voids	
4.1 Overview	
4.2 Void Source	
4.3 Effect of voids	
4.4 Void Detection	
4.5 Cavity Classification	
5 Measurement	
5.1 X-ray transmission equipment	
5.2 Measurement Environment	
5.3 Measurement process	
5.4 Recording of measured values	
5.5 Measurement Considerations	
5.5.1 X-ray intensity for void detection	
5.5.2 Detection of actual edges	
5.5.3 Verification of measurement results	
6 Void Rate	
6.1 Calculation of void ratio	
6.2 Void Ratio of Multiple Voids	
7 Evaluation	
7.1 Evaluation of solder joints	
7.2 Evaluation of thermal life cycle reduction due to voiding	
7.3 Empty Evaluation Criteria	
Appendix A (Informative) BGA Solder Ball Voids	
Appendix B (Informative) X-ray Transmission Equipment	
Appendix C (Informative) Cavity test results and life reduction under simulation and thermal stress	
Appendix D (Informative) X-ray transmission imaging measurement	

Reference

Figure 1 Void rate

Figure 2 Voids in solder joints

Figure A.1 Small voids gathered at the solder ball-device pad interface

Figure A.2 X-ray image of a solder ball with voids

Figure A.3 Example of void area at the interface between pad and substrate 11

Figure A.4 BGA void with cracked corner leads 17

Figure B.1 X-ray transmission equipment structure

Figure C.1 BGA solder joint, Sn-Ag-Cu

Figure C.2 BGA solder joint, Sn-Zn

Figure C.3 LGA solder joint

Figure D.1 X-ray transmission imaging

Figure D.2 X-ray transmission image of solder joint

Figure D.3 Typical X-ray transmission image of a solder joint

Table 1 Classification of voids

Table 2 Examples of solder joint cross sections and void ratios

Table 3 BGA solder joint void evaluation criteria

Table 4 Evaluation criteria for voids in LGA solder joints

Table A.1 Cavity classification

Table A.2 Limits for corrective actions for 1.5 mm, 1.27 mm, and 1.0 mm lead pitch pads

Table A.3 Limits for corrective actions for 0.8mm, 0.65mm, and 0.5mm lead pitch pads

Table A.4 Limits for corrective measures for micro-via pads with lead pitches of 0.5 mm, 0.4 mm, and 0.3 mm

Table A.5 Common solder ball contact diameter ball-void size image comparison

Table A.6 C=0 sampling plan (sample size for a specific indicator value a)

Table C.1 BGA solder joint voids reduce fatigue life

Table C.2 LGA solder joint voids reduce fatigue life

Table C.3 BGA solder joint void evaluation criteria

Table C.4 Evaluation criteria for voids in LGA solder joints

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 6 of GB/T 19247 "Printed Board Assembly". GB/T 19247 has been published in the following parts.

- Part 1: General specification Requirements for electronic and electrical soldering assemblies using surface mount and related assembly techniques;
- Part 2: Sectional specification Requirements for surface mount solder assemblies;
- Part 3: Sectional specification Requirements for through-hole mounting soldering assemblies;
- Part 4: Sectional specification Requirements for terminal welding assembly;
- Part 6: Evaluation requirements and test methods for ball grid array (BGA) and land grid array (LGA) solder joint voids.

This document is modified to adopt IEC 61191-6:2010 "Printed board assembly Part 6: Ball grid array (BGA) and land grid array (LGA) Evaluation Requirements and Test Methods for Solder Joint Voids.

This document has made the following structural adjustments compared to IEC 61191-6:2010.

- Appendix A corresponds to Appendix C in IEC 61191-6:2010;
- Appendix C corresponds to Appendix A in IEC 61191-6:2010.

The technical differences between this document and IEC 61191-6:2010 and their reasons are as follows.

- Change the normative references of IEC 60194:2006 to IEC 60194-1:2021 and IEC 60194-2:2017, and the original references to IEC the terminology standards have been split;
- The terms "ball grid array" and "disk grid array" have been deleted, and IEC 60194-2:2017 has a clear definition;
- Added two types of voids. Type A (voids inside the solder ball when the device is incoming) and Type B (voids at the solder ball/device interface when the device is incoming) (see 4.5), which is convenient for cavity identification and cavity assessment;
- Added the grayscale technical indicators of X-ray equipment (see 5.1). Grayscale has a significant impact on the observation, measurement and calculation accuracy of solder joints and voids.

Very important impact;

- Add Table A.3 and Table A.4 in Appendix A of IEC 61191-6:2010 to Chapter 7 of this document as Table 3 "BGA solder joints

Table 4 "Void Evaluation Criteria for LGA Solder Joints" and Table 5 "Void Evaluation Criteria for LGA Solder Joints" are provided to facilitate the application of this document.

The following editorial changes were made to this document.

--- Deleted the last paragraph of the scope of Chapter 1;

---Change the measurement process of solder joints and voids in 5.3, and make clear definition of operation process;

---Added the header of Table 2.

This document was 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 Printed Circuit Standardization Technical Committee (SAC/TC47).

Introduction

Printed circuit board assembly is the basic component technology of electronic products, and the printed circuit board assembly process is the basic process of electronic manufacturing.

High-quality product manufacturing process control, promote the development of electronic and electrical welding interconnection and assembly technology, establish unified assembly technology requirements and operations the primary task of printed circuit board assembly is to standardize the work. In this regard, my country has established a national standard system for printed circuit board assembly.

Among them, GB/T 19247 "Printed Circuit Board Assembly" is the basic and universal standard guiding the assembly of printed circuit boards for electronic products in my country.

GB/T 19247 is intended to specify the general application of printed circuit board surface mounting soldering, through-hole mounting soldering, lead-out terminal soldering, ball grid array and disk grid array the evaluation requirements and test method requirements for solder joint voids are listed and are intended to consist of the following parts.

--- Part 1: General specification Requirements for electronic and electrical soldering assemblies using surface mount and related assembly techniques.

Surface mount and related components used to specify materials, methods, and test criteria for high quality electronic and electrical solder interconnection and assembly Installation technology requirements.

--- Part 2: Sectional specification requirements for surface mount solder assembly. The purpose is to specify requirements for integral mounting, through-hole mounting, Surface