

# TECHNICAL REPORT



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**Printed board assemblies –  
Part 8: Voiding in solder joints of printed board assemblies for use in automotive  
electronic control units – Best practices**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

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## CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	7
2 Normative references .....	7
3 Terms and definitions .....	7
4 Technical background of voiding in solder joints and potential impact on assembly reliability.....	8
4.1 Void categories.....	8
4.2 Void occurrence in surface-mount technology solder joints .....	11
4.3 Influence of voiding on solder joint performance .....	14
4.3.1 Introductory remarks.....	14
4.3.2 Thermomechanical reliability .....	15
4.3.3 Mechanical reliability .....	17
4.3.4 Thermal functionality .....	18
4.3.5 Electrical functionality.....	19
5 Determination of voiding levels in solder joints .....	20
5.1 Instrumentation available for investigation of voiding in solder joints.....	20
5.1.1 General .....	20
5.1.2 X-ray inspection equipment operating in two-dimensional mode.....	20
5.1.3 X-ray inspection equipment operating in three-dimensional mode.....	21
5.2 Challenges for the X-ray inspection of voiding: two case studies.....	22
5.2.1 Influence of shadowing effects on measuring reproducibility – first results for 3D X-ray inspection equipment.....	22
5.2.2 Influence of X-ray parameters.....	23
5.2.3 Manual determination of voiding levels in solder joints in sample production .....	24
6 Recommendations for sample qualification .....	25
7 Recommendations for mass production .....	26
7.1 General remarks .....	26
7.2 Ramp-up quality assurance for voiding .....	26
7.3 X-ray sampling inspection .....	26
7.3.1 General .....	26
7.3.2 Control limits .....	26
7.3.3 Exceeding the control limits .....	26
7.4 Process control without X-ray sampling inspection.....	27
Annex A (informative) Types of voids and guidelines for acceptability.....	28
A.1 Types of voids – Summary .....	28
A.2 Typical voiding levels of components and guidelines for acceptability .....	29
A.2.1 General .....	29
A.2.2 Ball-grid array (BGA) components with collapsing balls .....	30
A.2.3 Bottom-termination components involving a lead-frame construction, as quad-flat no lead packages, dual-flat no lead packages .....	30
A.2.4 Exposed pads of components with gull wing solder joints as quad-flat packages.....	31
A.2.5 Transistors with thermal plane as D2PAK and TOLL (TO lead-less).....	31
A.2.6 Rectangular or square end chip components (2, 3 or 5 side terminations) .....	32

A.2.7    Light-emitting diodes .....	32
A.3    Further components currently under discussion .....	32
A.4    Tabular summary .....	32
Bibliography.....	34
Figure 1 – Example of inclusion/macro void .....	8
Figure 2 – Example of design induced void .....	9
Figure 3 – Example of shrinkage void .....	9
Figure 4 – Example of planar micro voids .....	10
Figure 5 – Example of intermetallic voids .....	10
Figure 6 – Example of pinholes .....	11
Figure 7 – Example of blowhole voids .....	11
Figure 8 – Theoretical model for voiding behaviour of preballed components .....	12
Figure 9 – Online X-ray images and trend of void level during melting phase .....	13
Figure 10 – Principal influencing parameters affecting solder joint reliability .....	14
Figure 11 – Correlation of BGA lifetime with average and maximum void levels .....	16
Figure 12 – Correlation void level standoff chip resistor 1206 and shear force after TC.....	17
Figure 13 – Sketch of heat transfer with exposed pad solder joints .....	18
Figure 14 – Calculation of void influence within exposed pads on overall $R^{th}$ .....	19
Figure 15 – Average voiding results for different shadowing conditions .....	22
Figure 16 – Gauge reproducibility of void measurement with different shadowing .....	23
Figure 17 – Void measurement of BGA region with varying X-ray parameters .....	24
Table A.1 – Types of voids with indication of root cause, occurrence in automotive electronic assemblies, detectability, effect on thermomechanical reliability, thermal and electrical function and overall assessment .....	28
Table A.2 – Recommendations for acceptable minimum solder coverage or maximum void level as well as ranges for process indicators .....	33

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## PRINTED BOARD ASSEMBLIES –

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IEC TR 61191-8, which is a technical report, has been prepared by IEC technical committee 91: Electronics assembly technology.

The text of this technical report is based on the following documents:

DTR	Report on voting
91/1665/DTR	91/1689/RVDTR

Full information on the voting for the approval of this technical report can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 61191 series, published under the general title *Printed board assemblies*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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## INTRODUCTION

This document applies to electronic and electromechanical automotive printed board assemblies and describes current best-practices for dealing with voiding in solder joints of surface-mount components soldered onto printed boards.

This document is an informative document which serves to illustrate the technically feasible options and to provide a basis for customer and supplier discussions and agreements. It is not intended to be regarded as a specification or standard.

Related standards are gathered in the bibliography.

This document has been prepared based on material provided by the working group DKE AK682.0.7 (Assembly and interconnect technology in automotive electronics).

## **PRINTED BOARD ASSEMBLIES –**

### **Part 8: Voiding in solder joints of printed board assemblies for use in automotive electronic control units – Best practices**

#### **1 Scope**

This part of IEC 61191 gives guidelines for dealing with voiding in surface-mount solder joints of printed board assemblies for use in automotive electronics. This technical report focuses exclusively on voids in solder joints connecting packaged electronic or electromechanical components with printed boards (PBs). Voids in other solder joints (e.g. in a joint between a silicon die and a substrate within an electronic component, solder joints of through-hole components, etc.) are not considered. The technical background for the occurrence of voids in solder joints, the potential impact of voiding on printed board assembly reliability and functionality, the investigation of voiding levels in sample- and series-production by use of X-ray inspection as well as typical voiding levels in different types of solder joints are discussed. Recommendations for the control of voiding in series production are also given.

Annex A collects typical voiding levels of components and recommendations for acceptability.

#### **2 Normative references**

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60194, *Printed board design, manufacture and assembly – Terms and definitions*