PD IEC TR 61191-8:2021

BSI Standards Publication

Printed board assemblies

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

bsi.

National foreword

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The UK participation in its preparation was entrusted to Technical Committee EPL/501, Electronic Assembly Technology.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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Published by BSI Standards Limited 2021

ISBN 978 0 539 10418 9

ICS 31.180; 31.190

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This Published Document was published under the authority of the Standards Policy and Strategy Committee on 31 March 2021.

Amendments/corrigenda issued since publication

Date	Text affected

IEC TR 61191-8

Edition 1.0 2021-03

TECHNICAL REPORT

colour inside

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

ICS 31.180; 31.190

ISBN 978-2-8322-9575-5

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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FOREWORD

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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- withdrawn,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.

IMPORTANT – The "colour inside" logo on the cover page of this document indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

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*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60194 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.1
design authority
individual, organization, company, contractually designated authority, or agency responsible for the design of electrical / electronic hardware, having the authority to define variations or restrictions to the requirements of applicable standards, i.e., the originator/custodian of the applicable design standard and the approved or controlled documentation

3.2
manufacturer
individual, organization, or company responsible for the assembly process and verification operations