



# TECHNICAL REPORT



---

**Device embedding assembly technology**  
**Part 2-7: Guidelines – Accelerated stress testing of passive embedded circuit boards**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

---

ICS 31.180; 31.190

ISBN 978-2-8322-6680-9

**Warning! Make sure that you obtained this publication from an authorized distributor.**

## CONTENTS

FOREWORD.....	3
1 Scope.....	5
2 Normative references .....	5
3 Terms and definitions .....	5
4 Overview of accelerated stress testing of passive embedded circuit boards.....	5
4.1 Testing under combined stresses.....	5
4.2 Test coupon design.....	6
5 Test procedure .....	8
5.1 General.....	8
5.2 Setting test temperature.....	8
5.3 Placement of samples on bending tester .....	8
5.4 Imposing combined stresses .....	9
5.5 Evaluation of results .....	9
6 Results .....	10
Annex A (informative) Test coupon design rule .....	11
Annex B (informative) Bending testing .....	12
Figure 1 – Testing principal.....	6
Figure 2 – Embedded circuit board panel with test coupons .....	6
Figure 3 – Test coupon structure .....	7
Figure 4 – Opened and closed sample jig .....	8
Figure 5 – Bending of test coupons.....	9
Figure 6 – Output voltage .....	10
Figure 7 – Cross section of sample after testing .....	10
Figure 8 – Cross section of failed sample .....	10
Figure B.1 – Bending tester in the chamber .....	12
Table 1 – Design information for test coupon .....	7
Table 2 – Stack-up information for test coupon .....	7
Table 3 – Coupon testing results.....	10
Table A.1 – Test coupon design rules .....	11

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

### DEVICE EMBEDDING ASSEMBLY TECHNOLOGY

#### Part 2-7: Guidelines – Accelerated stress testing of passive embedded circuit boards

#### FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

The main task of IEC technical committees is to prepare International Standards. However, a technical committee may propose the publication of a technical report when it has collected data of a different kind from that which is normally published as an International Standard, for example "state of the art".

IEC TR 62878-2-7, 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:

Enquiry draft	Report on voting
91/1553/DTR	91/1559/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 publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 62878 series, published under the general title *Device embedding assembly technology*, can be found on the IEC website.

Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of the next edition.

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

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

A bilingual version of this publication may be issued at a later date.

**IMPORTANT – The 'colour inside' logo on the cover page of this publication 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.**

## DEVICE EMBEDDING ASSEMBLY TECHNOLOGY

### Part 2-7: Guidelines – Accelerated stress testing of passive embedded circuit boards

#### 1 Scope

This part of IEC 62878 describes the accelerated stress testing of passive embedded circuit boards. It can be used for screening finished boards, including multilayer and high-density interconnection (HDI) boards. These boards are mainly for mobile devices.

#### 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*