IEC 62878-2-602

Edition 1.0 2021-06

INTERNATIONAL STANDARD

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Device embedding assembly technology – Part 2-602: Guideline for stacked electronic module – Evaluation method of inter-module electrical connectivity

Techniques d'assemblage avec appareil(s) intégré(s) – Partie 2-602: Lignes directrices pour un empilement de modules électroniques – Méthode d'évaluation de la connectivité électrique entre modules

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DEVICE EMBEDDING ASSEMBLY TECHNOLOGY –

Part 2-602: Guideline for stacked electronic module – Evaluation method of inter-module electrical connectivity

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The text of this International Standard is based on the following documents:

CDV	Report on voting
91/1663/CDV	91/1720/RVC

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

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.

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INTRODUCTION

High-end servers, network systems and smart phones have been driving the electronic assembly technologies for the last couple of decades. Any applications to enable the “Internet of Things” (aka IoT) require new electronic assembly technologies to achieve small size, low energy consumption and robust security in a cost-effective way.

This document is one of a series of guidelines for stacked electronic modules.

DEVICE EMBEDDING ASSEMBLY TECHNOLOGY –

Part 2-602: Guideline for stacked electronic module – Evaluation method of inter-module electrical connectivity

1 Scope

This part of IEC 62878 specifies the requirements and evaluation methods of electrical connectivity. It is applicable to stacked electronic modules.

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 60194-2, *Printed boards design, manufacture and assembly – Vocabulary – Part 2: Common usage in electronic technologies as well as printed board and electronic assembly technologies*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60194-2 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/

4 General

The 3D electronic module is an electronic module which is integrated and assembled using functional blocks, employing a three-dimensional or stacking method. A stacked electronic module is formed by mounting stackable device assembly technology modules vertically on top of one another. Figure 1 depicts an individual stackable electronic module. Figure 2 depicts three such individual modules into a stacked module.

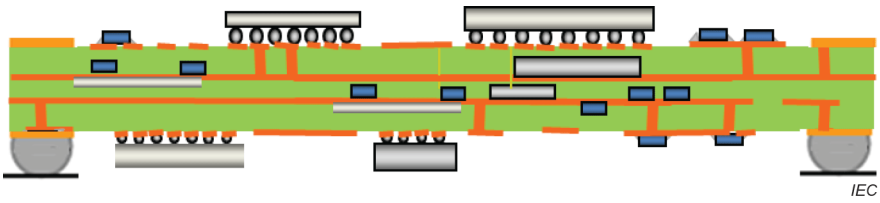

Figure 1 – Stackable electronic module

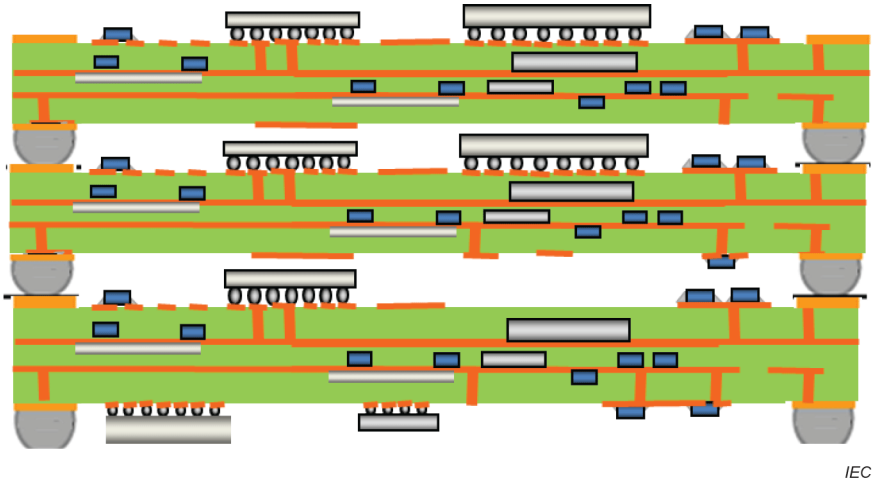

Figure 2 – Stacked electronic module

5 Test apparatus

The test apparatus, for evaluating electrical conductivity of stacked electronic modules, consist of digital multimeters, constant-current power supplies, an X-Y stage, micro probers and jigs for micro probers. Figure 3 depicts a test apparatus.

Such test apparatus requires the four-terminal measuring method to measure interconnect net resistance with high accuracy.

X-Y stage, micro prober and jig

digital multimeters and power supply

Figure 3 – Test apparatus

6 Test specimen

6.1 General

The test specimen should incorporate at least three stackable electronic modules and a base substrate. The specification of the test specimen on outline size and the terminal layouts are described in Annex A. Representative examples of stacking assembly methods are described in Annex B.

6.2 Preparation of test specimen

All terminals of the test specimen shall be connected to form a daisy-chained structure, as shown in Figure 4. Electric connectivity can be evaluated by measuring interconnect net resistance of the circuitry.

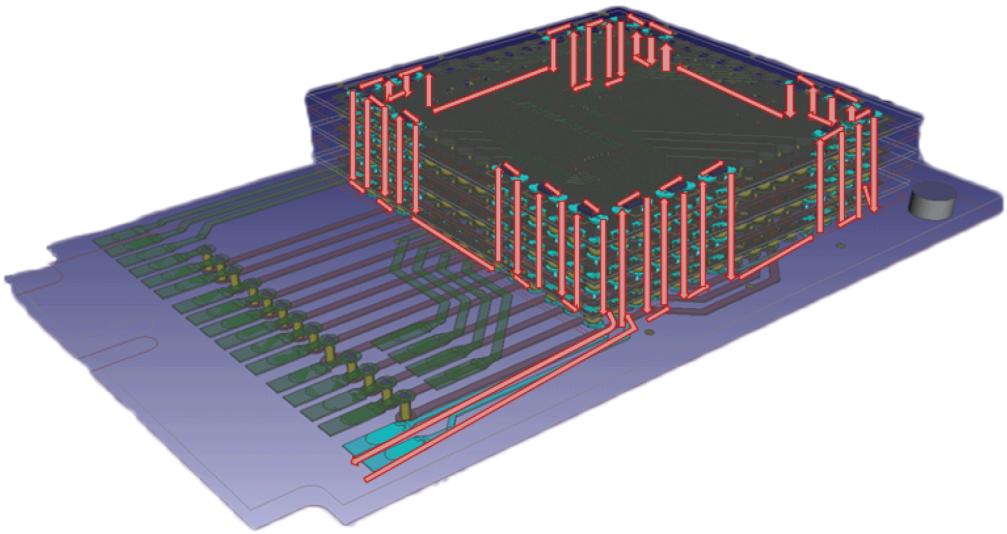

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Figure 4 – Illustration of a typical test specimen

7 Evaluation test

7.1 Test method

Four-terminal measurement is an effective method of measuring relatively low resistance values and is recommended to be adopted for this evaluation test.

7.2 Measurement

In order to evaluate the validity of inter-module connectivity, all terminals of the test specimen shall be connected to form a daisy-chained structure.

7.3 Test procedure

Figure 5 depicts input and output interface between test specimen and test apparatus. The test procedure is as listed below:

1) to supply constant current between IN(Force) and OUT(Force);
2) to measure voltage value between IN(Sense) and OUT(Sense);
3) to measure interconnect net resistance of the daisy-chained structure.