

**BUREAU OF INDIAN STANDARDS**

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**मसौदा भारतीय मानक  
पर्यावरण परीक्षण - भाग 2: परीक्षण-  
अनुभाग 21: परीक्षण यू: अंतक और पूर्णकीय आरोहण  
युक्तियों की मजबूती**

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***Draft Indian Standard***  
***Environmental Testing –***  
***Part 2: Tests –***  
***Section 21: Test U: Robustness of Terminations***  
***and Integral Mounting Devices***

***ICS 19.040; 31.190***

LITD 05 Semiconductor and other Electronic Components and Devices Sectional Committee	Last Date for Comments: 20 October 2023.
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**NATIONAL FOREWORD**

(Formal clauses will be added later)

This Draft Indian Standard (Part 2/Section 21) which is identical with IEC 60068-2-21:2021 ‘Environmental testing - Part 2-21: Tests - Test U: Robustness of terminations and integral mounting devices’ issued by the International Electrotechnical Commission (IEC) *will be* adopted by the Bureau of Indian Standards on the recommendation of the Electronic Display Devices and systems Sectional Committee (LITD 04) and approval of the Electronics and Information Technology Division Council.

IS 9000 (Part 19/Sec 1 to 5) was published in 1987 and was identical to IEC 60068-2-21:1983. This superseding of Standard is being done to align it with the latest version of IEC 60068-2-21:2021. On

publication of this Indian Standard (Part 2/Sec 21), IS 9000 (Part 19/Sec 1 to 5):1986 stands withdrawn.

This standard (Part 2/Sec 21) is one of the parts of a series of standards on 'Environmental testing'. The other parts in this series are:

Part 1: General and Guidance

Part 2: Tests

Part 3: Supporting Documentation and guidance

The text of IEC Standard *may be* approved as suitable for publication as an Indian Standard without deviations. Certain conventions are however not identical to those used in Indian Standards. Attention is particularly drawn to the following:

- a) Wherever the words 'International Standard' appears referring to this standard, they should be read as 'Indian Standard'.
- b) Comma (,) has been used as a decimal marker while in Indian Standards, the current Practice is to use a point (.) as the decimal marker.

In this adopted standard, reference appears to certain International Standards for which Indian Standards also exist. The corresponding Indian Standards, which are to be substituted in their respective places, are listed below along with their degree of equivalence for the editions indicated. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies:

<b>International Standards</b>	<b>Corresponding Indian Standards</b>	<b>Degree of Equivalence</b>
IEC 60068-1:2013 Environmental testing – Part 1: General and guidance	IS/IEC 60068-1 : 2013 Environmental Testing Part 1 General and Guidance	Identical
IEC 60068-2-58:2015 Environmental testing – Part 2- 58: Tests – Test Td – Test methods for solderability, resistance to dissolution of metallization and to soldering heat of surface mounting devices (SMD)	IS/IEC 60068-2-58 : 2015 Environmental testing Part 2 Tests Section 58 Test Td: Test methods for solderability resistance to dissolution of metallization and to soldering heat of surface mounting devices SMD	-do-

The technical committee has reviewed the provisions of the following International Standard referred in this adopted draft standard and has decided that it is acceptable for use in conjunction with this standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies:

***International Standards***

***Title***

IEC 60194-2	Printed board design, manufacture and assembly – Vocabulary – Part 2: Common usage in electronic technologies as well as printed board and electronic assembly technologies
IEC 61191-2	Printed board assemblies – Part 2: Sectional specification – Requirements for surface mount soldered assemblies

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2:2022 ‘Rules for rounding off numerical values (*Second Revision*)’. The number of significant places retained in the rounded off value should be same as that of the specified value in this standard.

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**SCOPE OF IEC 60068-2-21:2021**

“This part of IEC 60068 is applicable to all electrical and electronic components whose terminations or integral mounting devices are liable to be submitted to stresses during normal assembly or handling operations and is also applicable to surface mount devices (SMDs).”

The recommended test methods suitable for specific terminations/lead of devices are shown in Table 1.”

Table 1 – Selection of test methods suitable for specific terminations/leads

Test method		Component	Mounted/not mounted	See Clause
Test	Type			
Ua <sub>1</sub>	Tensile	Leaded devices	Not mounted	Clause 4
Ua <sub>2</sub>	Thrust	Leaded devices	Not mounted	Clause 4
Ub	Bending	Leaded devices	Not mounted	Clause 5
Uc	Torsion	Leaded devices	Not mounted	Clause 6
Ud	Torque	Threaded stud, screw or other terminations	Not mounted	Clause 7
Ue <sub>1</sub>	Substrate bending	Surface mount devices	Mounted	Clause 8
Ue <sub>2</sub>	Pull/push	Surface mount devices	Mounted	Clause 8
Ue <sub>3</sub>	Shear	Surface mount devices	Mounted	Clause 8
Uf <sub>1</sub>	Body strength	Surface mount devices	Not mounted	Clause 9
Uf <sub>2</sub>	Impact shock	Surface mount devices	Not mounted	Clause 9

**Note:** - The Technical content of this document has not been enclosed as these are identical with the corresponding IEC Standard. For details please refer to IEC 60068-2-21:2021 or kindly contact.

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