

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Environmental testing –
Part 2-21: Tests – Test U: Robustness of terminations and integral mounting
devices**

**Essais d'environnement –
Partie 2-21: Essais – Essai U: Robustesse des sorties et des dispositifs de
montage incorporés**



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CONTENTS

FOREWORD.....	5
1 Scope.....	7
2 Normative references	7
3 Terms and definitions	8
4 Tests Ua: Robustness of terminals against axial stresses.....	8
4.1 Object.....	8
4.2 Application.....	8
4.3 General description.....	8
4.4 Preconditioning.....	8
4.5 Initial measurements.....	8
4.6 Test procedures.....	9
4.6.1 Test Ua ₁ : Tensile.....	9
4.6.2 Test Ua ₂ : Thrust.....	10
4.7 Final measurements.....	11
4.8 Information to be given in the relevant specification.....	11
5 Tests Ub: Robustness of terminals against bending stresses.....	11
5.1 Object.....	11
5.2 Application.....	12
5.2.1 General.....	12
5.2.2 Pliable terminations.....	12
5.2.3 Rigid and all other terminations.....	12
5.3 General description.....	13
5.4 Preconditioning.....	14
5.5 Initial measurements.....	14
5.6 Test procedures.....	14
5.6.1 Test Ub ₁ (for wire and strip terminations).....	14
5.6.2 Test Ub ₂ (for tag terminations).....	16
5.6.3 Test Ub ₃ Simultaneous bending.....	17
5.7 Final measurements.....	17
5.8 Information to be given in the relevant specification.....	17
6 Test Uc: Torsion.....	18
6.1 Object.....	18
6.2 Application.....	18
6.3 General description.....	18
6.4 Preparation of the specimen.....	18
6.5 Initial measurements.....	18
6.6 Test procedure.....	19
6.7 Final measurements.....	20
6.8 Information to be given in the relevant specification.....	20
7 Test Ud: Torque.....	20
7.1 Object.....	20
7.2 Application.....	20
7.3 General description.....	21
7.4 Preconditioning.....	21
7.5 Initial measurements.....	21

7.6	Test procedure.....	21
7.6.1	Terminations with threaded studs or screws	21
7.6.2	Other test configurations.....	23
7.7	Final measurements.....	23
7.8	Information to be given in the relevant specification	23
8	Test Ue: Robustness of terminations for SMD in the mounted state	24
8.1	Object.....	24
8.2	Application	24
8.3	Substrate for test method Ue	24
8.4	Mounting.....	26
8.4.1	Dimensions.....	26
8.4.2	Possible mounting methods	26
8.4.3	Mounting method for substrate bending, pull-off, push-off and shear	26
8.5	Preconditioning.....	27
8.6	Initial measurements.....	27
8.7	Test methods	27
8.7.1	Test Ue ₁ : Substrate bending test	27
8.7.2	Test Ue ₂ : Pull-off and push-off test.....	28
8.7.3	Test Ue ₃ : Shear test	30
8.8	Final measurements.....	32
8.8.1	Recovery	32
8.8.2	Visual examination of terminations	32
8.8.3	Electrical characteristics	32
8.8.4	Hidden defect	32
8.9	Information to be given in the relevant specification	32
9	Test Uf: Robustness of component body.....	34
9.1	Object.....	34
9.2	Application	34
9.3	General description.....	34
9.4	Preconditioning.....	34
9.5	Initial measurement	34
9.6	Test procedure.....	34
9.6.1	Test Uf ₁ : Body strength	34
9.6.2	Test Uf ₂ : Impact shock	36
9.7	Final measurements.....	38
9.7.1	Recovery	38
9.7.2	Visual examination	39
9.7.3	Electrical characteristics	39
9.7.4	Hidden defect	39
9.8	Information to be given in the relevant specification	39
Annex X (informative) Cross-reference for references to the previous editions of this document.....		40
X.1	Cross-reference for references to the previous edition of IEC 60068-2-21.....	40
X.2	Cross-reference for references to the last edition of IEC 60068-2-77	41
Bibliography.....		43

Figure 1 – Direction of the applied pull force F_p in test Ua₁.....9

Figure 2 – Direction of the applied thrust F_t in test Ua_2	10
Figure 3 – Displacement of pliable lead wires in test Ub	12
Figure 4 – Bending force applied to a specimen with non-pliable terminations	13
Figure 5 – Sequential test procedure of test Ub , Method 1	15
Figure 6 – Sequential test procedure of test Ub , Methods 2 and 3.....	16
Figure 7 – Clamp for the testing of short terminations	17
Figure 8 – Preparatory bending of a lead wire for test Uc	18
Figure 9 – Torsion test method 1: Rotation of clamped specimen body	19
Figure 10 – Torsion test method 2: Rotation of clamped other lead wire.....	20
Figure 11 – Assembly for the torque test applied to a threaded stud	22
Figure 12 – Preparation of a threaded termination for the torque test.....	22
Figure 13 – Assembly for the torque test applied to an embedded nut.....	23
Figure 14 – Example of substrate for test method Ue	25
Figure 15 – Substrate bending test	28
Figure 16 – Test Ue_2 , pull-off test	29
Figure 17 – Test Ue_2 , push-off test	30
Figure 18 – Test Ue_3 , shear test	31
Figure 19 – SMD Body strength test Uf_1 applied to a rectangular specimen	35
Figure 20 – SMD Body strength test Uf_1 applied to a MELF specimen	36
Figure 21 – Example of an apparatus for test Uf_2	37
Figure 22 – Example of a piston.....	37
Figure 23 – Examples of the application of the SMD Body impact shock test Uf_2	38
Table 1 – Selection of test methods suitable for specific terminations/leads	7
Table 2 – Value of applied pull force for test Ua_1	10
Table 3 – Value of applied thrust for test Ua_2	11
Table 4 – Value of applied force for test Ub	13
Table 5 – Torque severity	21
Table X.1 – Cross-reference to clauses	40
Table X.2 – Cross-reference to figures.....	41
Table X.3 – Cross reference to tables	41
Table X.4 – Cross-reference to clauses	42
Table X.5 – Cross-reference to figures.....	42

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ENVIRONMENTAL TESTING –**Part 2-21: Tests – Test U: Robustness of terminations and integral mounting devices**

FOREWORD

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International Standard IEC 60068-2-21 has been prepared by IEC technical committee 91: Electronics assembly technology.

This seventh edition cancels and replaces the sixth edition, published in 2006, and IEC 60068-2-77:1999. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) integration of parts of IEC 60068-2-77 (see Annex X); IEC 60068-2-77 is withdrawn with the publication of this document;
- b) Annex X is added to show the correlation of the clauses and subclauses in this edition of IEC 60068-2-21 with the clauses in IEC 60068-2-21:2006 and IEC 60068-2-77:1999.

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

FDIS	Report on voting
91/1732/FDIS	91/1742/RVD

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 complete list of all parts comprising the IEC 60068 series, under the general title *Environmental testing*, can be found on the IEC website.

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

ENVIRONMENTAL TESTING –

Part 2-21: Tests – Test U: Robustness of terminations and integral mounting devices

1 Scope

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 ₁	Tensile	Leaded devices	Not mounted	Clause 4
Ua ₂	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 ₁	Substrate bending	Surface mount devices	Mounted	Clause 8
Ue ₂	Pull/push	Surface mount devices	Mounted	Clause 8
Ue ₃	Shear	Surface mount devices	Mounted	Clause 8
Uf ₁	Body strength	Surface mount devices	Not mounted	Clause 9
Uf ₂	Impact shock	Surface mount devices	Not mounted	Clause 9

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 60068-1:2013, *Environmental testing – Part 1: General and guidance*

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)*

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*