

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE



**Fixed capacitors for use in electronic equipment –  
Part 14: Sectional specification – Fixed capacitors for electromagnetic  
interference suppression and connection to the supply mains**

**Condensateurs fixes utilisés dans les équipements électroniques –  
Partie 14: Spécification intermédiaire – Condensateurs fixes pour la suppression  
des interférences électromagnétiques et la connexion au réseau d'alimentation**



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## CONTENTS

FOREWORD.....	8
1 Scope.....	10
2 Normative references .....	10
3 Terms and definitions and classification .....	11
3.1 Terms and definitions.....	11
3.2 Classifications .....	16
3.2.1 Classification of X capacitors.....	16
3.2.2 Classification of Y capacitors.....	16
4 Preferred ratings and characteristics .....	17
4.1 Preferred climatic categories.....	17
4.2 Preferred values of ratings.....	18
4.2.1 Nominal capacitance ( $C_N$ ) .....	18
4.2.2 Tolerance on nominal capacitance.....	18
4.2.3 Selection of rated voltages ( $U_R$ ).....	18
4.2.4 Nominal resistance ( $R_N$ ).....	18
4.2.5 Rated temperature.....	18
4.2.6 Passive flammability.....	18
4.3 Requirements for sleeving, tape, tubing and wire insulation .....	18
5 Test and measurement procedures, and performance requirements .....	19
5.1 General.....	19
5.2 Visual examination and check of dimensions .....	19
5.2.1 General .....	19
5.2.2 Creepage distances and clearances.....	19
5.3 Electrical tests .....	20
5.3.1 Voltage proof.....	20
5.3.2 Capacitance .....	22
5.3.3 Tangent of loss angle .....	22
5.3.4 Resistance (Equivalent Series Resistance (ESR)) (for RC units only) .....	22
5.3.5 Insulation resistance.....	23
5.4 Robustness of terminations.....	24
5.5 Resistance to soldering heat.....	24
5.5.1 General .....	24
5.5.2 Test conditions .....	24
5.5.3 Final inspection, measurements, and requirements.....	25
5.6 Solderability.....	25
5.6.1 General .....	25
5.6.2 Test conditions .....	25
5.6.3 Requirements .....	25
5.7 Rapid change of temperature.....	25
5.7.1 General .....	25
5.7.2 Final inspection .....	26
5.8 Vibration .....	26
5.8.1 General .....	26
5.8.2 Test conditions .....	26
5.8.3 Final inspection .....	26
5.9 Repetitive shock (bump) .....	26

5.9.1	General .....	26
5.9.2	Test conditions .....	26
5.9.3	Final inspection, measurements, and requirements.....	26
5.10	Shock .....	27
5.10.1	General .....	27
5.10.2	Test conditions .....	27
5.10.3	Final inspection, measurements, and requirements.....	27
5.11	Container sealing.....	28
5.11.1	General .....	28
5.11.2	Test conditions .....	28
5.11.3	Requirements .....	28
5.12	Climatic sequence.....	28
5.12.1	General .....	28
5.12.2	Initial measurements .....	28
5.12.3	Dry heat .....	28
5.12.4	Damp heat, cyclic, test Db, first cycle .....	28
5.12.5	Cold.....	28
5.12.6	Damp heat, cyclic, test Db, remaining cycles .....	28
5.12.7	Final inspection, measurements, and requirements.....	28
5.13	Damp heat, steady state (DHSS) .....	29
5.13.1	General .....	29
5.13.2	Initial measurements .....	29
5.13.3	Test conditions .....	29
5.13.4	Final inspection, measurements, and requirements.....	30
5.13.5	Sample size summary for humidity tests .....	31
5.14	Impulse voltage.....	31
5.14.1	General .....	31
5.14.2	Initial measurements .....	31
5.14.3	Test conditions .....	32
5.14.4	Requirements .....	32
5.15	Endurance .....	33
5.15.1	General .....	33
5.15.2	Test conditions .....	33
5.15.3	Sampling .....	33
5.15.4	Initial measurements .....	33
5.15.5	Endurance for Class X capacitors and RC units containing Class X capacitors.....	33
5.15.6	Endurance for Class Y capacitors and RC units containing Class Y capacitors.....	34
5.15.7	Endurance for the lead-through arrangements .....	34
5.15.8	Test conditions – Combined voltage/current tests .....	35
5.15.9	Final inspection, measurements, and requirements.....	35
5.16	Charge and discharge.....	35
5.16.1	General .....	35
5.16.2	Initial measurements .....	35
5.16.3	Test conditions .....	36
5.16.4	Final measurements and requirements .....	36
5.17	Radiofrequency characteristics .....	37
5.18	Passive flammability test.....	37

5.18.1	Testing according to IEC 60384-1 .....	37
5.18.2	Alternative passive flammability test .....	37
5.19	Active flammability test .....	38
5.19.1	Test condition .....	38
5.19.2	Adjustment of $U_i$ .....	40
5.19.3	Requirements .....	40
5.20	Component solvent resistance (if applicable) .....	40
5.21	Solvent resistance of the marking .....	40
6	Marking .....	40
6.1	General .....	40
6.2	Information for marking .....	40
6.3	Marking of capacitors .....	41
6.4	Marking of packaging .....	41
6.5	Additional marking .....	41
7	Information to be given in a detail specification .....	41
7.1	General .....	41
7.2	Outline drawing and dimensions .....	41
7.3	Mounting .....	42
7.4	Ratings and characteristics .....	42
7.4.1	General .....	42
7.4.2	Nominal capacitance range .....	42
7.4.3	Nominal resistance range (if applicable) .....	42
7.4.4	Particular characteristics .....	42
8	Assessment procedures .....	42
8.1	Primary stage of manufacture .....	42
8.2	Structurally similar components .....	43
8.3	Certified records of released lots .....	43
8.4	Approval testing .....	43
8.4.1	Safety tests only qualification approval .....	43
8.4.2	Qualification approval based on safety and performance testing .....	43
8.4.3	Qualification approval based on the fixed sample size procedure .....	43
8.5	Quality conformance inspection .....	48
8.5.1	General .....	48
8.5.2	Formation of inspection lots .....	49
8.5.3	Test schedule for safety tests only approval .....	50
8.5.4	Delayed delivery .....	50
8.5.5	Assessment level .....	50
Annex A (normative)	Circuit for the impulse voltage test .....	52
Annex B (normative)	Circuit for the endurance test .....	54
Annex C (normative)	Circuit for the charge and discharge test .....	55
Annex D (normative)	Declaration of design (confidential to the manufacturer and the certification body) .....	56
Annex E (informative)	Pulse test circuits .....	57
E.1	General .....	57
E.2	Test circuits .....	57
E.3	Charging of the capacitor .....	57
E.4	Discharging of the capacitor .....	58
E.4.1	Discharging in resistive circuit .....	58

E.4.2	Discharging in inductive circuit .....	58
Annex F (normative)	Particular requirements for safety test of surface mount capacitors .....	60
F.1	General.....	60
F.2	Test and measurement procedures .....	60
Annex G (informative)	Capacitance ageing of fixed capacitors of ceramic dielectric, Class 2 .....	63
G.1	Overview.....	63
G.2	Law of capacitance ageing.....	63
G.3	Capacitance measurements and capacitance tolerance .....	64
G.4	Special preconditioning .....	64
Annex H (normative)	Use of safety approved AC rated capacitors in DC applications .....	66
H.1	Overview.....	66
H.2	Background.....	66
H.3	Additional requirement for use of X- and Y-capacitors in DC applications.....	66
H.4	Creepage and clearance distances .....	67
Annex I (normative)	Humidity robustness grades for applications, where high stability under high humidity operating conditions is required .....	68
I.1	Overview.....	68
I.2	Humidity robustness grades .....	68
I.2.1	General .....	68
I.2.2	Grade (I) robustness under humidity .....	68
I.2.3	Grade (II) robustness under high humidity .....	68
I.2.4	Grade (III) high robustness under high humidity.....	68
I.3	Test description .....	69
I.4	Indication of humidity robustness grades .....	69
Annex J (normative)	Description of creepage/clearance distance measurement for cased and conformal coated capacitors .....	70
J.1	Measurement of creepage distances and clearance – general .....	70
J.1.1	General .....	70
J.1.2	Capacitor styles.....	70
J.1.3	Capacitor body and terminal insulation .....	70
J.1.4	Measurement principle.....	71
J.2	Measurement.....	72
J.2.1	Creepage distance between terminals .....	72
J.2.2	Clearance between terminals.....	73
J.2.3	Clearance in mounted stage .....	73
J.2.4	Conductors between terminals.....	75
J.3	Precautions in handling.....	75
Annex K (normative)	Safety and performance tests qualification approval.....	76
K.1	Overview.....	76
K.2	Qualification approval .....	76
K.3	Quality conformance inspection .....	82
K.3.1	General .....	82
K.3.2	Groups A and B inspection .....	82
K.3.3	Group C inspection .....	82
K.3.4	Test schedule for qualification approval.....	82
Annex X (informative)	Cross-references to the previous edition of this document.....	84
Bibliography.....		88

Figure 1 – Two-terminal EMI suppression capacitor .....	12
Figure 2 – RC unit.....	12
Figure 3 – Lead-through capacitor (coaxial).....	12
Figure 4 – Lead-through capacitors.....	13
Figure 5 – By-pass capacitors.....	14
Figure 6 – Impulse wave form .....	32
Figure 7 – Typical circuit for pulse loading of capacitors under AC voltage .....	39
Figure 8 – Fundamental AC wave with randomly, not synchronized, superimposed high-voltage pulse.....	39
Figure 9 – Increased voltage for tests below 2 seconds .....	49
Figure A.1 – Impulse voltage test circuit .....	52
Figure B.1 – Endurance test circuit .....	54
Figure C.1 – Charge and discharge test circuit.....	55
Figure E.1 – Resistive pulse test circuit .....	57
Figure E.2 – Inductive pulse test circuit.....	57
Figure E.3 – Charge waveform for both circuits.....	58
Figure E.4 – Discharge waveform for resistive circuit.....	58
Figure E.5 – Discharge waveform for inductive circuit.....	59
Figure F.1 – Example of test substrate for safety test according to Table F.1.....	62
Figure J.1 – Example of a cased capacitor.....	70
Figure J.2 – Example of a conformal coated capacitor .....	70
Figure J.3 – Cased and conformal coated types.....	71
Figure J.4 – Description .....	72
Figure J.5 – Creepage distance – cased style.....	72
Figure J.6 – Creepage distance – conformal coated style .....	73
Figure J.7 – Clearance between terminals .....	73
Figure J.8 – Clearance in mounted stage – cased style.....	74
Figure J.9 – Clearance – capacitor body larger than lead pitch .....	74
Figure J.10 – Clearance – capacitor body smaller than lead pitch .....	74
Table 1 – Classification of Class X capacitors.....	16
Table 2 – Classification of Class Y capacitors.....	17
Table 3 – Creepage distances and clearances .....	20
Table 4 – Voltage proof.....	21
Table 5 – Insulation resistance – Safety tests only.....	23
Table 6 – Insulation resistance – Safety and performance tests .....	24
Table 7 – Resistance to soldering heat – Requirements .....	25
Table 8 – Shock test preferred severities .....	27
Table 9 – Climatic sequence – Requirements .....	29
Table 10 – Damp heat, steady state – Requirements for samples tested without voltage applied.....	30
Table 11 – Damp heat, steady state – Requirements for samples tested with voltage applied.....	31
Table 12 – Sample sizes for humidity tests .....	31



Table 13 – Endurance – Requirements .....	35
Table 14 – Charge and discharge – Requirements .....	36
Table 15 – Sampling plan – Tests concerning safety requirements only .....	45
Table 16 – Test schedule and sampling plan for lot-by-lot tests .....	46
Table 17 – Test schedule for safety tests only .....	46
Table 18 – Assessment level .....	51
Table A.1 – Values of $C_X$ , $C_T$ , $R_P$ , $R_S$ , $C_p$ .....	52
Table A.2 – Values and tolerances of $C_X$ , $t_r$ , $t_d$ .....	53
Table F.1 – Test schedule and sampling plan for safety test of surface mount capacitors .....	61
Table H.1 – Additional test conditions .....	67
Table I.1 – Requirements .....	69
Table K.1 – Sampling plan – Safety and performance tests qualification approval – Assessment level DZ .....	76
Table K.2 – Test schedule and sampling plan for lot-by-lot tests .....	78
Table K.3 – Test schedule for safety and performance tests qualification approval Assessment level DZ .....	78
Table K.4 – Assessment level .....	83
Table X.1 – Reference to IEC 60384-14 for clause/subclause or annex .....	84
Table X.2 – Reference to IEC 60384-14 for figure/table .....	87

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**FIXED CAPACITORS FOR USE IN ELECTRONIC EQUIPMENT –****Part 14: Sectional specification –  
Fixed capacitors for electromagnetic interference  
suppression and connection to the supply mains**

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IEC 60384-14 has been prepared by IEC technical committee 40: Capacitors and resistors for electronic equipment. It is an International Standard.

This fifth edition cancels and replaces the fourth edition published in 2013 and Amendment 1:2016. This edition constitutes a technical revision.

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

- a) in damp heat steady state test, all capacitor types are tested both with and without rated voltage; the number of test pieces has been increased;
- b) tangent of loss angle is added In Group 0 tests, in safety tests only;
- c) qualification approval based on safety and performance tests has been removed from the main text to a normative annex;
- d) the range of rated voltages is given instead of exact rated voltage values;

- e) normative annex for description of capacitor styles and of creepage/clearance distance measurement has been added;
- f) the importance of mechanical failures (cracks) in component encapsulation as a safety feature is highlighted in handling instructions and requirements after all relevant tests.

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

Draft	Report on voting
40/2985/FDIS	40/3022/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.

A list of all the parts of the IEC 60384 series, published under the general title *Fixed capacitors for use in electronic equipment*, can be found on the IEC website.

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](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/publications](http://www.iec.ch/publications).

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## FIXED CAPACITORS FOR USE IN ELECTRONIC EQUIPMENT –

### Part 14: Sectional specification – Fixed capacitors for electromagnetic interference suppression and connection to the supply mains

#### 1 Scope

This part of IEC 60384 applies to capacitors and resistor-capacitor combinations intended to be connected to AC mains or other supply with a nominal voltage not exceeding 1 000 V AC (RMS), and with a nominal frequency not exceeding 100 Hz. This document includes also additional specific conditions and requirements for the connection to DC supplies with a rated voltage not exceeding 1 500 V DC.

The principal object of this part of IEC 60384 is to prescribe preferred ratings and characteristics and to select, from IEC 60384-1, the appropriate quality assessment procedures, tests and measuring methods and to give general performance requirements for this type of capacitor. Test severities and requirements prescribed in detail specifications referring to this sectional specification are of equal or higher performance level; lower performance levels are not permitted.

This document also provides a schedule of safety tests to be used by national testing stations in countries where approval by such stations is required.

The overvoltage categories in combination with the AC mains voltages for the capacitors classified in this document are to be taken from IEC 60664-1.

#### 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 60060-1:2010, *High-voltage test techniques – Part 1: General definitions and test requirements*

IEC 60063, *Preferred number series for resistors and capacitors*

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

IEC 60068-2-17, *Basic environmental testing procedures – Part 2-17: Tests – Test Q: Sealing*

IEC 60384-1:2021, *Fixed capacitors for use in electronic equipment – Part 1: Generic specification*

IEC 60664-1, *Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements, and tests*

IEC 60695-11-10, *Fire hazard testing – Part 11-10: Test flames – 50 W horizontal and vertical flame test methods*

IEC 61193-2:2007, *Quality assessment systems – Part 2: Selection and use of sampling plans for inspection of electronic components and packages*

IEC 61210, *Connecting devices – Flat quick-connect terminations for electrical copper conductors – Safety requirements*

CISPR 17, *Methods of measurement of the suppression characteristics of passive EMC filtering devices*

ISO 7000, *Graphical symbols for use on equipment* (available at <http://www.graphical-symbols.info/equipment>)

### 3 Terms and definitions and classification

#### 3.1 Terms and definitions

For the purposes of this document, the terms, and definitions of IEC 60384-1, as well as the following, apply.

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

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

NOTE Some definitions of IEC 60384-1 have been expanded, as is indicated by a note.

##### 3.1.1

##### **AC capacitor**

capacitor designed essentially for application with a power-frequency alternating voltage

Note 1 to entry: AC capacitors may be used on DC supplies having the same voltage as the AC RMS rated voltage of the capacitor. For use of capacitors with rated DC voltage greater than the rated AC voltage, see Annex H.

##### 3.1.2

##### **electromagnetic interference suppression capacitor radio interference suppression capacitor**

AC capacitor used for the reduction of electromagnetic interference caused by electrical or electronic apparatus, or other sources

##### 3.1.3

##### **capacitor of Class X RC unit of Class X**

capacitor or RC unit of a type suitable for use in situations where failure of the capacitor or RC unit would not lead to danger of electrical shock but could result in a risk of fire

##### 3.1.4

##### **capacitor of Class Y RC unit of Class Y**

capacitor or RC unit of a type suitable for use in situations where failure of the capacitor could lead to danger of electric shock

##### 3.1.5

##### **two-terminal capacitor**

electromagnetic interference suppression capacitor having two terminals

Note 1 to entry: See Figure 1.