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INTERNATIONAL STANDARD



**Fixed capacitors for use in electronic equipment –
Part 9: Sectional specification – Fixed capacitors of ceramic dielectric, Class 2**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

FIXED CAPACITORS FOR USE IN ELECTRONIC EQUIPMENT –**Part 9: Sectional specification –
Fixed capacitors of ceramic dielectric, Class 2**

FOREWORD

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This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition IEC 60384-9:2015. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

IEC 60384-9 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 2015. This edition constitutes a technical revision.

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

- a) The document has been completely restructured to comply with ISO/IEC Directives, Part 2 and to make it more useable; tables, figures and references have been revised accordingly. Annex X contains all cross-references of changes in clause/subclause numbers.
- b) The requirements of reference temperature 25 °C have been added in Table 7, Table 9, Table 11, Table 13 and Table 15.
- c) The table of temperature characteristics of capacitance for the reference temperature 25 °C have been added in Table B.1, Table B.2 and Table B.3.
- d) Annex B has been changed from informative to normative.
- e) Clause C.5 (Test schedule for quality conformance inspection) has been newly added to withdraw the blank detail specification: IEC 60384-9-1.

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

| Draft | Report on voting |
|--------------|------------------|
| 40/3145/FDIS | 40/3162/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/publications.

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

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

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FIXED CAPACITORS FOR USE IN ELECTRONIC EQUIPMENT –

Part 9: Sectional specification – Fixed capacitors of ceramic dielectric, Class 2

~~1~~ **General**

~~1.1~~ **Scope**

This part of IEC 60384 is applicable to fixed capacitors of ceramic dielectric with a defined temperature coefficient (dielectric Class 2), intended for use in electronic equipment, including leadless capacitors but excluding fixed surface mount multilayer capacitors of ceramic dielectric, which are covered by IEC 60384-22 (Class 2).

Capacitors for electromagnetic interference suppression are not included, but are covered by IEC 60384-14.

~~1.2~~ **Object**

The object of this document is to ~~prescribe~~ specify preferred ratings and characteristics and to select from IEC 60384-1:~~2008~~2021 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~~ specified in detail specifications referring to ~~this sectional specification shall be of equal or higher performance level because lower performance levels are not permitted~~ this document provide specific test severities and requirements of an equal or higher performance level. Further information on the conception of generic, sectional and detail specifications can be found in the Introduction of IEC 60384-1:2021.

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 60063:1963, Preferred number series for resistors and capacitors~~

~~IEC 60063:1963/AMD1:1967~~

~~IEC 60063:1963/AMD2:1977~~

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

IEC 60384-1:~~2008~~2021, *Fixed capacitors for use in electronic equipment – Part 1: Generic specification*

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

~~ISO 3:1973, Preferred numbers – Series of preferred numbers~~

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Fixed capacitors for use in electronic equipment –
Part 9: Sectional specification – Fixed capacitors of ceramic dielectric, Class 2**

**Condensateurs fixes utilisés dans les équipements électroniques –
Partie 9: Spécification intermédiaire – Condensateurs fixes à diélectrique en
céramique, Classe 2**

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Fixed capacitors of ceramic dielectric, Class 2**

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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/publications.

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FIXED CAPACITORS FOR USE IN ELECTRONIC EQUIPMENT –

Part 9: Sectional specification – Fixed capacitors of ceramic dielectric, Class 2

1 Scope

This part of IEC 60384 is applicable to fixed capacitors of ceramic dielectric with a defined temperature coefficient (dielectric Class 2), intended for use in electronic equipment, including leadless capacitors but excluding fixed surface mount multilayer capacitors of ceramic dielectric, which are covered by IEC 60384-22 (Class 2).

Capacitors for electromagnetic interference suppression are not included, but are covered by IEC 60384-14.

The object of this document is to specify preferred ratings and characteristics and to select from IEC 60384-1:2021 the appropriate quality assessment procedures, tests and measuring methods and to give general performance requirements for this type of capacitor. Test severities and requirements specified in detail specifications referring to this document provide specific test severities and requirements of an equal or higher performance level. Further information on the conception of generic, sectional and detail specifications can be found in the Introduction of IEC 60384-1:2021.

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

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

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COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

CONDENSATEURS FIXES UTILISÉS DANS LES ÉQUIPEMENTS ÉLECTRONIQUES –

Partie 9: Spécification intermédiaire – Condensateurs fixes à diélectrique en céramique, classe 2

AVANT-PROPOS

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L'IEC 60384-9 a été établie par le comité d'études 40 de l'IEC: Condensateurs et résistances pour équipements électroniques. Il s'agit d'une Norme internationale.

Cette cinquième édition annule et remplace la quatrième édition parue en 2015. Cette édition constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

- a) le document a été entièrement restructuré pour se conformer aux Directives ISO/IEC, Partie 2, et pour en faciliter l'utilisation; les tableaux, les figures et les références ont été révisés en conséquence. L'Annexe X donne les références croisées des modifications apportées par rapport à la version précédente, avec numéros d'article/de paragraphe correspondants;
- b) les exigences relatives à la température de référence de 25 °C ont été ajoutées dans le Tableau 7, le Tableau 9, le Tableau 11, le Tableau 13 et le Tableau 15;
- c) les caractéristiques de température pour la capacité, à la température de référence de 25 °C, ont été ajoutées dans le Tableau B.1, le Tableau B.2 et le Tableau B.3;
- d) l'Annexe B est passée d'informatrice à normative;
- e) l'Article C.5 (Programme d'essais pour le contrôle de conformité de la qualité) a été ajouté afin de pouvoir retirer la spécification particulière-cadre: IEC 60384-9-1.

Le texte de cette Norme internationale est issu des documents suivants:

| Projet | Rapport de vote |
|--------------|-----------------|
| 40/3145/FDIS | 40/3162/RVD |

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à son approbation.

La version française de cette norme n'a pas été soumise au vote.

La langue employée pour l'élaboration de cette Norme internationale est l'anglais.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2, il a été développé selon les Directives ISO/IEC, Partie 1 et les Directives ISO/IEC, Supplément IEC, disponibles sous www.iec.ch/members_experts/refdocs. Les principaux types de documents développés par l'IEC sont décrits plus en détail sous www.iec.ch/publications.

Une liste de toutes les parties de la série IEC 60384, publiées sous le titre général *Condensateurs fixes utilisés dans les équipements électroniques*, se trouve sur le site Web de l'IEC.

Le comité a décidé que le contenu de ce document ne sera pas modifié avant la date de stabilité indiquée sur le site Web de l'IEC sous webstore.iec.ch dans les données relatives au document recherché. À cette date, le document sera

- reconduit,
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CONDENSATEURS FIXES UTILISÉS DANS LES ÉQUIPEMENTS ÉLECTRONIQUES –

Partie 9: Spécification intermédiaire – Condensateurs fixes à diélectrique en céramique, classe 2

1 Domaine d'application

La présente partie de l'IEC 60384 s'applique aux condensateurs fixes à diélectriques en céramique avec un coefficient de température défini (classe diélectrique 2), destinés à être utilisés dans les équipements électroniques, y compris les condensateurs sans plomb, à l'exclusion des condensateurs multicouches fixes à diélectriques en céramique pour montage en surface, qui sont couverts par l'IEC 60384-22 (classe 2).

Les condensateurs d'antiparasitage ne sont pas inclus, mais sont couverts par l'IEC 60384-14.

Le présent document a pour objet de spécifier les valeurs assignées et caractéristiques préférentielles, de sélectionner les procédures d'assurance de la qualité appropriées, les essais et les méthodes de mesure en se référant à l'IEC 60384-1:2021 et de fournir des exigences de performances générales pour ce type de condensateur. Les sévérités et les exigences des essais stipulées dans les spécifications particulières se référant au présent document fournissent des sévérités et des exigences d'essai d'un niveau de performance supérieur ou égal. Des informations supplémentaires sur la conception des spécifications générales, intermédiaires et particulières sont données dans l'introduction de l'IEC 60384-1:2021.

2 Références normatives

Les documents suivants sont cités dans le texte de sorte qu'ils constituent, pour tout ou partie de leur contenu, des exigences du présent document. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

IEC 60384-1:2021, *Condensateurs fixes utilisés dans les équipements électroniques – Partie 1: Spécification générique*

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