Ferrite cores - Guidelines on dimensions and the limits of surface irregularities - Part 9: Planar cores

EESTI STANDARDIKESKUS
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NATIONAL FOREWORD

See Eesti standard EVS-EN IEC 63093-9:2020 sisaldab Euroopa standardi EN IEC 63093-9:2020 ingliskeelset teksti.	This Estonian standard EVS-EN IEC 63093-9:2020 consists of the English text of the European standard EN IEC 63093-9:2020.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 12.06.2020.	Date of Availability of the European standard is 12.06.2020.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 29.100.10

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 63093-9

June 2020

ICS 29.100.10

Supersedes EN 60424-5:2009, EN 62317-9:2006 and all of its amendments and corrigenda (if any)

English Version

Ferrite cores - Guidelines on dimensions and the limits of surface irregularities - Part 9: Planar cores (IEC 63093-9:2020)

Noyaux ferrites - Lignes directrices relatives aux dimensions et aux limites des irrégularités de surface - Partie 9: Noyaux planaires (IEC 63093-9:2020)

Ferritkerne - Richtlinien zu Maßen und Grenzen von Oberflächenbeschädigungen - Teil 9: Planarkerne (IEC 63093-9:2020)

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Ref. No. EN IEC 63093-9:2020 E

European foreword

The text of document 51/1308/CDV, future edition 1 of IEC 63093-9, prepared by IEC/TC 51 "Magnetic components, ferrite and magnetic powder materials" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 63093-9:2020.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2021-02-21
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2023-05-21

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The text of the International Standard IEC 63093-9:2020 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60424-5:2009	NOTE	Harmonized as EN 60424-5:2009 (not modified)
IEC 63093-4	NOTE	Harmonized as EN IEC 63093-4

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 60205	2016	Calculation of the effective parameters of magnetic piece parts	EN 60205	2017
IEC 60401-1	-	Terms and nomenclature for cores made of magnetically soft ferrites - Part 1: Terms used for physical irregularities and reference of dimensions	-	-
IEC 60424-1	-	Ferrite cores - Guidelines on the limits of surface irregularities - Part 1: General specification	EN 60424-1	-

IEC 63093-9

Edition 1.0 2020-04

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Ferrite cores – Guidelines on dimensions and the limits of surface irregularities – Part 9: Planar-cores

Noyaux ferrites – Lignes directrices relatives aux dimensions et aux limites des irrégularités de surface – Partie 9: Noyaux planaires

IEC 63093-9:2020-04(en-fr)

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IEC 63093-9

Edition 1.0 2020-04

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

ICS 29.100.10

ISBN 978-2-8322-8080-5

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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FERRITE CORES – GUIDELINES ON DIMENSIONS AND THE LIMITS OF SURFACE IRREGULARITIES –

Part 9: Planar-cores

FOREWORD

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International Standard IEC 63093-9 has been prepared by IEC technical committee 51: Magnetic components, ferrite and magnetic powder materials.

This first edition cancels and replaces the first edition of IEC 60424-5 published in 2009 and first edition of IEC 62317-9 published in 2006 and its Amendment 1:2007. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous editions of IEC 60424-5 and IEC 62317-9:

a) IEC 63093-9 integrates IEC 60424-5 and IEC 62317-9;
b) Table 1, Table 2 and Table 3 in IEC 60424-5:2009 have been moved to Annex B;
c) some numbers are corrected in Table 4;
d) Table 6 is amended following IEC 60205.

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

CDV	Report on voting
51/1308/CDV	51/1326/RVC

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 63093 series, published under the general title *Ferrite cores – Guidelines on dimensions and the limits of surface irregularities,* 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 "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

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

INTRODUCTION

Today, DC-to-DC converter power supplies increasingly employ transformers and chokes, the windings of which are made of multi-layer printed circuit boards or are constructed in the motherboard, rather than the transformers wound by conventional copper wires. This document specifies the optimum shapes and dimensions of cores for surface mounted devices (SMDs) and of cores for which the windings are constructed in the motherboard. The motherboard has slots cut out to accept the ferrite cores. This is called the total integration in a multi-layer motherboard. The core shape specified in this document satisfies the demand for lower profile as well as for smaller floor space.

The relations between the main dimensions of planar E-, ER- and EL-cores differ from those of standard cores. For example, the width of planar-cores is larger while the total height is much smaller. Also the thickness of the legs is in most cases smaller than compared to standard cores. Therefore the concept of fixed reference dimensions to determine the length of crack limits yields crack lengths which are not acceptable for this type of core. This document follows another concept which relates the crack length to dimensions of the surface on which the crack occurs.

Also the concept to determine the maximum area of chips based on the total mating surface fails in the case of planar-cores. The outer legs of planar-cores are much thinner than those of standard cores which makes overlapping and gluing much more difficult. A single chip of maximum size on the outer leg can affect the functionality of the core set. Therefore this document uses as a reference the mating surface on which the chip occurs.

Windings of planar-cores are often PCBs which are glued to the inner surfaces of the planar-core. For this reason the inner surfaces of the planar-cores should have a better quality than the inner surfaces of standard cores. This was taken into account by reducing the maximum allowable area of pull-outs in the inner surfaces.