BS EN 60717:2012

BSI Standards Publication

Method for the determination of the space required by capacitors and resistors with unidirectional terminations

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This British Standard is the UK implementation of EN 60717:2012. It is identical to IEC 60717:2012. It supersedes BS 6303:1982 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee EPL/40X, Capacitors and resistors for electronic equipment.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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EUROPEAN STANDARD

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EN 60717

July 2012

ICS 31.040; 31.060

English version

Method for the determination of the space required by capacitors and resistors with unidirectional terminations
(IEC 60717:2012)

Méthode pour la détermination de l'encombrement des condensateurs et résistances à sorties unilatérales
(CEI 60717:2012)

Verfahren zum Bestimmen des Raumbedarfs bei Kondensatoren und Widerständen mit einseitigen Anschlüssen
(IEC 60717:2012)

CENELEC

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

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Ref. No. EN 60717:2012 E

Foreword

The text of document 40/2108/CDV, future edition 2 of IEC 60717, prepared by IEC TC 40, "Capacitors and resistors for electronic equipment" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60717:2012.

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)	2013-03-19
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2015-06-19

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 60717:2012 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following note has to be added for the standard indicated:

IEC 61192-3 NOTE Harmonized as EN 61192-3.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
IEC 60097	-	Grid systems for printed circuits	EN 60097	-
IEC 60294	-	Measurement of the dimensions of a cylindrical component with axial terminations	EN 60294	-[1)]
IEC 60301	-	Preferred diameters of wire terminations of capacitors and resistors	EN 60301	-[1)]

[1)] To be published.

CONTENTS

METHOD FOR THE DETERMINATION OF THE SPACE REQUIRED BY CAPACITORS AND RESISTORS WITH UNIDIRECTIONAL TERMINATIONS

1 Scope

This International Standard applies to capacitors and resistors with unidirectional wire terminations intended for use in electronic equipment.

This standard provides a method for determination of the space required by capacitors and resistors with unidirectional wire terminations.

NOTE Instead of measuring the actual space, it may be sufficient to ensure that a component fits into the maximum space for which it is designed. This may be achieved by means of fixed gauges.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60097, *Grid systems for printed circuits*

IEC 60294:–, *Measurement of the dimensions of a cylindrical component having two axial terminations* [1]

IEC 60301, *Preferred diameters of wire terminations of capacitors and resistors*

3 Gauge board

The gauge board shall provide an orthogonal matrix of holes based on standard grid dimensions as given in IEC 60097. Unless prescribed otherwise by the relevant specification, the nominal grid spacing shall be a multiple of 0,5 mm, preferably 2,5 mm. The non-cumulative tolerance on the relative position of grid holes along the same axis shall be ±0,02 mm.

The gauge board shall have a nominal thickness T of 1,5 mm.

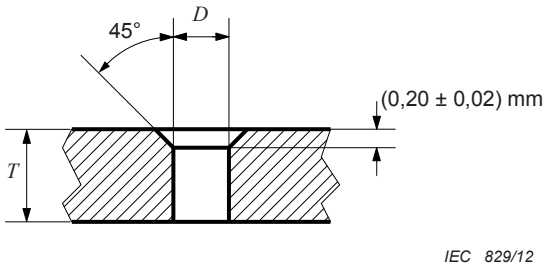
The grid hole diameters shall relate to the dimensions of the wire terminations according to commonly accepted printed circuit board practice. Unless prescribed otherwise by the relevant specification, the diameter of grid holes in the gauge board shall be selected from Table 1.

1 To be published.

Table 1 – Grid hole diameters for the gauge board

Diameter d [a] [b] of wire terminations mm	Diameter D [c] of gauge board grid holes mm
≤0,5	0,8
0,6	1,0
0,7 and 0,8	1,3
1,0	1,6
1,2	1,8
NOTE Rectangular terminations are considered like cylindrical terminations, with a diameter determined by the diagonal of the termination's cross-section.	
[a] Nominal diameter of the lead wire, permissible tolerance according to IEC 60301.	
[b] For diameters of terminations which do not meet the given values, the prescription for the next larger given diameter shall be applied.	
[c] The tolerance on the grid hole diameter D shall be ±0,02 mm.	

The gauge board grid holes shall be chamfered on the side intended for insertion of the wire terminations as shown in Figure 1.



Key
T Thickness of the gauge board
D Diameter of the gauge board grid hole

Figure 1 – Chamfer of the gauge board holes

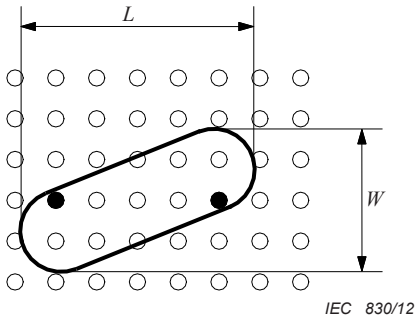
The relevant specification shall prescribe the characteristics of a special gauge board for the scope of components covered therein, if the above prescriptions are not suitable for those components.

4 Width and length

The width and length of the space required by a mounted component shall be measured as follows:

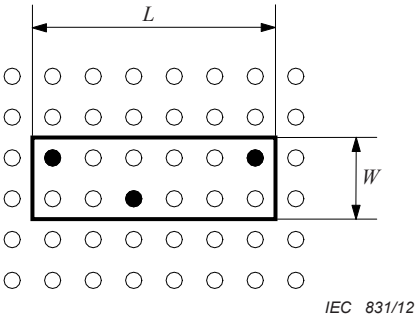
The terminations of the component to be measured shall be positioned and fully inserted into the holes of a gauge board with the appropriate grid hole diameter from the chamfered side. Any built-in feature for mounting shall be used as intended. No more force than appropriate for the specific terminations shall be applied during insertion.

The width W of the component shall be measured as the distance between two parallel planes perpendicular to the gauge board face and parallel to the lines of grid holes and tangential to the corresponding pair of sides of the component, as shown in Figures 2 and 3.



Key
L Length of the space required by a mounted component
W Width of the space required by a mounted component

Figure 2 – Dimensions of a component with two unidirectional wire terminations



Key
L Length of the space required by a mounted component
W Width of the space required by a mounted component

Figure 3 – Dimensions of a component with more than two unidirectional wire terminations

Similarly, the length L is the distance between two similar planes at right angles to the width planes and tangential to the other corresponding pair of sides of the component.

The parallel planes shall be applied so as to touch the component without deforming the component body or the termination and without causing any displacement of the component.

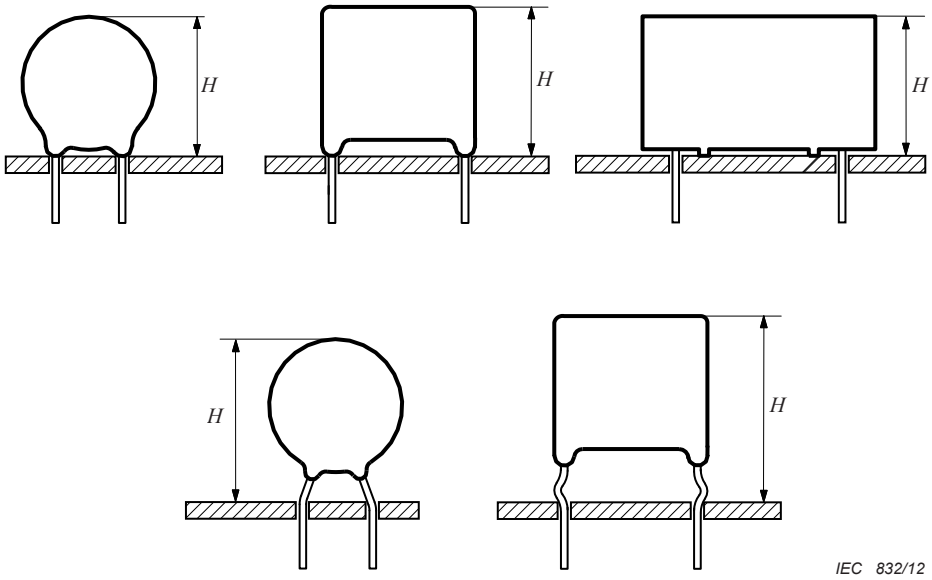
The distances between these planes and the centre lines of the grid mounting holes used for the terminations are a measure of the position of the terminations.

5 Height

The height of the space required by a mounted component shall be measured as follows:

The terminations of the component to be measured shall be positioned and fully inserted into the holes of a gauge board with the appropriate grid hole diameter from the chamfered side. Any built-in features for mounting shall be used as intended. No more force than appropriate for the specific terminations shall be applied during insertion.

The height of a mounted component is the distance measured from the seating plane to the highest part of the component, with the seating plane being the upper surface of the gauge board, see Figure 4.



Key
H Height of the space required by a mounted component

The relevant specification should prescribe the permissibility of coating material extending onto the terminations. A method for checking the length of such extended coating material is given in IEC 60294.

NOTE The mounting of components with the coating meniscus directly sitting on the circuit board surface, on the solder land surface, or protruding into the circuit board holes, may contravene the acceptance criteria for good workmanship, see IEC 61192-3.

Figure 4 – Examples for the height of component with unidirectional wire terminations

6 Information to be given in the relevant specification

When this method is applied in a relevant specification, the following details shall be given as far as they are applicable:

		Clause
a)	the dimension(s) to be measured	4, 5
b)	the grid spacing of the gauge board	3
c)	the grid hole diameter	3

Annex A
(informative)

Cross-reference

The revision of this standard has resulted in a new clause numbering. Table A.1 provides cross-references between the clause numbering of this edition compared to the first edition of this standard.

Table A.1 – Cross-references

IEC 60717:1981 1st edition Clause	IEC 60717:2012 2nd edition Clause	Notes
1	1	Scope and object are merged into one
2		
—	2	New clause
3.1 – 3.2	3	—
3.3 – 3.4	4	—
4	5	—
—	6	New clause

Bibliography

IEC 61192-3, *Workmanship requirements for soldered electronic assemblies – Part 3: Through-hole mount assemblies*

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