

Harmonized system of quality assessment for electronic components — Fixed resistors for use in electronic equipment —

Sectional specification: Fixed power resistors

[IEC title. Fixed resistors for use in electronic equipment —
Part 4: Sectional specification: Fixed power resistors]

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- British Telecommunications
- Electronic Components Industry Federation
- Electronic Engineering Association
- Ministry of Defence
- National Supervising Inspectorate
- Society of British Aerospace Companies Limited
- Telecommunication Engineering and Manufacturing Association (TEMA)

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National foreword

This Part of this British Standard has been prepared under the direction of the Electronic Components Standards Committee. It is identical with IEC Publication 115-4 [QC 400200] “*Fixed resistors for use in electronic equipment. Part 4: Sectional specification: Fixed power resistors*”, published in 1982 and Amendment 1 published in 1933 by the International Electrotechnical Commission (IEC).

This standard is a harmonized specification within the IECQ system of quality assessment for electronic components.

Terminology and conventions. The text of the International Standard has been approved as suitable for publication as a British Standard without deviation. Some terminology and certain conventions are not identical with those used in British Standards; attention is especially drawn to the following.

For the purposes of this Part of BS QC 400200 **1.1** and **1.2** should be regarded as constituting the scope of the standard.

Cross references

The British Standard harmonized with QC 001001 and QC 001002 is BS 9000 “*General requirements for a system for electronic components of assessed quality*” Part 1:1981 “*Specification of basic rules and procedures*”.

International Standard	Corresponding British Standard
ISO 3:1973	BS 2045:1965 <i>Preferred numbers</i> (Technically equivalent)
IEC 63:1963	BS 2488:1966 <i>Schedule of preferred numbers for the resistance of resistors and the capacitance of capacitors for telecommunication equipment</i> (Technically equivalent)
IEC 68	BS 2011 <i>Basic environmental testing procedures</i>
IEC 68-1:1982	Part 1.1:1983 <i>General and guidance</i> (Identical)
IEC 115-1:1982 (QC 400000:1982)	BS 9940 <i>Fixed capacitors for use in electronic equipment</i> Part 0:1983 <i>Generic specification</i> (Identical)
IEC 410:1973	BS 6001:1972 <i>Sampling procedures and tables for inspection by attributes</i> (Technically equivalent)

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 12, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Section 1. General

1.1 Scope

This standard relates to fixed power resistors with rated dissipations greater than 1 W up to and including 1 000 W which are provided with a cover or coating for environmental protection.

1.2 Object

The object of this standard is to prescribe preferred ratings and characteristics and to select from IEC Publication 115-1:1982, the appropriate quality assessment procedures, tests and measuring methods and to give general performance requirements for this type of resistor.

Test severities and requirements prescribed in detail specifications referring to this sectional specification shall be of equal or higher performance level, because lower performance levels are not permitted.

1.3 Related documents

IEC Publications

Publication 63:1963:	<i>Preferred Number Series for Resistors and Capacitors.</i> Amendment No. 1 (1967). Amendment No. 2 (1977).
Publication 68:	<i>Basic Environmental Testing Procedures.</i>
Publication 115-1:1982:	<i>Fixed Resistors for Use in Electronic Equipment. Part 1: Generic Specification.</i>
Publication 410:1973:	<i>Sampling Plans and Procedures for Inspection by Attributes.</i>
Publication QC 001001:1981:	<i>Basic Rules of the IEC Quality Assessment System for Electronic Components (IECQ).</i>
Publication QC 001002:1981:	<i>Rules of Procedure of the IEC Quality Assessment System for Electronic Components (IECQ).</i>

NOTE The above references apply to the current editions except for IEC Publication 68 for which the referenced edition in the applicable test clauses of the generic specification shall be used.

1.4 Information to be given in a detail specification

Detail specifications shall be derived from the relevant blank detail specification.

Detail specifications shall not specify requirements inferior to those of the generic, sectional or blank detail specification.

When more severe requirements are included, they shall be listed in Sub-clause 1.8 of the detail specification and indicated in the test schedules, for example by an asterisk.

NOTE The information given in Sub-clauses 1.4.1 and 1.4.3 may, for convenience, be presented in tabular form.

The following information shall be given in each detail specification and the values quoted shall preferably be selected from those given in the appropriate clause of this sectional specification.

1.4.1 Outline drawing and dimensions

There shall be an illustration of the resistor as an aid to easy recognition and for comparison of the resistor with others. Dimensions and their associated tolerances, which affect interchangeability and mounting, shall be given in the detail specification. All dimensions shall preferably be stated in millimetres, however when the original dimensions are given in inches, the converted metric dimensions in millimetres shall be added.

Normally the numerical values shall be given for the length of the body, the width and height of the body and the wire spacing, or for cylindrical types, the body diameter, and the length and diameter of the terminations. When necessary, for example when in a detail specification more than one dissipation value is covered, the dimensions and their associated tolerances shall be presented in tabular form below the drawing.

When the configuration is other than described above, the detail specification shall state such dimensional information as will adequately describe the resistor. When the resistor is not designed for use on printed boards, this shall be clearly stated in the detail specification.

1.4.2 Mounting

The detail specification shall specify the method of mounting to be applied for normal use and for the application of the vibration and the bump or shock tests. The resistors shall be mounted by their normal means. The design of the resistor may be such that special mounting fixtures are required in its use. In this case, the detail specification shall describe the mounting fixtures and they shall be used in the application of the vibration and bump or shock tests.

1.4.3 Style (IEC Publication 115-1, Sub-clause 2.2.3)

For the purpose of this standard, the style is a combination of rated dissipation and temperature characteristic (or coefficient) of resistance.

It shall be represented by a double-letter code e.g. AB, BC, CD, etc., which is arbitrarily chosen for each dissipation/temperature characteristic combination covered by a detail specification. The style designation, therefore, has no meaning unless the number of the detail specification is also given.

1.4.4 Ratings and characteristics

The ratings and characteristics shall be in accordance with the relevant clauses of this specification together with the following:

1.4.4.1 Rated resistance range

See Sub-clause 2.2.1. The preferred values are those of the E-series of IEC Publication 63.

NOTE When products approved to the detail specification may have different ranges, the following statement should be added: "The range of values available in each style is given in the qualified products list."

1.4.5 Marking

The detail specification shall specify the content of the marking on the resistor and on the package. Deviations from Sub-clause 2.4 of the Generic Specification, IEC Publication 115-1, shall be specifically stated.

Section 2. Preferred ratings, characteristics and test severities

2.1 Preferred characteristics

The values given in detail specifications shall preferably be selected from the following:

2.1.1 Preferred climatic categories

The resistors covered by this specification are classified into climatic categories according to the general rules given in IEC Publication 68-1.

The lower and upper category temperature and the duration of the damp heat, steady-state test shall be chosen from the following:

Lower category temperature: $-55\text{ }^{\circ}\text{C}$, $-40\text{ }^{\circ}\text{C}$, $-25\text{ }^{\circ}\text{C}$ and $-10\text{ }^{\circ}\text{C}$

Upper category temperature: $+125\text{ }^{\circ}\text{C}$, $+155\text{ }^{\circ}\text{C}$ and $+200\text{ }^{\circ}\text{C}$

Duration of the damp heat, steady-state test: 4, 10, 21 and 56 days

The severities for the cold and dry heat tests are the lower and upper category temperatures respectively. Because of the construction of some resistors, these temperatures will occur between two of the preferred temperatures given in IEC Publication 68-2. In this event the nearest preferred temperature within the actual temperature range of the resistor shall be chosen for this severity.

2.1.2 Temperature coefficients and temperature characteristics of resistance

The preferred limits of change in resistance for the temperature characteristic of the resistance test are given in Table I.

Each line in the table gives the preferred temperature coefficient and corresponding temperature characteristic for $20\text{ }^{\circ}\text{C}$ to $70\text{ }^{\circ}\text{C}$ and limits of change in resistance for the measurement of the temperature characteristic of resistance (see IEC Publication 115-1, Sub-clause 4.8) on the basis of the category temperature ranges of Sub-clause 2.1.1 of this sectional specification.