IEC 60115-9-1

Edition 1.0 2003-10

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Fixed resistors for use in electronic equipment –
Part 9-1: Blank detail specification: Fixed surface mount resistor networks with individually measurable resistors – Assessment level EZ

Résistances fixes utilisées dans les équipements électroniques –
Partie 9-1: Spécification particulière cadre: Réseaux de résistances fixes montés en surface avec des résistances mesurables individuellement – Niveau d'assurance EZ

IEC Central Office
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

FIXED RESISTORS FOR USE IN ELECTRONIC EQUIPMENT –

Part 9-1: Blank detail specification: Fixed surface mount resistor networks with individually measurable resistors – Assessment level EZ

FOREWORD

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International Standard IEC 60115-9-1 has been prepared by IEC technical committee 40: Capacitors and resistors for electronic equipment.

This bilingual version (2012-09) corresponds to the monolingual English version, published in 2003-10.

The text of this standard is based on the following documents:

FDIS	Report on voting
40/1345/FDIS	40/1367/RVD

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

The French version of this standard has not been voted upon.

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

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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- withdrawn,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

INTRODUCTION

Blank detail specification

A blank detail specification is a supplementary document to the sectional specification and contains requirements for style, layout and minimum content of detail specifications. Detail specifications not complying with these requirements may not be considered as being in accordance with IEC specifications nor shall they be so described.

In the preparation of detail specifications the content of 1.4 of the sectional specification shall be taken into account.

The numbers between square brackets on the first page of the detail specification correspond to the following information which shall be inserted in the position indicated.

Identification of the detail specification

[1] The "International Electrotechnical Commission" or the National Standards Organization under whose authority the detail specification is drafted.

[2] The IEC or National Standards number of the detail specification, date of issue and any further information required by the national system.

[3] The number and issue number of the IEC or national generic specification.

[4] The IEC number of the blank detail specification.

Identification of the resistor network

[5] A short description of the type of resistor network.

[6] Information on typical construction (when applicable).

[7] Outline drawing with main dimensions which are of importance for interchangeability and/or reference to the national or international documents for outlines. Alternatively, this drawing may be given in an annex to the detail specification.

[8] Application or group of applications covered and/or assessment level.

[9] Reference data on the most important properties, to allow comparison between the various resistor network types.

[1]	IEC 60115-9-1-XXX QC 400701XXXXXX	[2]
ELECTRONIC COMPONENTS OF ASSESSED QUALITY IN ACCORDANCE WITH: [3]	IEC 60115-9-1 QC 400701	[4]
Outline drawing: (see Table 1) (... angle projection) [7] (Other shapes are permitted within the dimensions given)	FIXED SURFACE MOUNT RESISTOR NETWORKS WITH INDIVIDUALLY MEASURABLE RESISTORS	[5]
		[6]
	Assessment level: EZ	[8]
NOTE For [1] to [9]: see previous page.		

Information on the availability of components qualified to this detail specification is given in the IEC QC 001005 [9]

FIXED RESISTORS FOR USE IN ELECTRONIC EQUIPMENT –

Part 9-1: Blank detail specification: Fixed surface mount resistor networks with individually measurable resistors – Assessment level EZ

1 General data

1.1 Dimensions, ratings and characteristics

Table 1 – Styles related to dimensions, ratings and characteristics

Style	Rated element dissipation at 70 °C [a)] W	Rated network dissipation at 70 °C W	Limiting element voltage (DC or AC r.m.s.) V	Insulation voltage against ambient V	Insulation voltage between neighbouring resistors V	Dimensions mm						
						L	*W*	*T*	*A*	*B*	*P*	…
[a)] The detail specification shall specify the conditions under which the rated dissipation applies.												

Resistance range[1]	… Ω to … Ω
Tolerances on rated resistance	± … %
Climatic category	–/–/–/
Stability class	… %
Limits for change of resistance:	
– for long-term tests	±(… %R + … Ω)
– for short-term tests	±(… %R + … Ω)
Temperature coefficient	α: …10^{-6}/K

[1] The preferred values are those of the E24 and E96 series of IEC 60063.

1.1.1 Derating

Resistors covered by this specification are derated according to the following curve:

(A suitable curve to be included
in the detail specification)

NOTE See also 2.2.3 of the sectional specification.

1.2 Recommended method(s) of mounting (to be inserted)

(See 1.4.2 of IEC 60115-9.)

1.3 Related documents

Generic specification

IEC 60115-1:1999, *Fixed resistors for use in electronic equipment – Part 1: Generic specification*

Sectional specification

IEC 60115-9:2003, *Fixed resistors for use in electronic equipment – Part 9: Sectional specification: Fixed surface mount resistor networks with individually measurable resistors*

1.4 Marking

The marking of the resistors and the package shall be in accordance with the requirements of 2.4 of IEC 60115-1 and 1.4.5 of IEC 60115-9.

The details of the marking of the component and packaging shall be given in full in the detail specification.

1.5 Ordering information

Orders for resistors covered by this specification shall contain, in clear or in coded form, the following minimum information:

a) rated element resistance;

b) tolerance on rated resistance;

c) number and issue reference of the detail specification and style reference;

d) packaging instructions.

1.6 Certified records of released lots

Required/non required.

1.7 Additional information (not for inspection purposes)

1.8 Additional or increased severities or requirements to those specified in the generic and/or sectional specification

NOTE Additions or increased requirements should be specified only when essential.

2 Inspection requirements

2.1 Procedures

2.1.1 For qualification approval, the procedure shall be in accordance with 3.2 of IEC 60115-9.

2.1.2 For quality conformance inspection, the test schedule (Table 2) includes sampling, periodicity, severities and requirements. The formation of inspection lots is covered by 3.3.1 of IEC 60115-9.

The following list applies to the test schedules developed in Table 2 and Table 3.

a) Subclause numbers of tests and performance requirements refer to the generic specification, IEC 60115-1, except for resistance change requirements, which shall be selected from Table 3 of IEC 60115-9, as appropriate.

b) Number to be tested: sample size as directly allotted to the code letter for *IL* in Table IIA of IEC 60410 (single sampling plan for normal inspection).

c) In these tables:
- *p* is the periodicity (in months)
- *n* is the sample size
- *c* is the acceptance criterion (permitted number of non-conforming items)
- D indicates a destructive test
- ND indicates a non-destructive test
- *IL* is the inspection level

d) 100 % testing shall be followed by re-inspection by sampling in order to monitor outgoing quality level by non-conforming items per million (ppm). The sampling level shall be established by the manufacturer. For the calculation of $\times 10^{-6}$ values, any parametric failure shall be counted as a non-conforming item. In case one or more non-conforming items occur in a sample, this lot shall be rejected.

e) If one non-conforming item is obtained, all the tests of the subgroup shall be repeated on a new sample and then no further non-conforming items are permitted. Release of product may continue during repeat testing.

Table 2 – Test schedule for quality conformance inspection: lot-by-lot

Subclause number and test (see 2.1.2, list item a of this specification)	D or ND	Conditions of test (see 2.1.2, list item a of this specification)	*IL*	*n*	*c*	Performance requirements (see 2.1.2, list item a of this specification)
GROUP A INSPECTION (lot-by-lot)						
Subgroup A0	ND		100 % (see 2.1.2, list item d of this specification)			
4.5 Resistance						As in 4.5.2
Subgroup A1	ND		S-4	1)	0	
4.4.1 Visual examination						As in 4.4.1
4.4.2 Dimensions (gauging)						As specified in the detail specification
GROUP B INSPECTION (lot-by-lot)						
Subgroup B1	ND		S-3	1)	0	
4.7 Voltage proof (insulated resistors only)		Method: …				As in 4.7.3
		Insulation resistance (insulated resistors only)				≥ 100 MΩ
Voltage proof between neighbouring resistors		Voltage: … V				As in 4.7.3
Subgroup B2	D		S-3	1)	0	
4.17 Solderability		Aging, if applicable				As in 4.17.5
Subgroup B3	D		S-3	1)	0	
4.31 Mounting		Substrate material and spacing: see 2.3.2 of IEC 60115-9				
4.13 Overload (in the mounted state)		The applied voltage shall be 2,5 times the rated voltage or twice the limiting element voltage, whichever is the less severe				
		Duration: 2 s				
		Visual examination				No visible damage
		Resistance				$\Delta R \leq \pm(\ldots\ \%R + \ldots\ \Omega)$
4.30 Solvent resistance of the marking (if applicable)		Solvent: … Solvent temperature: … Method 1 Rubbing material: cotton wool Recovery: …				Legible marking

1) See 2.1.2, list item b of this specification.