

# PUBLICLY AVAILABLE SPECIFICATION

## PRE-STANDARD

Miniature fuses –  
Part 8: Fuse resistors with particular overcurrent protection



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**Miniature fuses –  
Part 8: Fuse resistors with particular overcurrent protection**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**MINIATURE FUSES –**

**Part 8: Fuse resistors with particular overcurrent protection**

**FOREWORD**

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IEC PAS 60127-8 has been processed by subcommittee 32C: Miniature fuses, of IEC technical committee 32: Fuses.

The text of this PAS is based on the following document:

This PAS was approved for publication by the P-members of the committee concerned as indicated in the following document

Draft PAS	Report on voting
32C/500/PAS	32C/503/RVD

Following publication of this PAS, which is a pre-standard publication, the technical committee or subcommittee concerned may transform it into an International Standard.

A list of all parts in the IEC 60127, published under the general title *Miniature fuses*, can be found on the IEC website.

This PAS shall remain valid for an initial maximum period of 3 years starting from the publication date. The validity may be extended for a single period up to a maximum of 3 years, at the end of which it shall be published as another type of normative document, or shall be withdrawn.

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## INTRODUCTION

In recent years, so-called “fuse resistors” have increasingly been used in electrical and electronic applications. The term “fuse resistor”, however, which has become established in the market, is misleading. The actual function of a fuse resistor is that of a resistor in an electrical or electronic circuit. Only when an overload of multiple times the rated dissipation occurs can fuse resistors interrupt an electric current. In a wide range between the rated dissipation and the manufacturer’s specified breaking dissipation, fuse resistors provide poor or no overcurrent protection. So if they are incorrectly rated and improperly used in an application, this may result in potential risk of fire.

Fuse resistors perform the function of a fuse only within a particular overcurrent range, and, from a technical point of view, must therefore be referred to as “fuse resistors with particular overcurrent protection”.

Fuse resistors with particular overcurrent protection can safely interrupt high short-circuit currents, but are not capable of interrupting overload currents.

For safety reasons, they shall therefore only be used in combination with an accompanying overload current protection device, i.e. a true fuse, if overload currents cannot be excluded to occur in the respective application.

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## MINIATURE FUSES –

### Part 8: Fuse resistors with particular overcurrent protection

#### 1 Scope

This part of IEC 60127 relates to fuse resistors with particular overcurrent protection rated up to 500 V a.c. and/or 500 V d.c. for printed circuits and other substrate systems, used for the protection of electric appliances, electronic equipment and component parts thereof, normally intended to be used indoors.

It does not apply to fuse resistors with particular overcurrent protection for appliances intended to be used under special conditions, such as in a corrosive or explosive atmosphere.

The object of this PAS is

- a) to establish uniform requirements for fuse resistors with particular overcurrent protection so as to protect appliances or parts of appliances in the most suitable way;
- b) to define the performance of the fuse resistors with particular overcurrent protection, so as to give guidance to manufacturers of electrical appliances and electronic equipment and to ensure replacement of fuse resistors with particular overcurrent protection by those of similar dimensions and characteristics;
- c) to define methods of testing.

This PAS applies in addition to the requirements of IEC 60127-1.

NOTE Manufacturers of fuse resistors with particular overcurrent protection must ensure on their own responsibility that their products comply with the requirements of the resistor-related standards IEC 60115-1, IEC 60115-4-101 and IEC 60115-4-102 (withdrawn).

The object of this PAS is to establish uniform test methods for fuse resistors with particular overcurrent protection, so as to allow verification of the values (for example rated dissipation, functioning characteristic and rated breaking capacity values) specified by the manufacturer.

#### 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 60063:1963, *Preferred number series for resistors and capacitors*  
Amendment 1:1967  
Amendment 2:1977

IEC 60068-2-21:2006, *Environmental testing – Part 2-21: Tests – Test U: Robustness of terminations and integral mounting devices*

IEC 60127-1:2006, *Miniature fuses – Part 1: Definitions for miniature fuses and general requirements for miniature fuse-links*

IEC 60194:2006, *Printed board design, manufacture and assembly – Terms and definitions*

IEC 60695-2-12:2010, *Fire hazard testing – Part 2-12: Glowing/hot-wire based test methods – Glow-wire flammability index (GWFI) test method for materials*

IEC 60695-2-13:2010, *Fire hazard testing – Part 2-13: Glowing/hot-wire based test methods – Glow-wire ignition temperature (GWIT) test method for materials*

IEC 60695-4:2012, *Fire hazard testing – Part 4: Terminology concerning fire tests for electrotechnical products*

IEC 61249-2-7:2002, *Materials for printed boards and other interconnecting structures – Part 2-7: Reinforced base materials clad and unclad – Epoxide woven E-glass laminated sheet of defined flammability (vertical burning test), copper-clad*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in Clause 3 of IEC 60127-1:2006, as well as the following apply.

#### 3.28

##### **fuse resistor with particular overcurrent protection**

fuse resistor capable of continuously carrying currents up to at least the rated power dissipation and of interrupting currents above a defined multiple of the rated dissipation up to its rated breaking capacity

Note 1 to entry: Fuse resistors with particular overcurrent protection can safely interrupt high short-circuit currents, but are not capable of interrupting overload currents. They are therefore allowed to be used only in combination with an accompanying overload current protection device such as a miniature fuse, if overload currents cannot be excluded to occur in the respective application.

#### 3.29

##### **fuse resistor with particular overcurrent protection for through-hole mounting**

fuse resistor with particular overcurrent protection designed for soldering directly into a printed wiring board, with insertion of its leads in suitably designed holes

#### 3.30

##### **fuse resistor with particular overcurrent protection for surface mounting**

fuse resistor with particular overcurrent protection designed for direct conductive attachment by solder or other means onto the surface of a substrate, without insertion of its leads in suitably designed holes or sockets

#### 3.31

##### **land**

portion of a conductive pattern usually but not exclusively used for the connection and/or attachment of components (see IEC 60194)

Note 1 to entry: Further definitions which may be useful in the application of surface-mount fuse resistors with particular overcurrent protection may be found in IEC 60115-1 and IEC 60115-8.

#### 3.32

##### **critical resistance**

resistance value at which the rated voltage is equal to the limiting element voltage

Note 1 to entry: At an ambient temperature of 70 °C, the maximum voltage which may be applied across the terminations of a fuse resistor with particular overcurrent protection is either the calculated rated voltage, if the resistance is less than the critical resistance, or the limiting element voltage, if the resistance is equal to or greater than the critical resistance. At temperatures other than 70 °C, it is important that account be taken of the derating curve and of the limiting element voltage in the calculation of any voltage to be applied.

Note 2 to entry: Related terminology: Rated voltage, limiting element voltage.