

# INTERNATIONAL STANDARD

**IEC**  
**60127-1**

Second edition  
2006-06

---

---

## Miniature fuses –

### Part 1: Definitions for miniature fuses and general requirements for miniature fuse-links

© IEC 2006 — Copyright - all rights reserved

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

International Electrotechnical Commission, 3, rue de Varembé, PO Box 131, CH-1211 Geneva 20, Switzerland  
Telephone: +41 22 919 02 11 Telefax: +41 22 919 03 00 E-mail: [inmail@iec.ch](mailto:inmail@iec.ch) Web: [www.iec.ch](http://www.iec.ch)



Commission Electrotechnique Internationale  
International Electrotechnical Commission  
Международная Электротехническая Комиссия

PRICE CODE

**U**

*For price, see current catalogue*

## CONTENTS

|  |    |
|--|----|
| FOREWORD.....  | 3  |
| 1 Scope and object.....  | 5  |
| 2 Normative references .....   | 5  |
| 3 Terms and definitions .....  | 5  |
| 4 General requirements .....   | 9  |
| 5 Standard ratings .....   | 9  |
| 6 Marking .....  | 9  |
| 7 General notes on tests .....   | 10 |
| 7.1 Atmospheric conditions for testing .....   | 10 |
| 7.2 Type tests .....   | 11 |
| 7.3 Fuse-bases for tests.....  | 11 |
| 7.4 Nature of supply .....   | 11 |
| 8 Dimensions and construction .....  | 12 |
| 8.1 Dimensions .....   | 12 |
| 8.2 Construction.....  | 12 |
| 8.3 Terminations .....   | 12 |
| 8.4 Alignment and configuration of terminations .....  | 12 |
| 8.5 Soldered joints .....  | 12 |
| 9 Electrical requirements.....   | 12 |
| 9.1 Voltage drop.....  | 12 |
| 9.2 Time/current characteristic .....  | 13 |
| 9.3 Breaking capacity .....  | 14 |
| 9.4 Endurance tests .....  | 15 |
| 9.5 Maximum sustained dissipation .....  | 16 |
| 9.6 Pulse tests .....  | 16 |
| 9.7 Fuse-link temperature .....  | 16 |
| Annex A (informative) Colour coding for miniature fuse-links .....   | 17 |
| Annex B (informative) Example presentations of time/current characteristic   |    |
| Annex C (informative) Audit testing and surveillance – Guidelines for the application of the principles of IEC 60303 (CB-FCS) to miniature fuse-links..... | 21 |
| Bibliography.....  | 27 |
| Figure A.1 – Layout of colour bands.....   | 17 |
| Figure B.1 – Example presentation of time/current characteristic, ratio 2:1 .....  | 19 |
| Figure B.2 – Example presentation of time/current characteristic, ratio 3:1 .....  | 20 |
| Figure C.1 – Example of a fuse-link description .....  | 22 |
| Table A.1 – Colour coding for miniature fuse-links .....   | 18 |
| Table C.1 – Audit testing for option 3 .....   | 25 |
| Table C.2 – Audit testing for option 4 .....   | 26 |

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## MINIATURE FUSES –

**Part 1: Definitions for miniature fuses and  
general requirements for miniature fuse-links**

## FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as far as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with an IEC Publication.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60127-1 has been prepared by subcommittee 32C: Miniature fuses, of IEC technical committee 32: Fuses.

This second edition cancels and replaces the first edition (1988), together with amendment 1 (1995), and amendment 2 (2002), and constitutes a technical revision.

The major technical changes with regard to the first edition concern subclause 9.2.3 where the nature of the current source has been clarified; in addition, IEC 60038: *IEC standard voltages*, has been added to the list of normative references.

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

|              |                  |
|--------------|------------------|
| FDIS         | Report on voting |
| 32C/387/FDIS | 32C/390/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.

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

This Part 1 of the IEC 60127 series covers definitions, general requirements and tests applicable to all types of miniature fuses (e.g. cartridge fuse-links, sub-miniature fuse-link and universal modular fuse-links). All subsequent parts of the complete series should be read in conjunction with this Part 1.

IEC 60127 consists of the following parts, under the general heading *Miniature fuses*:

- Part 1: Definitions for miniature fuses and general requirements for miniature fuse-links
- Part 2: Cartridge fuse-links
- Part 3: Sub-miniature fuse-links
- Part 4: Universal modular fuse-links (UMF) – Through-hole and surface mount types
- Part 5: Guidelines for quality assessment of miniature fuse-links
- Part 6: Fuse-holders for miniature fuse-links
- Part 7: (Free for further documents)
- Part 8: (Free for further documents)
- Part 9: (Free for further documents)
- Part 10: User guide for miniature fuses

The committee has decided that the contents of this publication will remain unchanged until the maintenance result 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.

A bilingual version of this publication may be issued at a later date.

## MINIATURE FUSES –

### Part 1: Definitions for miniature fuses and general requirements for miniature fuse-links

#### 1 Scope and object

This part of IEC 60127 covers the general requirements and tests applicable to all types of miniature fuse-links (e.g. cartridge fuse-links, sub-miniature fuse-links and universal miniature fuse-links) for the protection of electric appliances, electronic equipment and component parts thereof normally intended to be used indoors.

Specific details covering each major subdivision are given in subsequent parts.

This standard does not apply to fuses for appliances intended to be used under special conditions, such as in a corrosive or explosive atmosphere.

The object of this standard is

- a) to establish uniform requirements for miniature fuses so as to protect appliances or parts of appliances in the most suitable way,
- b) to define the performance of the fuses, so as to give guidance to designers of electrical appliances and electronic equipment and to ensure replacement of fuse-links by those of similar dimensions and characteristics,
- c) to define methods of testing,
- d) to define maximum sustained dissipation of fuse-links to ensure good compatibility of stated power acceptance when used with fuse-holders according to this standard (see IEC 60127-6).

#### 2 Normative references

The following referenced documents are indispensable for the application 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.

IEC 60038, *IEC standard voltages*

IEC 60127-6:1994, *Miniature fuses – Part 6: Fuse-holders for miniature fuse-links*  
Amendment 1 (1996)  
Amendment 2 (2003)