IEC 60127-4

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# INTERNATIONAL STANDARD

**Miniature fuses -**
**Part 4: Universal modular fuse-links (UMF) - Through-hole and surface mount types**



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# Miniature fuses - Part 4: Universal modular fuse-links (UMF) - Through-hole and surface mount types

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IEC 60127-4 has been prepared by subcommittee 32C: Miniature fuses, of IEC technical committee 32: Fuses. It is an International Standard.

This fourth edition cancels and replaces the third edition published in 2005, Amendment 1:2008 and Amendment 2:2012. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) align to IEC 60127-1:2023, third edition;
b) enhance the rated current of UMFs to 100A and provide the corresponding maximum voltage drop and maximum sustained dissipation;
c) modify the figures;
d) update the normative references to the latest version.

This International Standard is to be used in conjunction with IEC 60127-1:2023

The text of this International Standard is based on the following documents:

| Draft | Report on voting |
|---|---|
| 32C/676/FDIS | 32C/680/RVD |

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

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

This document is to be used in conjunction with IEC 60127-1:2023.

This document supplements or modifies the corresponding clauses in IEC 60127-1:2023, so as to convert that publication into the IEC standard: Universal modular fuse-links (UMF) – Through-hole and surface mount types.



The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be



– reconfirmed,
– withdrawn, or
– revised.

# INTRODUCTION

According to the wish expressed by the users of miniature fuses, all standards, recommendations and other documents relating to miniature fuses should have the same publication number in order to facilitate reference to fuses in other specifications, for example, equipment specifications.

Furthermore, a single publication number and subdivision into parts would facilitate the establishment of new standards, because clauses and subclauses containing general requirements need not be repeated.

The new IEC 60127 series is thus subdivided as follows:

IEC 60127, *Miniature fuses (general title)*

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

IEC 60127-2, *Miniature fuses - Part 2: Cartridge fuse-links*

IEC 60127-3, *Miniature fuses - Part 3: Sub-miniature fuse-links*

IEC 60127-4, *Miniature fuses - Part 4: Universal modular fuse-links (UMF) - Through-hole and surface mount types*



IEC 60127-5, *Miniature fuses - Part 5: Guidelines for quality assessment of miniature fuse- links*

IEC 60127-6, *Miniature fuses - Part 6: Fuse-holders for miniature fuse-links*



IEC 60127-7, *Miniature fuses - Part 7: Miniature fuse-links for special applications*

IEC 60127-8, *Miniature fuses - Part 8: Fuse resistors with particular overcurrent protection*

IEC 60127-9, *Miniature fuses - Part 9: Miniature fuse-links for special applications with partial-range breaking capacity*

IEC 60127-10 (withdrawn)

This part of IEC 60127 covers additional requirements, test equipment and standard sheets. The SI system of units is used throughout this standard.

## 1 Scope

This part of IEC 60127 relates to universal modular fuse-links (UMF) 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-links for appliances intended to be used under special conditions, such as in a corrosive or explosive atmosphere.

These fuses are normally intended to be mounted or replaced only by appropriately skilled persons using specialized equipment.

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

The objectives of this part of IEC 60127 are as given in IEC 60127-1, with the additional requirement of a degree of non-interchangeability.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 60068-2-20:2021, *Environmental testing - Part 2-20: Tests - Test Ta and Tb: Test methods for solderability and resistance to soldering heat of devices with leads*



IEC 60068-2-21:2021, *Environmental testing - Part 2-21: Tests - Test U: Robustness of terminations and integral mounting devices*



IEC 60068-2-58:2015, *Environmental testing - Part 2-58: Tests - Test Td: Test methods for solderability, resistance to dissolution of metallization and to soldering heat of surface mounting devices (SMD)*
IEC 60068-2-58:2015/AMD1:2017

IEC 60127-1:2023, *Miniature fuses - Part 1: Definitions for miniature fuses and general requirements for miniature fuse-links*

IEC 60194:2021 (all parts), *Printed boards design, manufacture and assembly - Vocabulary*

IEC 60216-1:2013, *Electrical insulating materials - Thermal endurance properties - Part 1: Ageing procedures and evaluation of test results*

IEC 60664-1:2020, *Insulation coordination for equipment within low-voltage supply systems - Part 1: Principles, requirements and tests*
IEC 60664-1:2020/AMD1:2025

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*

ISO 3:1973, *Preferred numbers - Series of preferred numbers*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in Clause 3 of IEC 60127-1:2023 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

– IEC Electropedia: available at https://www.electropedia.org/

– ISO Online browsing platform: available at https://www.iso.org/obp

**3.1**
**through-hole fuse-link**
UMF designed for soldering directly into a printed wiring board, with insertion of its terminations/leads in suitably designed holes

**3.2**
**surface mount fuse-link**
UMF designed for direct conductive attachment by solder or other means on to the surface of a substrate, without insertion of its terminations/leads in suitably designed holes or sockets

**3.3**
**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-links may be found in IEC 60115-1 and IEC 60115-8.



## 4 General requirements



Clause 4 of IEC 60127-1:2023 applies.

## 5 Standard ratings

### 5.1 Rated voltage

See Clause 10 standard sheets.

### 5.2 Rated current

See Table 2 for preferred rated ratings.

### 5.3 Rated breaking capacity

See Clause 10 standard sheets.

## 6 Marking

In addition to the requirements of Clause 6 of IEC 60127-1:2023, the following criteria concerning UMF shall be observed and marked:

**6.1** *Addition:*

e) For fuse-links rated at 250 V, a symbol denoting the breaking capacity. This symbol shall be placed between the marking for rated current and the marking for rated voltage.

These symbols are as follows:

*H*: denoting high-breaking capacity;

*I*: denoting intermediate-breaking capacity;

*L*: denoting low-breaking capacity.

f) The distinctive symbol shown in Figure 1 (see Annex B for more details).

g) The letters AC before the voltage for devices designed solely for alternating current application.

### 6.4 Colour coding for universal modular fuse-links

Not applicable.

### 6.5 Space limitations for markings

Where marking is impractical due to space limitations, the relevant information should appear on the smallest package and in the manufacturer's technical literature.



## 7 General notes on tests

In addition to the requirements of Clause 7 of IEC 60127-1:2023, the following criteria shall be observed:

### 7.2 Atmospheric conditions for testing

**7.2.1** *Addition:*

For testing of individual fuse ratings according to standard sheets 1 and 2, see Table 3. For fuse-links designed and rated both for AC and DC, the number of fuse-links required is 63. For fuse-links designed only for AC, the number of fuse-links required is 48. There are nine spares (fuse-link numbers 10, 11, 12, .37, 38, 39, 52, 53 and 54).

For the maximum current rating of a homogeneous series according to standard sheets 1 and 2, see Table 4. For fuse-links designed and rated both for AC and DC, the number of fuse-links required is 53. For fuse-links designed only for AC, the number of fuse-links required is 48. There are 19 spares (fuse-link numbers 19, 20, 21, 32 to 41, 45, 46, 47, 51, 52 and 53).

For the minimum current rating of a homogeneous series according to standard sheets 1 and 2, see Table 5. For fuse-links designed and rated both for AC and DC, the number of fuse links required is 38. For fuse-links designed only for AC, the number of fuse-links required is 33. There are 16 spares (fuse-link numbers 10, 11, 12, 23 to 32, 36, 37 and 38).