

# SLOVENSKI STANDARD oSIST prEN IEC 60127-4:2024

01-december-2024

Miniaturne varovalke – 4. del: Univerzalni modularni taljivi vložki – Skoznji vložki in vložki za površinsko montažo

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

Geräteschutzsicherungen - Teil 4: Welteinheitliche modulare Sicherungseinsätze (UMF) - Bauarten für Steck- und Oberflächenmontage

Coupe-circuit miniatures - Partie 4: Eléments de remplacement modulaires universels (UMF) - Types de montage en surface et montage par trous

prEN IEC 60127-4:2024 Ta slovenski standard je istoveten z:

ICS:

29.120.50 Varovalke in druga

Fuses and other overcurrent

nadtokovna zaščita protection devices

oSIST prEN IEC 60127-4:2024 en,fr,de

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oSIST prEN IEC 60127-4:2024

PROJECT NUMBER: IEC 60127-4 ED4

DATE OF CIRCULATION:



# 32C/646/CDV

# COMMITTEE DRAFT FOR VOTE (CDV)

CLOSING DATE FOR VOTING:

|   | 2024-10-18          |                      | 2025-01-10                             |  |
|---|---------------------|----------------------|--|--|
|   | SUPERSEDES DOCU     | MENTS:               |  |  |
|   | 32C/629/CD, 320     | C/640A/CC            |  |  |
|   |                     |                      |  |  |
| IEC SC 32C : MINIATURE FUSES  |                     |                      |  |  |
| SECRETARIAT:  |                     | SECRETARY:           |  |  |
| China   |                     | Mr Jun Cai           |  |  |
| OF INTEREST TO THE FOLLOWING COMMITTEES:  |                     | HORIZONTAL FUNC      | ction(s):                              |  |
| ASPECTS CONCERNED: Safety   |                     |                      |  |  |
| SUBMITTED FOR CENELEC PARALLI   | EL VOTING           | □ Nот submitter      | FOR CENELEC PARALLEL VOTING            |  |
| Attention IEC-CENELEC parallel vo   | oting eh Sta        | andard               |  |  |
| The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) is submitted for parallel voting.   |                     |                      |  |  |
| The CENELEC members are invited CENELEC online voting system.   | to vote through the |                      |  |  |
|   |                     |                      |  |  |
| This document is still under study an   | d subject to change | . It should not be u | sed for reference purposes. 11-100-600 |  |
| Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.   |                     |                      |  |  |
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| T   |                     |                      |  |  |
| TITLE:  |                     |                      |  |  |
| Miniature fuses - Part 4: Universal modular fuse-links (UMF) - Through-hole and surface mount types   |                     |                      |  |  |
|   |                     |                      |  |  |
| PROPOSED STABILITY DATE: 2027   |                     |                      |  |  |
|   |                     |                      |  |  |
| NOTE FROM TC/SC OFFICERS:   |                     |                      |  |  |
|   |                     |                      |  |  |

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### INTERNATIONAL ELECTROTECHNICAL COMMISSION

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MINIATURE FUSES -

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

# **FOREWORD**

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- IEC 6XXXX has been prepared by subcommittee XX: TITLE, of IEC technical committee XX: 107 TITLE. It is an International Standard.
- This XXX edition cancels and replaces the XXX edition published in [publication date], 109 Amendment 1:[publication\_date] and Amendment 2:[publication\_date]. This edition constitutes
- a technical revision.
- This edition includes the following significant technical changes with respect to the previous 112 edition:
- a) ...;
- b)

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

| Draft       | Report on voting |
|-------------|------------------|
| 32C/XX/FDIS | 32C/XX/RVD       |

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- 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 [change language if necessary].
- 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 <a href="https://www.iec.ch/members\_experts/refdocs">www.iec.ch/members\_experts/refdocs</a>. The main document types developed by IEC are
- described in greater detail at www.iec.ch/publications.
- 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
- 129 reconfirmed,
- 130 withdrawn, or
- 131 revised.

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| 134        | MINIATURE FUSES -  |
|------------|--|
| 135        |  |
| 136        | Part 4: Universal modular fuse-links (UMF) –   |
| 137        | Through-hole and surface mount types   |
| 138        |  |
| 139        |  |
| 140        |  |
| 140        |  |
| 141        | 1 Scope and object   |
| 142        | This part of IEC 60127 relates to universal modular fuse-links (UMF) for printed circuits and  |
| 143        | other substrate systems, used for the protection of electric appliances, electronic equipment,   |
| 144        | and component parts thereof, normally intended to be used indoors.   |
| 145        | It does not apply to fuse-links for appliances intended to be used under special conditions, such  |
| 146        | as in a corrosive or explosive atmosphere.   |
|            |  |
| 147        | These fuses are normally intended to be mounted or replaced only by appropriately skilled  |
| 148        | persons using specialized equipment.   |
|            |  |
| 149        | This standard applies in addition to the requirements of IEC 60127-1.  |
|            |  |
| 150        | The objectives of this part of IEC 60127 are as given in IEC 60127-1, with the additional  |
| 151        | requirement of a degree of non-interchangeability.   |
|            |  |
| 152        | 2 Normative references   |
| 132        | 2 Normative references   |
| 150        | The following documents are referred to in the text in such a way that some or all of their content  |
| 153<br>154 | constitutes requirements of this document. For dated references, only the edition cited applies.   |
| 155        | For undated references, the latest edition of the referenced document (including any   |
| 156 (a)    | amendments) applies.andards/sist/5d9b44bf-3bc6-4c79-856e-a704655fdaa8/osist-pren-iec-601   |
|            | real and the man parties of the part |
| 157        | IEC 60068-2-21:2021, Environmental testing - Part 2-21: Tests - Test U: Robustness of  |
| 158        | terminations and integral mounting devices   |
|            |  |
| 159        | IEC 60068-2-58:2015+AMD1:2017, Environmental testing - Part 2-58: Tests - Test Td: Test  |
| 160        | methods for solderability, resistance to dissolution of metallization and to soldering heat of   |
| 161        | surface mounting devices (SMD)   |
|            |  |
| 162        | IEC 60127-1:2023, Miniature fuses - Part 1: Definitions for miniature fuses and general  |
| 163        | requirements for miniature fuse-links  |
|            |  |
| 164        | IEC 60194:2021, Printed board design, manufacture and assembly – Terms and definitions   |
|            |  |
| 165        | IEC 60216-1: 2013, Electrical insulating materials – Thermal endurance properties – Part 1:  |
| 166        | Ageing procedures and evaluation of test results   |
|            |  |
| 167        | IEC 60664-1:2020, Insulation coordination for equipment within low-voltage systems – Part 1:   |
| 168        | Principles, requirements and tests   |
|            |  |
| 169        | IEC 61249-2-7:2002, Materials for printed boards and other interconnecting structures –  |
| 170        | Part 2-7: Reinforced base materials clad and unclad – Epoxide woven E-glass laminated sheet  |
| 171        | of defined flammability (vertical burning test), copper-clad   |
| 4==        | IDO 7054D-0040. Comonio no maine mente for conference and della de |
| 172        | IPC 7351B:2010, Generic requirements for surface mount design and land pattern standard  |

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173 ISO 3:1973, Preferred numbers – Series of preferred numbers

#### 174 3 Terms and definitions

- For the purposes of this document, the terms and definitions given in Clause 3 of IEC 60127-1,
- together with the following definitions, apply.
- 177 **3.1**
- 178 through-hole fuse-link
- 179 UMF designed for soldering directly into a printed wiring board, with insertion of its leads in
- suitably designed holes
- **181 3.2**
- 182 surface mount fuse-link
- 183 UMF designed for direct conductive attachment by solder or other means on to the surface of
- a substrate, without insertion of its leads in suitably designed holes or sockets
- 185 **3.3**
- 186 land
- portion of a conductive pattern usually but not exclusively used for the connection and/or
- attachment of components (see IEC 60194)
- 189 Note 1 to entry: Further definitions which may be useful in the application of surface mount fuse-links may be found
- 190 in IEC 60115-1 and IEC 60115-8<sup>1</sup>.
- 191 4 General requirements S: / Standards.itch.ai)
- 192 See IEC 60127-1.

### 193 **5 Standard ratings**

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- 194 5.1 Rated voltage
- 195 See standard sheets.
- 196 5.2 Rated current
- 197 See Table 1 for preferred ratings.
- 198 5.3 Rated breaking capacity
- 199 See standard sheets.
- 200 6 Marking
- 201 In addition to the requirements of Clause 6 in IEC 60127-1, the following criteria concerning
- 202 UMF shall be observed and marked:

<sup>1</sup> This standard has been withdrawn.

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#### 203 **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.
- 206 These symbols are as follows:
- 207 H: denoting high-breaking capacity;
- 208 *I*: denoting intermediate-breaking capacity;
- 209 L: denoting low-breaking capacity.
- 210 f) The distinctive symbol shown in Figure 1.
- g) The letters a.c. before the voltage for devices designed solely for alternating current application.

### 213 6.4 Colour coding for universal modular fuse-links

- 214 Under consideration.
- 215 **6.5** Where marking is impractical due to space limitations, the relevant information should
- appear on the smallest package and in the manufacturer's technical literature.

#### 217 7 General notes on tests

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

# 220 7.2 Addition: (https://standards.itel

- 7.2.1 For testing of individual fuse ratings according to standard sheets 1 and 2, see Table 2.
- 222 For fuse-links designed and rated both for a.c. and d.c., the number of fuse-links required is 63.
- 223 For fuse-links designed only for a.c., the number of fuse-links required is 48. There are nine
- 224 spares. <u>08181 prEN 1EC 60127-4:2024</u>

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- 225 For the maximum ampere rating of a homogeneous series according to standard sheets 1 and
- 226 2, see Table 3. For fuse-links designed and rated both for a.c. and d.c., the number of fuse-
- 227 links required is 53. For fuse-links designed only for a.c., the number of fuse-links required is
- 48. There are 19 spares.
- 229 For the minimum ampere rating of a homogeneous series according to standard sheets 1 and
- 230 2, see Table 4. For fuse-links designed and rated both for a.c. and d.c., the number of fuse links
- required is 38. For fuse-links designed only for a.c., the number of fuse-links required is 33.
- There are 16 spares.

#### 7.3 Fuse-bases for tests

## 234 7.3.1 General requirements

- Fuse-links shall be mounted upon the appropriate test board (see 7.3.2 or 7.3.3 as appropriate)
- 236 by soldering.

233

- 237 The test board shall be made of epoxide woven glass fabric copper-clad laminated sheet, as
- 238 defined in IEC 61249-2-7:
- 239 the nominal sheet thickness shall be 1,6 mm;
- 240 the nominal thickness of copper layer shall be in accordance with Table 6.
- The manufacturer must declare the PCBparameters listed in Table 6 and provide assembled
- PCBs for the tests.

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This test board shall then be mounted on the test fuse-base (Figure 4). Metal parts of the fusebase shall be made of brass with a copper content between 58 % and 70 %. Contact parts shall be silver-plated.

When two or more fuse-links are tested in series, the test fuse-bases shall be located so that there will be a spacing of not less than 50 mm between any two fuse-links under test. The conductor connecting the test fuse-bases together, and connecting the test fuse-bases to the ammeter and the source of supply shall be insulated copper wire. The length of each conductor shall be 250 mm, and the cross-sectional area of the wire shall be approximately 1 mm<sup>2</sup>.

For rated currents above 5 A the length of each conductor shall be at least 500 mm, and the cross-sectional area of the wire shall be according to Table 17.

Table 17 - Cross-sections of conductors

| Rated current                             | Copper conductor cross section |  |
|---|--------------------------------|--|
| Α   | mm <sup>2</sup>                |  |
| Up to and including 5                     | 1                              |  |
| More than 5, and up to and including 10   | 1.5                            |  |
| More than 10, and up to and including 16  | 2.5                            |  |
| More than 16, and up to and including 25  | 4                              |  |
| More than 25, and up to and including 35  | 6                              |  |
| More than 35, and up to and including 60  | Muarus 35                      |  |
| More than 60, and up to and including 100 | lands ital 50                  |  |

# 7.3.2 Through-hole fuse-links (standard sheet 1)

For electrical tests upon fuse-links covered by standard sheet 1, the fuse-link shall be mounted on the test board, as shown in Figure 2 in the pair of holes appropriate to the spacing of the terminations.

#### 7.3.3 Surface mount fuse-links (standard sheet 2)

For electrical tests upon fuse-links covered by standard sheet 2, the fuse-link shall be mounted on the test board, as shown in Figure 3. See Annex A for guidance.

## 8 Dimensions and construction

#### 8.1 Dimensions

The dimensions of the UMFs shall comply with the relevant standard sheets.

265 Compliance is checked by measurement of length, width and height.

For fuse-links to standard sheet 1, the termination spacing is checked. The termination shall also pass through a 1 mm hole. The length of the termination is not specified as this is subject to the method of packaging.

## 8.2 Construction

- 270 The fuse-element shall be completely enclosed.
- The UMF shall withstand the heat and chemical exposure of a printed circuit board or other substrate assembly operations with its performance unimpaired.