

# SLOVENSKI STANDARD

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**Pakiranje komponent za avtomatsko obdelavo - 5. del: Ploščati vlagalniki (IEC 60286-5:2018)**

Packaging of components for automatic handling - Part 5: Matrix trays (IEC 60286-5:2018)

Gurtung und Magazinierung von Bauelementen für automatische Verarbeitung - Teil 5: Flachmagazine (IEC 60286-5:2018)

Emballage de composants pour opérations automatisées - Partie 5: Supports matriciels (IEC 60286-5:2018)

**Ta slovenski standard je istoveten z: EN IEC 60286-5:2018**

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55.020	Pakiranje in distribucija blaga na splošno	Packaging and distribution of goods in general

**SIST EN IEC 60286-5:2018**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN IEC 60286-5**

June 2018

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English Version

**Packaging of components for automatic handling - Part 5: Matrix  
trays  
(IEC 60286-5:2018)**

Emballage de composants pour opérations automatisées -  
Partie 5: Supports matriciels  
(IEC 60286-5:2018)

Gurtung und Magazinierung von Bauelementen für  
automatische Verarbeitung - Teil 5: Flachmagazine  
(IEC 60286-5:2018)

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European Committee for Electrotechnical Standardization  
Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

**EN IEC 60286-5:2018 (E)****European foreword**

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- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2021-05-30

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IEC 60286-5

Edition 3.0 2018-04

# INTERNATIONAL STANDARD

**Packaging of components for automatic handling –  
Part 5: Matrix trays**

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**PACKAGING OF COMPONENTS FOR AUTOMATIC HANDLING –****Part 5: Matrix trays****FOREWORD**

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International Standard IEC 60286-5 has been prepared by IEC technical committee 40: Capacitors and resistors for electronic equipment.

This third edition cancels and replaces the second edition published in 2003 and Amendment 1:2009. This edition constitutes a technical revision.

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

- a) The generic rules for the design of matrix trays are given in this document. Newly developed trays which follow these rules will not be listed individually. Only those trays which conform to the design rules set forth herein are classified as "standard trays" and are thus preferred for use.
- b) An update of the matrix trays, which do not conform to the design rules set forth herein, are considered as "non-standard trays" and are not preferred for use, is listed in Annex A.

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

CDV	Report on voting
40/2556/CDV	40/2597/RVC

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

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

A list of all parts in the IEC 60286 series, published under the general title *Packaging of components for automatic handling*, can be found on the IEC website.

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

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

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# PACKAGING OF COMPONENTS FOR AUTOMATIC HANDLING –

## Part 5: Matrix trays

### 1 Scope

This part of IEC 60286 describes the common dimensions, tolerances and characteristics of the tray. It includes only those dimensions that are essential for the handling of the trays for the stated purpose and for placing or removing components from the trays.

Matrix trays are designed to facilitate the transport and handling of electronic components during their testing, baking, transport/storage, and final mounting by automatic placement equipment.

The generic rules for their design are given in this document. Newly developed trays that follow these rules will not be listed individually. Only those trays that conform to the design rules set forth herein are classified as "standard trays" and are thus preferred for use.

NOTE Matrix trays listed in Annex A that do not conform to the design rules set forth herein shall be considered as "non-standard trays" and are not preferred for use.

### 2 Normative references

There are no normative references in this document.

### 3 Terms, definitions and abbreviated terms

#### 3.1 Terms and definitions

No terms and definitions are listed in this document.

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

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

#### 3.2 Abbreviated terms

The following are the abbreviated terms used in Table A.1 and Table A.3.

<u>b</u> all <u>g</u> rid <u>a</u> rray ( <u>b</u> all <u>g</u> rid <u>a</u> rray type <u>p</u> ackage)	<b>BGA</b>
<u>c</u> eramic <u>q</u> uad <u>f</u> lat <u>p</u> ackage ( <u>c</u> eramic <u>q</u> uad <u>f</u> lat type <u>p</u> ackage)	<b>CQFP</b>
<u>m</u> etric <u>q</u> uad <u>f</u> lat <u>p</u> ackage ( <u>m</u> etric <u>q</u> uad <u>f</u> lat type <u>p</u> ackage)	<b>MQFP</b>
<u>p</u> lastic <u>l</u> eaded <u>c</u> hip <u>c</u> arrier ( <u>p</u> lastic <u>l</u> eaded type <u>c</u> hip <u>c</u> arrier)	<b>PLCC</b>
<u>p</u> lastic <u>q</u> uad <u>f</u> lat <u>p</u> ackage ( <u>p</u> lastic <u>q</u> uad <u>f</u> lat type <u>p</u> ackage)	<b>PQFP</b>
<u>t</u> hin <u>q</u> uad <u>f</u> lat <u>p</u> ackage ( <u>t</u> hin <u>q</u> uad <u>f</u> lat type <u>p</u> ackage)	<b>TQFP</b>
<u>s</u> mall <u>o</u> utline <u>j</u> -leaded package ( <u>s</u> mall <u>o</u> utline <u>j</u> -leaded type package)	<b>SOJ</b>
type 1 <u>t</u> hin <u>s</u> mall <u>o</u> utline <u>p</u> ackage ( <u>t</u> hin <u>s</u> mall <u>o</u> utline type package1)	<b>TSOP (I)</b>
type 2 <u>t</u> hin <u>s</u> mall <u>o</u> utline <u>p</u> ackage ( <u>t</u> hin <u>s</u> mall <u>o</u> utline type package2)	<b>TSOP (II)</b>

## 4 Material

### 4.1 Electrostatic dissipative requirements

Trays shall be moulded from material that meets the ESD dissipative requirements with surface resistance equal to or greater than  $1,0 \times 10^5$  ohms/square but less than  $1,0 \times 10^{-11}$  ohms/square.

### 4.2 Effect of properties

The tray material shall not adversely affect the mechanical, electrical characteristics, solder-ability, or marking of the component during or after transport, baking or storage in the tray.

### 4.3 Recycling and rigidity

The tray material shall be reusable or recyclable and shall be rigid enough to avoid damage to the components during handling, loading, baking, testing, shipping and placement operations.

There should be space for a recycle logo and material code or material declaration close to 'Detail B'.

## 5 Mechanical stability

### 5.1 Loaded tray

Mechanical stability of loaded trays shall be such that the components are adequately retained, without lead/terminal damage, and can be easily removed from the tray.

### 5.2 Empty tray

The empty tray shall withstand normal environmental conditions (including component baking temperatures, if required) without distorting, warping, expanding, shrinking or any other physical change outside the specified dimensions of the trays.

### 5.3 Outer edges

The outer edges of the tray shall be of sufficient thickness and strength to allow mechanical positioning and clamping.

## 6 Tray design, dimensions and other physical properties

### 6.1 Tray design

#### 6.1.1 Number of pockets

All new tray proposals should maximize the number of pockets in each tray-family variation without violating the pocket-density design rules specified in 6.1.3.

#### 6.1.2 Orientation of pockets

When designing a tray for a rectangular package, the longest dimension ( $D$ ) of the package is oriented parallel to the length of the tray to maximize tray pocket density.