IEC TS 60286-6-1

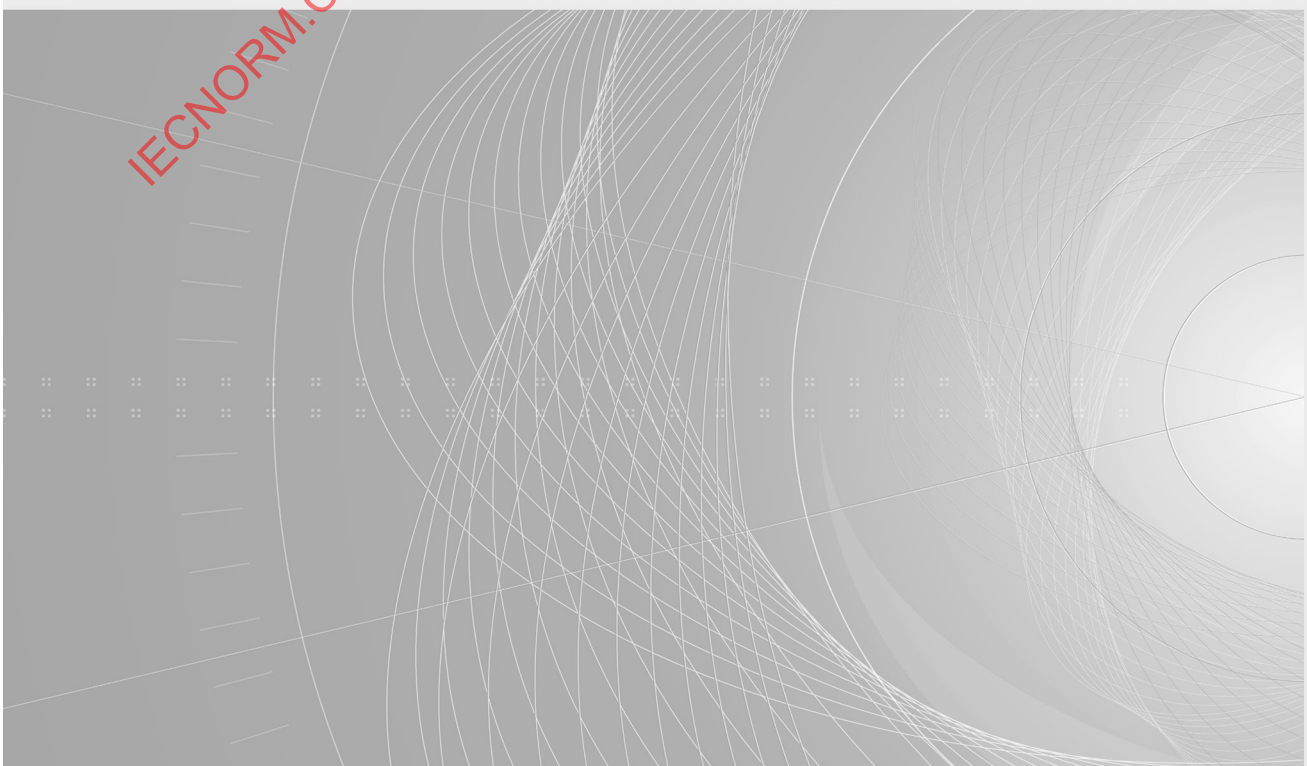
Edition 1.0 2023-11

TECHNICAL SPECIFICATION

IECNORM.COM : Click to view the full PDF of IEC TS 60286-6-1:2023

colour inside

Packaging of components for automatic handling – Part 6-1: Bulk case packaging for miniaturized surface mounting components



IEC TS 60286-6-1:2023-11(en)

THIS PUBLICATION IS COPYRIGHT PROTECTED
Copyright © 2023 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, 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 either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

IEC Secretariat
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

About the IEC
The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications
The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform
The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee, …). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished
Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc
If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

IEC Products & Services Portal - products.iec.ch
Discover our powerful search engine and read freely all the publications previews. With a subscription you will always have access to up to date content tailored to your needs.

Electropedia - www.electropedia.org
The world's leading online dictionary on electrotechnology, containing more than 22 300 terminological entries in English and French, with equivalent terms in 19 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IECNORM.COM : Click to view the full PDF of IEC TS 60286-6-1:2023

IEC TS 60286-6-1

Edition 1.0 2023-11

TECHNICAL SPECIFICATION

colour inside

IECNORM.COM : Click to view the full PDF of IEC TS 60286-6-1:2023

Packaging of components for automatic handling – Part 6-1: Bulk case packaging for miniaturized surface mounting components

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ICS 31.020

ISBN 978-2-8322-7707-2

Warning! Make sure that you obtained this publication from an authorized distributor.

® Registered trademark of the International Electrotechnical Commission

CONTENTS

IECNORM.COM : Click to view the full PDF of IEC TS 60286-6-1:2023

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

PACKAGING OF COMPONENTS FOR AUTOMATIC HANDLING –

Part 6-1: Bulk case packaging for miniaturized surface mounting components

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 nearly 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 itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
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.

IEC TS 60286-6-1 has been prepared by IEC technical committee 40: Capacitors and resistors for electronic equipment. It is a Technical Specification.

The text of this Technical Specification is based on the following documents:

Draft	Report on voting
40/3038/DTS	40/3066/RVDTS

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 Technical Specification is English.

IECNORM.COM : Click to view the full PDF of IEC TS 60286-6-1:2023

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 https://www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at https://www.iec.ch/standardsdev/publications.

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 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.

IMPORTANT – The "colour inside" logo on the cover page of this document indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

IECNORM.COM : Click to view the full PDF of IEC TS 60286-6-1:2023

INTRODUCTION

This Technical Specification was developed by the Technical Committee 40 Working group 36 on Components Packaging, in which the members such as assembly machine manufacturers, component manufacturers and packaging material manufacturers had proposed, considered and discussed the possible standardization on the application of a new type of bulk case to contain smaller sizes of SMD, aiming to supplement IEC 60286-6 Edition 2.0, issued in 2004.

NOTE For size limitations of components, see Annex A, Table A.1 and Table A.2.

The International Electrotechnical Commission (IEC) draws attention to the fact that it is claimed that compliance with this document may involve the use of a patent concerning “storage case for surface mounting electronic components” [1].

IEC takes no position concerning the evidence, validity and scope of this patent right.

The holder of this patent right has assured the IEC that he/she is willing to negotiate licences free of charge with applicants throughout the world for claims related to the items described in this document. In this respect, the statement of the holder of this patent right is registered with IEC. Information may be obtained from the patent database available at patents.iec.ch.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights other than those identified above. IEC shall not be held responsible for identifying any or all such patent rights.

IECNORM.COM : Click to view the full PDF of IEC TS 60286-6-1:2023

1 Patent Application No.: PCT/JP2021/023093, published 17.06.2021

PACKAGING OF COMPONENTS FOR AUTOMATIC HANDLING –

Part 6-1: Bulk case packaging for miniaturized surface mounting components

1 Scope

This part of IEC 60286 specifies a bulk case capable of containing miniaturized surface mount components of sizes within the range of 0402M to 1005M (see Table 1 for explanation of the codes). The bulk case is designed for transport and storage of components and to supply of components directly or by an appropriate feeder to the placement machine. The bulk case is equipped with a coupling interface to enable its automatic handling, e.g. by a robot or automatic handling machines.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological 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
component size
<metric> component dimensions expressed by a metric code

Note 1 to entry: For identification the size code is followed by a capital M.

Note 2 to entry: For comparison with inch-based size codes, an equivalency table is shown in Table 1.

Table 1 – Size codes for components

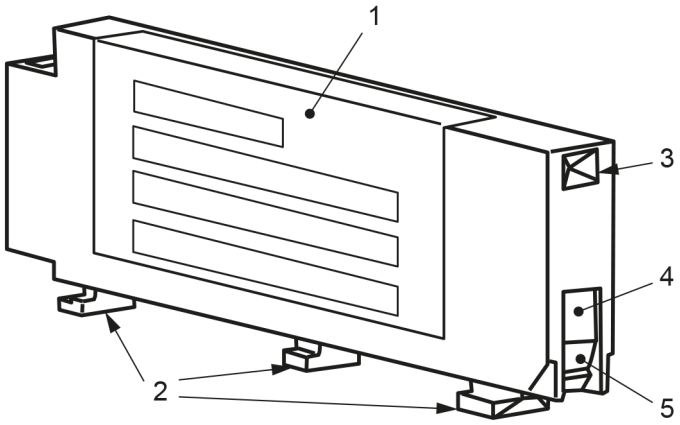
Metric size code	Inch size code
0402M	01005
0603M	0201
1005M	0402

4 Requirements for the bulk case

4.1 Case outline

Figure 1 shows the general outline of the bulk case. Figure 2 shows the photographic view of the bulk case.

IECNORM.COM : Click to view the full PDF of IEC TS 60286-6-1:2023



Key

1 Label
2 Coupling interface (T-Slot bar)
3 Chuck hole
4 Shutter mechanism
5 Access hole

Figure 1 – Bulk case – General view

Figure 2 – Bulk case – Photographic view

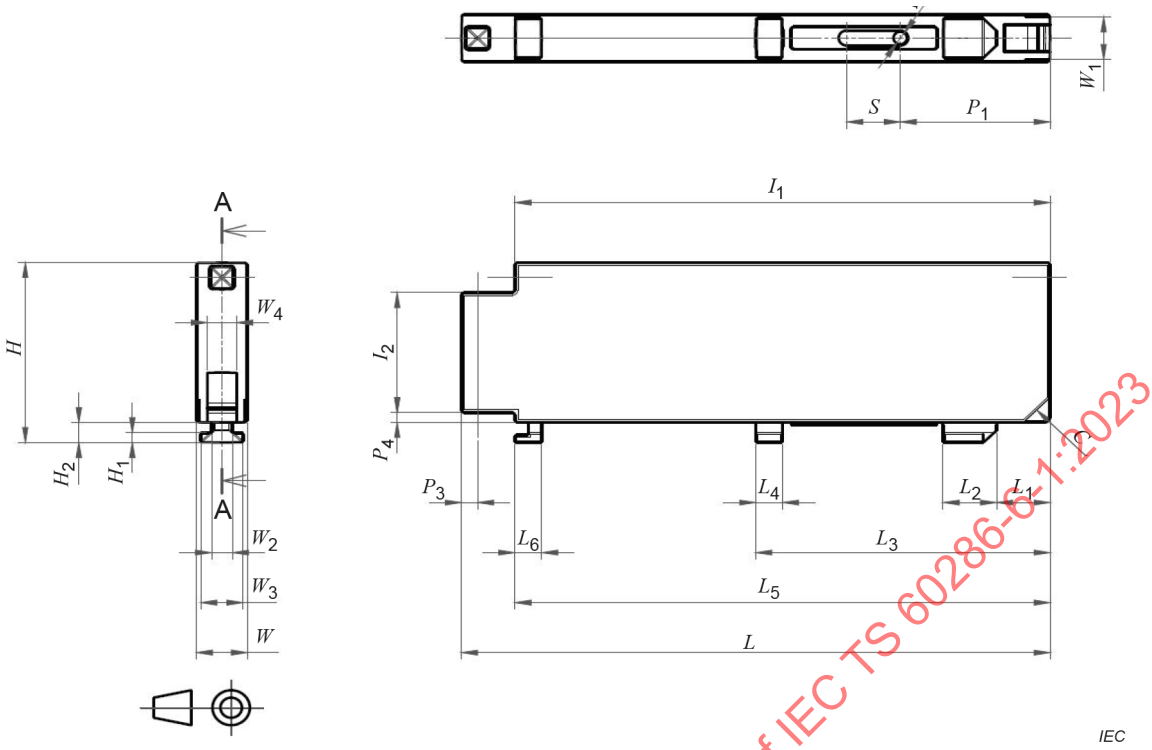
IECNORM.COM : Click to view the full PDF of IEC TS 60286-6-1:2023

4.2 Shutter mechanism

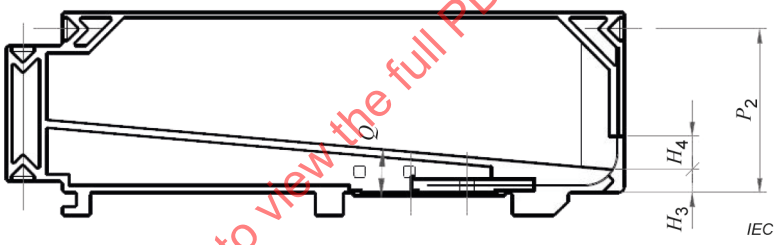
The bulk case shall have a slide combined with a shutter to open and close the access hole. After an identity check to prevent unintended mixing of components, the shutter can be opened by a tool connected to the actuating hole.

4.3 Dimensions

A general description and letter symbols for individual dimensions are given in Figure 3 and Table 2.



Cross Section A-A



Key:

L, L_1 to L_6: Length

H, H_1 to H_4: Hight

W, W_1 to W_4: Width

S: Slide length

P_1 to P_4: Distance from bottom to chucking hole, etc.

φD: Diameter of actuating hole

Details: See Table 2

Figure 3 – Dimensions of the bulk case

IECNORM.COM : Click to view the full PDF of IEC TS 60286-6-1:2023

Table 2 – Dimension of the bulk case

Symbol	Description	Dimension mm	Angle (°)
C	Connection chamfer	5,0 ± 0,2	-
D	Diameter of actuating hole	2,7 ± 0,2	-
H	Height	36,0 ± 0,5	-
H_1	Height of T-slot bottom	2,0 ± 0,1	-
H_2	Height of T-slot top	4,0 ± 0,1	-
H_3	Distance from bottom to access hole in the direction H	4 [a]	-
H_4	Height of access hole in the direction H	6 [a]	-
I_1	Chucking distance in the direction L	100,0 ± 0,5	-
I_2	Chucking distance in the direction H	24,0 ± 0,2	-
L	Length	110,0 ± 0,5	-
L_1	Distance from tip to first T-slot	10,0 ± 0,1	-
L_2	Length of first T-slot	10,0 ± 0,1	-
L_3	Length of distance from tip to second T-slot	55,0 ± 0,2	-
L_4	Length of second T-slot	5,0 ± 0,1	-
L_5	Distance from tip to third T-slot	100,0 ± 0,3	-
L_6	Length of third T-slot	5,0 ± 0,1	-
P_1	Slide start position (access hole completely close)	$28{,}0\ ^{0}_{-0{,}2}$	-
P_2	Distance from bottom to chucking hole in the direction H	29,00 ± 0,08	-
P_3	Distance from tip to chucking hole in the direction L	3,0 ± 0,3	-
P_4	Distance from bottom to chucking block in the direction H	2,0 ± 0,3	-
Q	Slope angle	-	5 [a]
S	Slide length	$10\ ^{+0{,}5}_{0}$ [a]	-
W	Width	$9{,}5\ ^{0}_{-0{,}2}$	-
W_1	Connection width	8,5 ± 0,1	-
W_2	Width of T-slot bottom	7,9 ± 0,1	-
W_3	Width of T-slot Top	3,9 ± 0,1	-
W_4	Width of access hole in the direction W	5,5 [a]	-

[a] Recommended value

IECNORM.COM : Click to view the full PDF of IEC TS 60286-6-1:2023

4.4 Material

The material of the bulk case shall be transparent or translucent. The bulk case material shall not adversely affect the mechanical and electrical characteristics, solderability, or marking of the devices during or after transport and storage. The materials shall be selected to avoid damage to electrostatic-sensitive components.

4.5 Mechanical characteristics of the bulk case

4.5.1 Mechanical stability

Mechanical stability of loaded bulk cases shall be such that during transport, storage and use the dimensions remain within its tolerances, and that the components are retained without damage and can be easily removed.

4.5.2 Performance and test methods

Annex C shows examples of test methods for the robustness of the bulk case in view of its mechanical characteristics.

See Annex C, Table C.1.

5 Marking of the bulk case

5.1 General

The bulk case shall provide space for a peelable label. The label shall be fixed onto the sides, or side and tops as shown in Figure 1.

The marking on the label shall comply with the requirements of the detail specification of the component.

The label style and content should be in accordance with IEC 62090. The labels on the packaging of electronic components applies for automatic handling Business to Business processes. The data elements shall be represented on the label as human-readable text and shall be encoded in machine-readable form, either linear bar code or two-dimensional(2D) symbols, or a combination of both. The label format accommodates mandatory, optional and mutually agreed data elements.

See Annex B for additional information on labels.

5.2 Recycling

Bulk cases defined in Figure 1 and Figure 2 shall be permanently and visibly marked with an appropriate recycling symbol. ISO 11469 is recommended.

IECNORM.COM : Click to view the full PDF of IEC TS 60286-6-1:2023

Annex A
(informative)

Packing capacity

A.1 Component types

This packing type can apply to small sized surface mounting devices, for example certain capacitors, resistors and other electronic or electromechanical components.

A.2 Component quantities

Table A.1 and Table A.2 show typical quantities of components contained in a bulk case.

Table A.1 – Typical quantities of Capacitors in the bulk case

Component size	Typical dimensions of components			Typical Quantities pcs
	Length mm	Width mm	Thickness mm	
0402M	0,4	0,2	0,2	500 000
0603M	0,6	0,3	0,3	150 000
1005M	1,0	0,5	0,5	30 000
NOTE The identifier M after the style code indicates a metric dimension base.				

Table A.2 – Typical quantities of Resistors in the bulk case

Component size	Typical dimensions of components			Typical Quantities pcs
	Length mm	Width mm	Thickness mm	
0402M	0,4	0,2	0,13	500 000
0603M	0,6	0,3	0,23	150 000
1005M	1,0	0,5	0,35	30 000
NOTE The identifier M after the style code indicates a metric dimension base.				

IECNORM.COM : Click to view the full PDF of IEC TS 60286-6-1:2023

Annex B
(informative)

Label information

B.1 Label material

The material is not specified. The same material of label is recommended to be used, when the original peelable label is not removed and another label is put over the original one. If a plastic label is used, its material normally is indicated on the label in accordance with ISO 11469.

B.2 Label adhesion

Peelable labels should keep their adhesive properties, if the bulk case is stored at temperatures between –45 °C to +70 °C and at a relative humidity between 45 % to 75 %, so that they can be peeled-off prior to re-use of the bulk case.

B.3 Label content

The label style and content should be in accordance with IEC 62090.

Figure B.1 to Figure B.3 show examples of bulk case labels.

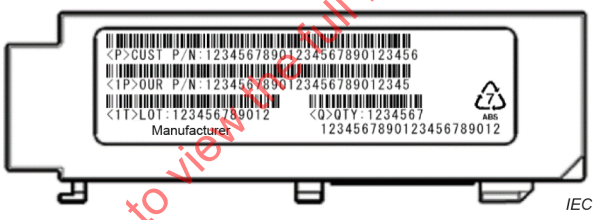


Figure B.1 – Example of a label with bar code

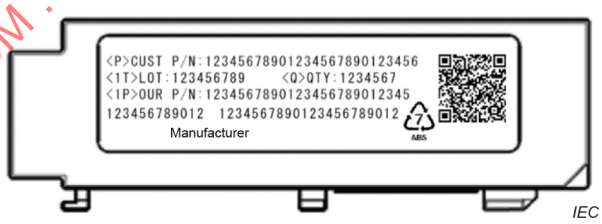


Figure B.2 – Example of a label with a 2D symbol

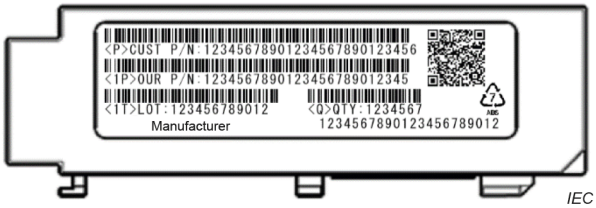


Figure B.3 – Example of a label with bar code and a 2D symbol

IECNORM.COM : Click to view the full PDF of IEC TS 60286-6-1:2023