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TECHNICAL REPORT

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Packaging of components for automatic handling – Part 3-3: Packaging of surface mount components on continuous paper tapes for Auto Loading Feeder

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PACKAGING OF COMPONENTS FOR AUTOMATIC HANDLING –

Part 3-3: Packaging of surface mount components on continuous paper tapes for Auto Loading Feeder

FOREWORD

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IEC TR 60286-3-3 has been prepared by IEC technical committee 40: Capacitors and resistors for electronic equipment. It is a Technical Report.

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

Draft	Report on voting
40/2843/DTR	40/2865/RVDTR

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 Report 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/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- withdrawn,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.

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INTRODUCTION

This Technical Report was developed by the technical committee 40 working group 36 on components packaging, in which the members, such as mounter manufacturers, component manufacturers and packaging material manufacturers, had proposed, considered and discussed the possible standardization of the application of Auto Loading Feeder to enable automatically exchange SMD continuous tapes, using paper carrier tape during mounter operation, aiming to support IEC 60286-3, Edition 6, issued in 2019.

This document includes data expressed in the form of provisions, such as requirements or recommendations. These data, however, do not claim to be provisions and are just suggested as the results of the discussion.

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 trademark concerning Auto Loading Feeder given in 3.1.1.

- Trademark ... AUTO LOADING FEEDER™
- Trademark registration number ... No.5983611 (Japan)

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

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PACKAGING OF COMPONENTS FOR AUTOMATIC HANDLING –

Part 3-3: Packaging of surface mount components on continuous paper tapes for Auto Loading Feeder

1 Scope

This part of IEC 60286 describes the possible requirements for paper taping for the Auto Loading Feeder mechanism to mount electronic components without leads or with stump type leads used for electric circuits. This document is applicable to the punched carrier tape with the bottom cover tape (nominal tape width: 8 mm only) among the tapes of Type 1a, and the pressed carrier tape (nominal tape width: 8 mm) of Type 1b in IEC 60286-3.

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 60286-3:2019, *Packaging of components for automatic handling – Part 3: Packaging of surface mount components on continuous tapes*

3 Terms, definitions and symbols

3.1 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 http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

NOTE Annex D features a Glossary of mounter and feeder related terms.

3.1.1
Auto Loading Feeder
AUTO LOADING FEEDER™
tape feeder that can keep supplying components by automatically carrying a tape of re-supplied SMD at the filling-in position into the components supply position, just after the components in the tape of previously supplied SMD are fed up during the assembly production

Note 1 to entry: Auto Loading Feeder has the mechanism that the cover tape of a SMD tape is automatically cut or peeled off to expose the pockets during the operation to supply components.

3.1.2
seal
bonding of a part of the top cover tape and a part of the carrier tape

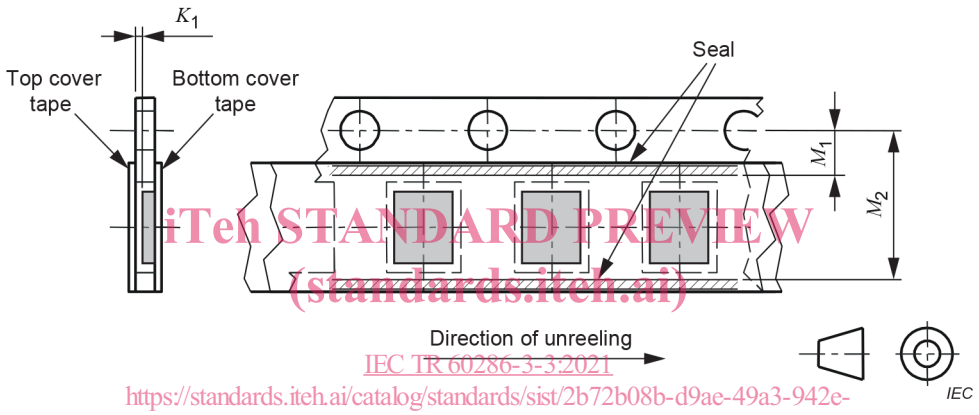
Note 1 to entry: The top cover tapes are classified as heat welding type and adhesive type by the way to bond itself on the carrier tape.

3.2 Symbols

The symbols used in this document are shown in Table 1 and Figure 1.

Table 1 – Symbols used in figures and tables

Symbol	Description	Figures and tables using the symbol
M_1	Distance between the reference point of the sprocket holes (centre) and the inner side of the seal on the upper end side, which is near the sprocket holes, of the carrier tape.	Figure 1 and Table 2
M_2	Distance between the reference point of the sprocket holes (centre) and the inner side of the seal on the lower end side, which is far from the sprocket holes, of the carrier tape.	Figure 1 and Table 2
K_1	Distance between the upper side of the carrier tape and the top surface of a component.	Figure 1 and Table 2



NOTE These symbols are the same as the ones for Type 1a and Type1b in IEC 60286-3.

Figure 1 – Specified dimensions for paper taping for Auto Loading Feeder

4 Requirements and required dimensions for paper taping for Auto Loading Feeder

4.1 General

The requirements and required dimensions for paper taping are classified as follows:

a) Required dimensions for the cover tape sealed positions (see 4.2);

b) Required dimensions for the distance between the upper side of the carrier tape and the top surface of a component (see 4.3);

c) Required specifications for the sealing method of the cover tape (see 4.4);

d) Requirements about fluff generated at removal of the cover tape (see 4.5);

e) Required specifications for the maximum trailer length (see 4.6).

The overview and features of Auto Loading Feeder are shown in Annex A. The methods and mechanisms of automatically exposing the pockets in using Auto Loading Feeder are shown in Annex B. The history of discussion on the proposed requirements and dimensions for paper taping for Auto Loading Feeder are shown in Annex C.

4.2 Required dimensions for the cover tape sealed positions

The required dimensions for the cover tape sealed positions for Auto Loading Feeder are shown in Table 2.

Table 2 – The cover tape sealed positions required for paper taping for Auto Loading Feeder

Dimensions in millimetres

Target nominal component dimensions [a]	Required dimensions (design values)	
	M_1	M_2
0402M	2,9 or less	4,1 or more
0603M	2,9 or less	4,1 or more
1005M	2,6 or less	4,4 or more
1608M	2,4 or less [b]	4,6 or more [b]
2012M	2,2 or less [b]	4,8 or more [b]
3216M	1,7 or less	5,3 or more

NOTE 1 The symbols are shown in Table 1 and Figure 1.

NOTE 2 SMD tape with sealed pockets is not applicable to Auto Loading Feeder.

NOTE 3 Sealing tape should be attached symmetric to the centre of the pocket.

[a] Components with intermediate size between each nominal dimension follow the larger nominal dimension.

[b] Considering the maximum lateral deviation of components in the pockets specified in IEC 60286-3, if possible, the target design values should be set out by about 0,2 mm smaller for M_1 and about 0,2 mm larger for M_2.

4.3 Required dimensions for the distance between the upper side of the carrier tape and the top surface of a component

The required dimensions for the distance between the upper side of the carrier tape and the top surface of a component for Auto Loading Feeder are shown in Table 3.

Table 3 – Distance between the upper side of the carrier tape and top surface of a component required for paper taping for Auto Loading Feeder

Dimensions in millimetres

Target nominal component dimensions [a]	Required dimensions (design values) K_1
0402M	(0,03 or more) [b]
0603M	(0,03 or more) [b]
1005M	0,03 or more
1608M	0,03 or more
2012M	0,03 or more
3216M	0,03 or more

NOTE The symbols are shown in Table 1 and Figure 1.

[a] Components with intermediate size between each nominal dimension follow the larger nominal dimension.

[b] Since components can be inverted in the pockets and there are some restrictions in the assembly manufacturing, the dimensions are shown as reference values in brackets. If the tapes do not meet these dimensions, persons involved should discuss in advance whether Auto Loading Feeder can be used.