

Standard Linear IC

Standard Taping and Magazine Specifications

1. Delivery Format and Quantity

Renesas supports the following packing specifications to handle the automatic assembly equipment used by end-product manufacturers.

Table 1 Delivery Format and Quantity

Package	Delivery Format	Quantity
TO-92MOD	Radial taping packing (Fan-fold box)	2,500 units per box
TO-92	Radial taping packing (Fan-fold box)	2,500 units per box
SOP	Taping packing	2,000 units per reel (2,500 units per reel)
TSSOP	Taping packing (reel packing)	2,000 units per reel (3,000 units per reel)
UPAK	Horizontal magazine packing	25 units per magazine
	Taping packing (reel packing)	1,000 units per reel
MPAK-5	Taping packing (reel packing)	3,000 units per reel
MPAK	Taping packing (reel packing)	3,000 units per reel
CMPAK-5	Taping packing (reel packing)	3,000 units per reel

2. Radial Taping Packing Specifications (Conforms to the JEITA ET-7102 standard.) (TO-92MOD)

2.1 Taping Dimensions

These dimensions apply to both reel-wound and fan-folded packing.

Item	Symbol	Size (mm)	
		TO-92MOD	TO-92
Product width	A ₁	5.2 Max	5.2 Max
Product height	A	8.5 Max	5.2 Max
Product thickness	T	4.2 Max	4.2 Max
Lead width	d	0.55 Typ*1	0.5 Typ*1
Mounting lead length	l ₁	2.5*3	2.5*3
Inter-product pitch	P	12.7 Typ	12.7 Typ
Sprocket hole pitch	P ₀	12.7 Typ*2	12.7 Typ*2
Sprocket hole position	P ₂	6.35 Typ	6.35 Typ
Lead spacing	F ₁	2.5 Typ	2.5 Typ
Lead spacing	F ₂	2.5 Typ	2.5 Typ
Tape width	W	18.0 Typ	18.0 Typ
Mounting tape width	W ₀	6.0 Typ	6.0 Typ
Sprocket hole position	W ₁	9.0 Typ	9.0 Typ
Mounting tape width	W ₂	0.5*3	0.5*3
Lead clinch height	H ₀	16.0 Typ	16.0 Typ
Product upper surface position	H ₁	28.0 Max	24.7 Max
Sprocket hole diameter	D ₀	4.0 Typ	4.0 Typ
Tape thickness (total thickness)	t	0.7 Typ	0.7 Typ
Product lower surface position	H	19.0 Typ	19.0 Typ

Notes: 1. Thickness: 0.5 mm Typ
 2. Cumulative pitch error: ±1 mm/ 20 pitches
 3. Reference value

Figure 1 Radial Taping Dimensions

3. TO-92 and TO-92MOD Taping Specifications

3.1 Used Parts

- Taping IC
- Mounting paper
- Adhesive tape
- Corrugated cardboard box

3.2 Quantity

- 2,500 units per box (Typ)

3.3 Fan-Folded Packing Specifications

1. Radial taping packing specifications are adopted. Tape is folded at the length of 25 ICs.
2. At the start and the end of the tape more than 4 pieces are removed.

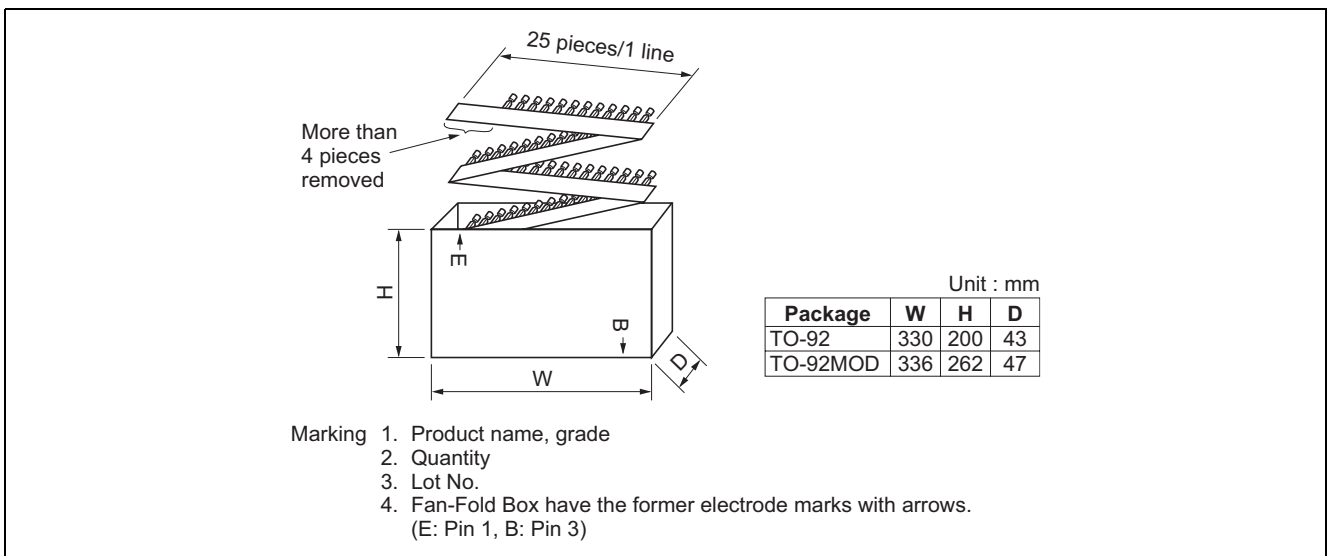


Figure 2 Fan-Folded Box Dimensions and Appearance

3.4 Missing Products

- Consecutive missing products shall be confined to no more than three.

3.5 Splicing

- After cutting, tapes are spliced (in case of completion or cut of tape) by splicing tape as shown figure 3.

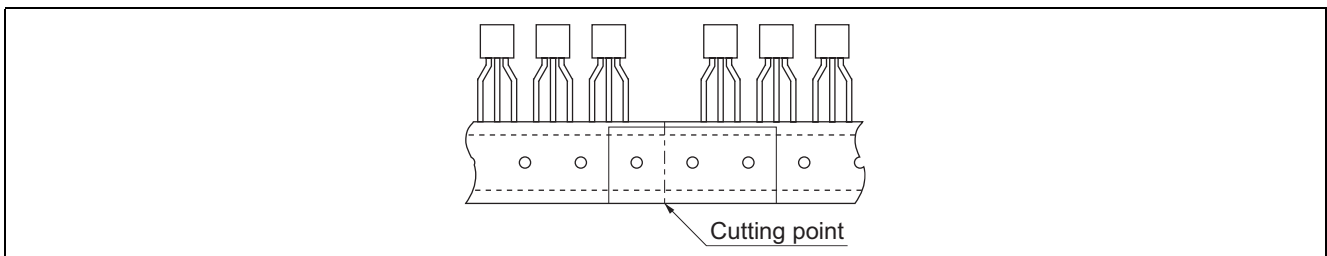


Figure 3 Splicing

- Point of splicing
 1. Cutting method of the tape

In splicing, edge of tapes shall be cut at the center between hole and hole after putting one tape upon another tape.
 2. Splicing of the tape

After cutting, splice the tapes as shown in the preceding clause.
- Notes: 1. In cutting, holes shall not be cut.
 2. Splicing tape will be located on the opposite side of the parts.
 3. Splicing tape length is longer than three pitches.
 4. After splicing, total tape thickness is less than 1.5 mm.
 5. Splicing tape does not fill holes.
- Tolerance of splicing

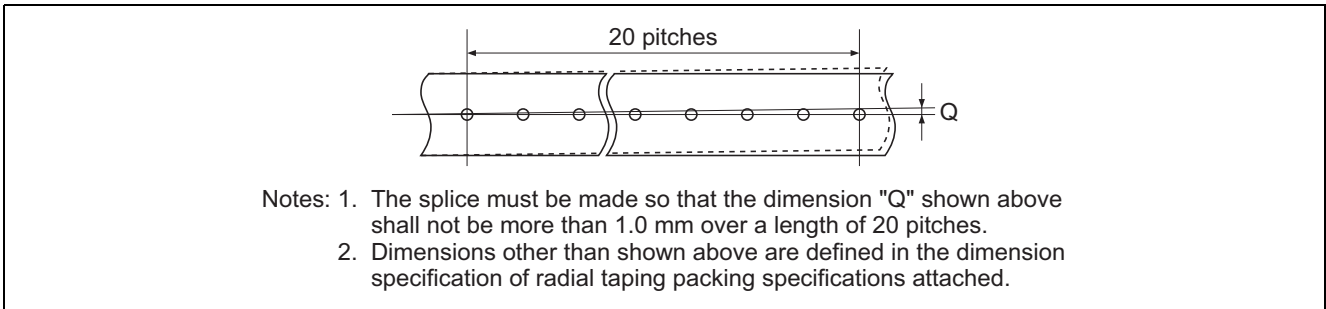


Figure 4 Tolerance of Splicing

4. UPAK Embossed Taping Packing Specifications

4.1 UPAK Horizontal Magazine Packing Specifications

The UPAK package was designed for the horizontal magazine packing format, and thus there is no special identification code for the magazine packing format for UPAK products.

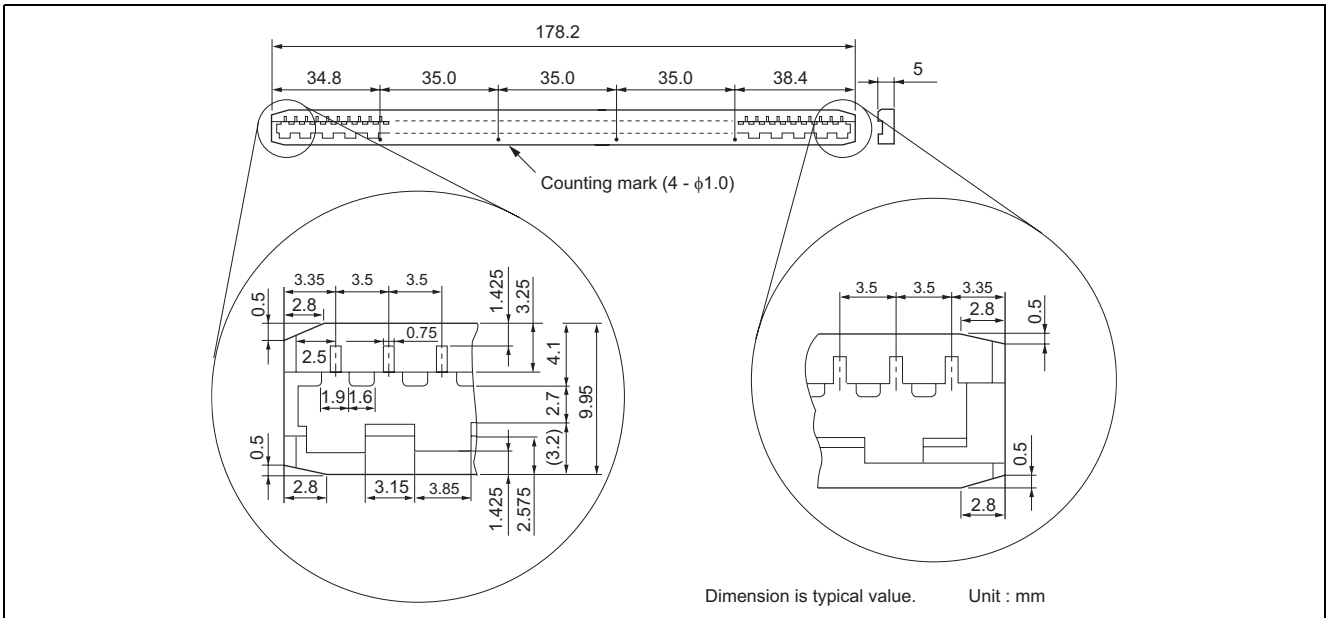


Figure 5 UPAK Horizontal Magazine Dimensions

4.2 UPAK Taping Specifications

- Leader tape section and empty tape section

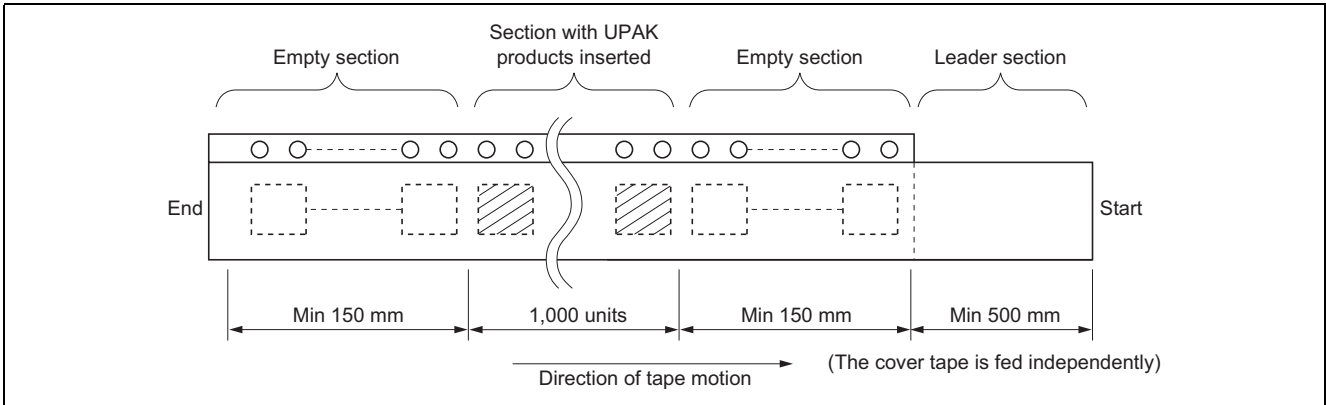


Figure 6 Leader Tape Section and Empty Tape Section

- Taping direction

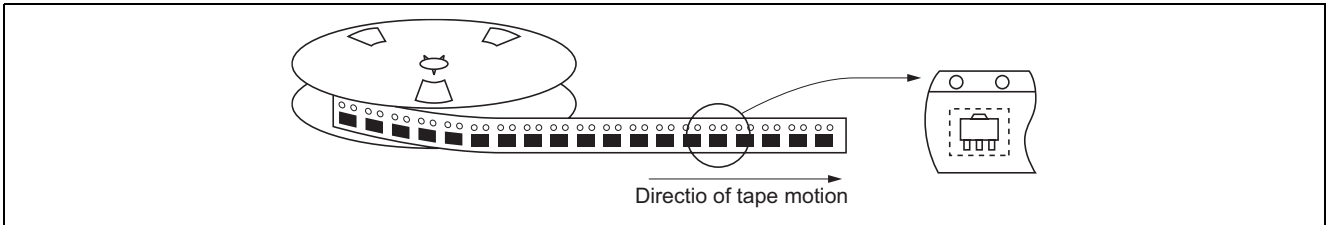


Figure 7 Taping Direction

- Product insertion

As shown in figure 8, products are inserted with the printed side up and the mounting side down.

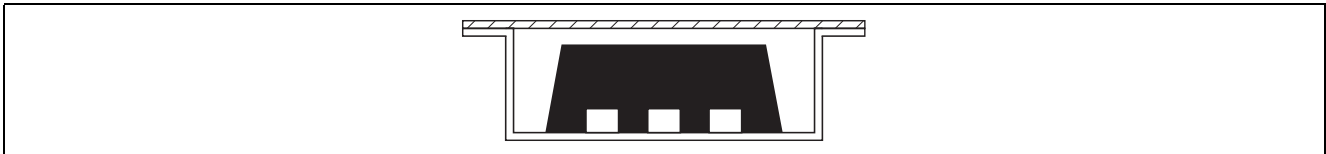


Figure 8 Product Insertion Example

- Missing ICs

No more than 2 ICs will be missing in a single reel, and there will never be two adjacent missing ICs.

4.3 UPAK Tape Specifications

- Form and dimensions

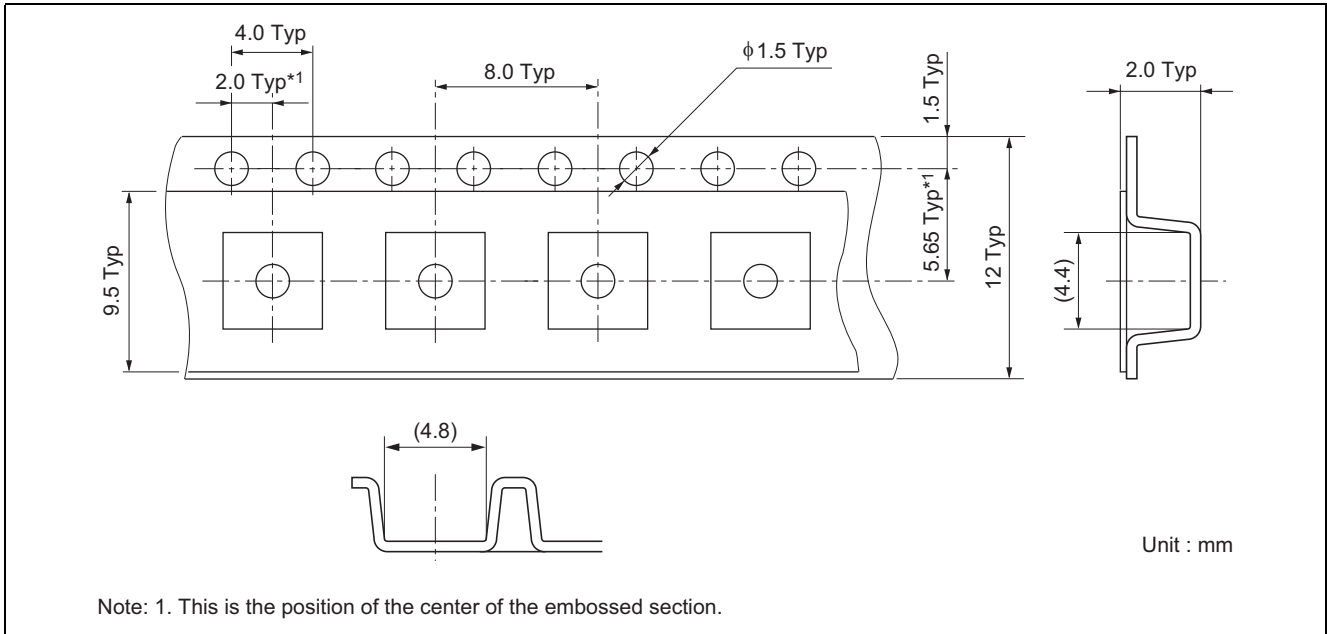


Figure 9 Tape Dimensions (UPAK)

4.4 UPAK Reel Specifications

- Form and dimensions

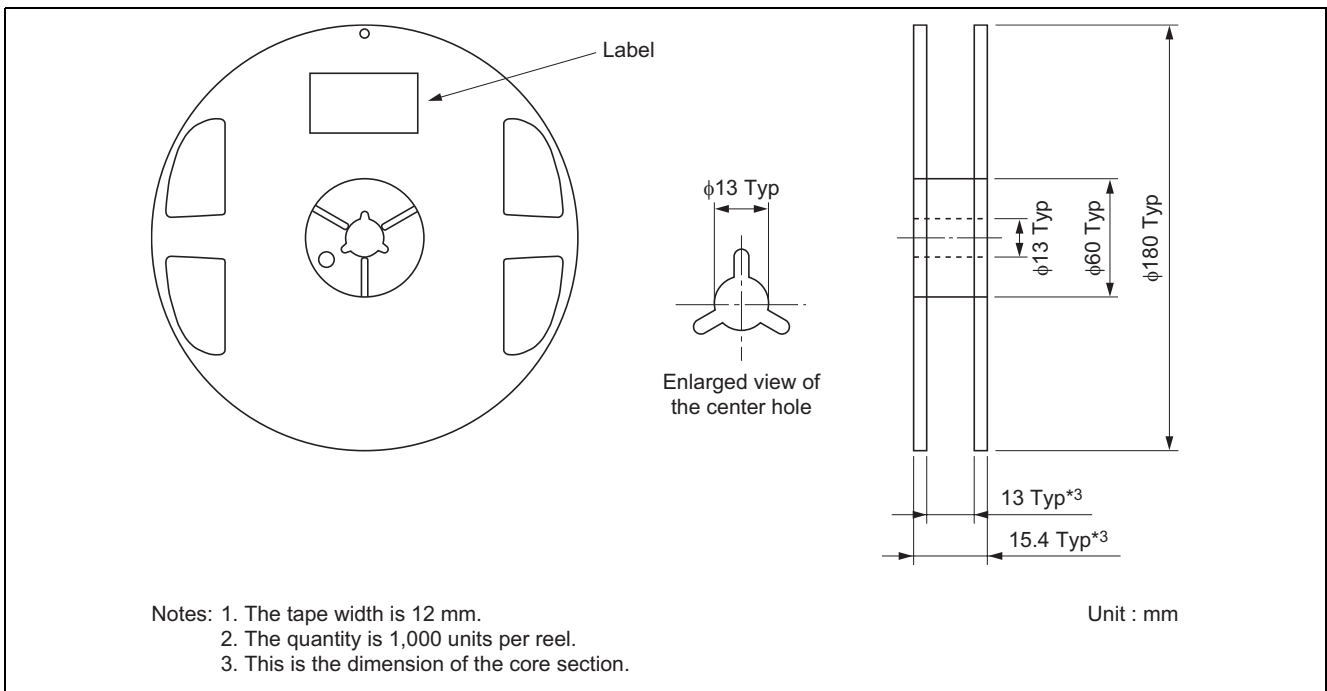


Figure 10 Reel Dimensions (UPAK)

5. MPAK-5 Embossed Taping Packing Specifications

5.1 MPAK-5 Taping Specifications

- Leader tape section and empty tape section

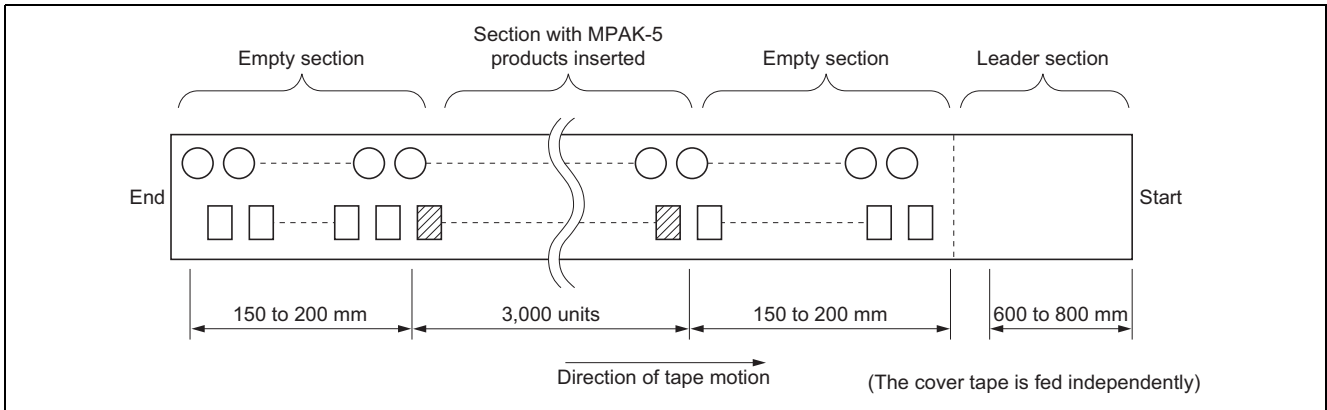


Figure 11 Leader Tape Section and Empty Tape Section

- Taping direction
It packs up so that pin 1 may come to right side toward the direction of a drawer of a tape.

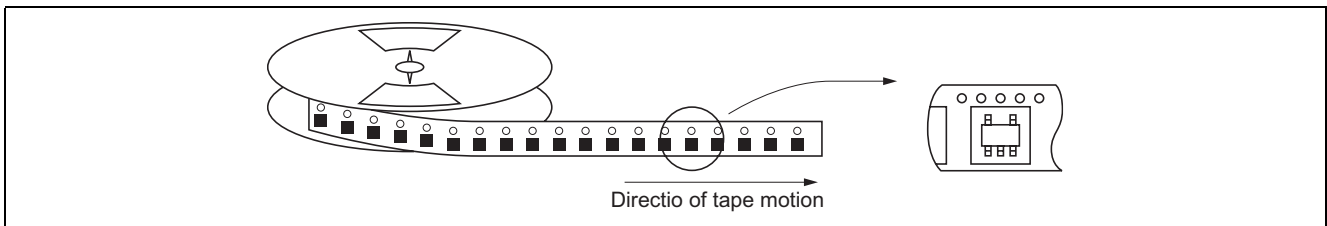


Figure 12 Taping Direction

- Product insertion
As shown in figure 13, products are inserted with the printed side up and the mounting side down.

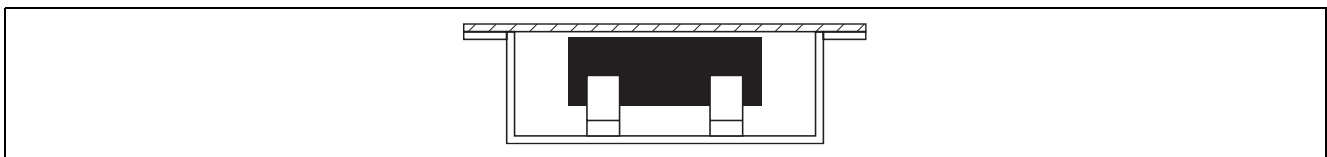


Figure 13 Product Insertion Example

- Missing ICs
The number of missing ICs shall not exceed 0.2% of the total. However, there shall be no consecutive missing ICs.

5.2 MPAK-5 Tape Specifications

- Form and dimensions

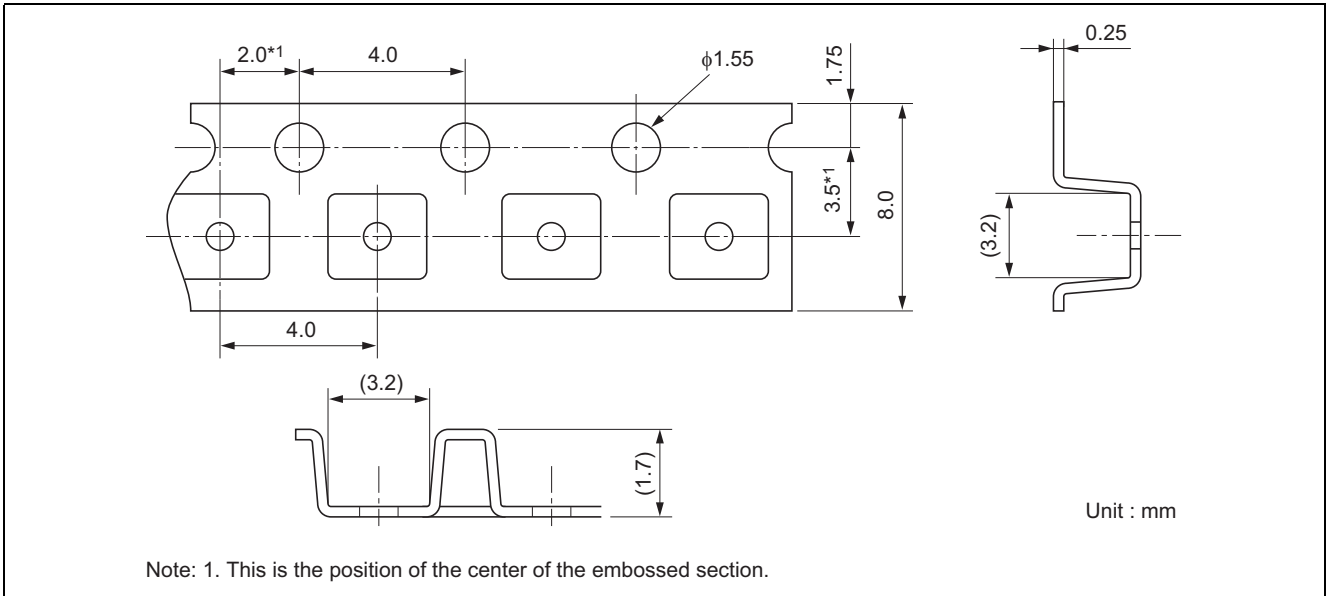


Figure 14 Tape Dimensions (MPAK-5)

5.3 MPAK-5 Reel Specifications

- Form and dimensions

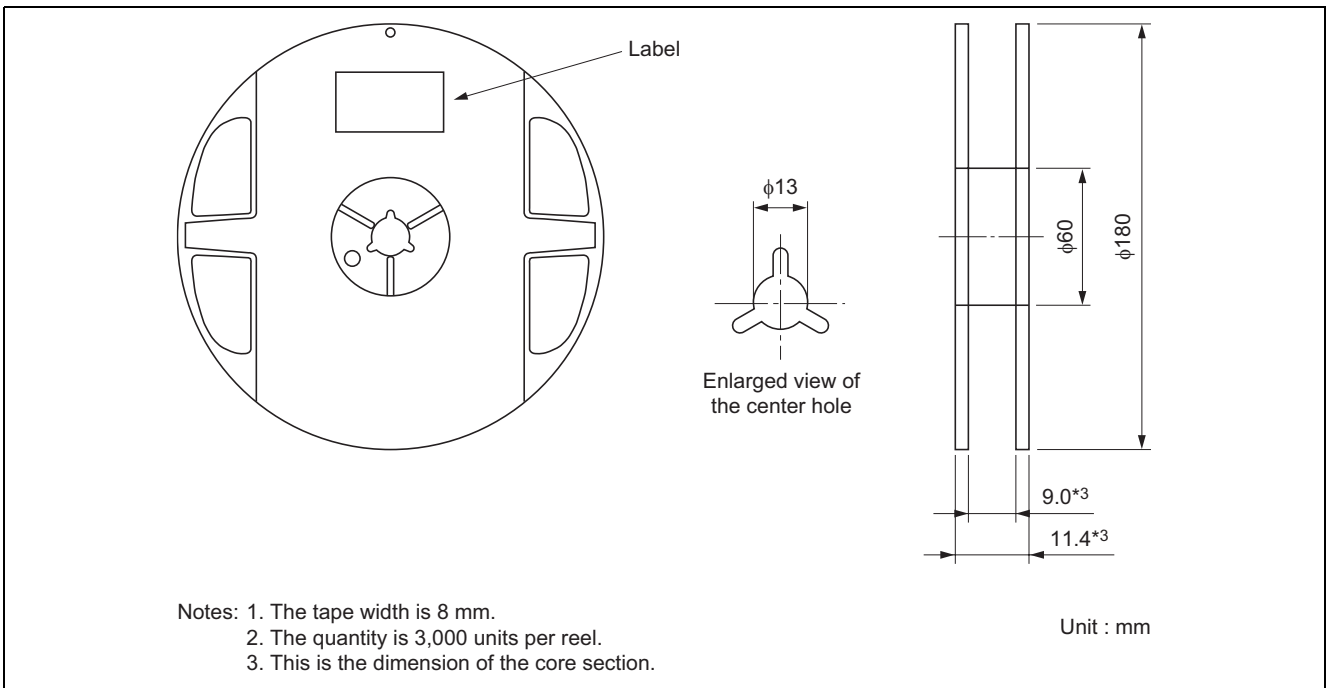


Figure 15 Reel Dimensions (MPAK-5)

6. SOP Embossed Taping Packing Specifications

6.1 SOP Taping Specifications

- Leader tape section and empty tape section

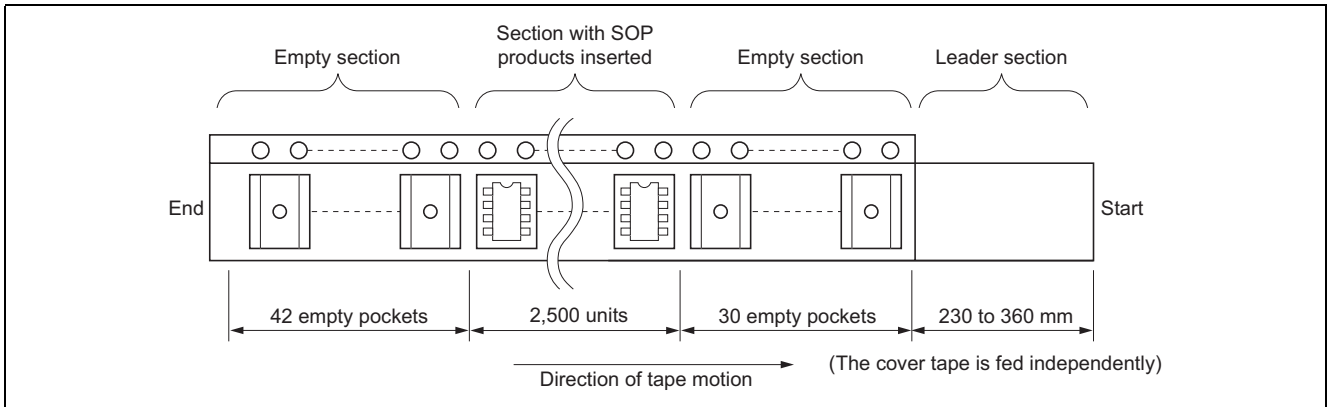


Figure 16 Leader Tape Section and Empty Tape Section

- Taping direction

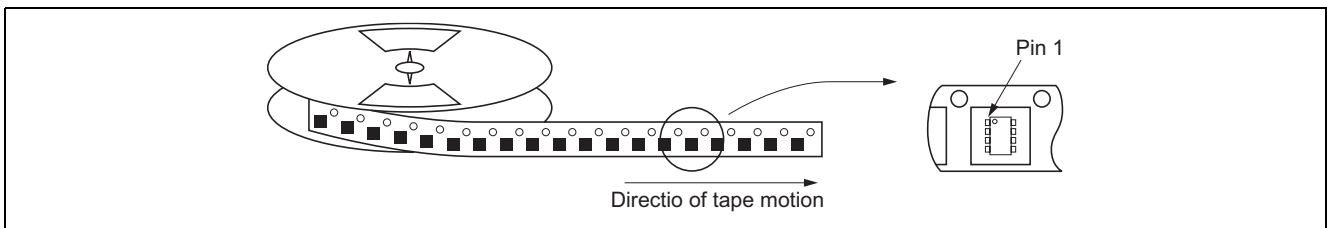


Figure 17 Taping Direction

- Product insertion

As shown in figure 18, products are inserted with the printed side up and the mounting side down.

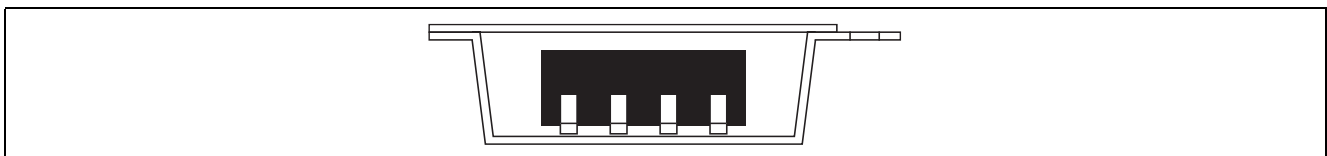


Figure 18 Product Insertion Example

- Missing ICs

No more than 4 ICs will be missing in a single reel, and there will never be two adjacent missing ICs.

6.2 SOP Tape Specifications

- Form and dimensions

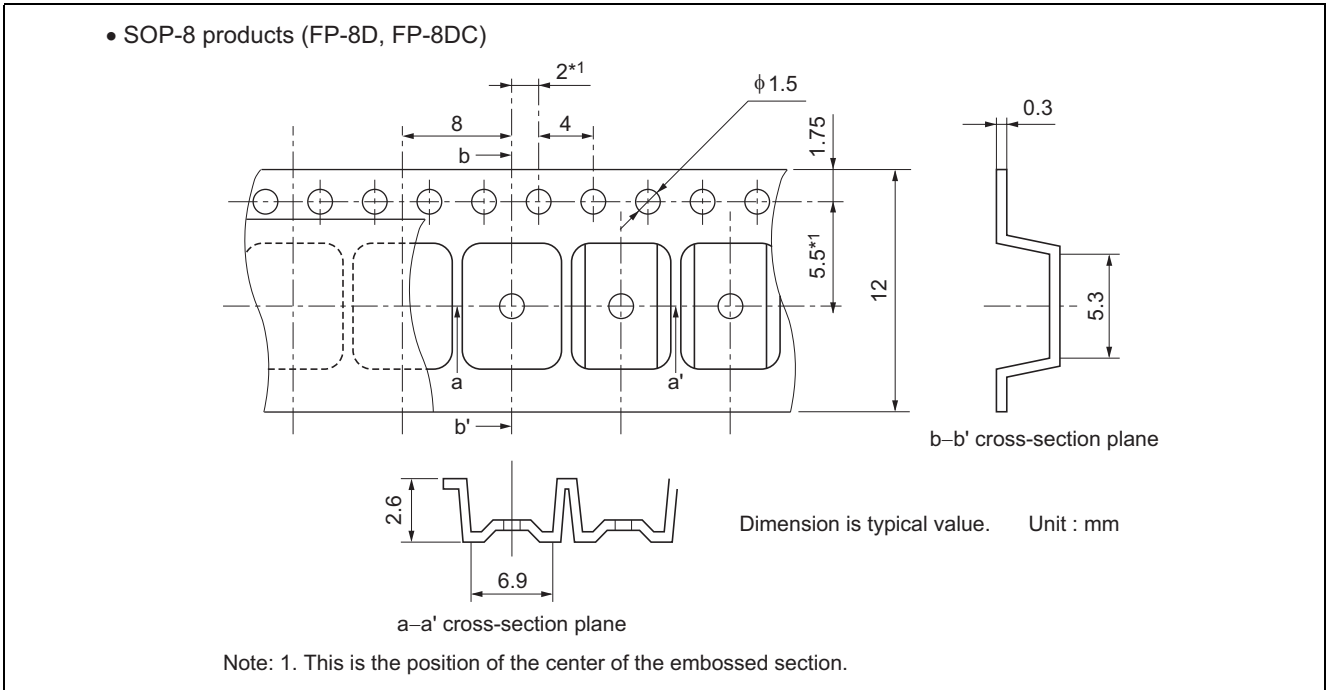


Figure 19 Tape Dimensions (SOP-8)

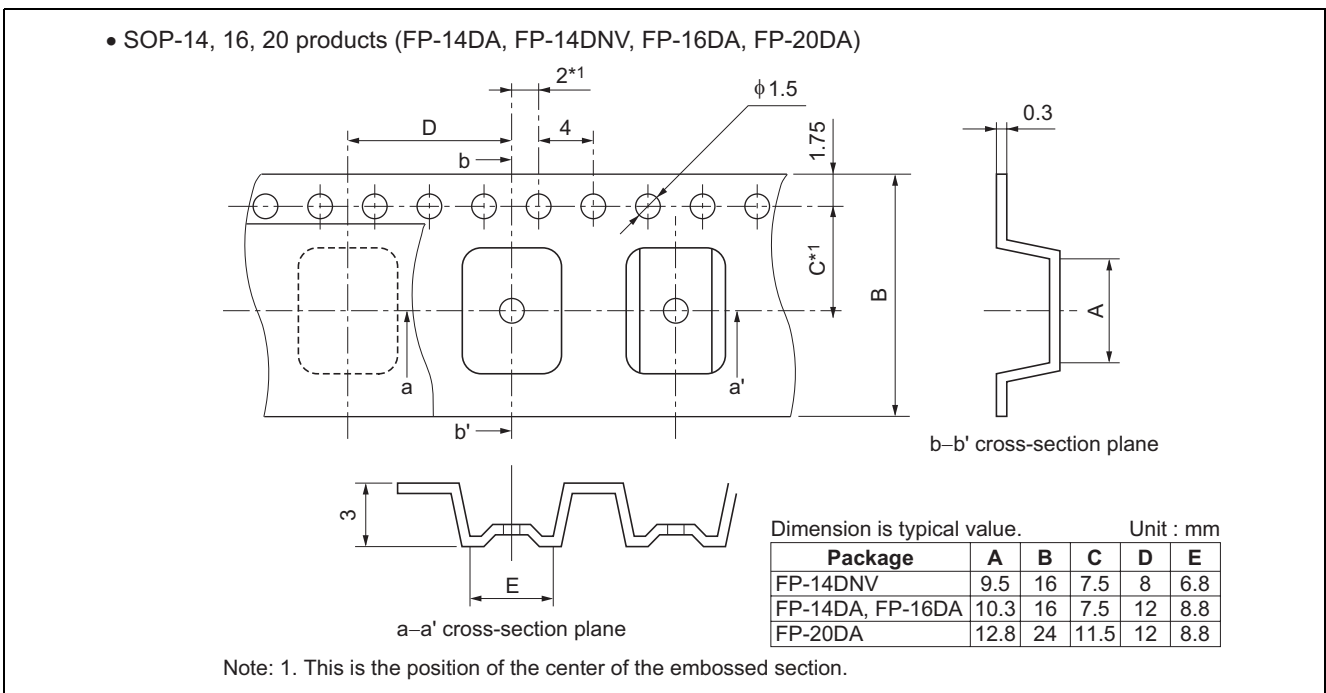


Figure 20 Tape Dimensions (SOP-14, 16, and 20)

6.3 SOP Reel Specifications

- Form and dimensions

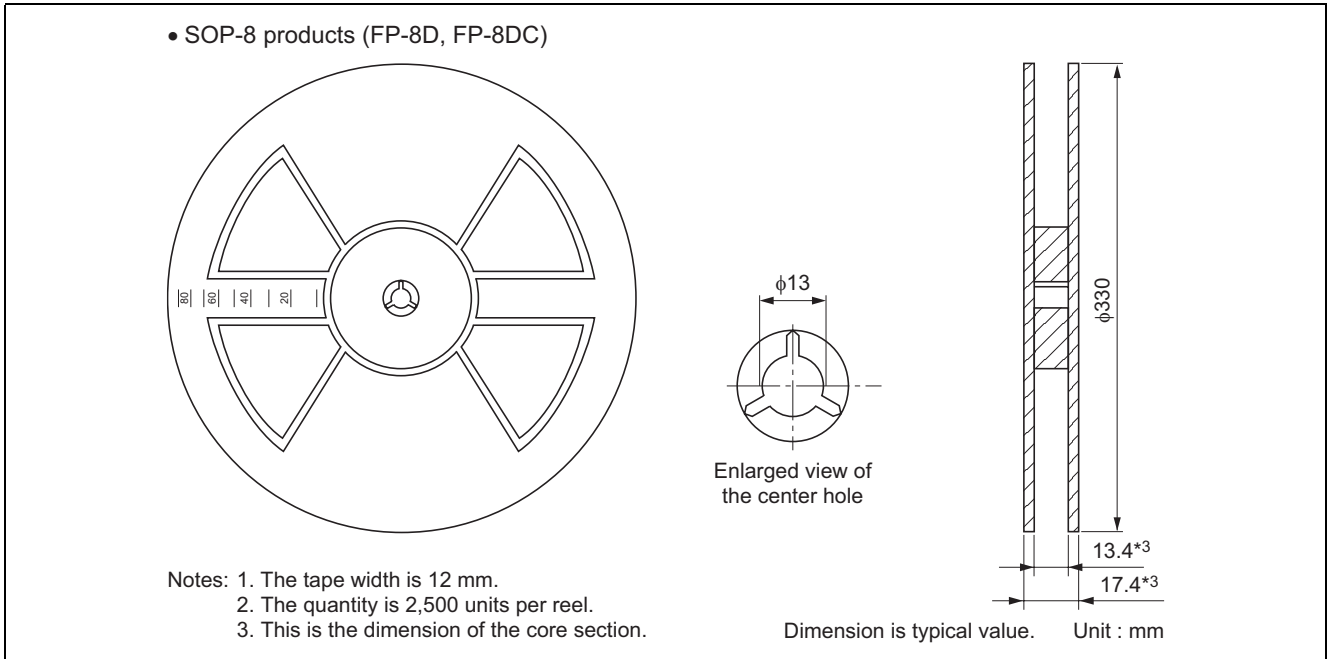


Figure 21 Reel Dimensions (SOP-8)

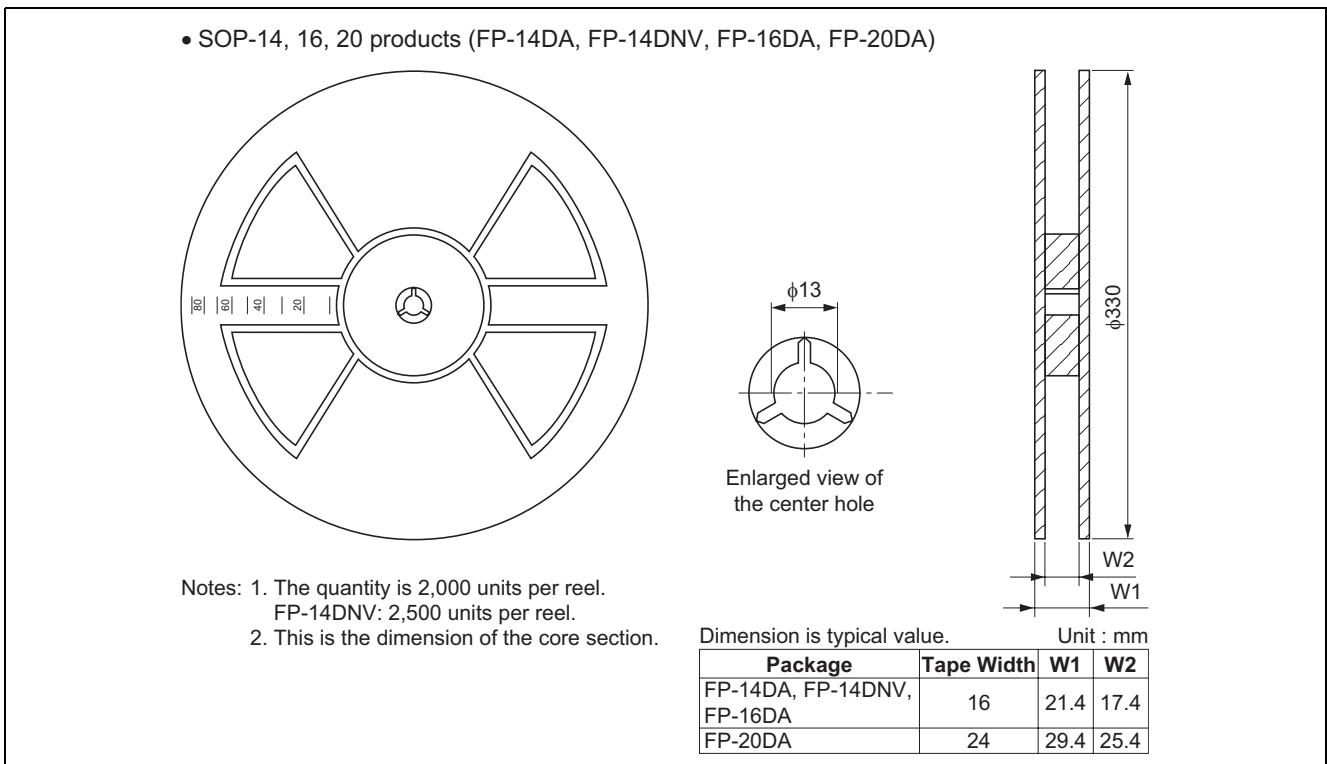


Figure 22 Reel Dimensions (SOP-14, 16, and 20)

7. TSSOP Embossed Taping Packing Specifications

7.1 TSSOP Tape Specifications

- Form and dimensions

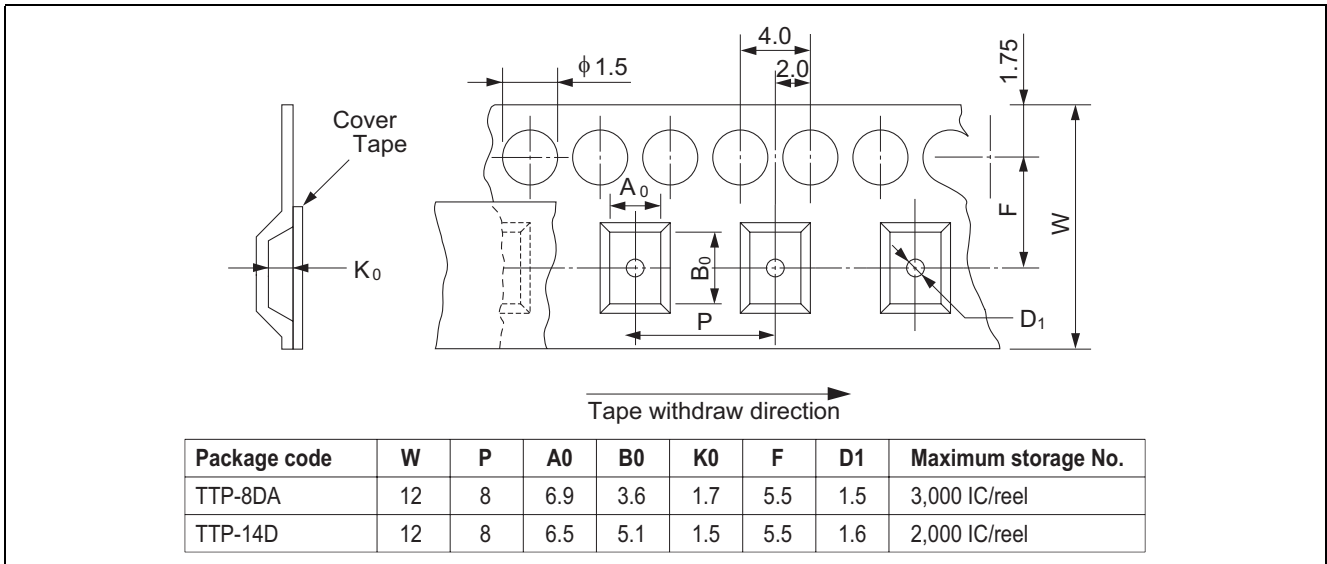


Figure 23 Tape Dimensions (TSSOP)

7.2 TSSOP Reel Specifications

- Form and dimensions

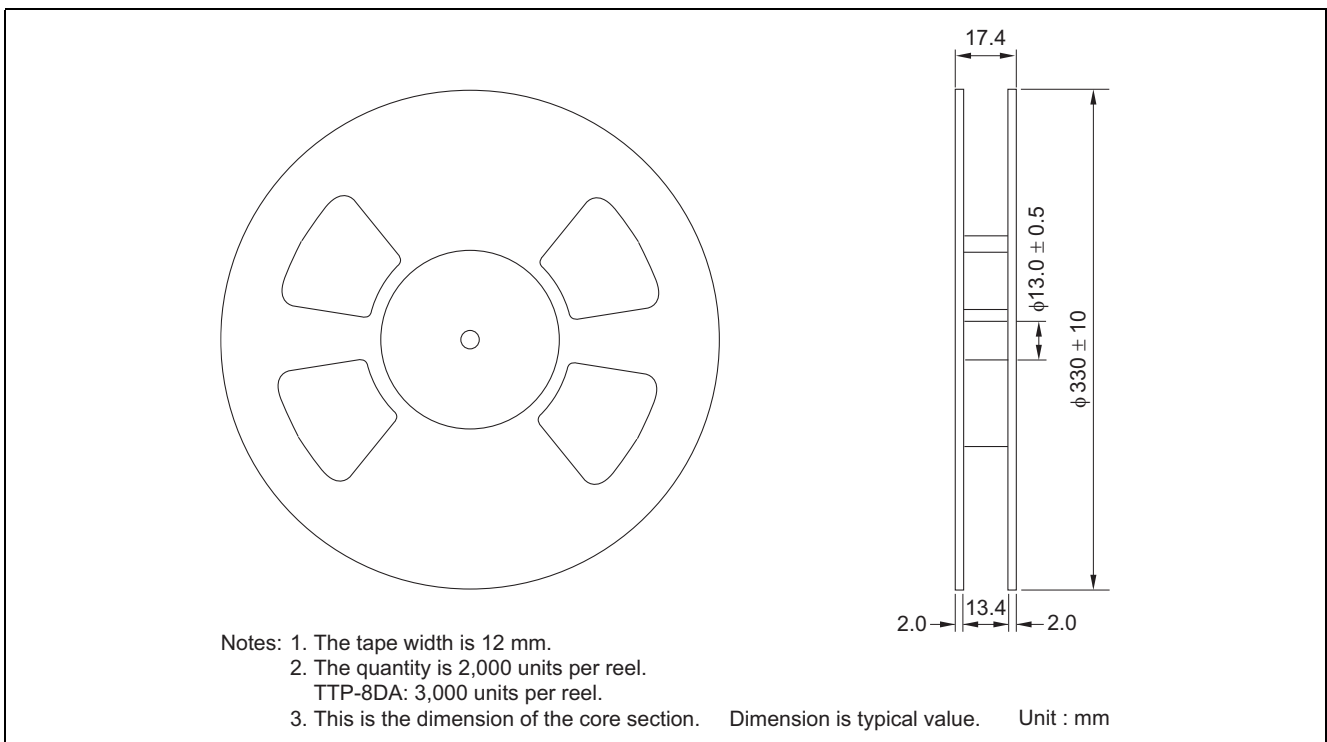


Figure 24 Reel Dimensions (TSSOP)

8. MPAK Embossed Taping Packing Specifications

8.1 MPAK Tape Specifications

- Form and dimensions

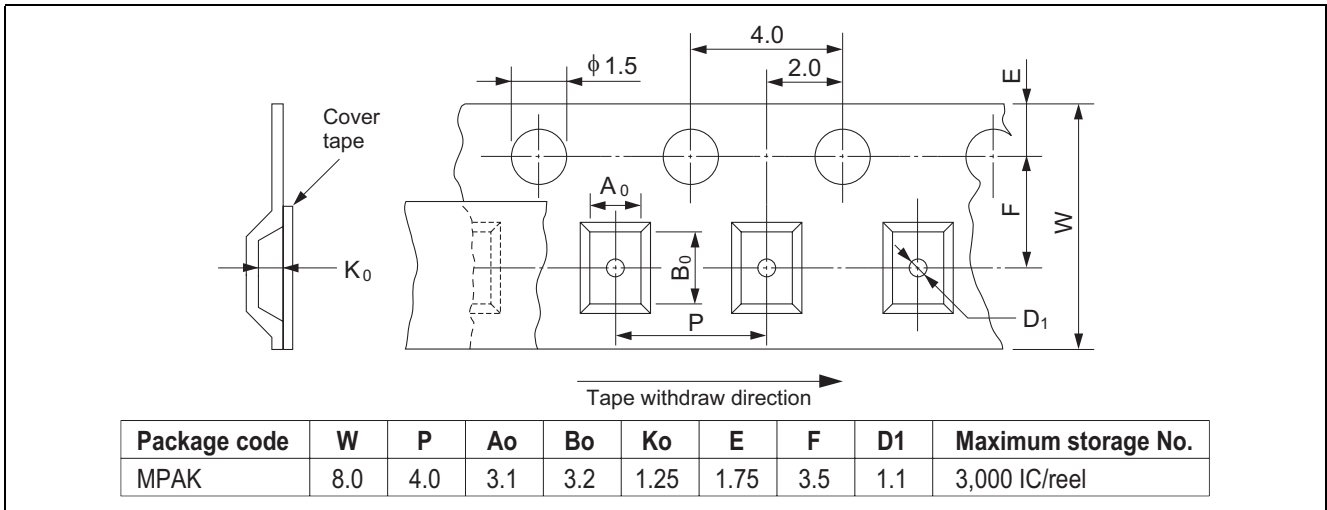


Figure 25 Tape Dimensions (MPAK)

8.2 MPAK Reel Specifications

- Form and dimensions

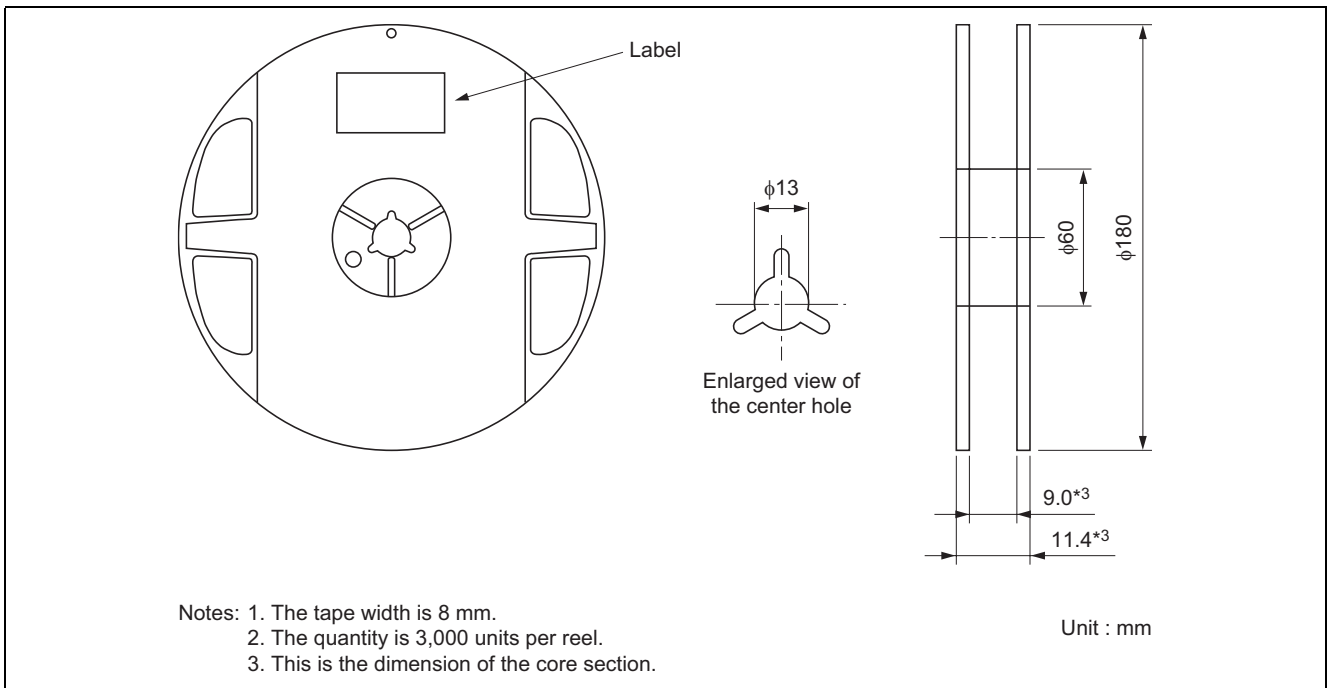


Figure 26 Reel Dimensions (MPAK)

9. CMPAK-5 Embossed Taping Packing Specifications

9.1 CMPAK-5 Tape Specifications

- Form and dimensions

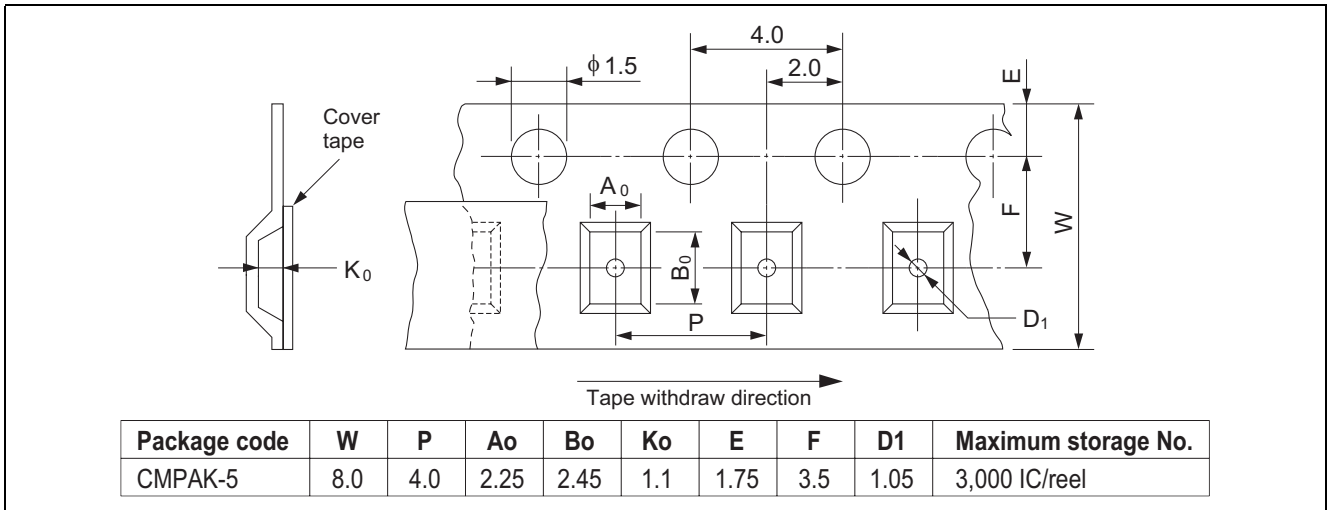


Figure 27 Tape Dimensions (CMPAK-5)

9.2 CMPAK-5 Reel Specifications

- Form and dimensions

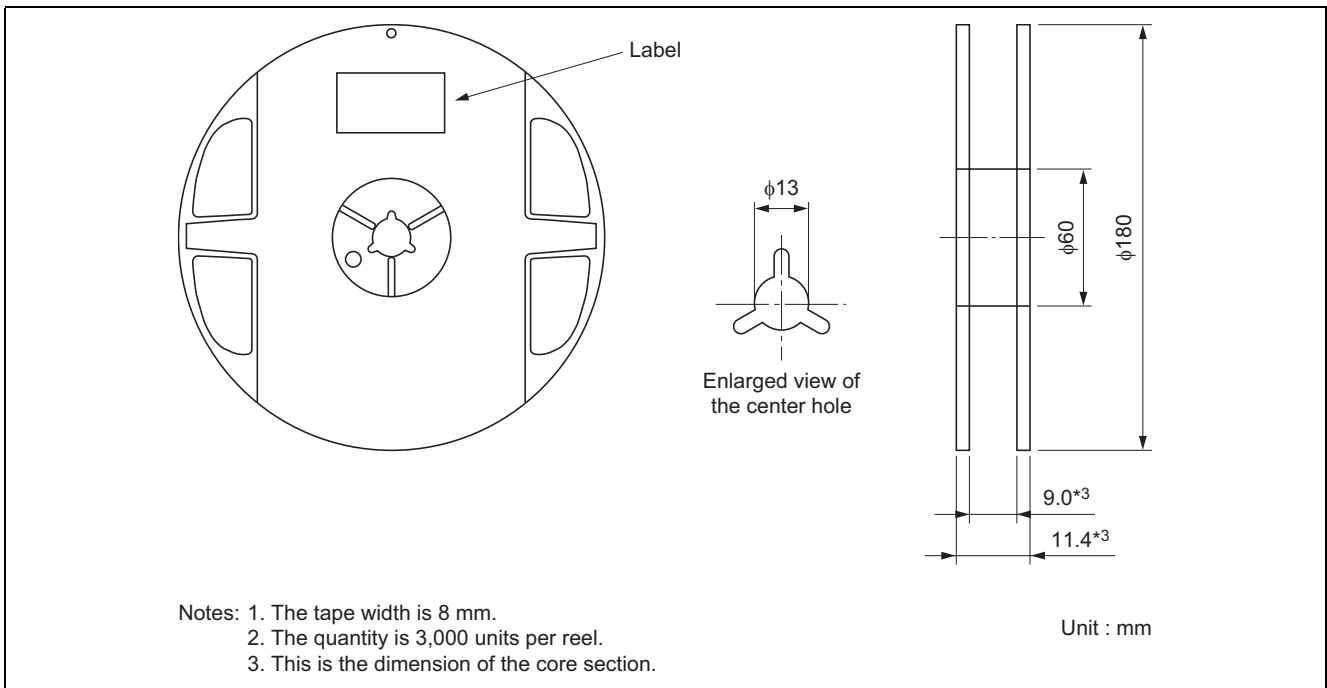


Figure 28 Reel Dimensions (CMPAK-5)

Revision Record

Rev.	Date	Description	
		Page	Summary
1.00	Jul.28.04	—	First edition issued

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