To our customers,

Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: http://www.renesas.com

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (http://www.renesas.com)

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Information

Voltage Regulator of SMD

SC-63 (3-pin MP-3Z)
SC-98 (5-pin MP-3Z)
SOT-89 (Power Mini Mold)
SC-74A (5-pin Mini Mold)

Document No. G11872EJ4V0IF00 (4th edition)
Date Published May 2005 NS CP(K)

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M8E 02. 11-1

1. INTRODUCTION

As demands for higher density have increased for electronic devices, demands for semiconductor packages that are small, have many pins, and can be surface-mounted have grown increasingly. To satisfy these market demands, NEC Electronics provides surface mount packages for power ICs, such as SC-63, SC-98, SOT-89, and SC-74A.

This document describes the characteristics and taping specifications of these packages.

2. PACKAGE DRAWINGS (Unit: mm)

Figure 2–1. SC-63

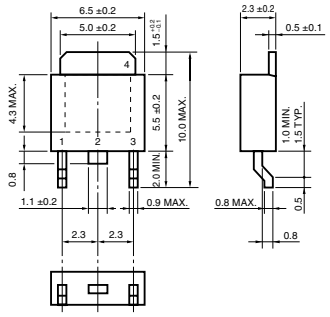


Figure 2–2. SC-98

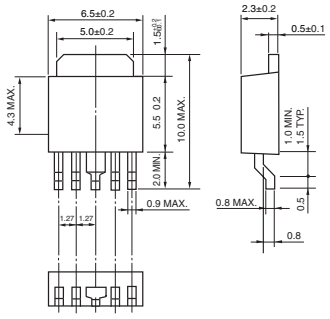


Figure 2–3. SOT-89

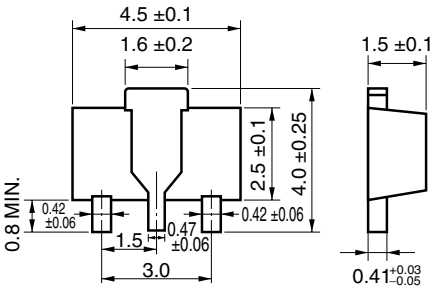
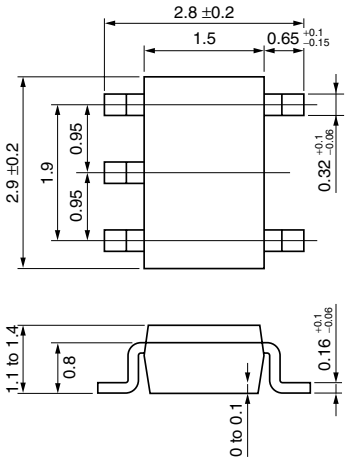


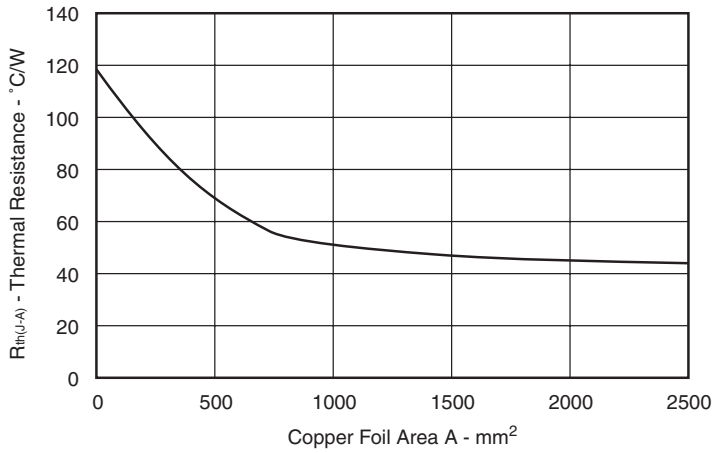
Figure 2–4. SC-74A



3. THERMAL RESISTANCE

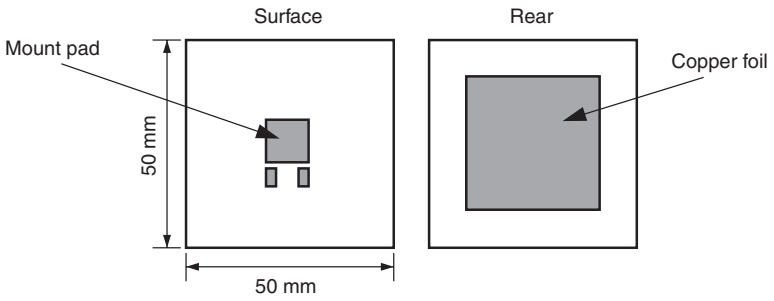
The thermal performance of a surface mount package varies depending on the materials and area of a PC board onto which it is to be mounted, because of its structure. The following graph shows, for your reference, the thermal resistance between the junction and atmosphere of each package when the package is mounted on a glass epoxy board.

Figure 3–1. Thermal Resistance on Glass Epoxy Board (SC-63 and SC-98)



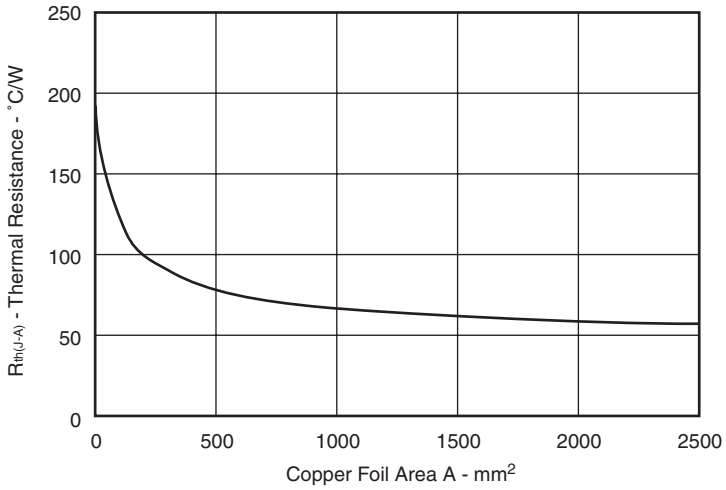
Measurement sample: μPC29M05AT
Board material: Glass epoxy (both side)
Board size: 50 mm x 50 mm x 1.6 mm
Copper foil thichness: 35 μm
Ambient temperature: 25°C
Wind velocity: 0 m/s

Image of Board for Measurement



The mount pad on the surface and the copper foil on the rear are joined by thermal via.

Figure 3–2. Thermal Resistance on Glass Epoxy Board (SOT-89)



Measurement sample: μPD120N15T1B
Board material: Glass epoxy (single side)
Board size: 50 mm x 50 mm x 1.6 mm
Copper foil thichness: 35 μm
Ambient temperature: 25°C
Wind velocity: 0 m/s

Image of Board for Measurement

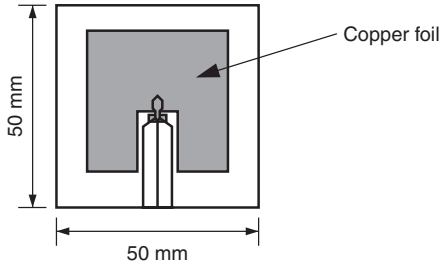
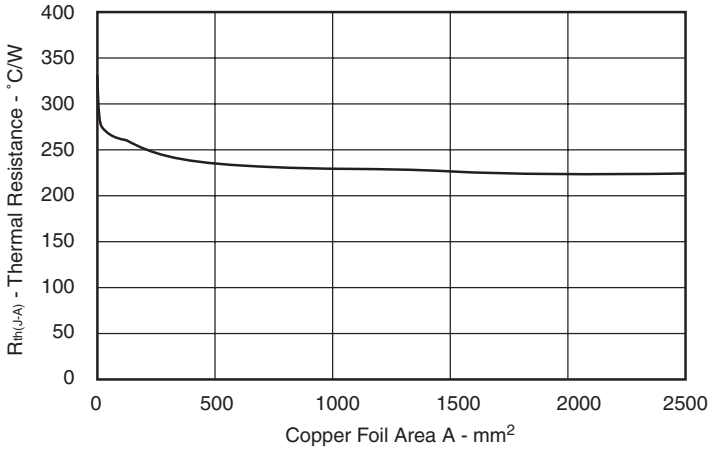
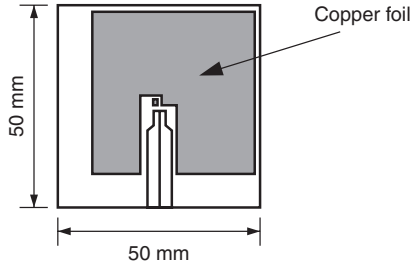


Figure 3–3. Thermal Resistance on Glass Epoxy Board (SC-74A)



Measurement sample: μPD120N15TA
Board material: Glass epoxy (single side)
Board size: 50 mm x 50 mm x 1.6 mm
Copper foil thichness: 35 μm
Ambient temperature: 25°C
Wind velocity: 0 m/s

Image of Board for Measurement



4. MOUNT PAD

The dimensions of the mount pad are shown below (for reference).

For the recommended soldering conditions, refer to the Data Sheet.

Figure 4–1. Dimensions of Mount Pad of SC-63 (for Reference)

(Unit: mm)

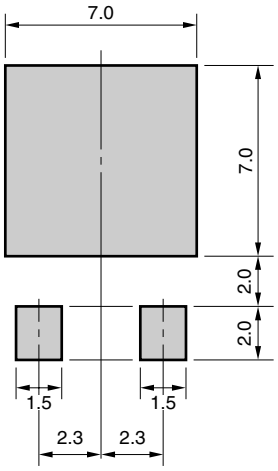


Figure 4–2. Dimensions of Mount Pad of SC-98 (for Reference)

(Unit: mm)

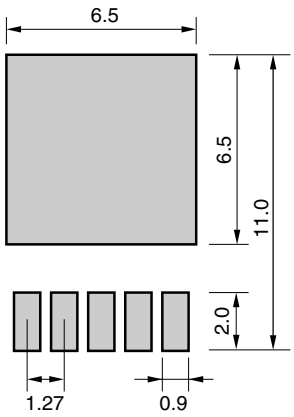


Figure 4–3. Dimensions of Mount Pad of SOT-89 (for Reference)

(Unit: mm)

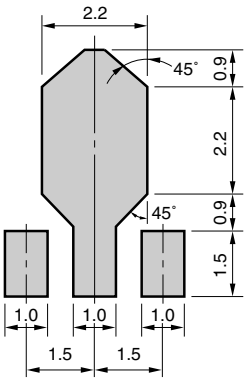
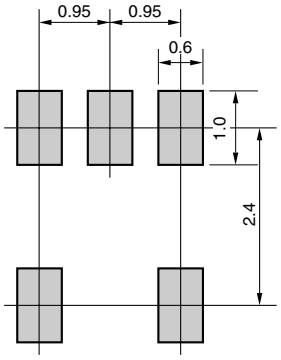


Figure 4–4. Dimensions of Mount Pad of SC-74A (for Reference)

(Unit: mm)



5. TAPING SPECIFICATIONS

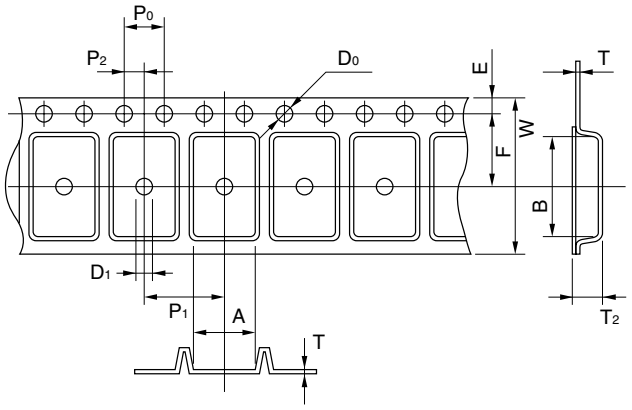
The SC-63, SC-98, SOT-89, and SC-74A can be delivered packaged on a tape.

The taping specifications of each package (tape shape, reel shape, and taping direction) are shown below.

Figure 5–1. Taping Specifications of SC–63 and SC-98

(1) 16 mm wide embossed taping

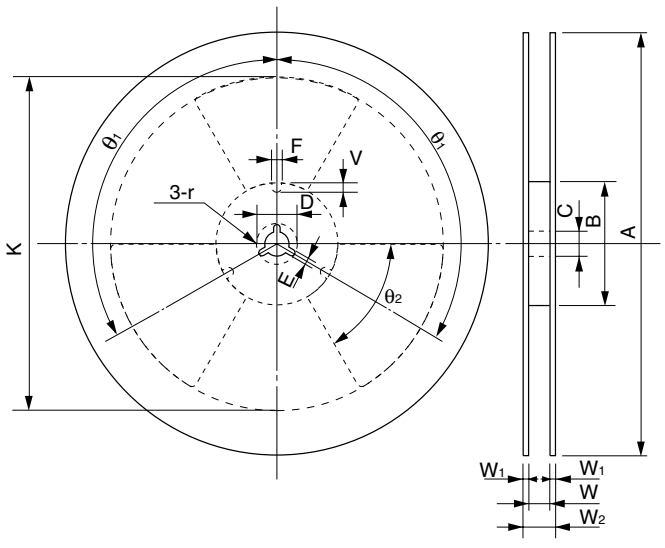
(a) Taping shape



Unit: mm

Symbol	Size
A	7.1 MAX.
B	10.7 MAX.
D_0	$\phi 1.5^{+0.1}_{-0}$
D_1	ϕ 1.5 MIN.
E	1.75 ±0.1
F	7.5 ±0.1
P_0	4.0 ±0.1
P_1	8.0 ±0.1
P_2	2.0 ±0.1
T	0.2
T_2	2.7 ±0.1
W	16.0 ±0.3

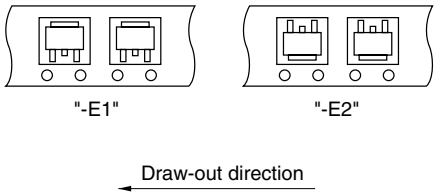
(b) Reel shape



Unit: mm

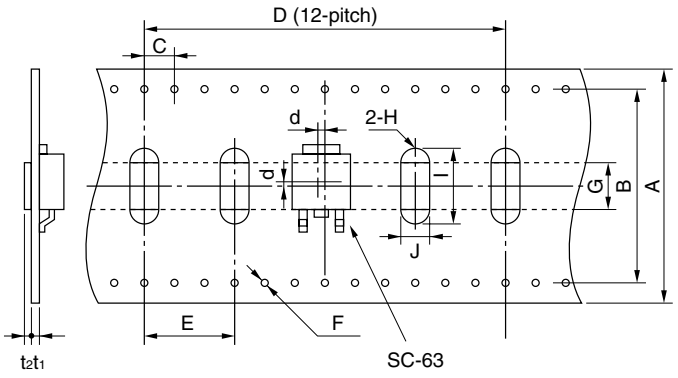
Symbol	Size
A	329
B	100
C	13 ±0.5
D	21 ±0.8
E	2.0 ±0.5
F	2
V	8
W	$16.4^{+2.0}_{-0}$
W_1	(2.5)
W_2	22.4 MAX.
K	260
r	1.0
θ_1	120°
θ_2	60°

(c) Taping direction



(2) 32 mm wide adhesive taping

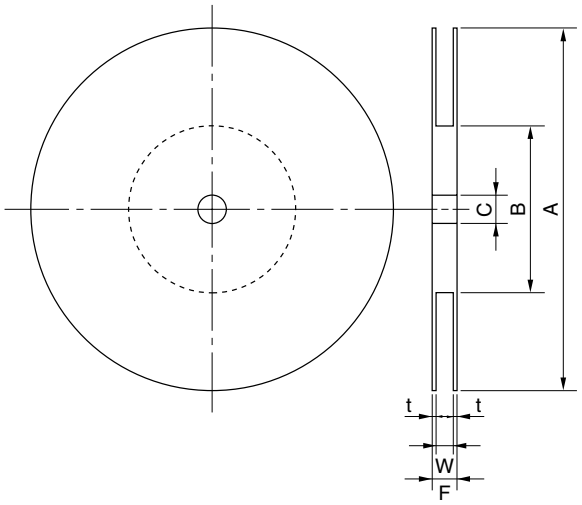
(a) Taping shape



Unit: mm

Symbol	Size
A	$32^{+0}_{-0.4}$
B	26 ±0.1
C	4.0 ±0.1
D	48 ±0.3
E	12 ±0.1
F	$\phi 1.0^{+0.1}_{-0}$
G	6.0 ±0.2
H	R2.0
I	8.0
J	4.0
t_2	0.15
t_1	0.18
d	0 ±0.5

(b) Reel shape



Unit: mm

Symbol	Size
A	ϕ300
B	ϕ80
C	ϕ15.5
W	34
t	2
F	38 ±1

(c) Taping direction

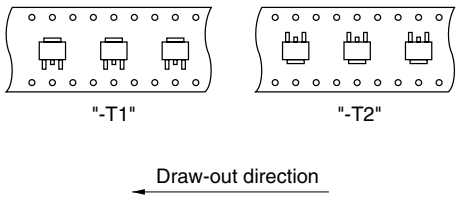
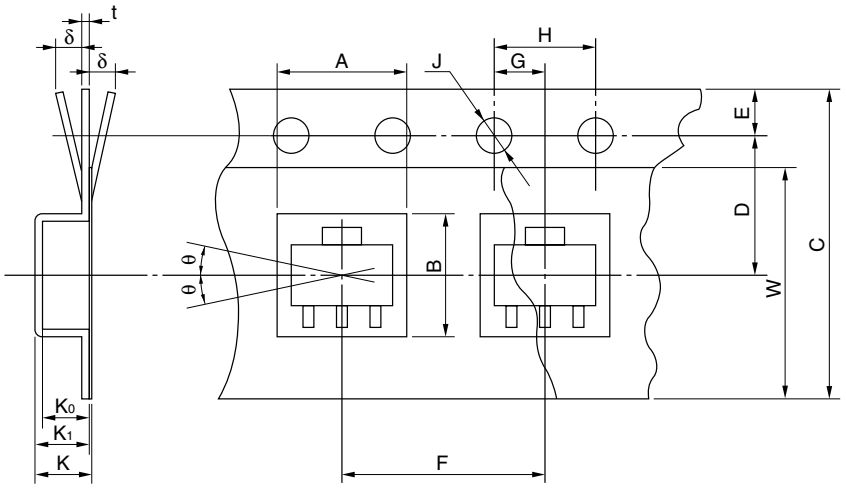


Figure 5–2. Taping Specifications of SOT-89

(1) 12 mm wide embossed carrier taping

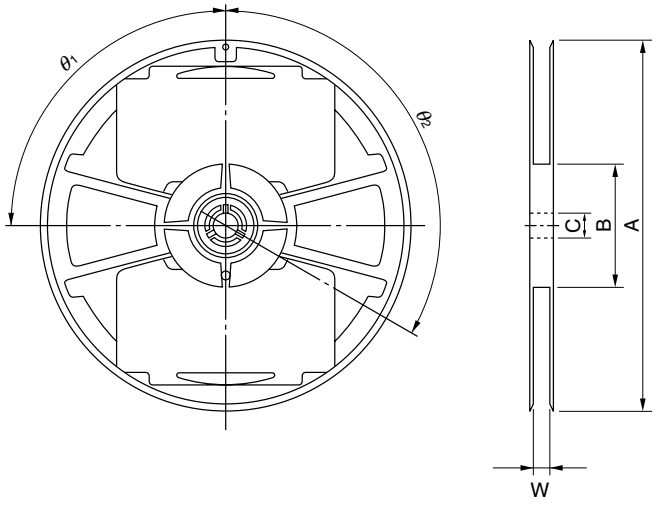
(a) Taping shape



Unit: mm

Item		Symbol	Size	Remarks
Depression Angular Hole for Device Insertion	Length	A	$5.0^{+0.1}_{-0.1}$	Inside of cutout on plane 0.5 mm above inner bottom
	Width	B	$4.6^{+0.1}_{-0.1}$	Inside of cutout on plane 0.5 mm above inner bottom
	Depth	K_0	1.8 ±0.1	Inner space
	Pitch	F	8.0 ±0.1	Accumulative pitch: $^{+0.1}_{-0.3}$ MAX./ 10 pitch
Round Hole for Feeding	Diameter	J	$\phi 1.5^{+0.1}_{-0.05}$	
	Pitch	H	4.0 ±0.1	Accumulative pitch: $^{+0.1}_{-0.3}$ MAX./ 10 pitch
	Position	E	1.5 ±0.1	Distance from tape end to center of hole
Distance Between Center-lines	Length direction	G	2.0 ±0.05	Distance from center line of pocket to that of perforation
	Width direction	D	5.65 ±0.05	Distance from center line of pocket to that of perforation
Cover Tape	Width	W	$9.5^{+0.3}_{-0}$	Thickness: 0.1 MAX.
Carrier Tape	Width	C	12 ±0.2	Warpage δ: 0.3 MAX.
	Thickness	t	0.3 ±0.05	
	Outer depth of hole	K_1	2.1 ±0.1	
Device	Tilt	θ	30° MAX.	
Whole Thickness		K	2.15 ±0.1	Total for cover tape and carrier tape

(b) Reel shape



Unit: mm

Symbol	Size
A	φ178 ±2
W	13 ±0.5
B	φ60 ±1
θ1	90°
C	φ13 ±0.5
θ2	120°

(c) Taping direction

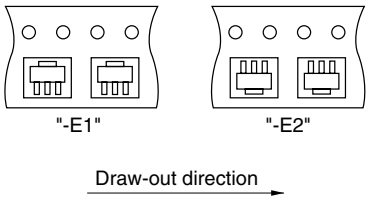
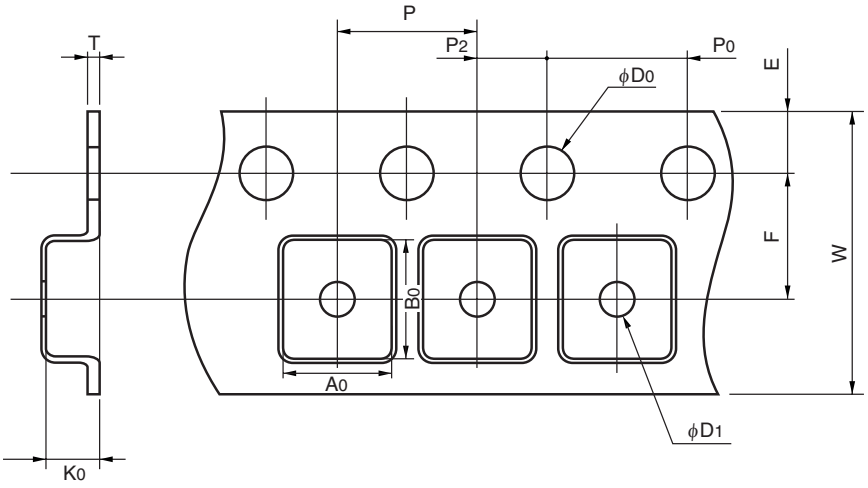


Figure 5–3. Taping Specifications of SC-74A

(1) 8 mm width embossed taping

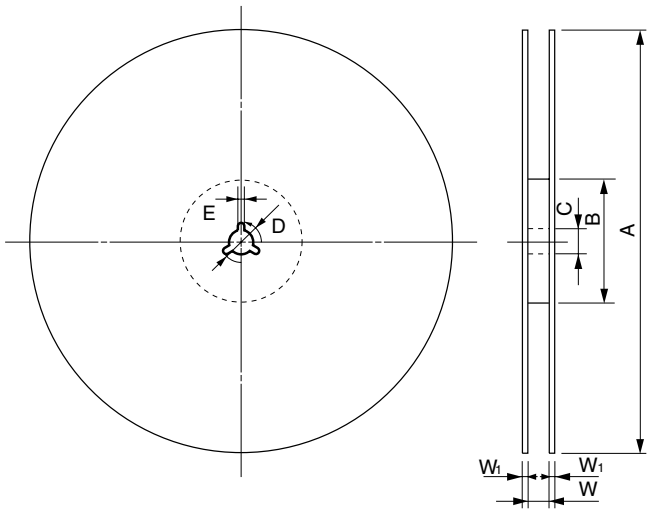
(a) Taping shape



Unit: mm

Symbol	Size
A0	3.18
B0	3.4
K0	1.6
W	8.0 ±0.3
F	3.5 ±0.1
E	1.75 ±0.1
P	4.0 ±0.1
P2	2.0 ±0.1
P0	4.0 ±0.1
D0	$1.5^{+0.1}_{-0}$
T	0.3
D1	1.0 MIN.

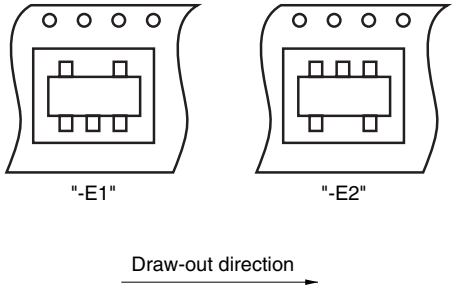
(b) Reel shape



Unit: mm

Symbol	Size
A	ϕ180 ±2.0
B	ϕ60
C	ϕ13 ±0.2
D	ϕ21 ±0.8
E	2.0 ±0.5
W	9
W_1	2.0 ±0.5

(c) Taping direction



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