NEC

Information

Voltage Regulator of SMD

SOT-89 (Power mini mold)
MP-3Z (SC-63)

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1. INTRODUCTION

In recent years electronic devices such as camcorders, notebook PCs, and cellular telephones, have been increasingly miniaturized. In response, the need for smaller and lighter semiconductor devices and electronic components employed for these systems to increase the mounting density on PC boards has intensified.

NEC offers SOT-89 and MP-3Z surface-mount packages for power supply ICs.

This document explains the characteristics and taping specifications of the SOT-89 and MP-3Z packages.

2. DIMENSIONS

Figure 1 shows the dimensions of the SOT-89 package, and Figure 2 shows the dimensions of the MP-3Z package.

Figure 1. SOT-89 Dimensions (unit: mm)

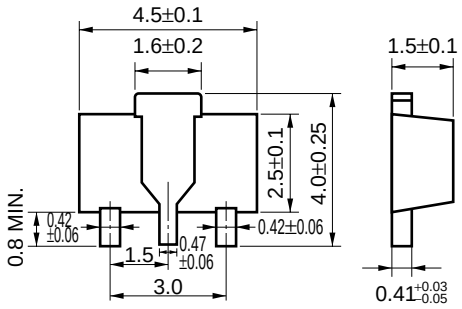
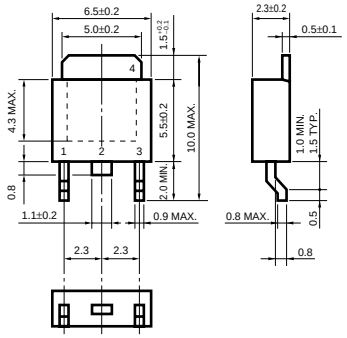


Figure 2. MP-3Z Dimensions (unit: mm)



3. CHARACTERISTICS

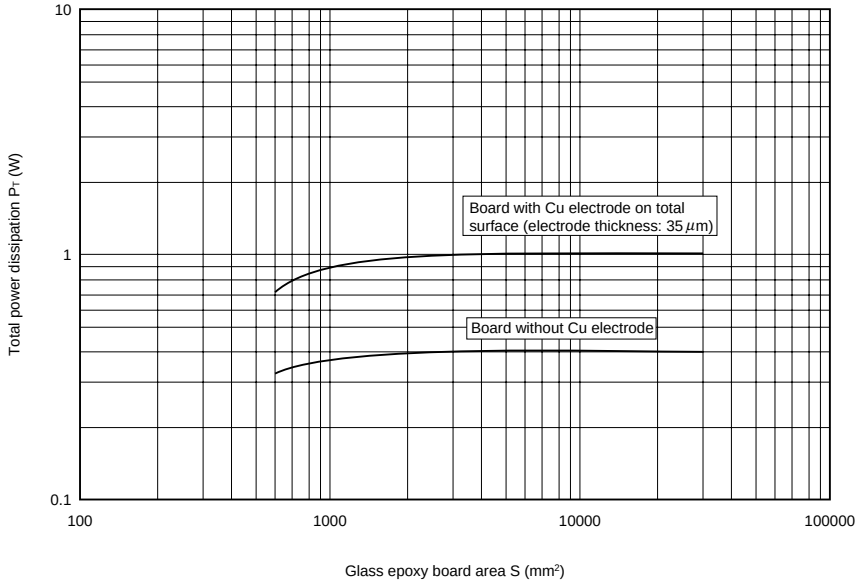
Because of the construction, the SOT-89 and MP-3Z packages change their thermal characteristics, i.e., total power dissipation, depending on the material and area of the PC board on which the packages are to be mounted.

The Data Sheet for a power IC housed in the SOT-89 package shows the total power dissipation when the package is mounted on a ceramic PC board. Figure 3 shows the total power dissipation when the package is mounted on a glass epoxy board.

Figures 4 and 5 show the typical mounting pad dimensions.

The recommended soldering conditions are described in the Data Sheet of each product. Be sure to read this description.

Figure 3. Size of Glass Epoxy Board and Total Power Dissipation of SOT-89



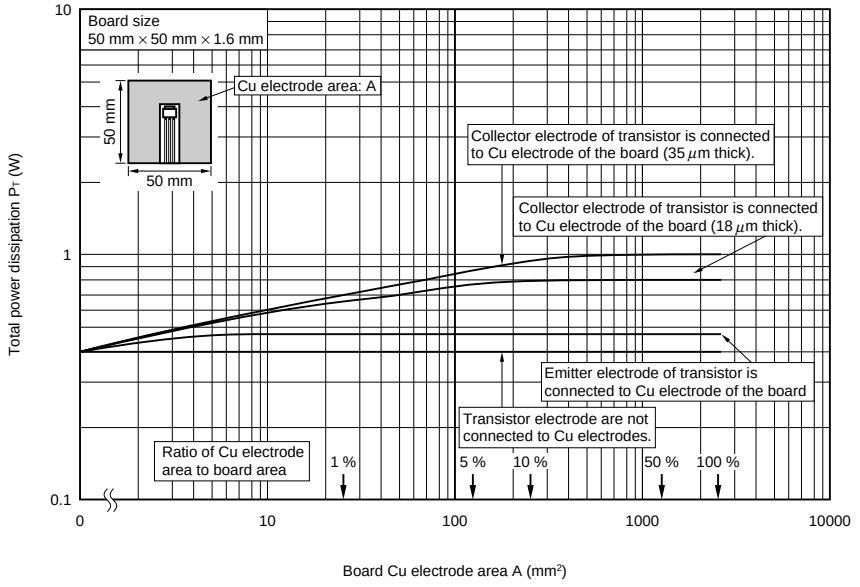


Figure 4. SOT-89 Typical Mounting Pad Dimensions (unit: mm)

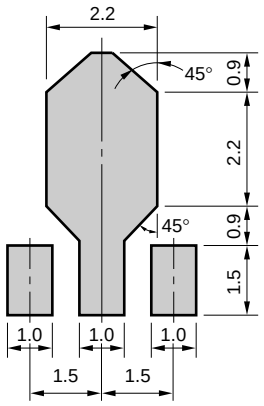
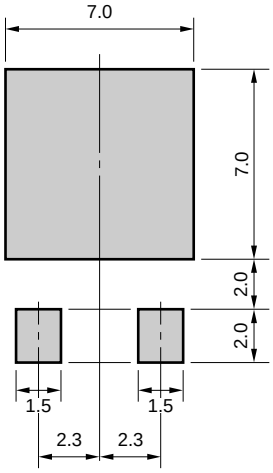


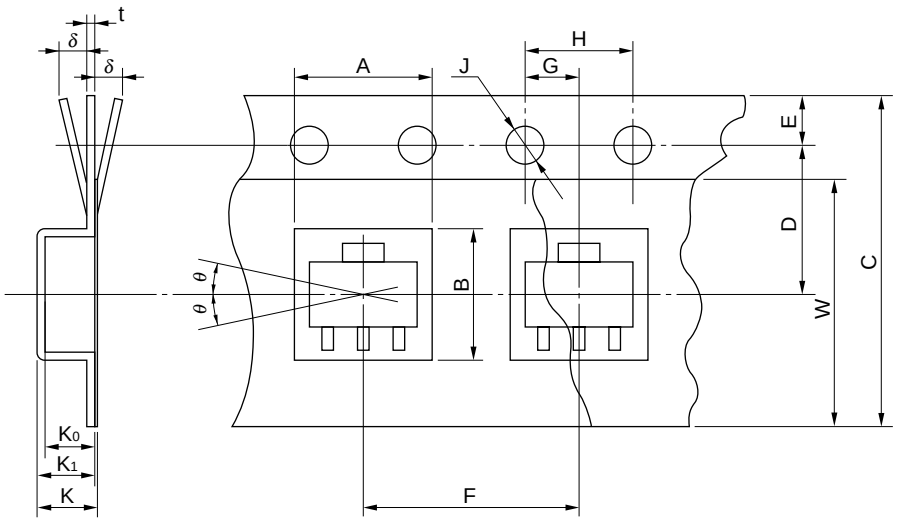
Figure 5. MP-3Z Typical Mounting Pad Dimensions (unit: mm)



4. TAPING SPECIFICATIONS

The SOT-89 and MP-3Z packages can be delivered on a tape like other ICs.
Figures 6 and 7 show the tape shape and dimensions. Figures 8 and 9 show the reel shape.

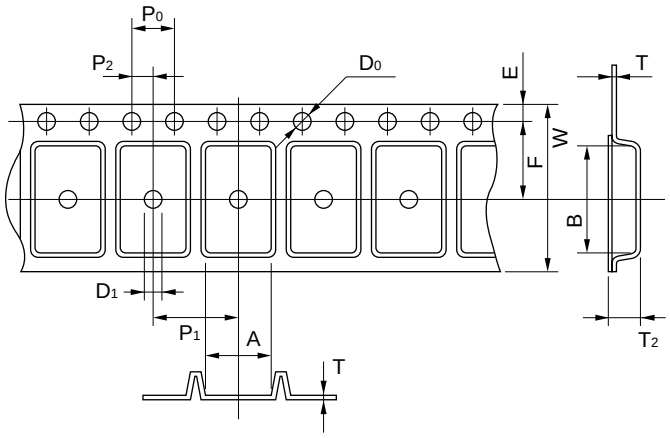
Figure 6. SOT-89 Tape Dimensions (12 mm embossed-type carrier tape)



Unit: mm

Item		Symbol	Dimensions, Angle	Remark
Recessed hole for component insertion	Height	A	$5.0^{+0.1}_{-0.1}$	Inner side of edge on surface 0.5 mm above inner bottom
	Width	B	$4.6^{+0.1}_{-0.1}$	Inner side of edge on surface 0.5 mm above inner bottom
	Depth	K_0	1.8±0.1	Internal space
	Pitch	F	8.0±0.1	Total error: $^{+0.1}_{-0.3}$MAX./10 pitch
Feeding hole	Diameter	J	$\phi 1.5^{+0.1}_{-0.05}$	
	Pitch	H	4.0±0.1	Total error: $^{+0.1}_{-0.3}$MAX./10 pitch
	Position	E	1.5±0.1	Distance between edge of tape and center of hole
Distance between center lines	Vertical	G	2.0±0.05	Center line of recessed hole and feeding hole
	Horizontal	D	5.65±0.05	Center line of recessed hole and feeding hole
Cover tape	Width	W	$9.5^{+0.3}_{-0}$	Thickness: 0.1 MAX.
Carrier tape	Width	C	12±0.2	Warp δ 0.3 MAX.
	Thickness	t	0.3±0.05	
	Hole depth	K_1	2.1±0.1	
Device	Inclination	θ	30° MAX.	
Total thickness		K	2.15±0.1	Total of cover tape and carrier tape

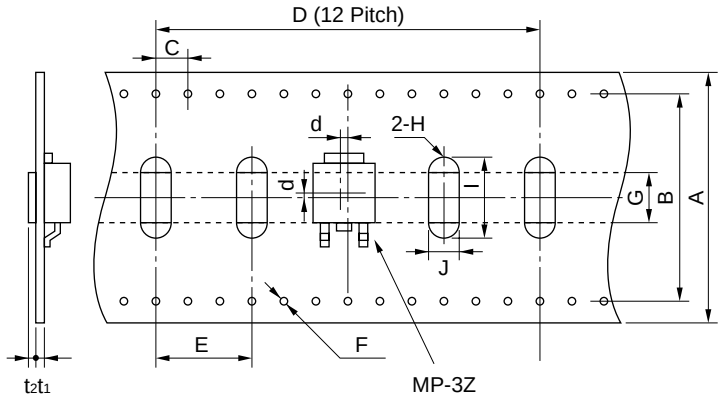
Figure 7 (A). MP-3Z Tape Dimensions (16 mm embossed-type taping)



Unit: mm

Symbol	Standard
A	7.1 MAX.
B	10.7 MAX.
D_0	$\phi 1.5^{+0.1}_{-0}$
D_1	ϕ1.5 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

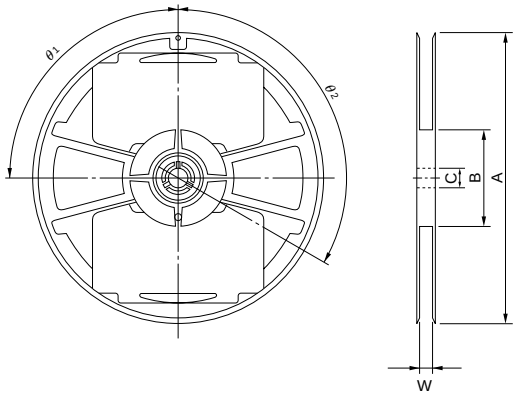
Figure 7 (B). MP-3Z Tape Dimensions (32 mm adhesive-type taping)



Unit: mm

Symbol	Standard
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

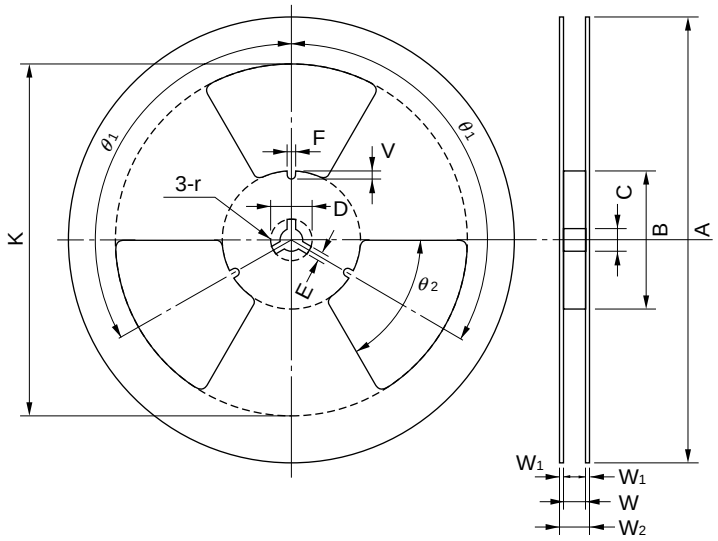
Figure 8. SOT-89 Reel Dimensions



Unit: mm

Symbol	Dimensions, Angle
A	ϕ178±2
W	13±0.5
B	ϕ60±1
θ_1	90°
C	ϕ13±0.5
θ_2	120°

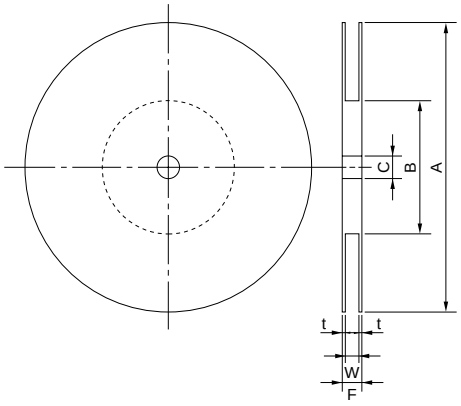
Figure 9 (A). MP-3Z Reel Dimensions (embossed-type taping)



Unit: mm

Symbol	Standard
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

Figure 9 (B). MP-3Z Reel Dimensions (adhesive-type taping)



Unit: mm

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

The direction of a taped product is as shown in Figures 10 and 11. The part number of a taped product, including the symbol indicating the direction, is as follows:

Note The part number of the taped product of the SOT-89 package differs from those of discrete devices such as transistors and diodes.

Figure 10. SOT-89 Taping Direction

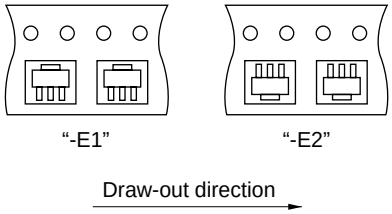
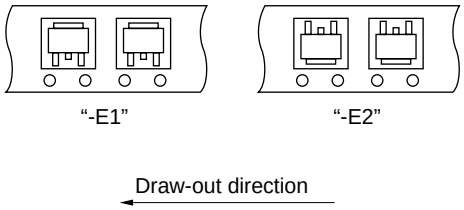


Figure 11. MP-3Z Taping Direction

(A) Embossed-type taping



(B) Adhesive-type taping

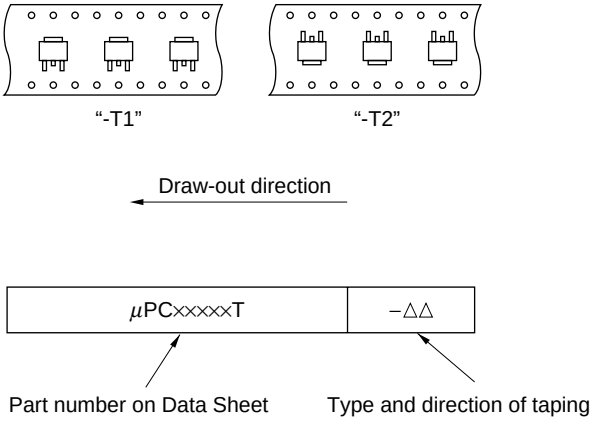


Table 1 shows the number of packages on a tape.

Table 1. Number of Packages per Tape

Package	Quantity (units/reel)
SOT-89	1000
MP-3Z (embossed taping)	2000
MP-3Z (adhesive taping)	1500

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