

2SD1403

2022

NPN Triple Diffused Planar
Silicon Transistor

T-33-13

Color TV Horizontal Deflection Output Applications

©1270B

Features:

- High breakdown voltage and high reliability
- High switching speed
- Capable of being mounted easily due to one-point fixing-type plastic mold package

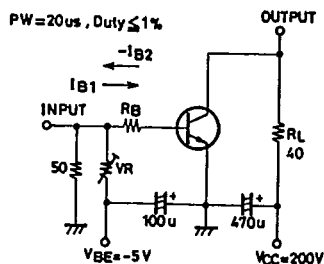
Absolute Maximum Ratings at $T_a=25^\circ\text{C}$

			unit
Collector to Base Voltage	V_{CB0}	1500	V
Collector to Emitter Voltage	V_{CEO}	800	V
Emitter to Base Voltage	V_{EBO}	7	V
Collector Current	I_C	6	A
Peak Collector Current	i_{cp}	16	A
Collector Dissipation	P_C	120	W
Junction Temperature	T_j	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

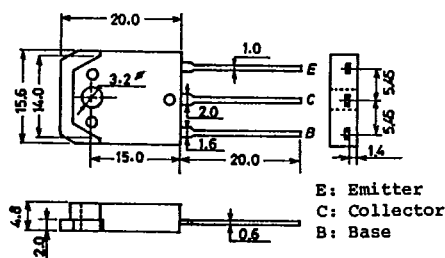
Electrical Characteristics at $T_a=25^\circ\text{C}$

			min	typ	max	unit
Collector Cutoff Current	I_{CBO}	$V_{CB}=800\text{V}, I_E=0$			10	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB}=5\text{V}, I_C=0$			1	mA
DC Current Gain	h_{FE}	$V_{CE}=5\text{V}, I_C=1\text{A}$	8			
Gain Bandwidth Product	f_T	$V_{CE}=10\text{V}, I_C=1\text{A}$		3		MHz
C-E Saturation Voltage	$V_{CE(sat)}$	$I_C=5\text{A}, I_B=1\text{A}$			5	V
B-E Saturation Voltage	$V_{BE(sat)}$	$I_C=5\text{A}, I_B=1\text{A}$			1.5	V
C-B Breakdown Voltage	$V_{(BR)CBO}$	$I_C=5\text{mA}, I_E=0$	1500			V
C-E Breakdown Voltage	$V_{(BR)CEO}$	$I_C=100\text{mA}, R_{BE}=00$	800			V
E-B Breakdown Voltage	$V_{(BR)EBO}$	$I_E=200\text{mA}, I_C=0$	7			V
Fall Time	t_f	$I_C=5\text{A}, I_{B1}=1\text{A}, I_{B2}=-2\text{A}$			0.4	μs

Switching Time Test Circuit

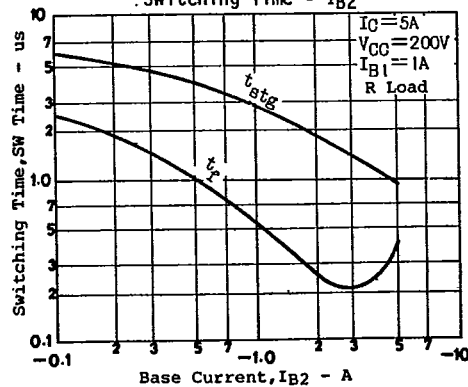
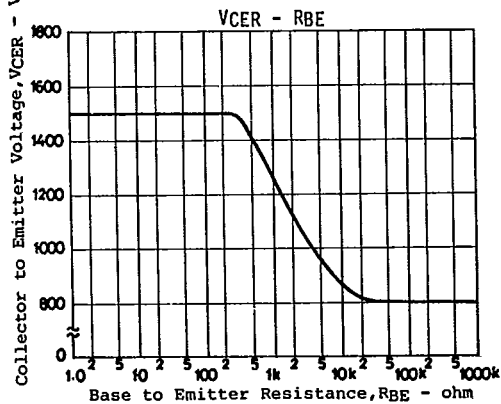
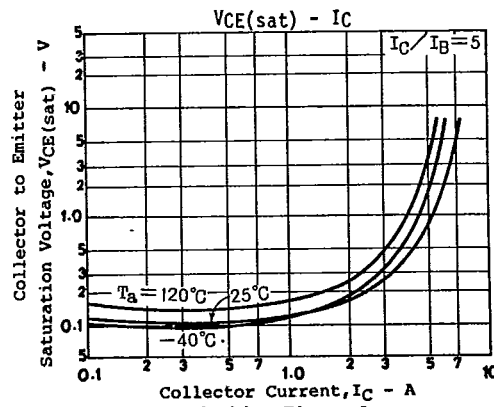
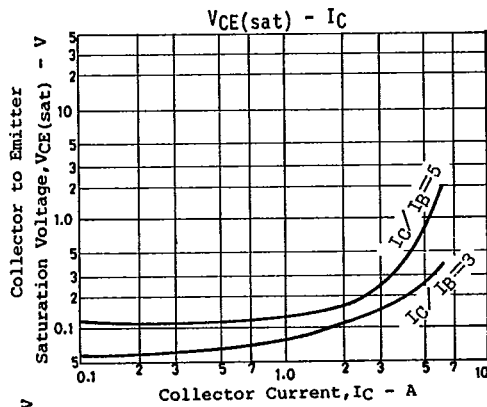
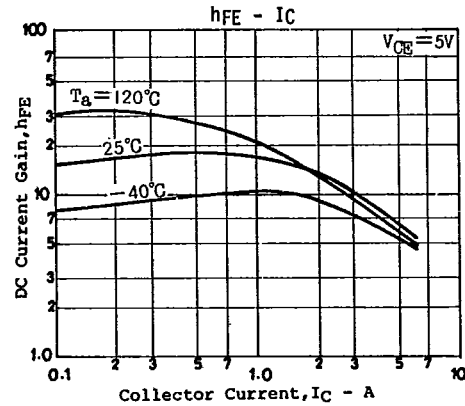
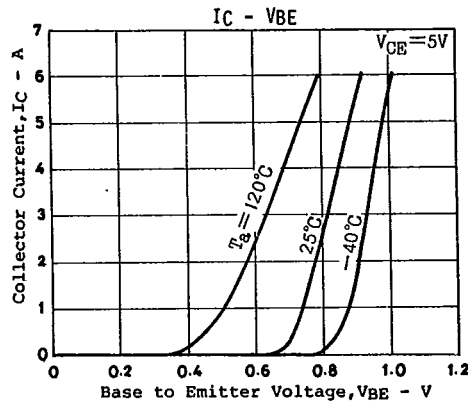
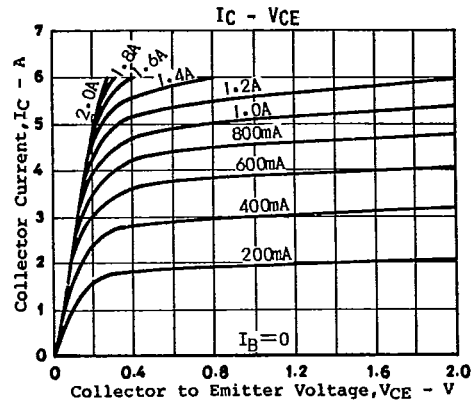
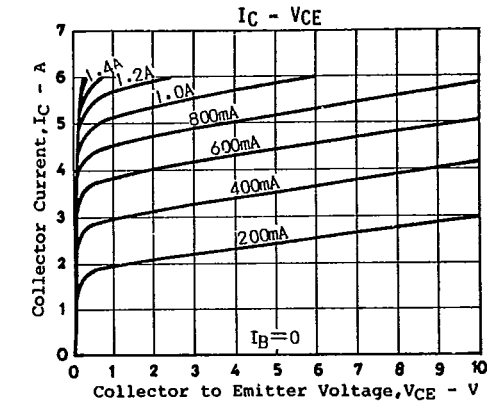


Case Outline 2022 (unit:mm)



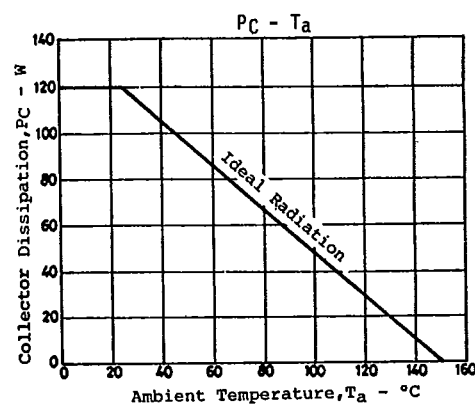
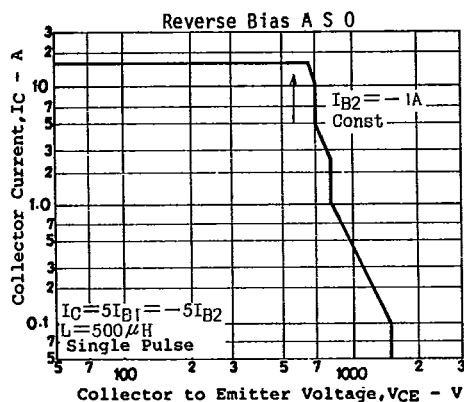
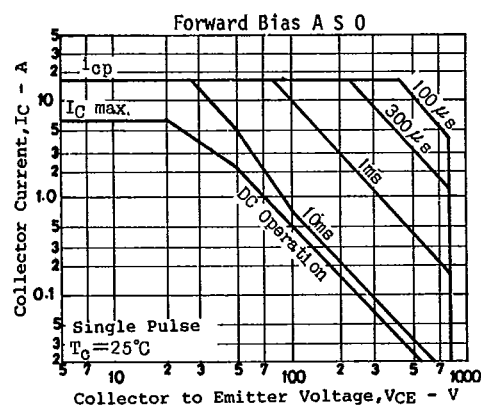
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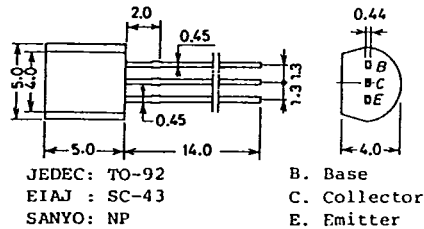
T-91-20

CASE OUTLINES AND ATTACHMENTS

- All of Sanyo Transistor case outlines are illustrated below.
- All dimensions are in mm, and dimensions which are not followed by min. or max. are represented by typical values.
- No marking is indicated.

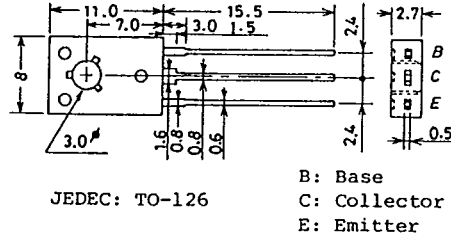
Case Outline—[2003A]

unit:mm



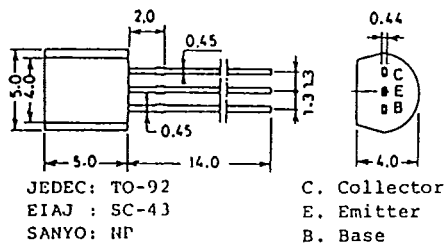
Case Outline—[2009A]

unit:mm



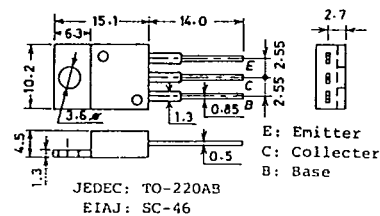
Case Outline—[2004A]

unit:mm



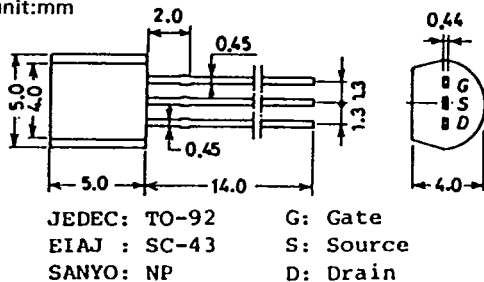
Case Outline—[2010A]

unit:mm



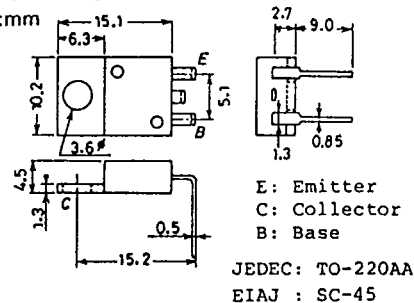
Case Outline—[2005A]

unit:mm



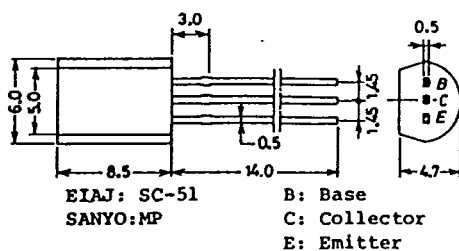
Case Outline—[2012]

unit:mm



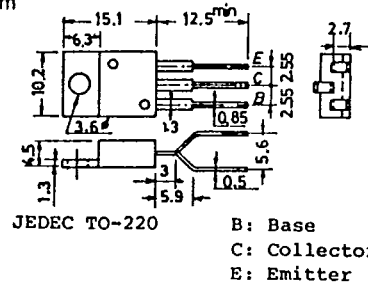
Case Outline—[2006A]

unit:mm



Case Outline—[2013]

unit:mm



EIAJ TC-3, TB-3
JEDEC. TO-3

C:Collector
E:Emitter
B:Base

G: Gate
S: Source
D: Drain

G: Gate
D: Drain
S: Source

B: Base
C: Collector
E: Emitter
SANYO: CP

D: Drain
G: Gate
S: Source

SANYO: DP6A

JEDEC: TO-92
EIAJ : SC-43
SANYO: NP

D: Drain
G: Gate
S: Source

D: Drain
G: Gate
S: Source

ANYO: TO3PB

E: Emitter
C: Collector
B: Base

E: Emitter
C: Collector
B: Base
SANYO:DP6A

S: Source
G: Gate
D: Drain
SANYO: CP

E: Emitter
C: Collector
B: Base
SANYO: DP6B

E: Emitter
C: Collector
B: Base

SANYO: KIP

G1: Cat1
\$: Source
D-r Drain
G2: Gate2
SANYO: OP4A

E: Emitter
C: Collector
B: Base

SANYO:TO3PML

B: Base
C: Collector
E: Emitter
SANYO: SPA

G: Gate
S: Source
D: Drain
SANYO: SPA

D: Drain
G: Gate
S: Source
SANYO: SPA

SANYO: TO220ML

D: Drain
G: Gate
S: Source
SANYO: SP'

SANYO: TO126ML

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unit:mm

The drawing shows three views of the SANYO CP package. The top view is a rectangle with a width of 2.9 mm and a height of 2.5 mm. It features a Gate (G) at the top center with a width of 0.5 mm, and Source (S) and Drain (D) contacts at the bottom. The distance between the S and D contacts is 1.9 mm, and the distance from the center of the S/D contacts to the side edge is 0.5 mm. The side view shows a package height of 0.5 mm and a top flange width of 0.16 mm. The bottom view shows a package width of 1.1 mm and a central contact width of 0.8 mm. A dimension of 0-0.1 mm is indicated for the top flange thickness.

G : Gate
S : Source
D : Drain

SANYO : CP

SANYO: TO126LP

SANYO : CP

Case Outline—[2051]

unit:mm

The diagram shows a mechanical drawing of the SANYO SPA transistor. It includes a side view on the left and a top view on the right. The side view shows a base with a width of 4 mm and a height of 3 mm. The distance from the base to the start of the leads is 3 mm. The total length of the device is 15.0 mm. The distance from the base to the end of the leads is 13.1 mm. The distance between the leads is 0.4 mm. The top view shows a base with a width of 2.2 mm and a height of 0.4 mm. The distance between the leads is 0.4 mm. The leads are labeled C (Collector), E (Emitter), and B (Base).

C : Collector
E : Emitter
B : Base

SANYO: SPA

C : Collector
E : Emitter
B : Base

SANYO: SPA

Case Outline—[2052A]

unit:mm

JEDEC: TO-220AB
EIAJ: SC-46

1:Source
2:Drain
3:Gate

JEDEC: TO-220AB
EIAJ: SC-46

Case Outline—[2053]

unit:mm

1:Drain
2:Source
3:Gate 1
4:Gate 2

1: Drain
2: Source
3: Gate 1
4: Gate 2

Case Outline—[2054]

unit:mm

The drawing shows three views of the SANYO CP transistor package:

- Top View:** A rectangular package with overall dimensions of 2.9 mm (width) by 2.5 mm (height). The emitter (E) is a small rectangle at the top center, 0.3 mm wide. The collector (C) and base (B) are at the bottom, with C on the left and B on the right. The distance between the centerlines of C and B is 1.9 mm, and the total width of the base area is 2.9 mm.
- Side View:** Shows the package height as 0.16 mm. The base area at the bottom has a width of 1.1 mm. The distance from the base to the top of the package is 0.1 mm.
- Bottom View:** Shows the mounting pads. The distance between the centerlines of the collector and base pads is 0.4 mm.

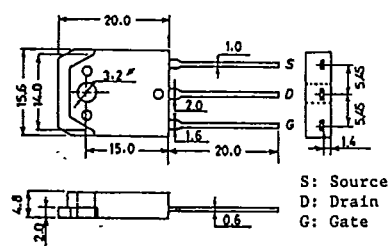
E: Emitter
C: Collector
B: Base

SANYO: CP

E: Emitter
C: Collector
B: Base

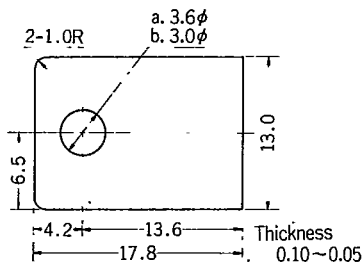
SANYO: CP

Case Outline—[2056] unit:mm



SANYO: TO3PB

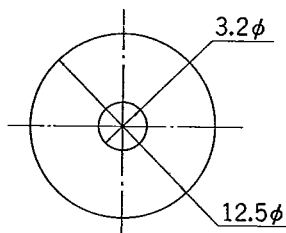
Case Outline—[0008] unit:mm

a. IS-313B
b. IS-313D

SANYO

Case Outline—[0004] unit:mm

unit:mm

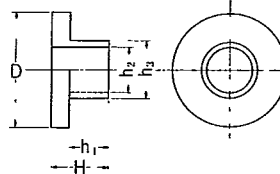


SANYO IS-126

Thickness : 0.075

Case Outline—[0009] unit:mm

unit:mm

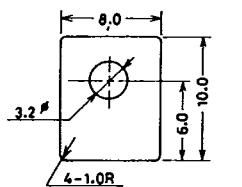


SANYO Bush

Bush	D	H	h ₁	h ₂	h ₃
A	8.0φ	4.0	2.8	3.1φ	3.89φ
B	8.0φ	3.0	1.8	3.1φ	3.89φ
C	8.0φ	5.7	4.5	3.1φ	3.89φ
D	8.0φ	2.7	1.5	3.1φ	3.89φ
E	8.0φ	3.4	2.2	3.1φ	3.89φ
F	8.0φ	4.0	2.8	3.0φ	3.59φ
K	16.0φ	3.4	1.4	3.1φ	6.0φ
L	6.0φ	3.1	1.5	2.6φ	3.5φ
M	6.0φ	3.1	1.5	3.0φ	3.59φ
P	6.0φ	2.3	1.1	3.0φ	3.59φ

Case Outline—[0005] unit:mm

unit:mm

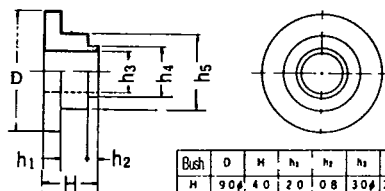


Thickness : 0.075

SANYO IS-126A Mica

Case Outline—[0010] unit:mm

unit:mm

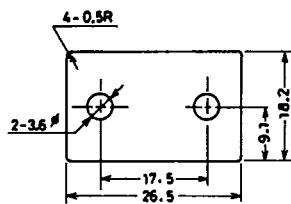


SANYO Bush

Bush	D	H	h ₁	h ₂	h ₃	h ₄	h ₅
H	9.0φ	4.0	2.0	0.8	3.0φ	3.59φ	5.6φ
T	9.0φ	5.8	2.0	2.6	3.0φ	3.59φ	5.6φ
UB	16.0φ	6.8	1.5	3.3	3.0φ	3.89φ	8.0φ

Case Outline—[0006] unit:mm

unit:mm

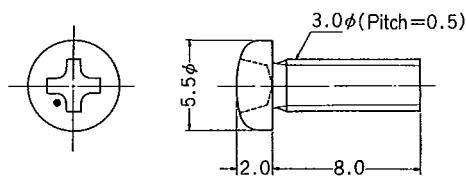


Thickness : 0.05~0.1

SANYO IS-20MA Mica

Case Outline—[0011] unit:mm

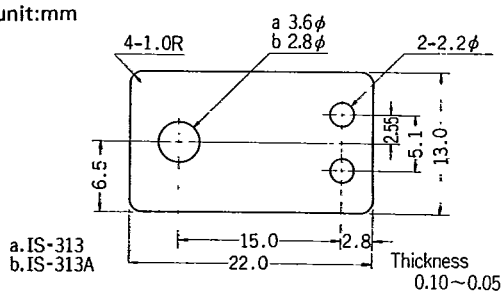
unit:mm



JIS No. B1111 M3×0.5

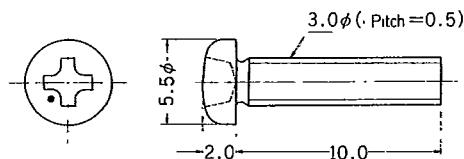
Case Outline—[0007] unit:mm

unit:mm



Case Outline—[0012] unit:mm

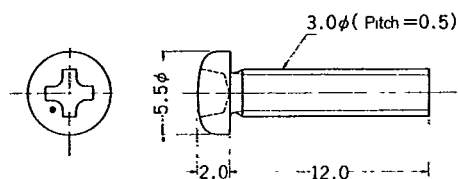
unit:mm



JIS No. B1111 M3×0.5

Case Outline—[0013]

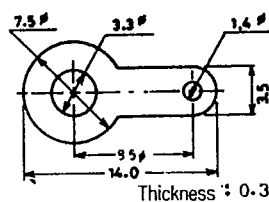
unit:mm



JIS No. B1111 M3×0.5

Case Outline—[0018]

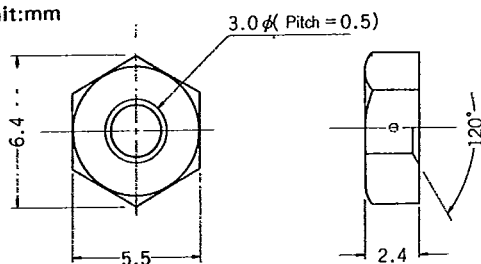
unit:mm



SANYO Lug 1.4

Case Outline—[0014]

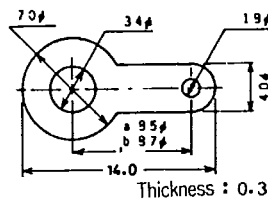
unit:mm



JIS No. B1181 M3×0.5

Case Outline—[0019]

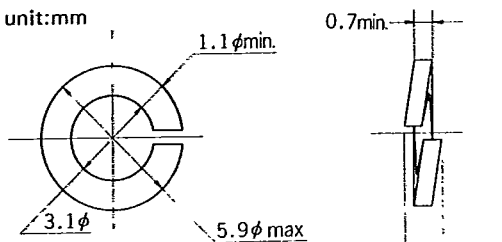
unit:mm



SANYO Lug 1.8φ

Case Outline—[0015]

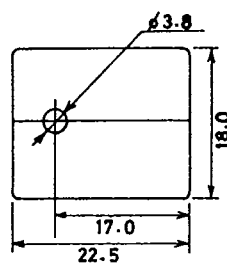
unit:mm



JIS No. B 1251 Spring washer (M3)

Case Outline—[0020]

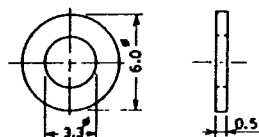
unit:mm



SANYO IS-3MP Mica

Case Outline—[0016]

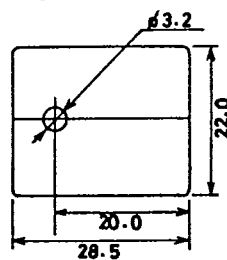
unit:mm



JIS No. B1252 Flat washer

Case Outline—[0021]

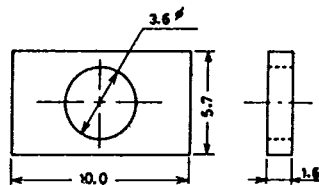
unit:mm



SANYO IS-MPC Mica

Case Outline—[0017]

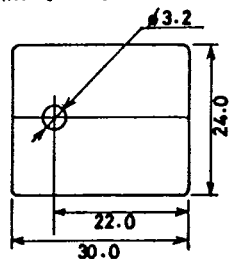
unit:mm



JIS No. G3141 Rectangular washer

Case Outline—[0022]

unit:mm



SANYO IS-3PBL Mica