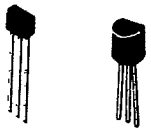
T-31-15
T-31-17

2SC930



2033 2003A

NPN Epitaxial Planar Silicon Transistor

AM Converter, FM RF • IF Amp Applications

©545E

The 2SC930 has two types of packge: SPA and NP.

Use

- FM RF amp, mixer, OSC, converter, and IF amplifier.

Absolute Maximum Ratings at Ta=25°C

		2SC930SPA	2SC930NP	unit
Collector to Base Voltage	V_{CBO}	30	30	V
Collector to Emitter Voltage	V_{CEO}	20	20	V
Emitter to Base Voltage	V_{EBO}	5	5	V
Collector Current	I_C	30	30	mA
Collector Dissipation	P_C	120	250	mW
Junction Temperature	T_j	125	125	°C
Storage Temperature	T_{stg}	-40 to +125	-55 to +125	°C

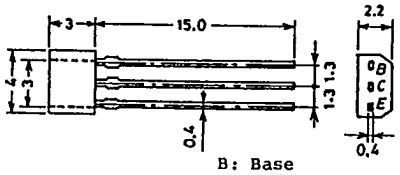
Electrical Characteristics at Ta=25°C

			min	typ	max	unit
Collector Cutoff Current	I_{CBO}	V_{CB}=10V, I_E=0			1	uA
Emitter Cutoff Current	I_{EBO}	V_{EB}=4V, I_C=0			1	uA
DC Current Gain	h_{FE}	V_{CE}=6V, I_C=1mA	40*	80	320*	
Gain Bandwidth Product	f_T	V_{CE}=6V, I_C=1mA	170	300		MHz
Reverse Transfer capacitance	C_{re}	V_{CB}=6V, I_C=1MHz [2SC930SPA]	0.8		1.6	pF
		V_{CB}=6V, f=1MHz [2SC930NP]	1.0	1.3	1.8	pF
Base to Collector Time Constant	$r_{bb'}C_C$	V_{CE}=6V, I_C=1mA f=31.9MHz		20	36	pS
Noise Figure	NF	V_{CE}=6V, I_C=1mA f=100MHz		4.0		dB
Turn-on Time	t_{on}	V_{IN}=+12V, V_{BB}=-3V, appointed circuit		30		ns
Turn-off Time	t_{off}	V_{IN}=-12V, V_{BB}=+3V, appointed circuit		30		ns

*The 2SC930 is graded as follows by 1mA h_{FE}:

40 C 80	60 D 120	100 E 200	160 F 320

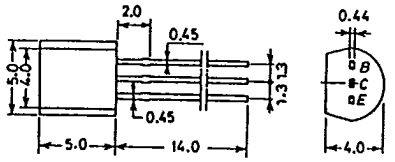
Case Outline 2033
(unit:mm)



B: Base
C: Collector
E: Emitter

SANYO: SPA

Case Outline 2003A
(unit:mm)



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

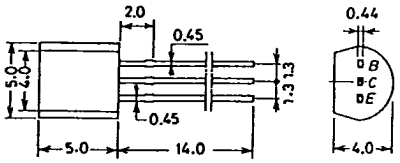
B. Base
C. Collector
E. Emitter

The 2SC930 is scheduled to be discontinued soon. Use the 2SC2839, instead of the 2SC930, in new applications where you are planning to use the 2SC930.

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.

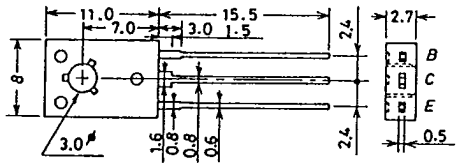
Case Outline—[2003A]
unit:mm



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

B. Base
C. Collector
E. Emitter

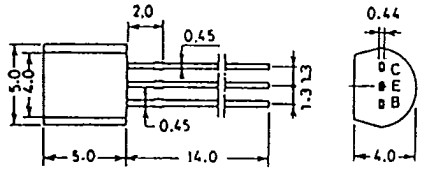
Case Outline—[2009A]
unit:mm



JEDEC: TO-126

B: Base
C: Collector
E: Emitter

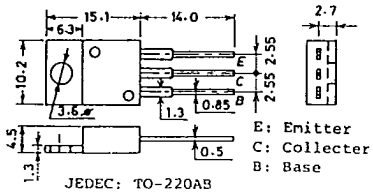
Case Outline—[2004A]
unit:mm



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

C. Collector
E. Emitter
B. Base

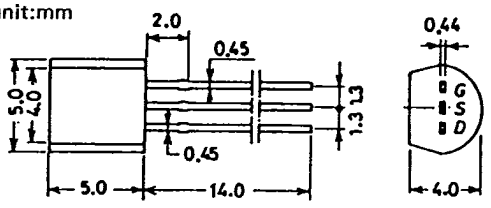
Case Outline—[2010A]
unit:mm



JEDEC: TO-220AB
EIAJ: SC-46

E: Emitter
C: Collecter
B: Base

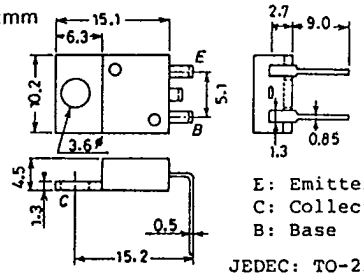
Case Outline—[2005A]
unit:mm



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

G: Gate
S: Source
D: Drain

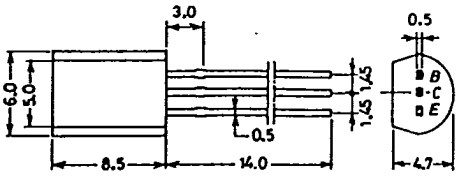
Case Outline—[2012]
unit:mm



E: Emitter
C: Collector
B: Base

JEDEC: TO-220AA
EIAJ : SC-45

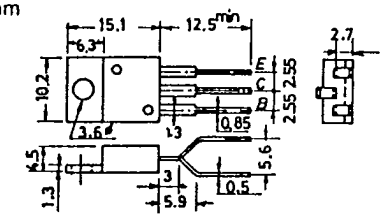
Case Outline—[2006A]
unit:mm



EIAJ: SC-51
SANYO:MP

B: Base
C: Collector
E: Emitter

Case Outline—[2013]
unit:mm

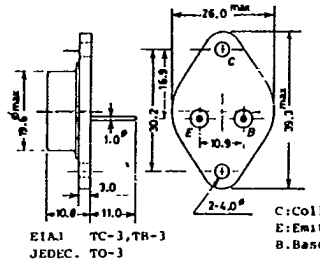


JEDEC TO-220

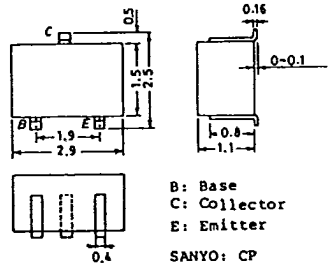
B: Base
C: Collector
E: Emitter

T-91-20

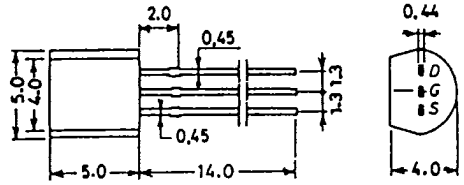
Case Outline—[2017]
unit:mm



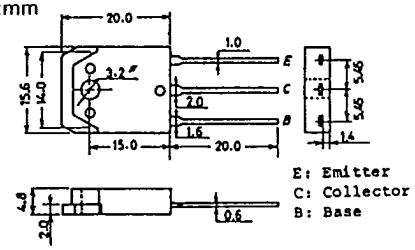
Case Outline—[2018A]
unit:mm



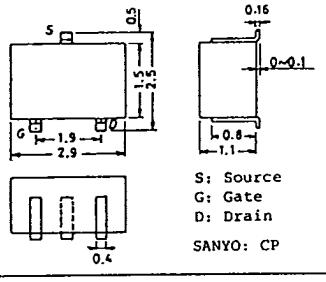
Case Outline—[2019A]
unit:mm



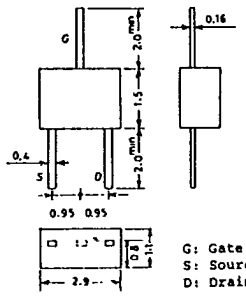
Case Outline—[2022]
unit:mm



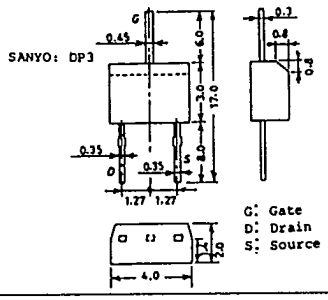
Case Outline—[2024A]
unit:mm



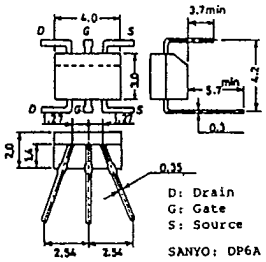
Case Outline—[2025]
unit:mm



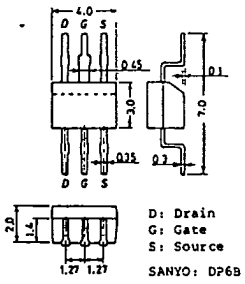
Case Outline—[2026]
unit:mm



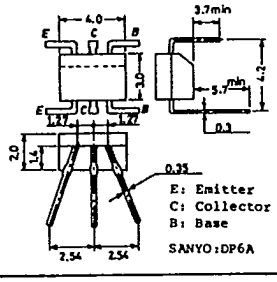
Case Outline—[2027A]
unit:mm



Case Outline—[2028A]
unit:mm

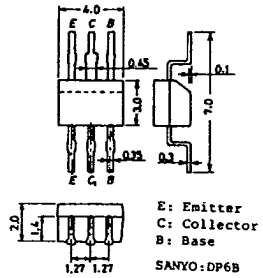


Case Outline—[2029A]
unit:mm

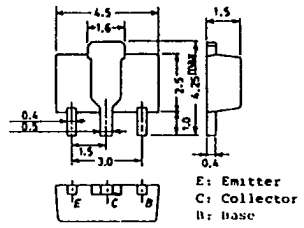


T-91-20

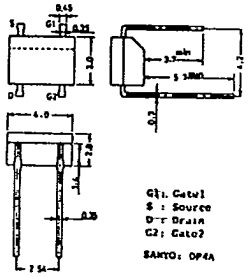
Case Outline—[2030A]
unit:mm



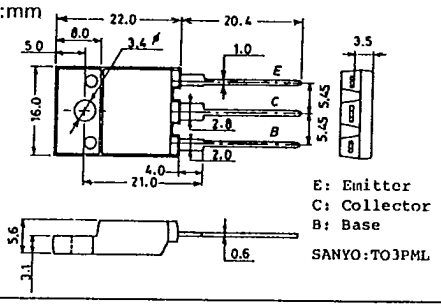
Case Outline—[2038]
unit:mm



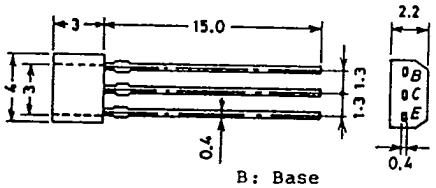
Case Outline—[2031A]
unit:mm



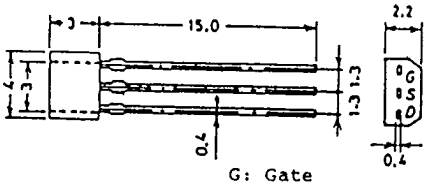
Case Outline—[2039]
unit:mm



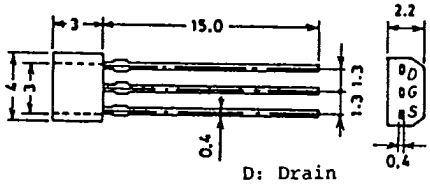
Case Outline—[2033]
unit:mm



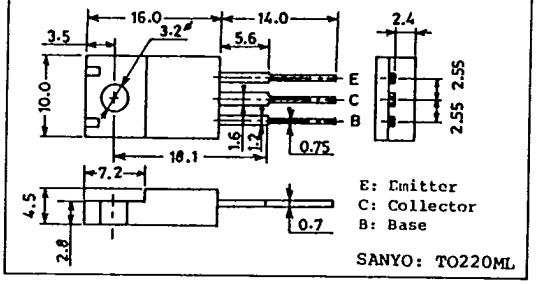
Case Outline—[2040]
unit:mm



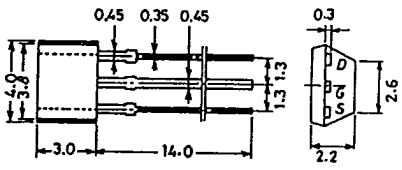
Case Outline—[2034]
unit:mm



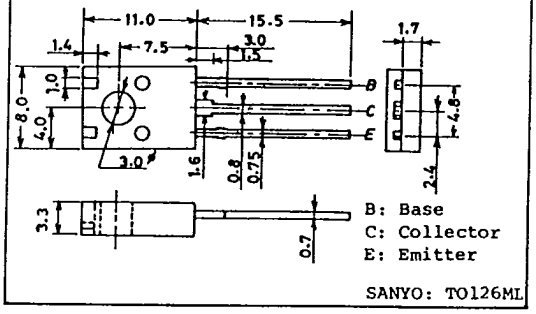
Case Outline—[2041]
unit:mm



Case Outline—[2037]
unit:mm

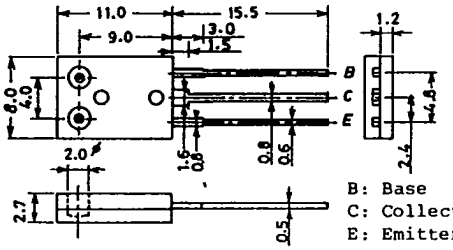


Case Outline—[2042A] unit:mm



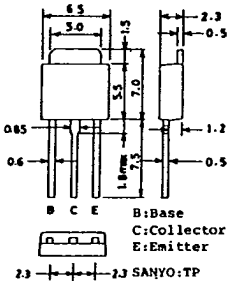
T-91-20

Case Outline—[2043A] unit:mm



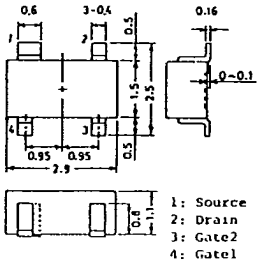
SANYO: TO126LP

Case Outline—[2045] unit:mm

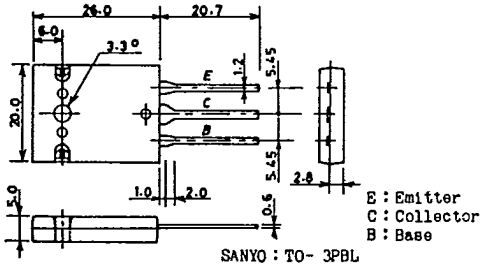


SANYO:TP

Case Outline—[2046] unit:mm

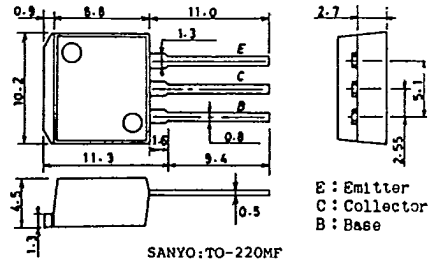


Case Outline—[2048] unit:mm



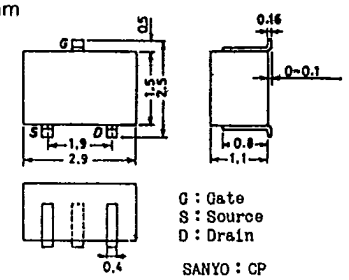
SANYO : TO- 3PBL

Case Outline—[2049] unit:mm



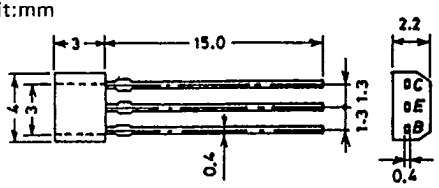
SANYO:TO-220MF

Case Outline—[2050] unit:mm



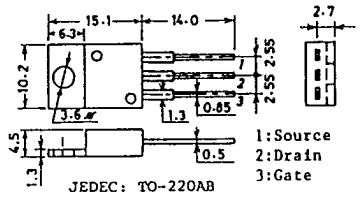
SANYO : CP

Case Outline—[2051] unit:mm



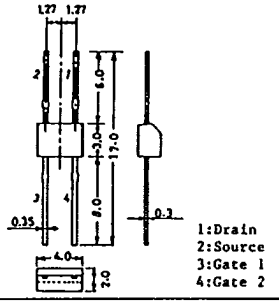
SANYO: SPA

Case Outline—[2052A] unit:mm

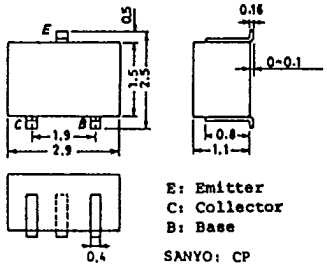


JEDEC: TO-220AB
EIAJ: SC-46

Case Outline—[2053] unit:mm



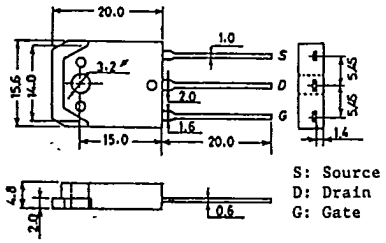
Case Outline—[2054] unit:mm



SANYO: CP

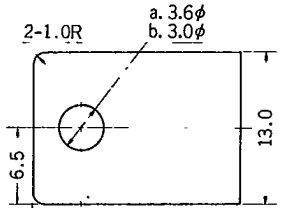
T-91-20

Case Outline—[2056] unit:mm



SANYO: TO3PB

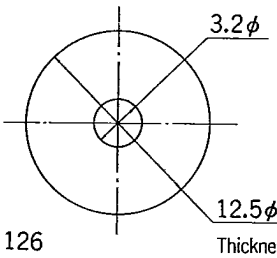
Case Outline—[0008]
unit:mm



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

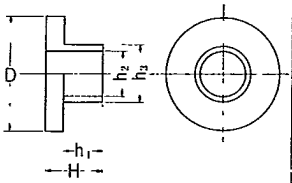
SANYO Thickness 0.10~0.05

Case Outline—[0004]
unit:mm



SANYO IS-126 Thickness : 0.075

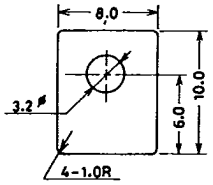
Case Outline—[0009]
unit:mm



Bush	D	H	h1	h2	h3
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

SANYO Bush

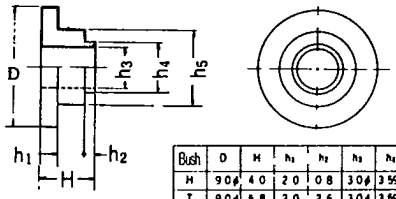
Case Outline—[0005]
unit:mm



Thickness : 0.075

SANYO IS-126A Mica

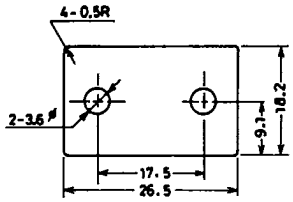
Case Outline—[0010]
unit:mm



Bush	D	H	h1	h2	h3	h4	h5
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

SANYO Bush

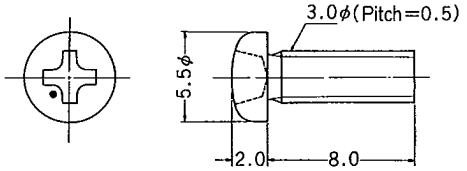
Case Outline—[0006]
unit:mm



Thickness : 0.05~0.1

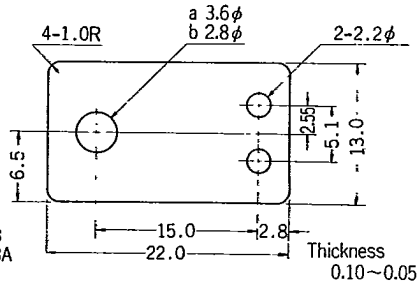
SANYO IS-20MA Mica

Case Outline—[0011]
unit:mm



JIS No.B1111 M3×0.5

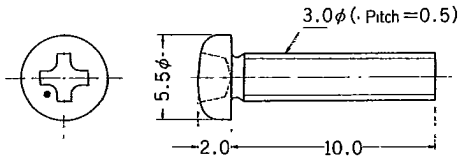
Case Outline—[0007]
unit:mm



a. IS-313
b. IS-313A

Thickness 0.10~0.05

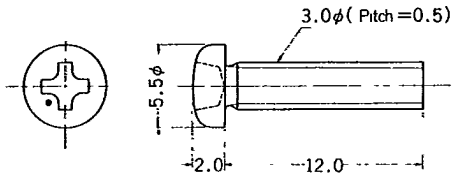
Case Outline—[0012]
unit:mm



JIS No.B1111 M3×0.5

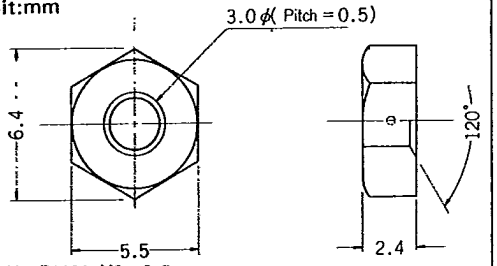
T-91-20

Case Outline—[0013]
unit:mm



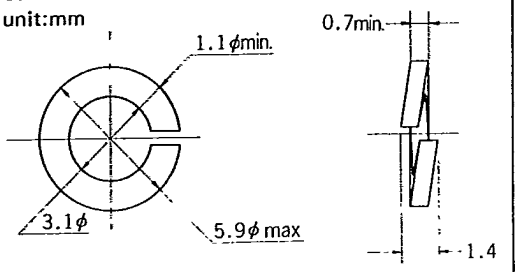
JIS No.B1111 M3×0.5

Case Outline—[0014]
unit:mm



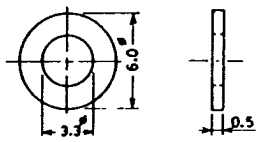
JIS No. B1181 M3×0.5

Case Outline—[0015]
unit:mm



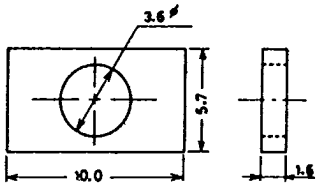
JIS No. B 1251 Spring washer (M3)

Case Outline—[0016]
unit:mm



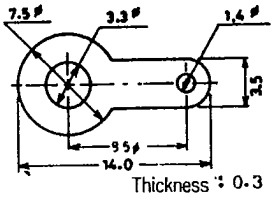
JIS No.B1252 Flat washer

Case Outline—[0017]
unit:mm



JIS No.G3141 Rectangular washer

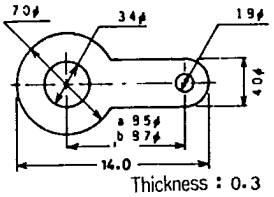
Case Outline—[0018]
unit:mm



Thickness : 0.3

SANYO Lug 1.4

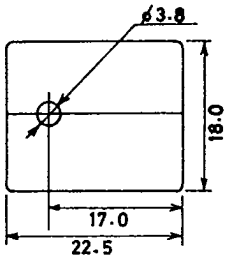
Case Outline—[0019]
unit:mm



Thickness : 0.3

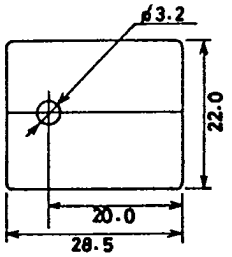
SANYO Lug 1.8φ

Case Outline—[0020]
unit:mm



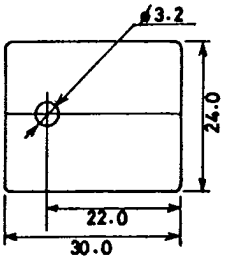
SANYO IS-3MP Mica

Case Outline—[0021]
unit:mm



SANYO IS-MPC Mica

Case Outline—[0022]
unit:mm



SANYO IS-3PBL Mica