2SC930
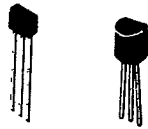
2033   2003A

NPN Epitaxial Planar
Silicon Transistor

AM Converter, FM RF·IF Amp Applications

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 lmA h_{FE}:

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

Case Outline 2033
(unit:mm)
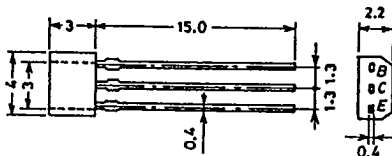
B: Base
C: Collector
E: Emitter

SANYO: SPA

Case Outline 2003A
(unit:mm)
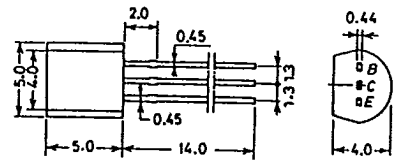
JEDEC: TO-92
EIAJ : SC-43
SANYO: NP

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.
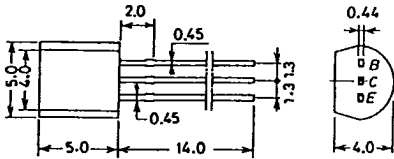
CASE OUTLINES AND ATTACHMENTS

- ● 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.
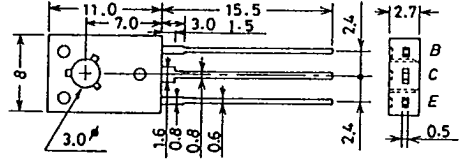- ● No marking is indicated.

Case Outline—[2003A]
unit:mm

JEDEC: TO-92   B. Base
EIAJ : SC-43   C. Collector
SANYO: NP   E. Emitter

Case Outline—[2009A]
unit:mm

JEDEC: TO-126   B: Base
    C: Collector
    E: Emitter

Case Outline—[2004A]
unit:mm

JEDEC: TO-92   C. Collector
EIAJ : SC-43   E. Emitter
SANYO: NP   B. Base

Case Outline—[2010A]
unit:mm

JEDEC: TO-220AB   E: Emitter
EIAJ: SC-46   C: Collecter
    B: Base

Case Outline—[2005A]
unit:mm

JEDEC: TO-92   G: Gate
EIAJ : SC-43   S: Source
SANYO: NP   D: Drain

Case Outline—[2012]
unit:mm
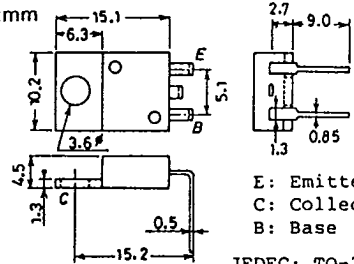
JEDEC: TO-220AA   E: Emitter
EIAJ : SC-45   C: Collector
    B: Base

Case Outline—[2006A]
unit:mm
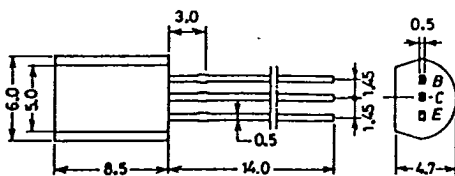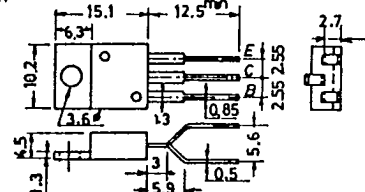

EIAJ: SC-51   B: Base
SANYO: MP   C: Collector
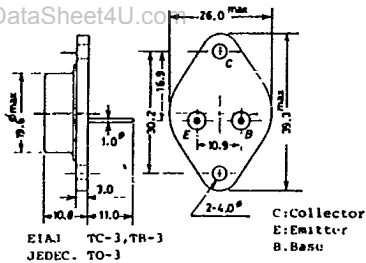   E: Emitter

Case Outline—[2013]
unit:mm

JEDEC TO-220   B: Base
    C: Collector
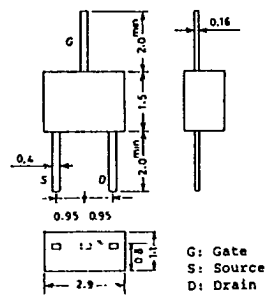   E: Emitter

T-91-20

Case Outline—[2017]
unit:mm

26.0 max
19.8 max
30.2 16.9
1.0
39.3 max
1.0
10.9
11.0
2-4.0

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

C:Collector
E:Emitter
B:Base

Case Outline—[2025]
unit:mm

G
2.0
1.5
0.16
2.0 min
0.4
S   D
0.95 0.95
2.9

G: Gate
S: Source
D: Drain

Case Outline—[2018A]
unit:mm

C
0.5
0.16
1.5 2.5
0~0.1
B   E
1.9
2.9
0.8
1.1
0.4

B: Base
C: Collector
E: Emitter

SANYO: CP
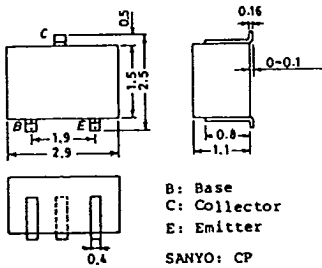
Case Outline—[2026]
unit:mm

SANYO: DP3

G
0.45
6.0
0.7
0.8
2.0
17.0
0.35
8.0
D   0.35
1.27 1.27
4.0

G: Gate
D: Drain
S: Source
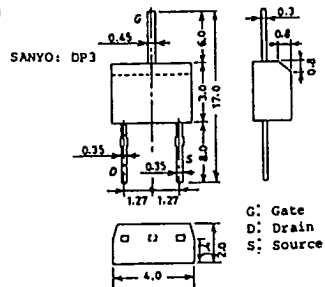
Case Outline—[2019A]
unit:mm

2.0
0.45
0.44
5.0 4.0
1.3 1.3
D
G
S
0.45
5.0   14.0
4.0

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

D: Drain
G: Gate
S: Source
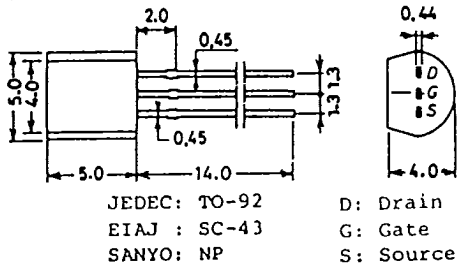
Case Outline—[2027A]
unit:mm

D   G   S
4.0
3.7min
1.0
5.7 min
4.2
D   G   S
1.27
0.3
2.0
1.4
0.35
2.54 2.54

D: Drain
G: Gate
S: Source
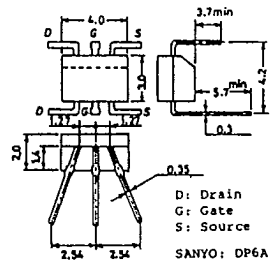
SANYO: DP6A

Case Outline—[2022]
unit:mm

20.0
1.0
E
3.2
5.45
15.6 14.0
C
2.0
5.45
B
15.0
1.6
20.0
1.4
4.0
2.0
0.6

E: Emitter
C: Collector
B: Base

SANYO: TO3PB
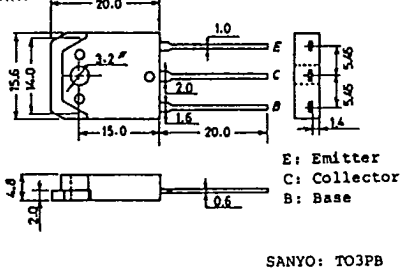
Case Outline—[2028A]
unit:mm

D G S
4.0
0.45
0.1
2.0
7.0
D G S
0.35
0.2
2.0
1.4
1.27 1.27

D: Drain
G: Gate
S: Source
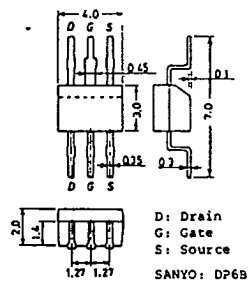
SANYO: DP6B

Case Outline—[2024A]
unit:mm

S
0.5
0.16
1.5 2.5
0~0.1
G   D
1.9
2.9
0.8
1.1
0.4

S: Source
G: Gate
D: Drain

SANYO: CP
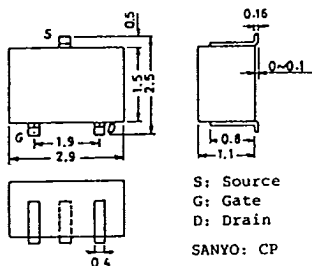
Case Outline—[2029A]
unit:mm

E   C   B
4.0
3.7min
1.0
5.7 min
4.2
E   C   B
1.27
0.3
2.0
1.4
0.35
2.54 2.54

E: Emitter
C: Collector
B: Base

SANYO:DP6A

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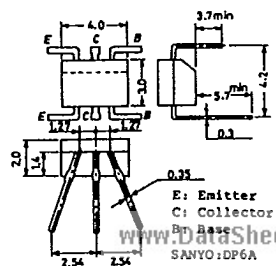
Case Outline—[2030A]
unit:mm
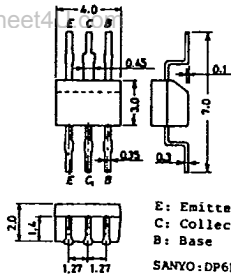
E: Emitter
C: Collector
B: Base
SANYO: DP6B

Case Outline—[2038]
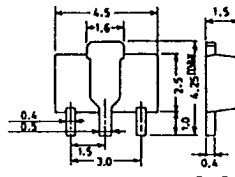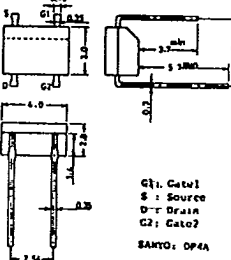unit:mm

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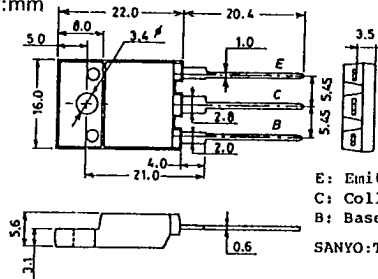SANYO: PCP

Case Outline—[2031A]
unit:mm

G1: Gate1
S: Source
D: Drain
G2: Gate2
SANYO: DP4A
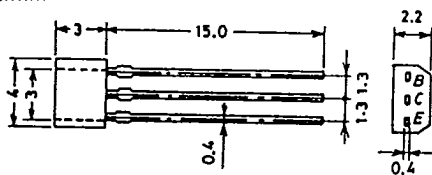
Case Outline—[2039]
unit:mm

E: Emitter
C: Collector
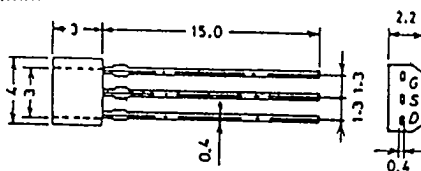B: Base
SANYO: TO3PML

Case Outline—[2033]
unit:mm

B: Base
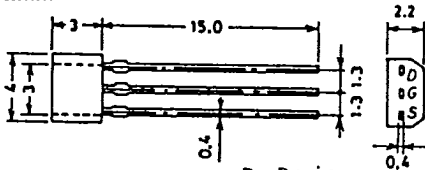C: Collector
E: Emitter

SANYO: SPA

Case Outline—[2040]
unit:mm

G: Gate
S: Source
D: Drain

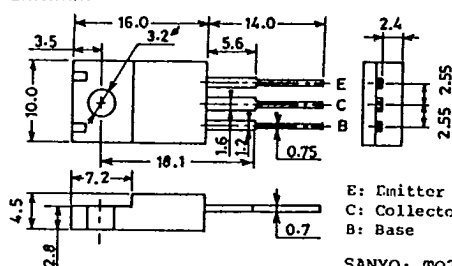SANYO: SPA

Case Outline—[2034]
unit:mm

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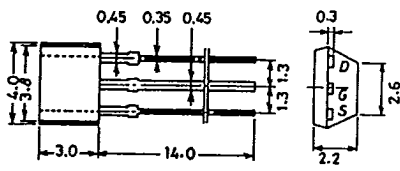
SANYO: SPA

Case Outline—[2041]
unit:mm

E: Emitter
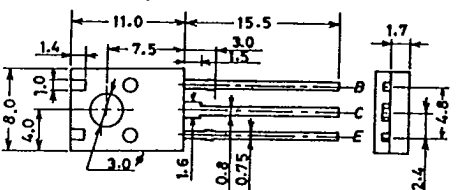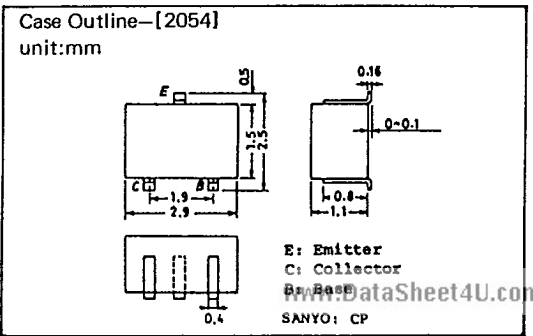C: Collector
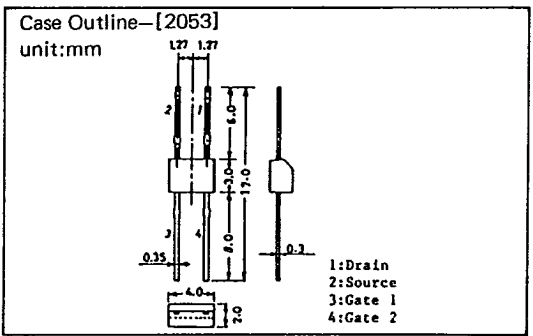B: Base

SANYO: TO220ML

Case Outline—[2037]
unit:mm

D: Drain
G: Gate
S: Source

SANYO: SP'

Case Outline—[2042A] unit:mm

B: Base
C: Collector
E: Emitter

SANYO: TO126ML

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Case Outline—[2043A] unit:mm

B: Base
C: Collector
E: Emitter

SANYO: TO126LP

Case Outline—[2045] unit:mm

B:Base
C:Collector
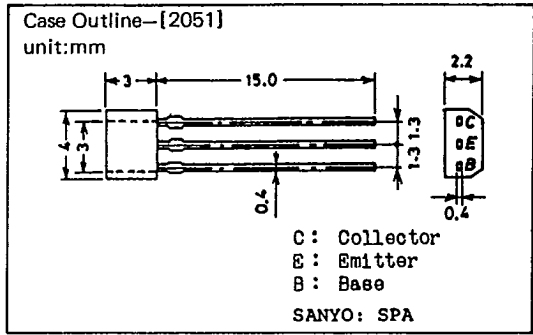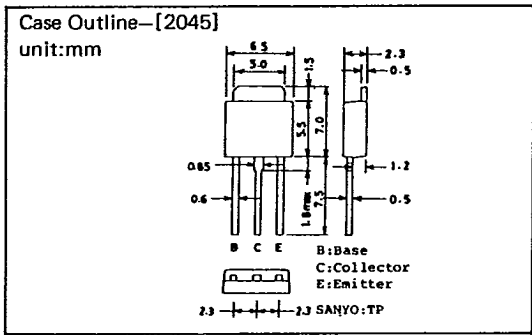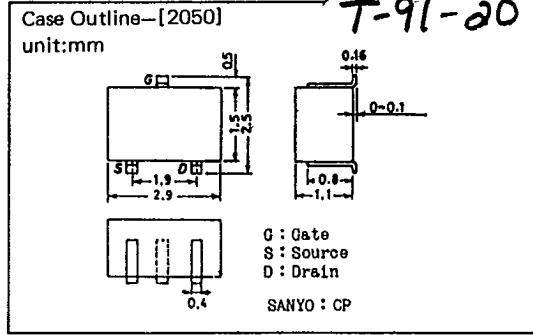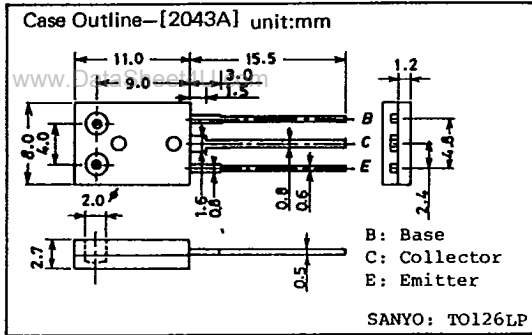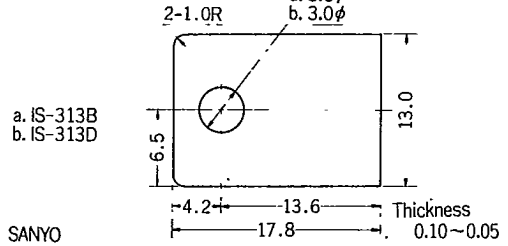E:Emitter

SANYO:TP

Case Outline—[2046] unit:mm

1: Source
2: Drain
3: Gate2
4: Gate1

Case Outline—[2048] unit:mm

E : Emitter
C : Collector
B : Base

SANYO : TO- 3PBL

Case Outline—[2049] unit:mm

E : Emitter
C : Collector
B : Base

SANYO:TO-220MF

Case Outline—[2050] unit:mm

G : Gate
S : Source
D : Drain

SANYO : CP

Case Outline—[2051] unit:mm

C : Collector
E : Emitter
B : Base

SANYO : SPA

Case Outline—[2052A] unit:mm

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

Case Outline—[2054] unit:mm

E : Emitter
C: Collector
B: Base

SANYO : CP

Case Outline—[2056] unit:mm

20.0

1.0

S

D

G

3.2φ

15.6 14.0

5.45 5.45

5.45

2.0

1.6

15.0

20.0

1.6
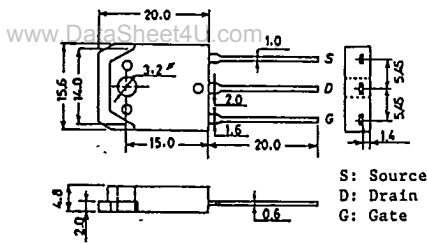
S: Source
D: Drain
G: Gate

4.8

2.0

0.6

SANYO: TO3PB

Case Outline—[0004]
unit:mm

3.2φ

12.5φ
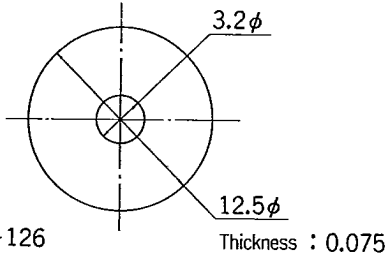
SANYO IS-126

Thickness : 0.075

Case Outline—[0005]
unit:mm

8.0

3.2φ

10.0

6.0

4-1.0R
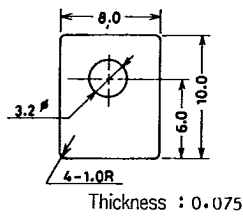
SANYO IS-126A Mica

Thickness : 0.075

Case Outline—[0006]
unit:mm

4-0.5R

2-3.6φ

16.2

9.1

17.5

26.5

Thickness : 0.05~0.1

SANYO IS-20MA Mica

Case Outline—[0007]
unit:mm

4-1.0R

a 3.6φ
b 2.8φ

2-2.2φ

2.55

5.1

13.0

6.5

15.0

2.8

22.0
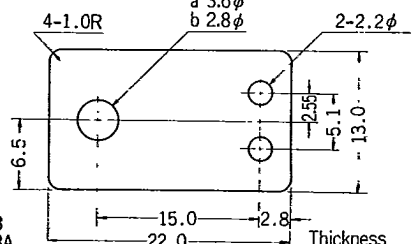
a. IS-313
b. IS-313A

Thickness
0.10~0.05

Case Outline—[0008]
unit:mm

2-1.0R

a. 3.6φ
b. 3.0φ

13.0

6.5

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

4.2

13.6

17.8

SANYO

Thickness
0.10~0.05

Case Outline—[0009]
unit:mm

D

h_2

h_3

h_1

H

SANYO Bush

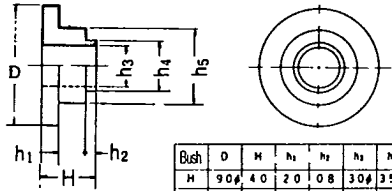| Bush	D	H	h_1	h_2	h_3
A	8.0φ	4.0	2.8	3.0φ	3.89φ
B	8.0φ	3.0	1.8	3.1φ	3.89φ
C	8.0φ	5.7	4.5	3.1φ	3.89φ
D	8.0φ	2.7	1.5	3.1φ	3.89φ
E	8.0φ	3.4	2.2	3.1φ	3.89φ
F	8.0φ	4.0	2.8	3.0φ	3.59φ
K	16.0φ	3.4	1.4	3.1φ	6.0φ
L	6.0φ	3.1	1.5	2.6φ	3.5φ
M	6.0φ	3.1	1.5	3.0φ	3.59φ
P	6.0φ	2.3	1.1	3.0φ	3.59φ

Case Outline—[0010]
unit:mm

D

h_3

h_4

h_5

h_1

h_2

H

SANYO Bush

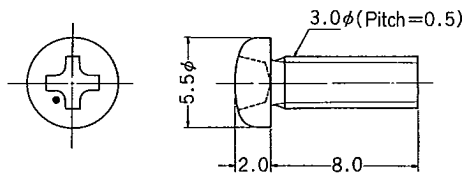| Bush	D	H	h_1	h_2	h_3	h_4	h_5
H	9.0φ	4.0	2.0	0.8	3.0φ	3.59φ	5.6φ
T	9.0φ	5.8	2.0	2.6	3.0φ	3.59φ	5.6φ
UB	16.0φ	6.8	1.5	3.3	3.0φ	3.89φ	8.0φ

Case Outline—[0011]
unit:mm

3.0φ(Pitch=0.5)

5.5φ

2.0

8.0

JIS No.B1111 M3×0.5

Case Outline—[0012]
unit:mm

3.0φ(·Pitch=0.5)

5.5φ

2.0

10.0
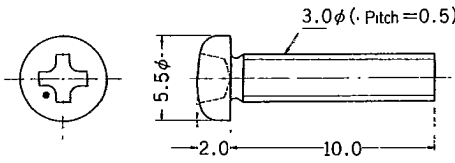
JIS No.B1111 M3×0.5

T-91-20

Case Outline—[0013]
unit:mm

3.0φ(Pitch =0.5)

5.5φ

2.0

12.0

JIS No.B1111 M3×0.5

Case Outline—[0014]
unit:mm

3.0φ(Pitch =0.5)

6.4

5.5

120°

2.4

JIS No. B1181 M3×0.5

Case Outline—[0015]
unit:mm

0.7min.

1.1φmin.

3.1φ

5.9φ max

1.4

JIS No. B 1251　Spring washer (M3)

Case Outline—[0016]
unit:mm

6.0

3.3

0.5

JIS No.B1252　Flat washer

Case Outline—[0017]
unit:mm

3.6φ

5.7

10.0

1.6

JIS No.G3141　Rectangular washer
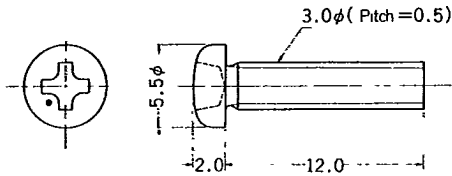
Case Outline—[0018]
unit:mm

7.5φ　　3.3φ　　1.4φ

3.5

9.5φ

14.0

Thickness : 0.3
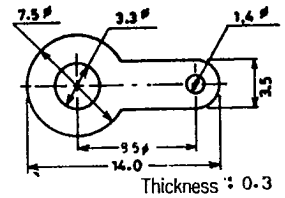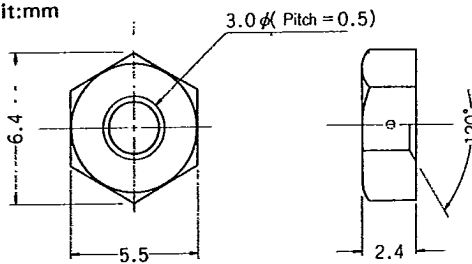
SANYO Lug 1.4

Case Outline—[0019]
unit:mm

7.0φ　　3.4φ　　1.9φ

4.0φ

a 9.5φ
b 9.7φ

14.0

Thickness : 0.3
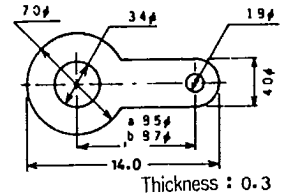
SANYO Lug 1.8φ

Case Outline—[0020]
unit:mm

φ3.8

18.0

17.0

22.5
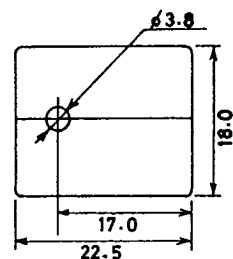
SANYO IS-3MP Mica

Case Outline—[0021]
unit:mm

φ3.2

22.0

20.0

28.5
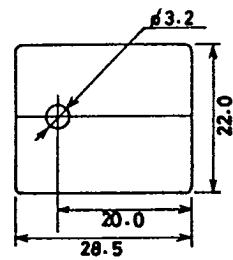
SANYO IS-MPC Mica

Case Outline—[0022]
unit:mm

φ3.2

24.0

22.0

30.0

SANYO IS-3PBL Mica