

2SK688

2052A

N-Channel MOS
Silicon Field-Effect Transistor

T-39-11

High Speed Power Switching Applications

©2465A

Features

Low-on resistance, very high-speed switching, converters

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

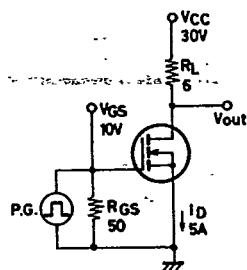
			unit
Drain to Source Voltage	V_{DS}	60	V
Gate to Source Voltage	V_{GS}	± 20	V
Drain Current(DC)	I_D	15	A
Peak Drain Current(Pulse)	$I_{D \text{ peak}}$	25	A
Allowable Power Dissipation	P_D	60	W
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

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

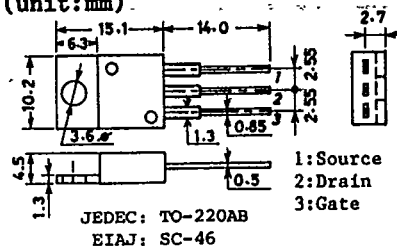
			min	typ	max	unit
D-S Breakdown Voltage	V_{DSS}	$I_D=1\text{mA}, V_{GS}=0$	60			V
Drain Current	I_{DSS}	$V_{DS}=60\text{V}, V_{GS}=0$			100	μA
G-S Leakage Current	I_{GSS}	$V_{GS}=\pm 20\text{V}, V_{DS}=0$			± 100	nA
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=10\text{V}, I_D=1\text{mA}$	1.5		4.0	V
Forward Transfer Admittance	$ Y_{fs} $	$V_{DS}=10\text{V}, I_D=8\text{A}$	4.0	5.5		S
Saturation Resistance	$r_{DS(on)}$	$I_D=8\text{A}, V_{GS}=10\text{V}$		0.08	0.12	ohm
Input Capacitance	C_{iss}	$V_{DS}=20\text{V}, f=1\text{MHz}$		900		pF
Output Capacitance	C_{oss}	$V_{DS}=20\text{V}, f=1\text{MHz}$		450		pF
Reverse Transfer Capacitance	C_{rss}	$V_{DS}=20\text{V}, f=1\text{MHz}$		180		pF
Turn-on Time	t_{on}	$I_D=5\text{A}, V_{GS}=10\text{V}$		90		ns
Turn-off Time	t_{off}	$I_D=5\text{A}, V_{GS}=10\text{V}$		110		ns

Note: Be careful in handling the 2SK688 because it has no protect diode between gate and source.

Switching Time Test Circuit

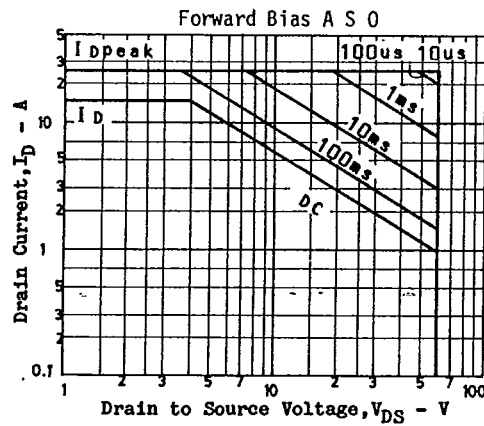
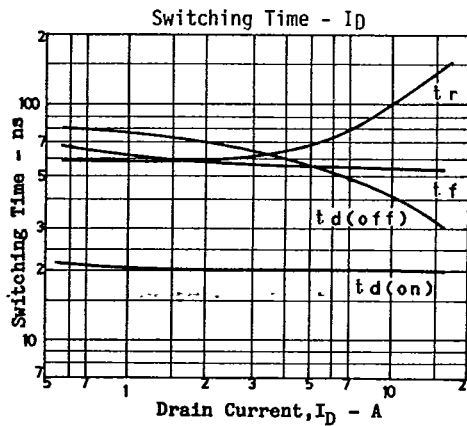
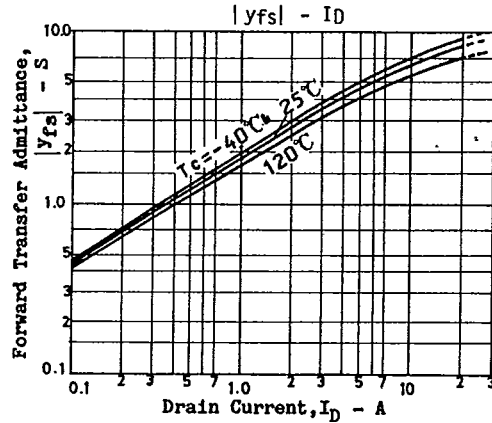
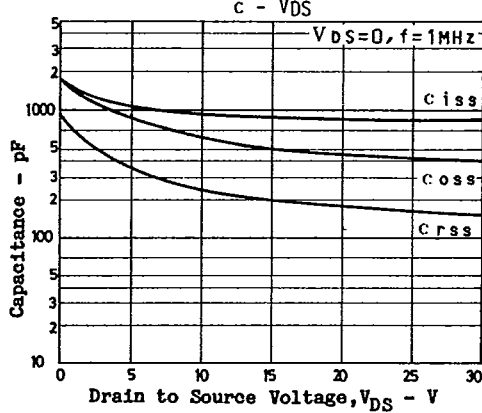
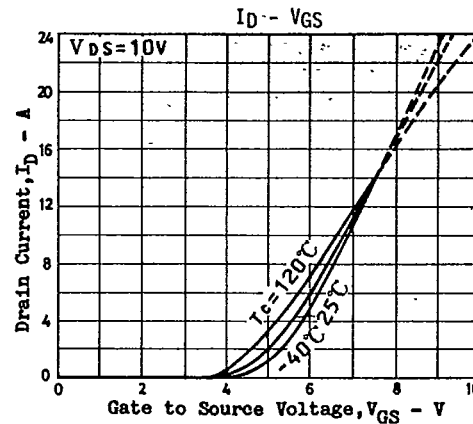
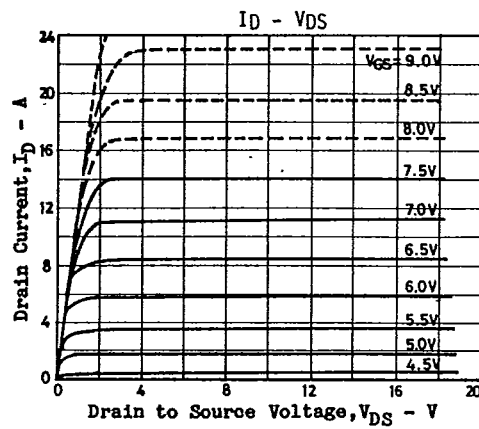


Case Outline 2052A (unit:mm)



2SK688

(T-39-11)



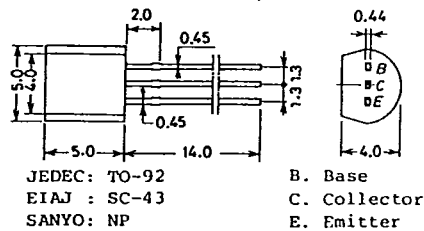
T-91-20

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.

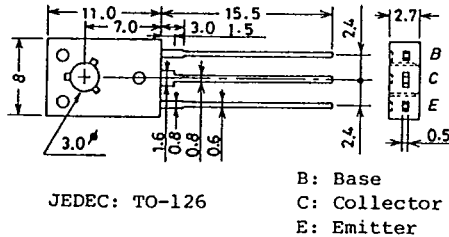
Case Outline—[2003A]

unit:mm



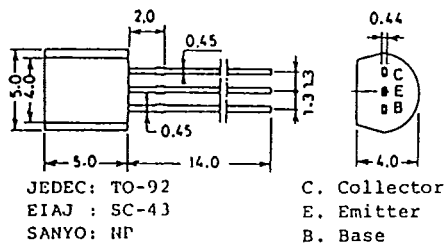
Case Outline—[2009A]

unit:mm



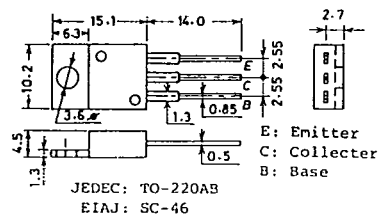
Case Outline—[2004A]

unit:mm



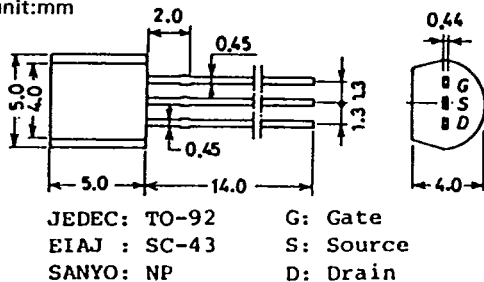
Case Outline—[2010A]

unit:mm



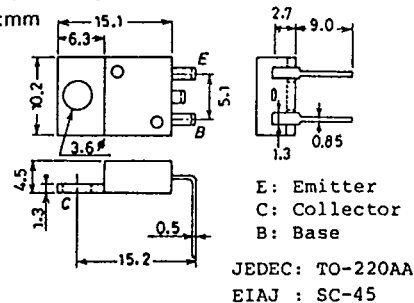
Case Outline—[2005A]

unit:mm



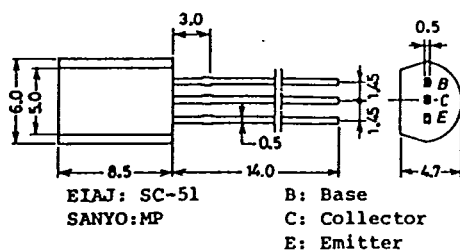
Case Outline—[2012]

unit:mm



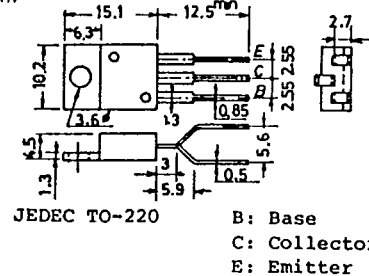
Case Outline—[2006A]

unit:mm



Case Outline—[2013]

unit:mm



EIA-1 TC-3, TB-3
JEDEC. TO-3

C:Collector
E:Emitter
B.Basu

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

SANYO: D26B

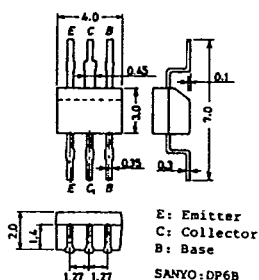
ANYO: TO3PB

E: Emitter
C: Collector
B: Base

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

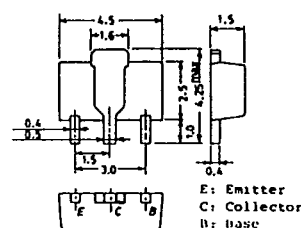
S: Source
G: Gate
D: Drain
SANYO: CP

unit:mm



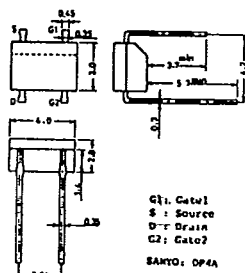
E: Emitter
C: Collector
B: Base
SANYO: DP6B

unit:mm



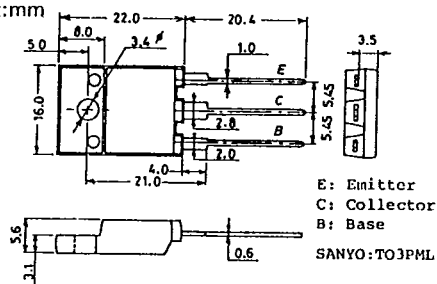
E: Emitter
C: Collector
B: Base

unit:mm



G1: Catw1
\$: Source
D-r Drain
G2: Gate2
SANYO: OP4A

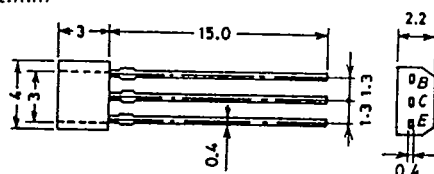
unit:mm



E: Emitter
C: Collector
B: Base

SANYO:TO3PML

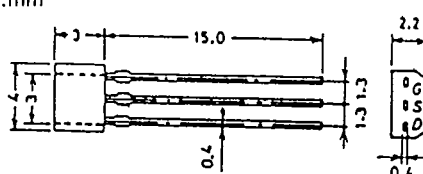
unit:mm



B: Base
C: Collector
E: Emitter

SANYO: SPA

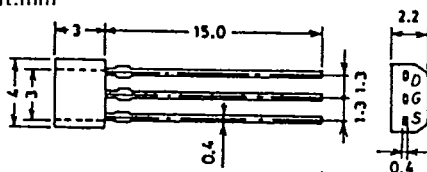
unit:mm



G: Gate
S: Source
D: Drain

SANYO: SPA

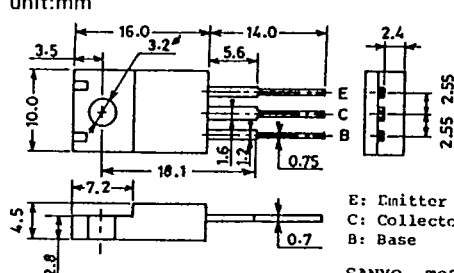
unit:mm



D: Drain
G: Gate
S: Source

SANYO: SPA

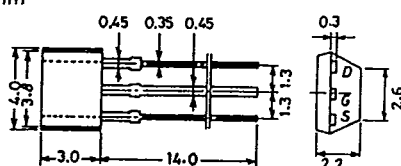
unit:mm



E: Emitter
C: Collector
B: Base

SANYO: TO220ML

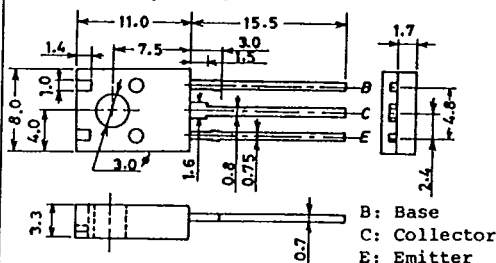
unit:mm



D: Drain
G: Gate
S: Source

SANYO: SP'

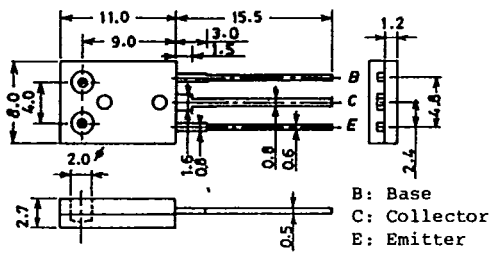
11.0



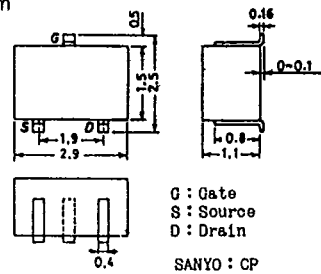
B: Base
C: Collector
E: Emitter

SANYO: TO126ML

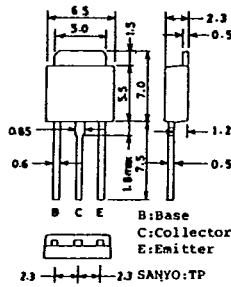
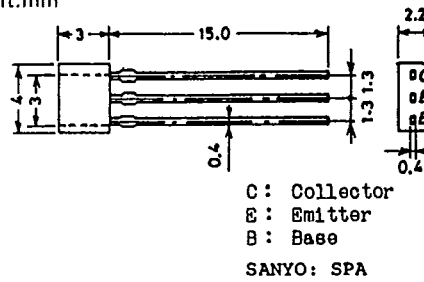
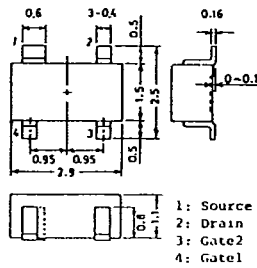
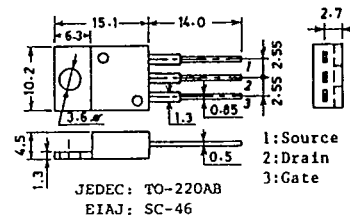
Case Outline—[2043A] unit:mm



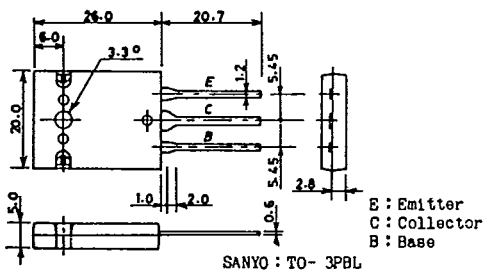
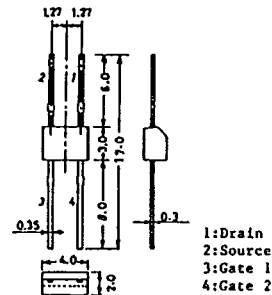
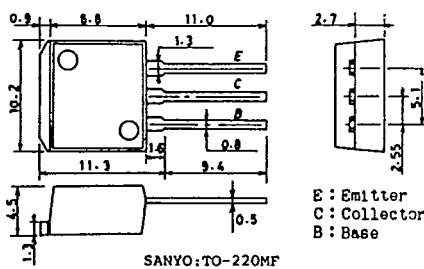
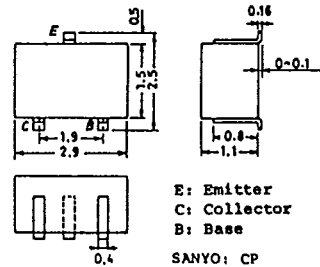
SANYO: TO126LP

Case Outline—[2050]
unit:mm

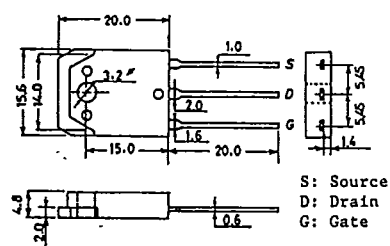
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Case Outline—[2045]
unit:mmCase Outline—[2051]
unit:mmCase Outline—[2046]
unit:mmCase Outline—[2052A]
unit:mm

Case Outline—[2048] unit:mm

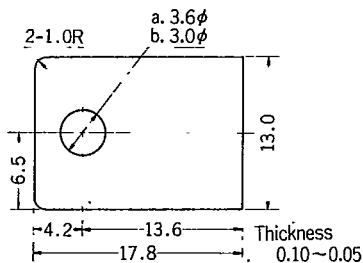
Case Outline—[2053]
unit:mmCase Outline—[2049]
unit:mmCase Outline—[2054]
unit:mm

Case Outline—[2056] unit:mm



SANYO: TO3PB

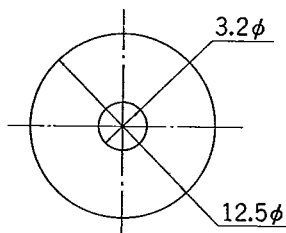
Case Outline—[0008] unit:mm

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

SANYO

Case Outline—[0004] unit:mm

unit:mm

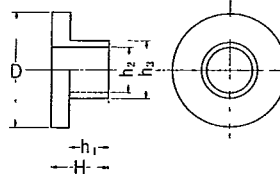


SANYO IS-126

Thickness : 0.075

Case Outline—[0009] unit:mm

unit:mm

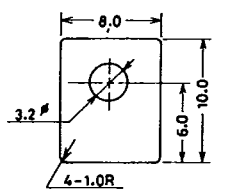


SANYO Bush

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

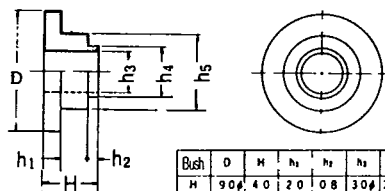


Thickness : 0.075

SANYO IS-126A Mica

Case Outline—[0010] unit:mm

unit:mm

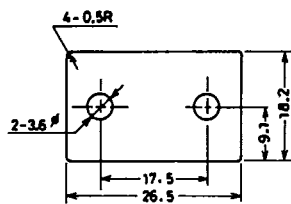


SANYO Bush

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

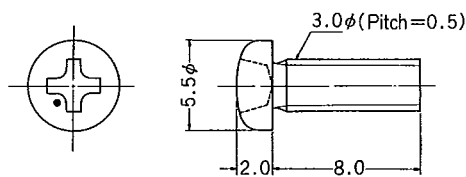


Thickness : 0.05~0.1

SANYO IS-20MA Mica

Case Outline—[0011] unit:mm

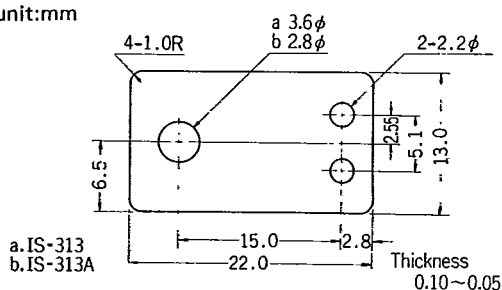
unit:mm



JIS No. B1111 M3×0.5

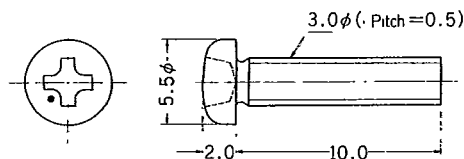
Case Outline—[0007] unit:mm

unit:mm



Case Outline—[0012] unit:mm

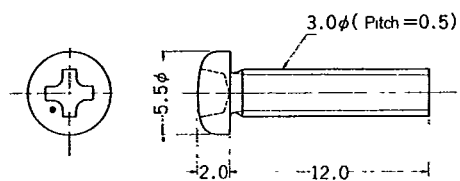
unit:mm



JIS No. B1111 M3×0.5

Case Outline—[0013]

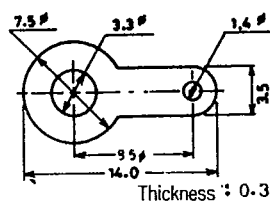
unit:mm



JIS No. B1111 M3×0.5

Case Outline—[0018]

unit:mm

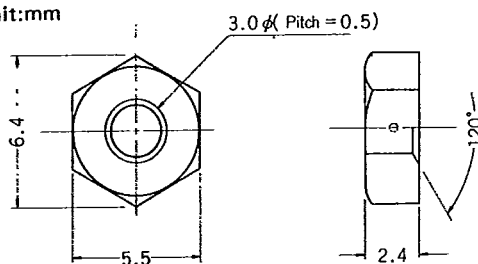


SANYO Lug 1.4

T=91-20

Case Outline—[0014]

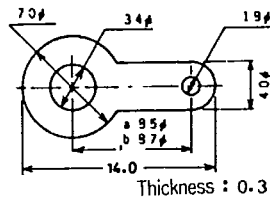
unit:mm



JIS No. B1181 M3×0.5

Case Outline—[0019]

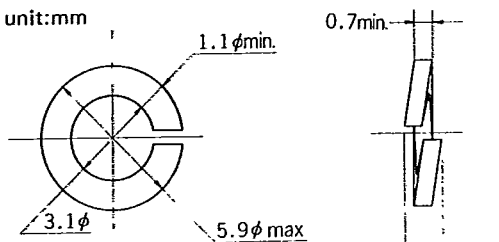
unit:mm



SANYO Lug 1.8φ

Case Outline—[0015]

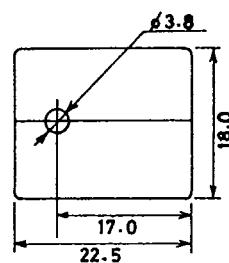
unit:mm



JIS No. B 1251 Spring washer (M3)

Case Outline—[0020]

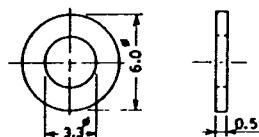
unit:mm



SANYO IS-3MP Mica

Case Outline—[0016]

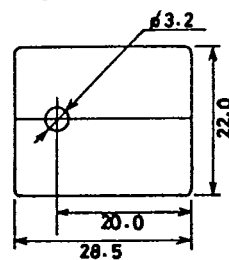
unit:mm



JIS No. B1252 Flat washer

Case Outline—[0021]

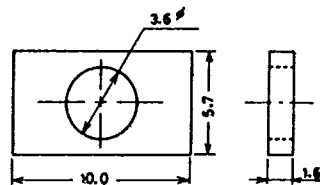
unit:mm



SANYO IS-MPC Mica

Case Outline—[0017]

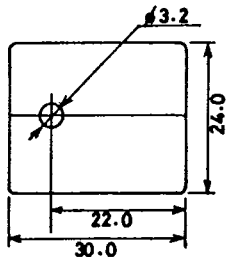
unit:mm



JIS No. G3141 Rectangular washer

Case Outline—[0022]

unit:mm



SANYO IS-3PBL Mica