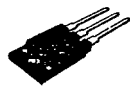


2SD1649

T-33-11



2039

NPN Triple Diffused Planar Silicon Transistor

Color TV Horizontal Deflection Output Applications(with Damper Diode)

©1755B

Applications

- High-voltage, power switching

Features

- Fast speed ($t_{max}=0.4\mu s$).
- High reliability (Adoption of HVP process).
- High breakdown voltage ($V_{CBO}=1500V$).
- Micaless package facilitating mounting operation.

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

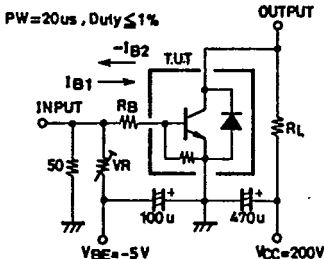
Parameter	Symbol	Value	Unit
Collector to Base Voltage	V_{CBO}	1500	V
Collector to Emitter Voltage	V_{CEO}	800	V
Emitter to Base Voltage	V_{EBO}	6	V
Collector Current	I_C	2.5	A
Peak Collector Current	i_{cp}	10	A
Collector Dissipation	P_C	50	W
Junction Temperature	T_J	150	$^\circ C$
Storage Temperature	T_{stg}	-55 to +150	$^\circ C$

$T_C=25^\circ C$

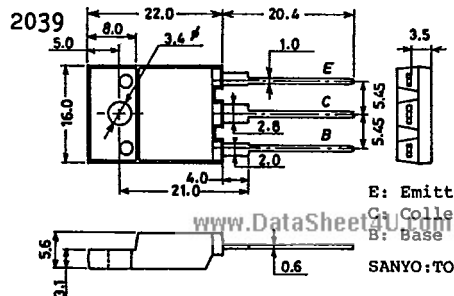
Electrical Characteristics at $T_a=25^\circ C$

Parameter	Symbol	Conditions	min	typ	max	unit
Collector Cutoff Current	I_{CBO}	$V_{CB}=800V, I_E=0$			10	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB}=4V, I_C=0$	40		130	mA
DC Current Gain	h_{FE}	$V_{CE}=5V, I_C=0.5A$	8			
Gain Bandwidth Product	f_T	$V_{CE}=10V, I_C=0.5A$		3		MHz
Collector to Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=2A, I_B=0.6A$			8	V
Base to Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=2A, I_B=0.6A$			1.5	V
Collector to Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=5mA, I_E=0$	1500			V
Collector to Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=100mA, R_{BE}=\infty$	800			V
Emitter to Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=200mA, I_C=0$	7			V
Diode Forward Voltage	V_F	$I_{EC}=2.5A$			2	V
Fall Time	t_f	$I_C=2A, I_{B1}=0.6A, I_{B2}=-1.2A, V_{CC}=200V, R_L=100\Omega$			0.4	μs

Switching Time Test Circuit

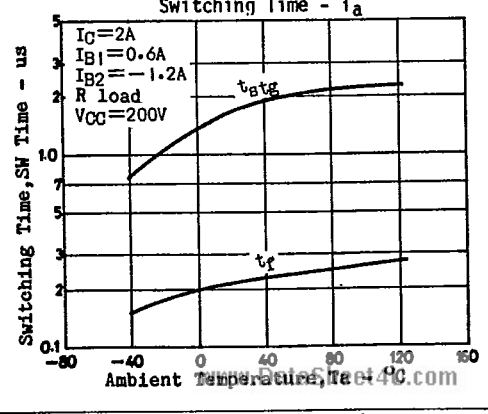
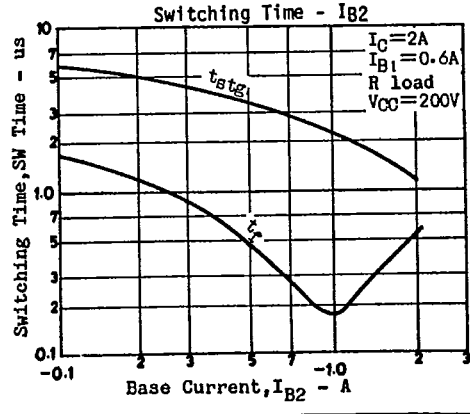
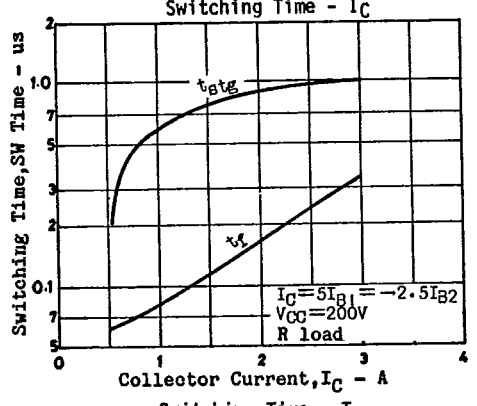
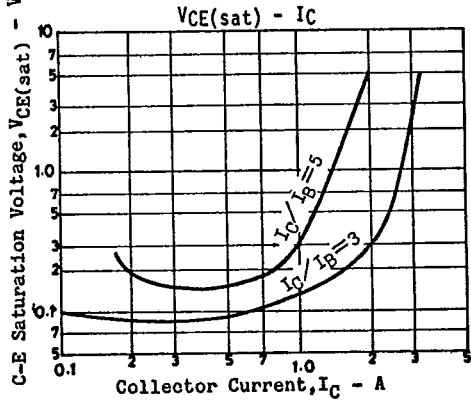
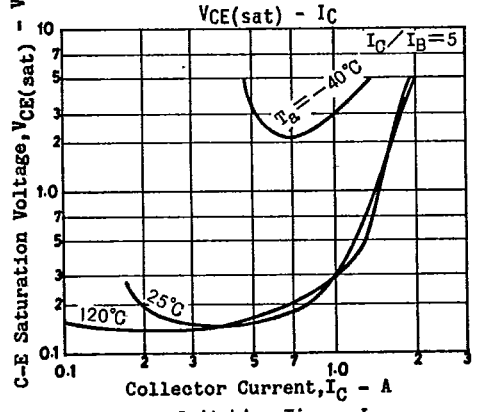
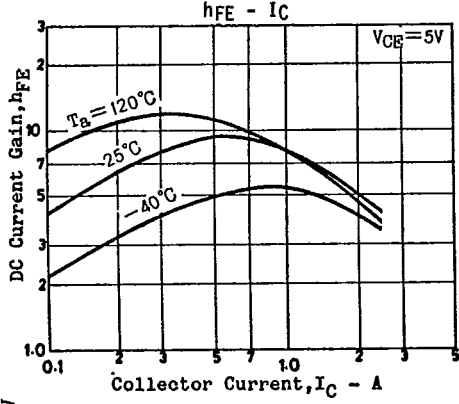
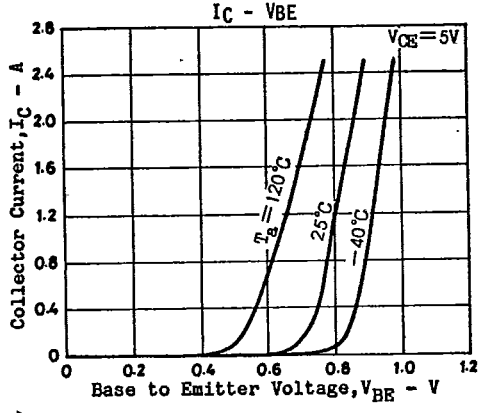
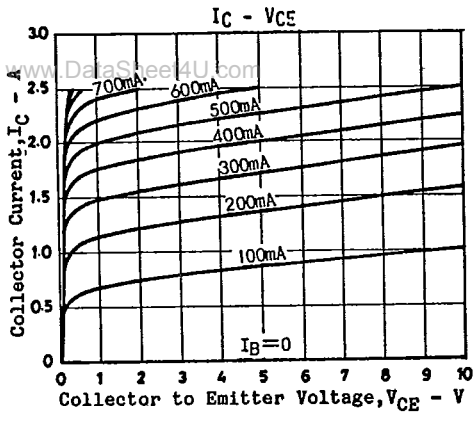


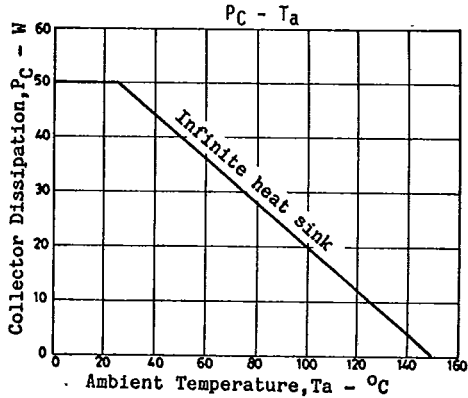
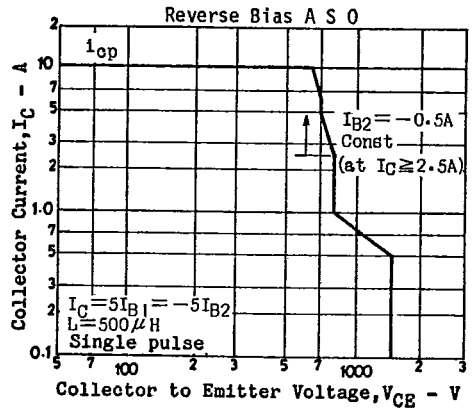
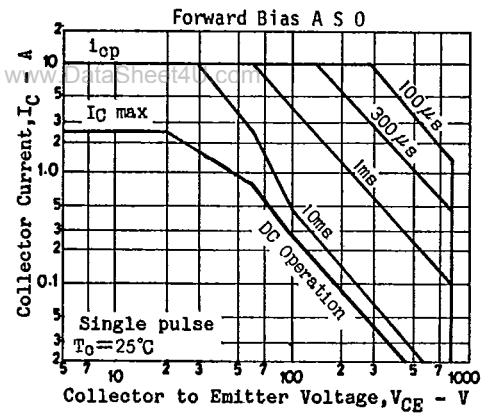
Case Outline 2039 (unit:mm)



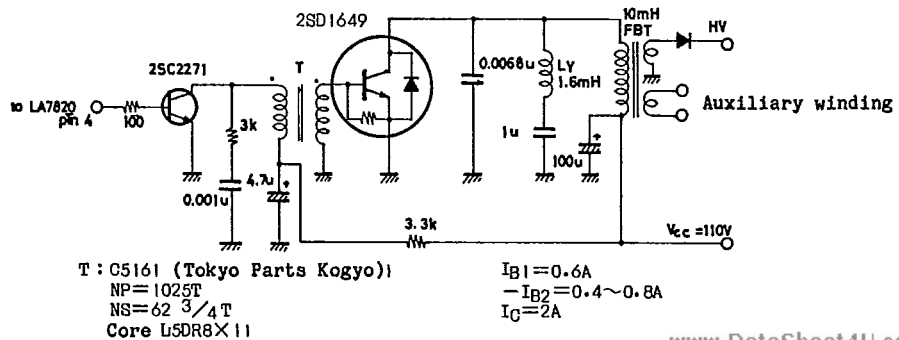
E: Emitter
C: Collector
B: Base
SANYO:TO3PML

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Sample Application Circuit



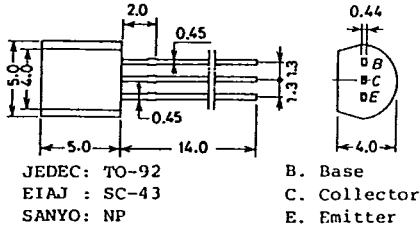
CASE OUTLINES AND ATTACHMENTS

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- 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.

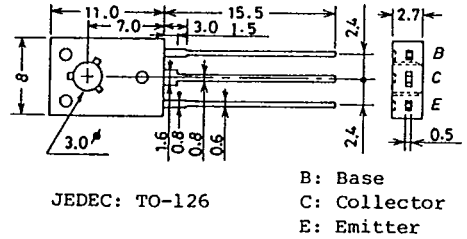
Case Outline—[2003A]

unit:mm



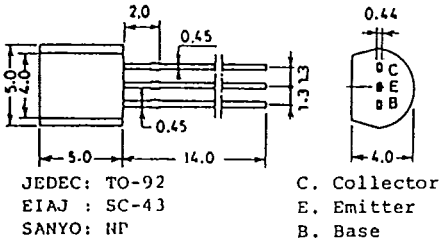
Case Outline—[2009A]

unit:mm



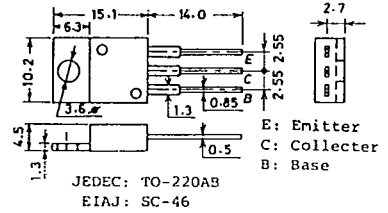
Case Outline—[2004A]

unit:mm



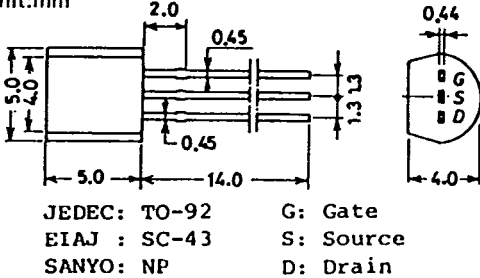
Case Outline—[2010A]

unit:mm



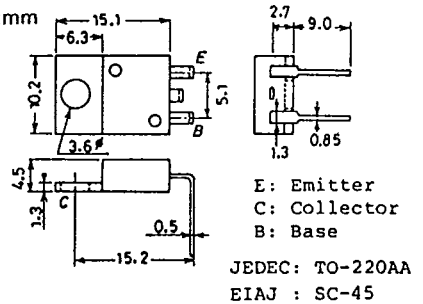
Case Outline—[2005A]

unit:mm



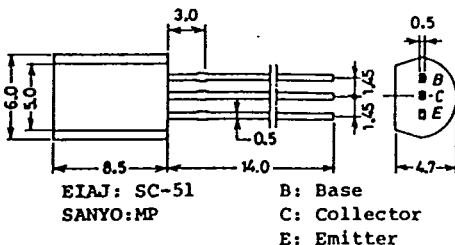
Case Outline—[2012]

unit:mm



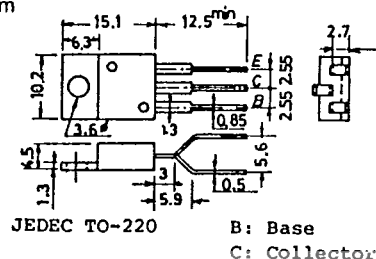
Case Outline—[2006A]

unit:mm



Case Outline—[2013]

unit:mm

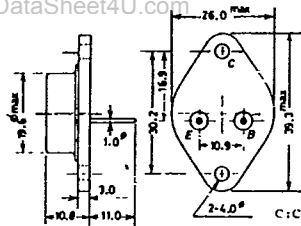


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Case Outline—[2017]

unit:mm

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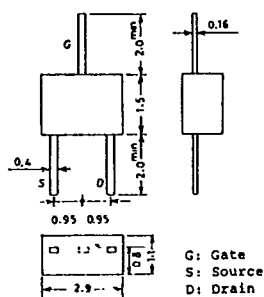
EIAJ TC-3,TR-3
JEDEC TO-3

C:Collector
E:Emitter
B:Base

Case Outline—[2025]

unit:mm

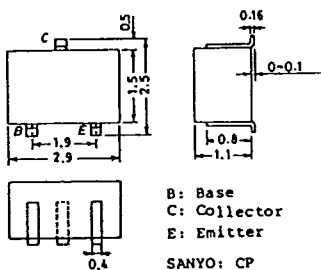
T=91-20



G: Gate
S: Source
D: Drain

Case Outline—[2018A]

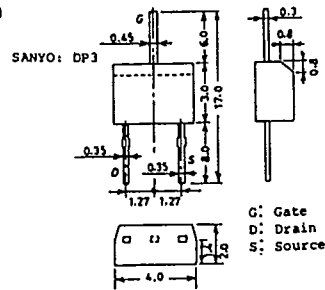
unit:mm



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

Case Outline—[2026]

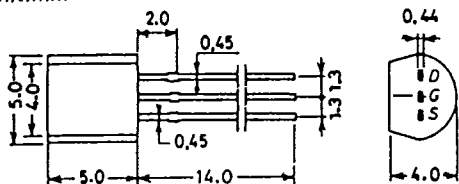
unit:mm



C: Gate
D: Drain
S: Source

Case Outline—[2019A]

unit:mm

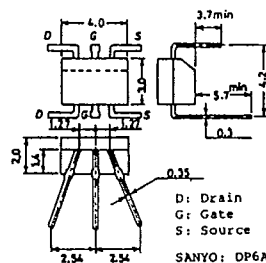


JEDEC: TO-92
EIAJ: SC-43
SANYO: NP

D: Drain
G: Gate
S: Source

Case Outline—[2027A]

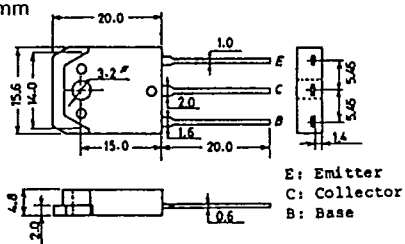
unit:mm



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

Case Outline—[2022]

unit:mm

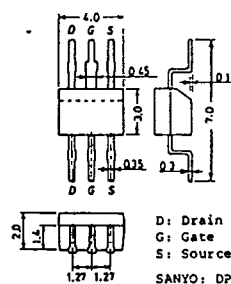


E: Emitter
C: Collector
B: Base

SANYO: TO3PB

Case Outline—[2028A]

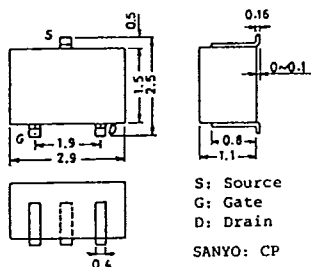
unit:mm



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

Case Outline—[2024A]

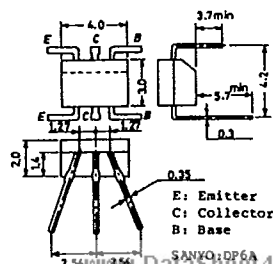
unit:mm



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

Case Outline—[2029A]

unit:mm

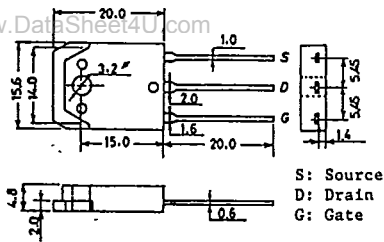


E: Emitter
C: Collector
B: Base
SANYO: DP6A

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Case Outline-[2056] unit:mm

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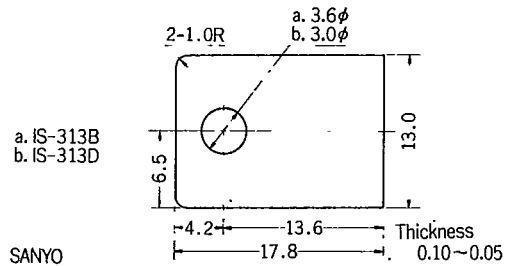


S: Source
D: Drain
G: Gate

SANYO: TO3PB

Case Outline-[0008]

unit:mm



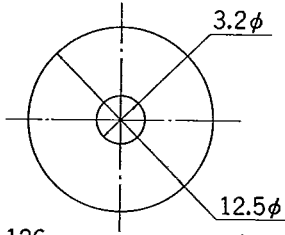
a. IS-313B
b. IS-313D

SANYO

T-91-20

Case Outline-[0004]

unit:mm

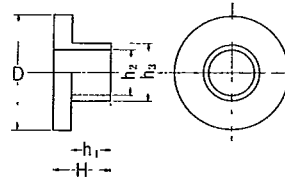


SANYO IS-126

Thickness : 0.075

Case Outline-[0009]

unit:mm

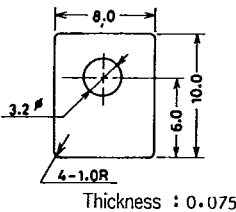


SANYO Bush

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

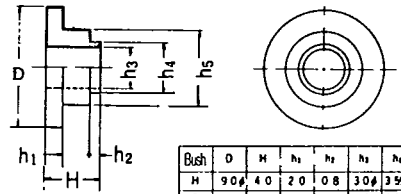


Thickness : 0.075

SANYO IS-126A Mica

Case Outline-[0010]

unit:mm

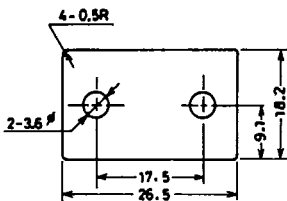


SANYO Bush

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

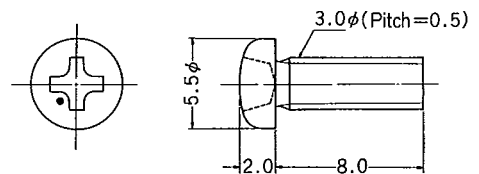


Thickness : 0.05~0.1

SANYO IS-20MA Mica

Case Outline-[0011]

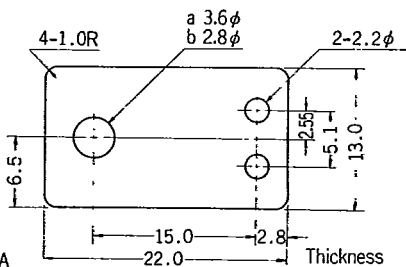
unit:mm



JIS No. B1111 M3×0.5

Case Outline-[0007]

unit:mm

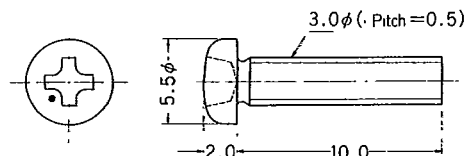


a. IS-313
b. IS-313A

Thickness
0.10~0.05

Case Outline-[0012]

unit:mm



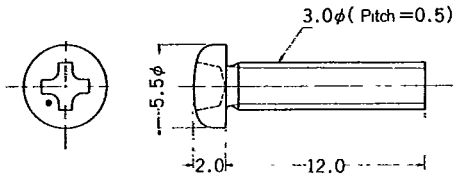
JIS No. B1111 M3×0.5

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Case Outline—[0013]

unit:mm

www.DataSheet4U.com

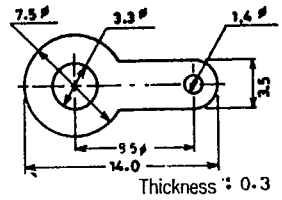


JIS No. B1111 M3X0.5

Case Outline—[0018]

unit:mm

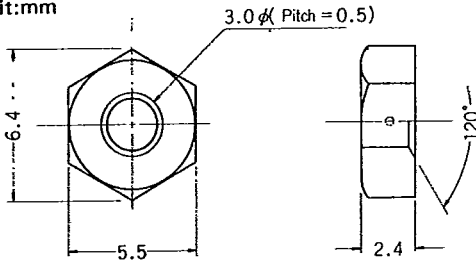
T-91-20



SANYO Lug 1.4

Case Outline—[0014]

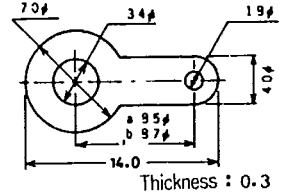
unit:mm



JIS No. B1181 M3X0.5

Case Outline—[0019]

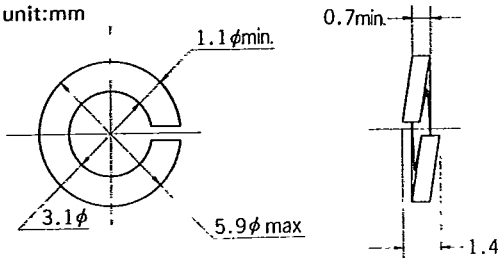
unit:mm



SANYO Lug 1.8φ

Case Outline—[0015]

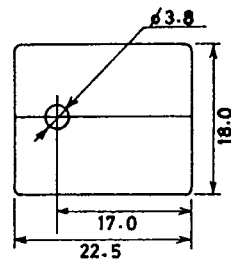
unit:mm



JIS No. B 1251 Spring washer (M3)

Case Outline—[0020]

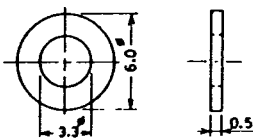
unit:mm



SANYO IS-3MP Mica

Case Outline—[0016]

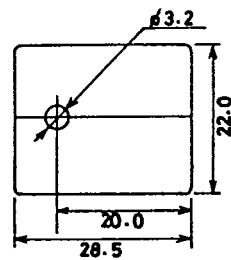
unit:mm



JIS No. B1252 Flat washer

Case Outline—[0021]

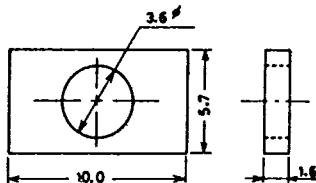
unit:mm



SANYO IS-MPC Mica

Case Outline—[0017]

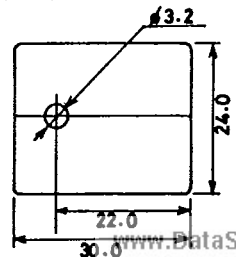
unit:mm



JIS No. G3141 Rectangular washer

Case Outline—[0022]

unit:mm



SANYO IS-3PBL Mica

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