

2SD1399

2022

NPN Triple Diffused Planar
Silicon Transistor

T-33-13

©1225C

Color TV Horizontal Deflection Output Applications (with Damper Diode)

Features:

- High Breakdown Voltage and High Reliability.
- High Switching Speed.
- Capable of being mounted easily due to one-point fixing type plastics mold package.

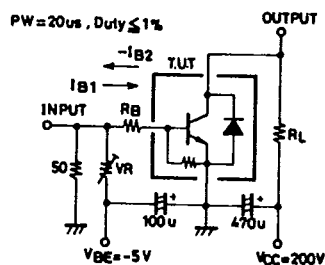
Absolute Maximum Ratings at $T_a=25^\circ\text{C}$

			unit
Collector to Base Voltage	V_{CB0}	1500	V
Collector to Emitter Voltage	V_{CE0}	800	V
Emitter to Base Voltage	V_{EB0}	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	$^\circ\text{C}$

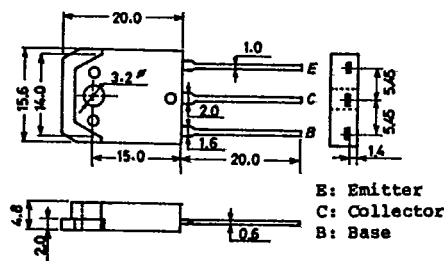
Electrical Characteristics at $T_a=25^\circ\text{C}$

			min	typ	max	unit
Collector Cutoff Current	I_{CBO}	$V_{CB}=800\text{V}, I_E=0$			10	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB}=4\text{V}, I_C=0$	40		130	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	$V_{(BR)CEO}$	$I_C=100\text{mA}, R_{BE}=\infty$	800			V
E-B Breakdown Voltage	$V_{(BR)EBO}$	$I_E=200\text{mA}, I_C=0$	7			V
Diode Forward Voltage	V_F	$I_{EC}=6\text{A}$			2	V
Fall Time	t_f	$I_C=5\text{A}, I_{B1}=1\text{A}, I_{B2}=-2\text{A}$ $V_{CC}=200\text{V}, R_L=40\text{ohm}$			0.4	μs

Switching Time Test Circuit

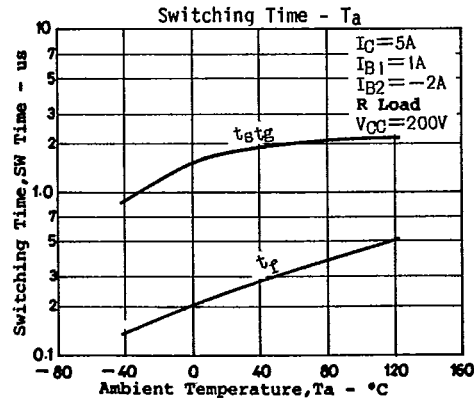
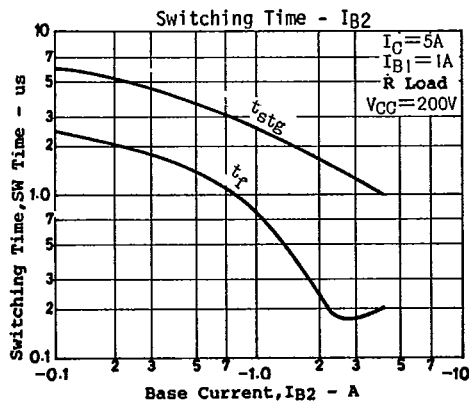
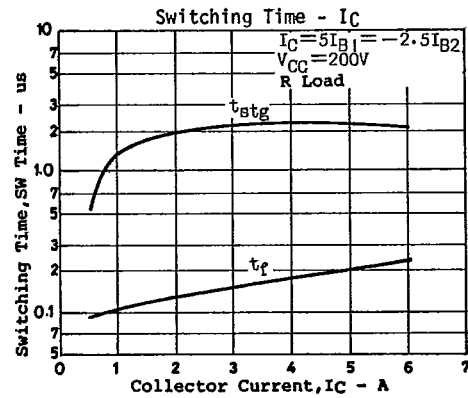
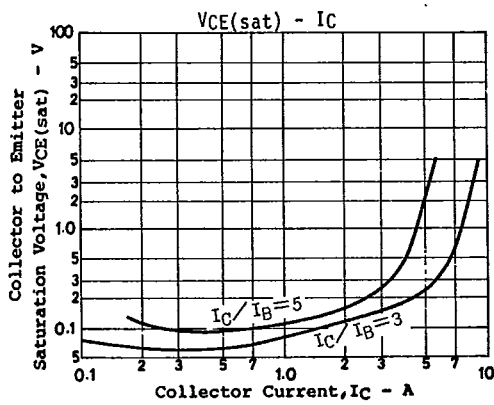
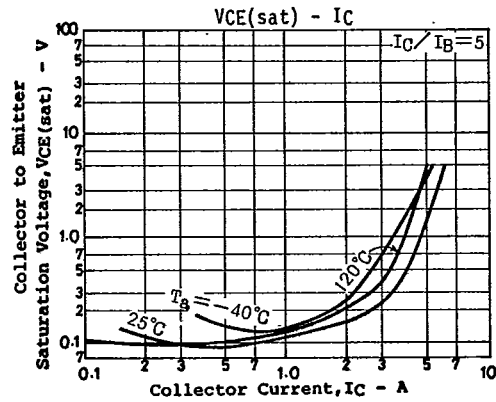
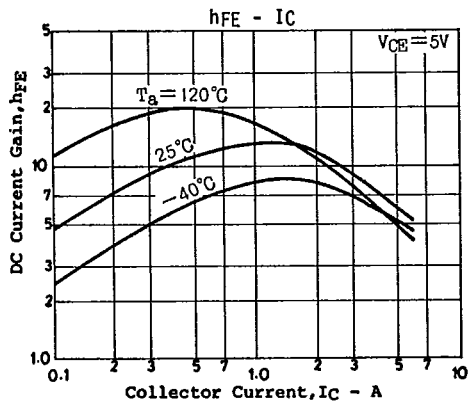
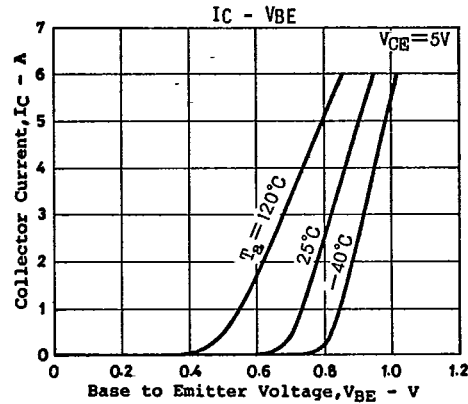
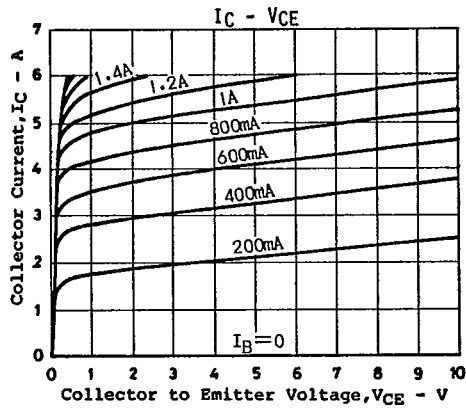


Case Outline 2022 (unit:mm)



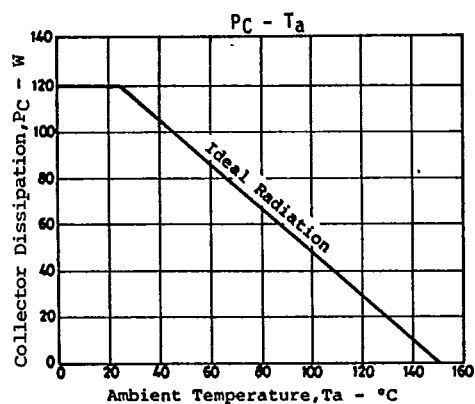
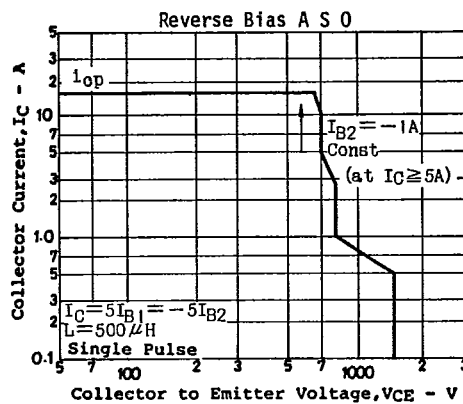
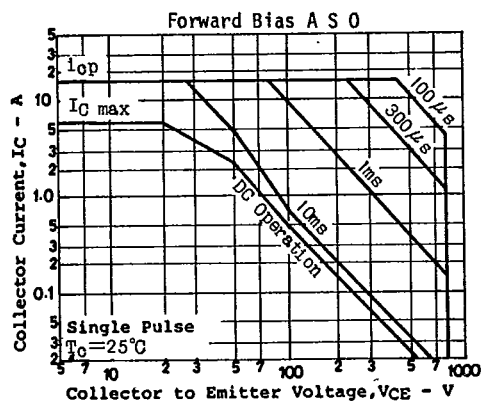
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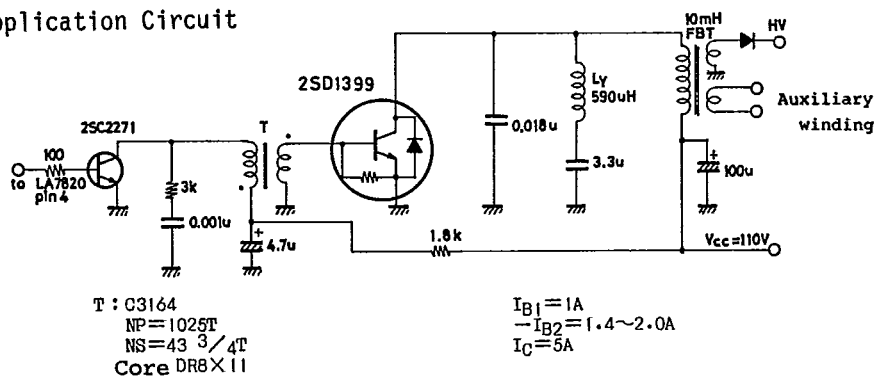


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Sample Application Circuit



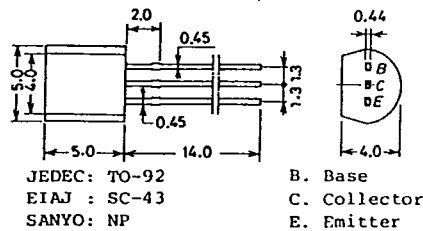
T-91-20

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.

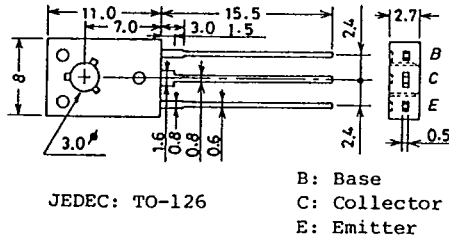
Case Outline—[2003A]

unit:mm



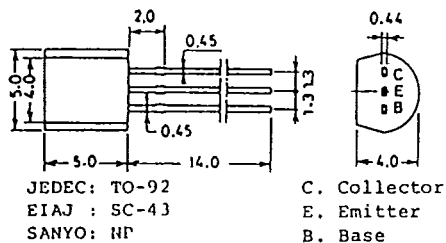
Case Outline—[2009A]

unit:mm



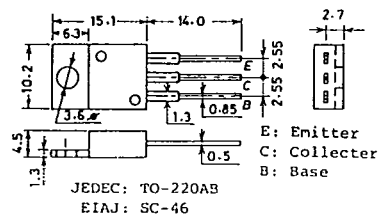
Case Outline—[2004A]

unit:mm



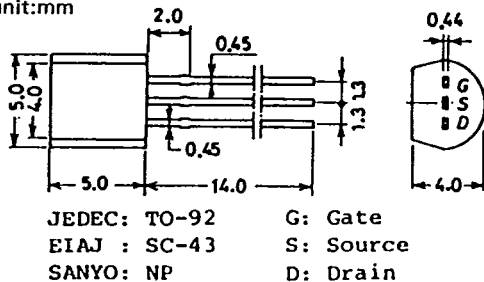
Case Outline—[2010A]

unit:mm



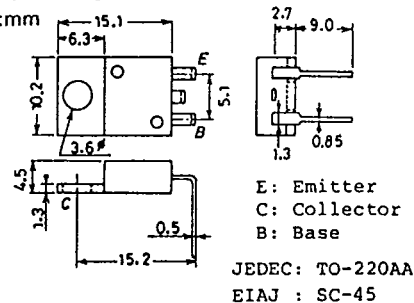
Case Outline—[2005A]

unit:mm



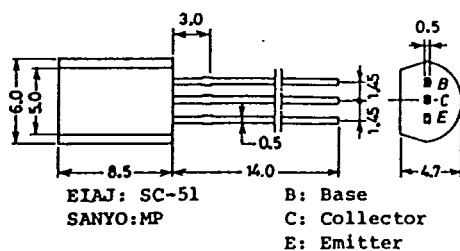
Case Outline—[2012]

unit:mm



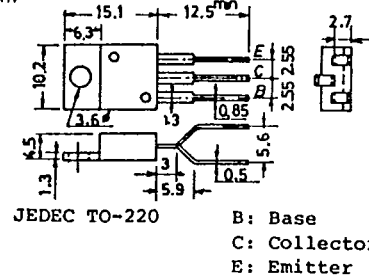
Case Outline—[2006A]

unit:mm

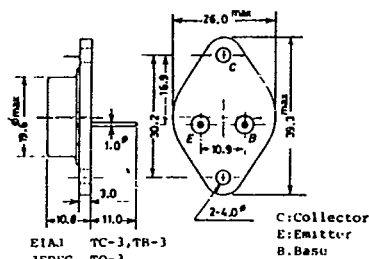


Case Outline—[2013]

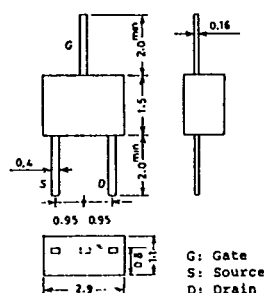
unit:mm



unit:mm

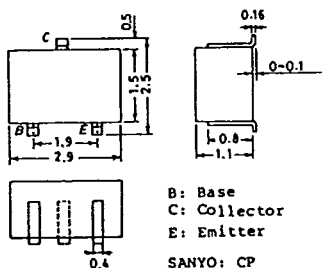


unit:mm

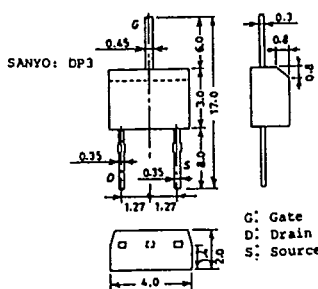


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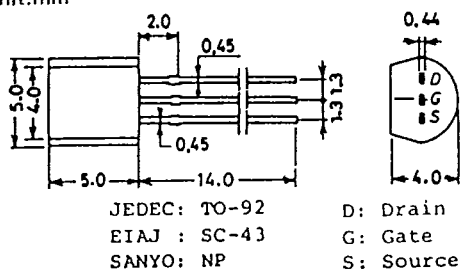
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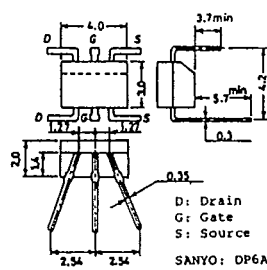
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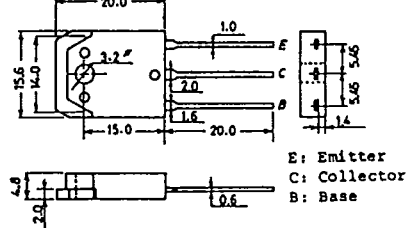
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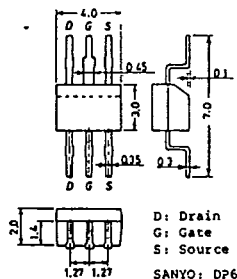
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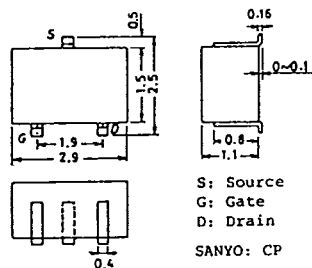
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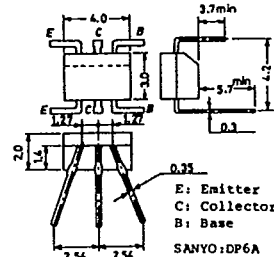
unit:mm



unit:mm



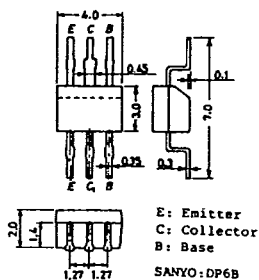
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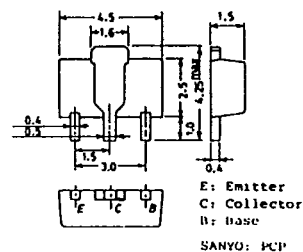
Case Outline—[2030A]

unit:mm



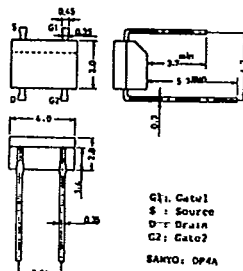
Case Outline—[2038]

unit:mm



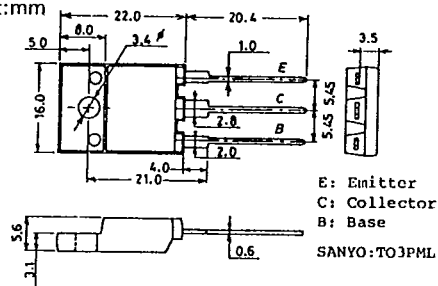
Case Outline—[2031A]

unit:mm



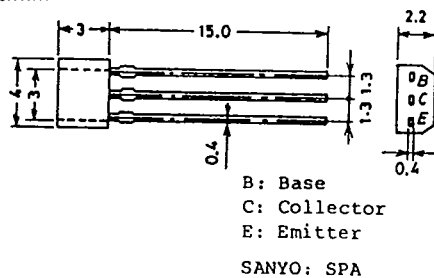
Case Outline—[2039]

unit:mm



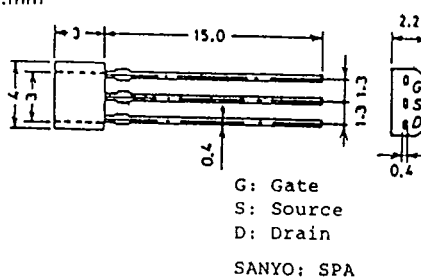
Case Outline—[2033]

unit:mm



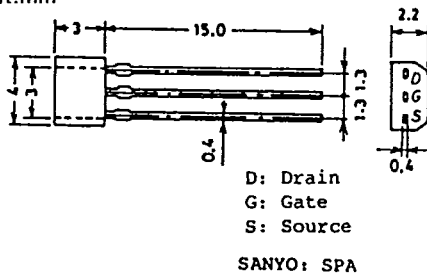
Case Outline—[2040]

unit:mm



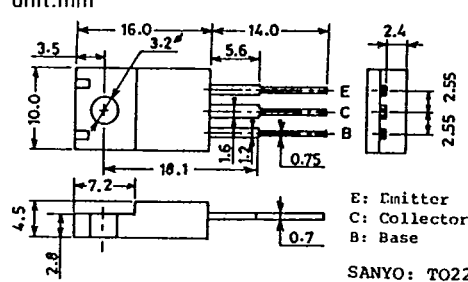
Case Outline—[2034]

unit:mm



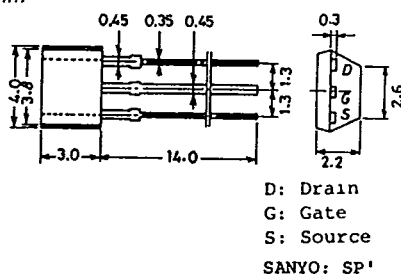
Case Outline—[2041]

unit:mm

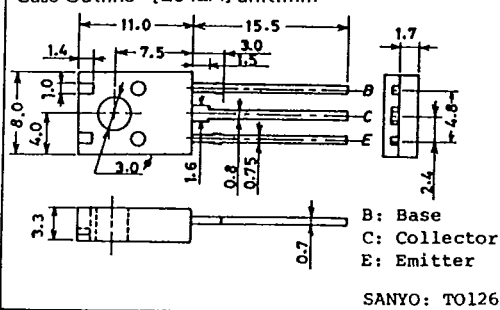


Case Outline—[2037]

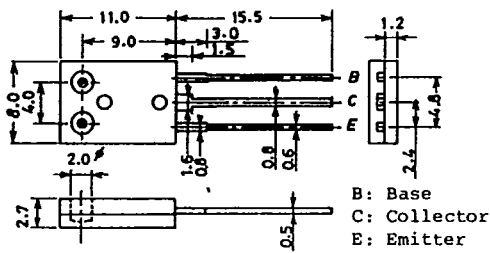
unit:mm



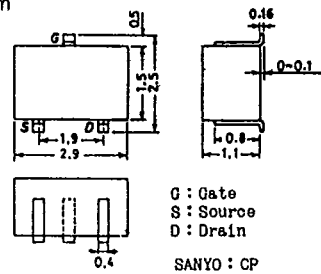
Case Outline—[2042A] unit:mm



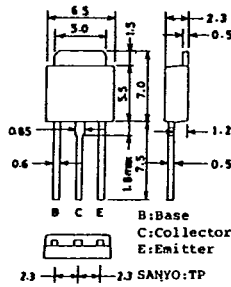
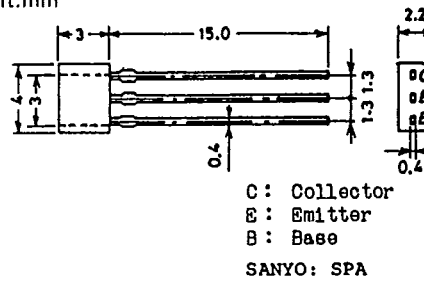
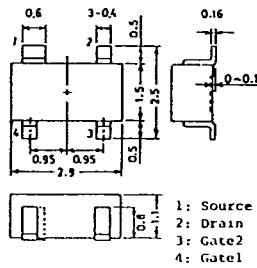
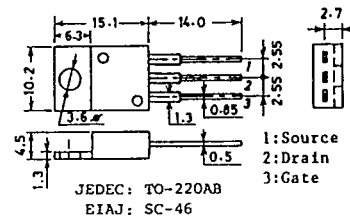
Case Outline—[2043A] unit:mm



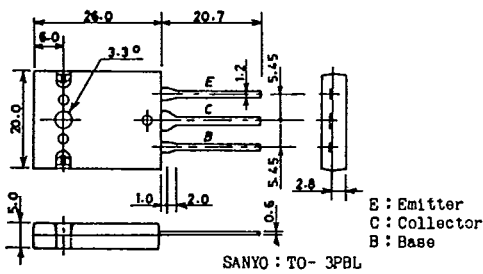
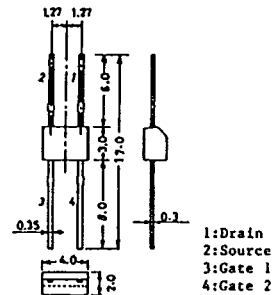
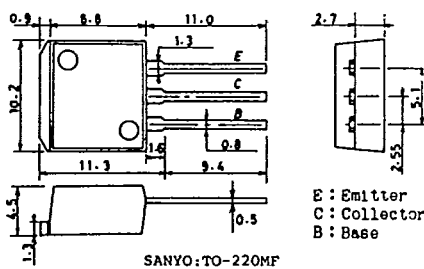
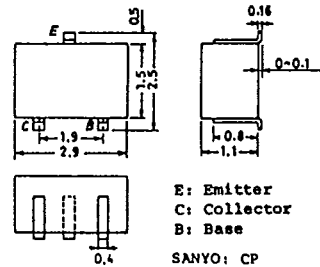
SANYO: TO126LP

Case Outline—[2050]
unit:mm

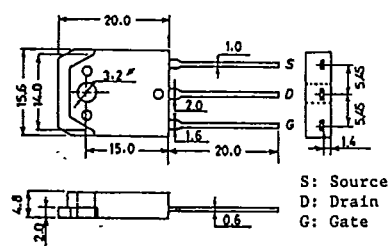
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Case Outline—[2045]
unit:mmCase Outline—[2051]
unit:mmCase Outline—[2046]
unit:mmCase Outline—[2052A]
unit:mm

Case Outline—[2048] unit:mm

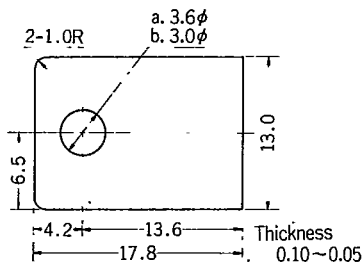
Case Outline—[2053]
unit:mmCase Outline—[2049]
unit:mmCase Outline—[2054]
unit:mm

Case Outline—[2056] unit:mm



SANYO: TO3PB

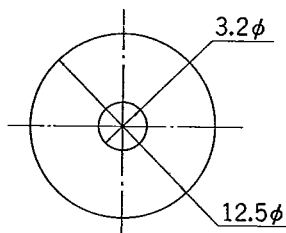
Case Outline—[0008] unit:mm

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

SANYO

Case Outline—[0004] unit:mm

unit:mm

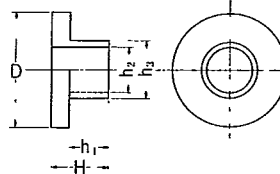


SANYO IS-126

Thickness : 0.075

Case Outline—[0009] unit:mm

unit:mm

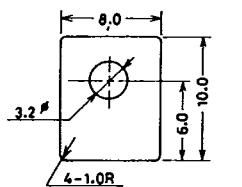


SANYO Bush

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

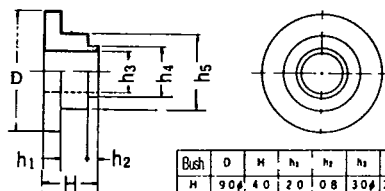


Thickness : 0.075

SANYO IS-126A Mica

Case Outline—[0010] unit:mm

unit:mm

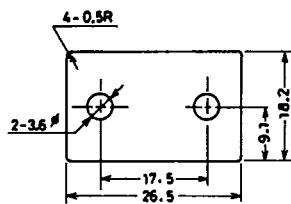


SANYO Bush

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

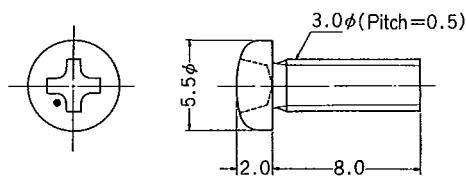


Thickness : 0.05~0.1

SANYO IS-20MA Mica

Case Outline—[0011] unit:mm

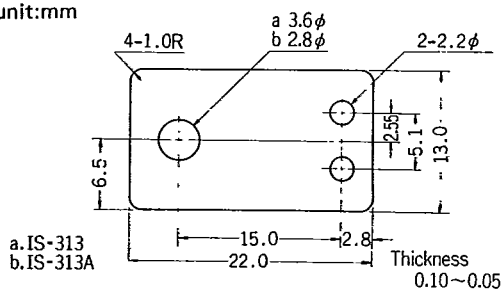
unit:mm



JIS No. B1111 M3×0.5

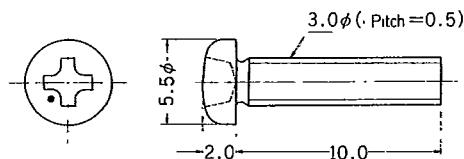
Case Outline—[0007] unit:mm

unit:mm



Case Outline—[0012] unit:mm

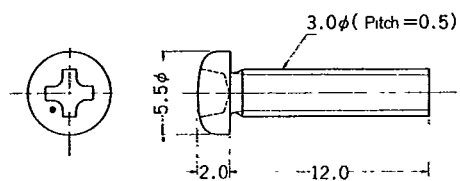
unit:mm



JIS No. B1111 M3×0.5

Case Outline—[0013]

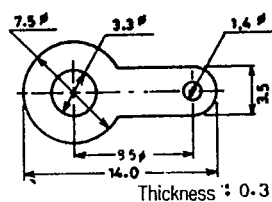
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JIS No. B1111 M3×0.5

Case Outline—[0018]

unit:mm

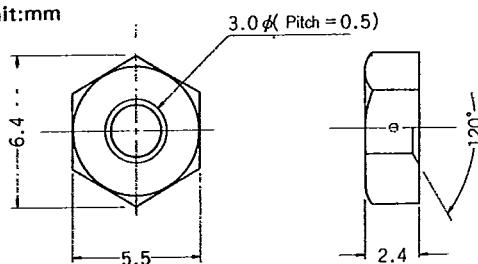


SANYO Lug 1.4

T=91-20

Case Outline—[0014]

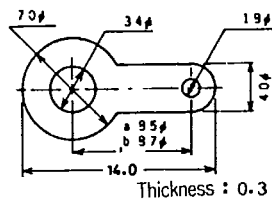
unit:mm



JIS No. B1181 M3×0.5

Case Outline—[0019]

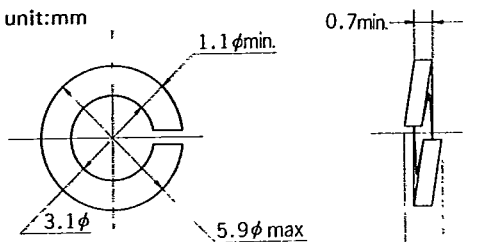
unit:mm



SANYO Lug 1.8φ

Case Outline—[0015]

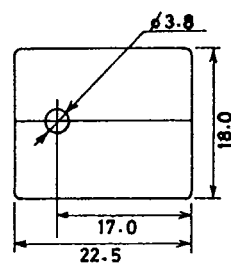
unit:mm



JIS No. B 1251 Spring washer (M3)

Case Outline—[0020]

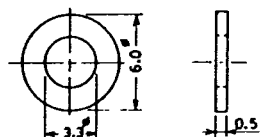
unit:mm



SANYO IS-3MP Mica

Case Outline—[0016]

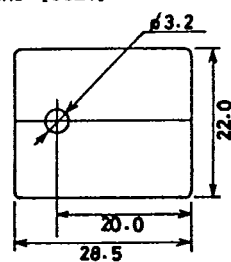
unit:mm



JIS No. B1252 Flat washer

Case Outline—[0021]

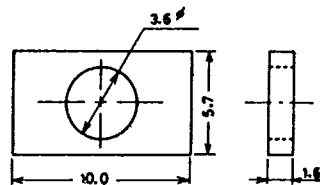
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SANYO IS-MPC Mica

Case Outline—[0017]

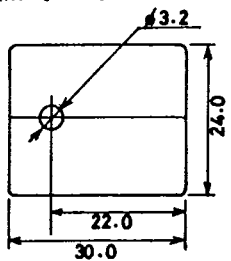
unit:mm



JIS No. G3141 Rectangular washer

Case Outline—[0022]

unit:mm



SANYO IS-3PBL Mica