T-33-11

2SD1649



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 ($t_f$max=0.4us).
. High reliability (Adoption of HVP process).
. High breakdown voltage (V_{CBO}=1500V).
. Micaless package facilitating mounting operation.

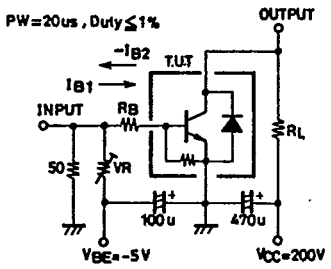
Absolute Maximum Ratings at Ta=25°C

				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	T_C=25°C	50	W
Junction Temperature	Tj		150	°C
Storage Temperature	Tstg		-55 to +150	°C

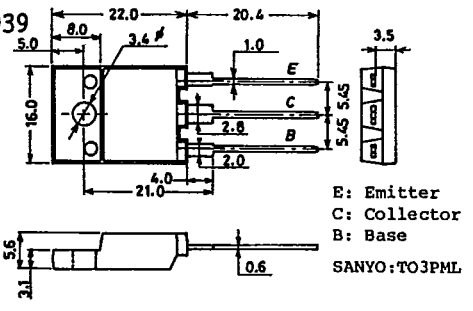
Electrical Characteristics at Ta=25°C

			min	typ	max	unit
Collector Cutoff Current	I_{CBO}	V_{CB}=800V,I_E=0			10	uA
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}=∞	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=100ohm			0.4	us

Switching Time Test Circuit



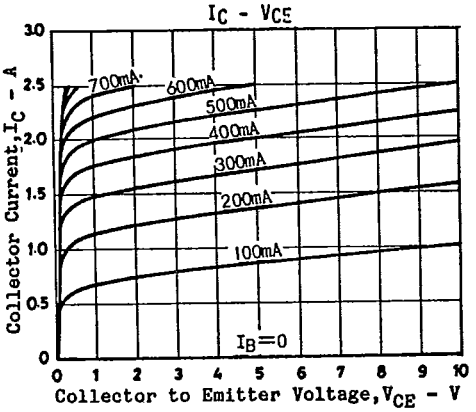
Case Outline 2039 (unit:mm)



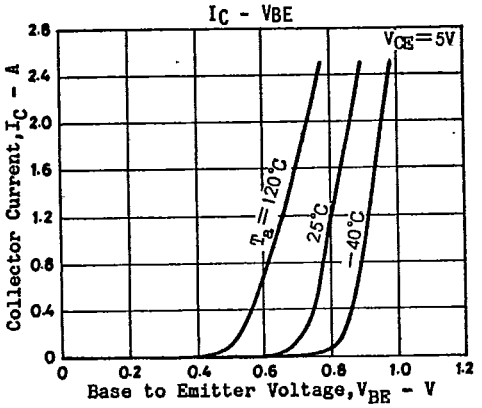
E: Emitter
C: Collector
B: Base
SANYO:TO3PML

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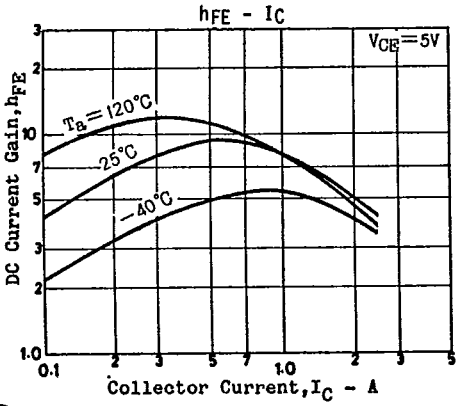
I_C - V_{CE}



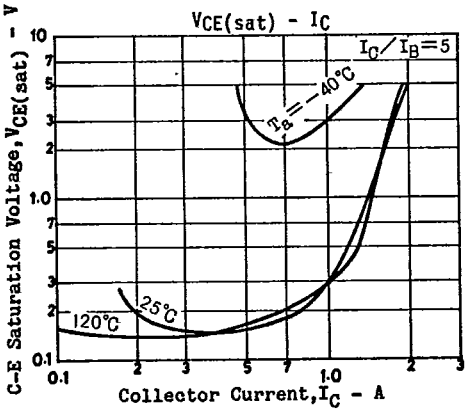
I_C - V_{BE}



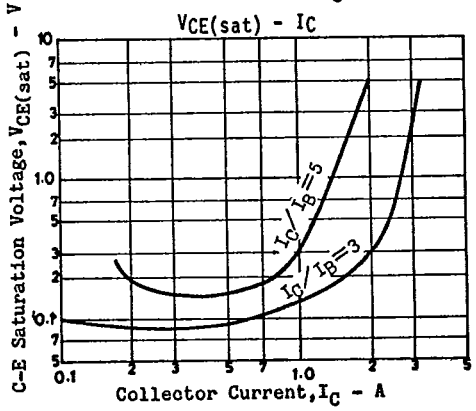
h_{FE} - I_C



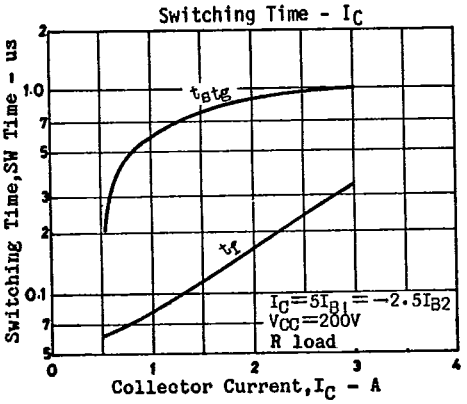
$V_{CE(sat)}$ - I_C



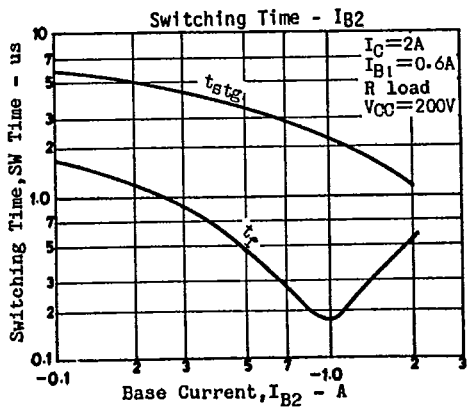
$V_{CE(sat)}$ - I_C



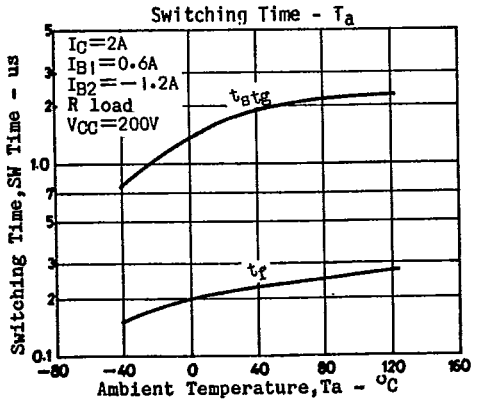
Switching Time - I_C



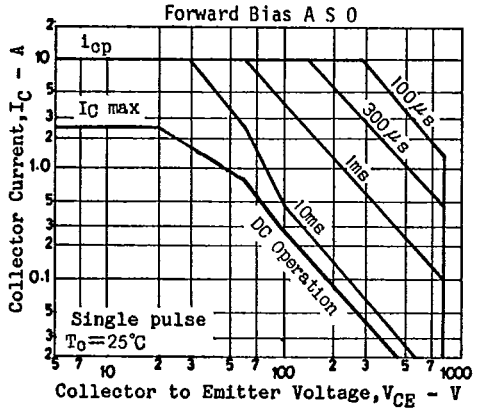
Switching Time - I_{B2}

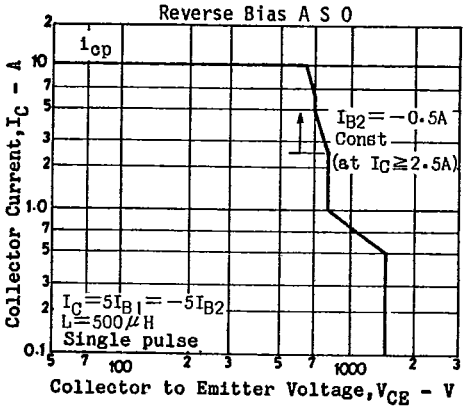


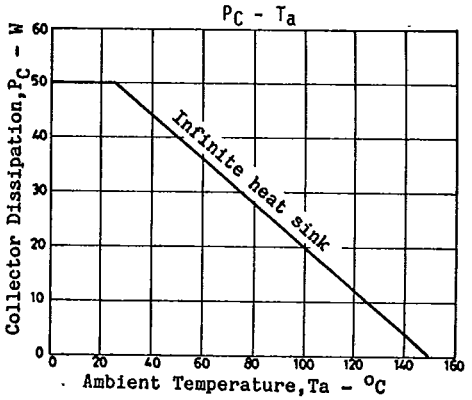
Switching Time - T_a



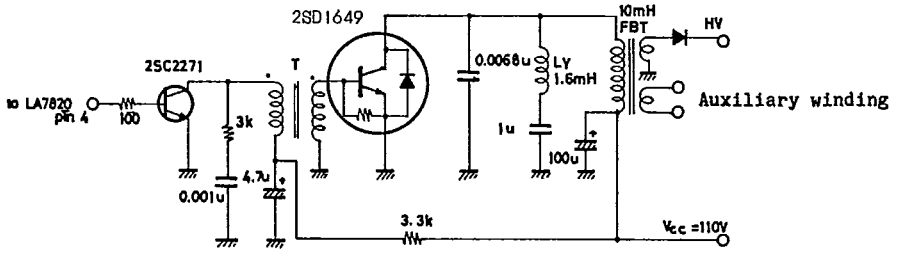
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Sample Application Circuit



T : C5161 (Tokyo Parts Kogyo)
NP=1025T
NS=62 3/4T
Core L5DR8×11

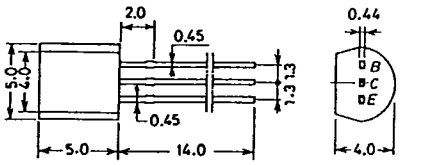
I_{B1}=0.6A
$-I_{B2}$=0.4~0.8A
I_C=2A

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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.

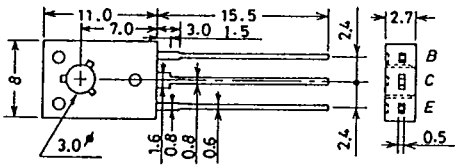
Case Outline—[2003A]
unit:mm



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

B. Base
C. Collector
E. Emitter

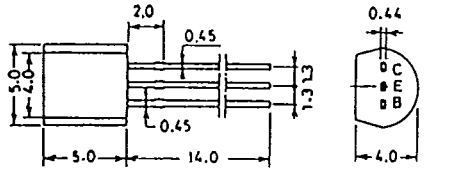
Case Outline—[2009A]
unit:mm



JEDEC: TO-126

B: Base
C: Collector
E: Emitter

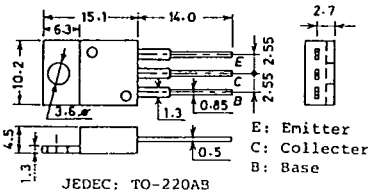
Case Outline—[2004A]
unit:mm



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

C. Collector
E. Emitter
B. Base

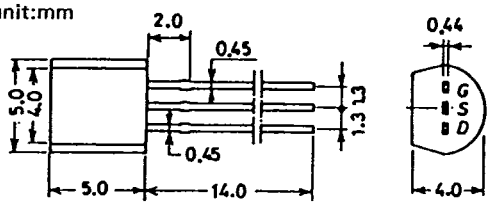
Case Outline—[2010A]
unit:mm



JEDEC: TO-220AB
EIAJ: SC-46

E: Emitter
C: Collecter
B: Base

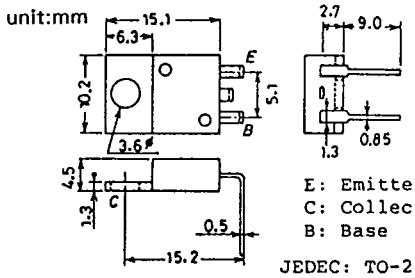
Case Outline—[2005A]
unit:mm



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

G: Gate
S: Source
D: Drain

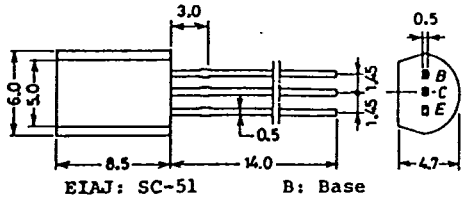
Case Outline—[2012]
unit:mm



E: Emitter
C: Collector
B: Base

JEDEC: TO-220AA
EIAJ : SC-45

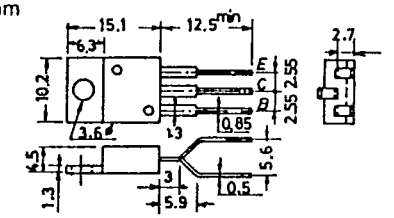
Case Outline—[2006A]
unit:mm



EIAJ: SC-51
SANYO:MP

B: Base
C: Collector
E: Emitter

Case Outline—[2013]
unit:mm



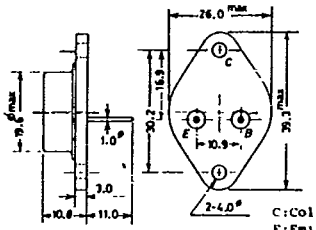
JEDEC TO-220

B: Base
C: Collector
E: Emitter

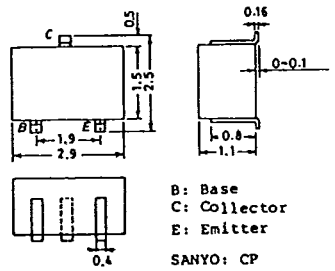
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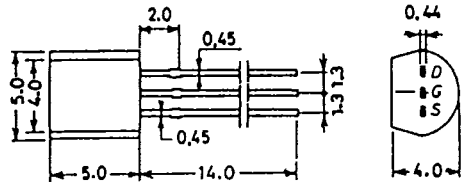
Case Outline—[2017]
unit:mm



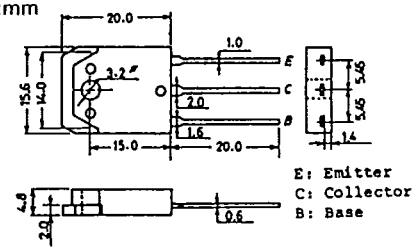
Case Outline—[2018A]
unit:mm



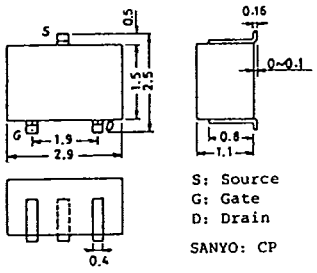
Case Outline—[2019A]
unit:mm



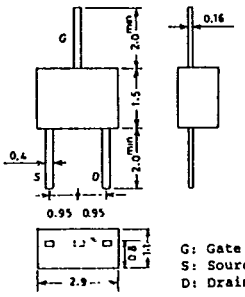
Case Outline—[2022]
unit:mm



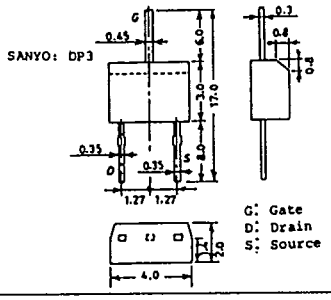
Case Outline—[2024A]
unit:mm



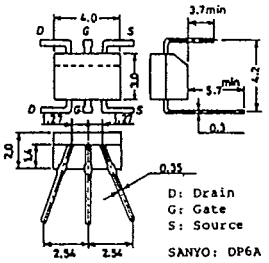
Case Outline—[2025]
unit:mm



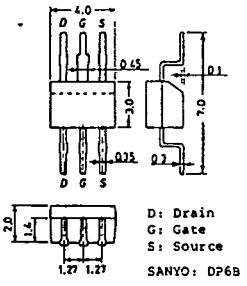
Case Outline—[2026]
unit:mm



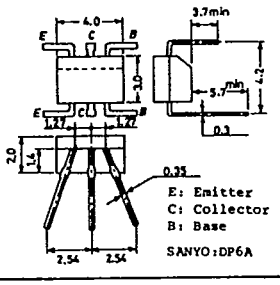
Case Outline—[2027A]
unit:mm



Case Outline—[2028A]
unit:mm



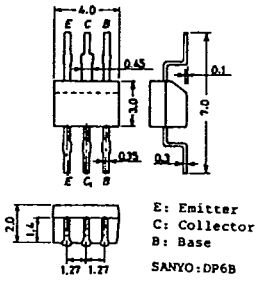
Case Outline—[2029A]
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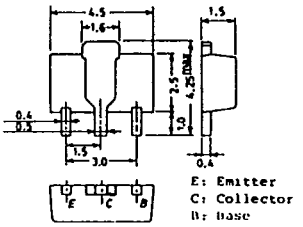
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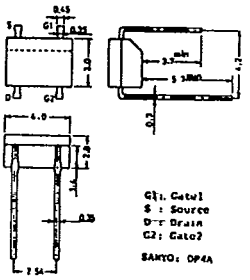
Case Outline—[2030A]
unit:mm



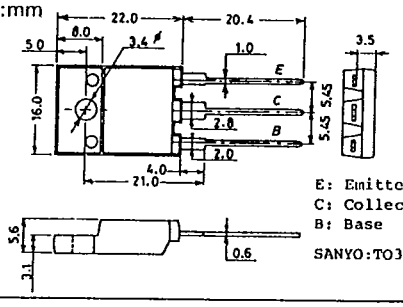
Case Outline—[2038]
unit:mm



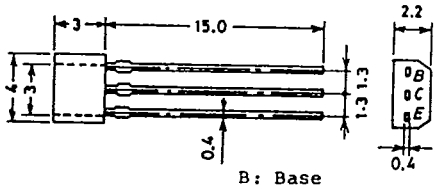
Case Outline—[2031A]
unit:mm



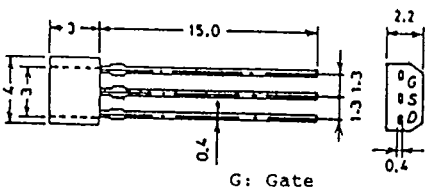
Case Outline—[2039]
unit:mm



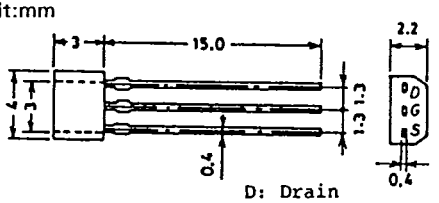
Case Outline—[2033]
unit:mm



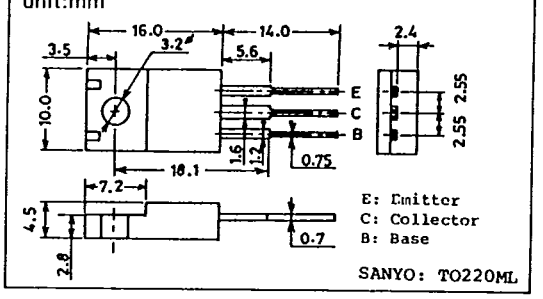
Case Outline—[2040]
unit:mm



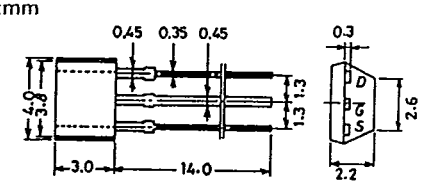
Case Outline—[2034]
unit:mm



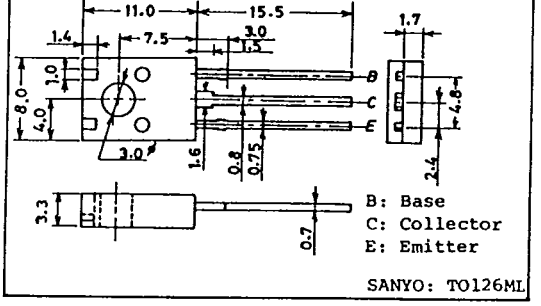
Case Outline—[2041]
unit:mm



Case Outline—[2037]
unit:mm



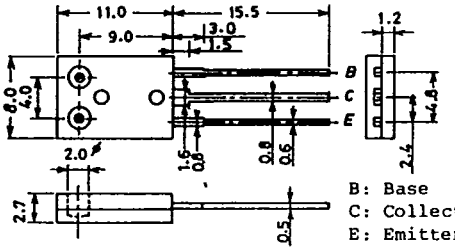
Case Outline—[2042A] unit:mm



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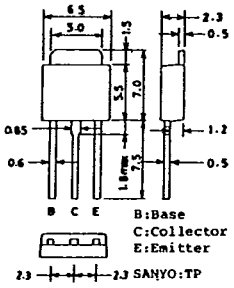
T-91-20

Case Outline—[2043A] unit:mm

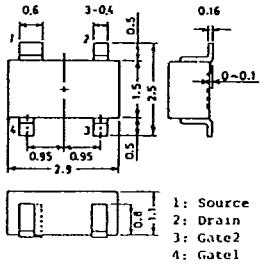


SANYO: TO126LP

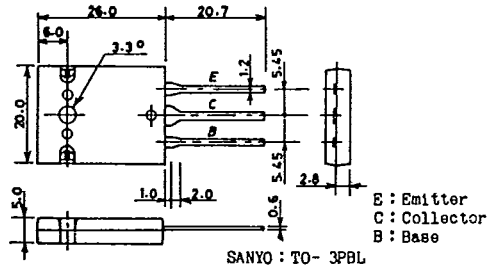
Case Outline—[2045] unit:mm



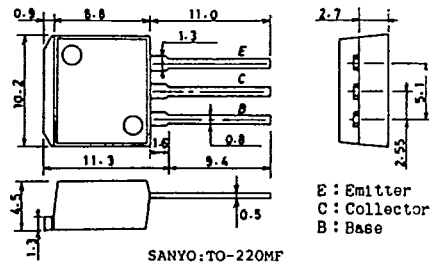
Case Outline—[2046] unit:mm



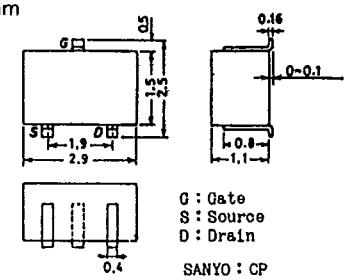
Case Outline—[2048] unit:mm



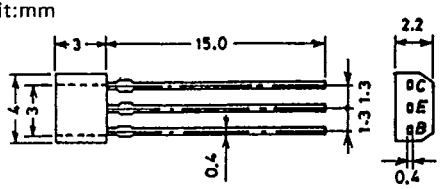
Case Outline—[2049] unit:mm



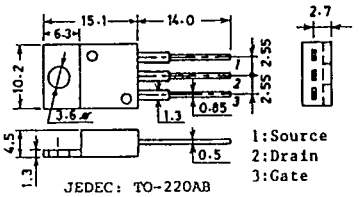
Case Outline—[2050] unit:mm



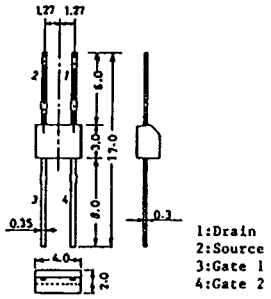
Case Outline—[2051] unit:mm



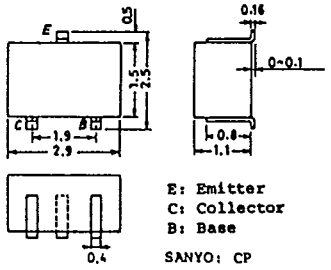
Case Outline—[2052A] unit:mm



Case Outline—[2053] unit:mm



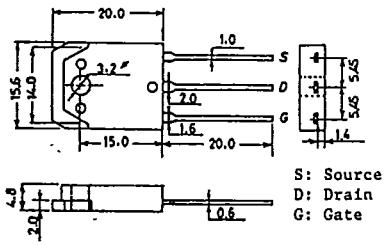
Case Outline—[2054] unit:mm



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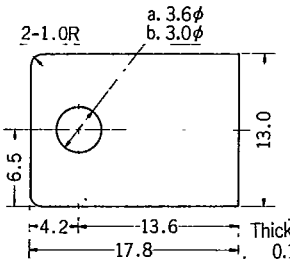
T-91-20

Case Outline—[2056] unit:mm



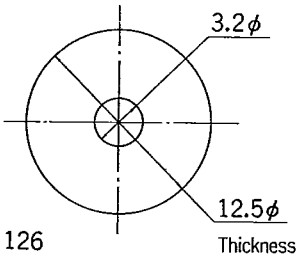
SANYO: TO3PB

Case Outline—[0008]
unit:mm



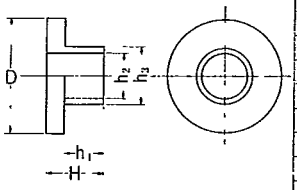
SANYO

Case Outline—[0004]
unit:mm



SANYO IS-126 Thickness : 0.075

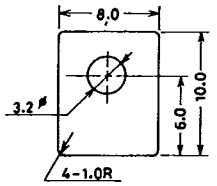
Case Outline—[0009]
unit:mm



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

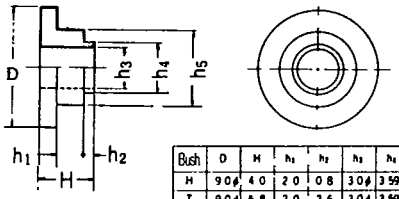
Case Outline—[0005]
unit:mm



Thickness : 0.075

SANYO IS-126A Mica

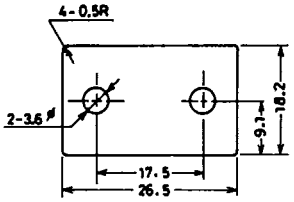
Case Outline—[0010]
unit:mm



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

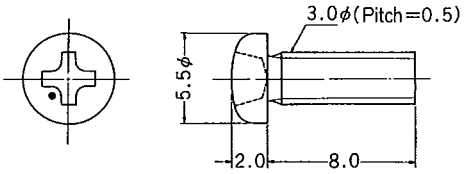
Case Outline—[0006]
unit:mm



Thickness : 0.05~0.1

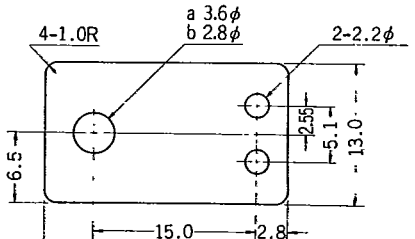
SANYO IS-20MA Mica

Case Outline—[0011]
unit:mm



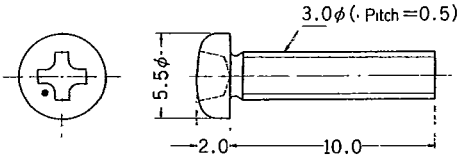
JIS No.B1111 M3×0.5

Case Outline—[0007]
unit:mm



a. IS-313
b. IS-313A

Case Outline—[0012]
unit:mm

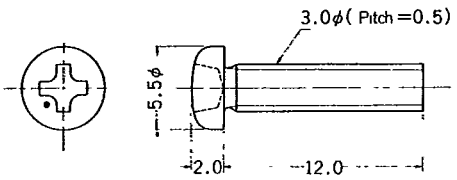


JIS No.B1111 M3×0.5

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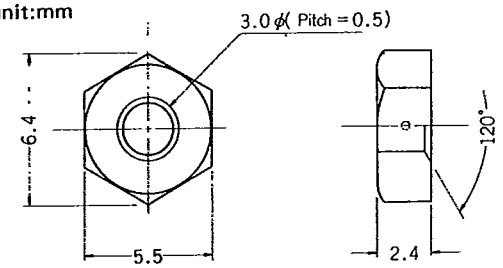
T-91-20

Case Outline—[0013]
unit:mm



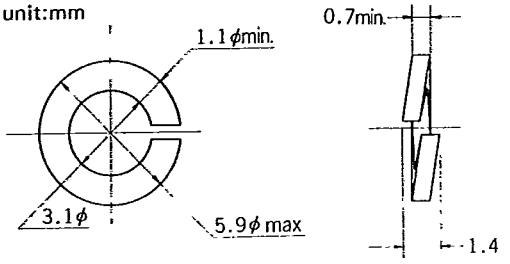
JIS No.B1111 M3×0.5

Case Outline—[0014]
unit:mm



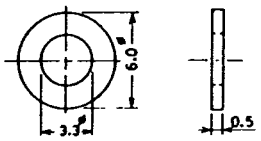
JIS No. B1181 M3×0.5

Case Outline—[0015]
unit:mm



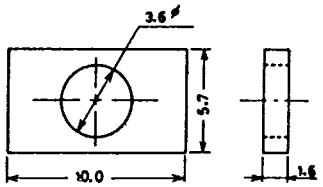
JIS No. B 1251 Spring washer (M3)

Case Outline—[0016]
unit:mm



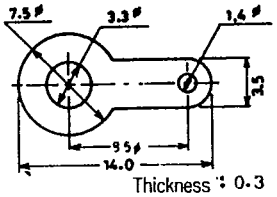
JIS No.B1252 Flat washer

Case Outline—[0017]
unit:mm



JIS No.G3141 Rectangular washer

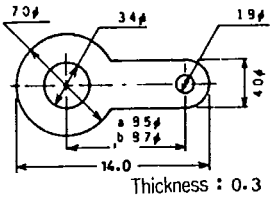
Case Outline—[0018]
unit:mm



Thickness : 0.3

SANYO Lug 1.4

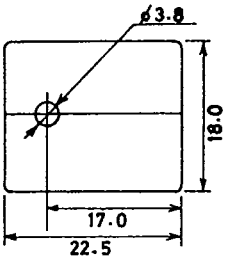
Case Outline—[0019]
unit:mm



Thickness : 0.3

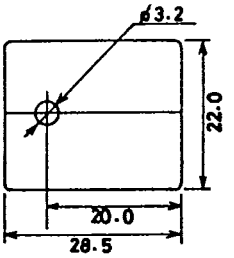
SANYO Lug 1.8φ

Case Outline—[0020]
unit:mm



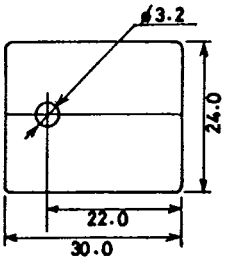
SANYO IS-3MP Mica

Case Outline—[0021]
unit:mm



SANYO IS-MPC Mica

Case Outline—[0022]
unit:mm



SANYO IS-3PBL Mica

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