

**2SD330,
331**

2010A



2012

NPN/PNP Triple Diffused Planar
Silicon Transistors

T-33-09

**2SB514,
515****Low Frequency Power Amp
Applications**

©397D

Especially suited for use in output stage of 10W AF Power amp. The only difference between B514 and D515 lies in package design; and the same is true of D330 and D331. The B514 and D330 can be connected to form a complementary pair; and the same is true of B515 and D331.

(): 2SB514, 514.

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

			unit
Collector to Base Voltage	V_{CB0}	(-)50	V
Collector to Emitter Voltage	V_{CE0}	(-)50	V
Emitter to Base Voltage	V_{EB0}	(-)5	V
Collector Current	I_C	(-)2	A
Peak Collector Current	i_{cp}	(-)5	A
Collector Dissipation	P_C	1.75	W
	$T_C=25^\circ\text{C}$	20	W
Junction Temperature	T_j	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

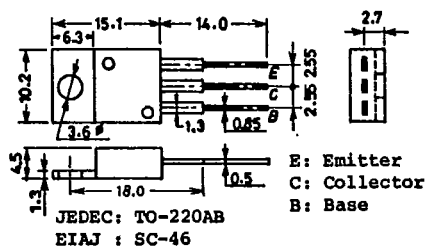
Electrical Characteristics at $T_a=25^\circ\text{C}$

			min	typ	max	unit
Collector Cutoff Current	I_{CBO}	$V_{CB}=(-)20\text{V}, I_E=0$		(-)0.1		mA
Emitter Cutoff Current	I_{EBO}	$V_{EB}=(-)4\text{V}, I_C=0$		(-)1.0		mA
DC Current Gain	$h_{FE}(1)$	$V_{CE}=(-)2\text{V}, I_C=(-)1\text{A}$	40*		320*	
	$h_{FE}(2)$	$V_{CE}=(-)2\text{V}, I_C=(-)0.1\text{A}$	35			
Gain Bandwidth Product	f_T	$V_{CE}=(-)5\text{V}, I_C=(-)0.5\text{A}$		8		MHz
C-E Saturation Voltage	$V_{CE(sat)}$	$I_C=(-)2\text{A}, I_B=(-)0.2\text{A}$		(-)1.0		V
Base to Emitter Voltage	V_{BE}	$I_C=(-)1\text{A}, V_{CE}=(-)5\text{V}$		(-)1.5		V

* The 2SB514, 515/2SD330, 331 are classified by 1A h_{FE} as follows

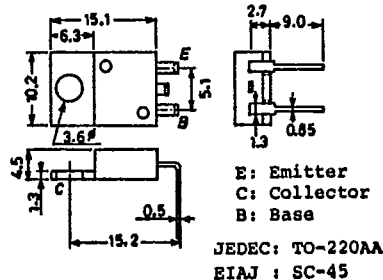
40	C	80	60	D	120	100	E	200	160	F	320
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Case Outline 2010A
(unit:mm) [2SB514/2SD330]



E: Emitter
C: Collector
B: Base

Case Outline 2012
(unit:mm) [2SB515/2SD331]



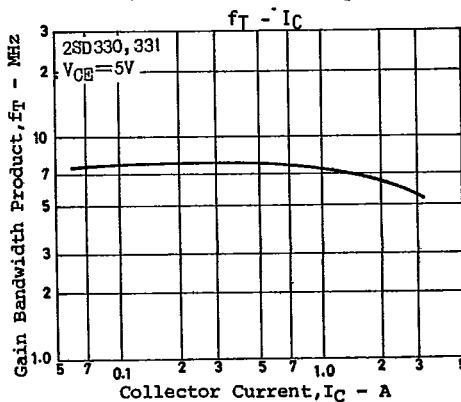
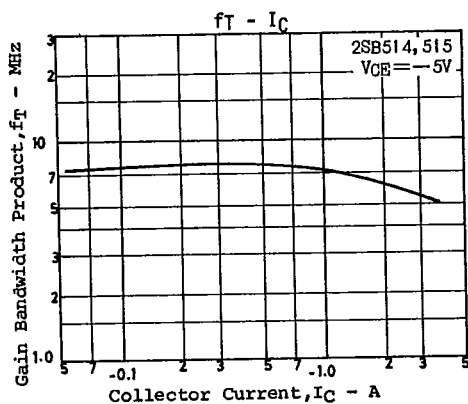
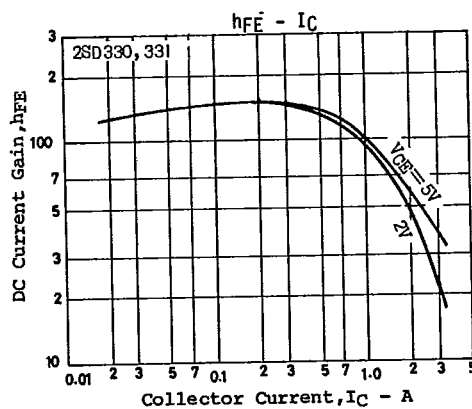
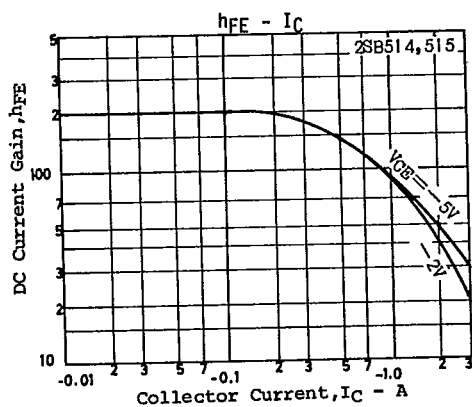
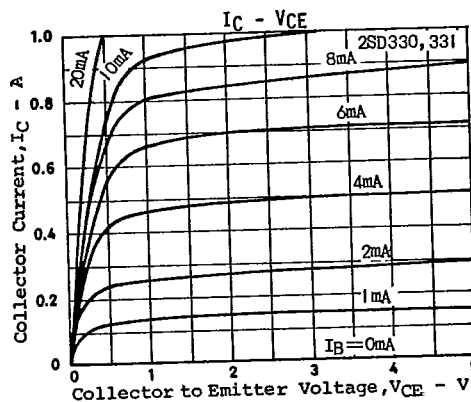
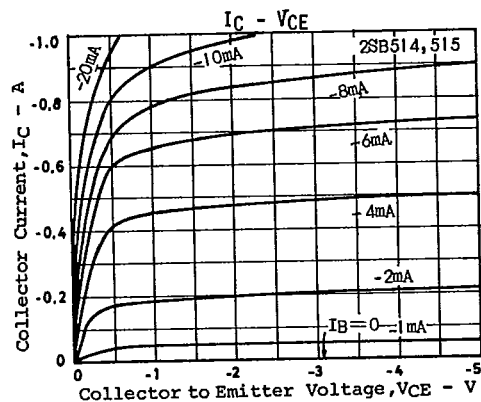
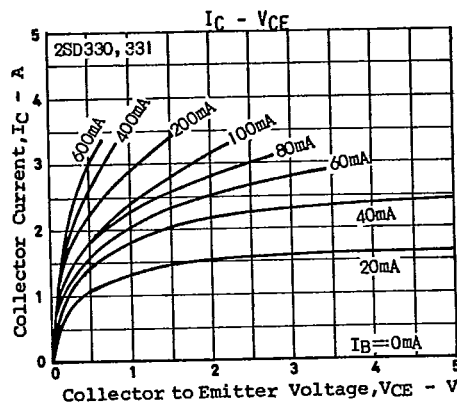
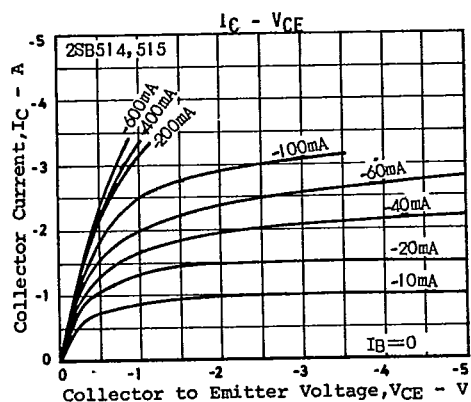
E: Emitter
C: Collector
B: Base

The 2SB515/D331 are scheduled to be discontinued soon. Use the 2SB514/D330, instead of the 2SB515/D331, in new applications where you are planning to use the 2SB515/D331.

3257AT/7193KI, TS No. 397-1/3

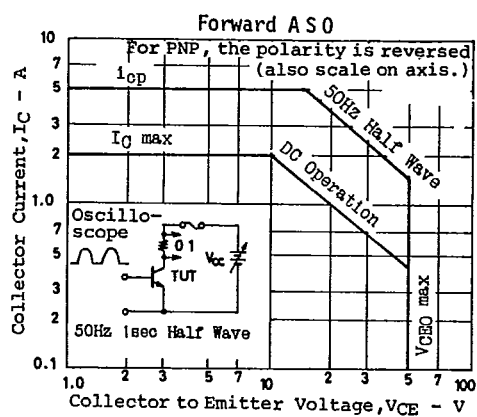
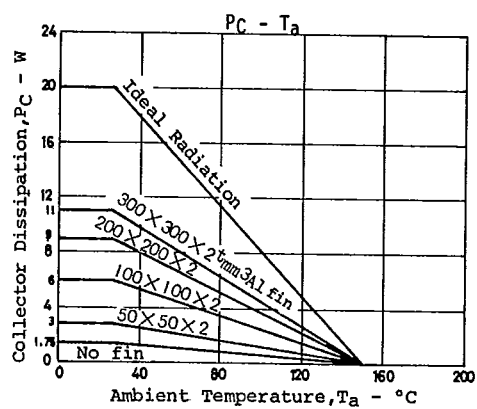
2SD330,331/2SB514,515

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2SD330, 331/2SB514, 515

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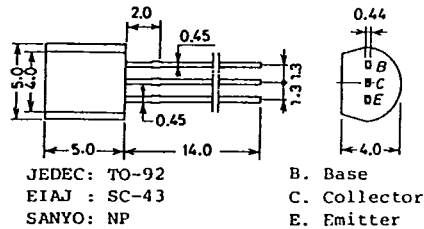
T-91-20

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.

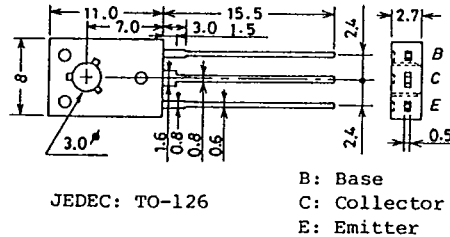
Case Outline—[2003A]

unit:mm



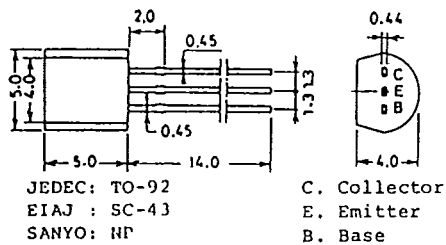
Case Outline—[2009A]

unit:mm



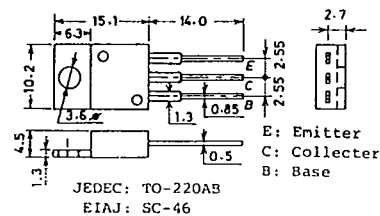
Case Outline—[2004A]

unit:mm



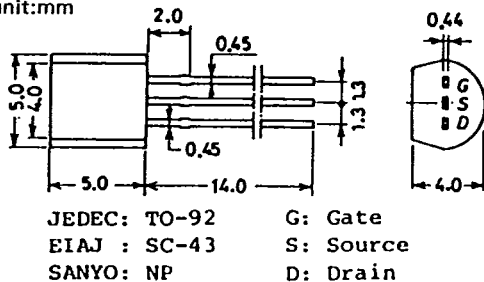
Case Outline—[2010A]

unit:mm



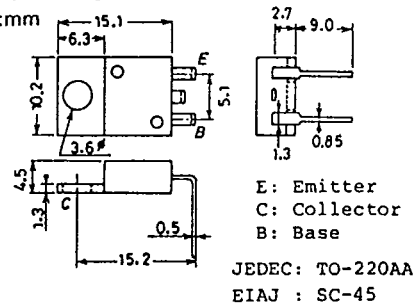
Case Outline—[2005A]

unit:mm



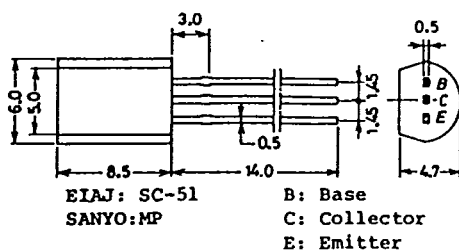
Case Outline—[2012]

unit:mm



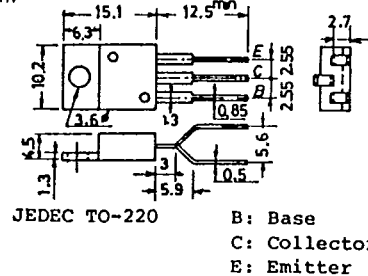
Case Outline—[2006A]

unit:mm

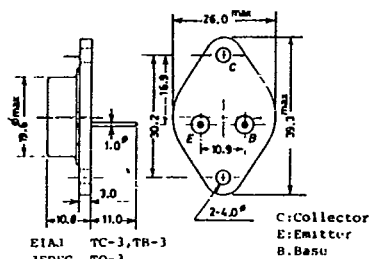


Case Outline—[2013]

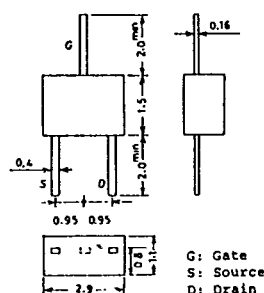
unit:mm



unit:mm

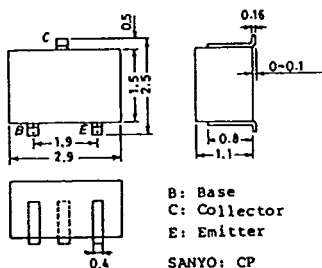


unit:mm

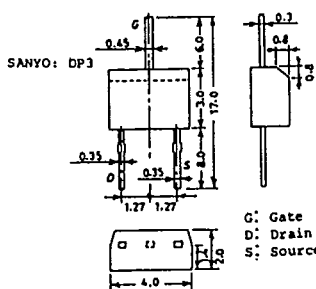


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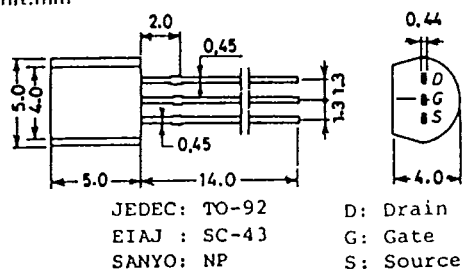
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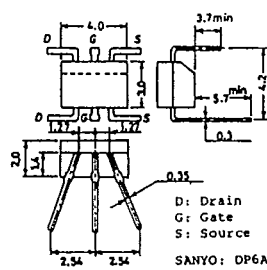
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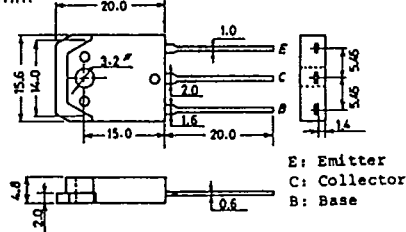
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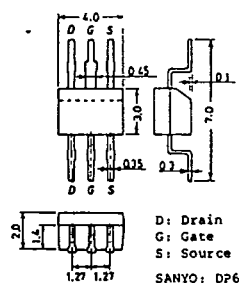
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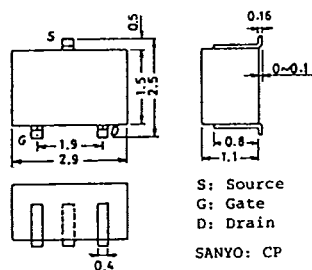
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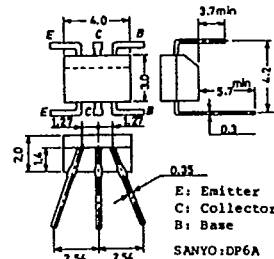
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unit:mm



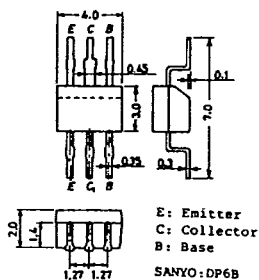
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T-91-20

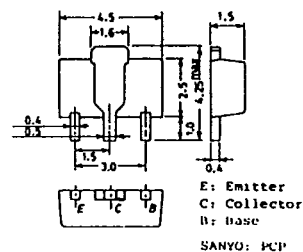
Case Outline—[2030A]

unit:mm



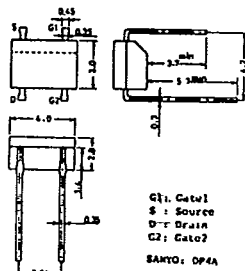
Case Outline—[2038]

unit:mm



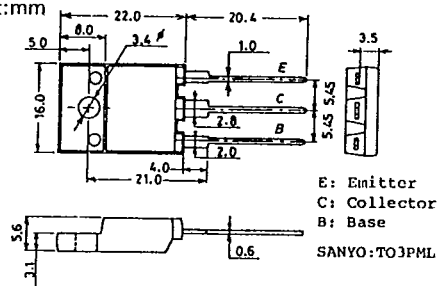
Case Outline—[2031A]

unit:mm



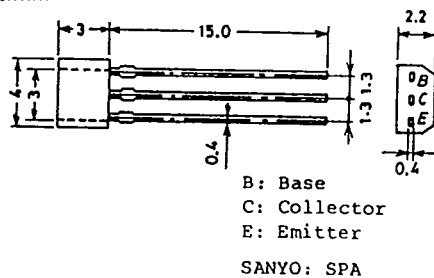
Case Outline—[2039]

unit:mm



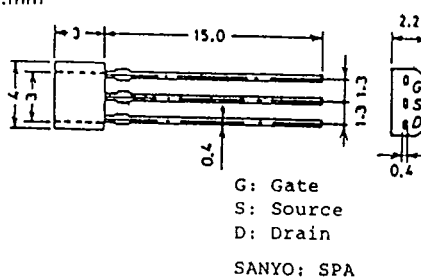
Case Outline—[2033]

unit:mm



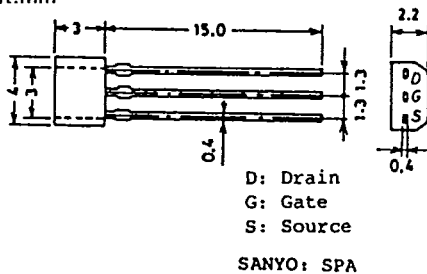
Case Outline—[2040]

unit:mm



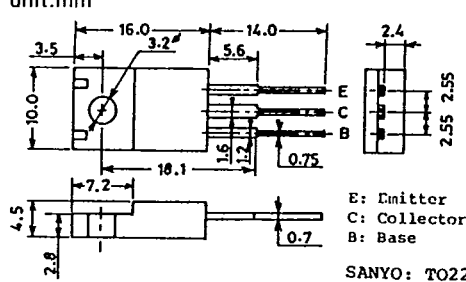
Case Outline—[2034]

unit:mm



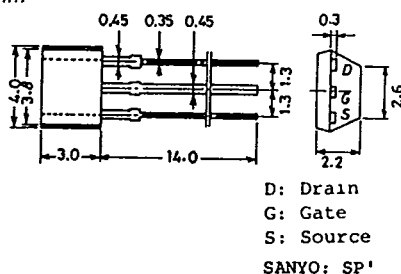
Case Outline—[2041]

unit:mm

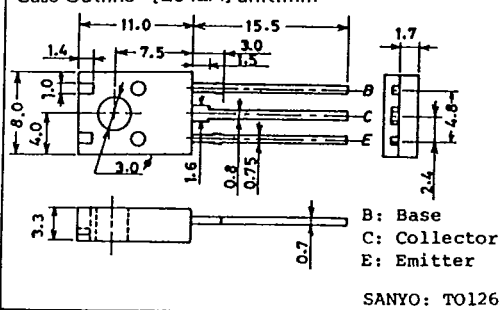


Case Outline—[2037]

unit:mm

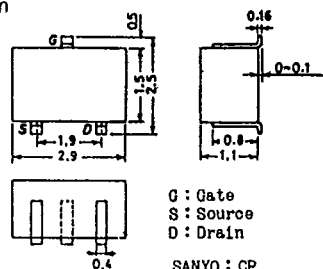


Case Outline—[2042A] unit:mm



T-91-20

unit:mm

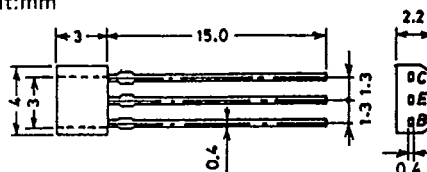


SANYO: TO126LP

G : Gate
S : Source
D : Drain

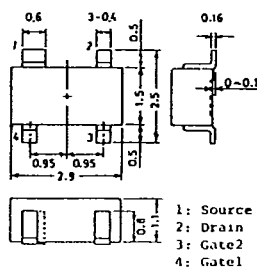
SANYO : CP

unit:mm



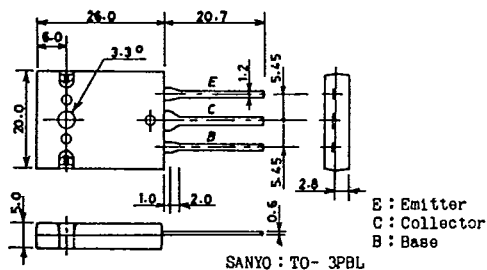
C : Collector
E : Emitter
B : Base
SANYO: SPA

unit:mm

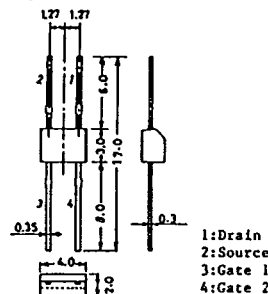


JEDEC: TO-220AB
EIAJ: SC-46

unit:mm

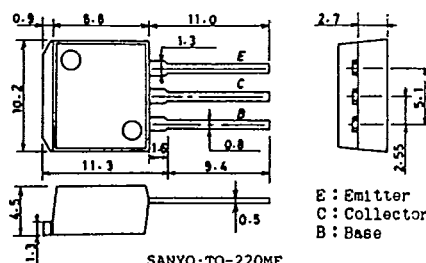


SANYO : TO- 3PBL

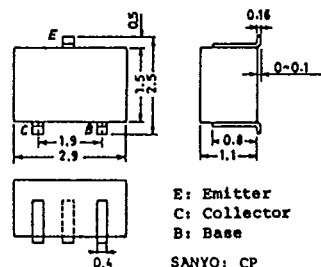


1: Drain
2: Source
3: Gate 1
4: Gate 2

unit:mm



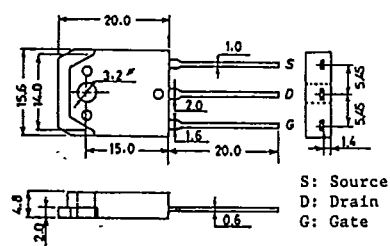
SANYO:TO-220MF



E: Emitter
C: Collector
B: Base

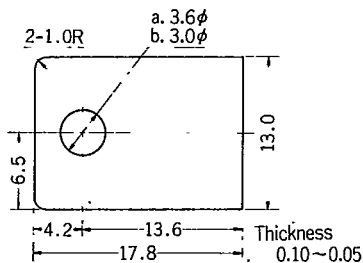
SANYO: CP

Case Outline—[2056] unit:mm



SANYO: TO3PB

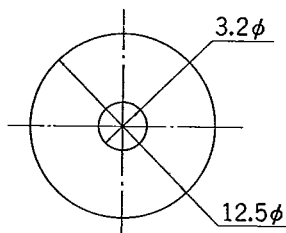
Case Outline—[0008] unit:mm

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

SANYO

Case Outline—[0004] unit:mm

unit:mm

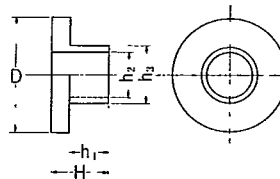


SANYO IS-126

Thickness : 0.075

Case Outline—[0009] unit:mm

unit:mm

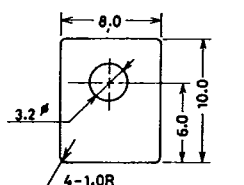


SANYO Bush

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

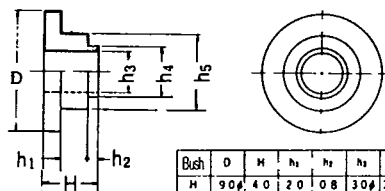


Thickness : 0.075

SANYO IS-126A Mica

Case Outline—[0010] unit:mm

unit:mm

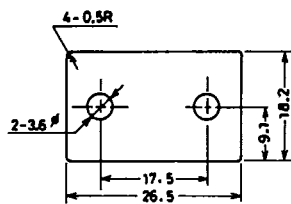


SANYO Bush

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

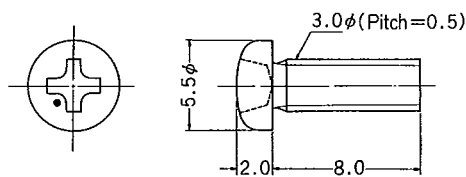


Thickness : 0.05~0.1

SANYO IS-20MA Mica

Case Outline—[0011] unit:mm

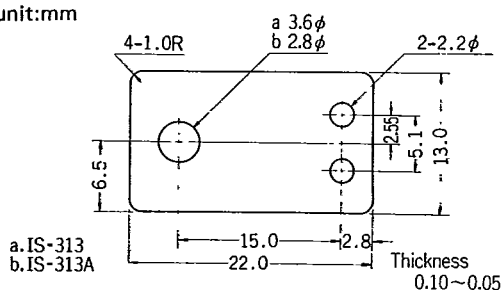
unit:mm



JIS No. B1111 M3×0.5

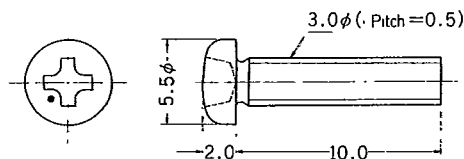
Case Outline—[0007] unit:mm

unit:mm



Case Outline—[0012] unit:mm

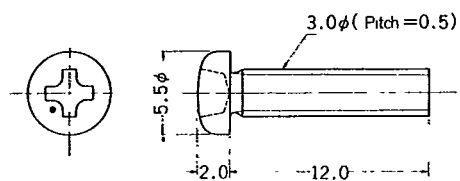
unit:mm



JIS No. B1111 M3×0.5

Case Outline—[0013]

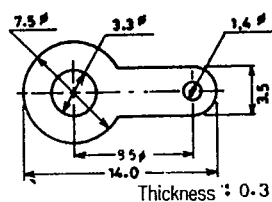
unit:mm



JIS No. B1111 M3×0.5

Case Outline—[0018]

unit:mm

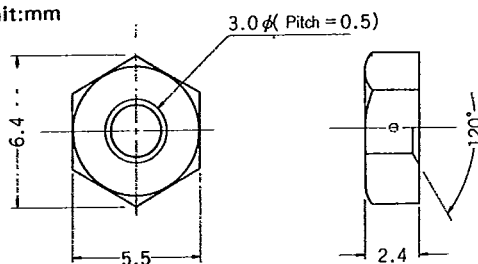


SANYO Lug 1.4

T=91-20

Case Outline—[0014]

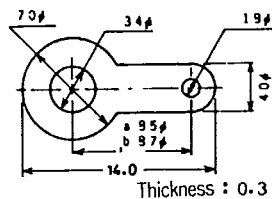
unit:mm



JIS No. B1181 M3×0.5

Case Outline—[0019]

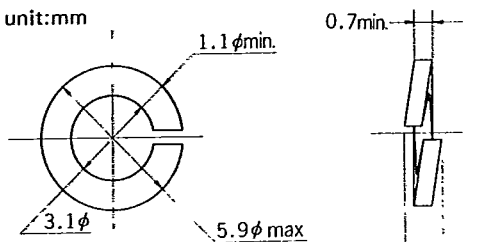
unit:mm



SANYO Lug 1.8φ

Case Outline—[0015]

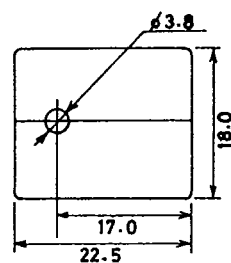
unit:mm



JIS No. B 1251 Spring washer (M3)

Case Outline—[0020]

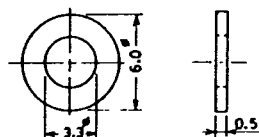
unit:mm



SANYO IS-3MP Mica

Case Outline—[0016]

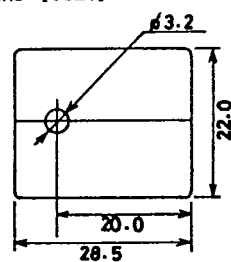
unit:mm



JIS No. B1252 Flat washer

Case Outline—[0021]

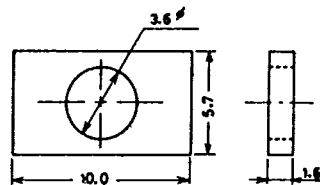
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SANYO IS-MPC Mica

Case Outline—[0017]

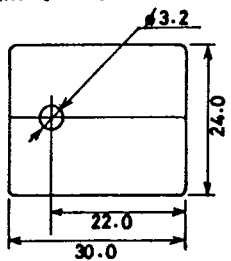
unit:mm



JIS No. G3141 Rectangular washer

Case Outline—[0022]

unit:mm



SANYO IS-3PBL Mica