

2SC930

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T-31-15
T-31-17

2033

2003A

NPN Epitaxial Planar
Silicon Transistor

AM Converter, FM RF · IF Amp Applications

©545E

The 2SC930 has two types of package: SPA and NP.

Use

- FM RF amp, mixer, OSC, converter, and IF amplifier.

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

	2SC930SPA	2SC930NP	unit
Collector to Base Voltage	V_{CB0} 30	30	V
Collector to Emitter Voltage	V_{CE0} 20	20	V
Emitter to Base Voltage	V_{EB0} 5	5	V
Collector Current	I_C 30	30	mA
Collector Dissipation	P_C 120	250	mW
Junction Temperature	T_j 125	125	$^\circ\text{C}$
Storage Temperature	T_{stg} -40 to +125	-55 to +125	$^\circ\text{C}$

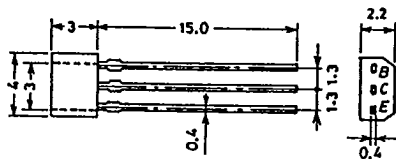
Electrical Characteristics at $T_a=25^\circ\text{C}$

		min	typ	max	unit
Collector Cutoff Current	I_{CBO}			1	μA
Emitter Cutoff Current	I_{EBO}			1	μA
DC Current Gain	h_{FE}		40*	320*	
Gain Bandwidth Product	f_T		170	300	MHz
Reverse Transfer capacitance	C_{re}		0.8	1.6	pF
				1.3	pF
Base to Collector	$r_{bb'}c_c$		20	36	pS
Time Constant					
Noise Figure	NF		4.0		dB
Turn-on Time	t_{on}		30		ns
Turn-off Time	t_{off}		30		ns

*The 2SC930 is graded as follows by $\text{mA } h_{FE}$:

40	C	80	60	D	120	100	E	200	160	F	320
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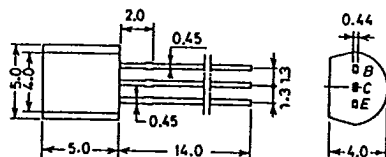
Case Outline 2033
(unit:mm)



B: Base
C: Collector
E: Emitter

SANYO: SPA

Case Outline 2003A
(unit:mm)



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

B: Base
C: Collector
E: Emitter

The 2SC930 is scheduled to be discontinued soon. Use the 2SC2839, instead of the 2SC930, in new applications where you are planning to use the 2SC930.

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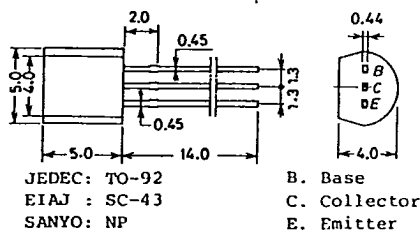
CASE OUTLINES AND ATTACHMENTS

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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.

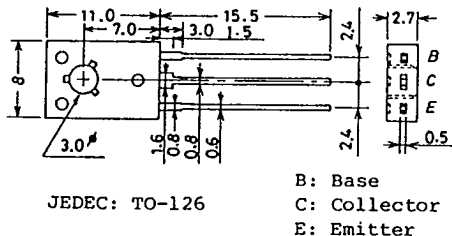
Case Outline—[2003A]

unit:mm



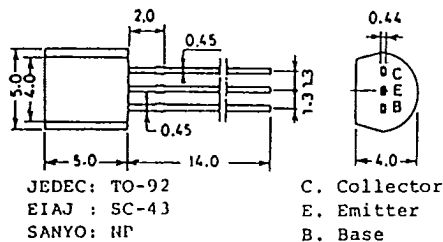
Case Outline—[2009A]

unit:mm



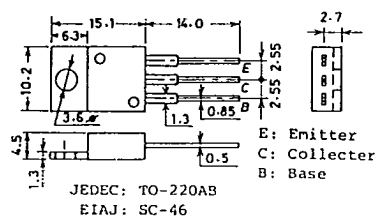
Case Outline—[2004A]

unit:mm



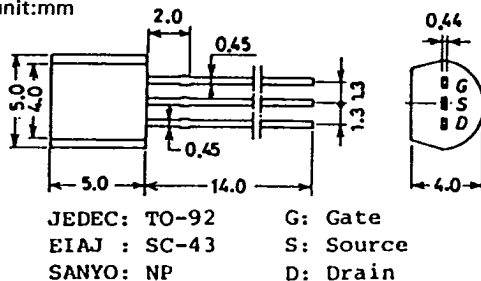
Case Outline—[2010A]

unit:mm



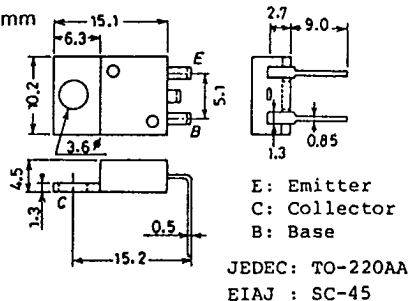
Case Outline—[2005A]

unit:mm



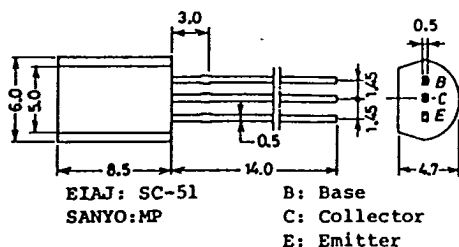
Case Outline—[2012]

unit:mm



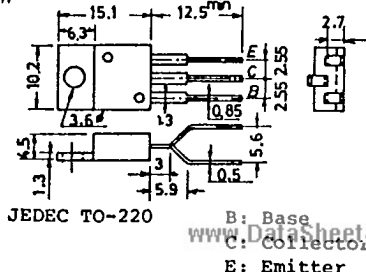
Case Outline—[2006A]

unit:mm



Case Outline—[2013]

unit:mm



SANYO: DP6B

E: Emitter
C: Collector
B: Base

SANYO: PCP

G1: Catw1
\$: Source
D-r Drain
G2: Gato?
SAYO: On

mm

22.0 20.4 1.0 3.4 8.0 5.0 16.0 21.0 4.0 2.8 2.0 3.5 5.5 8 3.5

E: Emitter
C: Collector
B: Base

SANYO TO3PML

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

Figure 1 shows the dimensions of the Sanyo SPA device. The diagram includes a cross-sectional view of the device with the following dimensions:

- Gate width: 3
- Channel length: 15.0
- Source/Drain width: 2.2
- Source/Drain height: 0.4
- Gate height: 1.3
- Channel height: 1.3

Legend:

- G: Gate
- S: Source
- D: Drain

SANYO: SPA

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

The drawing shows the mechanical specifications for the SANYO TO22 package. It includes three views: a top view, a side view, and a detail view of the lead spacing.

Top View Dimensions:

- Overall width: 16.0 mm
- Distance from left edge to mounting hole center: 3.5 mm
- Mounting hole diameter: 3.2 mm
- Distance from mounting hole center to lead center: 5.6 mm
- Distance from lead center to right edge: 14.0 mm
- Lead thickness: 0.75 mm
- Lead pitch (distance between leads): 1.6 mm
- Distance from lead center to base: 1.2 mm
- Overall length: 10.0 mm
- Distance from left edge to base: 10.1 mm

Side View Dimensions:

- Overall height: 7.2 mm
- Base thickness: 4.5 mm
- Lead height: 0.7 mm
- Distance from base to mounting hole center: 2.8 mm

Lead Spacing Detail View:

- Lead thickness: 2.4 mm
- Lead pitch: 2.55 mm
- Lead width: 2.55 mm

Legend:

- E: Emitter
- C: Collector
- B: Base

Manufacturer: SANYO: TO22

D: Drain
G: Gate
S: Source
SANYO: SP'

Technical drawing of a transistor package showing top, side, and detail views with dimensions in millimeters.

Top View Dimensions:

- Overall width: 11.0
- Overall length: 15.3
- Pin spacing (left): 1.4
- Pin spacing (right): 3.0
- Pin diameter: 1.5
- Mounting hole diameter: 3.0
- Mounting hole offset: 7.5
- Mounting hole diameter: 4.0
- Mounting hole offset: 8.0
- Mounting hole offset: 1.0
- Mounting hole offset: 1.6
- Mounting hole offset: 0.8
- Mounting hole offset: 0.75

Side View Dimensions:

- Pin height: 1.7
- Pin width: 4.8
- Pin width: 2.4

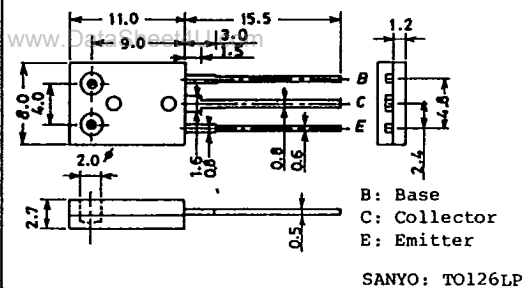
Detail View Dimensions:

- Pin diameter: 0.7
- Pin length: 3.3

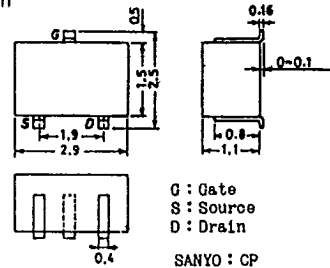
Legend:

- B: Base
- C: Collector
- E: Emitter

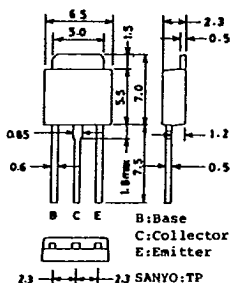
Case Outline—[2043A] unit:mm



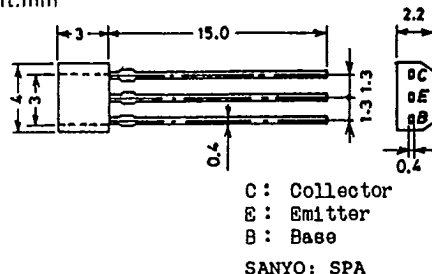
Case Outline—[2050]
unit:mm



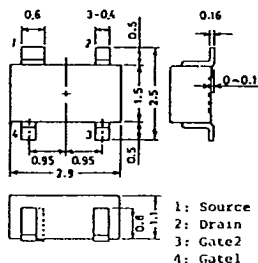
Case Outline—[2045]
unit:mm



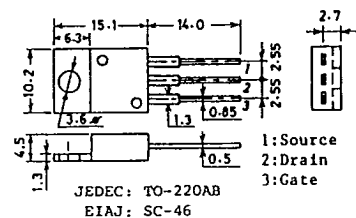
Case Outline—[2051]
unit:mm



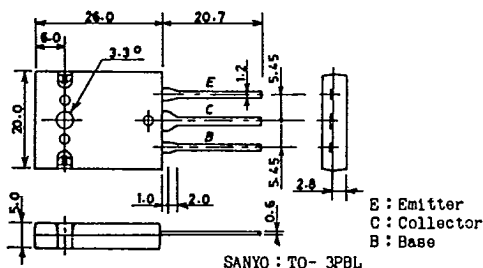
Case Outline—[2046]
unit:mm



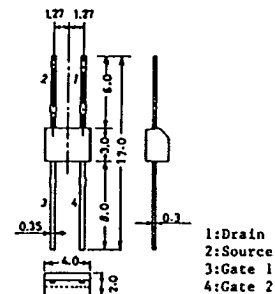
Case Outline—[2052A]
unit:mm



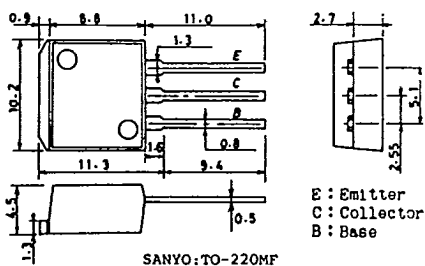
Case Outline—[2048] unit:mm



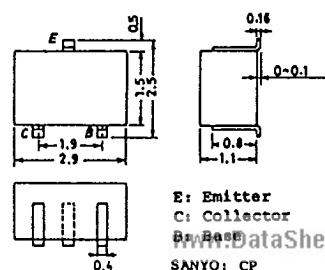
Case Outline—[2053]
unit:mm



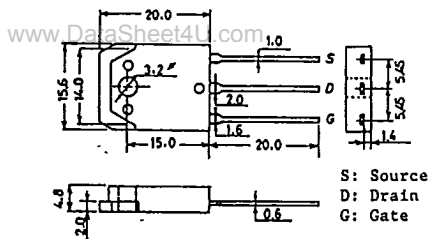
Case Outline—[2049]
unit:mm



Case Outline—[2054]
unit:mm



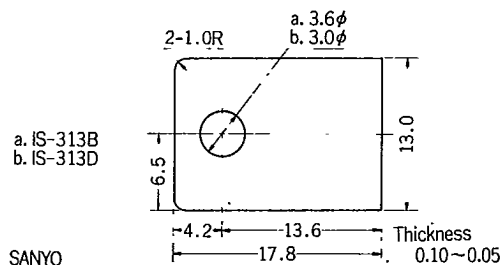
Case Outline—[2056] unit:mm



SANYO: TO3PB

Case Outline—[0008]

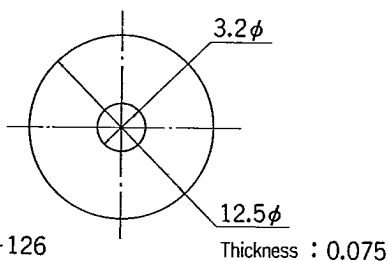
unit:mm



SANYO

Case Outline—[0004]

unit:mm

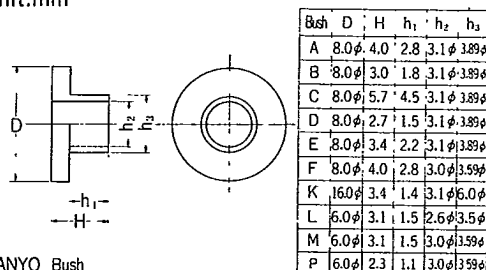


SANYO IS-126

Thickness : 0.075

Case Outline—[0009]

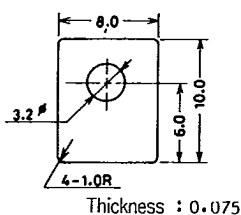
unit:mm



SANYO Bush

Case Outline—[0005]

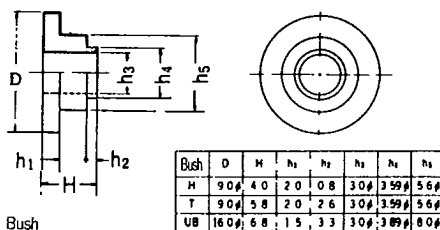
unit:mm



SANYO IS-126A Mica

Case Outline—[0010]

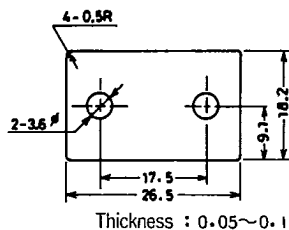
unit:mm



SANYO Bush

Case Outline—[0006]

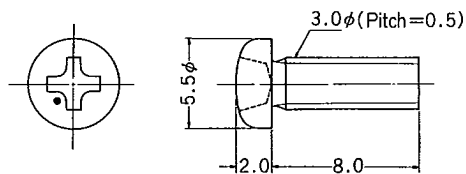
unit:mm



SANYO IS-20MA Mica

Case Outline—[0011]

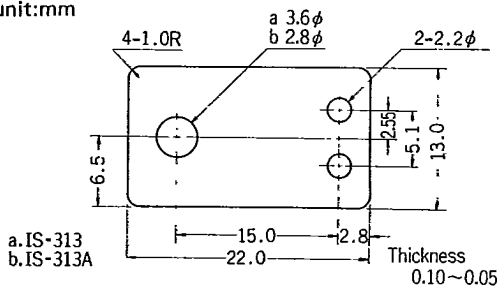
unit:mm



JIS No. B1111 M3×0.5

Case Outline—[0007]

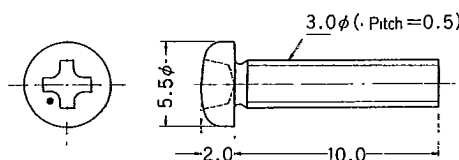
unit:mm



a. IS-313
b. IS-313A

Case Outline—[0012]

unit:mm



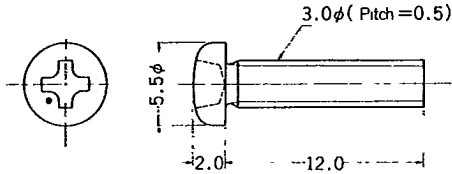
JIS No. B1111 M3×0.5

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Case Outline—[0013]

unit:mm

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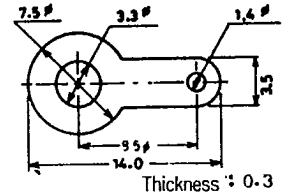


JIS No. B1111 M3x0.5

Case Outline—[0018]

unit:mm

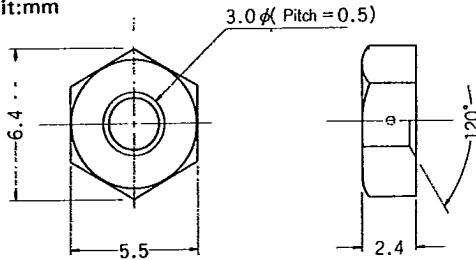
T=91-20



SANYO Lug 1.4

Case Outline—[0014]

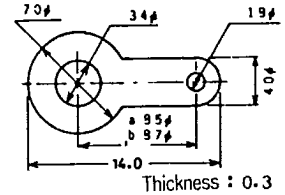
unit:mm



JIS No. B1181 M3x0.5

Case Outline—[0019]

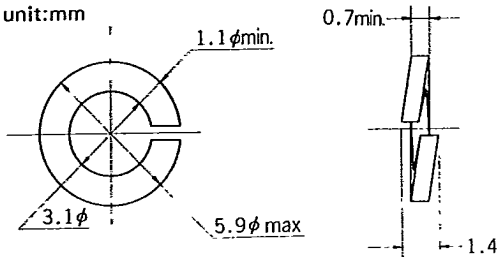
unit:mm



SANYO Lug 1.8φ

Case Outline—[0015]

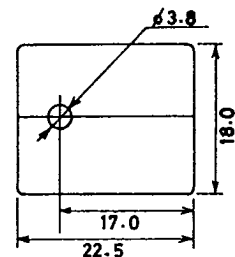
unit:mm



JIS No. B 1251 Spring washer (M3)

Case Outline—[0020]

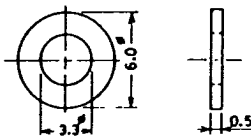
unit:mm



SANYO IS-3MP Mica

Case Outline—[0016]

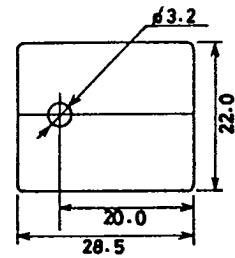
unit:mm



JIS No. B1252 Flat washer

Case Outline—[0021]

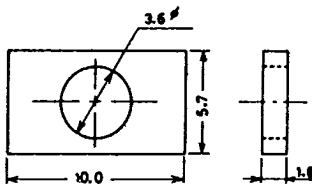
unit:mm



SANYO IS-MPC Mica

Case Outline—[0017]

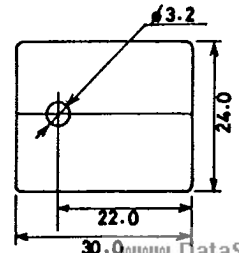
unit:mm



JIS No. G3141 Rectangular washer

Case Outline—[0022]

unit:mm



SANYO IS-3PBL Mica

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