

2SC4406

T-31-15

2059

NPN Epitaxial Planar Silicon Transistor

VHF MIX, OSC Applications

©2759A

Applications

- VHF mixers, frequency converters, local oscillators

Features

- High cutoff frequency : $f_T = 1.2\text{GHz typ}$
- High power gain : $PG = 15\text{dB typ (}f = 0.4\text{GHz)}$
- Good dependence of f_T on current
- Very small-sized package permitting 2SC4406-applied sets to be made smaller and slimmer

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

		unit
Collector to Base Voltage	V_{CBO}	30 V
Collector to Emitter Voltage	V_{CEO}	15 V
Emitter to Base Voltage	V_{EBO}	3 V
Collector Current	I_C	50 mA
Collector Dissipation	P_C	150 mW
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}	$V_{CB} = 15\text{V}, I_E = 0$			0.1	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB} = 2\text{V}, I_C = 0$			1	μA
DC Current Gain	h_{FE}	$V_{CE} = 10\text{V}, I_C = 5\text{mA}$	$\times 40$		$\times 200$	
Gain-Bandwidth Product	f_T	$V_{CE} = 10\text{V}, I_C = 10\text{mA}$	0.6	1.2		GHz
Output Capacitance	c_{ob}	$V_{CB} = 10\text{V}, f = 1\text{MHz}$		0.75	1.1	pF
Reverse Transfer Capacitance	c_{re}	$V_{CB} = 10\text{V}, f = 1\text{MHz}$		0.5		pF
Power Gain	PG	$V_{CE} = 10\text{V}, I_C = 10\text{mA}, f = 0.4\text{GHz}$		15		dB
Noise Figure	NF	$V_{CE} = 10\text{V}, I_C = 3\text{mA}, f = 0.4\text{GHz}$		2.0		dB

See specified Test Circuit.

* The 2SC4406 is classified by 5mA h_{FE} as follows:

40	2	80	60	3	120	100	4	200
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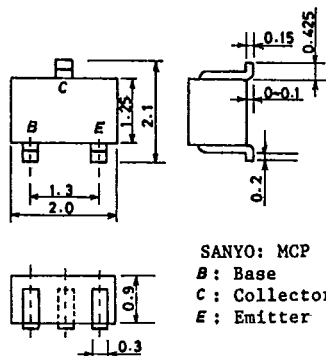
(Note) Marking: JT

 h_{FE} rank: 2,3,4

• For CP package version, use the 2SC4269.

Case Outline 2059

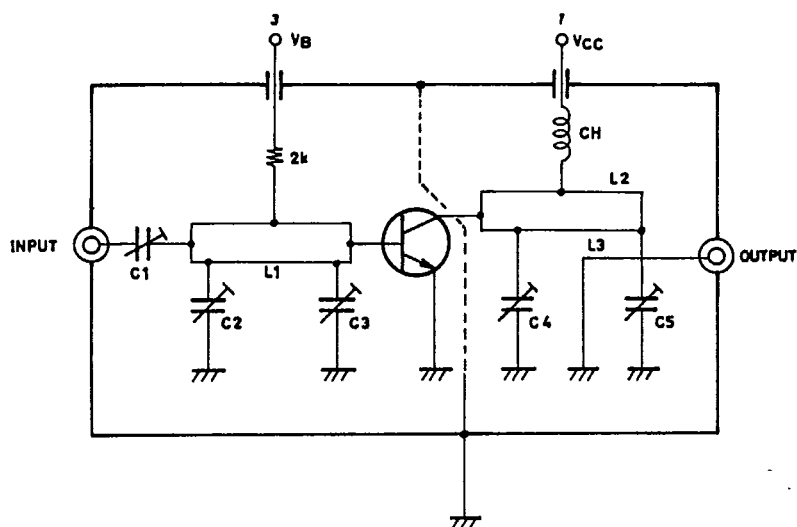
(unit: mm)



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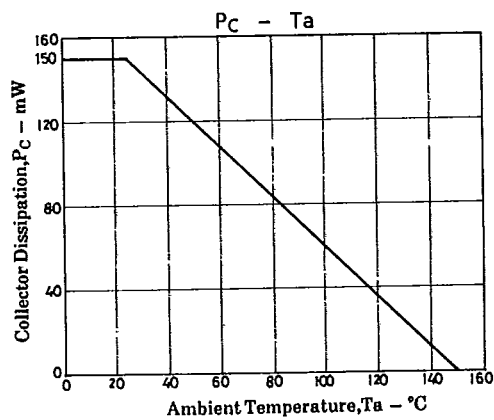
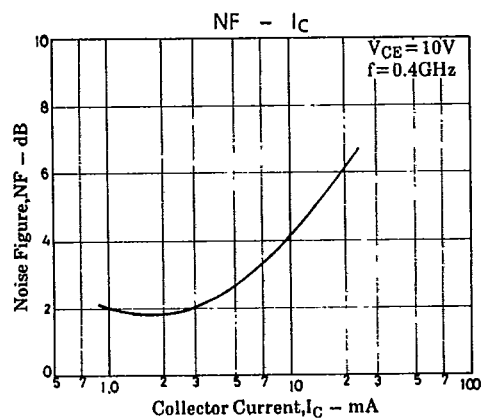
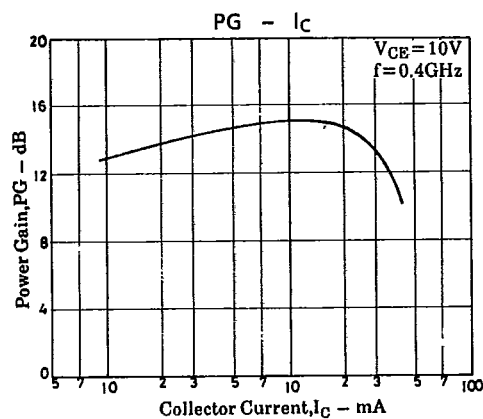
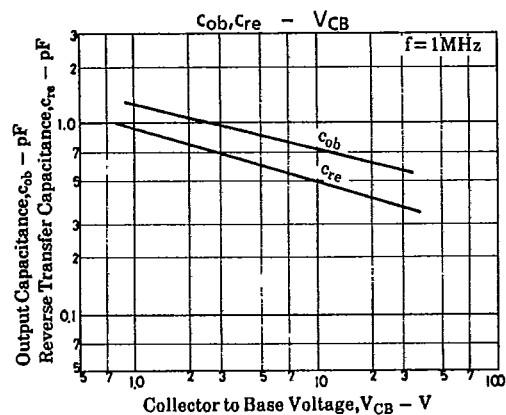
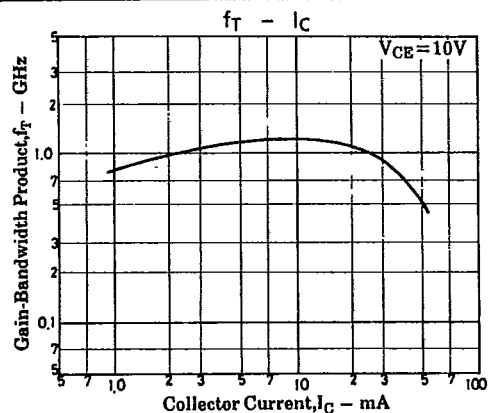
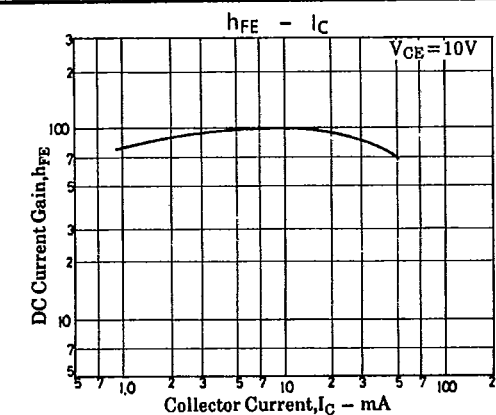
PG,NF Test Circuit



	$f = 400\text{MHz}$
C1	$\sim 20\text{pF}$
C2	$\sim 10\text{pF}$
C3	$\sim 10\text{pF}$
C4	$\sim 20\text{pF}$
C5	$\sim 30\text{pF}$
L1	$2\phi, l = 40\text{mm } 2/3t$
L2	$2\phi, l = 40\text{mm } 2/3t$
L3	$1\phi, l = 40\text{mm } 1/2t$

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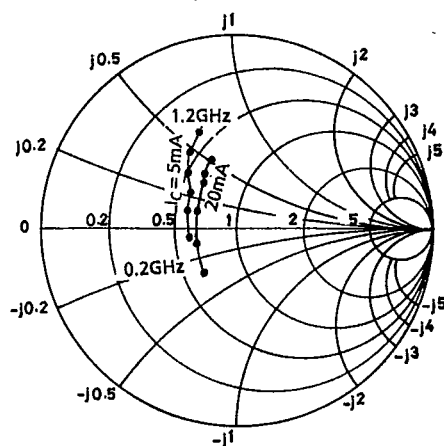
T-31-15



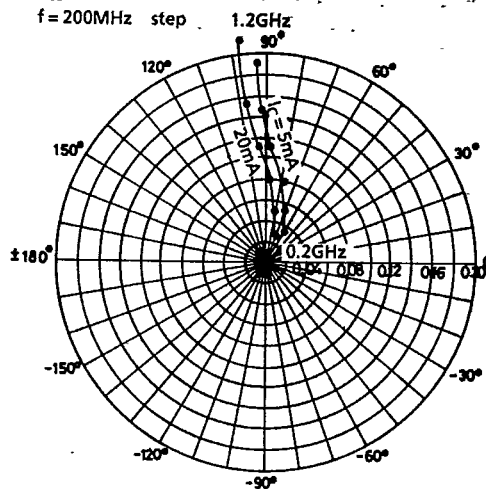
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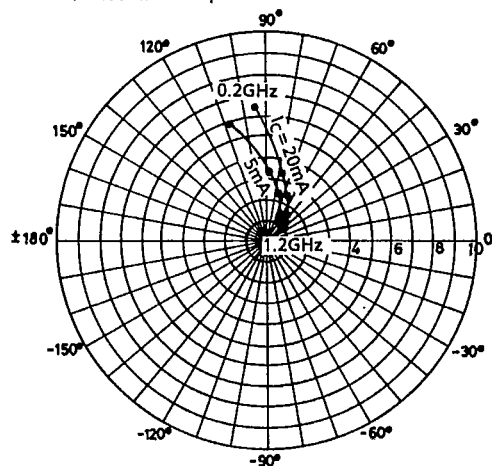
S11e: $V_{CE} = 10V$
 $f = 200MHz$ step



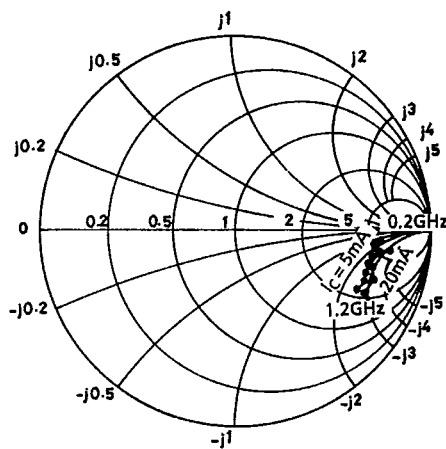
S12e: $V_{CE} = 10V$
 $f = 200MHz$ step



S21e: $V_{CE} = 10V$
 $f = 200MHz$ step



S22e: $V_{CE} = 10V$
 $f = 200MHz$ step

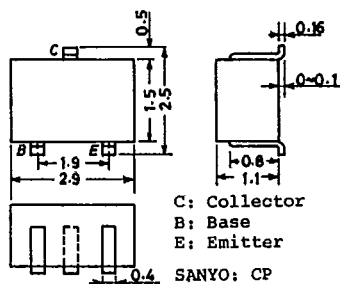


T-91-20

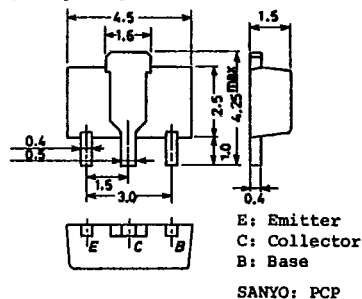
CASE OUTLINES OF SURFACE MOUNT TRANSISTORS

- All of Sanyo surface mount 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.

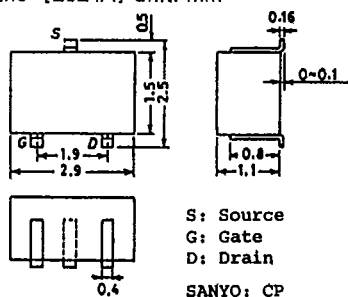
Case Outline—[2018A] unit: mm



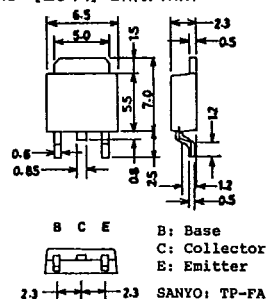
Case Outline—[2038] unit: mm



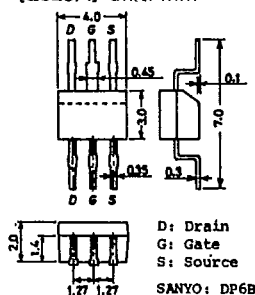
Case Outline—[2024A] unit: mm



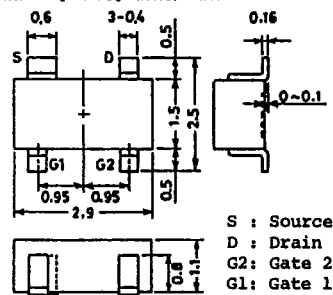
Case Outline—[2044] unit: mm



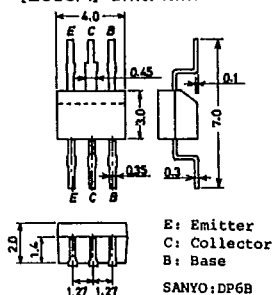
Case Outline—[2028A] unit: mm



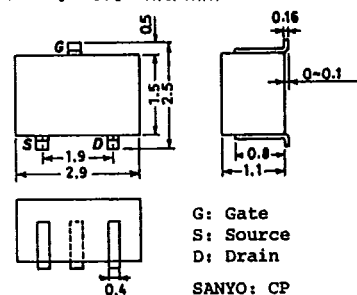
Case Outline—[2046] unit: mm



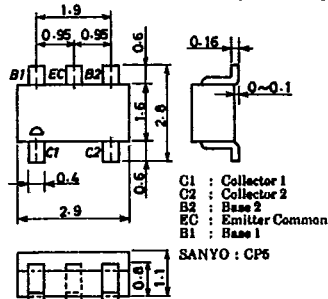
Case Outline—[2030A] unit: mm



Case Outline—[2050] unit: mm



Case Outline—[2066] unit: mm

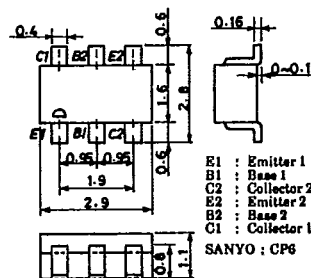


S: Source
G: Gate
D: Drain
SANYO: MCT

C1 : Collector 1
C2 : Collector 2
B2 : Base 2
EC : Emitter Common
B1 : Base 1
SANYO : CP5

SANYO : CP5

Case Outline—[2067] unit: mm

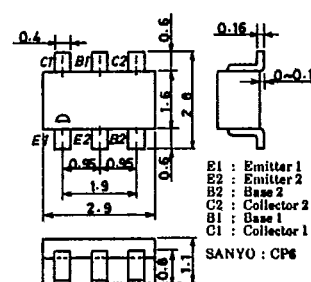


G: Gate
S: Source
D: Drain
SANYO: MCP

E1 : Emitter 1
B1 : Base 1
C2 : Collector 2
E2 : Emitter 2
B2 : Base 2
C1 : Collector 1
SANYO : CP6

SANYO : CP8

Case Outline—[2068] unit: mm



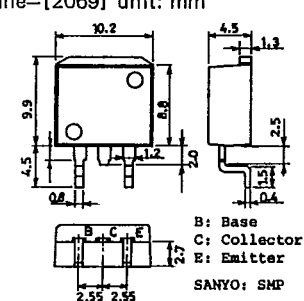
B: Base
C: Collector
E: Emitter
SANYO: MCP

E1 : Emitter 1
E2 : Emitter 2
B2 : Base 2
C2 : Collector 2
B1 : Base 1
C1 : Collector 1

SANYO : CP6

SANYO : CP

Case Outline—[2069] unit: mm



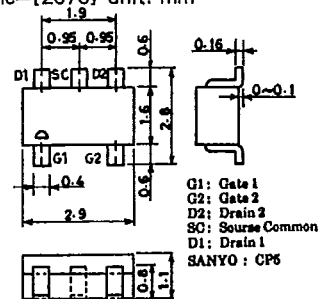
S: Source
D: Drain
G: Gate

SANYO: PCP

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

SANYO: SMP

Case Outline—[2070] unit: mm



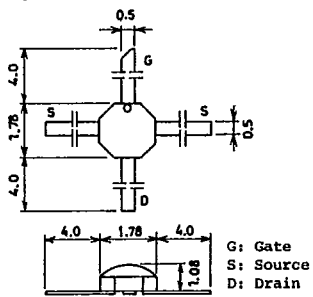
S: Source
D: Drain
G: Gate

SANYO: CP

G1: Gate 1
G2: Gate 2
D2: Drain 2
SC: Source Common
D1: Drain 1
SANYO : CP6

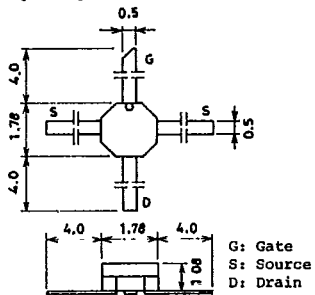
SANYO : CP8

Case Outline—[2071] unit: mm



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Case Outline—[2072] unit: mm



Case Outline—[2073] unit: mm

