

2SC4402

T-31-17

2059

NPN Epitaxial Planar Silicon Transistor

**V/U MIX, OSC, Low-Voltage
Amp Applications**

©2755

Applications

- VHF/UHF MIX/OSC, low-voltage high-frequency amplifiers

Features

- Low-voltage operation : $f_T = 3.0\text{GHz typ}$ ($V_{CE} = 3\text{V}$)
: $\text{MAG} = 12\text{dB typ}$ ($V_{CE} = 3\text{V}, I_C = 10\text{mA}$)
: $\text{NF} = 1.5\text{dB typ}$ ($V_{CE} = 3\text{V}, I_C = 5\text{mA}$)
- Very small-sized package permitting 2SC4402-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}	25	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}	$V_{CB} = 15\text{V}, I_E = 0$			1.0	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB} = 1\text{V}, I_C = 0$			1.0	μA
DC Current Gain	h_{FE}	$V_{CE} = 3\text{V}, I_C = 10\text{mA}$	$\times 40$		$\times 200$	
Gain-Bandwidth Product	f_T	$V_{CE} = 3\text{V}, I_C = 10\text{mA}$		3.0		GHz
Output Capacitance	c_{ob}	$V_{CB} = 3\text{V}, f = 1\text{MHz}$		0.85	1.5	pF
Reverse Transfer Capacitance	c_{re}	$V_{CB} = 3\text{V}, f = 1\text{MHz}$		0.8		pF
Forward Transfer Gain	$ S_{21} ^2$	$V_{CE} = 3\text{V}, I_C = 10\text{mA}, f = 0.9\text{GHz}$		7		dB
Maximum Available Power Gain	MAG	$V_{CE} = 3\text{V}, I_C = 10\text{mA}, f = 0.9\text{GHz}$		12		dB
Noise Figure	NF	$V_{CE} = 3\text{V}, I_C = 5\text{mA}, f = 0.9\text{GHz}$		1.5	3.0	dB

See specified Test Circuit.

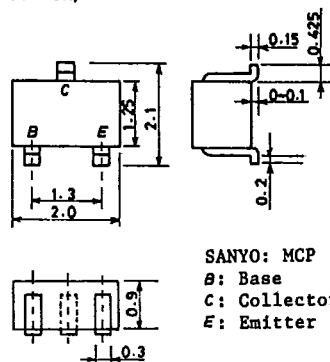
* The 2SC4402 is classified by 10mA h_{FE} as follows:

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

 h_{FE} rank: 2,3,4

• For CP package version, use the 2SC4365.

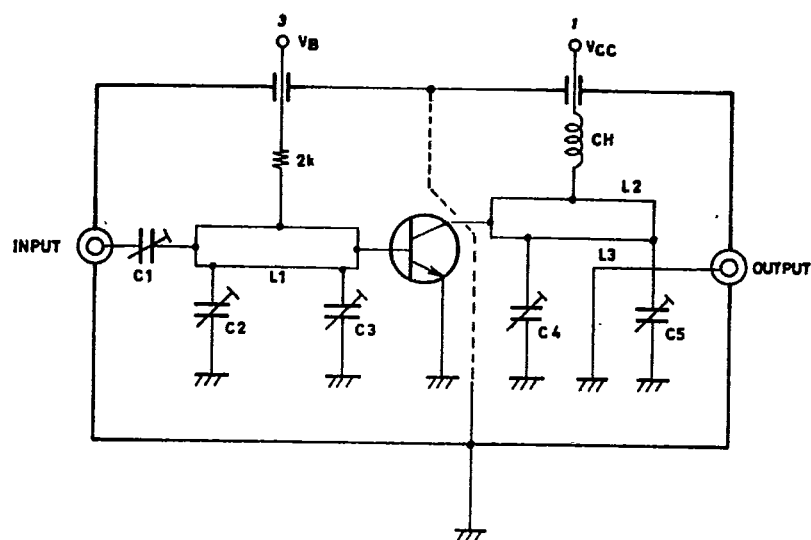
Case Outline 2059
(unit: mm)

6018TA, TS No.2755-1/4

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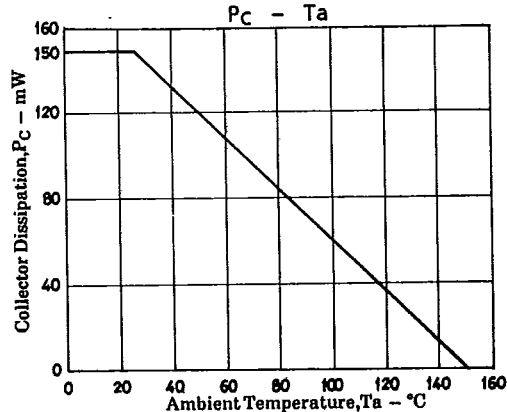
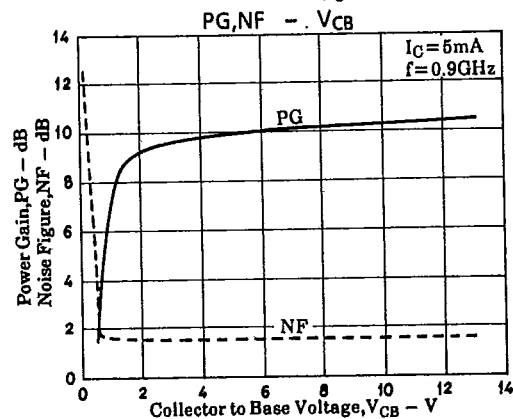
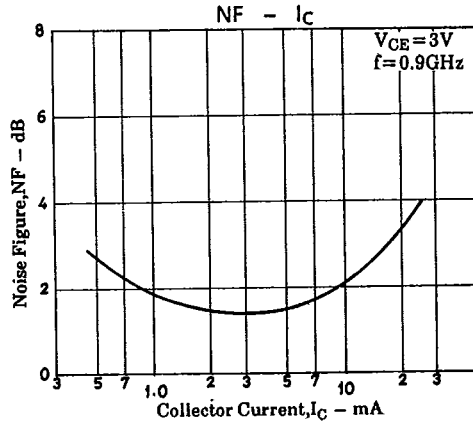
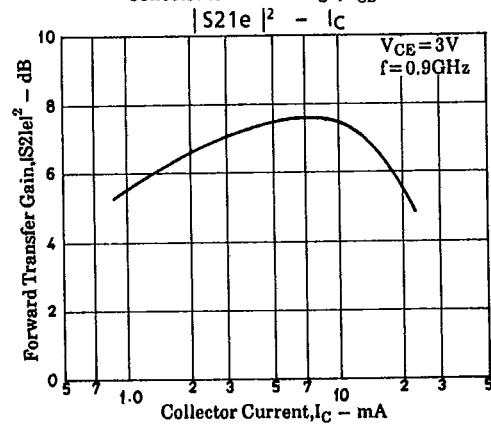
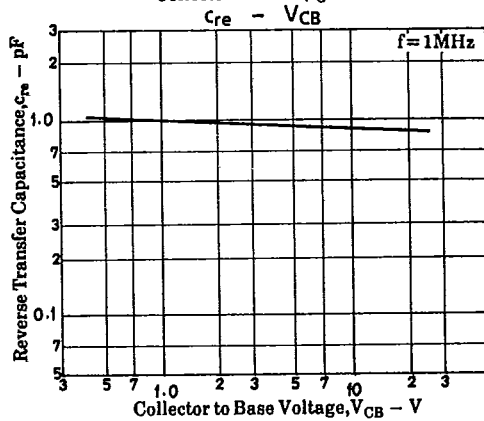
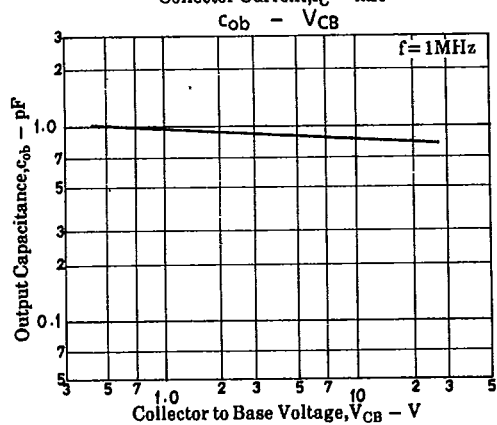
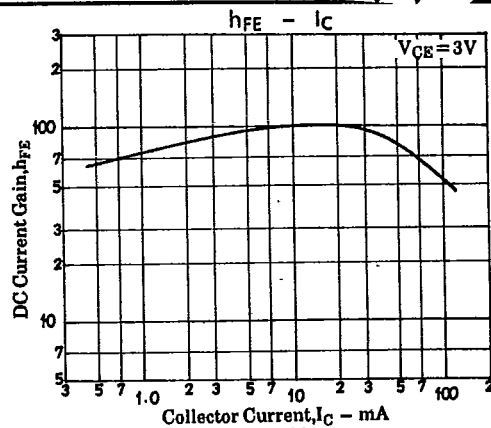
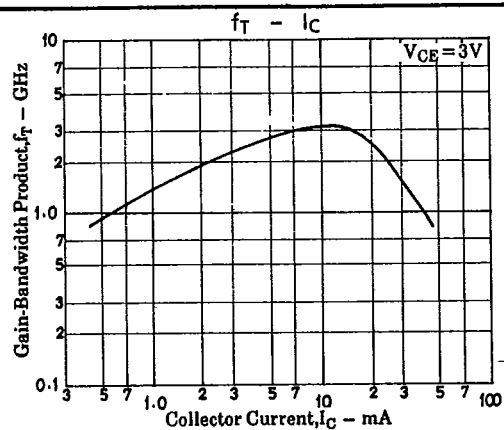
NF Test Circuit



	900MHz
C 1	~5 pF
C 2	~10 pF
C 3	~10 pF
C 4	~10 pF
C 5	~10 pF
L 1	W ≐ 1.5mm, l ≐ 2.5mm strip line
L 2	W ≐ 4mm, l ≐ 2.5mm strip line
L 3	0.5 φ, l ≐ 4.0mm
CH	2t + bead core

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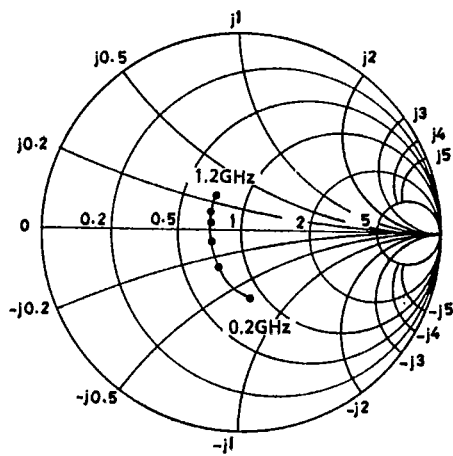
T-31-17



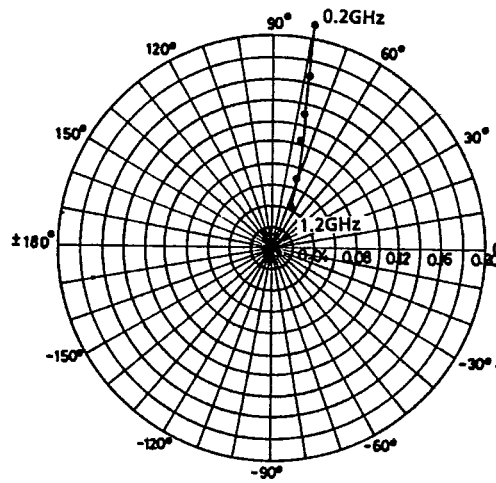
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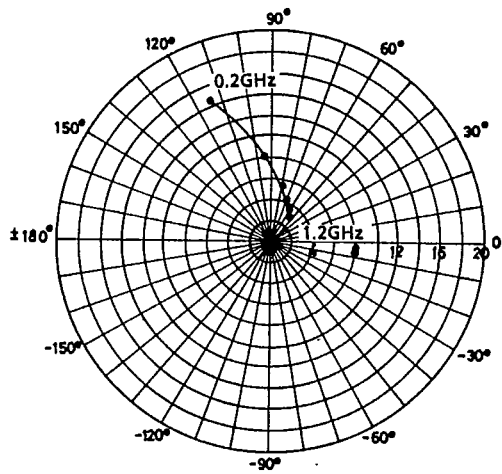
S11e: $V_{CE} = 3V$
 $I_C = 5mA$
 $f = 0.2GHz$ step



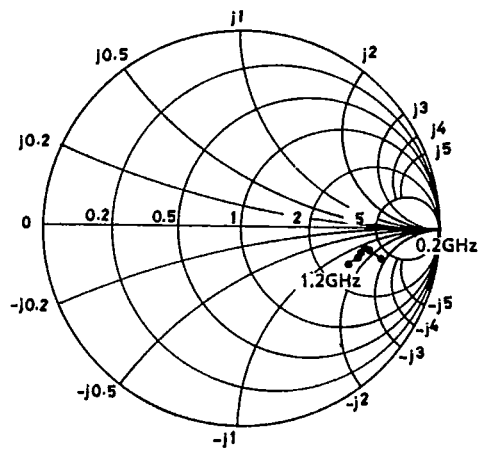
S12e: $V_{CE} = 3V$
 $I_C = 5mA$
 $f = 0.2GHz$ step



S21e: $V_{CE} = 3V$
 $I_C = 5mA$
 $f = 0.2GHz$ step



S22e: $V_{CE} = 3V$
 $I_C = 5mA$
 $f = 0.2GHz$ step

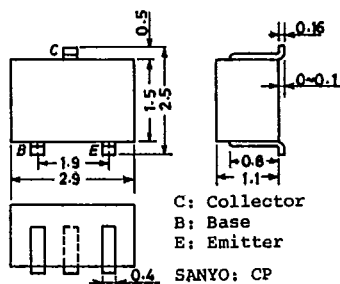


T-91-20

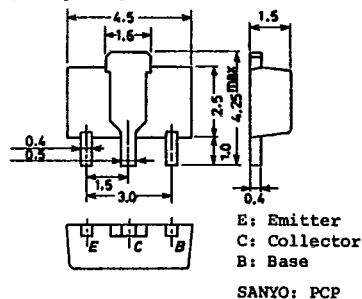
CASE OUTLINES OF SURFACE MOUNT TRANSISTORS

- 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.

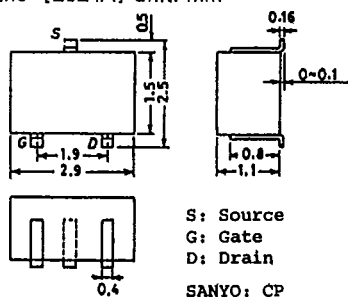
Case Outline—[2018A] unit: mm



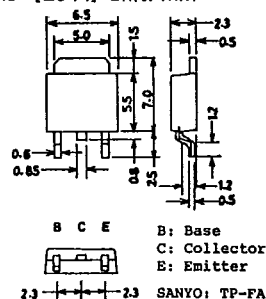
Case Outline—[2038] unit: mm



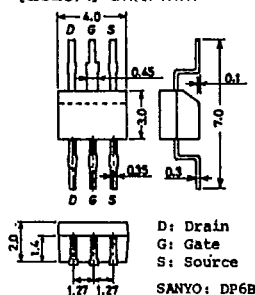
Case Outline—[2024A] unit: mm



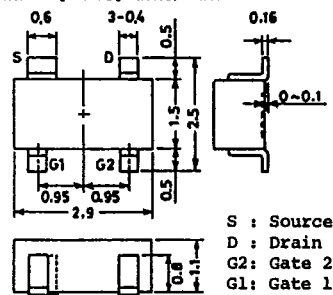
Case Outline—[2044] unit: mm



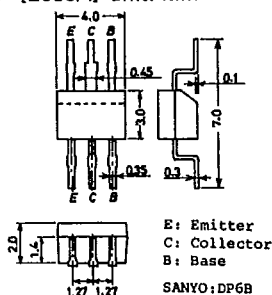
Case Outline—[2028A] unit: mm



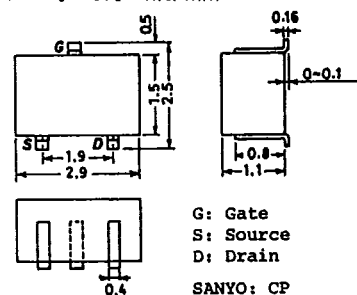
Case Outline—[2046] unit: mm



Case Outline—[2030A] unit: mm

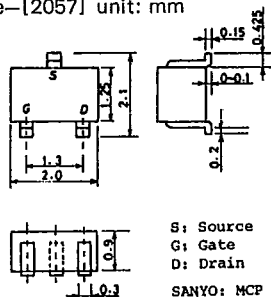


Case Outline—[2050] unit: mm

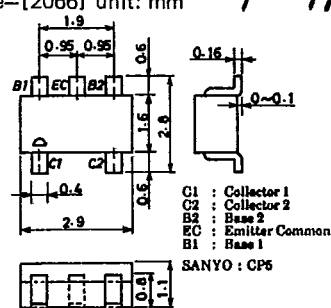


T-91-20

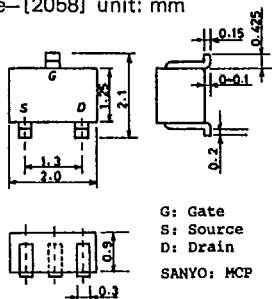
Case Outline—[2057] unit: mm



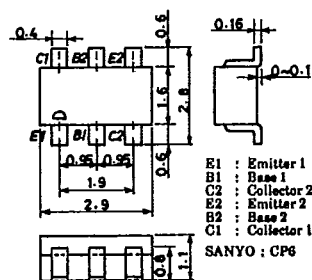
Case Outline—[2066] unit: mm



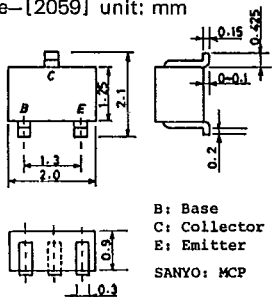
Case Outline—[2058] unit: mm



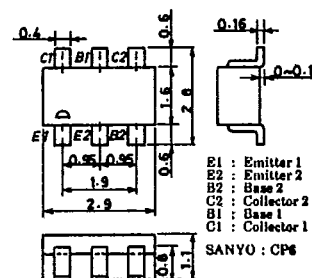
Case Outline—[2067] unit: mm



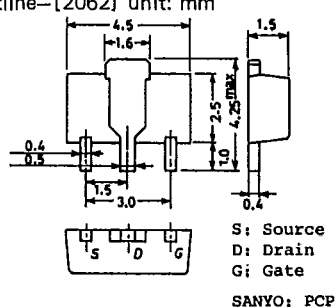
Case Outline—[2059] unit: mm



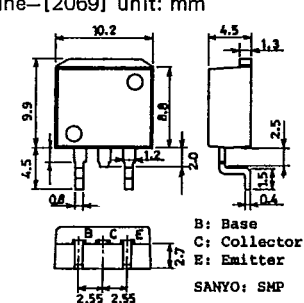
Case Outline—[2068] unit: mm



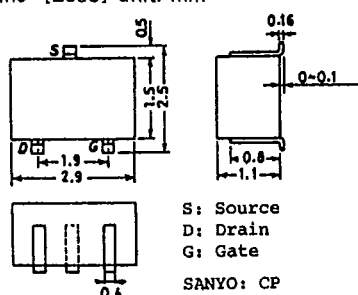
Case Outline—[2062] unit: mm



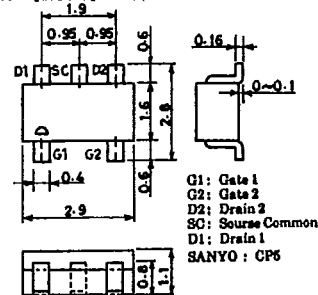
Case Outline—[2069] unit: mm



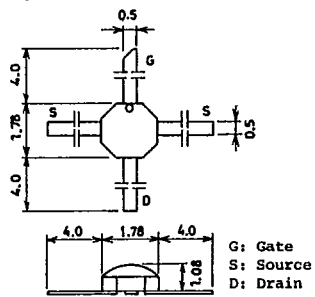
Case Outline—[2065] unit: mm



Case Outline—[2070] unit: mm

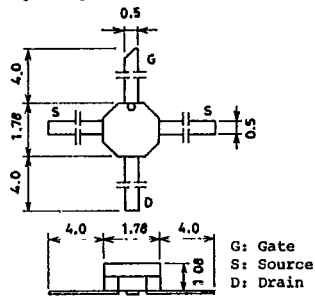


Case Outline—[2071] unit: mm



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Case Outline—[2072] unit: mm



Case Outline—[2073] unit: mm

