

<b>SANYO</b>	No.2755	<b>2SC4402</b>
		NPN Epitaxial Planar Silicon Transistor VHF/UHF Mixer, Local Oscillator, Low-Voltage Amp Applications

**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	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = 1\text{V}, I_C = 0$			1.0	$\mu\text{A}$
DC Current Gain	$h_{FE}$	$V_{CE} = 3\text{V}, I_C = 10\text{mA}$	*40		*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_{21e} ^2$	$V_{CE} = 3\text{V}, I_C = 10\text{mA}, f = 0.9\text{GHz}$		7		dB
Maximum Available Power Gain	$\text{MAG}$	$V_{CE} = 3\text{V}, I_C = 10\text{mA}, f = 0.9\text{GHz}$		12		dB
Noise Figure	$\text{NF}$	$V_{CE} = 3\text{V}, I_C = 5\text{mA}, f = 0.9\text{GHz}$		1.5	3.0	dB

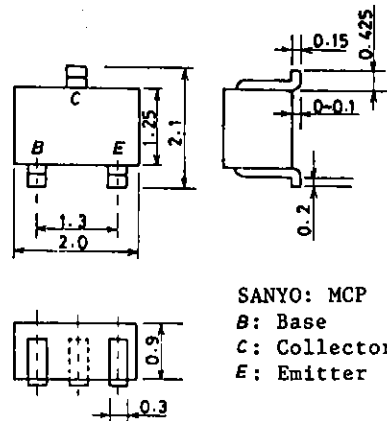
See specified Test Circuit.

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

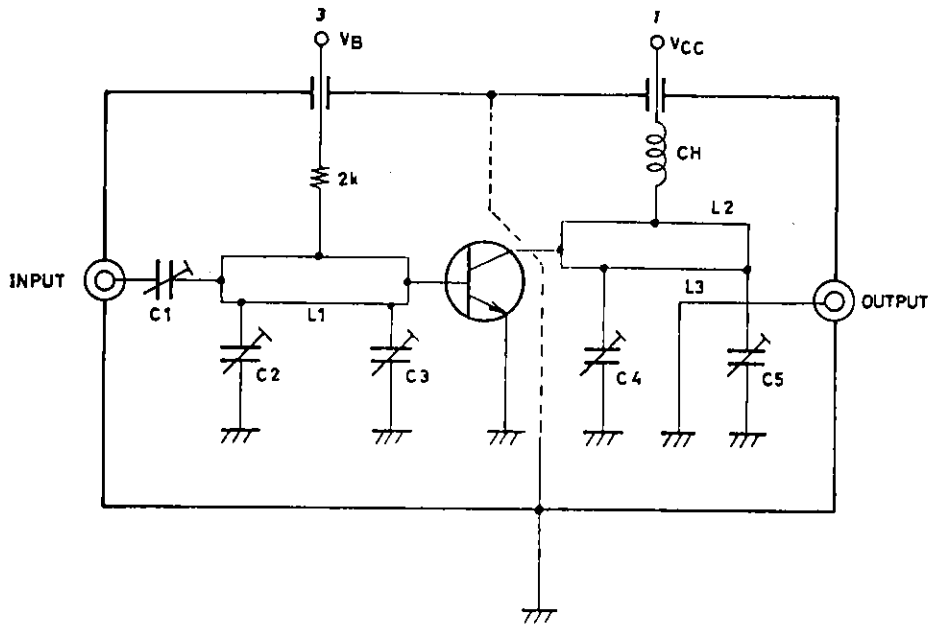
40	2	80	60	3	120	100	4	200
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- (Note) Marking: PT  
 $h_{FE}$  rank: 2,3,4  
 • For CP package version, use the 2SC4365.

**Package Dimensions 2059**  
(unit: mm)



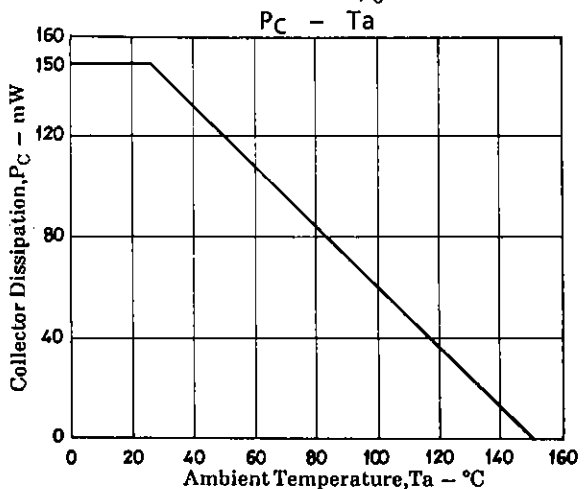
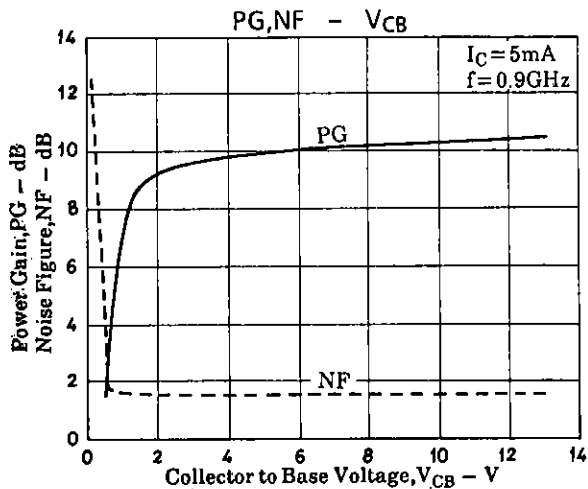
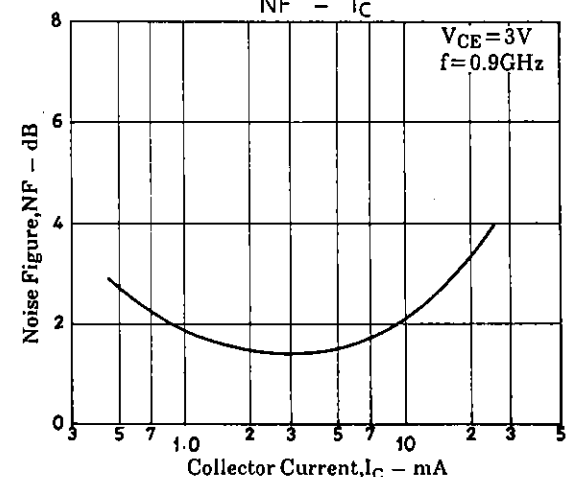
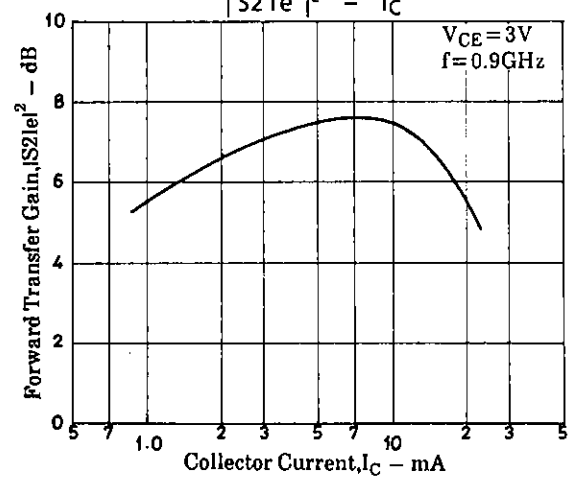
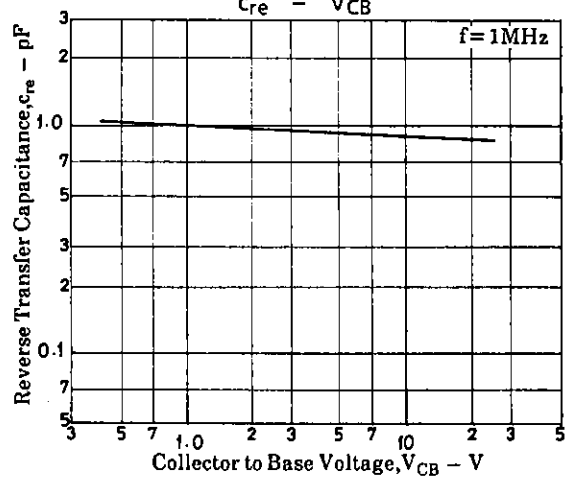
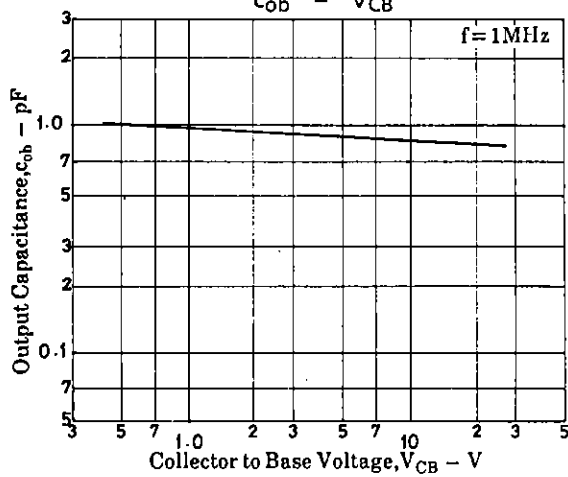
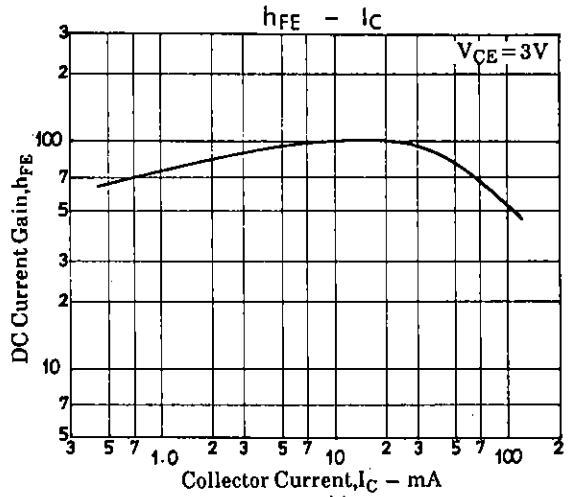
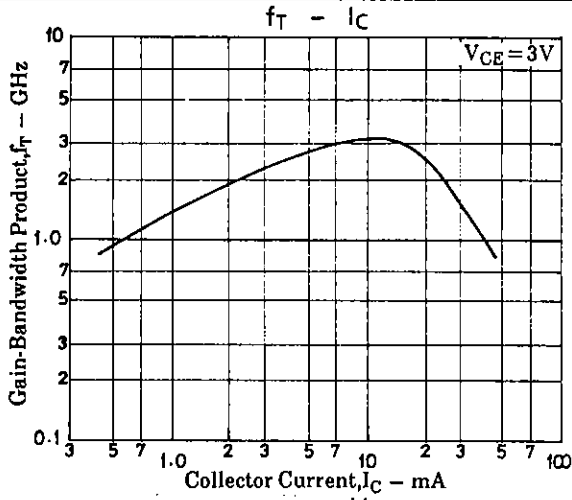
NF Test Circuit



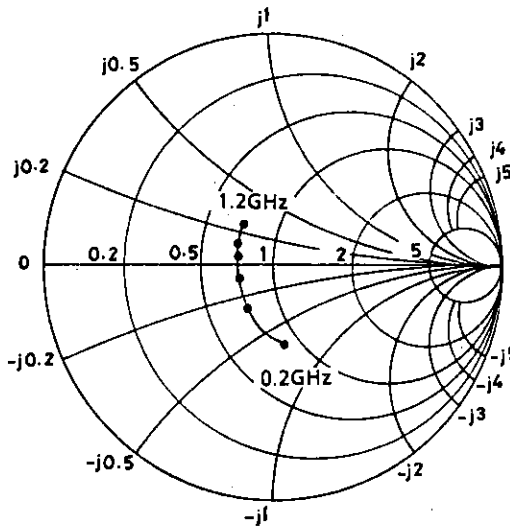
Unit (Resistance : Ω)

900MHz	
C1	~5 pF
C2	~10 pF
C3	~10 pF
C4	~10 pF
C5	~10 pF
L1	W ≐ 1.5 mm, l ≐ 2.5 mm strip line
L2	W ≐ 4 mm, l ≐ 2.5 mm strip line
L3	0.5 φ, l ≐ 4.0 mm
CH	2t + bead core

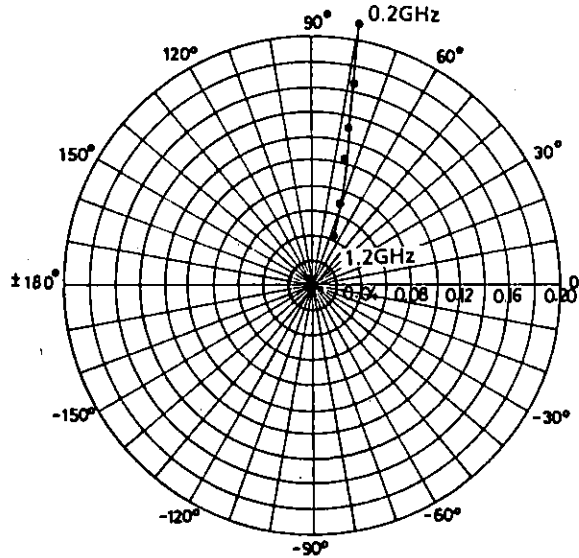
2SC4402



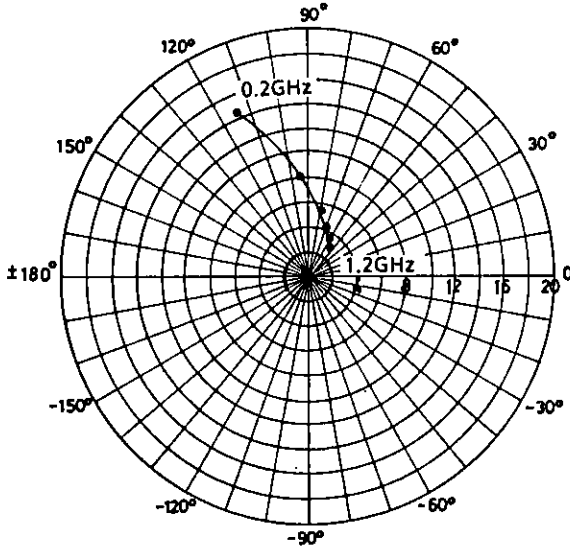
S11e:  $V_{CE} = 3V$   
 $I_C = 5mA$   
 $f = 0.2GHz$  step



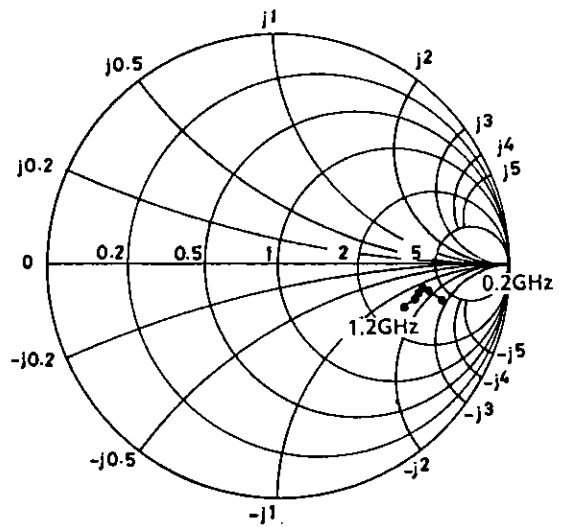
S12e:  $V_{CE} = 3V$   
 $I_C = 5mA$   
 $f = 0.2GHz$  step



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



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



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