

**2SC4407**

## VHF/UHF Mixer, Local Oscillator Applications

### Applications

- VHF/UHF mixers, frequency converters, local oscillators.

### Features

- High cutoff frequency :  $f_T=3.0\text{GHz}$  typ
- High power gain :  $PG=12\text{dB}$  typ ( $f=0.9\text{GHz}$ )
- Small noise figure :  $NF=3.0\text{dB}$  typ ( $f=0.9\text{GHz}$ )
- Very small-sized package permitting 2SC4407-applied sets to be made smaller and slimmer.

### Specifications

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

Parameter	Symbol	Conditions	Ratings	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 $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	$I_{CBO}$	$V_{CB}=15\text{V}, I_E=0$			0.1	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=2\text{V}, I_C=0$			10	$\mu\text{A}$
DC Current Gain	$h_{FE}$	$V_{CE}=10\text{V}, I_C=5\text{mA}$	40*		200*	
Gain-Bandwidth Product	$f_T$	$V_{CE}=10\text{V}, I_C=10\text{mA}$	1.5	3.0		GHz
Output Capacitance	$C_{ob}$	$V_{CB}=10\text{V}, f=1\text{MHz}$		0.7	1.0	pF
Reverse Transfer Capacitance	$C_{re}$	$V_{CB}=10\text{V}, f=1\text{MHz}$		0.45		pF

\* : The 2SC4407 is classified by 5mA  $h_{FE}$  as follows :

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

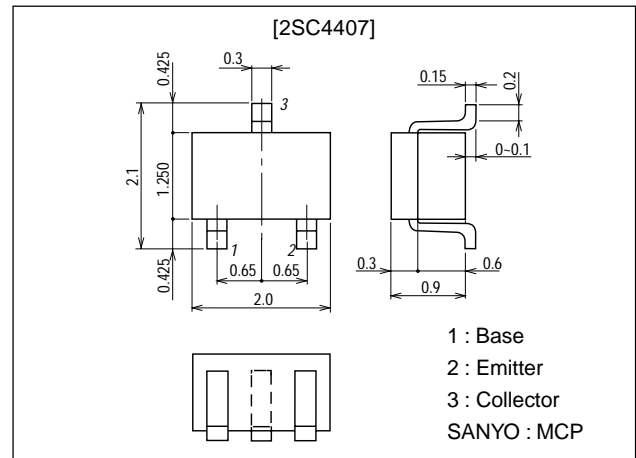
$h_{FE}$  rank : 2, 3, 4

- For CP package version, use the 2SC4270.

### Package Dimensions

unit:mm

2059B



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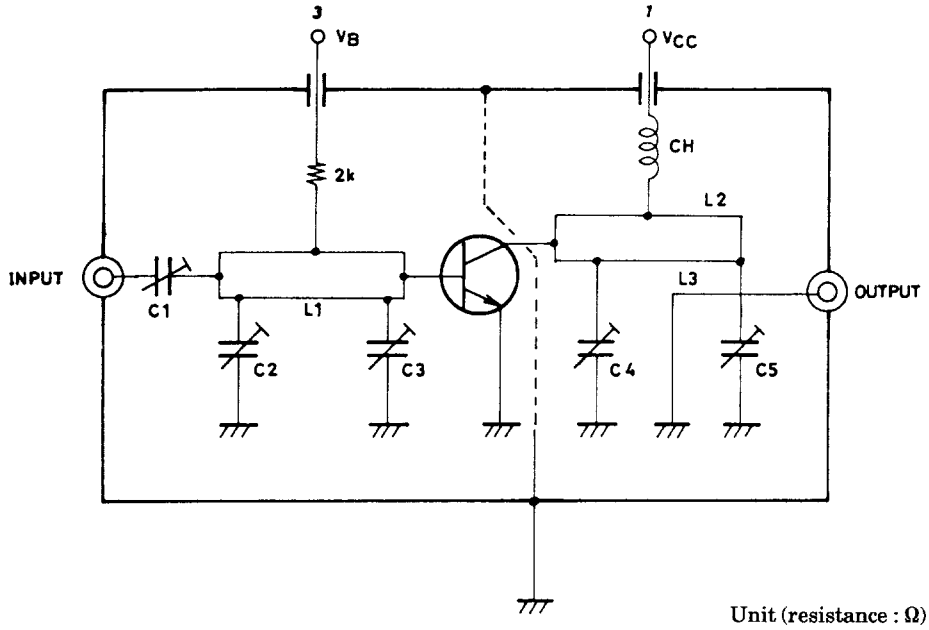
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## 2SC4407

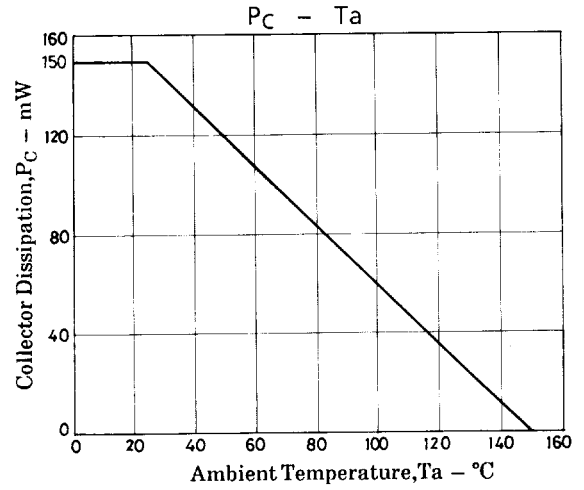
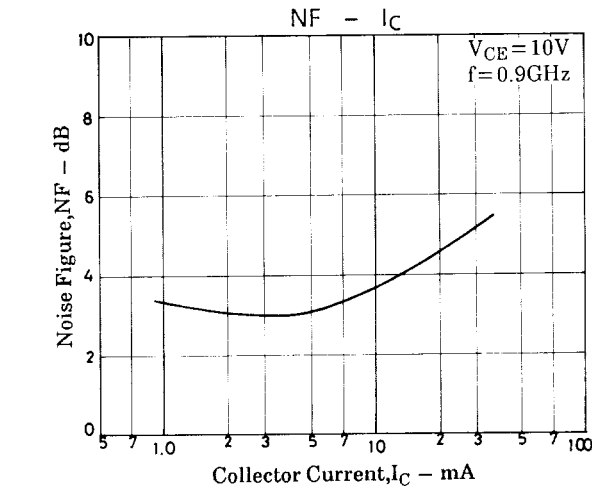
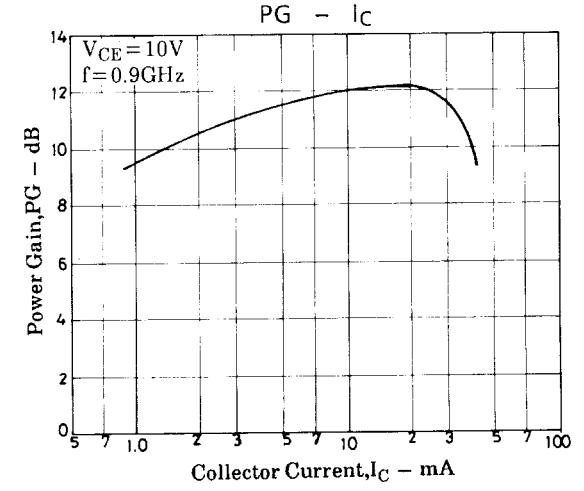
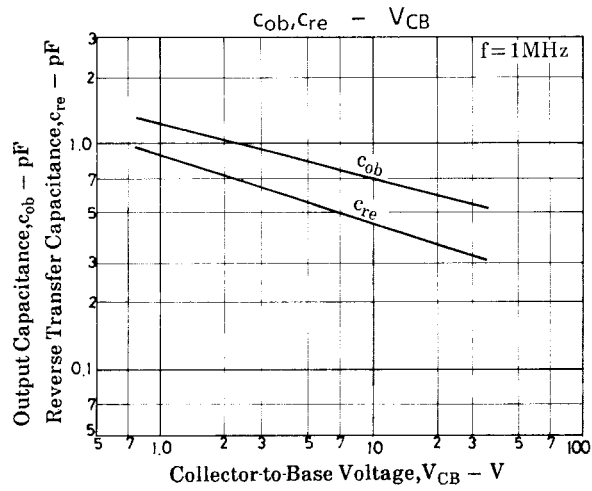
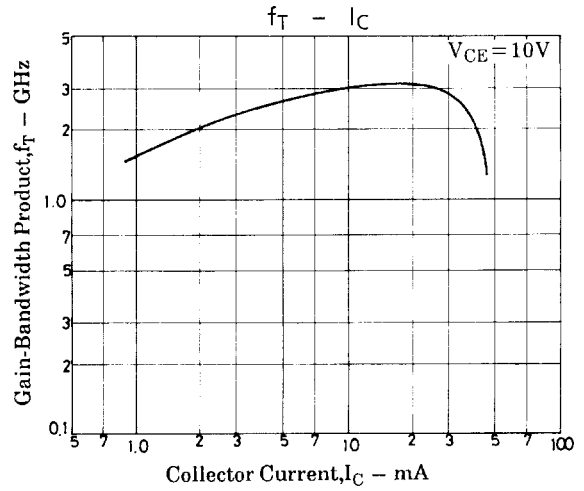
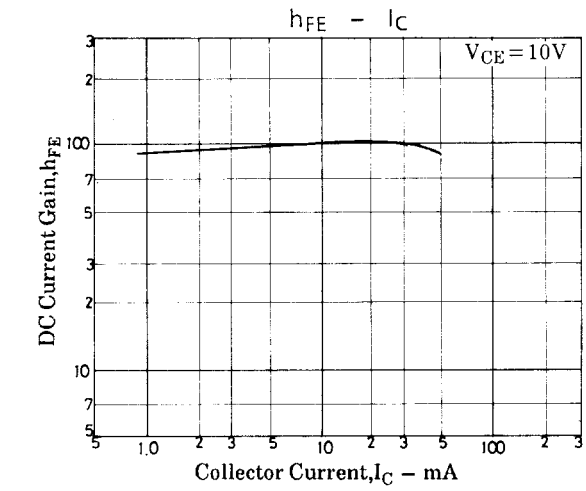
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Power Gain	PG	$V_{CE}=10V, I_C=10mA, f=0.9GHz$		12		dB
Noise Figure	NF	$V_{CE}=10V, I_C=3mA, f=0.9GHz$ See specified Test Circuit.		3.0		dB

### NF Test Circuit



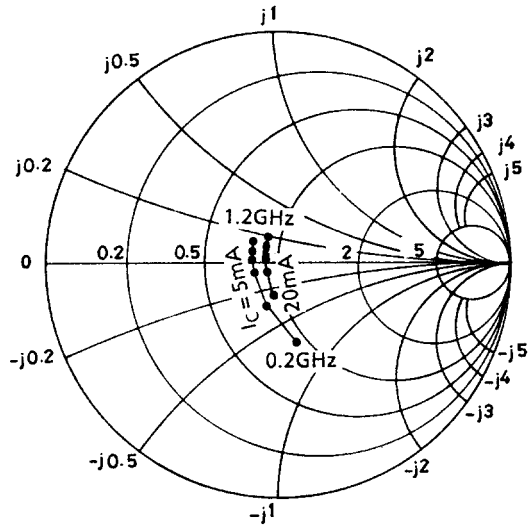
900MHz	
C1	~5pF
C2	~10pF
C3	~10pF
C4	~10pF
C5	~10pF
L1	W $\approx$ 1.5mm, l $\approx$ 25mm Strip line
L2	W $\approx$ 4mm, l $\approx$ 25mm Strip line
L3	0.5 $\phi$ , l $\approx$ 40mm
CH	2t+bead core

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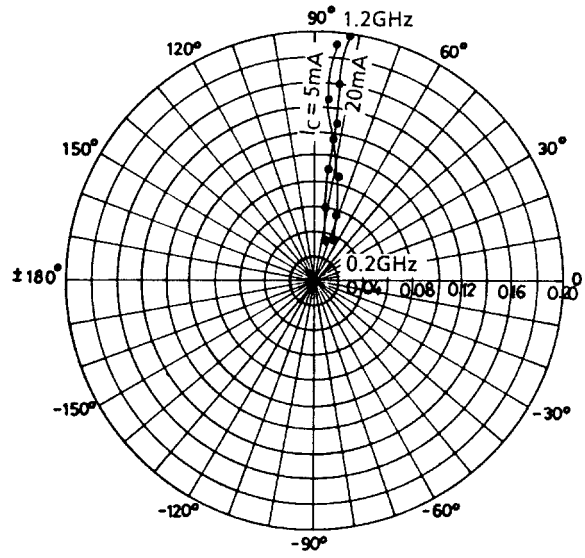


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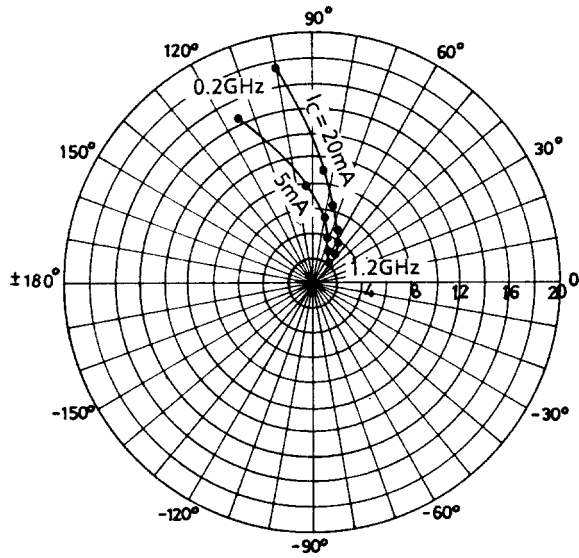
S11e:  $V_{CE} = 10V$   
 $f = 200MHz$  step



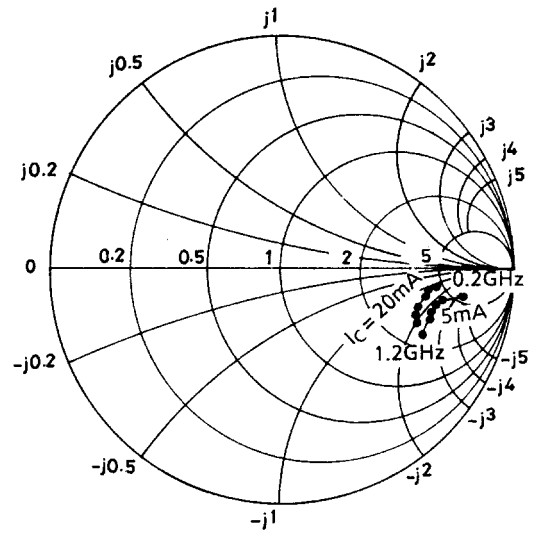
S12e:  $V_{CE} = 10V$   
 $f = 200MHz$  step



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



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



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