

**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	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB}=2\text{V}, I_C=0$			10	μA
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

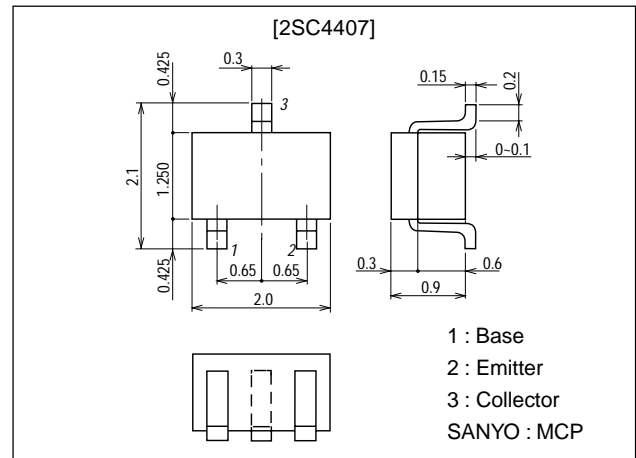
h_{FE} rank : 2, 3, 4

- For CP package version, use the 2SC4270.

Package Dimensions

unit:mm

2059B



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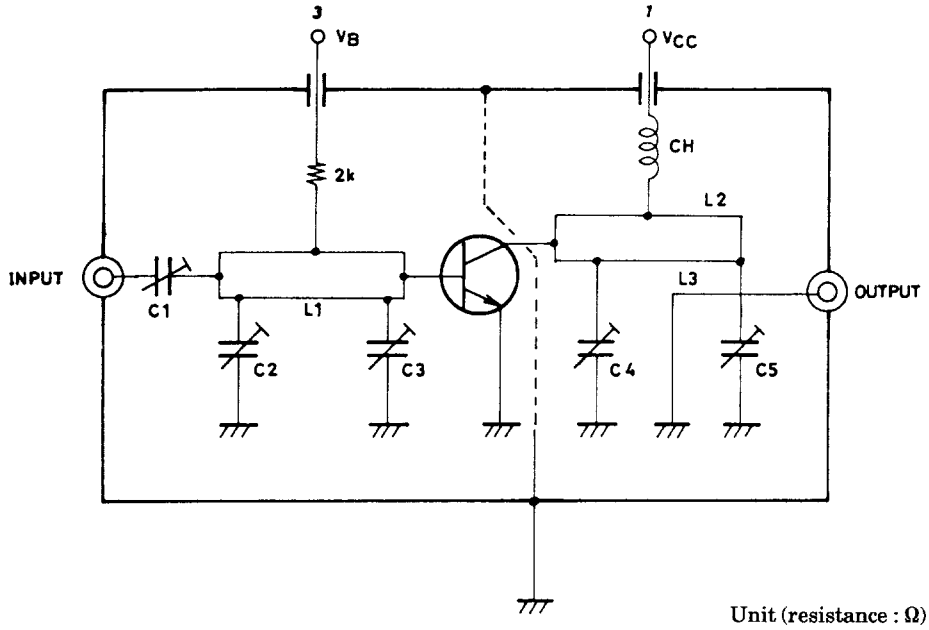
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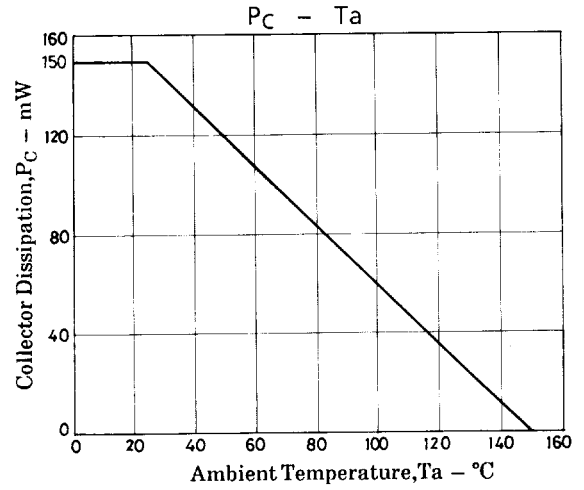
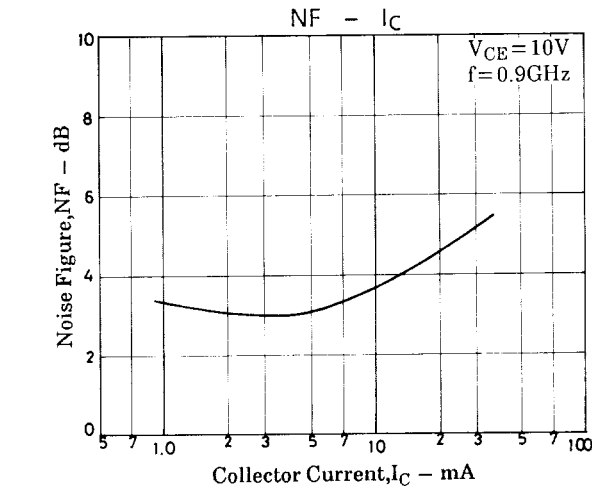
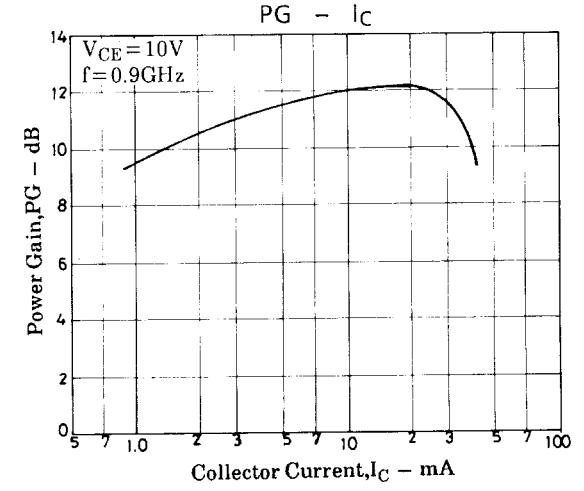
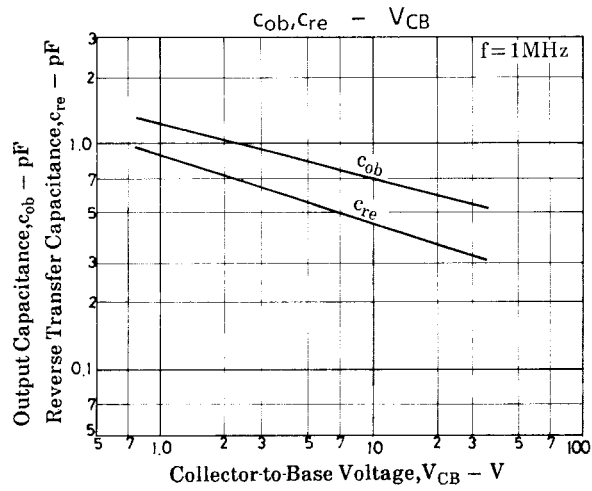
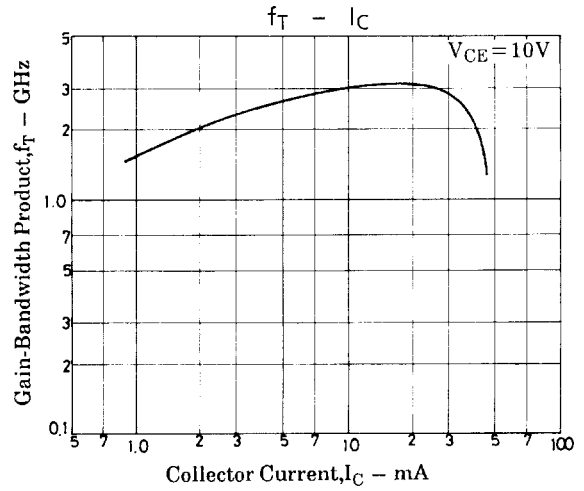
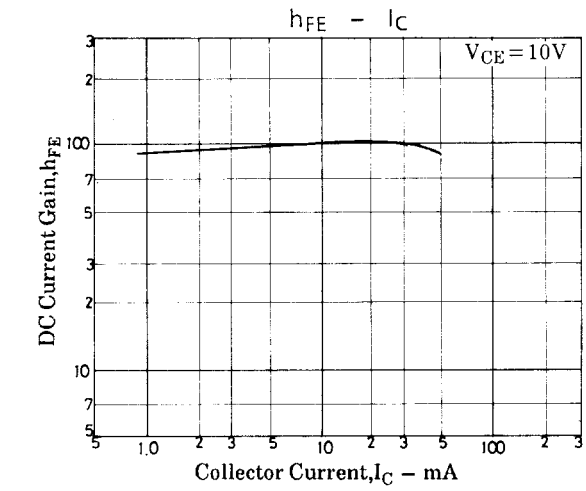
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Power Gain	PG	$V_{CE}=10V, I_C=10mA, f=0.9GHz$		12		dB
Noise Figure	NF	$V_{CE}=10V, I_C=3mA, f=0.9GHz$ See specified Test Circuit.		3.0		dB

NF Test Circuit



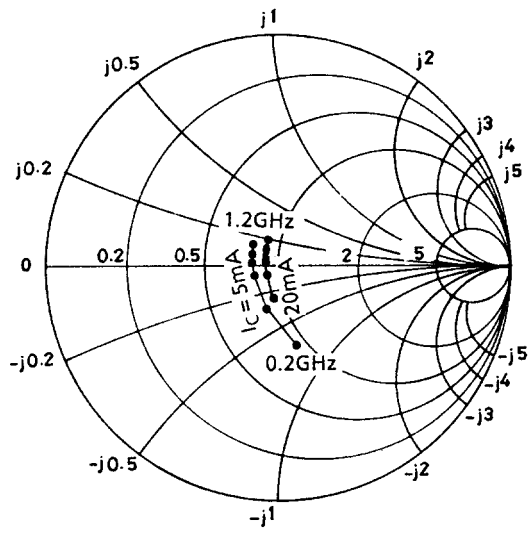
900MHz	
C1	~5pF
C2	~10pF
C3	~10pF
C4	~10pF
C5	~10pF
L1	W \approx 1.5mm, l \approx 25mm Strip line
L2	W \approx 4mm, l \approx 25mm Strip line
L3	0.5 ϕ , l \approx 40mm
CH	2t+bead core

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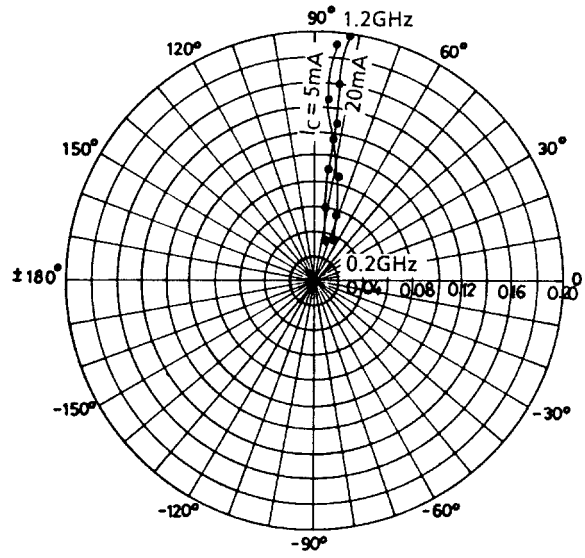


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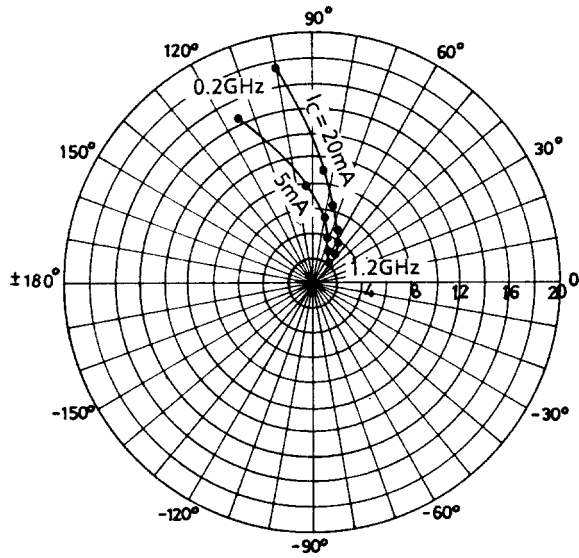
S11e: $V_{CE} = 10V$
 $f = 200MHz$ step



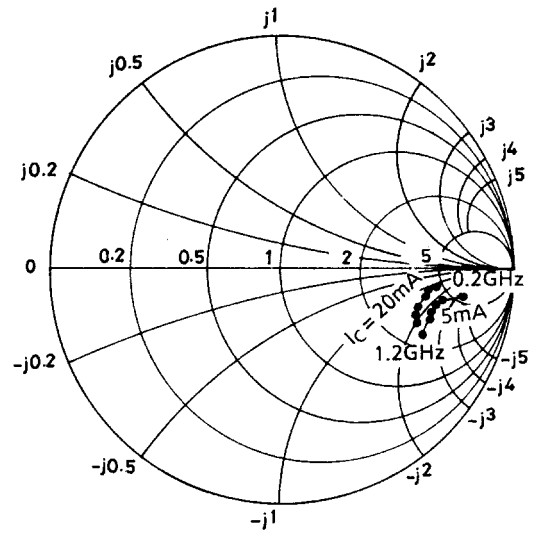
S12e: $V_{CE} = 10V$
 $f = 200MHz$ step



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



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



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