

**2SC4406**

VHF Frequency Mixer, Local Oscillator Applications

Applications

- VHF mixer, frequency converters, local oscillators.

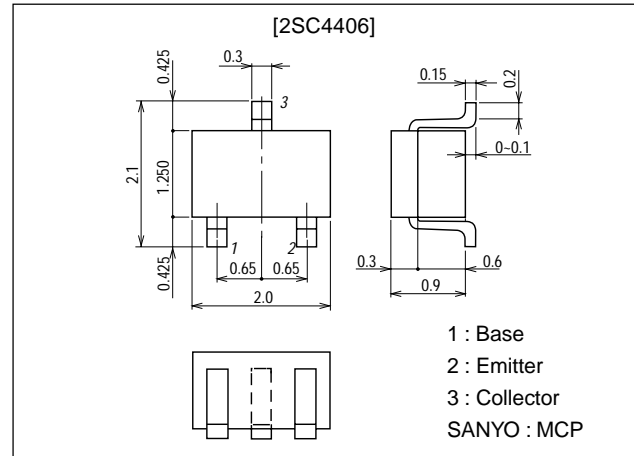
Features

- 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.

Package Dimensions

unit:mm

2059B



Specifications

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

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

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}	$V_{EB}=2\text{V}, I_C=0$			1	μA
DC Current Gain	h_{FE}	$V_{CE}=10\text{V}, I_C=5\text{mA}$	40*		200*	
Gain-Bandwidth Product	f_T	$V_{CE}=10\text{V}, I_C=10\text{mA}$	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

* : 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 : JY

h_{FE} rank : 2, 3, 4

• For CP package version, use the 2SC4269.

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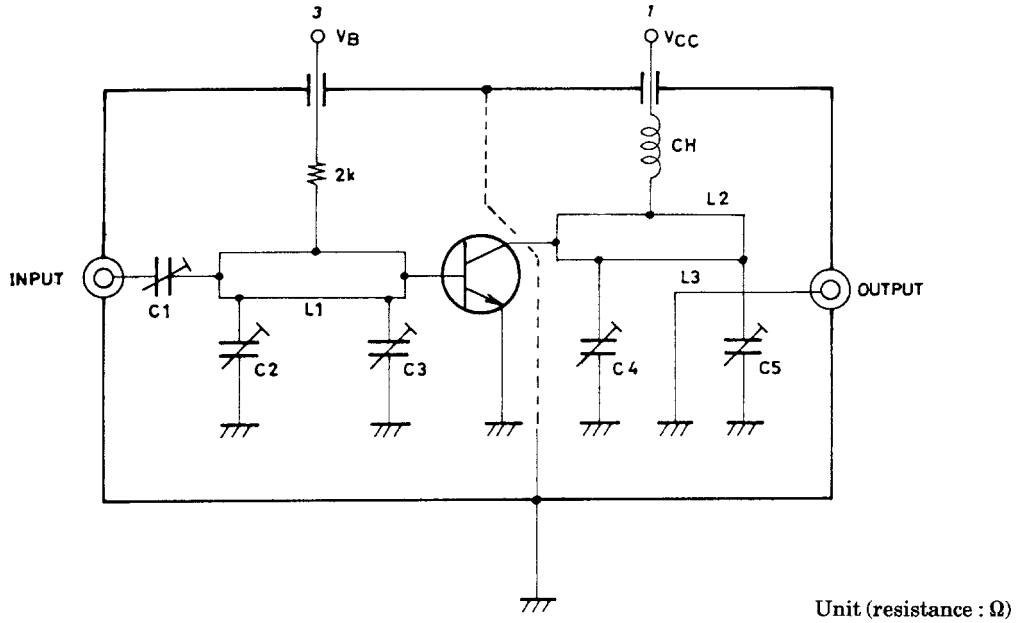
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

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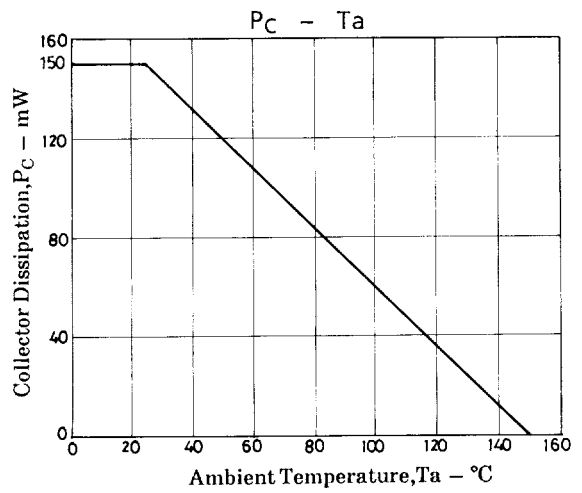
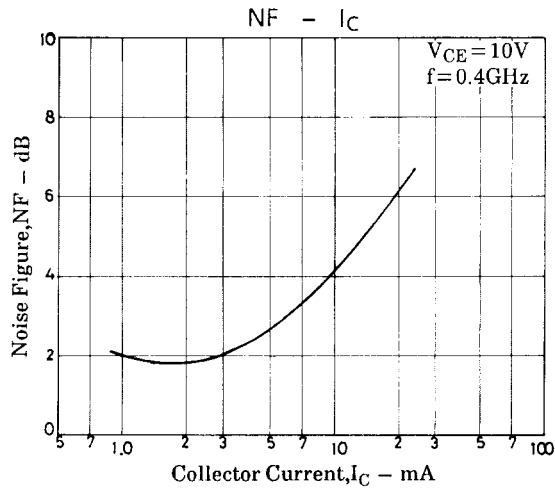
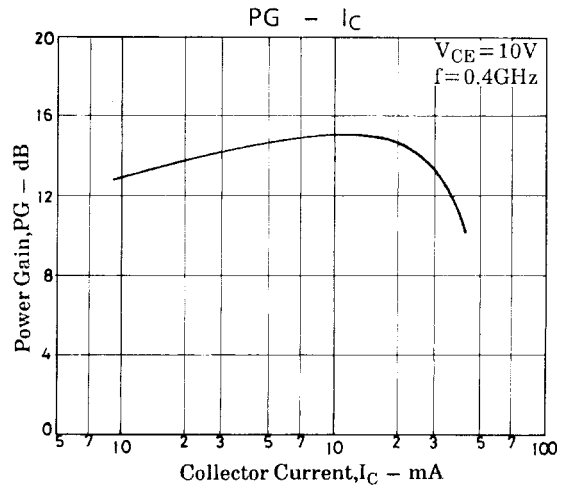
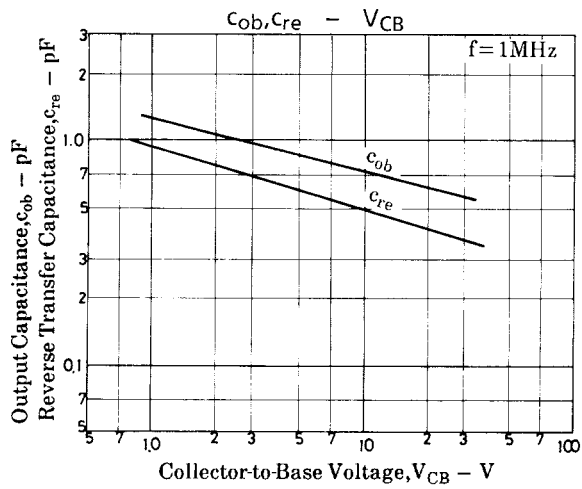
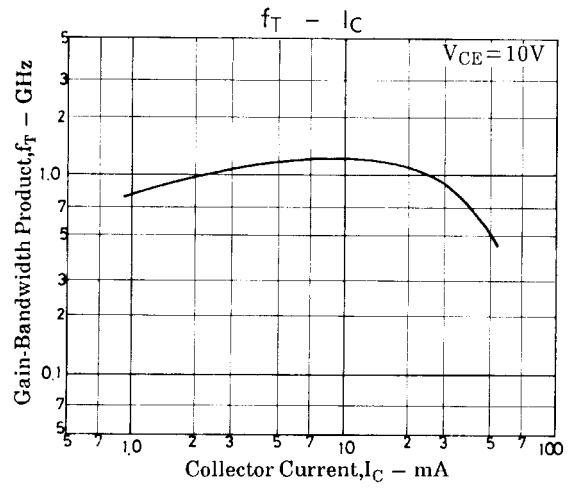
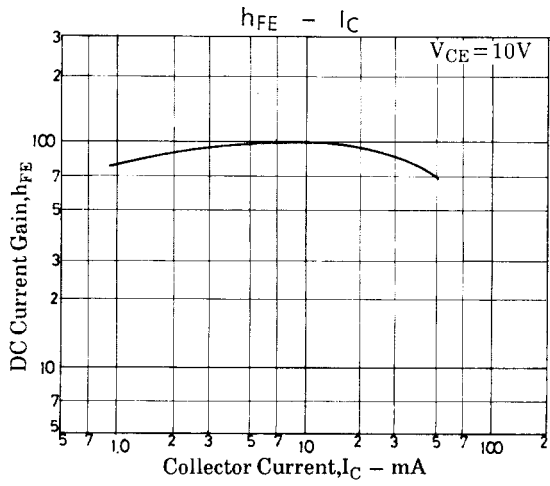
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Power Gain	PG	$V_{CE}=10V, I_C=10mA, f=0.4GHz$		15		dB
Noise Figure	NF	$V_{CE}=10V, I_C=3mA, f=0.4GHz$ See specified Test Circuit.		2.0		dB

NF Test Circuit



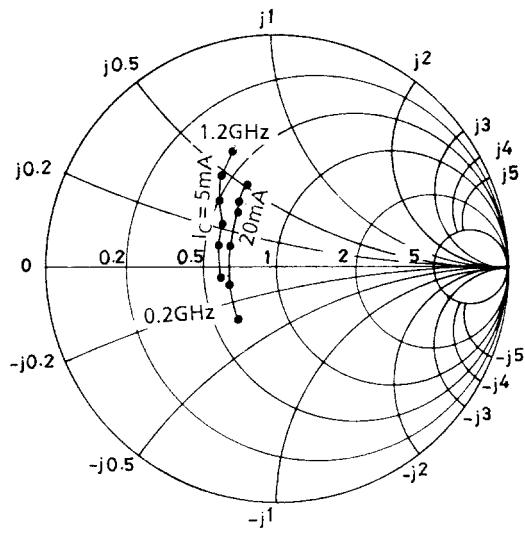
f=400MHz	
C1	~20pF
C2	~10pF
C3	~10pF
C4	~20pF
C5	~30pF
L1	2 ϕ , l=40mm 2/3t
L2	2 ϕ , l=40mm 2/3t
L3	1 ϕ , l=40mm 1/2t

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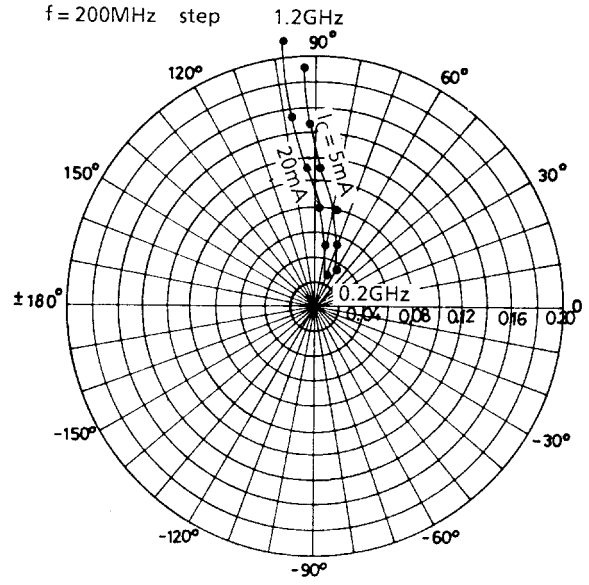


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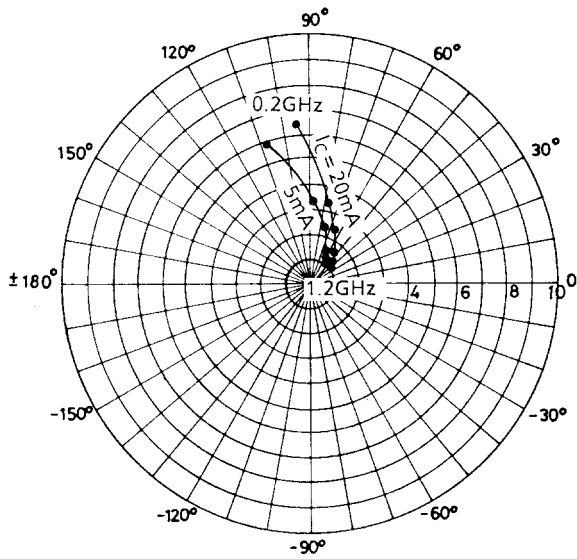
S11e: $V_{CE} = 10V$
 $f = 200MHz$ step



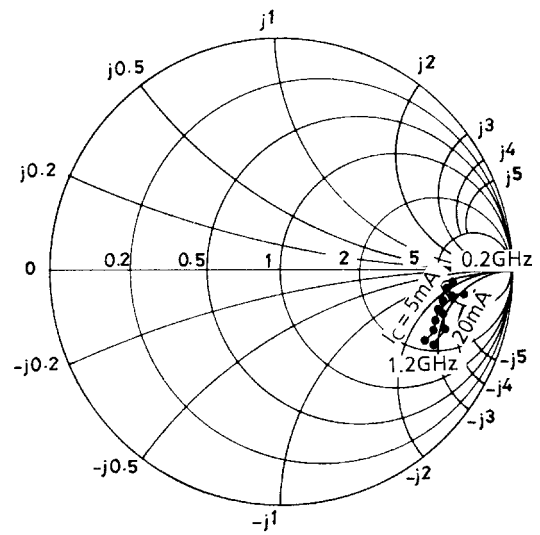
S12e: $V_{CE} = 10V$
 $f = 200MHz$ step



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



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



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