



2SC4406

VHF Frequency Mixer, Local Oscillator Applications

Applications

- VHF mixer, frequency converters, local oscillators.

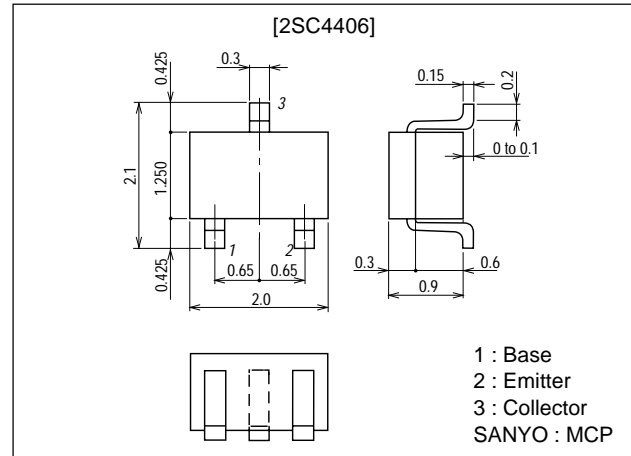
Features

- 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.
- Ultrasmall-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 :

Continued on next page.

(Note) Marking : JY

 h_{FE} rank : 2, 3, 4

• For CP package version, use the 2SC4269.

Rank	2	3	4
h_{FE}	40 to 80	60 to 120	100 to 200

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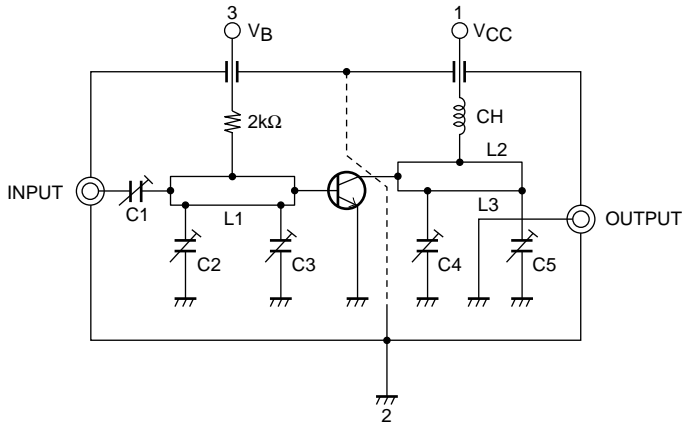
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2SC4406

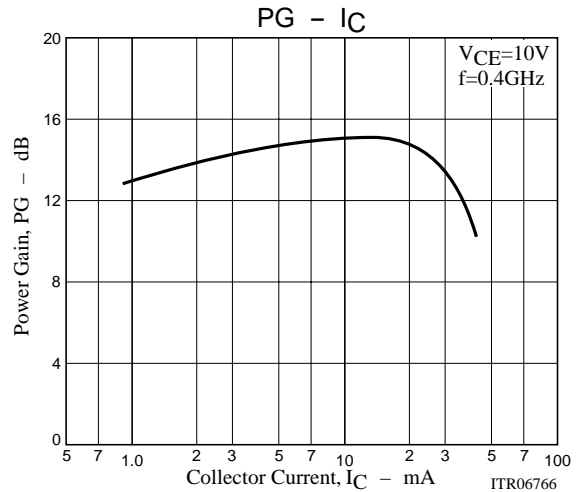
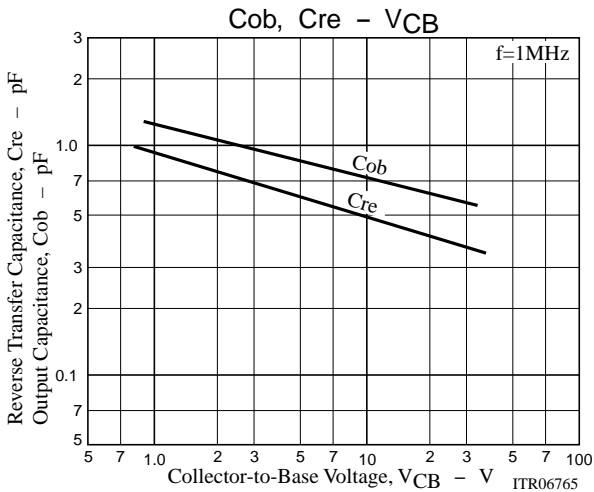
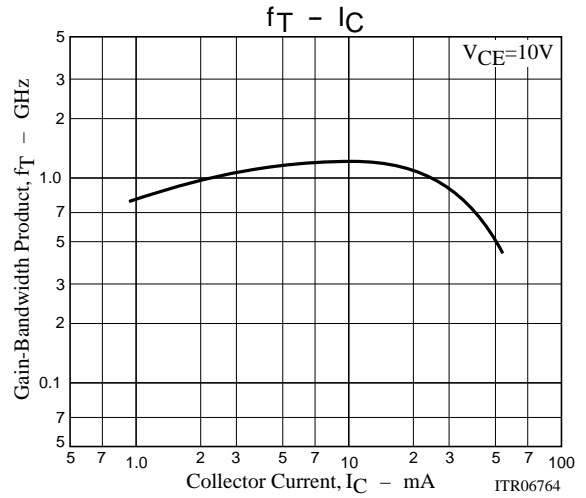
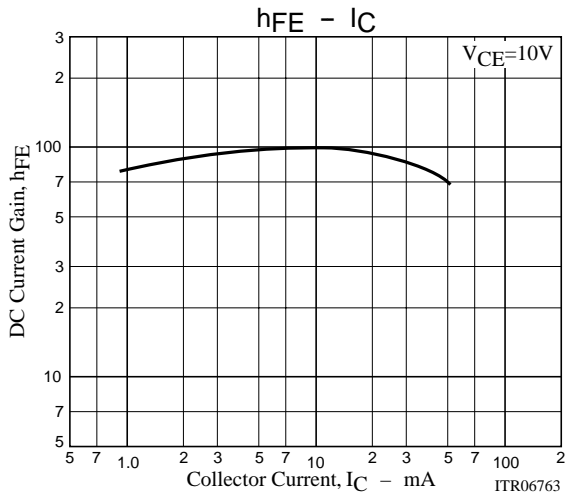
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Power Gain	PG	$V_{CE}=10V, I_C=10mA, f=0.4GHz$		15		dB
Noise Figure	NF	$V_{CE}=10V, I_C=3mA, f=0.4GHz$ See specified Test Circuit.		2.0		dB

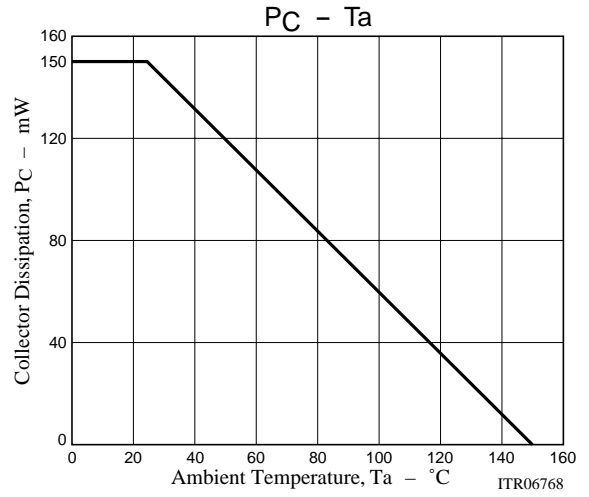
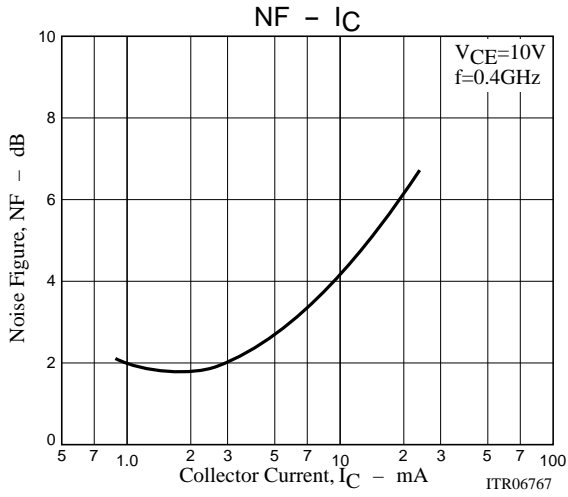
NF Test Circuit



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

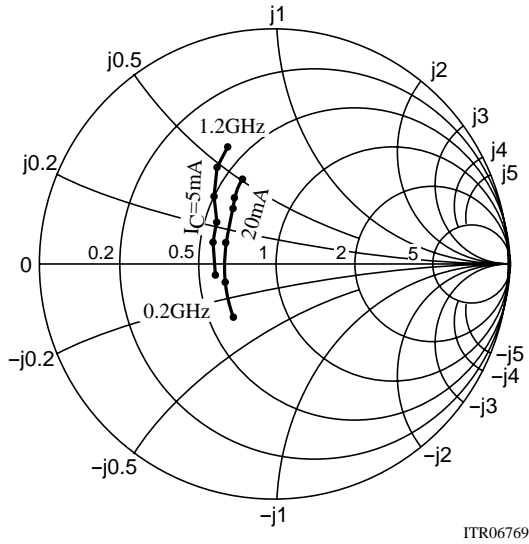


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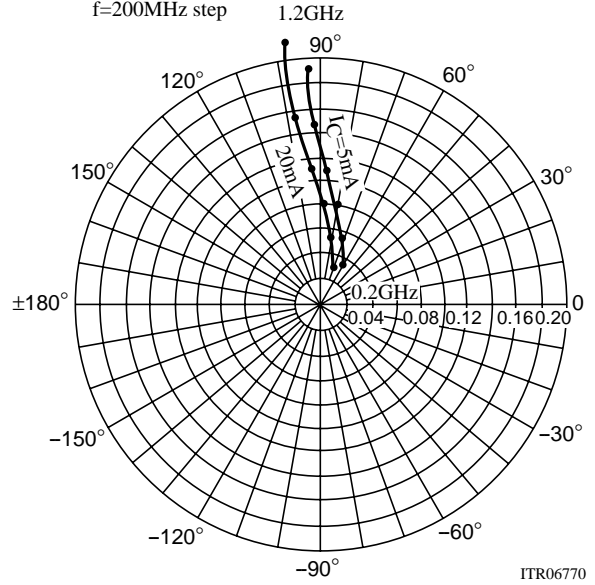


S parameter

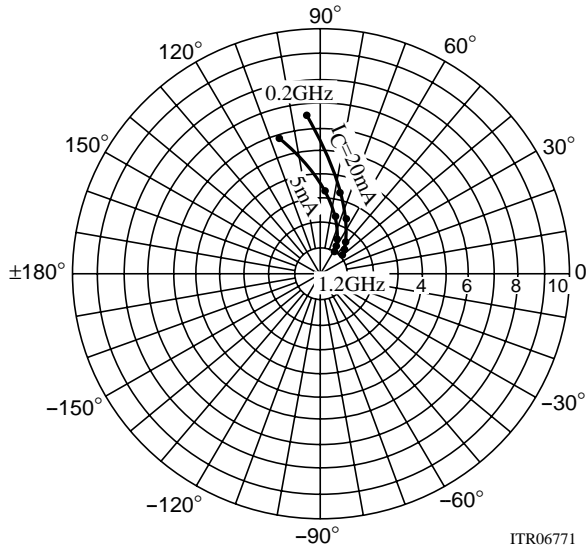
S11e : $V_{CE}=10V$
 $f=200MHz$ step



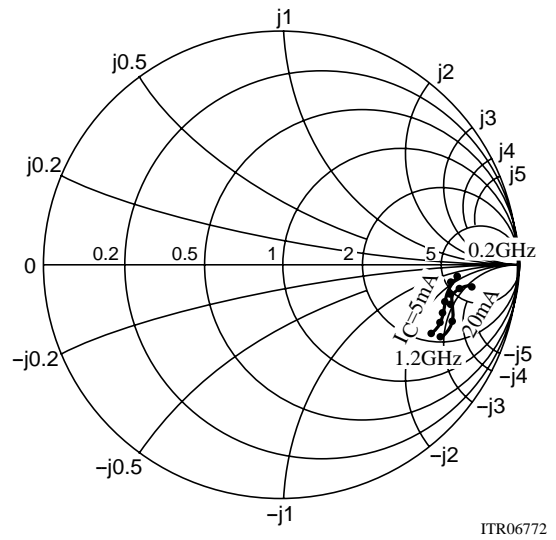
S12e : $V_{CE}=10V$
 $f=200MHz$ step



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



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



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