Ordering number:EN2759A

NPN Epitaxial Planar Silicon Transistor

2SC4406

VHF Frequency Mixer, Local Oscillator Applications

Applications

· VHF mixer, frequency converters, local oscillators.

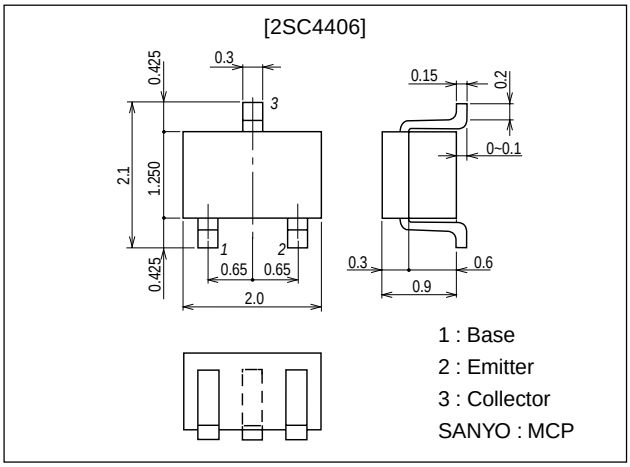
Features

· High cutoff frequency : f_T=1.2GHz typ
· High power gain : PG=15dB typ (f=0.4GHz)
· 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 Ta = 25˚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	Tj		150	˚C
Storage Temperature	Tstg		–55 to +150	˚C

Electrical Characteristics at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	V_{CB}=15V, I_E=0			0.1	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=2V, I_C=0			1	μA
DC Current Gain	h_{FE}	V_{CE}=10V, I_C=5mA	40*		200*	
Gain-Bandwidth Product	f_T	V_{CE}=10V, I_C=10mA	0.6	1.2		GHz
Output Capacitance	C_{ob}	V_{CB}=10V, f=1MHz		0.75	1.1	pF
Reverse Transfer Capacitance	C_{re}	V_{CB}=10V, f=1MHz		0.5		pF

* : The 2SC4406 is classified by 5mA h_{FE} as follows :

40	2	80	60	3	120	100	4	200

(Note) Marking : JY
h_{FE} rank : 2, 3, 4
• For CP package version, use the 2SC4269.

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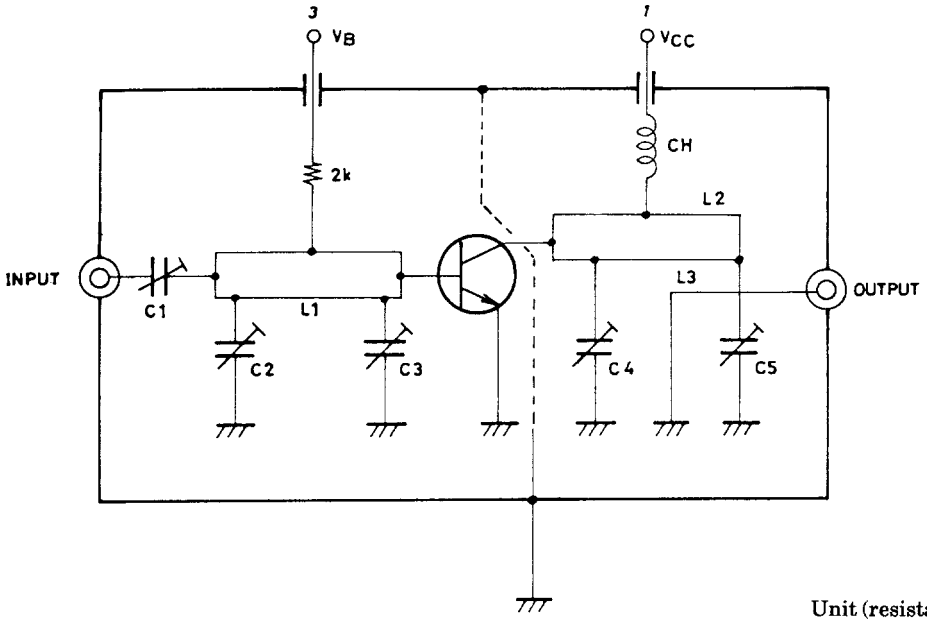
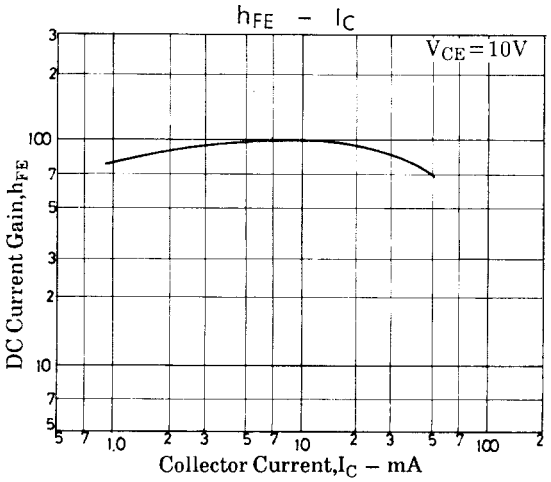
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Power Gain	PG	V_{CE}=10V, I_C=10mA, f=0.4GHz		15		dB
Noise Figure	NF	V_{CE}=10V, I_C=3mA, f=0.4GHz See specified Test Circuit.		2.0		dB

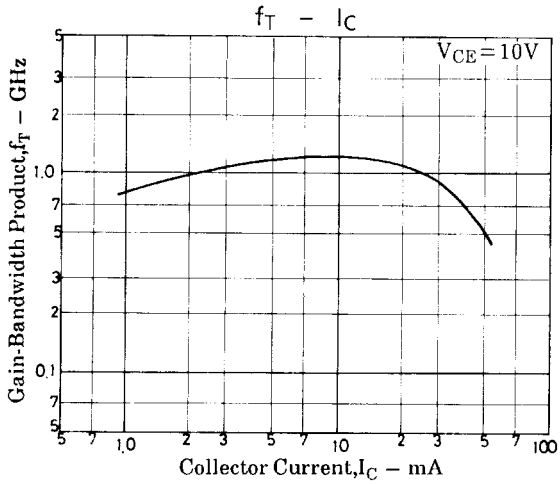
NF Test Circuit

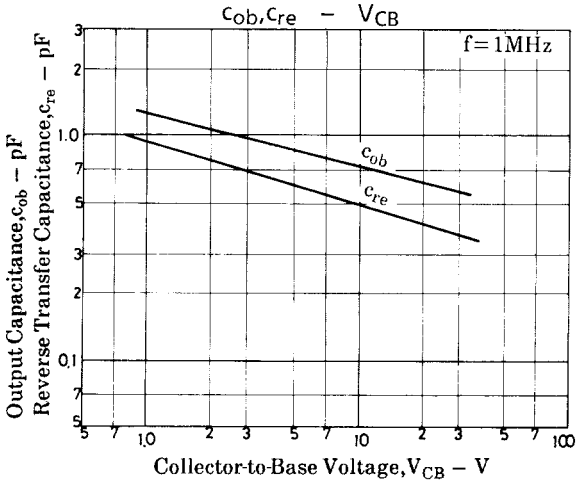


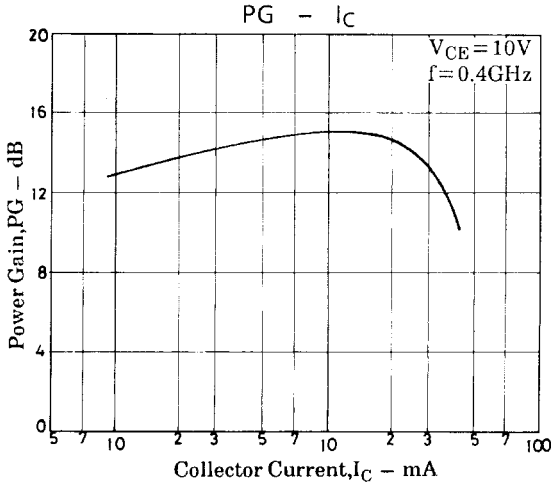
Unit (resistance : Ω)

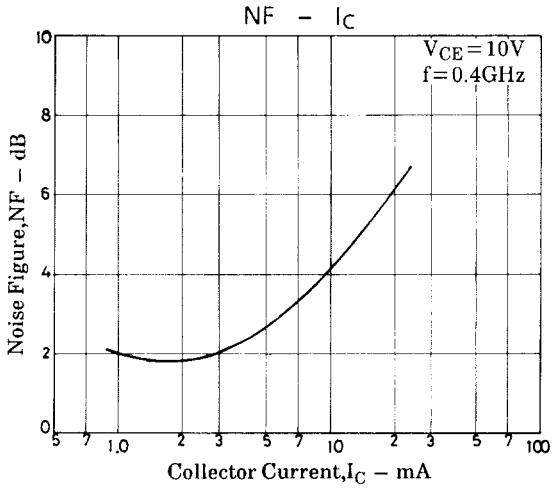
	f=400MHz
C1	~20pF
C2	~10pF
C3	~10pF
C4	~20pF
C5	~30pF
L1	2 ϕ, l=40mm 2/3t
L2	2 ϕ, l=40mm 2/3t
L3	1 ϕ, l=40mm 1/2t

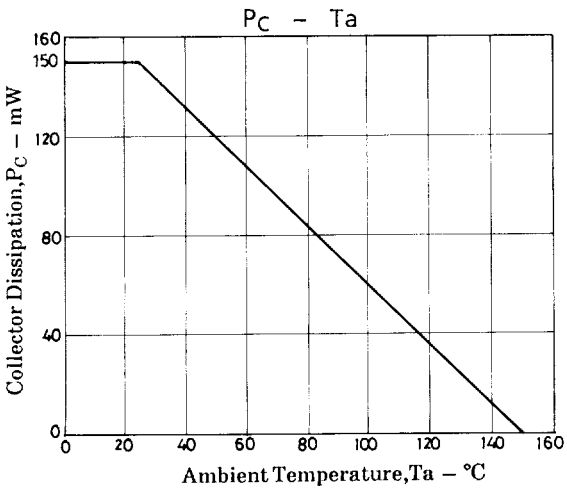

hFE – IC
VCE=10V
DC Current Gain,hFE
Collector Current,IC – mA


fT – IC
VCE=10V
Gain-Bandwidth Product,fT – GHz
Collector Current,IC – mA

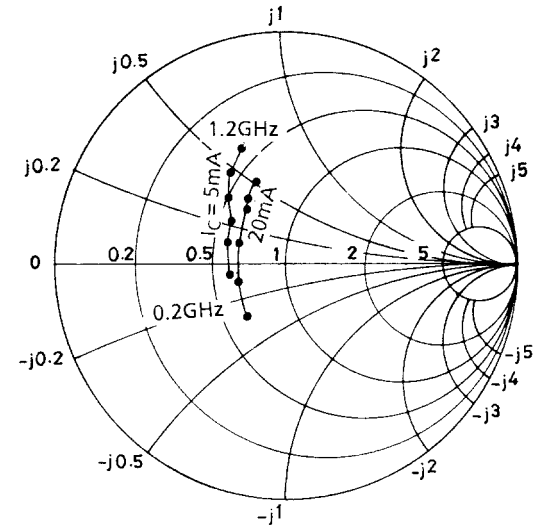

Cob,Cre – VCB
f=1MHz
Cob
Cre
Output Capacitance,Cob – pF
Reverse Transfer Capacitance,Cre – pF
Collector-to-Base Voltage,VCB – V


PG – IC
VCE=10V
f=0.4GHz
Power Gain,PG – dB
Collector Current,IC – mA

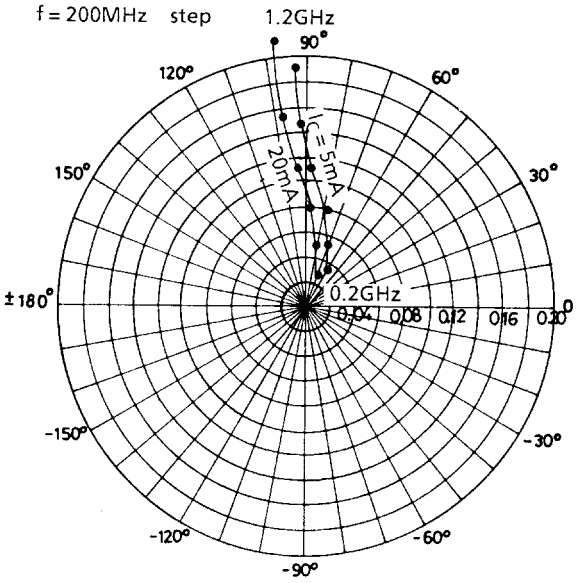

NF – IC
VCE=10V
f=0.4GHz
Noise Figure,NF – dB
Collector Current,IC – mA


PC – Ta
Collector Dissipation,PC – mW
Ambient Temperature,Ta – °C

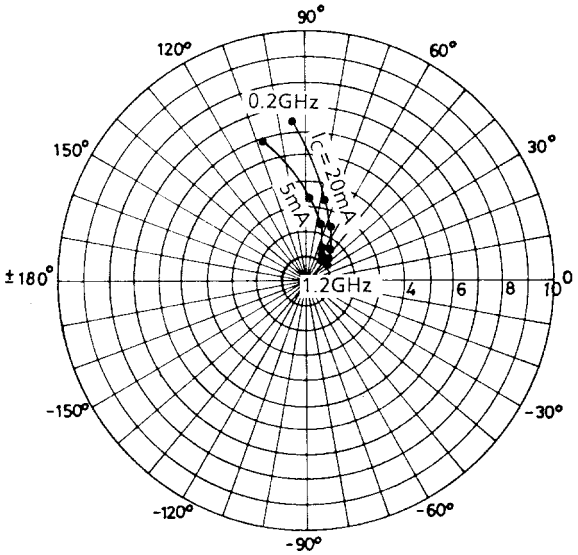
S11e : V_{CE} = 10V
f = 200MHz step



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



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



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