Ordering number:EN5541A

NPN Epitaxial Planar Silicon Transistor

2SC5375

VHF to UHF Band OSC, High-Frequency Amplifiers Applications

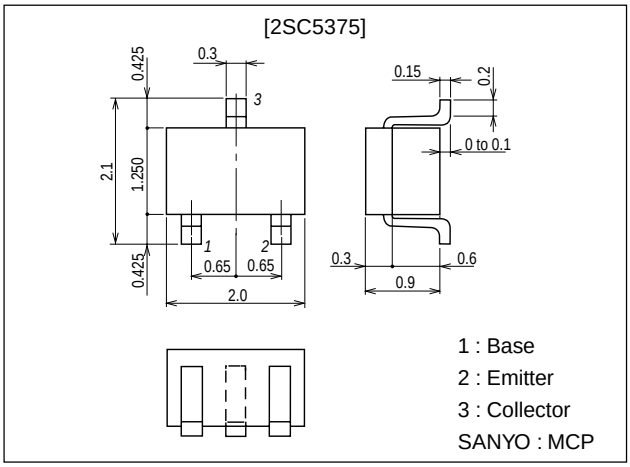
Features

- High gain : $|S21e|^2$=10dB typ (f=1GHz).
- High cutoff frequency : f_T=5.2GHz typ.

Package Dimensions

unit:mm

2059B



Specifications

Absolute Maximum Ratings at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		20	V
Collector-to-Emitter Voltage	V_{CEO}		10	V
Emitter-to-Base Voltage	V_{EBO}		2	V
Collector Current	I_C		100	mA
Collector Dissipation	P_C		150	mW
Junction Temperature	Tj		150	˚C
Storage Temperature	Tstg		–55 to +150	˚C

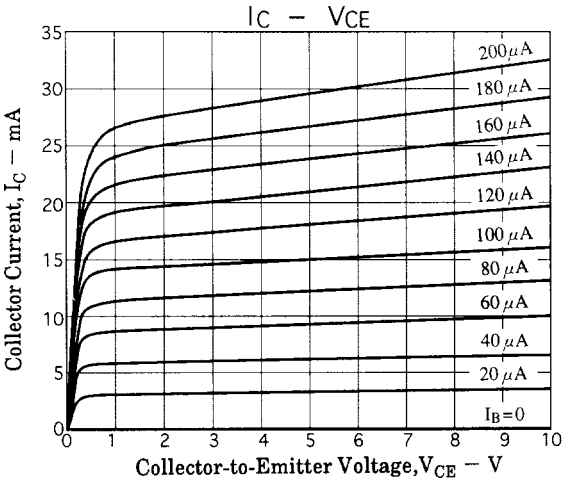
Electrical Characteristics at Ta = 25˚C

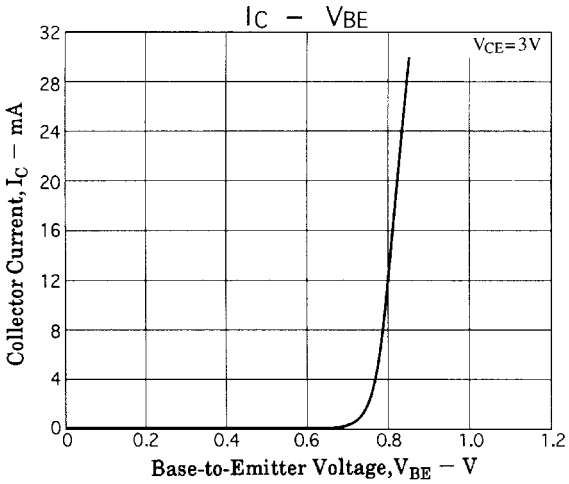
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	V_{CB}=10V, I_E=0			1.0	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=1V, I_C=0			10	μA
DC Current Gain	$h_{FE}1$	V_{CE}=3V, I_C=7mA	110		180	
	$h_{FE}2$	V_{CE}=3V, I_C=30mA	100			
Gain-Bandwidth Product	f_T	V_{CE}=3V, I_C=7mA	3	5.2		GHz
Output Capacitance	Cob	V_{CB}=3V, f=1MHz		1.0	1.5	pF
Reverse Transfer Capacitance	Cre	V_{CB}=3V, f=1MHz		0.7		pF
Forward Transfer Gain	$\|S21e\|^2$	V_{CE}=3V, I_C=7mA, f=1GHz	8	10		dB
Noise Figure	NF	V_{CE}=3V, I_C=7mA, f=1GHz		1.4	2.5	dB

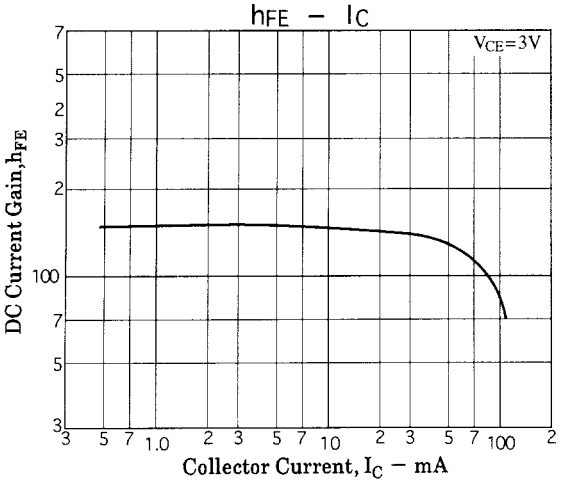
Marking : NA

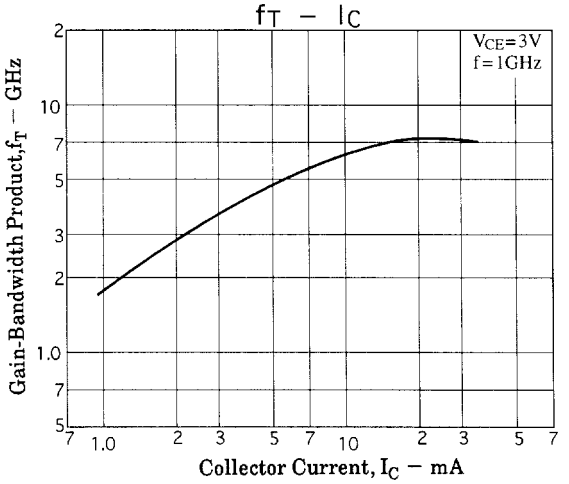
SANYO Electric Co.,Ltd. Semiconductor Bussiness Headquaters

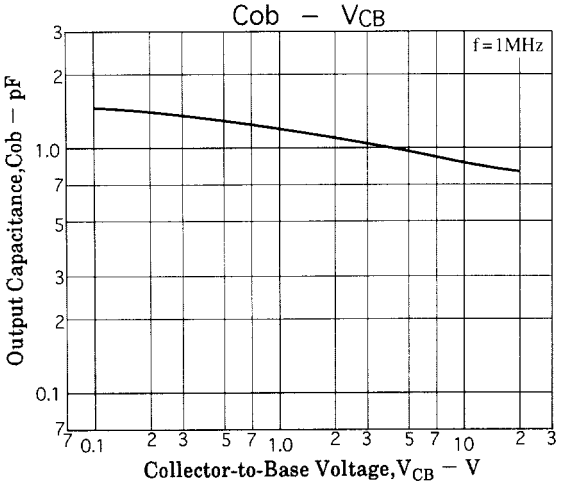
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

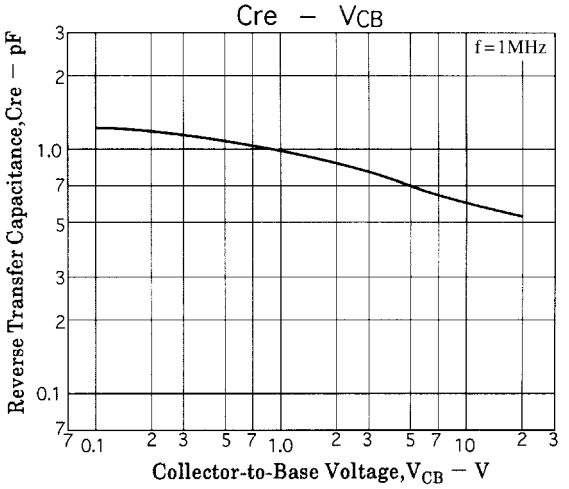

IC – VCE
Collector Current, IC – mA
Collector-to-Emitter Voltage, VCE – V
200 μA
180 μA
160 μA
140 μA
120 μA
100 μA
80 μA
60 μA
40 μA
20 μA
IB=0

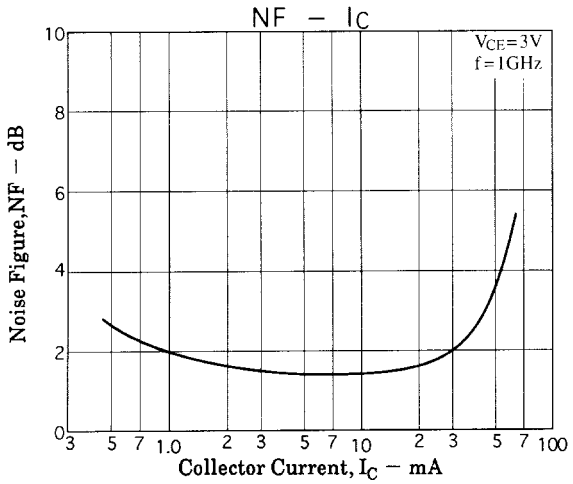

IC – VBE
VCE=3V
Collector Current, IC – mA
Base-to-Emitter Voltage, VBE – V

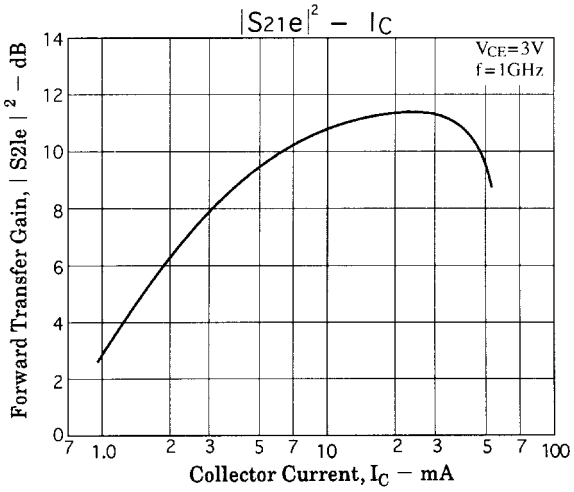

hFE – IC
VCE=3V
DC Current Gain, hFE
Collector Current, IC – mA

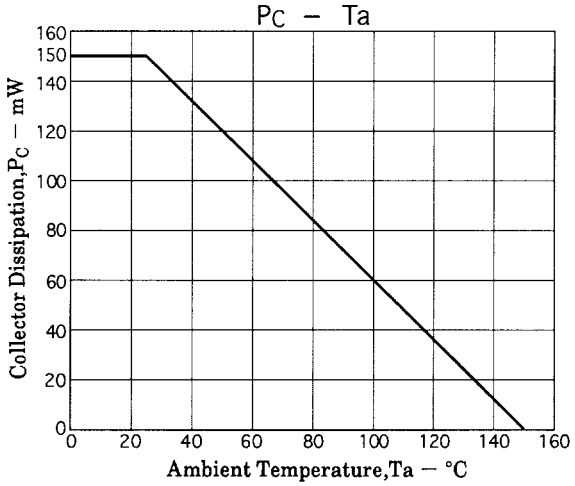

fT – IC
VCE=3V
f=1GHz
Gain-Bandwidth Product, fT – GHz
Collector Current, IC – mA


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


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


NF – IC
VCE=3V
f=1GHz
Noise Figure, NF – dB
Collector Current, IC – mA

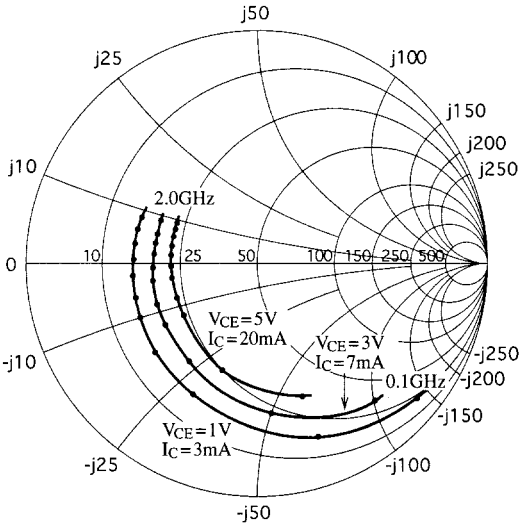

|S21e|2 – IC
VCE=3V
f=1GHz
Forward Transfer Gain, |S21e|2 – dB
Collector Current, IC – mA



S Parameters

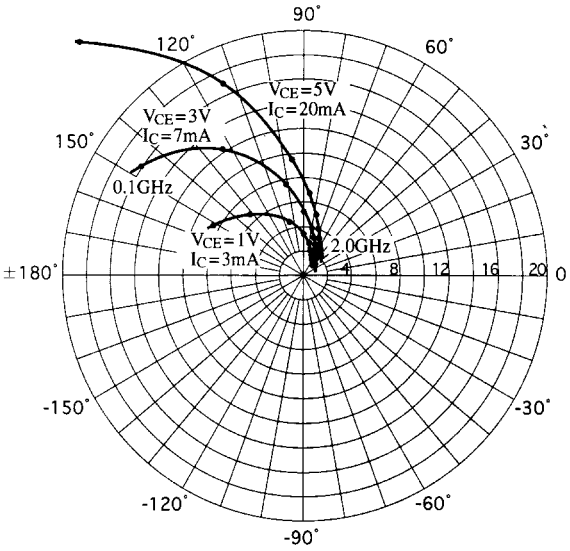
S11e

f=100MHz, 200 to 2000MHz (200MHz step)



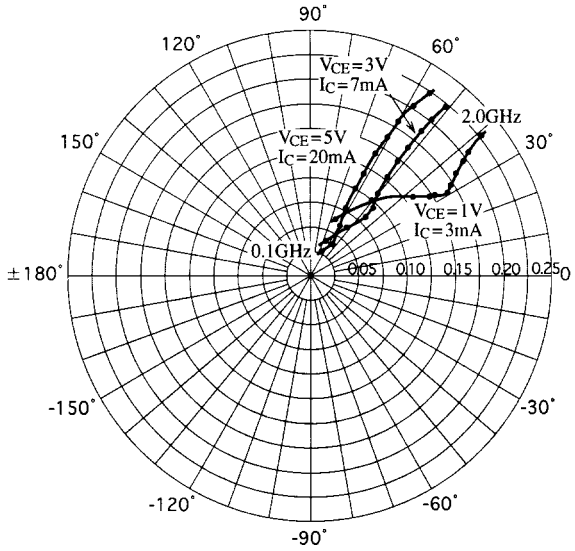
S21e

f=100MHz, 200 to 2000MHz (200MHz step)



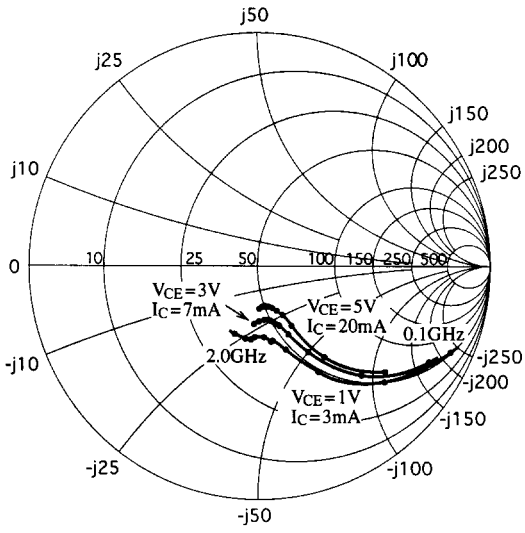
S12e

f=100MHz, 200 to 2000MHz (200MHz step)



S22e

f=100MHz, 200 to 2000MHz (200MHz step)



S parameters (Common emitter)

V_{CE}=1V, I_C=3mA, Z_O=50Ω

Freq (MHz)	$\|S_{11}\|$	$\angle S_{11}$	$\|S_{21}\|$	$\angle S_{21}$	$\|S_{12}\|$	$\angle S_{12}$	$\|S_{22}\|$	$\angle S_{22}$
100	0.875	–40.1	8.529	152.1	0.062	67.4	0.905	–24.3
200	0.782	–70.7	6.673	131.8	0.101	51.6	0.745	–42.0
400	0.621	–115.9	4.733	104.7	0.135	37.2	0.524	–59.1
600	0.576	–138.2	3.353	90.2	0.143	33.3	0.387	–71.5
800	0.547	–155.7	2.686	79.1	0.151	33.0	0.329	–79.4
1000	0.542	–165.4	2.165	70.4	0.165	31.2	0.330	–80.5
1200	0.534	–174.7	1.873	62.4	0.173	33.0	0.310	–86.0
1400	0.529	178.3	1.638	55.7	0.184	35.1	0.295	–91.9
1600	0.529	170.8	1.480	49.7	0.194	35.6	0.308	–95.7
1800	0.533	165.4	1.321	43.4	0.208	36.8	0.312	–101.6
2000	0.532	159.3	1.215	38.3	0.227	38.6	0.304	–109.1

V_{CE}=3V, I_C=7mA, Z_O=50Ω

Freq (MHz)	$\|S_{11}\|$	$\angle S_{11}$	$\|S_{21}\|$	$\angle S_{21}$	$\|S_{12}\|$	$\angle S_{12}$	$\|S_{22}\|$	$\angle S_{22}$
100	0.777	–48.9	16.116	146.5	0.040	65.9	0.852	–29.0
200	0.643	–84.8	12.223	124.2	0.061	52.9	0.646	–46.3
400	0.505	–126.1	7.484	101.5	0.083	46.6	0.428	–58.8
600	0.473	–146.2	5.198	89.7	0.096	48.3	0.317	–65.6
800	0.454	–160.6	3.984	80.7	0.112	49.9	0.273	–70.2
1000	0.446	–170.4	3.275	73.6	0.129	51.4	0.248	–74.1
1200	0.449	–177.6	2.738	66.9	0.147	52.0	0.239	–76.3
1400	0.445	175.5	2.391	61.2	0.165	52.4	0.229	–79.6
1600	0.443	168.9	2.135	55.9	0.184	52.4	0.225	–84.6
1800	0.439	164.1	1.944	50.5	0.203	51.5	0.227	–90.0
2000	0.443	157.7	1.760	45.7	0.222	50.4	0.240	–93.0

V_{CE}=5V, I_C=20mA, Z_O=50Ω

Freq (MHz)	$\|S_{11}\|$	$\angle S_{11}$	$\|S_{21}\|$	$\angle S_{21}$	$\|S_{12}\|$	$\angle S_{12}$	$\|S_{22}\|$	$\angle S_{22}$
100	0.595	–70.3	26.610	134.3	0.028	62.1	0.724	–39.3
200	0.480	–107.7	17.090	113.5	0.041	56.3	0.482	–54.3
400	0.406	–143.8	9.432	95.7	0.060	58.8	0.296	–61.9
600	0.393	–160.3	6.459	86.2	0.079	61.8	0.227	–64.4
800	0.388	–171.0	4.909	79.0	0.100	62.8	0.200	–67.5
1000	0.387	–178.6	3.989	73.3	0.121	62.8	0.188	–70.3
1200	0.390	175.1	3.356	67.3	0.142	62.0	0.182	–72.4
1400	0.385	169.8	2.918	62.1	0.163	61.0	0.176	–75.0
1600	0.386	163.9	2.588	57.7	0.184	59.9	0.173	–80.1
1800	0.388	159.8	2.322	52.8	0.205	57.9	0.177	–85.8
2000	0.394	154.7	2.117	48.5	0.226	56.0	0.185	–89.4