Ordering number : EN 5541A

SANYO

No.5541A

2SC5375

NPN Epitaxial Planar Silicon Transistor

VHF to UHF Band OSC, High-Frequency Amp Applications

Features

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

Absolute Maximum Ratings at Ta = 25°C

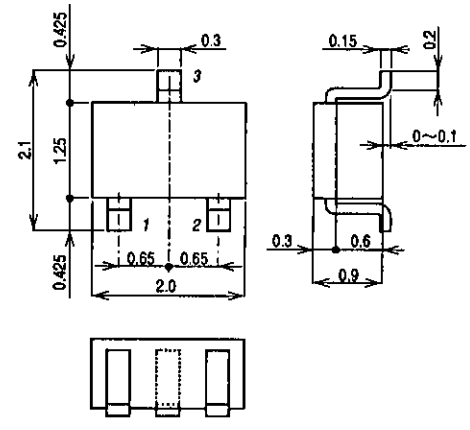
			unit
Collector-to-Base Voltage	V_{CBO}	20	V
Collector-to-Emitter Voltage	V_{CEO}	10	V
Emitter-to-Base Voltage	V_{EBO}	2	V
Collector Current	I_C	100	mA
Collector Dissipation	P_C	150	mW
Junction Temperature	Tj	150	°C
Storage Temperature	Tstg	−55 to +150	°C

Electrical Characteristics at Ta = 25°C

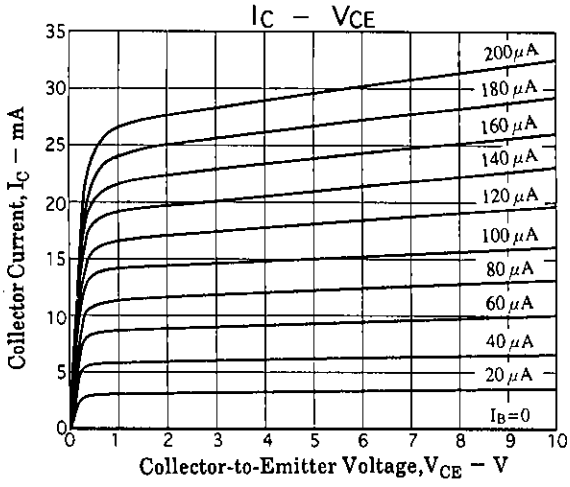
			min	typ	max	unit
Collector Cutoff Current	I_{CBO}	V_{CB} = 10V, I_E = 0			1.0	μA
Emitter Cutoff Current	I_{EBO}	V_{EB} = 1V, I_C = 0			10	μA
DC Current Gain	$h_{FE}1$	V_{CE} = 3V, I_C = 7mA	110		180	
	$h_{FE}2$	V_{CE} = 3V, I_C = 30mA	100			
Gain-Bandwidth Product	f_T	V_{CE} = 3V, I_C = 7mA	3	5.2		GHz
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

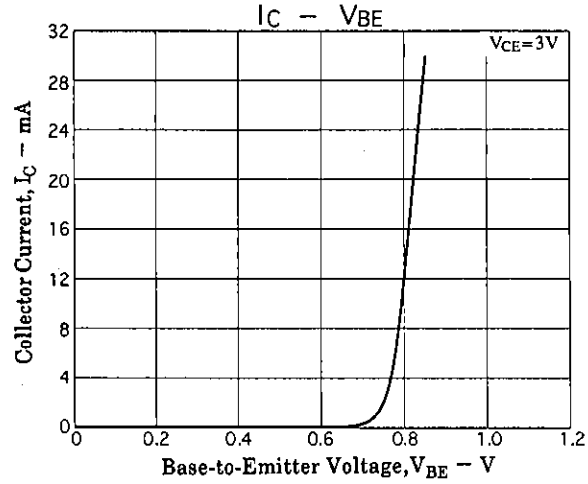
Marking : NA

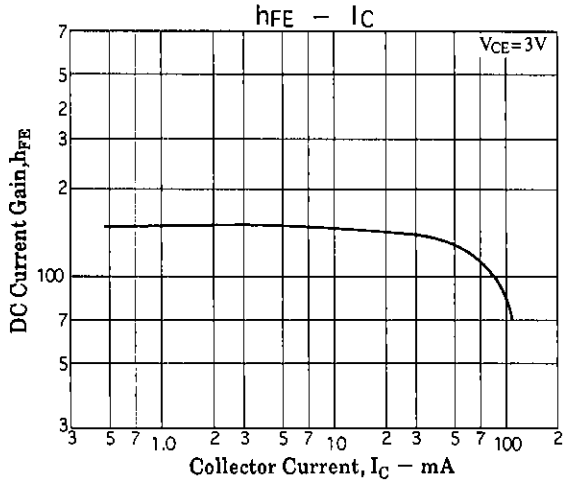
Package Dimensions 2059B
(unit : mm)

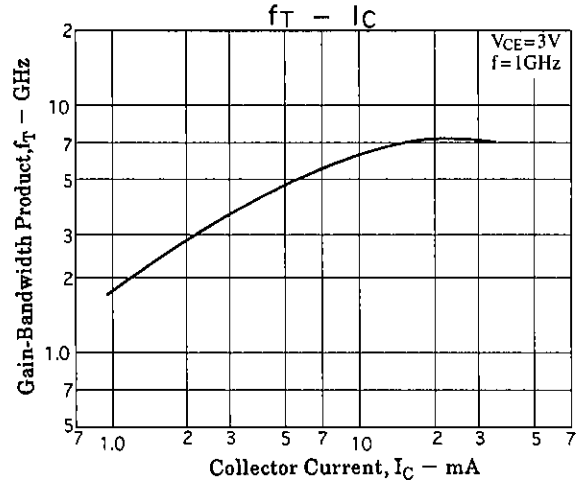


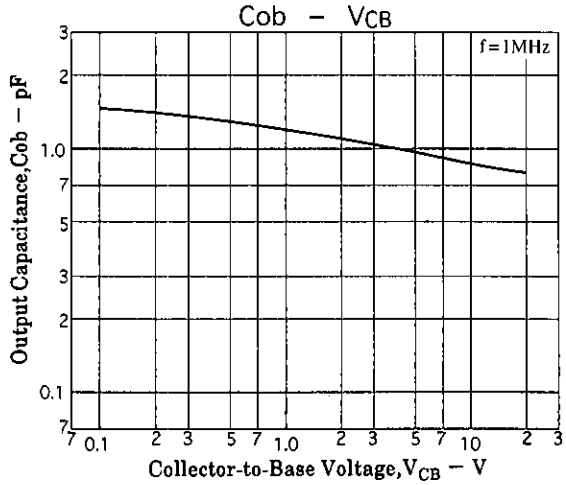
1 : Base
2 : Emitter
3 : Collector
SANYO : MCP

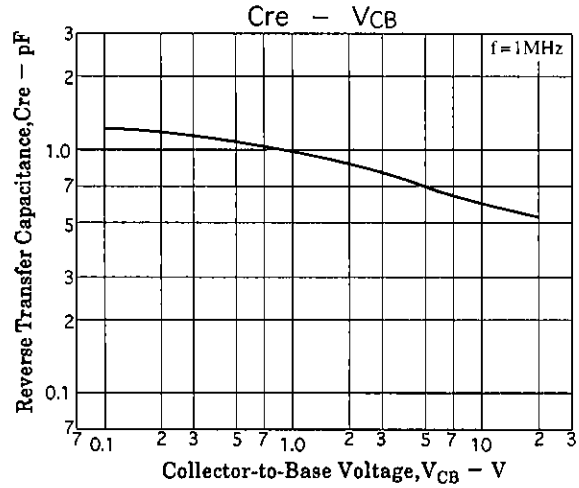

IC – VCE
Collector Current, IC – mA
Collector-to-Emitter Voltage, VCE – V
200μA
180μA
160μA
140μA
120μA
100μA
80μA
60μA
40μA
20μA
IB=0

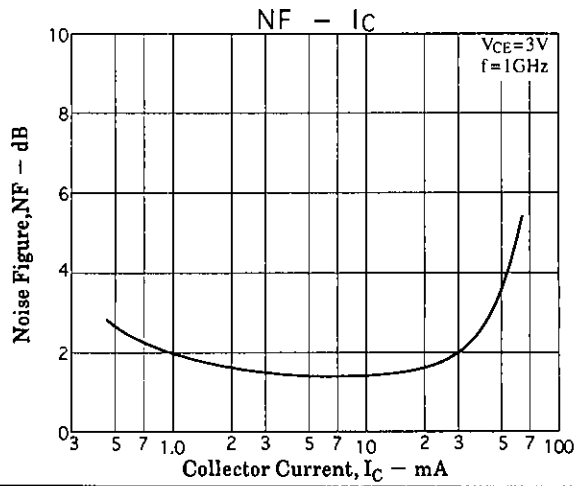

IC – VBE
VCE=3V
Collector Current, IC – mA
Base-to-Emitter Voltage, VBE – V

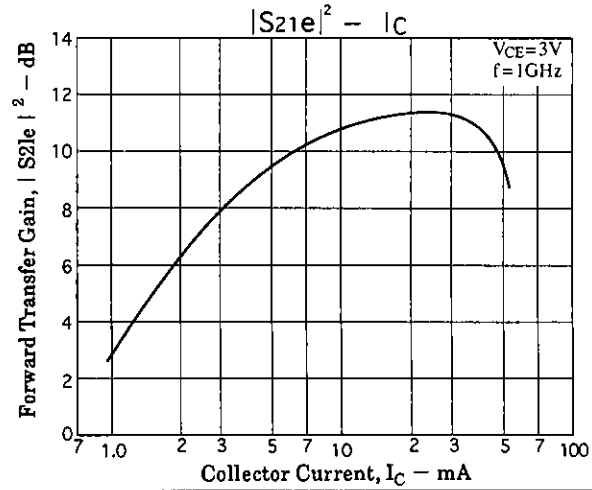

hFE – IC
VCE=3V
DC Current Gain, hFE
Collector Current, IC – mA

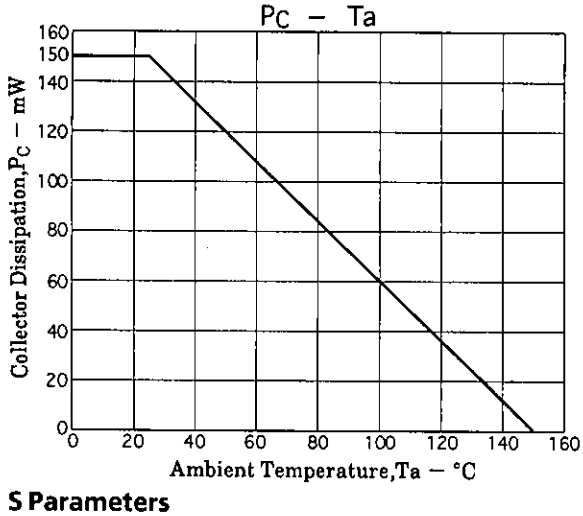

fT – IC
VCE=3V
f=1GHz
Gain-Bandwidth Product, fT – GHz
Collector Current, IC – mA


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

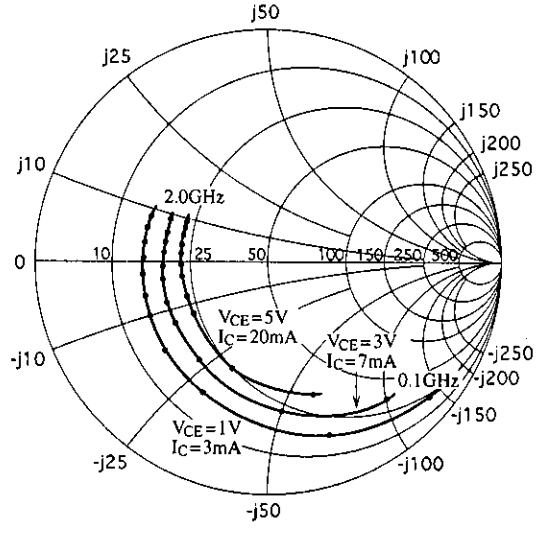

|S21e|2 – IC
VCE=3V
f=1GHz
Forward Transfer Gain, |S21e|2 – dB
Collector Current, IC – mA



S Parameters

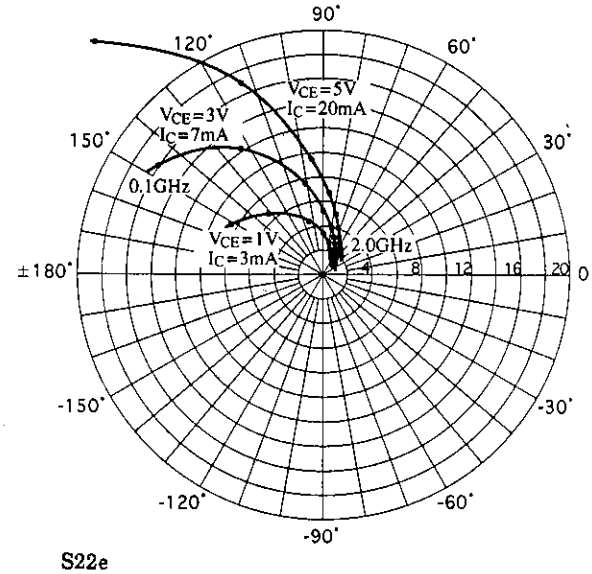
S11e

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



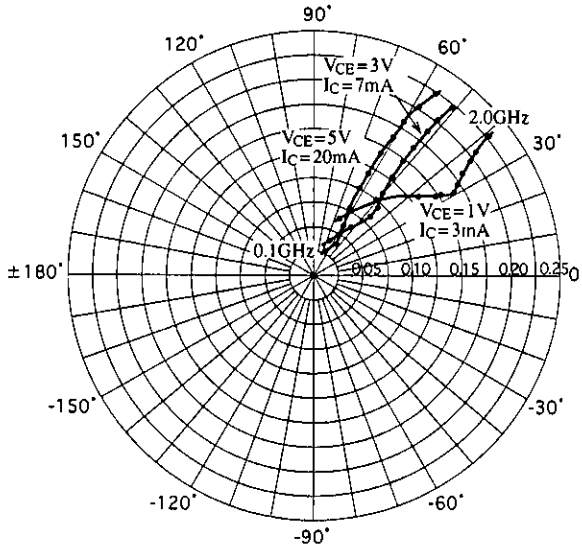
S21e

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



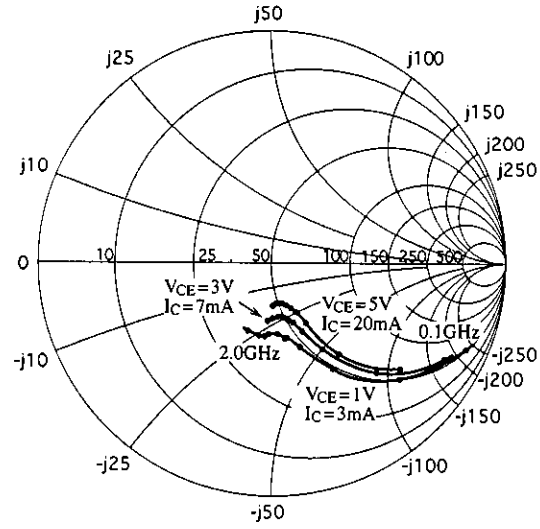
S12e

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



S22e

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



S Parameters (Common emitter)

$V_{CE}=1V$, $I_C=3mA$, $Z_O=50\Omega$

Freq (MHz)	$\lvert S_{11}\rvert$	$\angle S_{11}$	$\lvert S_{21}\rvert$	$\angle S_{21}$	$\lvert S_{12}\rvert$	$\angle S_{12}$	$\lvert S_{22}\rvert$	$\angle S_{22}$
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

$V_{CE}=3V$, $I_C=7mA$, $Z_O=50\Omega$

Freq (MHz)	$\lvert S_{11}\rvert$	$\angle S_{11}$	$\lvert S_{21}\rvert$	$\angle S_{21}$	$\lvert S_{12}\rvert$	$\angle S_{12}$	$\lvert S_{22}\rvert$	$\angle S_{22}$
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

$V_{CE}=5V$, $I_C=20mA$, $Z_O=50\Omega$

Freq (MHz)	$\lvert S_{11}\rvert$	$\angle S_{11}$	$\lvert S_{21}\rvert$	$\angle S_{21}$	$\lvert S_{12}\rvert$	$\angle S_{12}$	$\lvert S_{22}\rvert$	$\angle S_{22}$
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