Ordering number: EN5034

SANYO

No.5034

2SC5227

NPN Epitaxial Planar Silicon Transistor

VHF to UHF Wide-Band Low-Noise Amp Applications

Features

- Low noise : NF = 1.0dB typ (f = 1GHz).
- High gain : $|S21e|^2$ = 12dB typ (f = 1GHz).
- High cutoff frequency : f_T = 7GHz 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	70	mA
Collector Dissipation	P_C	200	mW
Junction Temperature	Tj	150	°C
Storage Temperature	Tstg	−55 to +150	°C

Electrical Characteristics at Ta = 25°C

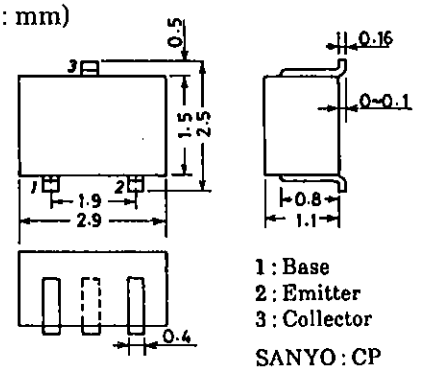
			min	typ	max	unit
Collector Cutoff Current	I_{CBO}	V_{CB} = 10V, I_E = 0			1.0	μA
Emitter Cutoff Current	I_{EBO}	V_{EB} = 1V, I_C = 0			10	μA
DC Current Gain	h_{FE}	V_{CE} = 5V, I_C = 20mA	60※		270※	
Gain-Bandwidth Product	f_T	V_{CE} = 5V, I_C = 20mA	5	7		GHz
Output Capacitance	Cob	V_{CB} = 10V, f = 1MHz		0.75	1.2	pF
Reverse Transfer Capacitance	Cre	V_{CB} = 10V, f = 1MHz		0.5		pF
Forward Transfer Gain	$\|S21e\|^2$(1)	V_{CE} = 5V, I_C = 20mA, f = 1GHz	9	12		dB
	$\|S21e\|^2$(2)	V_{CE} = 2V, I_C = 3mA, f = 1GHz		8		dB
Noise Figure	NF	V_{CE} = 5V, I_C = 7mA, f = 1GHz		1.0	1.8	dB

※ : The 2SC5227 is classified by 20mA h_{FE} as follows :

60 3 120	90 4 180	135 5 270

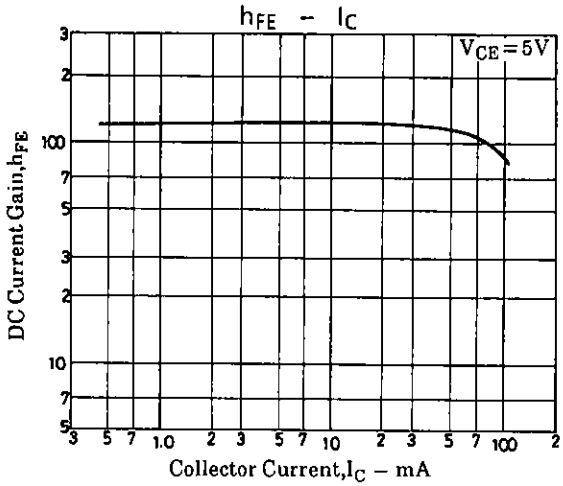
Marking : LN
h_{FE} rank : 3, 4, 5

Package Dimensions 2018B
(unit : mm)

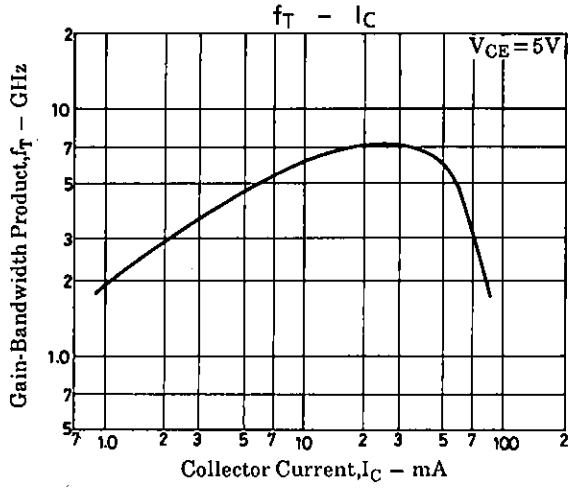


1 : Base
2 : Emitter
3 : Collector
SANYO : CP

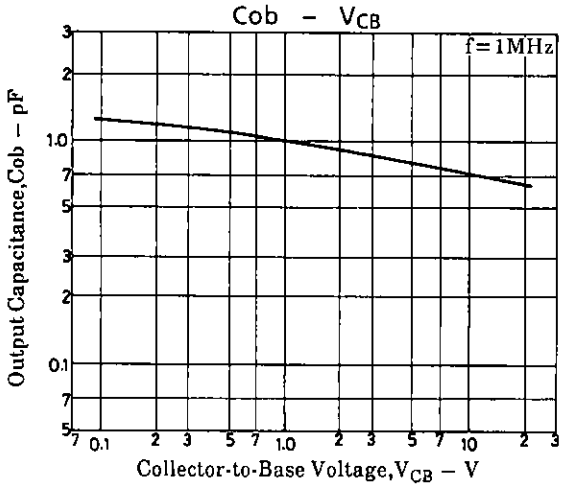
h_{FE} – I_C



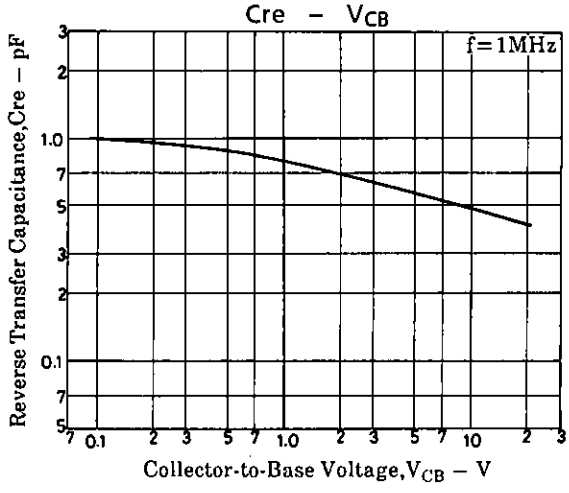
f_T – I_C



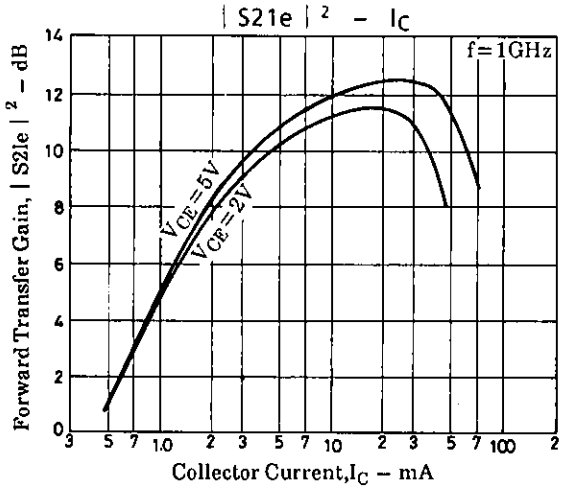
Cob – V_{CB}



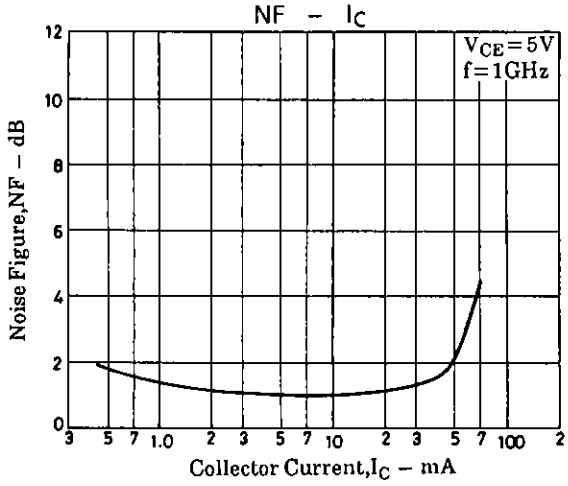
Cre – V_{CB}



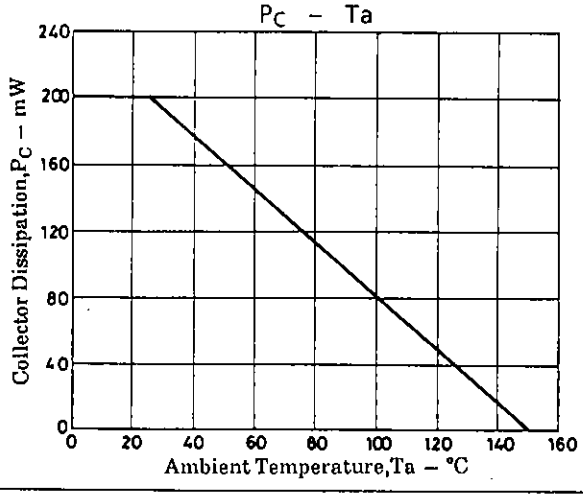
$|S21e|^2$ – I_C



NF – I_C

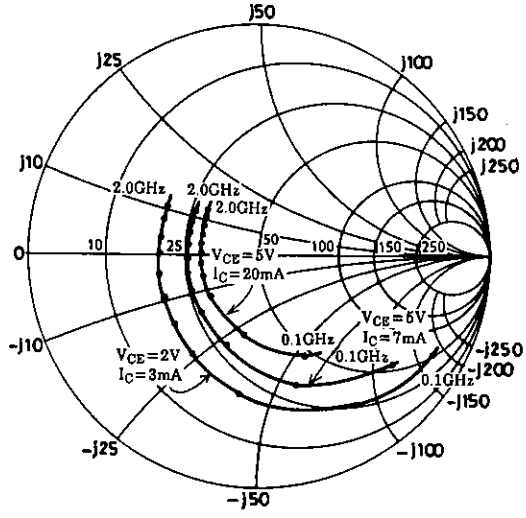


P_C – Ta

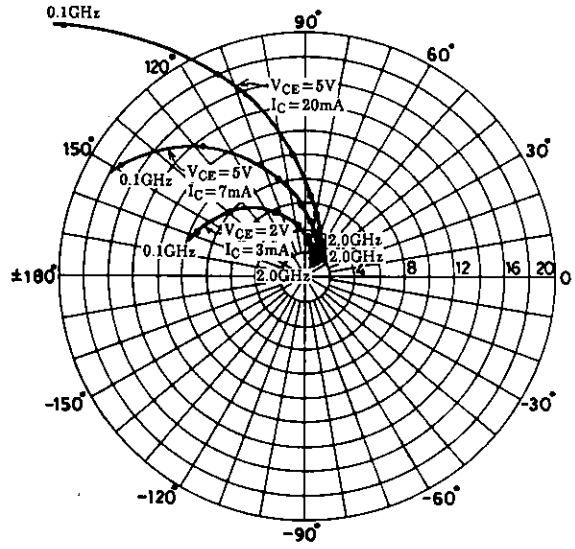


S Parameter

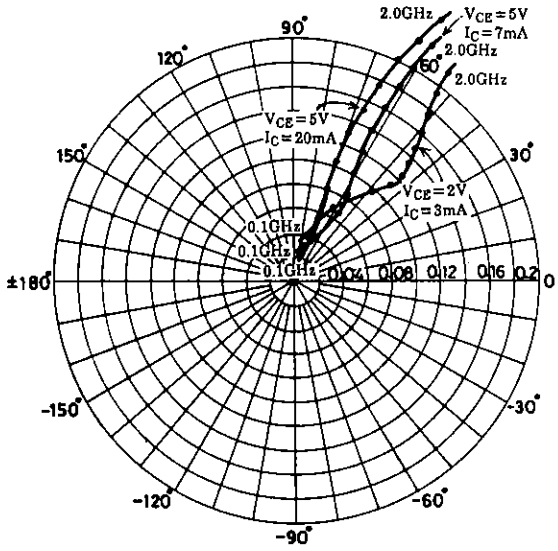
f=100MHz, 200 to 2000MHz (200MHz step)



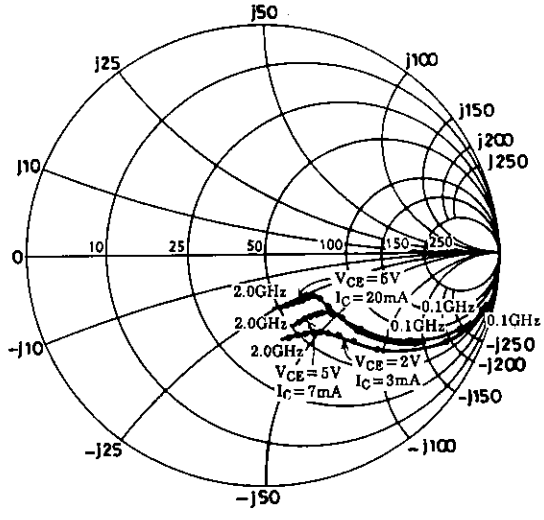
f=100MHz, 200 to 2000MHz (200MHz step)



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



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



S Parameter (Common emitter)

$V_{CE}=5V$; $I_C=7mA$, $Z_O=50\Omega$

Freq (MHz)	$\|S_{11}\|$	$\angle S_{11}$	$\|S_{21}\|$	$\angle S_{21}$	$\|S_{12}\|$	$\angle S_{12}$	$\|S_{22}\|$	$\angle S_{22}$
100	0.722	−41.6	17.352	148.7	0.029	70.9	0.883	−21.3
200	0.587	−73.2	13.419	127.6	0.046	60.8	0.710	−33.1
400	0.426	−113.0	8.371	105.1	0.067	56.9	0.507	−40.7
600	0.369	−136.6	5.914	92.7	0.084	58.4	0.423	−42.5
800	0.344	−152.9	4.593	83.9	0.102	60.3	0.382	−43.9
1000	0.334	−165.7	3.750	76.7	0.121	61.5	0.360	−46.3
1200	0.326	−177.9	3.178	70.3	0.141	62.0	0.350	−49.1
1400	0.324	172.3	2.784	64.9	0.162	61.8	0.341	−52.2
1600	0.328	163.4	2.476	59.5	0.183	61.2	0.334	−56.4
1800	0.335	154.5	2.246	54.6	0.204	60.5	0.328	−60.8
2000	0.346	147.5	3.073	50.0	0.226	59.6	0.328	−65.4

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

Freq (MHz)	$\|S_{11}\|$	$\angle S_{11}$	$\|S_{21}\|$	$\angle S_{21}$	$\|S_{12}\|$	$\angle S_{12}$	$\|S_{22}\|$	$\angle S_{22}$
100	0.477	−66.8	28.090	133.6	0.022	67.7	0.726	−32.7
200	0.358	−104.1	17.995	112.9	0.035	65.3	0.506	−41.6
400	0.288	−142.2	9.903	95.9	0.057	68.3	0.350	−42.4
600	0.273	−159.8	6.777	86.7	0.081	69.9	0.299	−41.8
800	0.270	−171.7	5.181	79.9	0.104	70.2	0.278	−43.2
1000	0.271	178.7	4.209	73.9	0.129	69.1	0.269	−45.9
1200	0.273	169.4	3.554	68.5	0.153	67.9	0.264	−49.6
1400	0.275	161.1	3.085	63.6	0.177	66.2	0.258	−53.3
1600	0.284	153.4	2.749	59.1	0.202	64.3	0.253	−58.3
1800	0.294	145.6	2.479	54.6	0.224	62.5	0.249	−63.4
2000	0.302	140.8	2.295	50.6	0.248	60.4	0.248	−68.7

$V_{CE}=2V$, $I_C=3mA$, $Z_O=50\Omega$

Freq (MHz)	$\|S_{11}\|$	$\angle S_{11}$	$\|S_{21}\|$	$\angle S_{21}$	$\|S_{12}\|$	$\angle S_{12}$	$\|S_{22}\|$	$\angle S_{22}$
100	0.858	−30.5	9.283	157.3	0.039	73.6	0.944	−15.6
200	0.769	−57.4	8.036	138.7	0.068	61.4	0.834	−27.5
400	0.607	−97.1	5.756	113.9	0.099	48.4	0.641	−40.5
600	0.528	−123.2	4.302	98.1	0.114	44.4	0.525	−46.5
800	0.486	−141.6	3.414	87.0	0.125	43.9	0.465	−50.2
1000	0.460	−156.4	2.834	78.0	0.137	45.4	0.429	−53.7
1200	0.453	−169.4	2.429	70.3	0.149	47.5	0.408	−57.3
1400	0.440	179.8	2.143	63.6	0.163	49.2	0.395	−60.9
1600	0.441	170.1	1.919	57.4	0.179	50.8	0.385	−65.4
1800	0.447	160.4	1.739	51.7	0.196	52.3	0.381	−70.1
2000	0.454	152.5	1.621	46.4	0.215	53.3	0.379	−75.2