

Ordering number:EN4579

NPN Epitaxial Planar Silicon Transistor



2SC4854

Low-Voltage, Low-Current High-Frequency Amplifier Applications

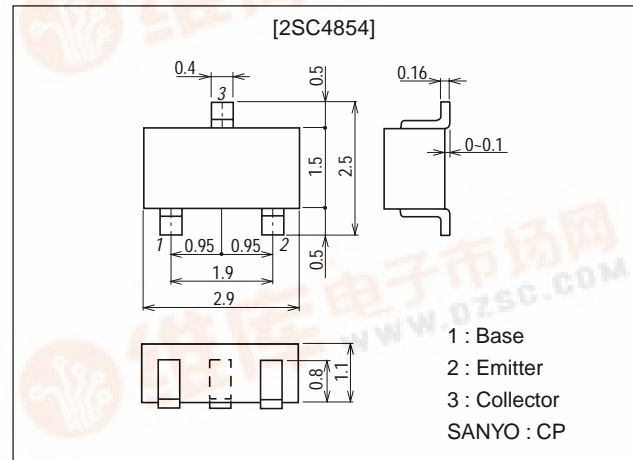
Features

- Low-voltage, low-current operation : $f_T=5\text{GHz}$ typ.
($V_{CE}=1\text{V}$, $I_C=1\text{mA}$) : $|S_{21e}|^2=7\text{dB}$ typ ($f=1\text{GHz}$).
: $NF=2.6\text{dB}$ typ ($f=1\text{GHz}$).

Package Dimensions

unit:mm

2018B



Specifications

Absolute Maximum Ratings at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CB0}		12	V
Collector-to-Emitter Voltage	V_{CEO}		6	V
Emitter-to-Base Voltage	V_{EBO}		1.5	V
Collector Current	I_C		15	mA
Collector Dissipation	P_C		80	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_{CB0}	$V_{CB}=5\text{V}$, $I_E=0$			1.0	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB}=1\text{V}$, $I_C=0$			10	μA
DC Current Gain	h_{FE}	$V_{CE}=1\text{V}$, $I_C=1\text{mA}$	60*		270*	
Gain-Bandwidth Product	f_T	$V_{CE}=1\text{V}$, $I_C=1\text{mA}$		5		GHz
Output Capacitance	C_{ob}	$V_{CB}=1\text{V}$, $f=1\text{MHz}$		0.6	1.0	pF

* : The 2SC4854 is classified by 1mA h_{FE} as follows :

60	3	120	90	4	180	135	5	270
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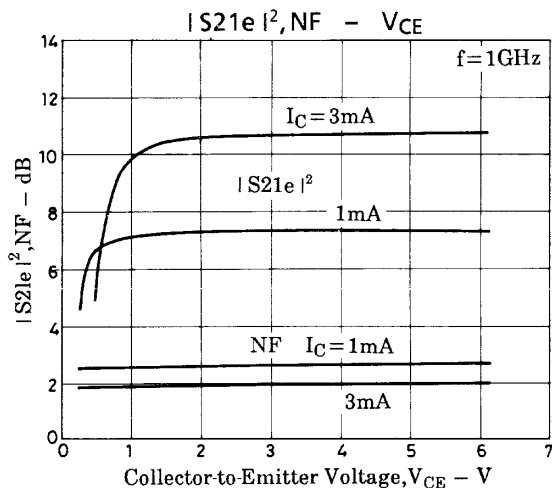
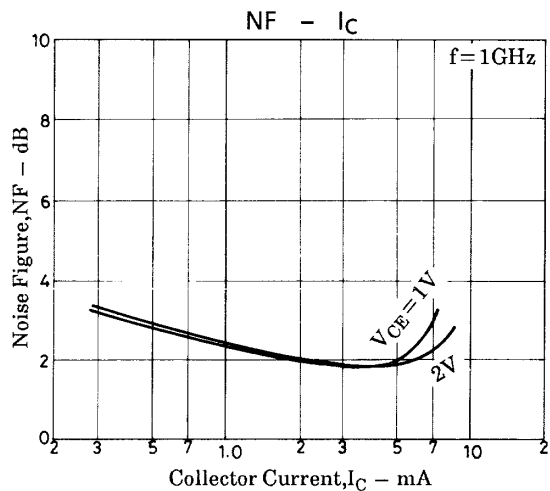
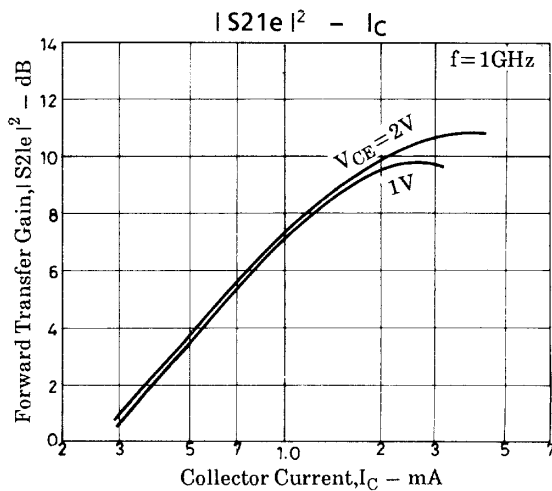
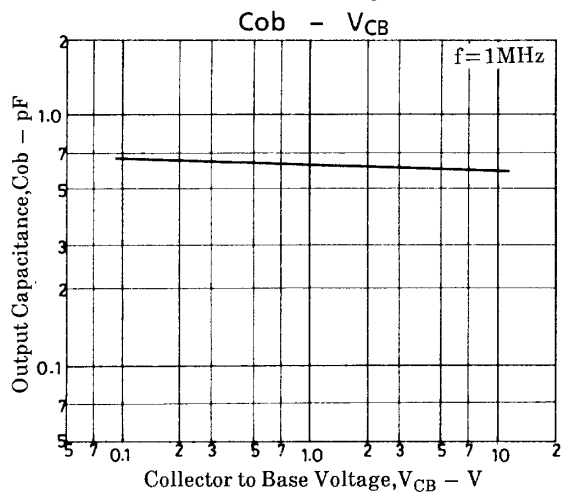
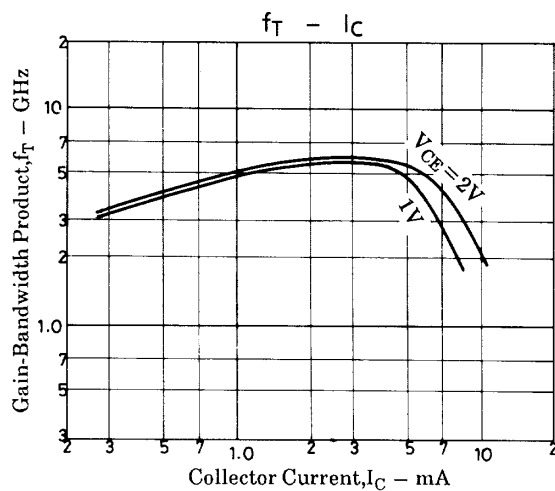
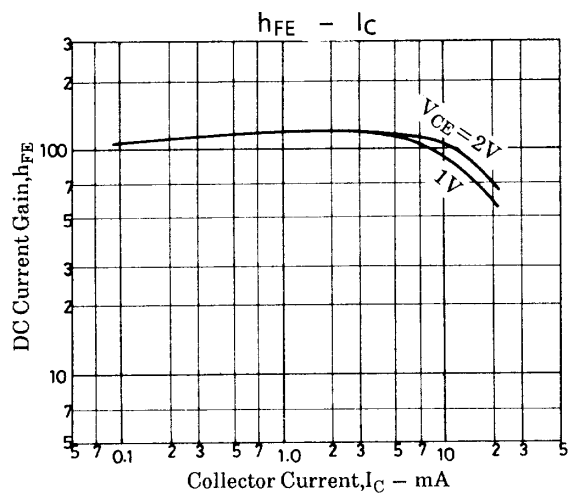
Marking : CN

h_{FE} rank : 3, 4, 5

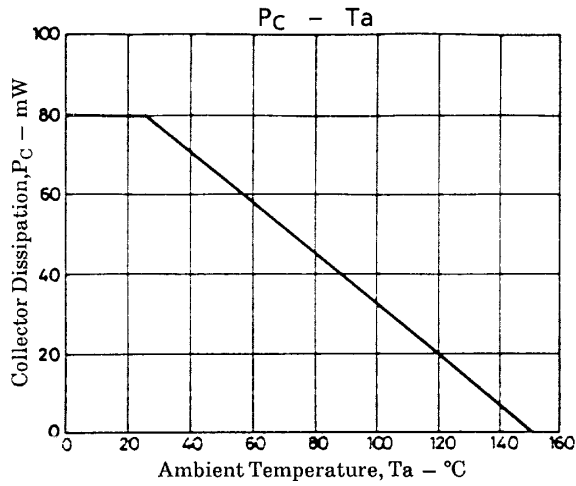
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Forward Transfer Gain	$ S_{21e} ^2$ 1	$V_{CE}=1V, I_C=1mA, f=1GHz$	4.5	7		dB
	$ S_{21e} ^2$ 2	$V_{CE}=2V, I_C=3mA, f=1GHz$		10.5		dB
Noise Figure	NF1	$V_{CE}=1V, I_C=1mA, f=1GHz$		2.6	4.5	dB
	NF2	$V_{CE}=2V, I_C=3mA, f=1GHz$		1.9		dB

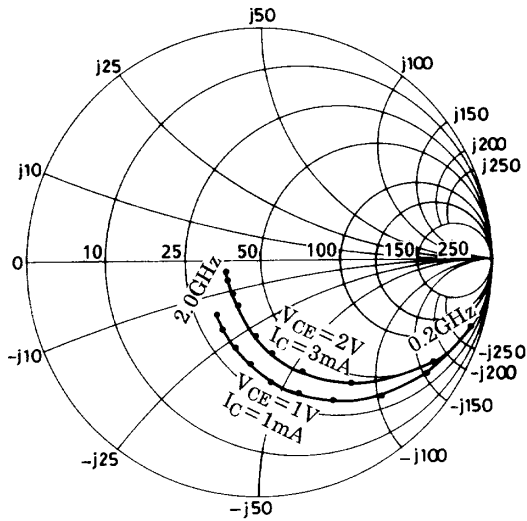


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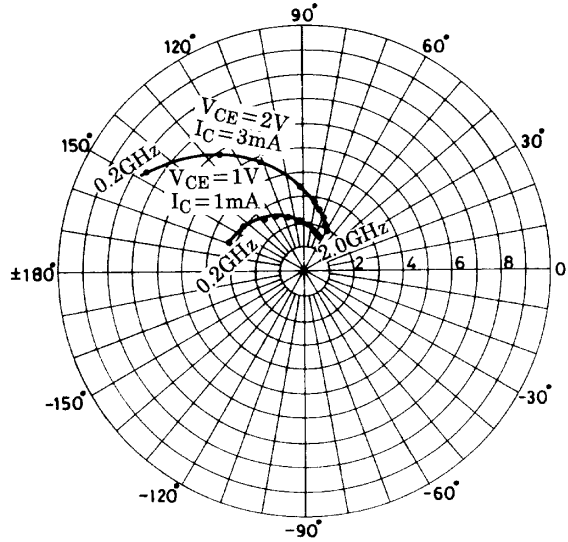


S parameter

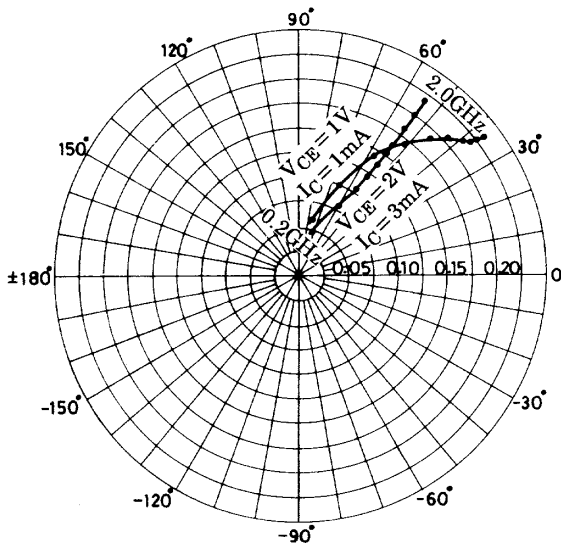
S_{11e}
f = 200 to 2000MHz (200MHz step)



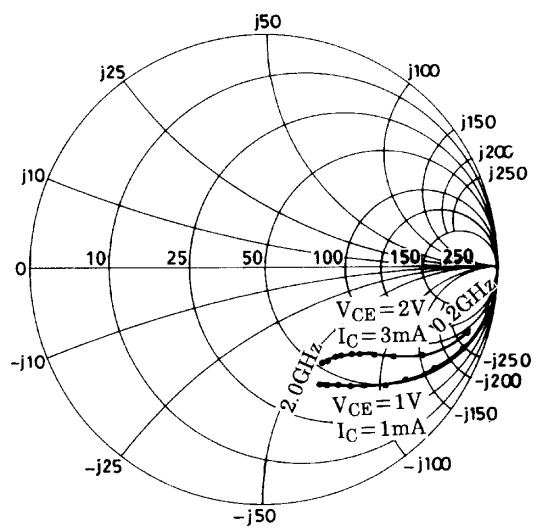
S_{21e}
f = 200 to 2000MHz (200MHz step)



S_{12e}
f = 200 to 2000MHz (200MHz step)



S_{22e}
f = 200 to 2000MHz (200MHz step)



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S parameter (Common emitter)

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

Freq (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
200	0.934	-18.2	3.251	158.9	0.057	76.7	0.965	-12.3
400	0.847	-34.7	3.003	142.1	0.105	66.2	0.904	-23.0
600	0.761	-48.9	2.680	128.3	0.142	57.9	0.835	-31.7
800	0.659	-62.8	2.524	114.7	0.169	51.4	0.765	-38.8
1000	0.576	-74.5	2.283	103.7	0.191	46.0	0.717	-44.7
1200	0.509	-85.9	2.078	93.7	0.204	42.3	0.658	-50.1
1400	0.432	-96.9	1.922	84.6	0.214	39.3	0.625	-54.5
1600	0.377	-107.6	1.785	76.2	0.219	37.3	0.591	-58.5
1800	0.332	-120.7	1.680	69.1	0.225	37.1	0.566	-62.3
2000	0.297	-131.1	1.588	62.9	0.231	36.8	0.552	-65.2

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

Freq (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
200	0.816	-31.3	7.561	147.5	0.049	71.7	0.903	-18.4
400	0.636	-53.9	5.976	125.9	0.081	61.2	0.763	-29.7
600	0.496	-70.3	4.789	111.3	0.102	57.0	0.663	-35.6
800	0.389	-83.8	3.976	99.3	0.120	55.4	0.593	-39.5
1000	0.318	-95.4	3.365	90.1	0.136	54.6	0.551	-43.0
1200	0.257	-108.4	2.940	81.9	0.153	54.3	0.523	-46.1
1400	0.212	-119.6	2.600	75.1	0.168	54.3	0.503	-49.4
1600	0.180	-133.1	2.340	68.5	0.183	54.1	0.491	-52.8
1800	0.171	-147.9	2.135	63.5	0.199	54.2	0.477	-56.4
2000	0.159	-159.9	1.989	58.6	0.217	54.0	0.476	-59.5

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