Ordering number:EN4583

NPN Epitaxial Planar Silicon Transistor

2SC4864

VHF to UHF Wide-Band Low-Noise Amplifier Applications

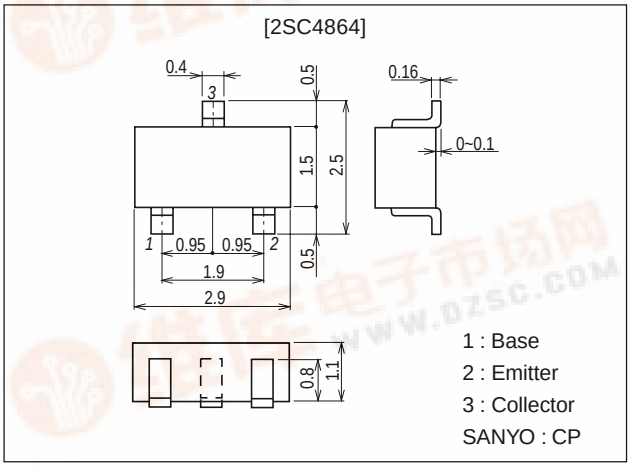
Features

- Low noise : NF=1.1dB typ (f=1GHz).
- High gain : $|S21e|^2$=11dB typ (f=1GHz).
- High cutoff frequency : f_T=7.0GHz typ.

Package Dimensions

unit:mm

2018B



Specifications

Absolute Maximum Ratings at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		16	V
Collector-to-Emitter Voltage	V_{CEO}		8	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

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}	V_{CE}=5V, I_C=20mA	60*		270*	
Gain-Bandwidth Product	f_T	V_{CE}=5V, I_C=20mA		7.0		GHz
Output Capacitance	Cob	V_{CB}=10V, f=1MHz		0.95	1.4	pF
Forward Transfer Gain	$\|S21e\|^2$	V_{CE}=5V, I_C=20mA, f=1GHz	7	11		dB
Noise Figure	NF	V_{CE}=5V, I_C=7mA, f=1GHz		1.1	2.0	dB

* : The 2SC4864 is classified by 20mA h_{FE} as follows :

60	3	120	90	4	180	135	5	270

Marking : FN

h_{FE} rank : 3, 4, 5

SANYO Electric Co.,Ltd. Semiconductor Bussiness Headquaters
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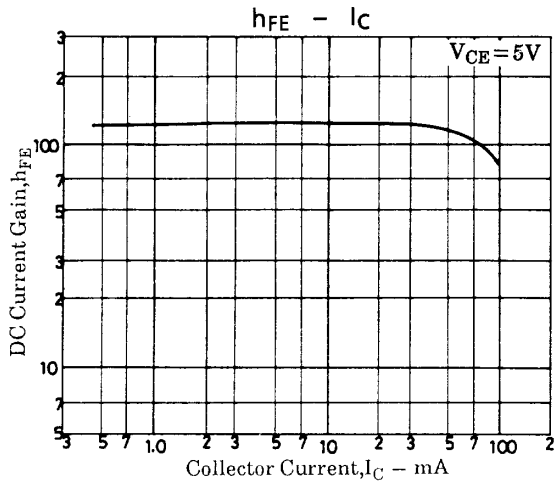
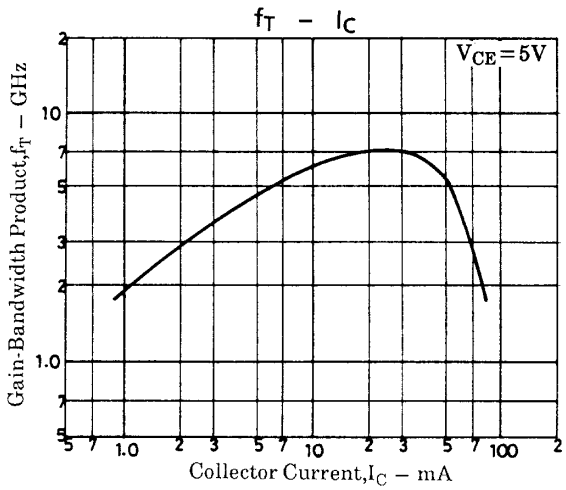
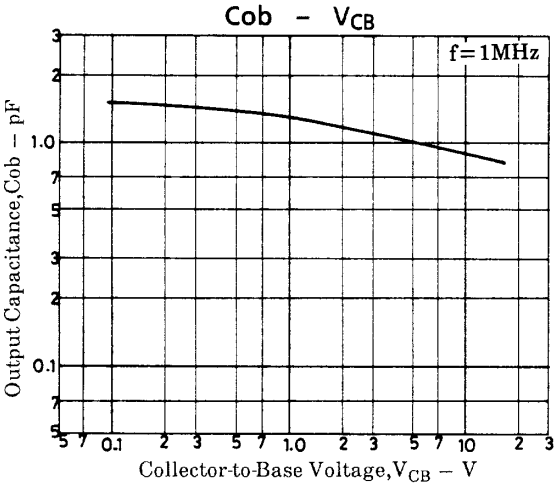
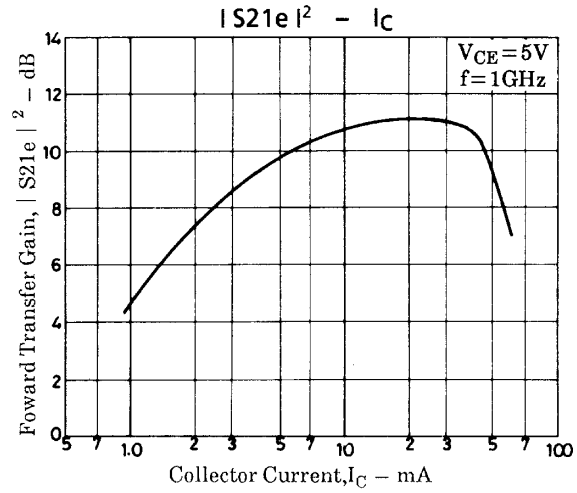
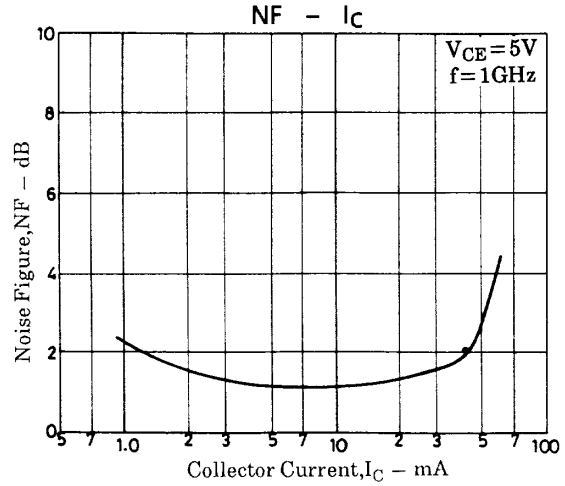
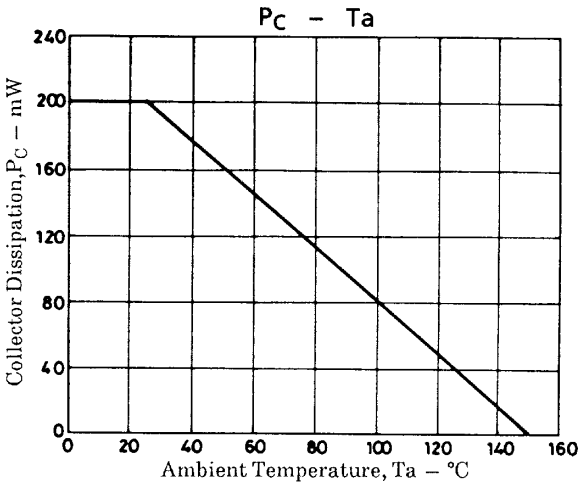

hFE – IC
VCE=5V
DC Current Gain,hFE
Collector Current,IC – mA


fT – IC
VCE=5V
Gain-Bandwidth Product,fT – GHz
Collector Current,IC – mA


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

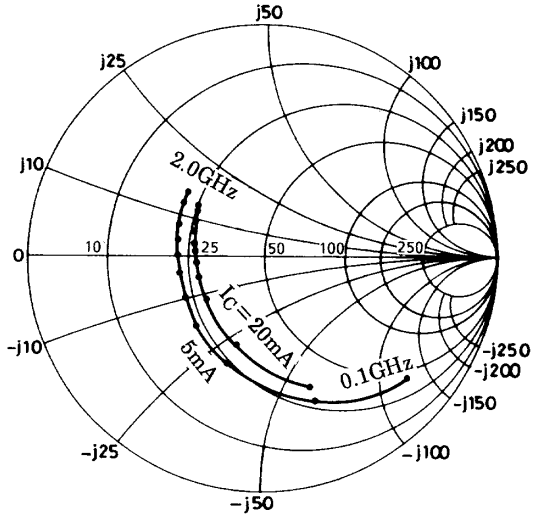

| S21e |2 – IC
VCE=5V
f=1GHz
Foward Transfer Gain, | S21e |2 – dB
Collector Current,IC – mA


NF – IC
VCE=5V
f=1GHz
Noise Figure,NF – dB
Collector Current,IC – mA

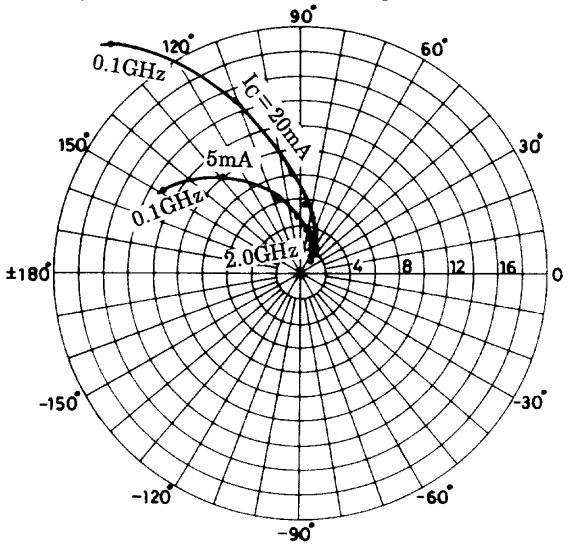

PC – Ta
Collector Dissipation,PC – mW
Ambient Temperature, Ta – °C

S parameter

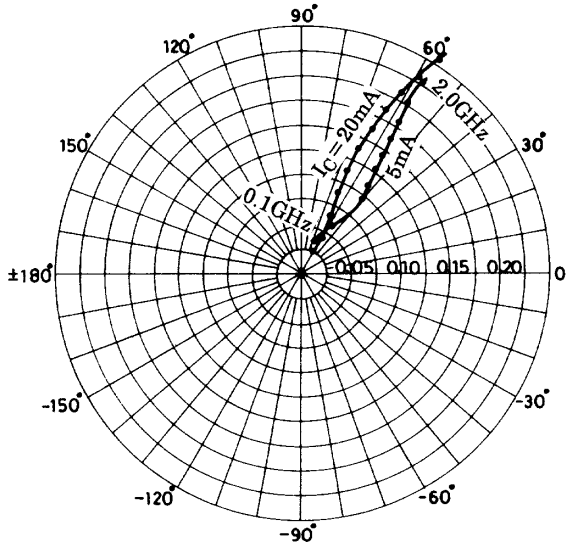
S11e : V_{CE} = 5V
f = 100MHz, 200 to 2000MHz (200MHz step)



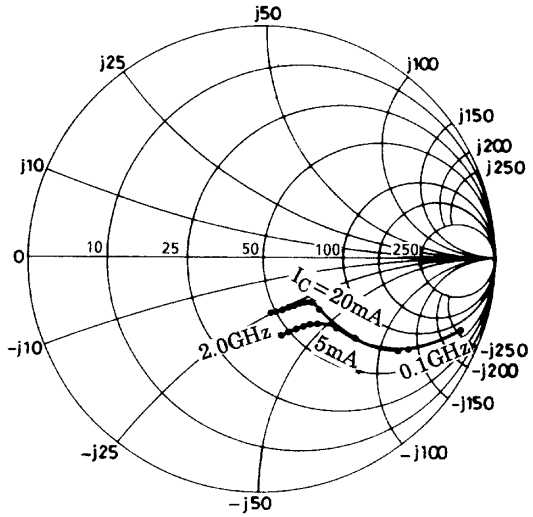
S21e : V_{CE} = 5V
f = 100MHz, 200 to 2000MHz (200MHz step)



S12e : V_{CE} = 5V
f = 100MHz, 200 to 2000MHz (200MHz step)



S22e : V_{CE} = 5V
f = 100MHz, 200 to 2000MHz (200MHz step)



S parameter (Common emitter)

V_{CE}=5V, I_C=5mA, 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	0.778	–40.2	13.012	149.1	0.036	68.7	0.893	–20.9
200	0.632	–70.8	10.144	128.7	0.058	57.4	0.729	–32.7
400	0.467	–110.34	6.532	106.1	0.080	50.1	0.523	–41.6
600	0.411	–136.7	4.723	93.2	0.096	50.7	0.436	–44.3
800	0.383	–154.6	3.712	83.1	0.111	52.8	0.388	–46.9
1000	0.379	–168.9	3.065	74.9	0.128	54.5	0.368	–50.3
1200	0.381	–179.0	2.624	67.4	0.146	55.7	0.354	–54.6
1400	0.383	168.7	2.302	61.2	0.163	56.6	0.346	–59.2
1600	0.395	160.2	2.051	54.7	0.182	57.3	0.342	–64.4
1800	0.412	154.1	1.858	50.0	0.202	57.6	0.339	–70.2
2000	0.423	147.1	1.729	44.9	0.227	57.4	0.337	–75.2

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	0.517	–70.9	24.026	130.6	0.027	63.8	0.702	–34.9
200	0.384	–108.5	15.011	110.9	0.041	60.5	0.478	–43.3
400	0.310	–144.9	8.261	94.4	0.064	64.0	0.329	–43.8
600	0.301	–164.7	5.701	85.1	0.087	66.0	0.285	–43.8
800	0.299	–176.9	4.392	77.6	0.112	66.5	0.263	–46.5
1000	0.307	173.7	3.586	71.1	0.137	65.6	0.255	–51.5
1200	0.318	165.5	3.035	65.2	0.162	64.2	0.248	–56.9
1400	0.329	158.0	2.650	59.6	0.185	62.7	0.244	–63.1
1600	0.339	151.5	2.345	54.1	0.207	61.1	0.243	–69.8
1800	0.361	147.3	2.126	50.3	0.230	59.6	0.240	–77.1
2000	0.369	142.4	1.977	45.6	0.256	57.7	0.238	–82.6