Ordering number:EN4582

NPN Epitaxial Planar Silicon Transistor

2SC4863

VHF to UHF Wide-Band Low-Noise Amplifier Applications

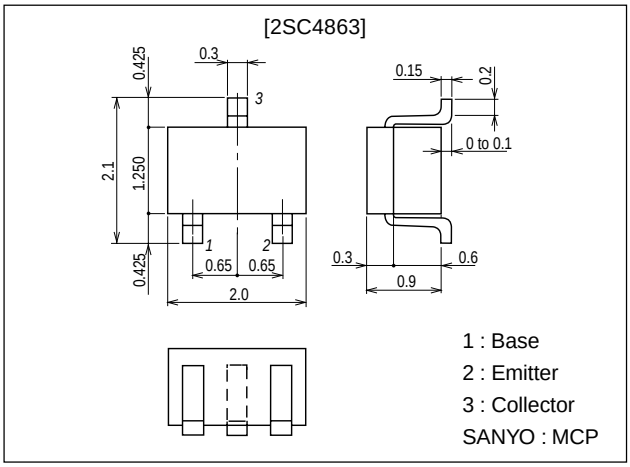
Features

- 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

2059B



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		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}	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 2SC4863 is classified by 20mA h_{FE} as follows :

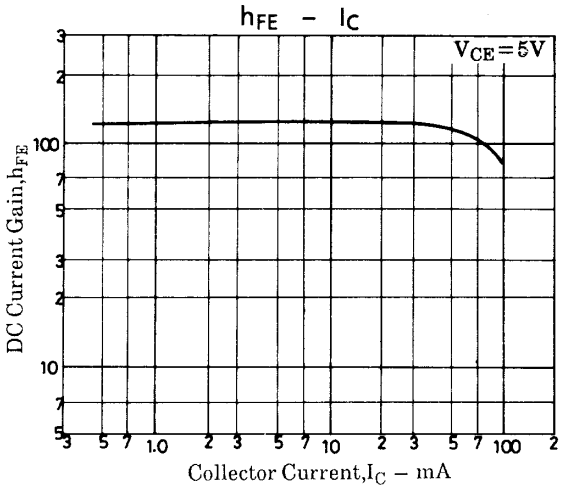
60	3	120	90	4	180	135	5	270

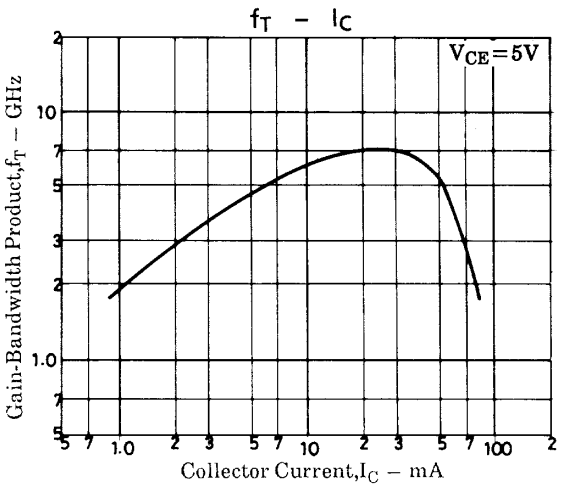
Marking : FN

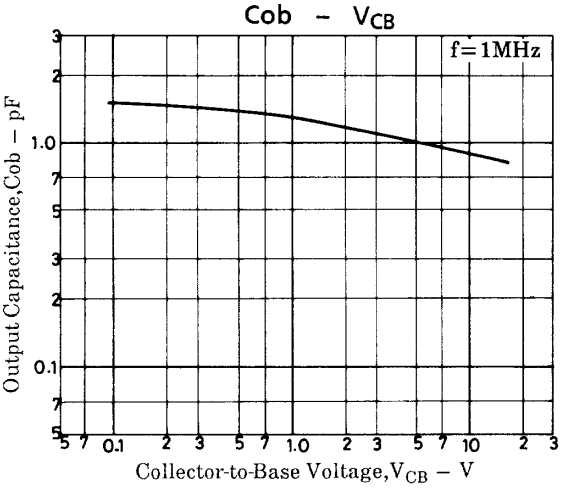
h_{FE} rank : 3, 4, 5

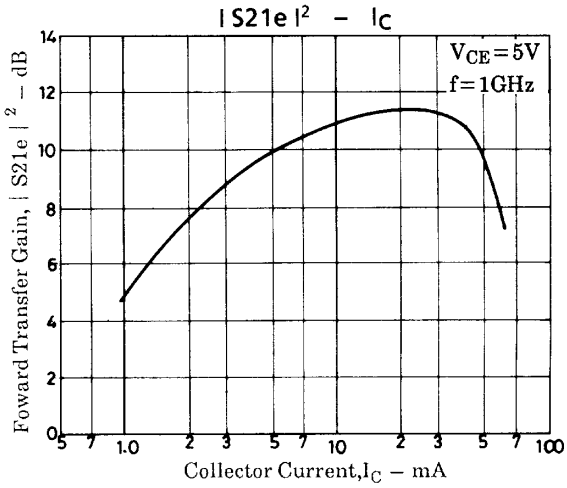
SANYO Electric Co.,Ltd. Semiconductor Bussiness Headquaters

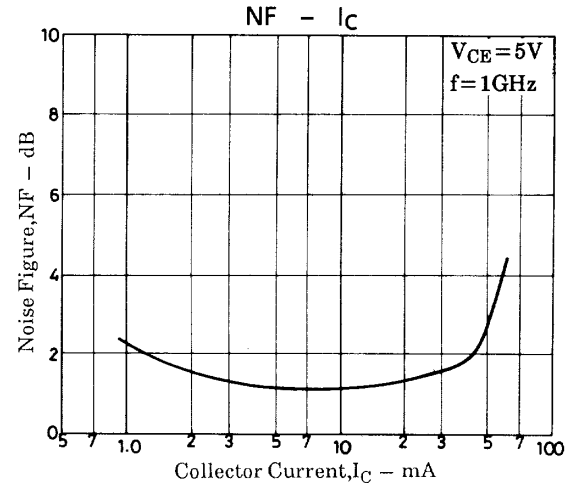
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

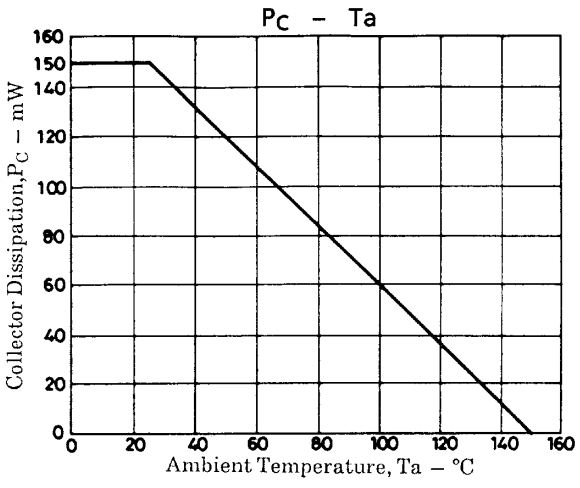

hFE – IC
VCE=5V
DC Current Gain,hFE
Collector Current,IC – mA


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

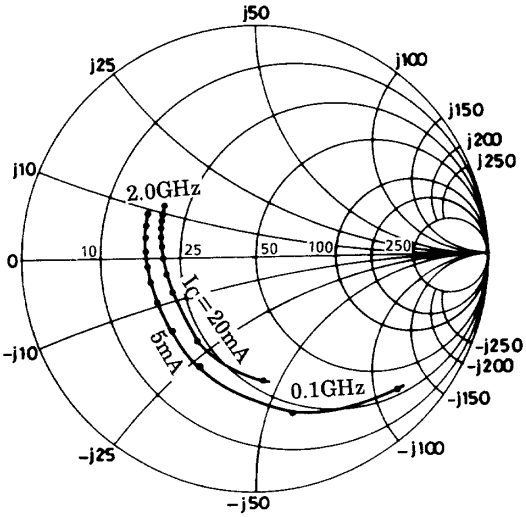

|S21e|2 – IC
VCE=5V
f=1GHz
Foward Transfer Gain, |S21e|2 – dB
Collector Current,IC – mA


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

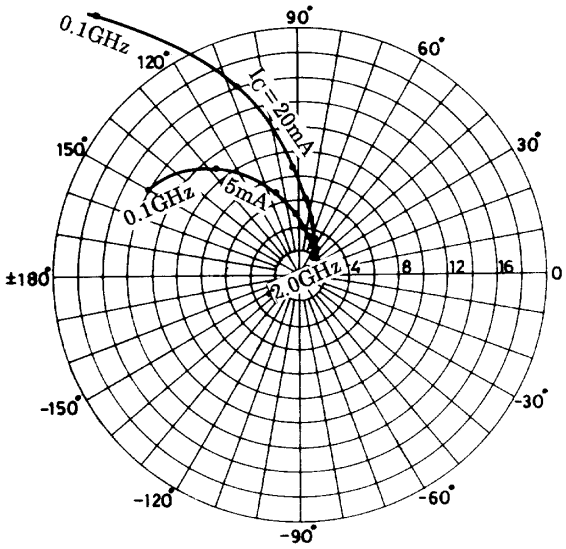

PC – Ta
Collector Dissipation,PC – mW
Ambient Temperature, Ta – °C

S parameter

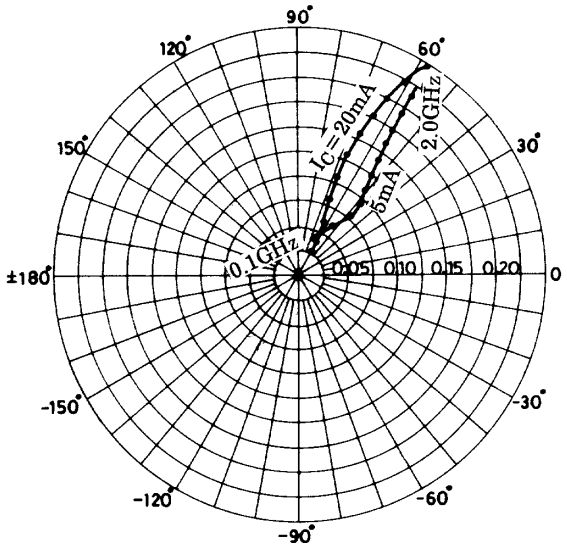
S11e : V_{CE}=5V
f=100MHz, 200 to 2000MHz (200MHz step)



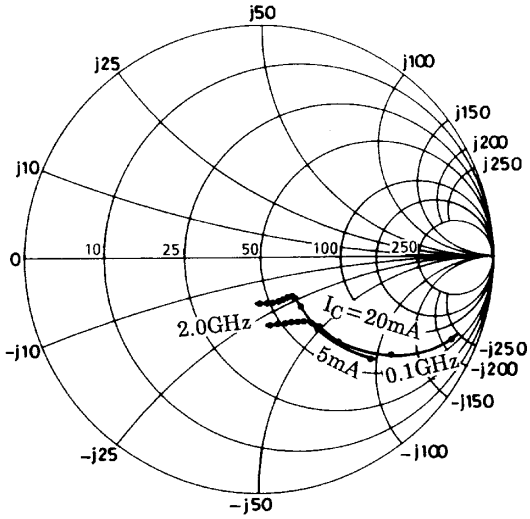
S21e : V_{CE}=5V
f=100MHz, 200 to 2000MHz (200MHz step)



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	0.810	–43.8	13.998	149.9	0.039	66.6	0.877	–23.4
200	0.669	–77.9	10.882	128.5	0.060	53.7	0.687	–37.0
400	0.521	–118.3	6.872	106.2	0.081	47.6	0.488	–46.9
600	0.478	–140.5	4.929	93.4	0.095	48.3	0.397	–50.5
800	0.470	–156.3	3.857	84.2	0.109	51.1	0.355	–52.7
1000	0.470	–168.2	3.194	75.7	0.125	53.0	0.331	–56.3
1200	0.473	–177.3	2.712	68.9	0.141	54.7	0.317	–59.9
1400	0.479	174.7	2.378	62.3	0.159	55.7	0.306	–65.3
1600	0.480	169.0	2.122	56.7	0.175	56.8	0.302	–69.9
1800	0.486	164.6	1.918	51.9	0.194	57.1	0.296	–76.0
2000	0.500	158.3	1.773	46.7	0.214	57.3	0.294	–82.0

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	0.519	–87.6	26.951	127.9	0.026	59.9	0.629	–42.6
200	0.433	–126.9	16.215	108.5	0.038	58.2	0.395	–51.2
400	0.397	–158.1	8.736	93.4	0.059	64.2	0.264	–50.4
600	0.394	–169.7	5.958	85.0	0.082	66.9	0.228	–50.2
800	0.404	–178.8	4.568	78.1	0.106	68.0	0.217	–51.7
1000	0.412	173.9	3.713	71.9	0.131	67.3	0.211	–56.8
1200	0.422	168.6	3.151	66.4	0.156	65.9	0.207	–61.9
1400	0.430	163.3	2.764	60.6	0.179	64.3	0.203	–69.1
1600	0.435	160.0	2.437	56.2	0.200	62.8	0.201	–75.3
1800	0.442	157.3	2.202	51.9	0.222	60.9	0.199	–83.5
2000	0.460	151.9	2.025	47.3	0.245	59.4	0.199	–90.7