Ordering number: EN 4583

SANYO

No.4583

2SC4864

NPN Epitaxial Planar Silicon Transistor

VHF to UHF Wide-Band Low-Noise Amp 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

Absolute Maximum Ratings at Ta = 25°C

			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

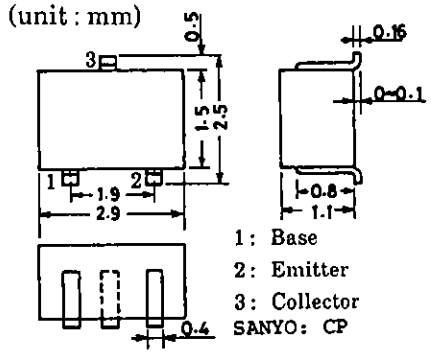
			min	typ	max	unit
Collector Cutoff Current	I_{CBO}	V_{CB} = 10V, I_E = 0			1.0	μA
Emitter Cutoff Current	I_{EBO}	V_{EB} = 1V, I_C = 0			10	μA
DC Current Gain	h_{FE}	V_{CE} = 5V, I_C = 20mA	60※		270※	
Gain-Bandwidth Product	f_T	V_{CE} = 5V, I_C = 20mA		7.0		GHz
Output Capacitance	Cob	V_{CB} = 10V, f = 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

Package Dimensions 2018B
(unit : mm)



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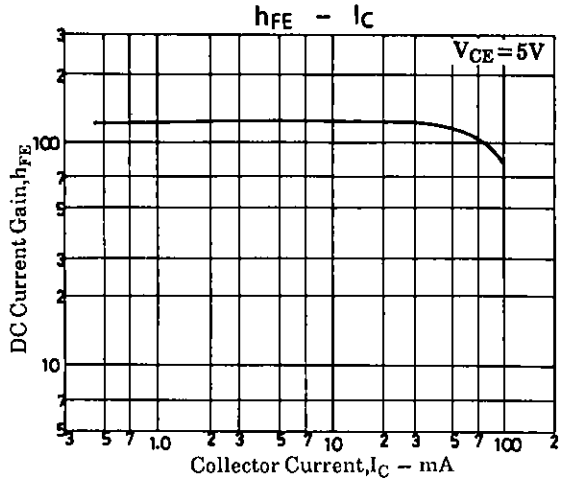
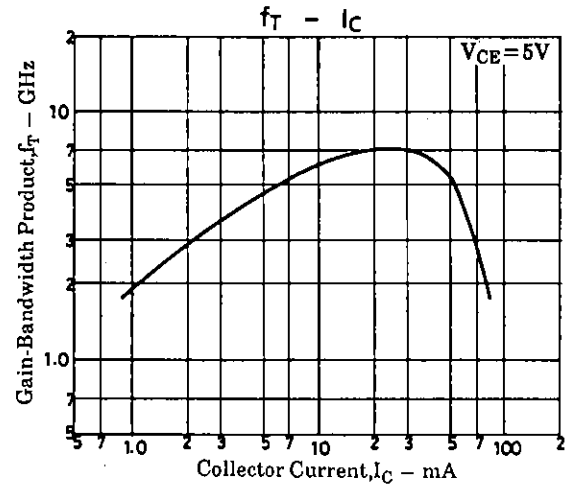
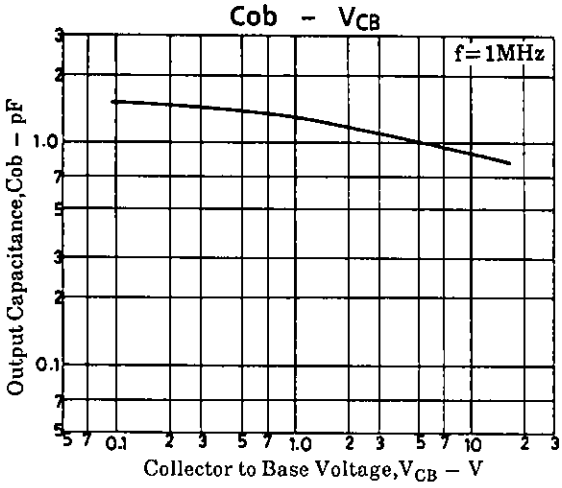
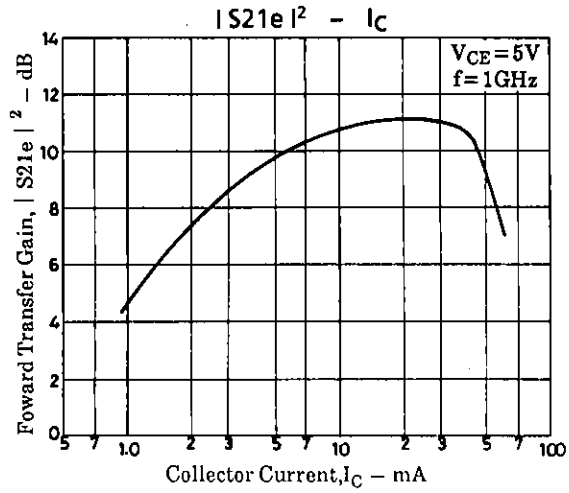
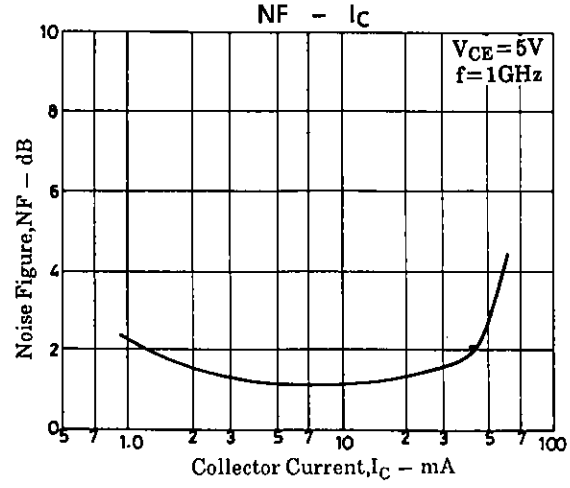
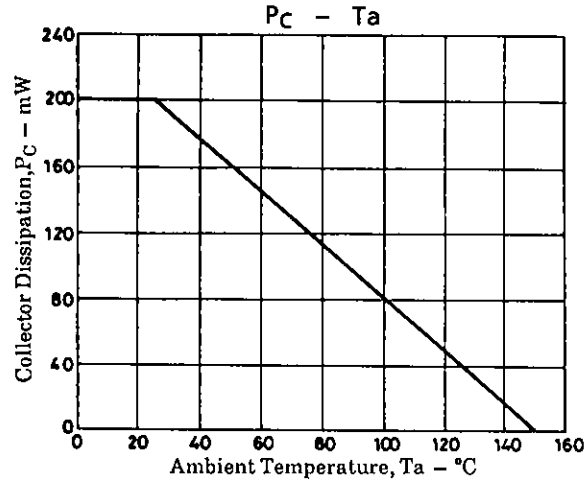

hFE – IC
VCE=5V
DC Current Gain,hFE
Collector Current,IC – mA


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

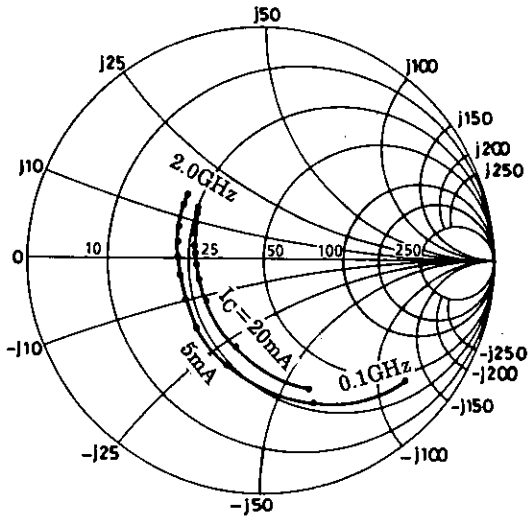

|S21e|2 – IC
VCE=5V
f=1GHz
Foward Transfer Gain, |S21e|2 – dB
Collector Current,IC – mA


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

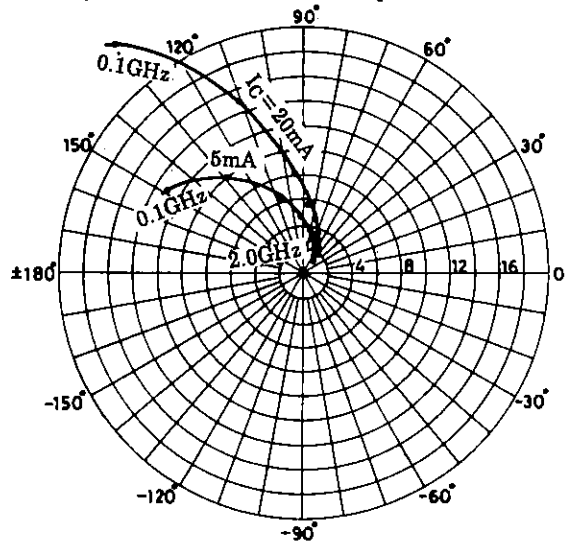

PC – Ta
Collector Dissipation,PC – mW
Ambient Temperature, Ta – °C

S Parameter

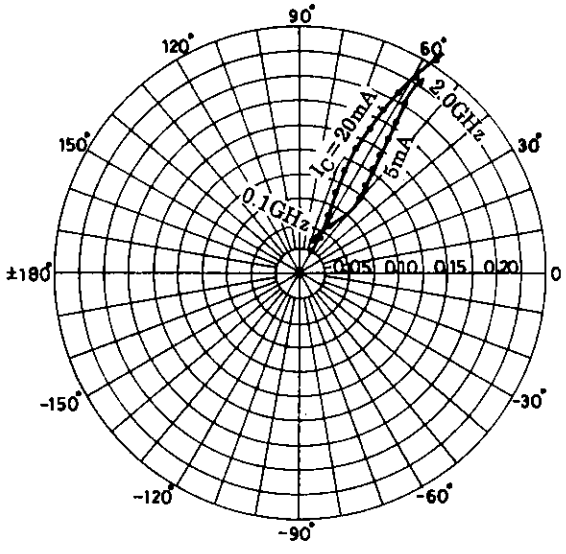
S11e : V_{CE}=5V
f=100MHz, 200~2000MHz (200MHz step)



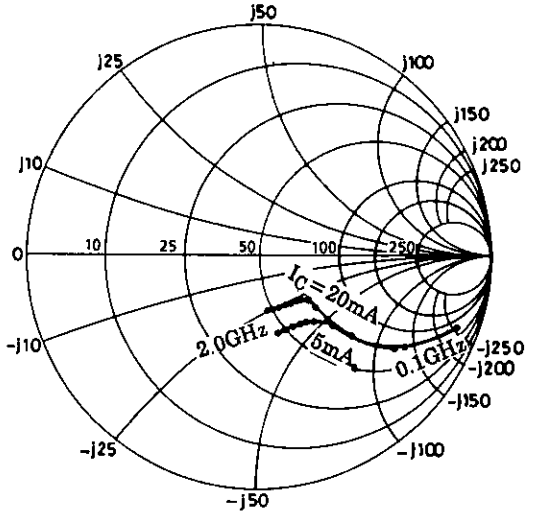
S21e : V_{CE}=5V
f=100MHz, 200~2000MHz (200MHz step)



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



S22e : V_{CE}=5V
f=100MHz, 200~2000MHz (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	−51.1
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