Ordering number: EN4857

SANYO

No.4857

2SC4871

NPN Epitaxial Planar Silicon Transistor

UHF to S Band Low-Noise Amp, OSC Applications

Features

- High cutoff frequency : $f_T = 10$GHz typ.
- High gain : $|S21e|^2 = 13$dB typ (f=1GHz).
- Low noise : NF=1.3dB typ (f=1GHz).
- Small Cob : Cob=0.4pF 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}	1.5	V
Collector Current	I_C	20	mA
Collector Dissipation	P_C	100	mW
Junction Temperature	Tj	150	°C
Storage Temperature	Tstg	−55 to +150	°C

Electrical Characteristics at Ta=25°C

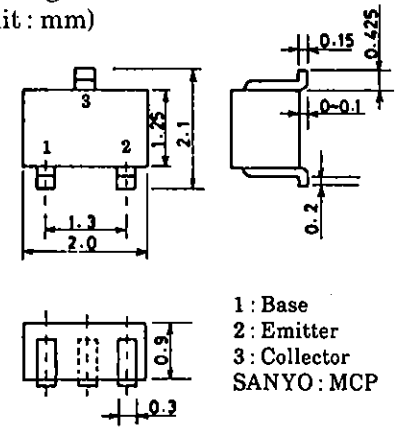
			min	typ	max	unit
Collector Cutoff Current	I_{CBO}	$V_{CB}=10V, I_E=0$			1.0	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB}=1V, I_C=0$			10	μA
DC Current Gain	h_{FE}	$V_{CE}=5V, I_C=4mA$	60※		270※	
Gain-Bandwidth Product	f_T	$V_{CE}=5V, I_C=4mA$		10		GHz
Output Capacitance	Cob	$V_{CB}=10V$, f=1MHz		0.4	0.7	pF
Forward Transfer Gain	$\|S21e\|^2$	$V_{CE}=5V, I_C=7mA$, f=1GHz	10	13		dB
Noise Figure	NF	$V_{CE}=5V, I_C=4mA$, f=1GHz		1.3	2.8	dB

※ : The 2SC4871 is classified by 4mA h_{FE} as follows :

60 3 120	90 4 180	135 5 270

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

Package Dimensions 2059A
(unit : mm)



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

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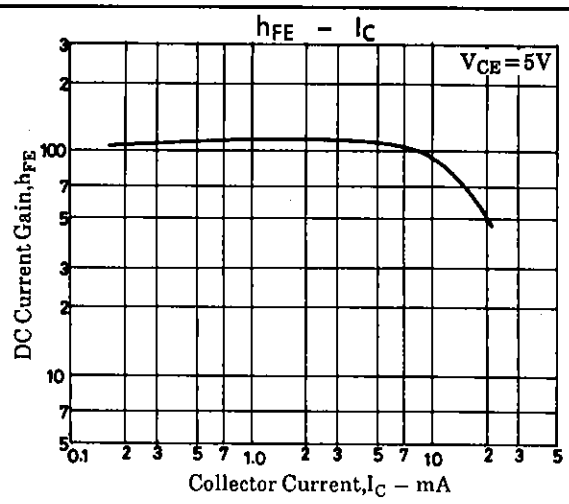
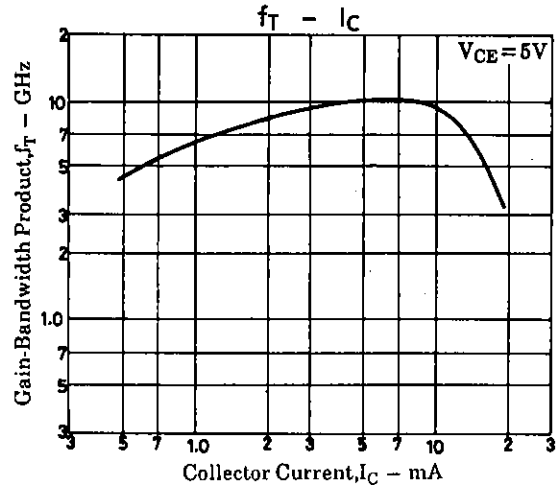
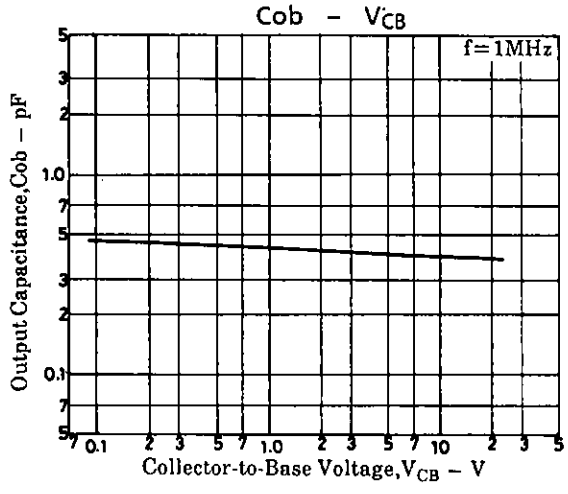
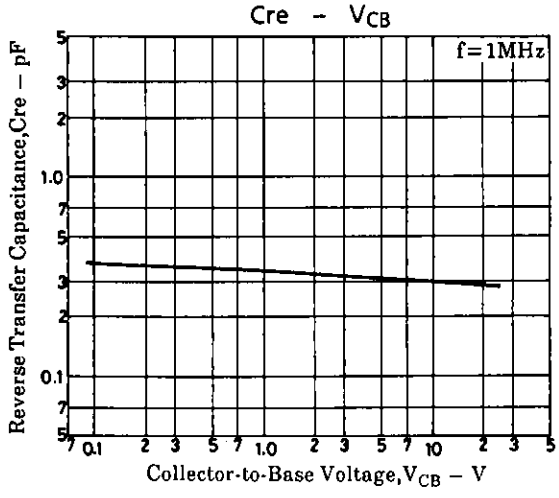
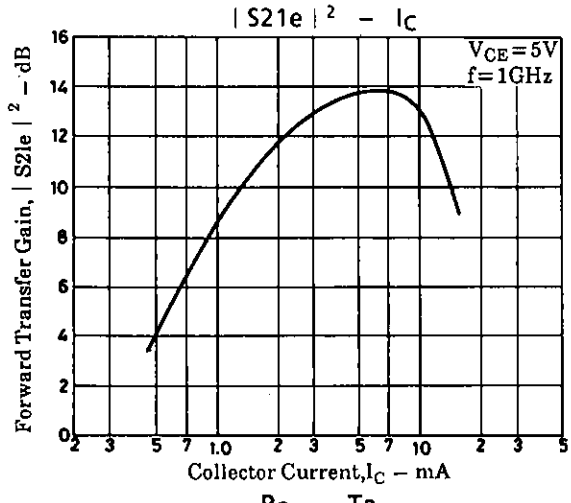
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110 JAPAN

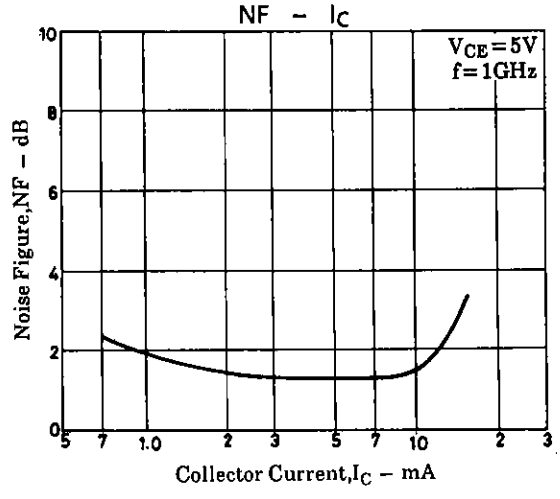

hFE – IC
VCE=5V
DC Current Gain,hFE
Collector Current,IC – mA

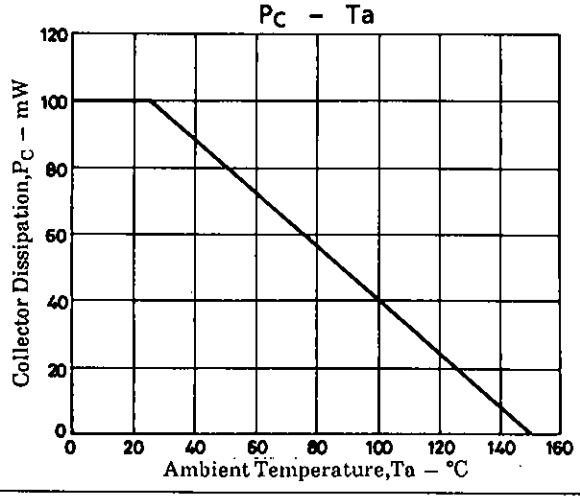

fT – IC
VCE=5V
Gain-Bandwidth Product,fT – GHz
Collector Current,IC – mA


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


Cre – VCB
f=1MHz
Reverse Transfer Capacitance,Cre – pF
Collector-to-Base Voltage,VCB – V

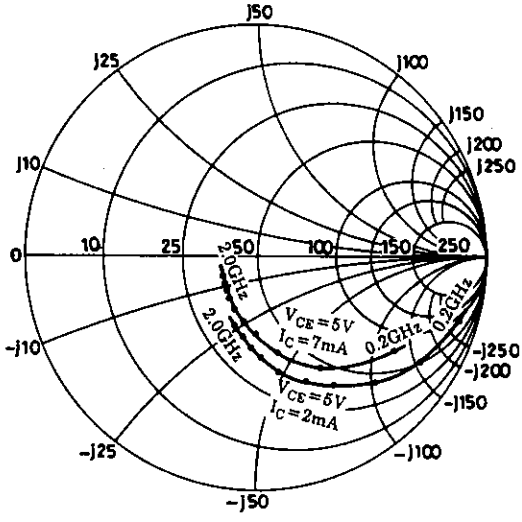

| S21e | 2 – IC
VCE=5V
f=1GHz
Forward Transfer Gain, | S21e | 2 – dB
Collector Current,IC – mA


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

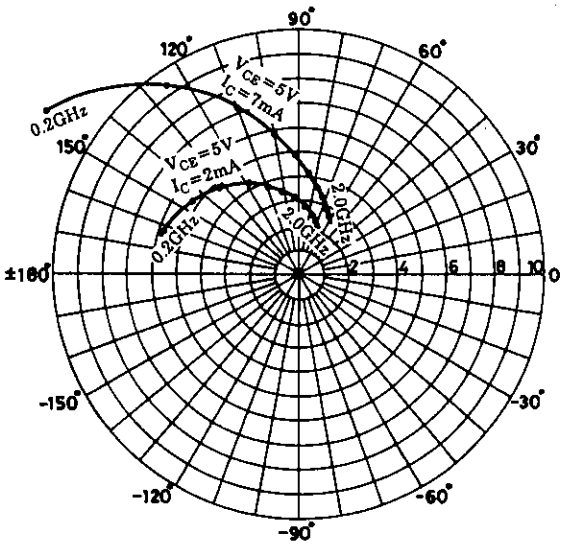

PC – Ta
Collector Dissipation,PC – mW
Ambient Temperature,Ta – °C

S Parameter

f=200 to 2000MHz (200MHz Step)

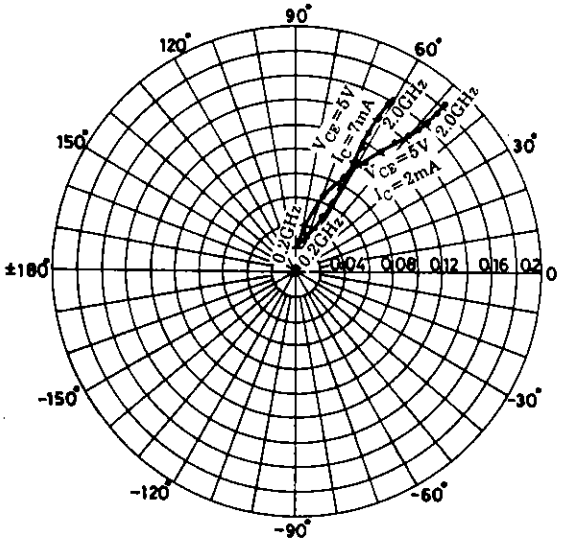


f=200 to 2000MHz (200MHz Step)

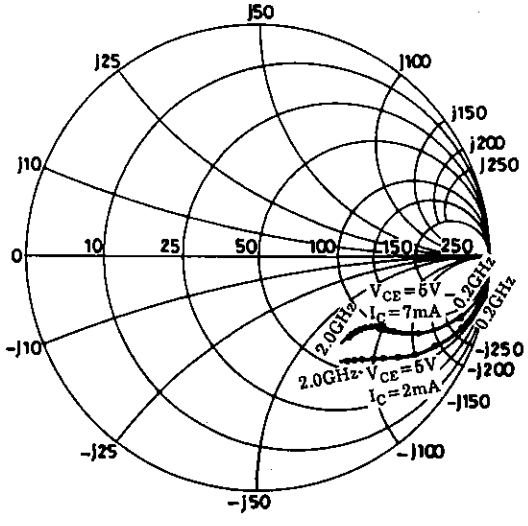


$V_{CE}=5V$

f=200 to 2000MHz (200MHz Step)



f=200 to 2000MHz (200MHz Step)



S Parameter (Common emitter)

$V_{CE}=5V, I_C=2mA, Z_O=50\Omega$

Freq (MHz)	$\lvert S_{11} \rvert$	$\angle S_{11}$	$\lvert S_{21} \rvert$	$\angle S_{21}$	$\lvert S_{12} \rvert$	$\angle S_{12}$	$\lvert S_{22} \rvert$	$\angle S_{22}$
200	0.912	−17.6	5.764	161.5	0.034	79.0	0.974	−10.3
400	0.835	−33.0	5.282	145.5	0.065	69.9	0.919	−19.2
600	0.742	−46.9	4.753	131.2	0.088	62.8	0.850	−26.3
800	0.649	−58.9	4.268	119.4	0.107	57.9	0.789	−31.6
1000	0.578	−68.7	3.840	109.4	0.121	54.5	0.740	−35.5
1200	0.512	−78.1	3.440	100.5	0.134	52.2	0.698	−38.9
1400	0.445	−86.3	3.123	92.5	0.145	50.3	0.664	−41.6
1600	0.400	−93.0	2.836	85.2	0.154	49.2	0.638	−44.3
1800	0.359	−98.5	2.588	79.0	0.164	48.4	0.615	−46.3
2000	0.319	−106.6	2.397	73.0	0.174	47.9	0.601	−48.3

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

Freq (MHz)	$\lvert S_{11} \rvert$	$\angle S_{11}$	$\lvert S_{21} \rvert$	$\angle S_{21}$	$\lvert S_{12} \rvert$	$\angle S_{12}$	$\lvert S_{22} \rvert$	$\angle S_{22}$
200	0.721	−35.1	12.262	147.1	0.030	72.8	0.900	−16.9
400	0.555	−59.9	9.445	124.9	0.050	64.4	0.763	−25.6
600	0.428	−77.5	7.290	110.2	0.065	61.9	0.666	−29.3
800	0.344	−89.9	5.877	100.1	0.078	61.5	0.611	−31.1
1000	0.291	−100.6	4.911	92.1	0.091	61.7	0.583	−32.5
1200	0.254	−110.9	4.223	85.1	0.104	61.5	0.563	−34.1
1400	0.221	−121.4	3.703	79.0	0.117	61.6	0.551	−35.7
1600	0.197	−128.9	3.294	73.6	0.129	61.6	0.540	−37.8
1800	0.178	−136.7	2.946	68.5	0.143	61.1	0.530	−39.7
2000	0.171	−148.6	2.692	63.8	0.157	60.7	0.529	−41.7

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