Ordering number:EN2972

PNP Epitaxial Planar Silicon Transistor

2SA1669

High-Frequency Amplifier Applications

Features

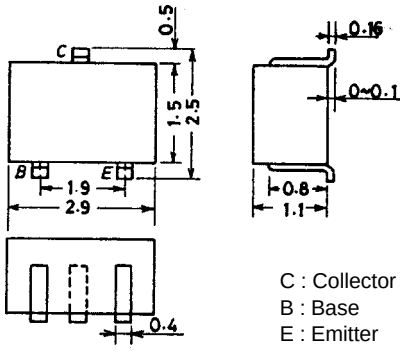
- High cutoff frequnecy : f_T=3.0GHz typ.
- High power gain : MAG=11dB typ (f=0.9GHz)
- Small noise figure : NF=2.0dB typ (f=0.9GHz)

Package Dimensions

unit:mm

2018A

[2SA1669]



Specifications

Absolute Maximum Ratings at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		–20	V
Collector-to-Emitter Voltage	V_{CEO}		–15	V
Emitter-to-Base Voltage	V_{EBO}		–3	V
Collector Current	I_C		–50	mA
Collector Dissipation	P_C		250	mW
Junction Temperature	Tj		150	˚C
Storage Temperature	Tstg		–55 to +150	˚C

Electrical Characteristics at Ta = 25˚C

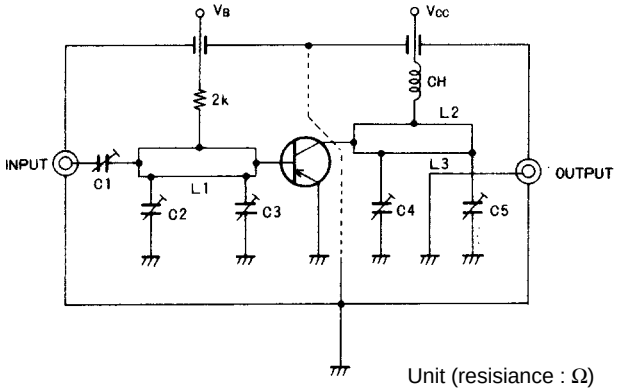
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	V_{CB}=–15V, I_E=0			–0.1	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=–2V, I_C=0			–0.1	μA
DC Current Gain	h_{FE}	V_{CE}=–10V, I_C=–5mA	15			
Gain-Bandwidth Product	f_T	V_{CE}=–10V, I_C=–5mA	1.5	3.0		GHz
Collector Output Capacitance	C_{ob}	V_{CB}=–10V, f=1MHz		1.0	1.5	pF
Reverse Transfer Capacitance	C_{re}	V_{CB}=–10V, f=1MHz		0.7		pF
Forward Transfer Gain	$\|S21e\|^2$	V_{CE}=–10V, I_C=–5mA, f=0.9GHz	5.0			dB
Maximum Available Power Gain	MAG	V_{CE}=–10V, I_C=–5mA, f=0.9GHz		11		dB
Noise Figure	NF	V_{CE}=–10V, I_C=–3mA, f=0.9GHz		2.0		dB

Note) Marking : DB

SANYO Electric Co.,Ltd. Semiconductor Bussiness Headquaters

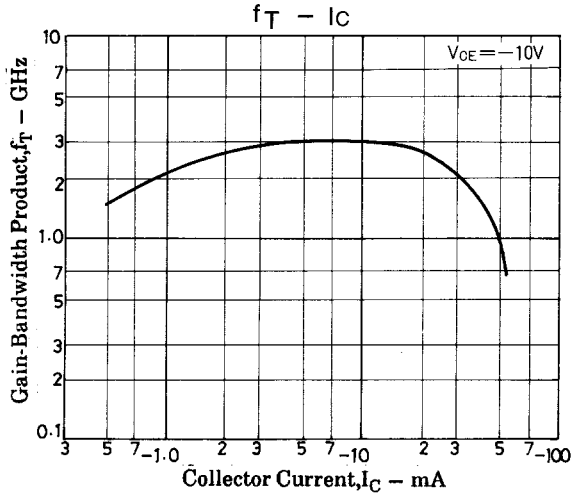
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

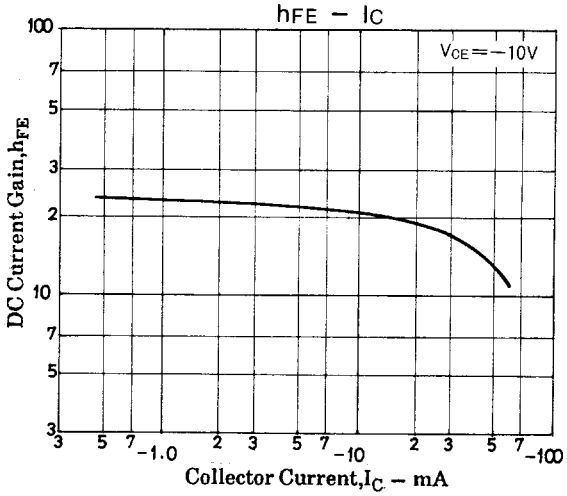
NF Test Circuit

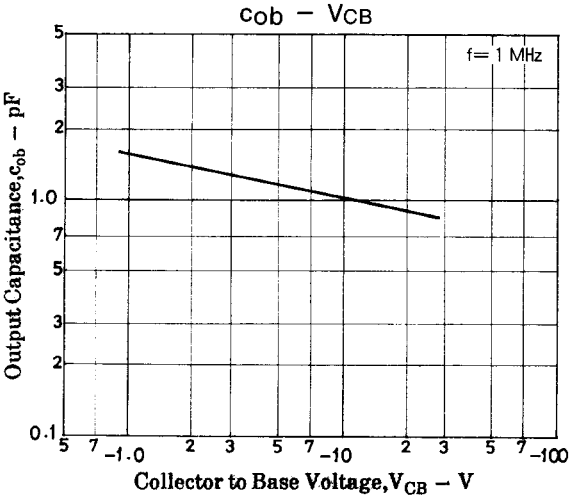


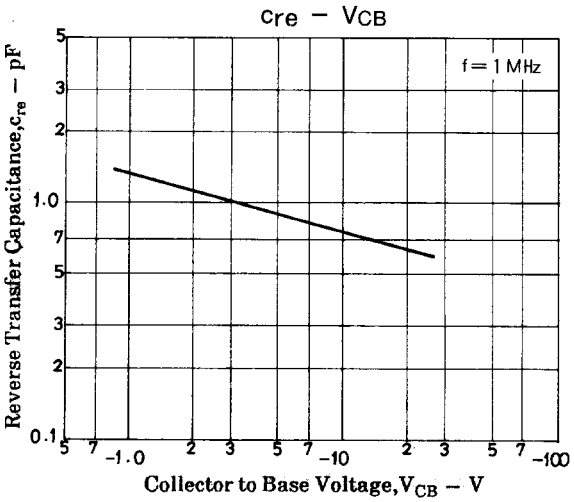
Unit (resisiance : Ω)

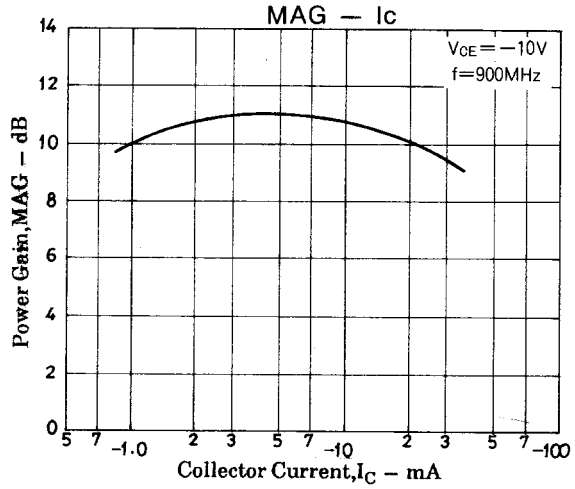
	900MHz	
C1	~5 pF	
C2	~10pF	
C3	~10pF	
C4	~10pF	
C5	~10pF	
L1	W÷1.5mm, 1 ÷25mm	**strip line**
L2	W÷4 mm, 1 ÷25mm	**strip line**
L3	0.5φ, 1 ÷40mm	
CH	**2t+bead core**	

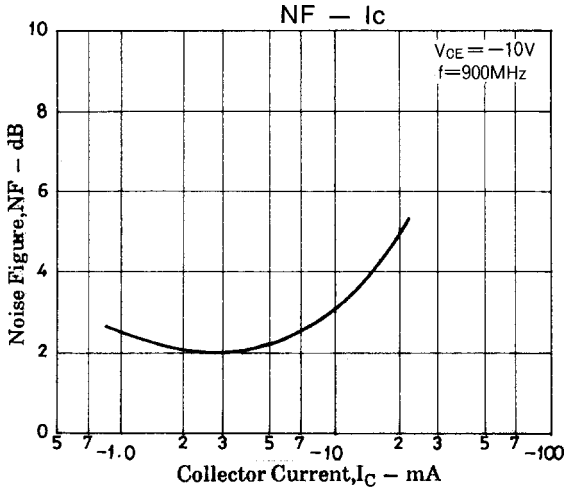


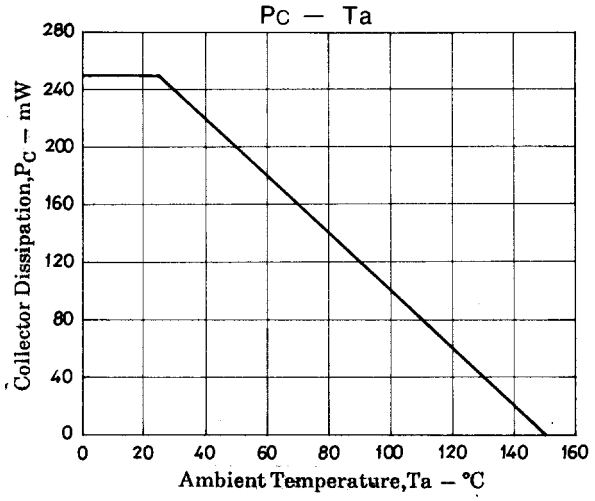






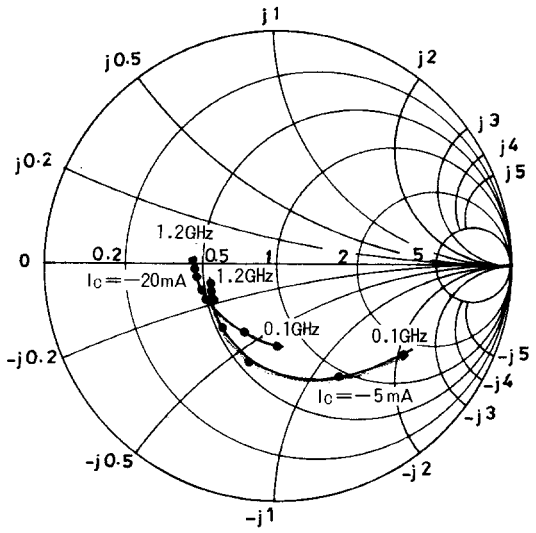




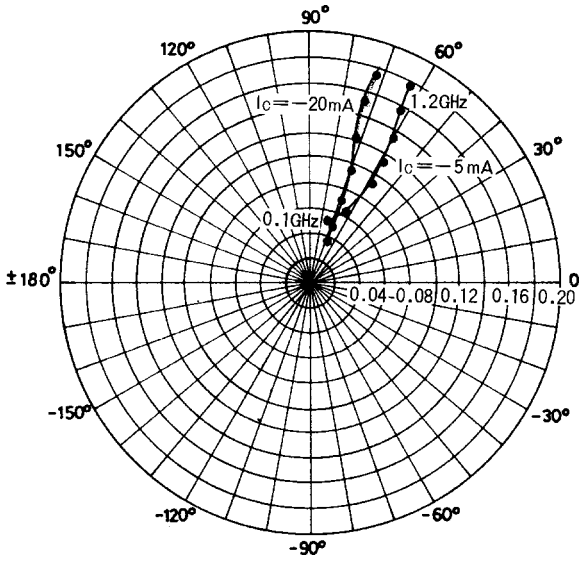


S parameter

S11w : V_{CE}=–10V
f=100MHz, 200 to 120MHz (200MHz step)

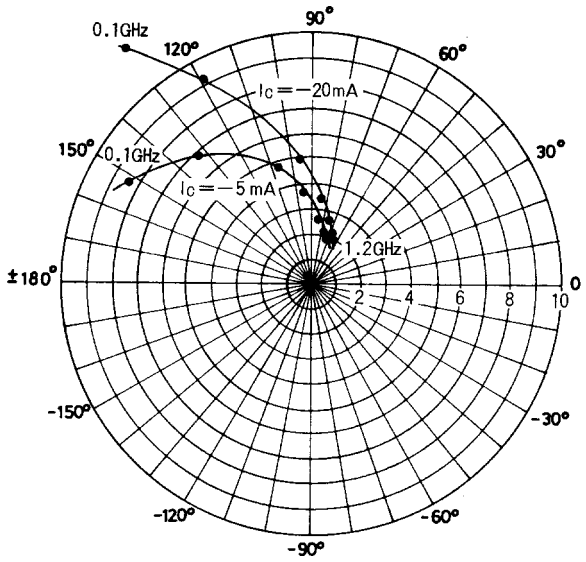


S12e : V_{CE}=–10V
f=100MHz, 200 to 1200MHz (200MHz step)

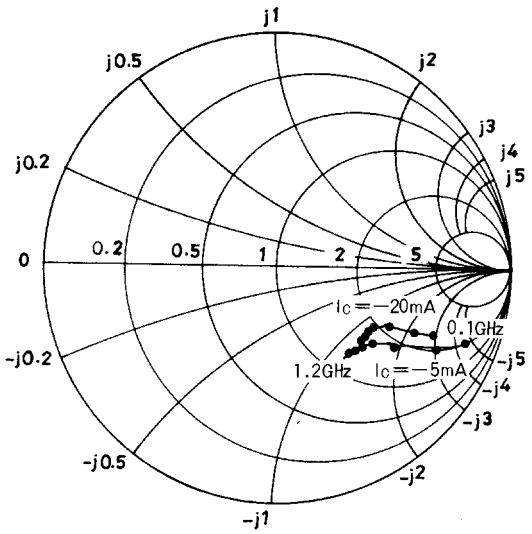


S parameter

S21e : V_{CE}=–10V
f=100MHz, 200 to 120MHz (200MHz step)



S22e : V_{CE}=–10V
f=100MHz, 200 to 1200MHz (200MHz step)



S parameter (Common emitter)

V_{CE}=–10V, I_C=–5mA, Z_O=50Ω

Freq (MHz)	|S11|	∠S11	|S21|	∠S21	|S12|	∠S12	|S22|	∠S22
100	0.707	–33.1	8.215	151.1	0.043	68.6	0.856	–19.8
200	0.589	–60.3	6.763	132.2	0.059	62.0	0.761	–25.4
400	0.435	–104.7	4.810	106.5	0.089	56.4	0.584	–34.2
600	0.373	–128.1	3.503	93.2	0.110	57.3	0.508	–36.6
800	0.349	–144.4	2.728	83.4	0.130	59.5	0.474	–39.0
900	0.346	–150.1	2.492	80.0	0.142	60.9	0.464	–40.3
1000	0.344	–155.4	2.266	76.8	0.154	61.4	0.459	–41.7
1200	0.340	–163.6	1.971	70.6	0.176	62.1	0.452	–45.2

V_{CE}=–10V, I_C=–20mA, Z_O=50Ω

Freq (MHz)	|S11|	∠S11	|S21|	∠S21	|S12|	∠S12	|S22|	∠S22
100	0.348	–92.8	12.039	129.4	0.031	67.3	0.727	–22.9
200	0.330	–116.7	9.073	118.2	0.041	66.0	0.634	–24.8
400	0.350	–151.2	4.962	95.1	0.068	67.7	0.510	–26.5
600	0.353	–164.5	3.408	84.4	0.093	69.9	0.481	–28.1
800	0.360	–172.9	2.591	76.4	0.118	71.6	0.470	–31.1
900	0.366	–176.2	2.346	73.3	0.131	72.0	0.467	–32.9
1000	0.371	–178.4	2.142	70.8	0.146	71.8	0.467	–34.8
1200	0.379	176.2	1.851	65.2	0.171	71.1	0.466	–39.1