SILICON NPN EPITAXIAL PLANAR TYPE TRANSISTOR

2SC4325

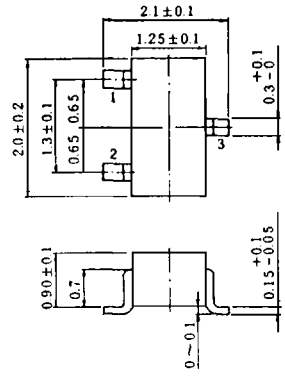
VHF~UHF BAND LOW NOISE AMPLIFIER APPLICATIONS.

- Low Noise Figure, High Gain.
- NF = 1.8dB, $|S_{21e}|^2$ = 7.5dB (f = 2GHz)

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	V_{CBO}	20	V
Collector-Emitter Voltage	V_{CEO}	10	V
Emitter-Base Voltage	V_{EBO}	1.5	V
Base Current	I_B	7	mA
Collector Current	I_C	15	mA
Collector Power Dissipation	P_C	100	mW
Junction Temperature	T_j	125	°C
Storage Temperature Range	T_{stg}	−55~125	°C

Unit in mm



1. BASE
2. EMITTER
3. COLLECTOR

JEDEC	—
EIAJ	SC-70
TOSHIBA	2-2E1A

Weight : 0.006g

MICROWAVE CHARACTERISTICS (Ta = 25°C)

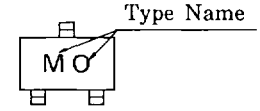
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Transition Frequency	f_T	V_{CE} = 6V, I_C = 7mA	7	10	—	GHz
Insertion Gain	$\|S_{21e}\|^2$ (1)	V_{CE} = 6V, I_C = 7mA, f = 1GHz	—	13	—	dB
	$\|S_{21e}\|^2$ (2)	V_{CE} = 6V, I_C = 7mA, f = 2GHz	4.5	7.5	—	
Noise Figure	NF (1)	V_{CE} = 6V, I_C = 3mA, f = 1GHz	—	1.4	—	dB
	NF (2)	V_{CE} = 6V, I_C = 3mA, f = 2GHz	—	1.8	3.0	

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

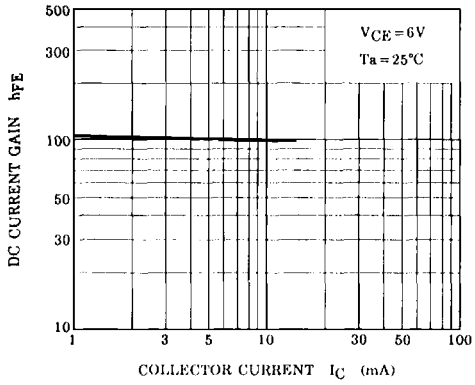
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	I_{CBO}	V_{CB} = 10V, I_E = 0	—	—	1	μA
Emitter Cut-off Current	I_{EBO}	V_{EB} = 1V, I_C = 0	—	—	1	μA
DC Current Gain	h_{FE}	V_{CE} = 6V, I_C = 7mA	50	—	250	—
Output Capacitance	C_{ob}	V_{CB} = 10V, I_E = 0, f = 1MHz (Note)	—	0.45	—	pF
Reverse Transfer Capacitance	C_{re}		—	0.35	0.8	pF

Note : C_{re} is measured by 3 terminal method with Capacitance Bridge.

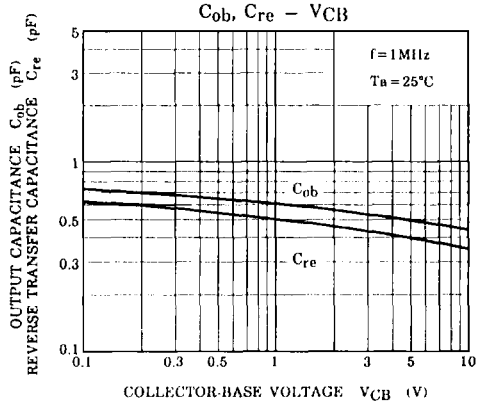
Marking



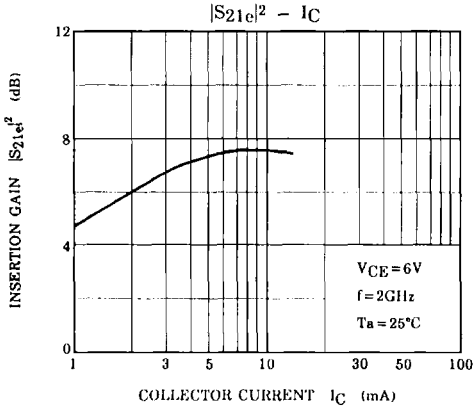
h_{FE} – I_C



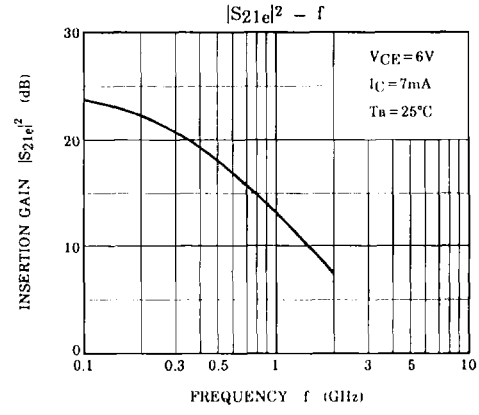
C_{ob}, C_{re} – V_{CB}



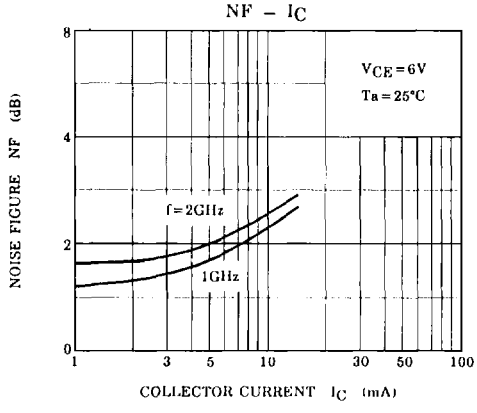
$|S_{21e}|^2$ – I_C



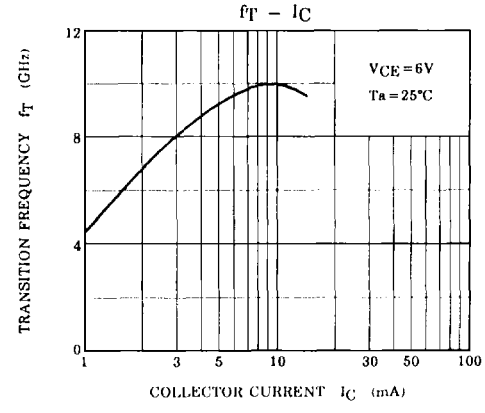
$|S_{21e}|^2$ – f

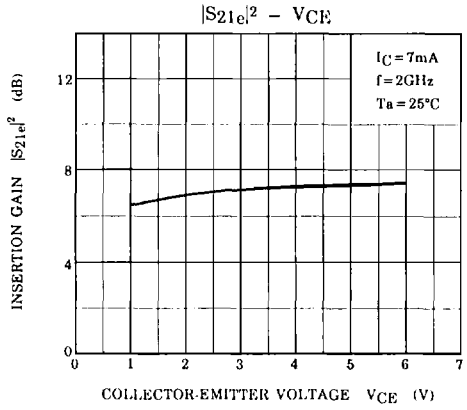


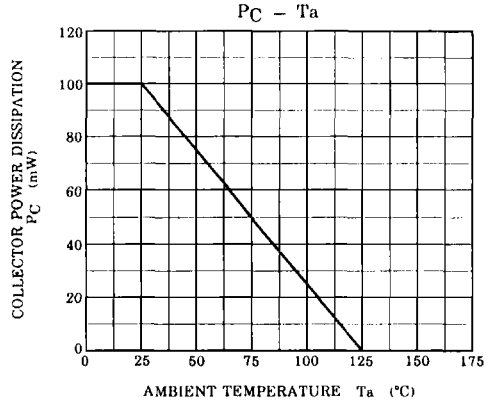
NF – I_C



f_T – I_C







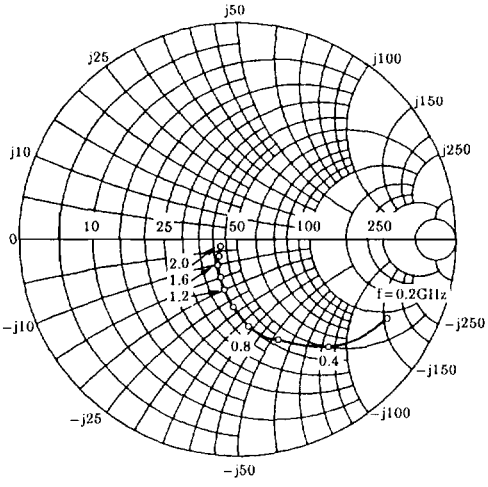
S-PARAMETER $Z_O = 50\Omega$, Ta = 25°C
V_{CE} = 6V, I_C = 3mA

FREQUENCY	S11		S21		S12		S22	
MHz	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
200	0.778	−27.1	7.781	154.1	0.043	75.7	0.932	−18.5
400	0.641	−49.4	6.538	133.4	0.075	66.5	0.800	−31.9
600	0.500	−67.1	5.409	118.1	0.097	61.9	0.683	−40.4
800	0.394	−80.5	4.508	106.6	0.115	59.9	0.595	−45.8
1000	0.311	−93.1	3.809	97.9	0.132	59.4	0.536	−49.6
1200	0.238	−103.0	3.314	90.6	0.149	59.3	0.492	−52.7
1400	0.194	−114.5	2.909	84.0	0.165	59.3	0.465	−55.3
1600	0.146	−122.2	2.619	78.7	0.183	59.4	0.444	−57.9
1800	0.102	−135.3	2.409	73.5	0.199	59.4	0.428	−60.8
2000	0.074	−150.4	2.188	70.0	0.216	59.6	0.415	−64.2

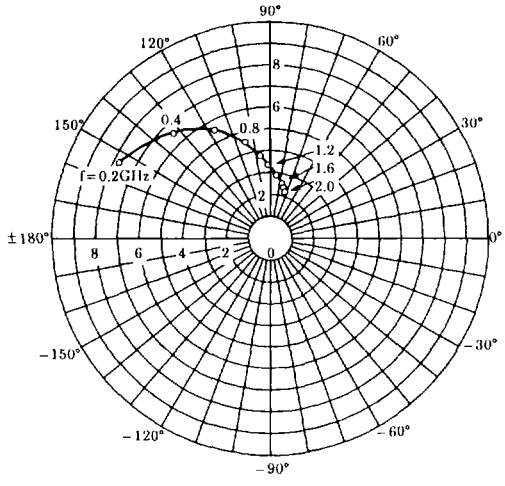
V_{CE} = 6V, I_C = 7mA

FREQUENCY	S11		S21		S12		S22	
MHz	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
200	0.581	−39.7	12.614	141.9	0.037	73.0	0.842	−24.8
400	0.397	−64.8	9.040	119.2	0.061	67.7	0.652	−36.1
600	0.278	−82.1	6.744	105.5	0.081	67.3	0.541	−40.4
800	0.194	−94.9	5.328	96.2	0.101	67.7	0.477	−42.6
1000	0.137	−109.4	4.364	89.2	0.121	67.8	0.440	−44.3
1200	0.096	−123.2	3.733	83.2	0.141	67.8	0.417	−46.4
1400	0.062	−140.8	3.254	77.9	0.162	67.1	0.403	−48.5
1600	0.041	−169.5	2.899	73.4	0.183	66.6	0.394	−50.9
1800	0.030	137.0	2.634	68.9	0.203	65.6	0.389	−54.0
2000	0.038	99.1	2.377	66.1	0.222	65.1	0.382	−57.6

S_{11e}
V_{CE} = 6V
I_C = 3mA
Ta = 25°C
(UNIT : Ω)



S_{21e}
V_{CE} = 6V
I_C = 3mA
Ta = 25°C



S_{12e}
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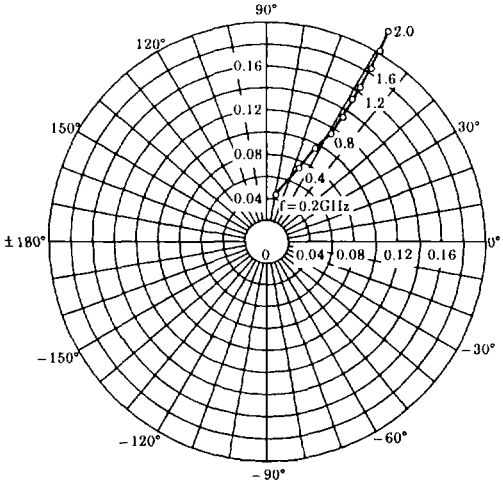
I_C = 3mA
Ta = 25°C



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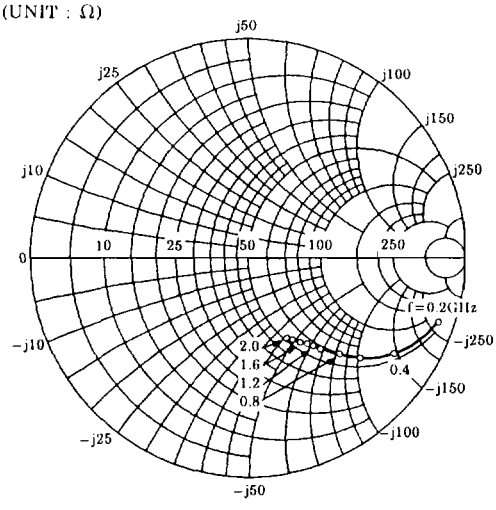

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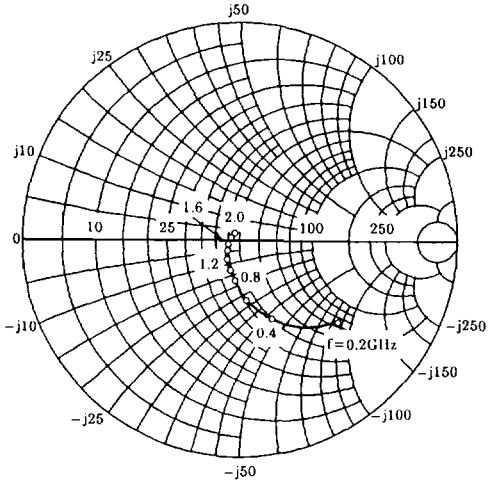

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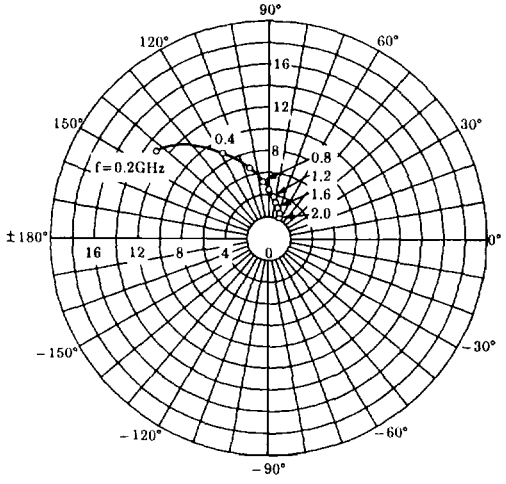

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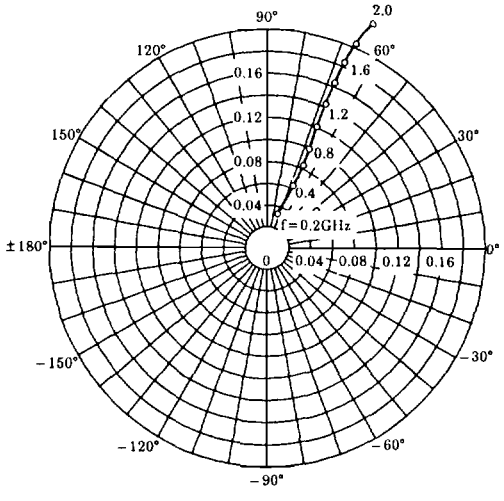

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