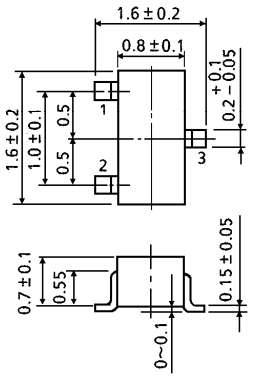
TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL PLANAR TYPE

2SC5066

VHF~UHF BAND LOW NOISE AMPLIFIER APPLICATIONS

Unit in mm

- Low Noise Figure, High Gain.
- NF = 1.1dB, $|S_{21e}|^2$ = 12dB (f = 1GHz)



1. BASE
2. EMITTER
3. COLLECTOR

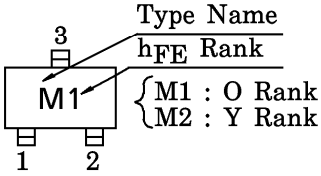
SSM	
JEDEC	—
EIAJ	SC-70
TOSHIBA	2-2H1A

Weight : 2.4mg

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	V_{CBO}	20	V
Collector-Emitter Voltage	V_{CEO}	12	V
Emitter-Base Voltage	V_{EBO}	3	V
Base Current	I_B	15	mA
Collector Current	I_C	30	mA
Collector Power Dissipation	P_C	100	mW
Junction Temperature	T_j	125	°C
Storage Temperature Range	T_{stg}	−55~125	°C

MARKING



MICROWAVE CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Transition Frequency	f_T	V_{CE} = 5V, I_C = 10mA	5	7	—	GHz
Insertion Gain	$\|S_{21e}\|^2$ (1)	V_{CE} = 5V, I_C = 10mA, f = 500MHz	—	17	—	dB
	$\|S_{21e}\|^2$ (2)	V_{CE} = 5V, I_C = 10mA, f = 1GHz	8.5	12	—	
Noise Figure	NF (1)	V_{CE} = 5V, I_C = 3mA, f = 500MHz	—	1	—	dB
	NF (2)	V_{CE} = 5V, I_C = 3mA, f = 1GHz	—	1.1	2.0	

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} (Note 1)	V_{CE} = 5V, I_C = 10mA	80	—	240	—
Output Capacitance	C_{ob}	V_{CB} = 5V, I_E = 0, f = 1MHz (Note 2)	—	0.7	—	pF
Reverse Transfer Capacitance	C_{re}		—	0.45	0.9	pF

(Note 1) h_{FE} Classification O : 80~160, Y : 120~240

(Note 2) C_{re} is measured by 3 terminal method with capacitance bridge.

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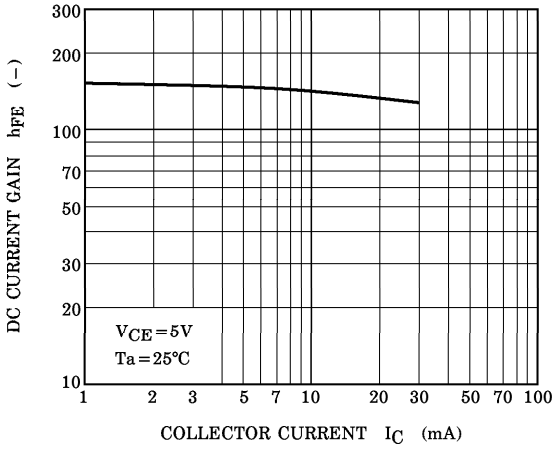
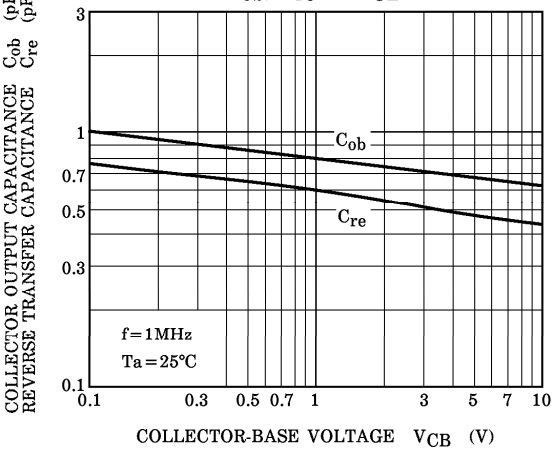
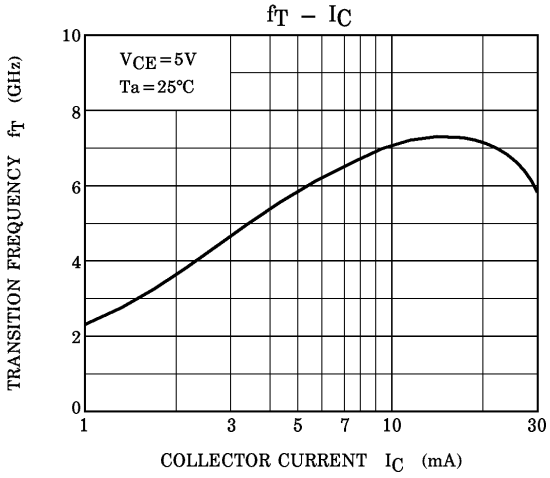
h_{FE} – I_C



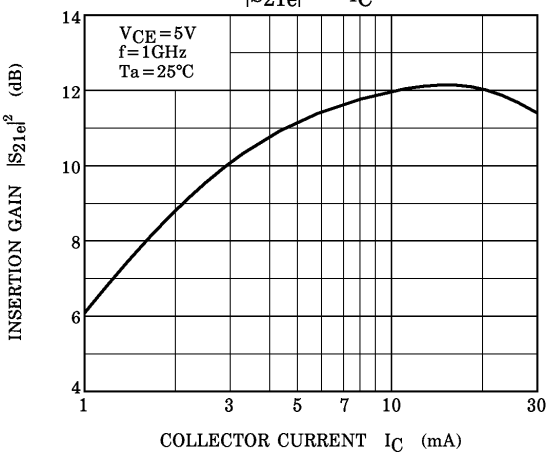
C_{ob}, C_{re} – V_{CB}



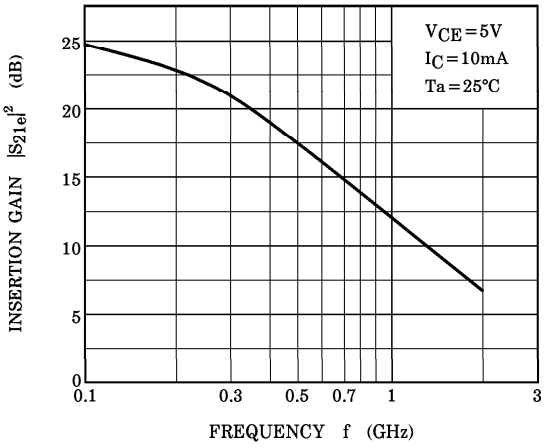
f_T – I_C



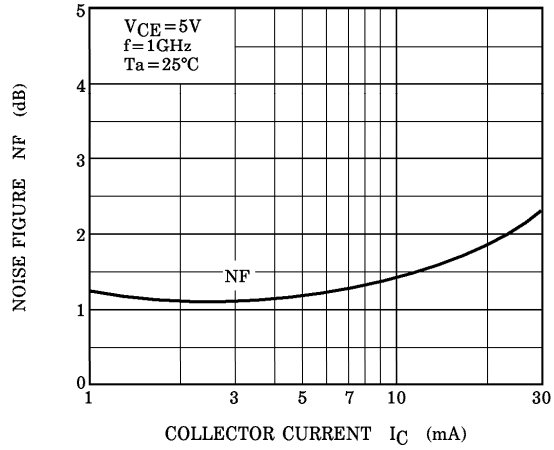
$|S_{21e}|^2$ – I_C

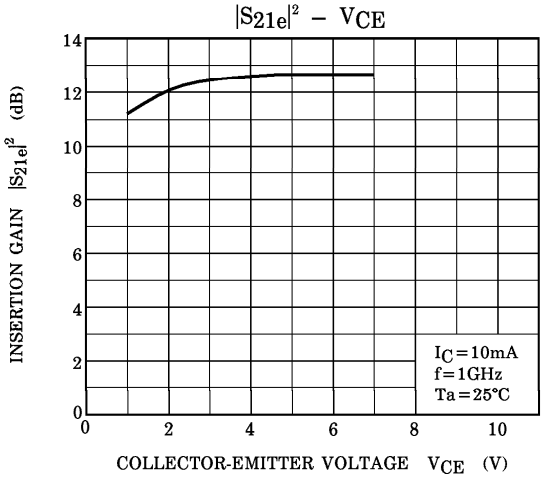


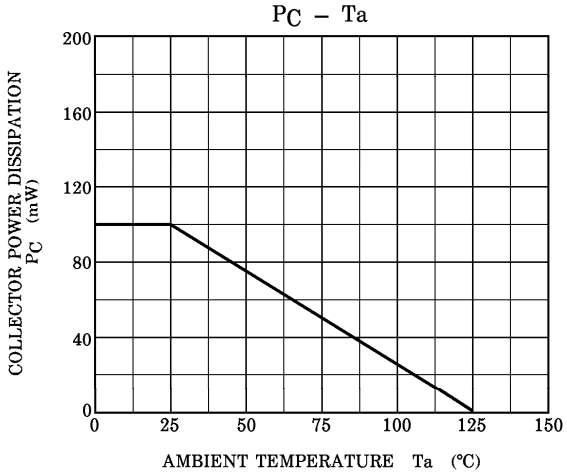
$|S_{21e}|^2$ – f



NF – I_C







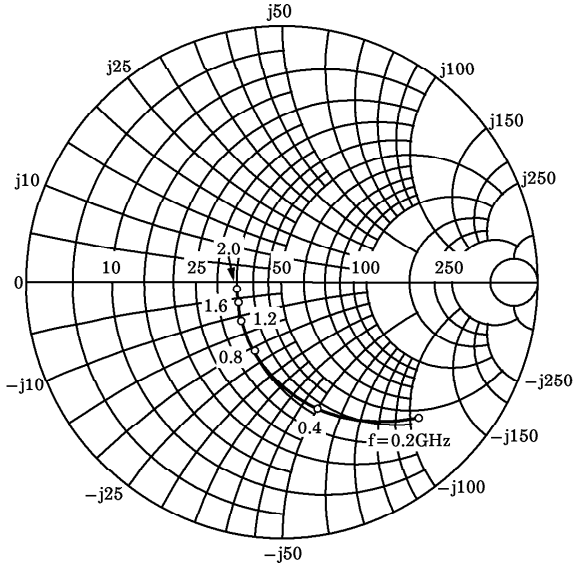
S-Parameter $Z_O = 50\Omega$, Ta = 25°C
V_{CE} = 5V, I_C = 5mA

frequency	S11		S21		S12		S22	
(MHz)	Mag.	Ang.	Mag.	Ang.	Mag.	Ang.	Mag.	Ang.
200	0.753	−43.7	10.247	140.6	0.040	65.6	0.827	−22.6
400	0.531	−75.1	7.684	117.1	0.060	57.1	0.648	−30.3
600	0.384	−96.4	5.815	103.0	0.074	56.1	0.551	−32.0
800	0.305	−112.6	4.523	93.6	0.086	57.0	0.500	−32.3
1000	0.255	−126.5	3.788	86.3	0.099	58.9	0.472	−32.4
1200	0.224	−138.4	3.244	80.7	0.112	60.2	0.455	−32.2
1400	0.203	−150.1	2.833	75.4	0.127	60.3	0.442	−32.6
1600	0.187	−159.4	2.529	70.6	0.139	60.0	0.434	−33.0
1800	0.174	−166.5	2.283	66.7	0.150	60.3	0.429	−32.6
2000	0.176	−171.2	2.107	63.0	0.164	59.2	0.428	−32.2

V_{CE} = 5V, I_C = 10mA

frequency	S11		S21		S12		S22	
(MHz)	Mag.	Ang.	Mag.	Ang.	Mag.	Ang.	Mag.	Ang.
200	0.591	−58.0	14.955	129.6	0.034	64.3	0.714	−27.5
400	0.367	−90.3	9.581	107.5	0.052	61.9	0.534	−30.8
600	0.260	−110.7	6.781	96.1	0.067	63.9	0.462	−30.1
800	0.209	−126.9	5.207	88.6	0.083	65.2	0.428	−29.2
1000	0.178	−141.8	4.269	82.5	0.100	66.4	0.412	−28.6
1200	0.160	−153.7	3.618	77.7	0.117	66.7	0.403	−28.3
1400	0.150	−166.3	3.152	72.7	0.135	65.4	0.398	−28.8
1600	0.141	−175.2	2.801	68.7	0.149	64.0	0.393	−29.4
1800	0.130	178.2	2.521	65.0	0.163	63.4	0.392	−29.0
2000	0.133	174.0	2.314	61.7	0.179	61.3	0.395	−28.6

S_{11e}
V_{CE} = 5V
I_C = 5mA
Ta = 25°C
(UNIT : Ω)



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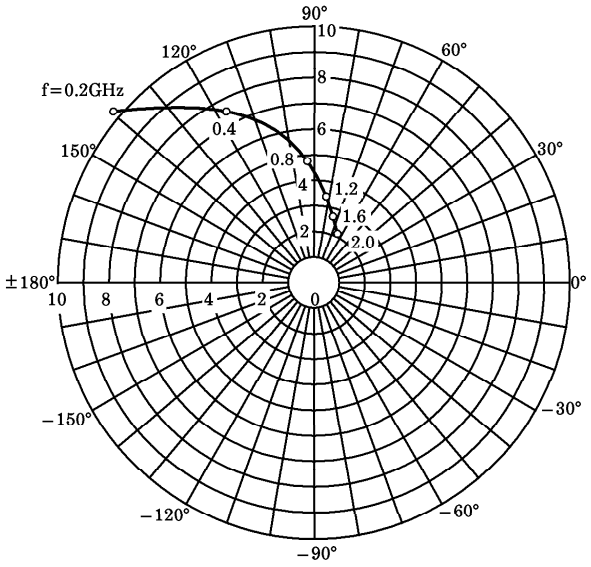

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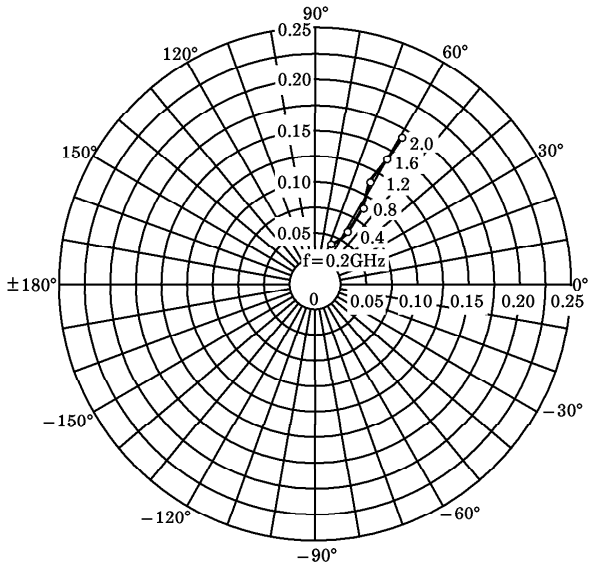

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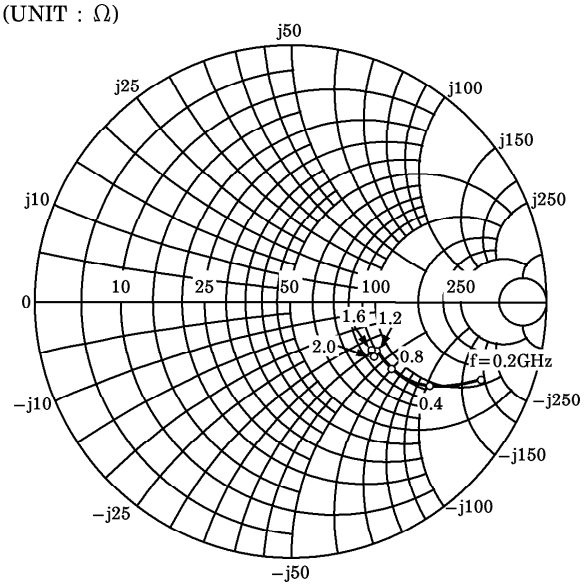

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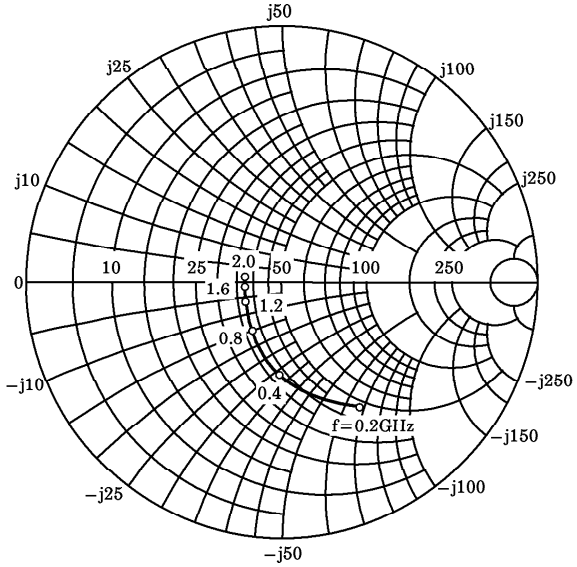

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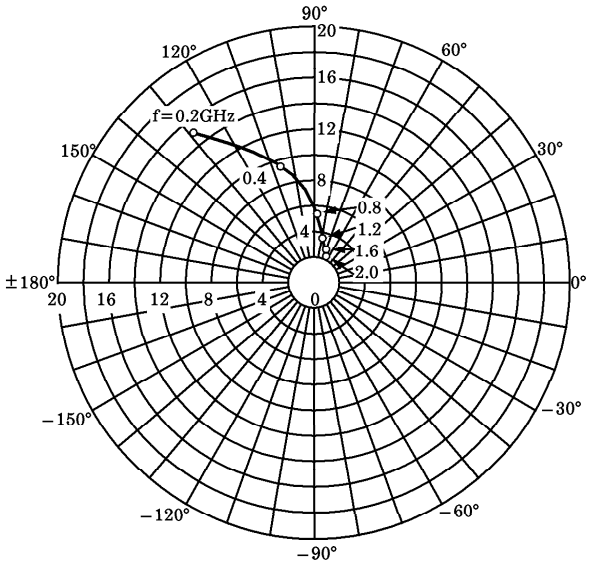

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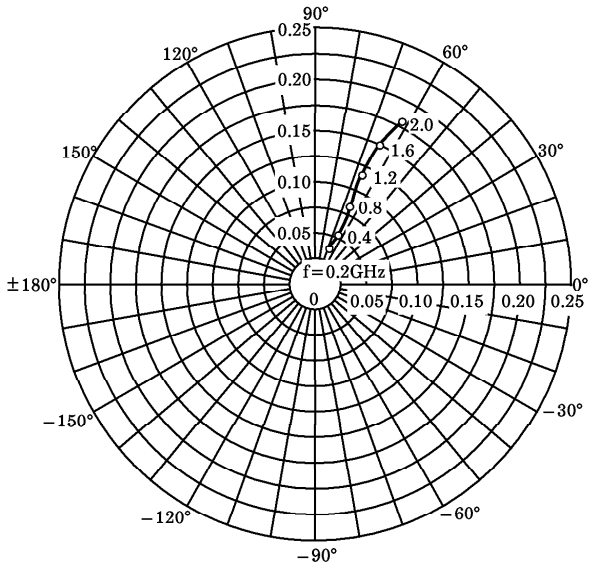

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