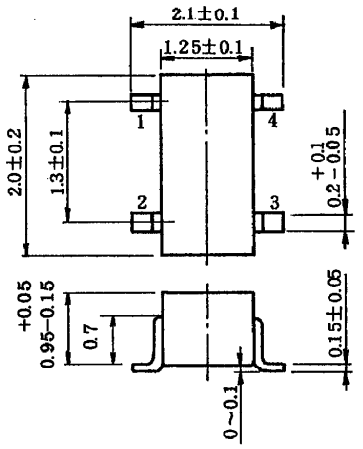
TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL PLANAR TYPE

2SC4844

VHF~UHF BAND LOW NOISE AMPLIFIER APPLICATIONS.

Unit in mm

- Low Noise Figure, High Gain.
- NF = 1.8dB, $|S_{21e}|^2$ = 9.5dB (f = 2GHz)



1, 3. EMITTER
2. BASE
4. COLLECTOR

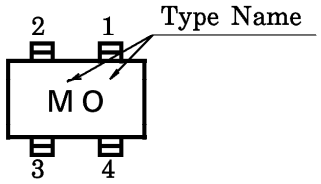
JEDEC	—
EIAJ	—
TOSHIBA	2-2K1A

Weight : 0.006g

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

Marking



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	—	15	—	dB
	$\|S_{21e}\|^2$ (2)	V_{CE} = 6V, I_C = 7mA, f = 2GHz	6.5	9.5	—	
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)	—	0.55	—	pF
Reverse Transfer Capacitance	C_{re}		—	0.35	0.8	pF

Note : C_{re} is measured by 3 terminal method with capacitance bridge.

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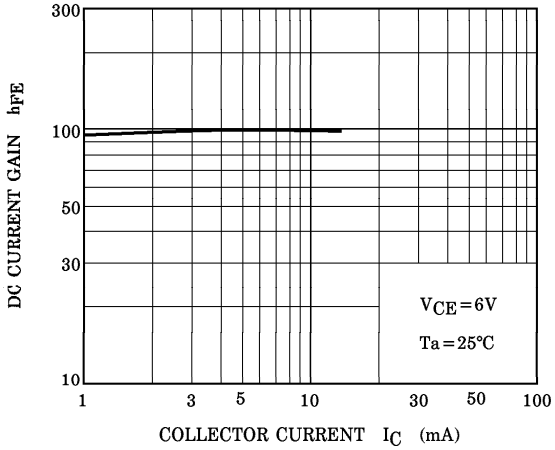
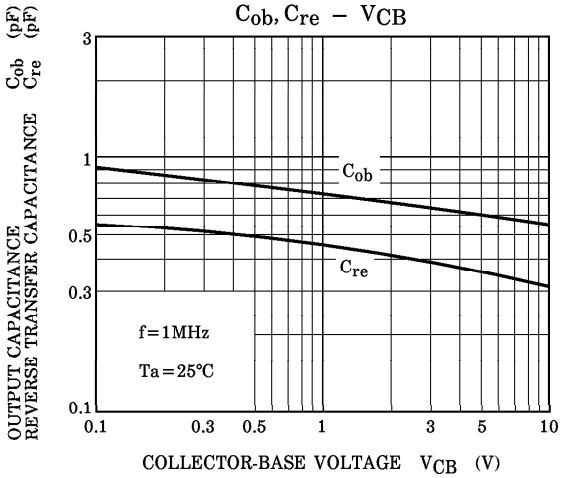
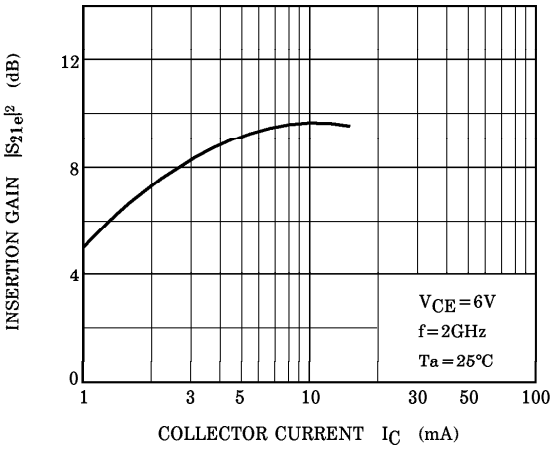
h_{FE} – I_C



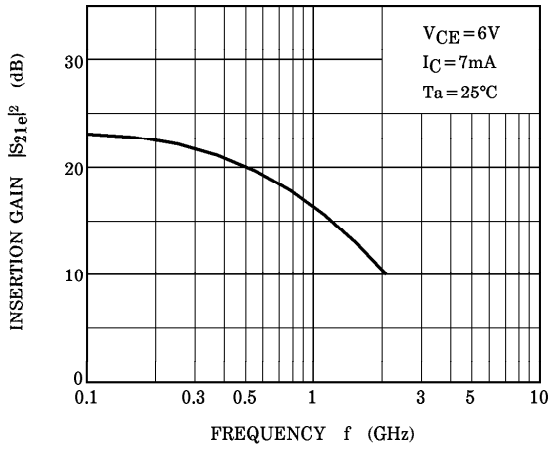
C_{ob}, C_{re} – V_{CB}



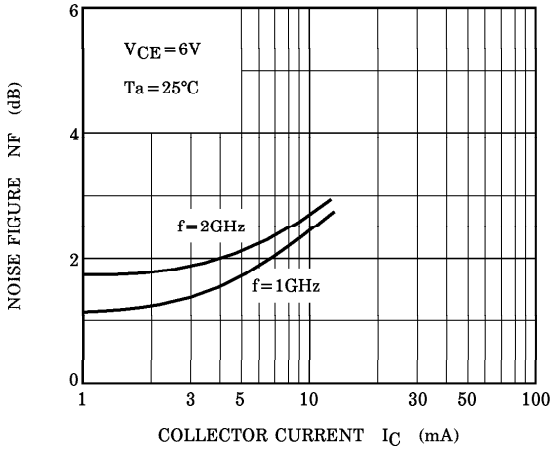
$|S_{21e}|^2$ – I_C



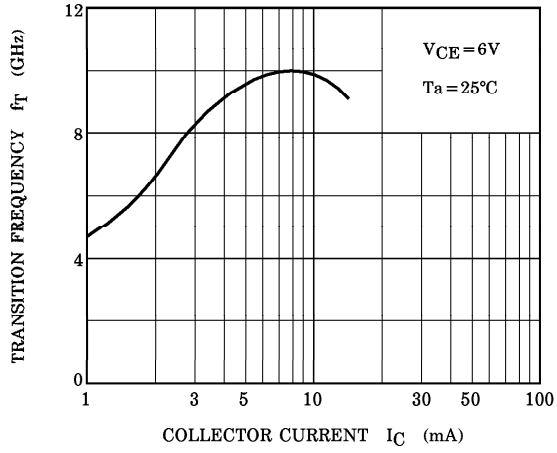
$|S_{21e}|^2$ – f



NF – I_C



f_T – I_C



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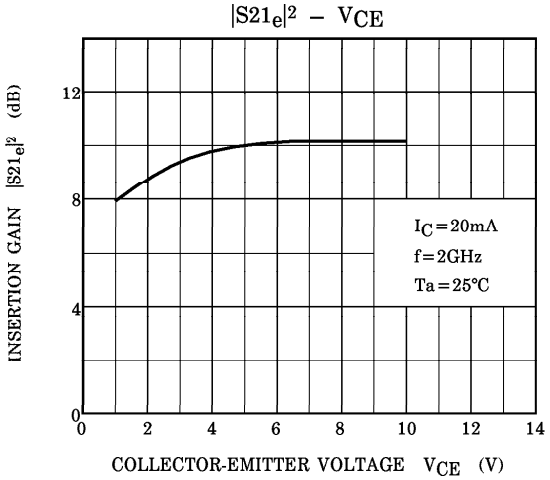
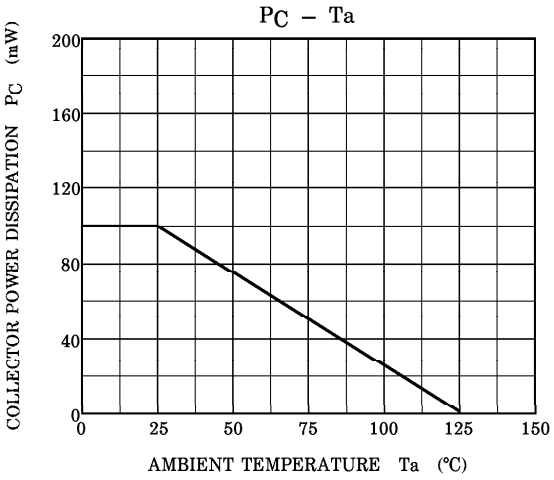




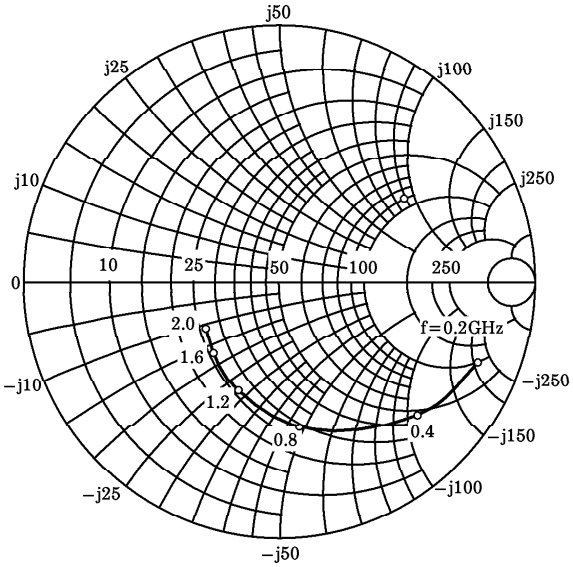
S-PARAMETER Z_O = 50Ω, Ta = 25°C
V_{CE} = 6V, I_C = 3mA

FREQUENCY	S11		S21		S12		S22	
MHz	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
200	0.847	−22.2	7.290	159.9	0.037	75.5	0.954	−16.2
400	0.767	−43.8	6.718	143.8	0.066	64.5	0.857	−29.3
600	0.666	−63.7	6.064	129.8	0.087	56.5	0.765	−39.3
800	0.573	−80.8	5.332	119.0	0.102	51.3	0.680	−47.0
1000	0.492	−96.6	4.642	109.6	0.113	47.5	0.612	−53.3
1200	0.435	−111.0	4.133	102.7	0.121	45.1	0.560	−58.2
1400	0.393	−122.1	3.671	96.6	0.126	44.0	0.518	−62.6
1600	0.366	−132.7	3.314	92.1	0.131	43.5	0.486	−66.5
1800	0.351	−141.5	3.051	88.0	0.136	43.4	0.466	−70.2
2000	0.340	−149.6	2.820	83.7	0.141	43.8	0.450	−73.2

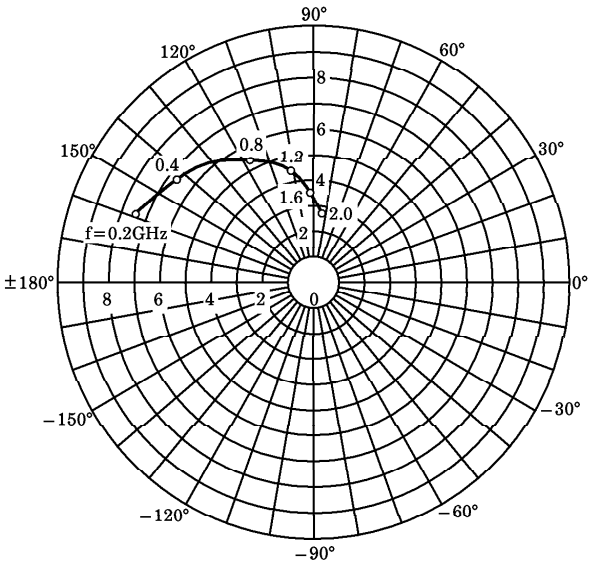
V_{CE} = 6V, I_C = 7mA

FREQUENCY	S11		S21		S12		S22	
MHz	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
200	0.708	−36.8	13.239	151.4	0.032	70.2	0.890	−23.8
400	0.582	−69.7	11.041	131.1	0.053	59.2	0.718	−39.1
600	0.491	−96.0	8.920	116.6	0.066	54.3	0.589	−48.1
800	0.425	−116.4	7.290	107.1	0.074	52.7	0.502	−53.8
1000	0.386	−133.3	6.049	99.4	0.082	52.7	0.442	−58.0
1200	0.368	−147.0	5.176	94.3	0.090	53.5	0.405	−61.3
1400	0.353	−157.1	4.527	89.3	0.097	54.5	0.378	−64.7
1600	0.347	−166.1	4.007	85.7	0.105	55.7	0.359	−67.9
1800	0.345	−172.9	3.634	82.2	0.113	56.7	0.347	−70.7
2000	0.344	−179.0	3.333	78.8	0.120	57.9	0.340	−74.1

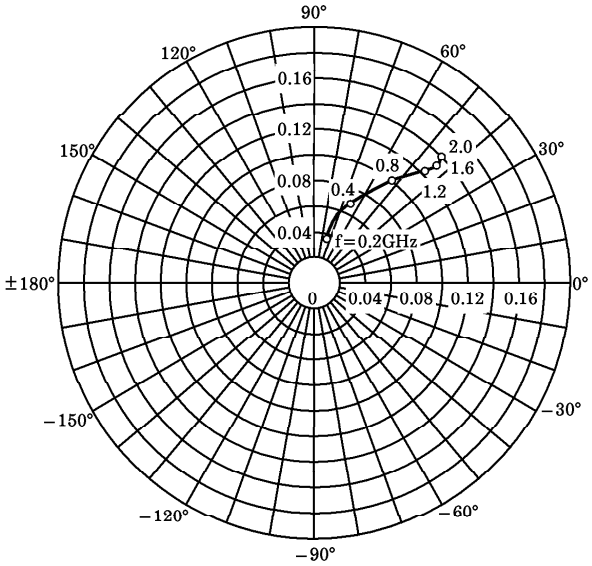
S_{11e}
V_{CE} = 6V
I_C = 3mA
Ta = 25°C
(UNIT : Ω)



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



S_{12e}
V_{CE} = 6V
I_C = 3mA
Ta = 25°C



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I_C = 3mA
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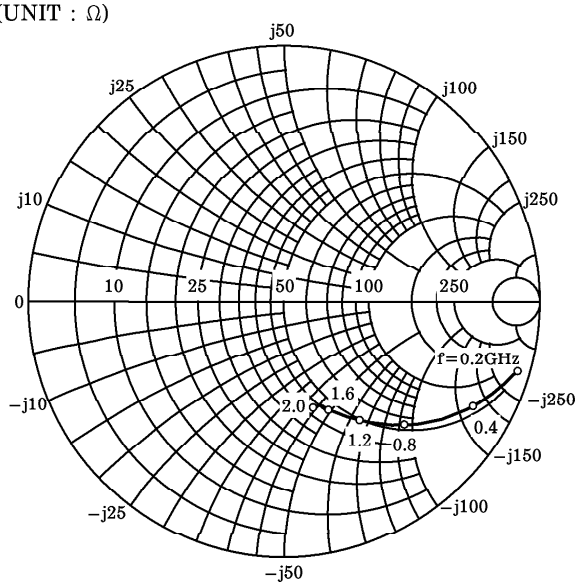
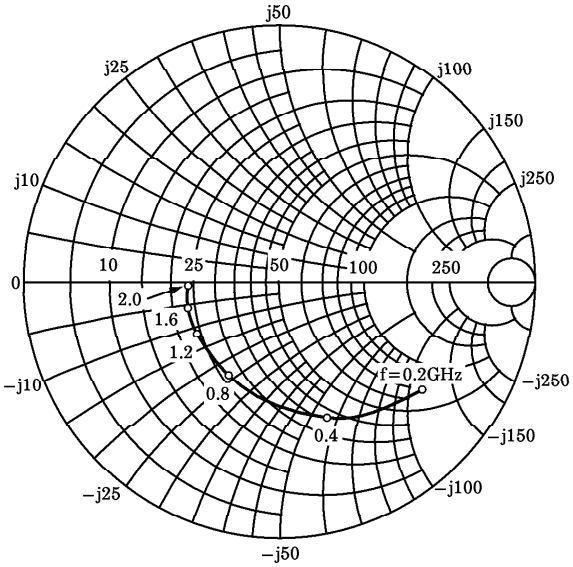
(UNIT : Ω)



S_{11e}
V_{CE} = 6V
I_C = 7mA
Ta = 25°C
(単位 : Ω)



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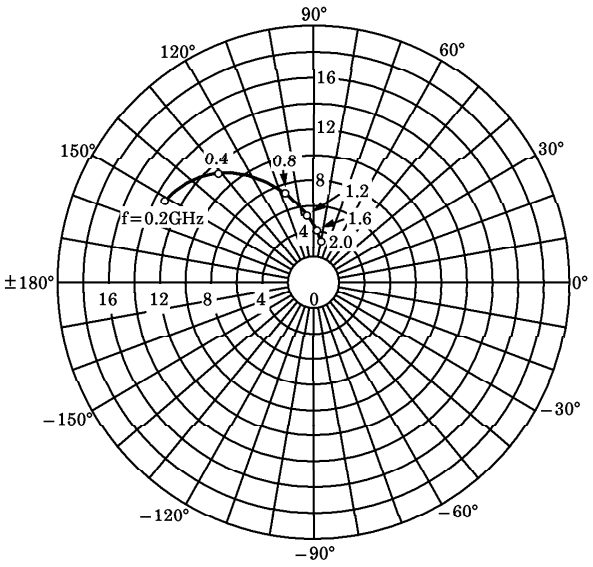

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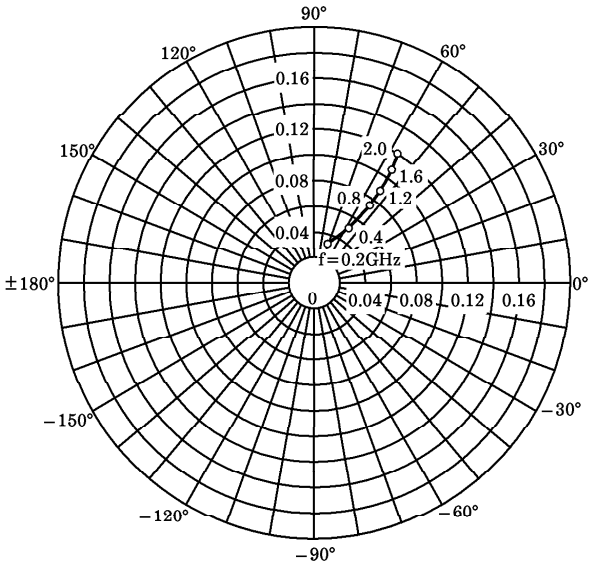

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