

TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL PLANAR TYPE

2SC4844

VHF~UHF BAND LOW NOISE AMPLIFIER APPLICATIONS.

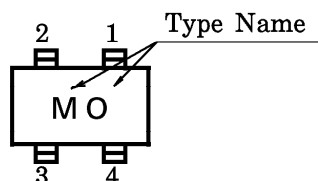
Unit in mm

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

MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

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	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	$-55 \sim 125$	$^\circ\text{C}$

Marking



		1, 3. EMITTER
		2. BASE
		4. COLLECTOR
JEDEC	—	
EIAJ	—	
TOSHIBA	2-2K1A	

Weight : 0.006g

MICROWAVE CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Transition Frequency	f_T	$V_{CE} = 6\text{V}$, $I_C = 7\text{mA}$	7	10	—	GHz
Insertion Gain	$ S_{21e} ^2 (1)$	$V_{CE} = 6\text{V}$, $I_C = 7\text{mA}$, $f = 1\text{GHz}$	—	15	—	dB
	$ S_{21e} ^2 (2)$	$V_{CE} = 6\text{V}$, $I_C = 7\text{mA}$, $f = 2\text{GHz}$	6.5	9.5	—	
Noise Figure	NF (1)	$V_{CE} = 6\text{V}$, $I_C = 3\text{mA}$, $f = 1\text{GHz}$	—	1.4	—	dB
	NF (2)	$V_{CE} = 6\text{V}$, $I_C = 3\text{mA}$, $f = 2\text{GHz}$	—	1.8	3.0	

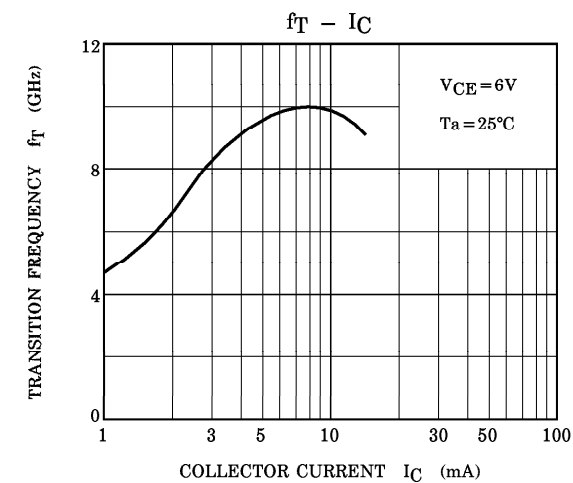
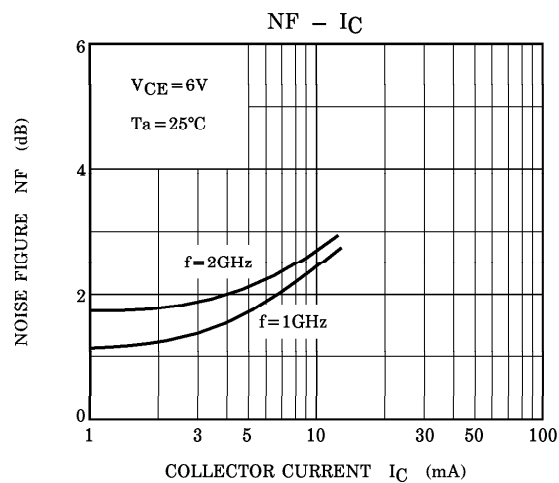
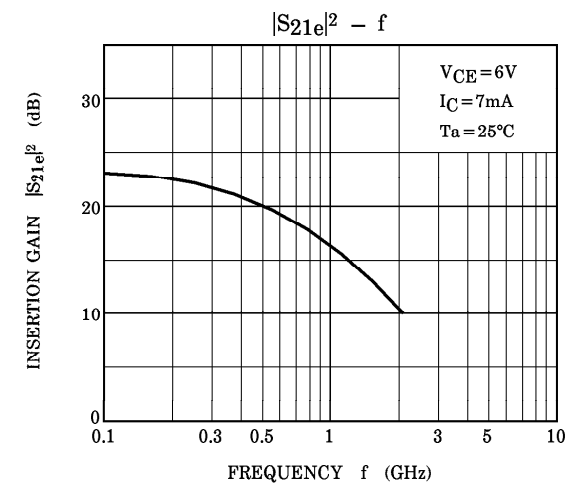
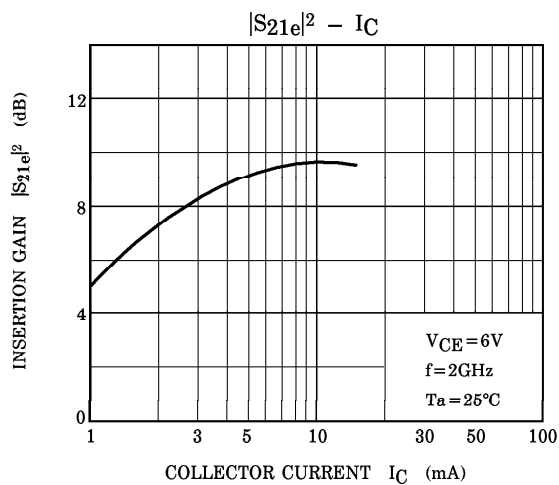
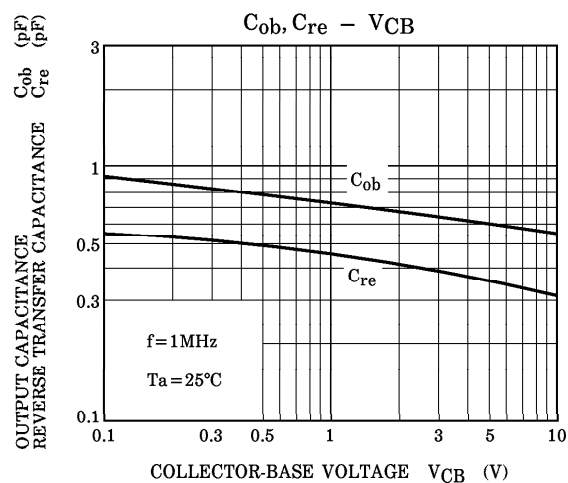
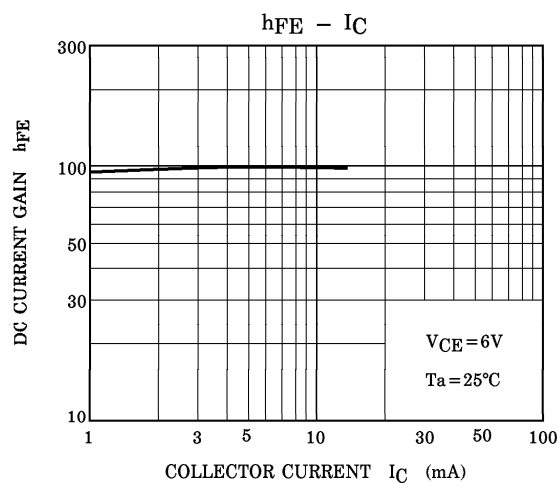
ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	I_{CBO}	$V_{CB} = 10\text{V}$, $I_E = 0$	—	—	1	μA
Emitter Cut-off Current	I_{EBO}	$V_{EB} = 1\text{V}$, $I_C = 0$	—	—	1	μA
DC Current Gain	h_{FE}	$V_{CE} = 6\text{V}$, $I_C = 7\text{mA}$	50	—	250	—
Output Capacitance	C_{ob}	$V_{CB} = 10\text{V}$, $I_E = 0$, $f = 1\text{MHz}$	—	0.55	—	pF
Reverse Transfer Capacitance	C_{re}	(Note)	—	0.35	0.8	pF

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

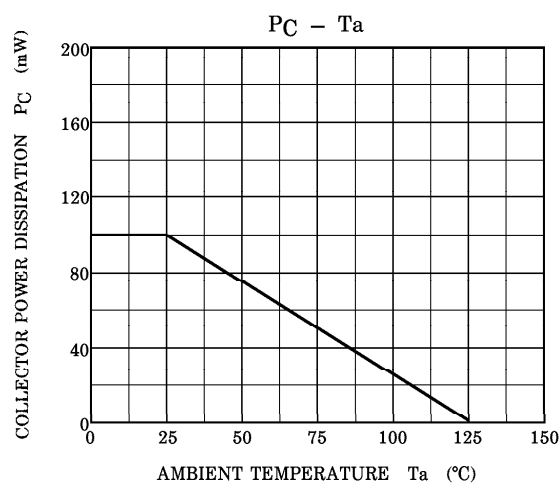
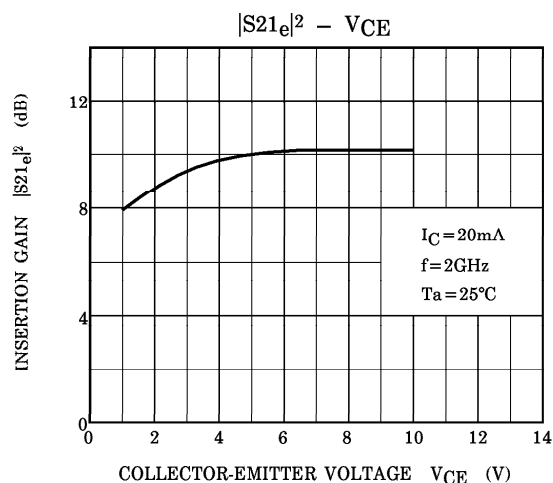
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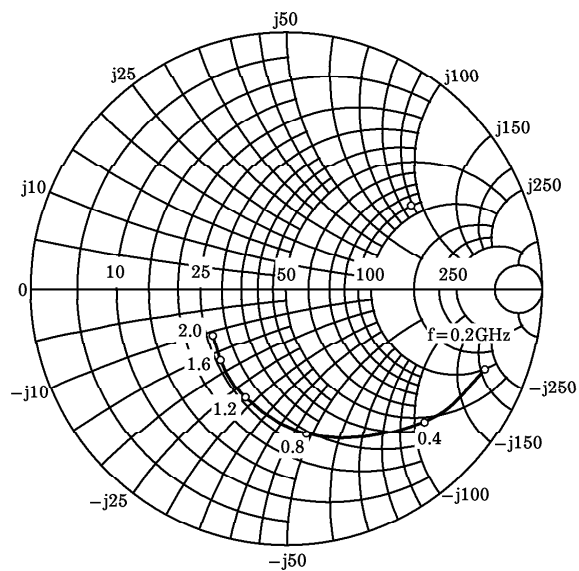
S-PARAMETER $Z_O = 50\Omega$, $T_a = 25^\circ\text{C}$
 $V_{CE} = 6\text{V}$, $I_C = 3\text{mA}$

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	

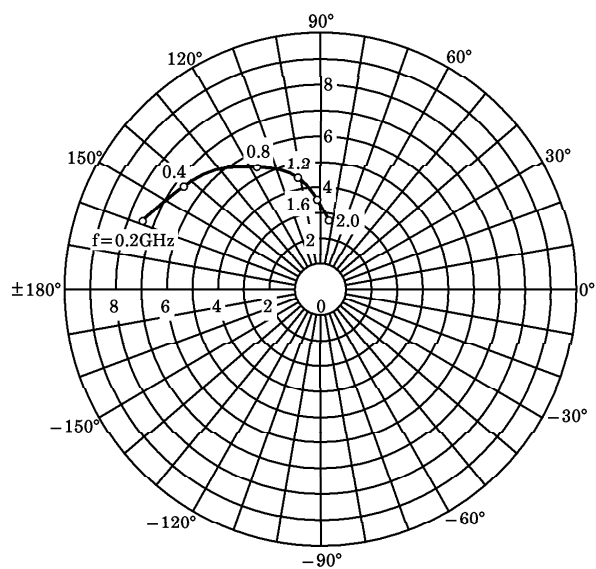
$V_{CE} = 6\text{V}$, $I_C = 7\text{mA}$

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	

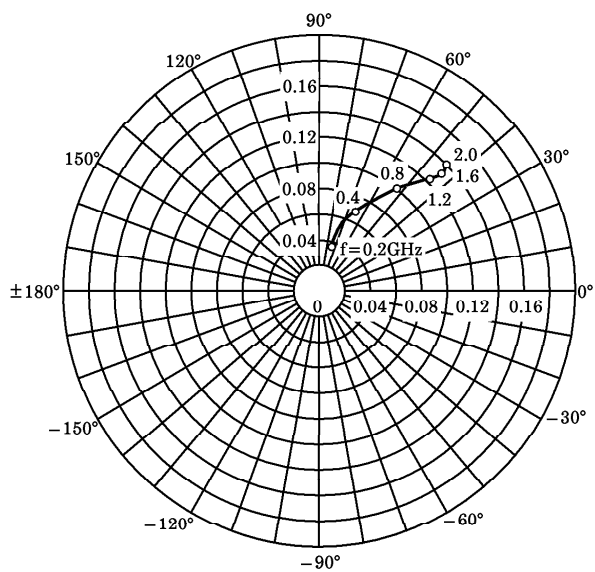
S_{11e}
 $V_{CE}=6V$
 $I_C=3mA$
 $T_a=25^\circ C$
 (UNIT : Ω)



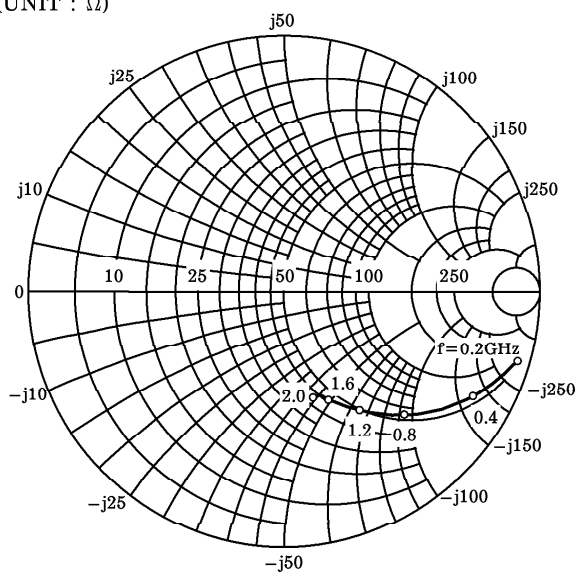
S_{21e}
 $V_{CE}=6V$
 $I_C=3mA$
 $T_a=25^\circ C$



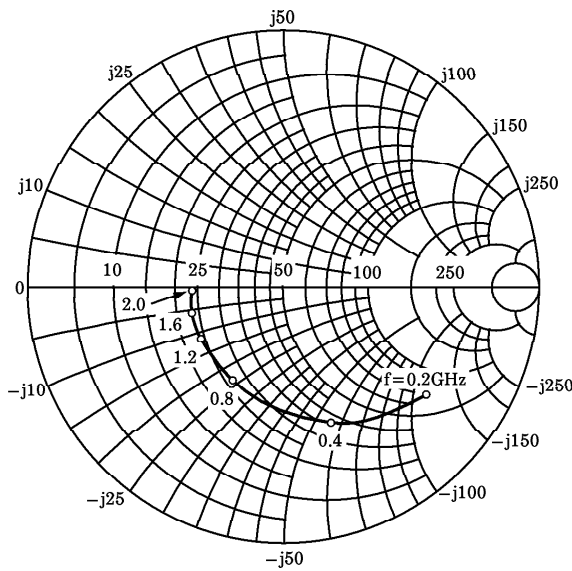
S_{12e}
 $V_{CE}=6V$
 $I_C=3mA$
 $T_a=25^\circ C$



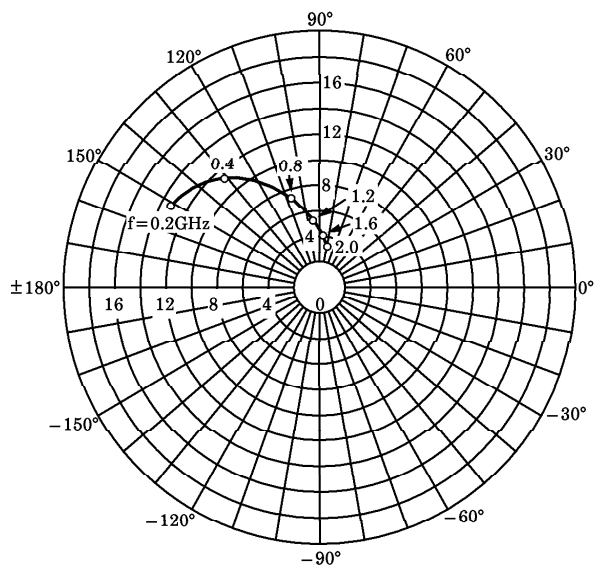
S_{22e}
 $V_{CE}=6V$
 $I_C=3mA$
 $T_a=25^\circ C$
 (UNIT : Ω)



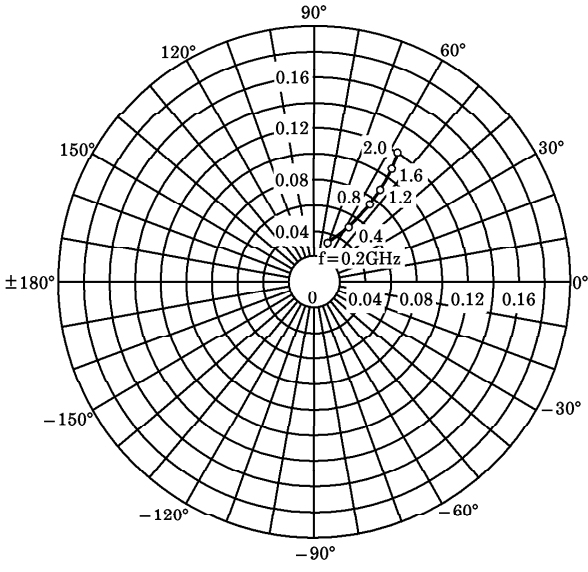
S_{11e}
V_{CE}=6V
I_C=7mA
T_a=25°C
(単位 : Ω)



S_{21e}
V_{CE}=6V
I_C=7mA
T_a=25°C



S_{12e}
V_{CE}=6V
I_C=7mA
T_a=25°C



S_{22e}
V_{CE}=6V
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