

TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL PLANAR TYPE

2SC4843

VHF~UHF BAND LOW NOISE AMPLIFIER APPLICATIONS.

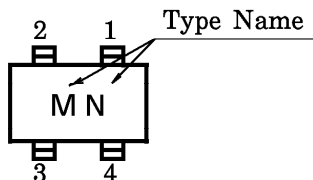
Unit in mm

- Low Noise Figure, High Gain.
- $NF = 1.1\text{dB}$, $|S_{21e}|^2 = 15.5\text{dB}$ ($f = 1\text{GHz}$)

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	20	mA
Collector Current	I_C	40	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	$V_{CE} = 8\text{V}$, $I_C = 20\text{mA}$	7	10	—	GHz
Insertion Gain	$ S_{21e} ^2 (1)$	$V_{CE} = 8\text{V}$, $I_C = 20\text{mA}$, $f = 1\text{GHz}$	12	15.5	—	dB
	$ S_{21e} ^2 (2)$	$V_{CE} = 8\text{V}$, $I_C = 20\text{mA}$, $f = 2\text{GHz}$	—	9	—	
Noise Figure	NF (1)	$V_{CE} = 8\text{V}$, $I_C = 5\text{mA}$, $f = 1\text{GHz}$	—	1.1	2.5	dB
	NF (2)	$V_{CE} = 8\text{V}$, $I_C = 5\text{mA}$, $f = 2\text{GHz}$	—	1.7	—	

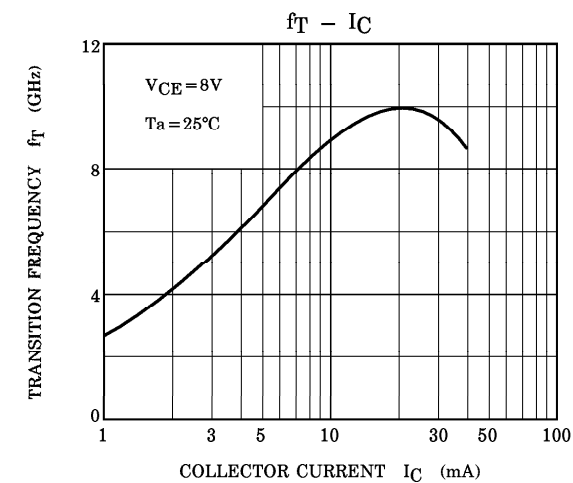
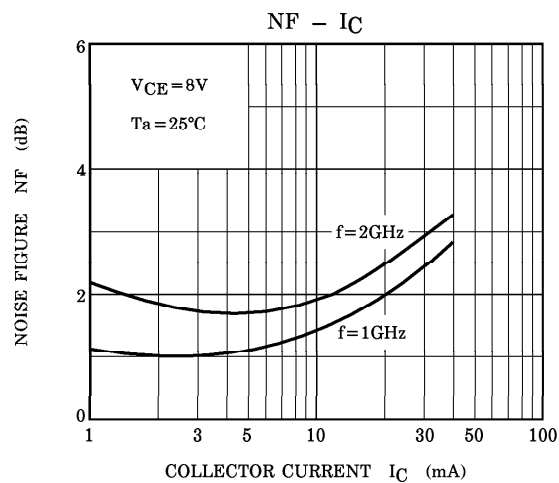
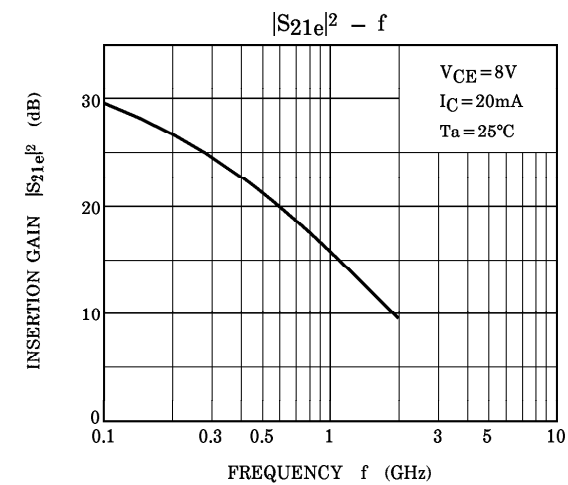
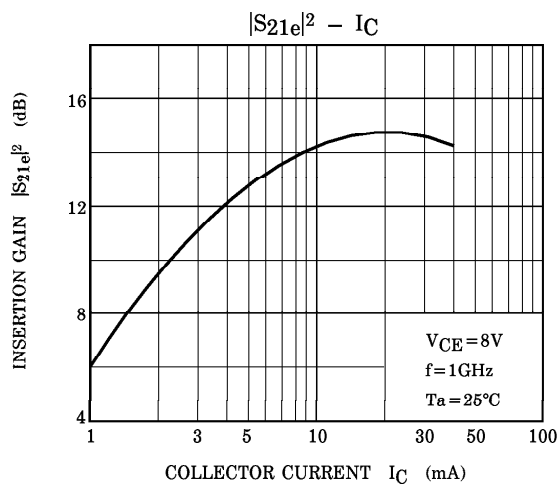
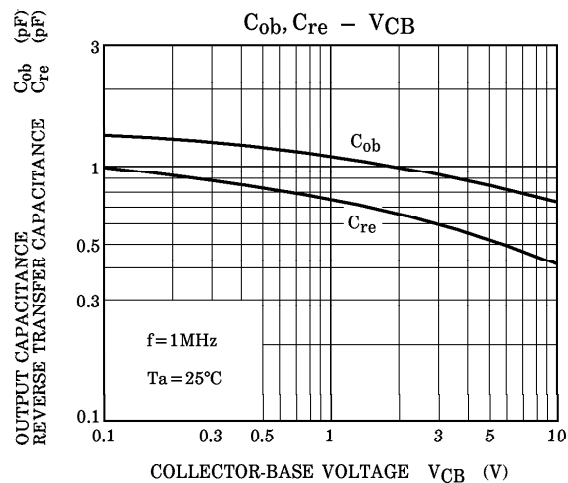
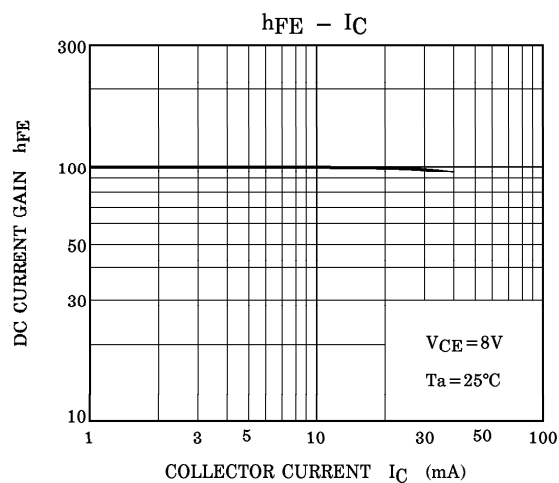
ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

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}	$V_{CE} = 8\text{V}$, $I_C = 20\text{mA}$	50	—	250	—
Output Capacitance	C_{ob}	$V_{CB} = 10\text{V}$, $I_E = 0$, $f = 1\text{MHz}$	—	0.8	—	pF
Reverse Transfer Capacitance	C_{re}	(Note)	—	0.45	0.9	pF

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

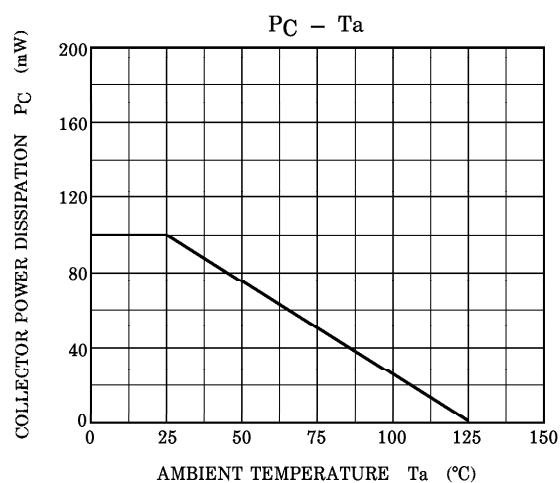
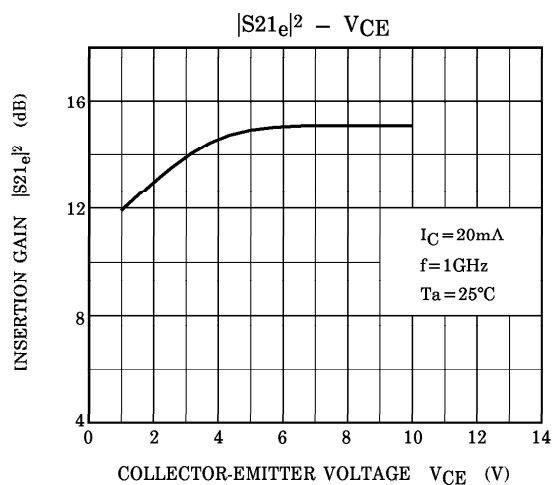
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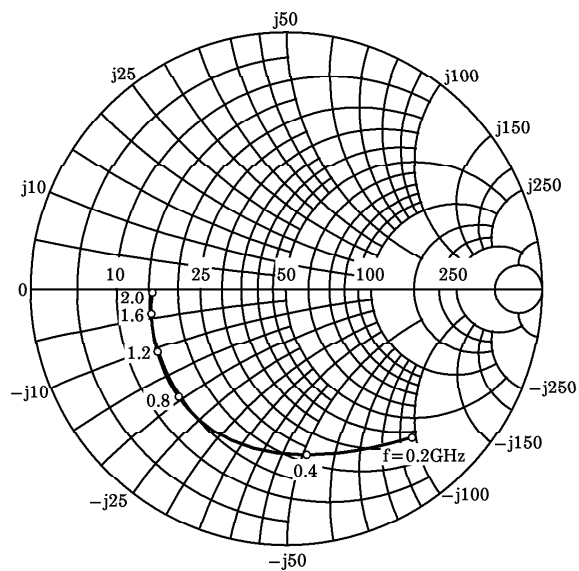
S-PARAMETER $Z_O = 50\Omega$, $T_a = 25^\circ\text{C}$
 $V_{CE} = 8\text{V}$, $I_C = 5\text{mA}$

FREQUENCY		S11		S21		S12		S22	
MHz	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG	
200	0.760	−47.2	10.933	146.8	0.043	63.8	0.859	−27.2	
400	0.651	−83.8	8.697	125.2	0.068	50.1	0.671	−42.8	
600	0.629	−112.6	6.938	111.4	0.079	43.6	0.545	−51.3	
800	0.590	−132.4	5.621	102.2	0.085	41.6	0.463	−56.5	
1000	0.579	−148.9	4.645	94.4	0.091	41.0	0.413	−60.8	
1200	0.559	−157.4	3.953	89.1	0.095	41.7	0.382	−64.5	
1400	0.547	−166.0	3.457	84.5	0.099	43.3	0.362	−68.1	
1600	0.521	−170.2	3.052	80.5	0.103	45.3	0.350	−71.8	
1800	0.512	−174.5	2.752	76.9	0.107	47.2	0.344	−75.2	
2000	0.536	−177.5	2.534	73.6	0.113	49.3	0.341	−78.7	

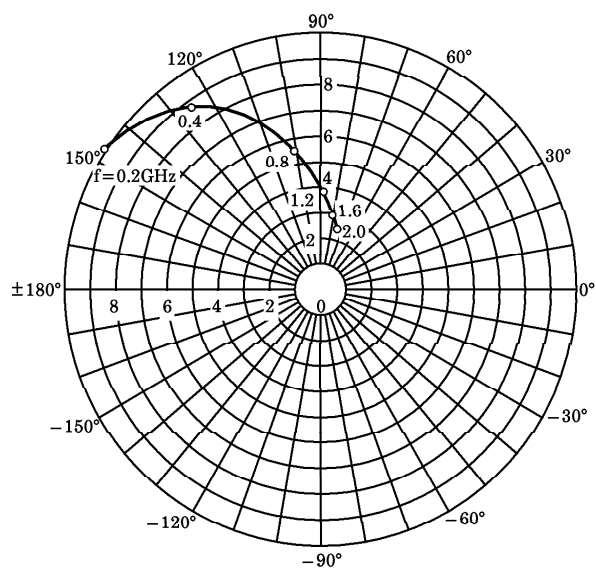
$V_{CE} = 8\text{V}$, $I_C = 20\text{mA}$

FREQUENCY		S11		S21		S12		S22	
MHz	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG	
200	0.551	−93.3	22.441	127.0	0.030	55.6	0.622	−46.5	
400	0.511	−132.8	13.552	107.5	0.040	52.6	0.393	−59.9	
600	0.517	−151.6	9.551	98.0	0.049	55.2	0.299	−65.0	
800	0.514	−163.6	7.326	92.1	0.057	58.7	0.250	−68.7	
1000	0.520	−172.3	5.966	87.3	0.067	60.8	0.225	−72.2	
1200	0.527	−178.0	4.961	84.0	0.077	62.7	0.211	−75.6	
1400	0.526	−176.6	4.322	80.6	0.086	64.1	0.206	−80.0	
1600	0.528	−172.9	3.820	77.5	0.096	65.4	0.203	−84.1	
1800	0.534	−169.3	3.428	74.3	0.105	66.3	0.203	−87.4	
2000	0.529	−166.7	3.132	71.6	0.115	67.0	0.209	−91.1	

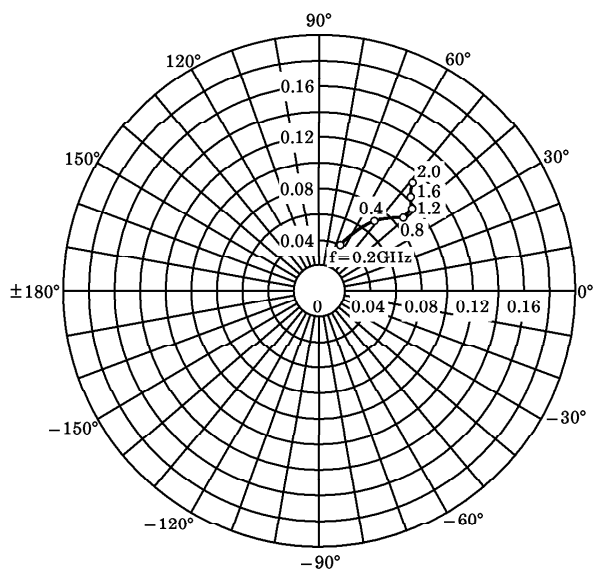
S_{11e}
 $V_{CE}=8V$
 $I_C=5mA$
 $T_a=25^\circ C$
 (UNIT : Ω)



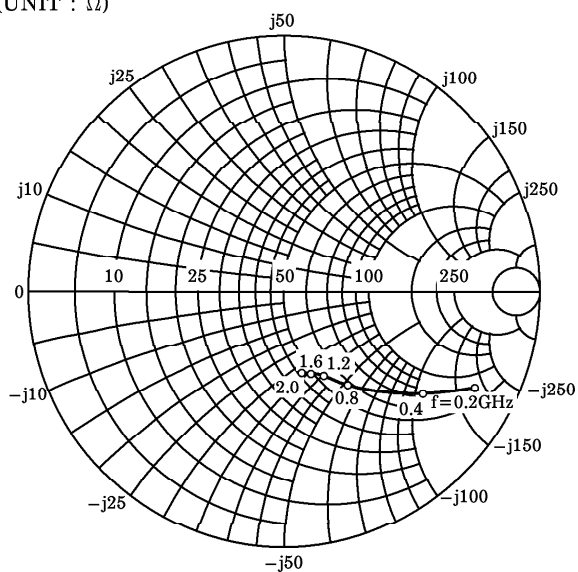
S_{21e}
 $V_{CE}=8V$
 $I_C=5mA$
 $T_a=25^\circ C$



S_{12e}
 $V_{CE}=8V$
 $I_C=5mA$
 $T_a=25^\circ C$



S_{22e}
 $V_{CE}=8V$
 $I_C=5mA$
 $T_a=25^\circ C$
 (UNIT : Ω)



S_{11e}
 $V_{CE}=8V$
 $I_C=20mA$
 $T_a=25^\circ C$
 (UNIT : Ω)

