

TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL PLANAR TYPE

2SC4843

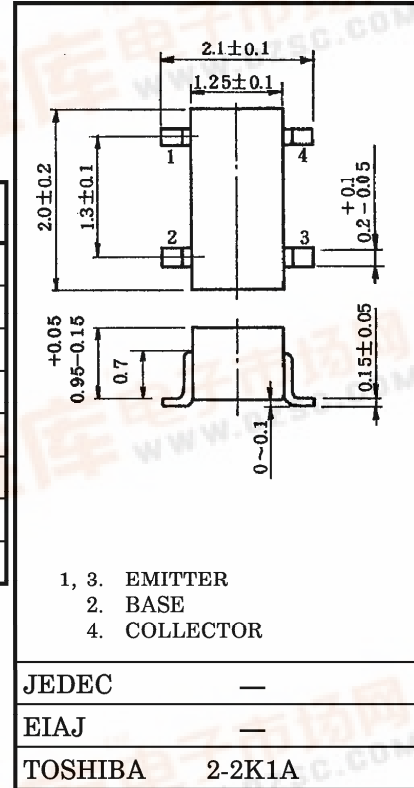
VHF~UHF BAND LOW NOISE AMPLIFIER APPLICATIONS.

Unit in mm

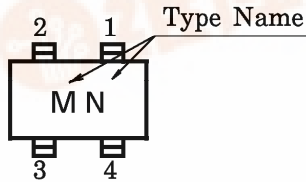
- Low Noise Figure, High Gain.
- $NF=1.1dB, |S_{21e}|^2=15.5dB (f=1GHz)$

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	V _{CB0}	20	V
Collector-Emitter Voltage	V _{CEO}	10	V
Emitter-Base Voltage	V _{EB0}	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	°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} = 8V, I _C = 20mA	7	10	—	GHz
Insertion Gain	S _{21e} ² (1)	V _{CE} = 8V, I _C = 20mA, f = 1GHz	12	15.5	—	dB
	S _{21e} ² (2)	V _{CE} = 8V, I _C = 20mA, f = 2GHz	—	9	—	
Noise Figure	NF (1)	V _{CE} = 8V, I _C = 5mA, f = 1GHz	—	1.1	2.5	dB
	NF (2)	V _{CE} = 8V, I _C = 5mA, f = 2GHz	—	1.7	—	

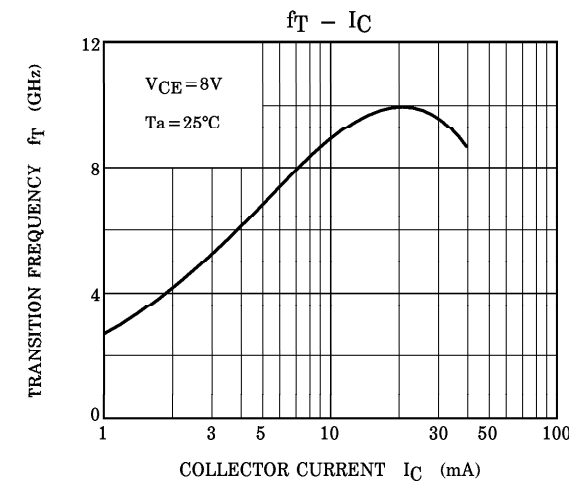
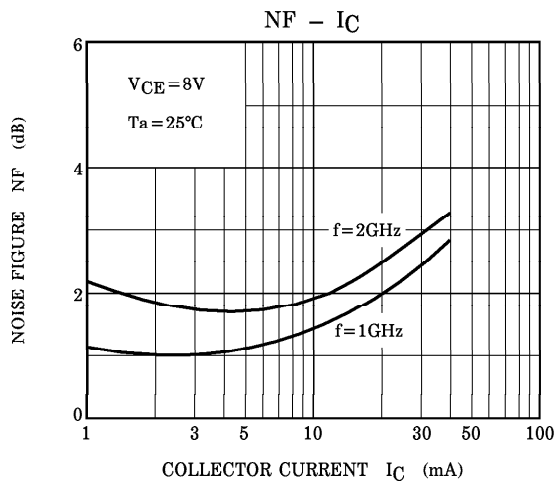
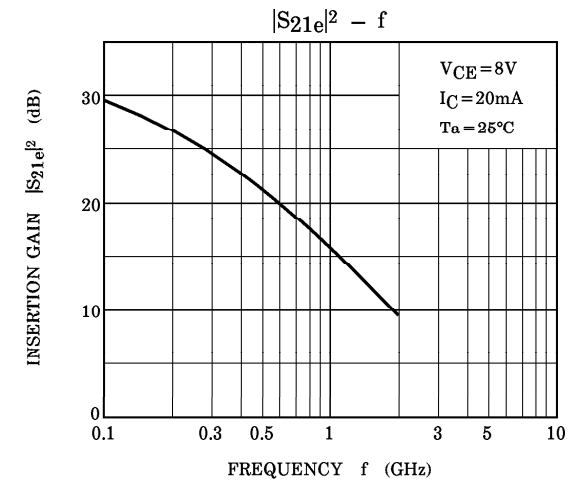
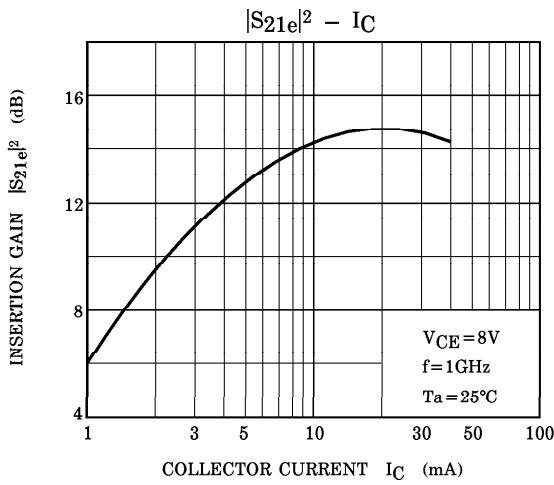
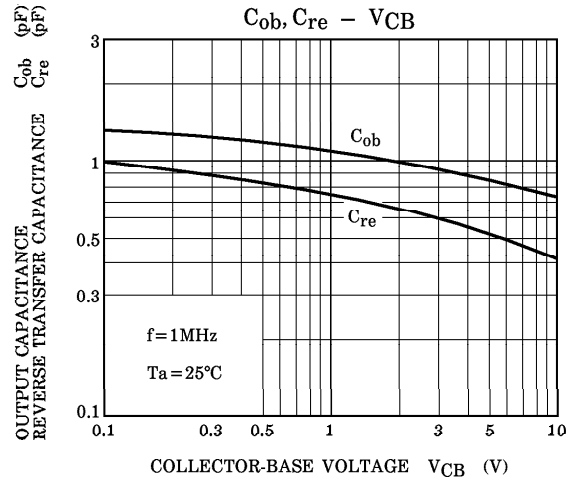
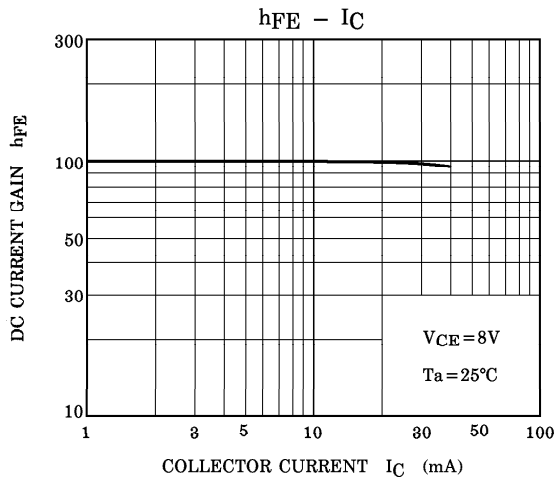
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

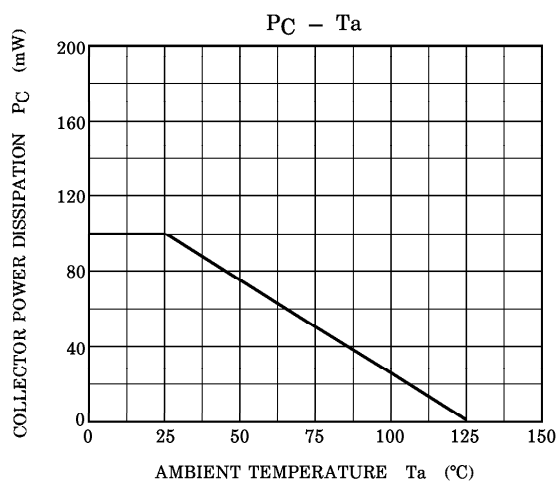
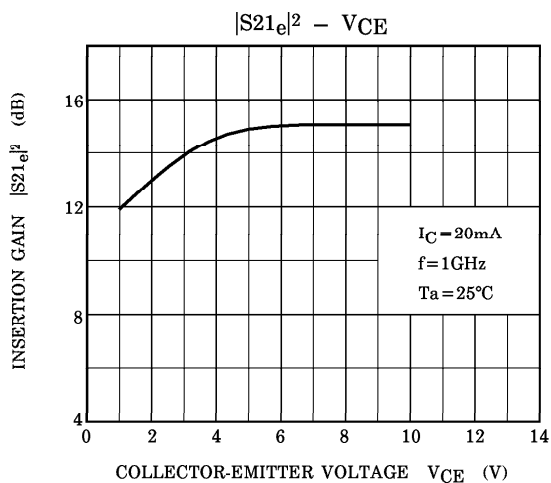
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	I _{CB0}	V _{CB} = 10V, I _E = 0	—	—	1	μA
Emitter Cut-off Current	I _{EB0}	V _{EB} = 1V, I _C = 0	—	—	1	μA
DC Current Gain	h _{FE}	V _{CE} = 8V, I _C = 20mA	50	—	250	—
Output Capacitance	C _{ob}	V _{CB} = 10V, I _E = 0, f = 1MHz (Note)	—	0.8	—	pF
Reverse Transfer Capacitance	C _{re}		—	0.45	0.9	pF

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

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TOSHIBA is continually working to improve the quality and the reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to observe standards of safety, and to avoid situations in which a malfunction or failure of a TOSHIBA product could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent products specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbook.





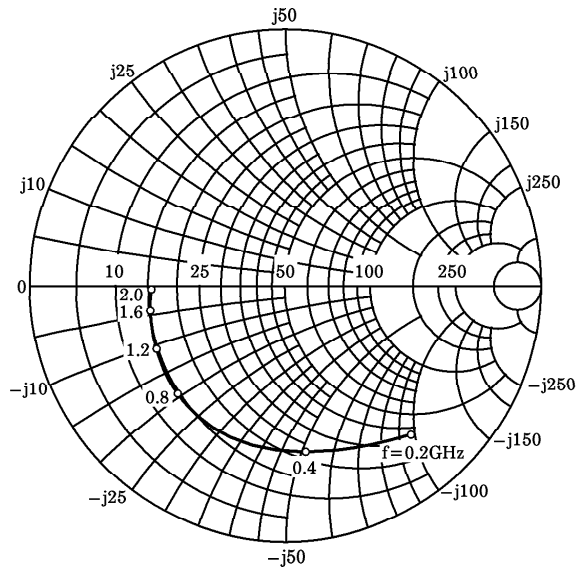
S-PARAMETER $Z_O = 50\Omega$, $T_a = 25^\circ\text{C}$
 $V_{CE} = 8\text{V}$, $I_C = 5\text{mA}$

FREQUENCY MHz	S11		S21		S12		S22	
	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

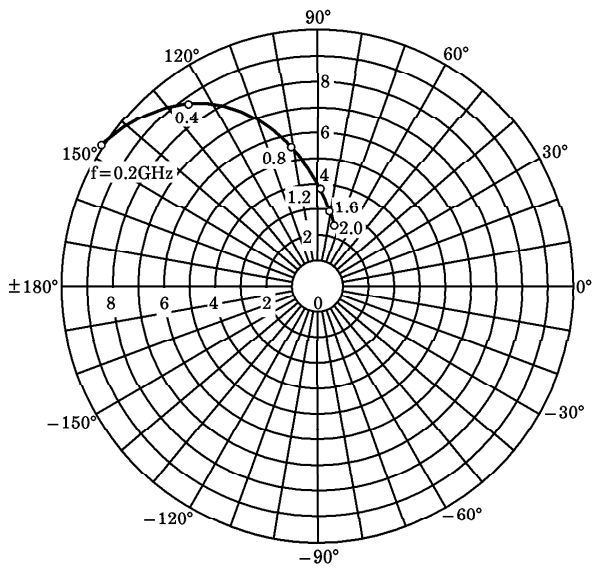
$V_{CE} = 8\text{V}$, $I_C = 20\text{mA}$

FREQUENCY MHz	S11		S21		S12		S22	
	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

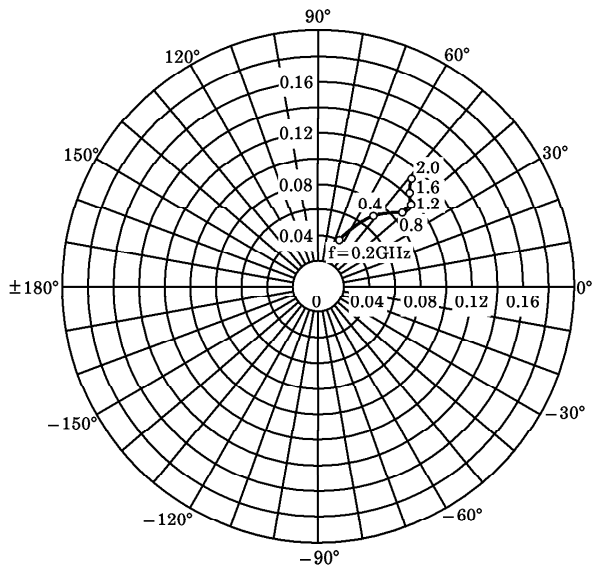
S_{11e}
 $V_{CE} = 8V$
 $I_C = 5mA$
 $T_a = 25^\circ C$
 (UNIT : Ω)



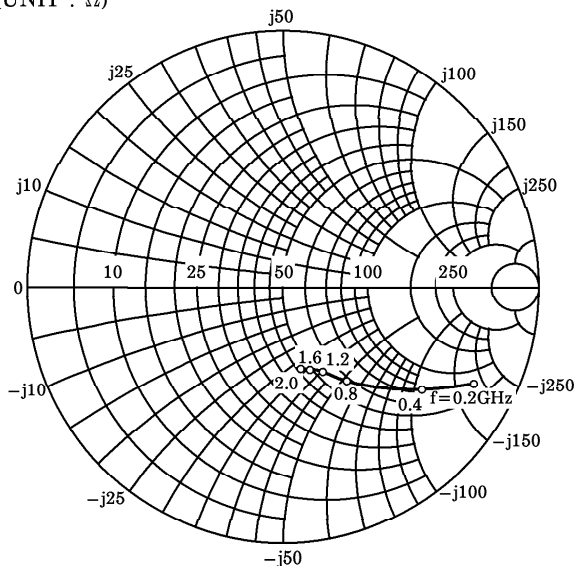
S_{21e}
 $V_{CE} = 8V$
 $I_C = 5mA$
 $T_a = 25^\circ C$



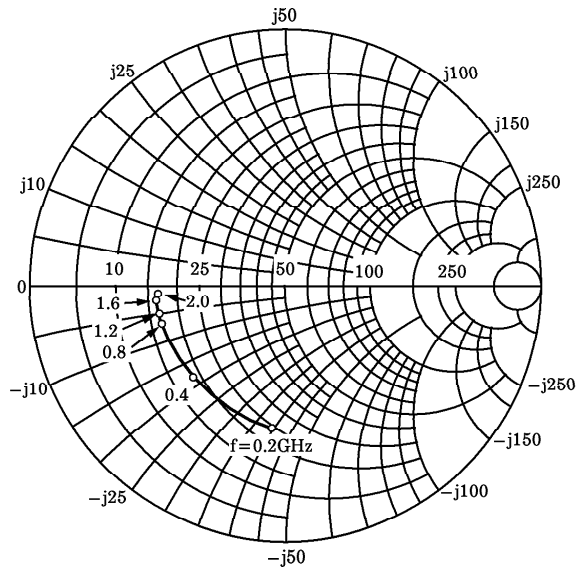
S_{12e}
 $V_{CE} = 8V$
 $I_C = 5mA$
 $T_a = 25^\circ C$



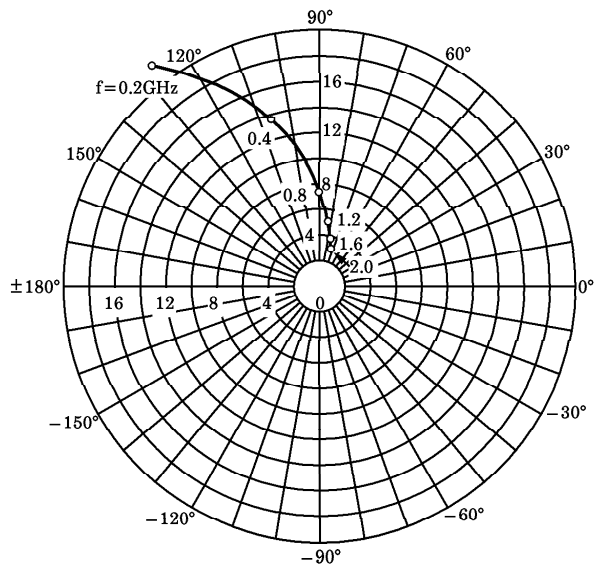
S_{22e}
 $V_{CE} = 8V$
 $I_C = 5mA$
 $T_a = 25^\circ C$
 (UNIT : Ω)



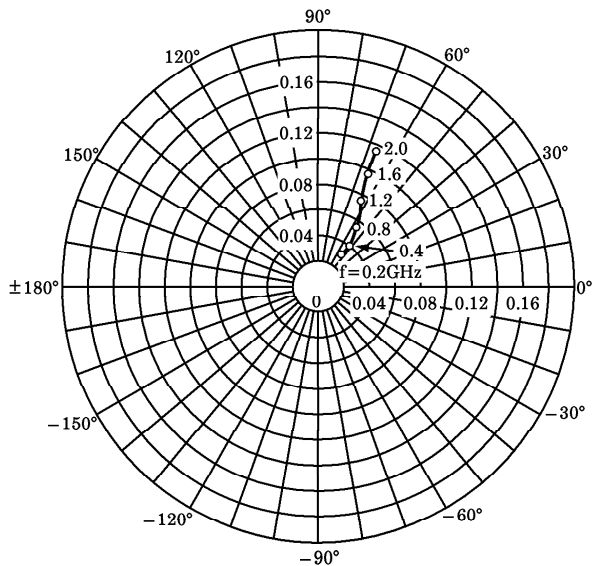
S_{11e}
 $V_{CE} = 8V$
 $I_C = 20mA$
 $T_a = 25^\circ C$
 (UNIT : Ω)



S_{21e}
 $V_{CE} = 8V$
 $I_C = 20mA$
 $T_a = 25^\circ C$



S_{12e}
 $V_{CE} = 8V$
 $I_C = 20mA$
 $T_a = 25^\circ C$



S_{22e}
 $V_{CE} = 8V$
 $I_C = 20mA$
 $T_a = 25^\circ C$
 (UNIT : Ω)

