

TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL PLANAR TYPE

2SC4394

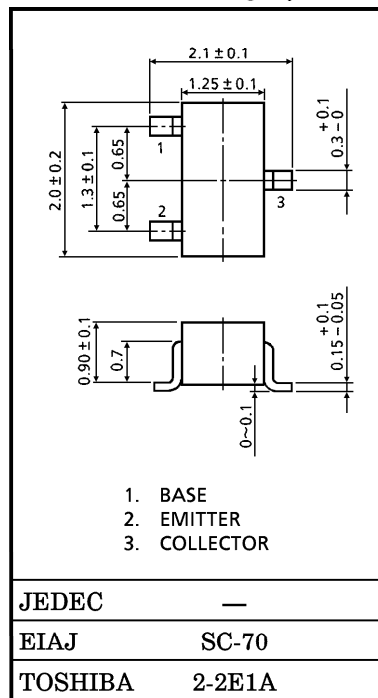
VHF~UHF BAND LOW NOISE AMPLIFIER APPLICATIONS

Unit in mm

- Low Noise Figure, High Gain.
- $NF = 1.1\text{dB}$, $|S_{21e}|^2 = 11\text{dB}$ ($f = 1\text{GHz}$)

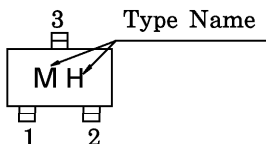
MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	V_{CBO}	20	V
Collector-Emitter Voltage	V_{CEO}	12	V
Emitter-Base Voltage	V_{EBO}	3	V
Collector Current	I_C	80	mA
Base Current	I_B	40	mA
Collector Power Dissipation	P_C	100	mW
Junction Temperature	T_j	125	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55~125	$^\circ\text{C}$



Weight : 0.006g

Marking



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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Transition Frequency	f_T	$V_{CE} = 10\text{V}$, $I_C = 20\text{mA}$	5	7	—	GHz
Insertion Gain	$ S_{21e} ^2$ (1)	$V_{CE} = 10\text{V}$, $I_C = 20\text{mA}$, $f = 500\text{MHz}$	—	16.5	—	dB
	$ S_{21e} ^2$ (2)	$V_{CE} = 10\text{V}$, $I_C = 20\text{mA}$, $f = 1\text{GHz}$	7.5	11	—	
Noise Figure	NF (1)	$V_{CE} = 10\text{V}$, $I_C = 5\text{mA}$, $f = 500\text{MHz}$	—	1	—	dB
	NF (2)	$V_{CE} = 10\text{V}$, $I_C = 5\text{mA}$, $f = 1\text{GHz}$	—	1.1	2	

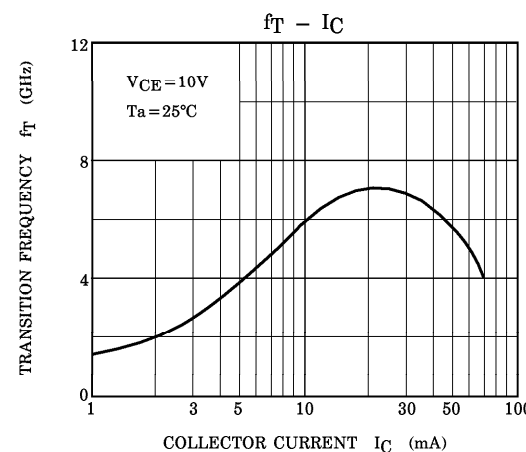
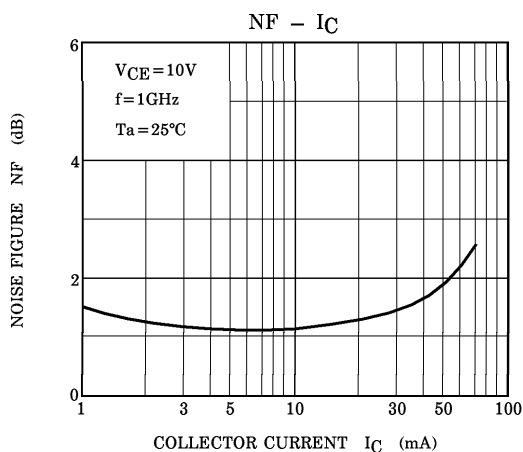
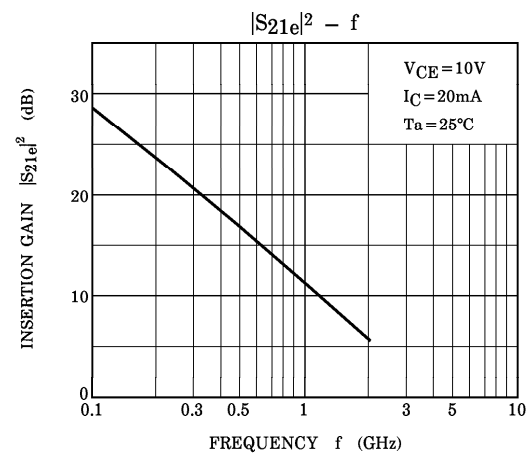
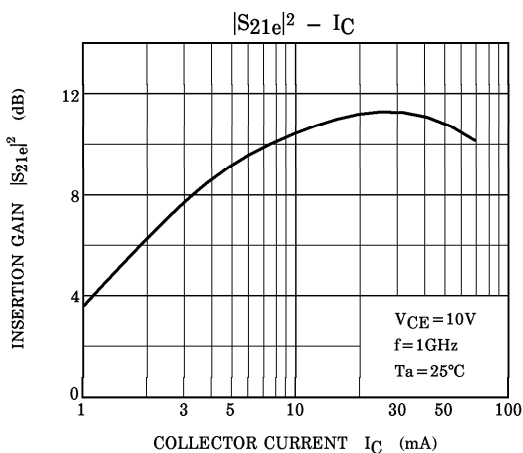
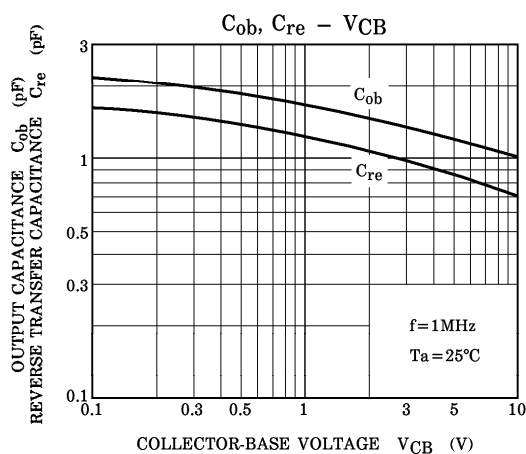
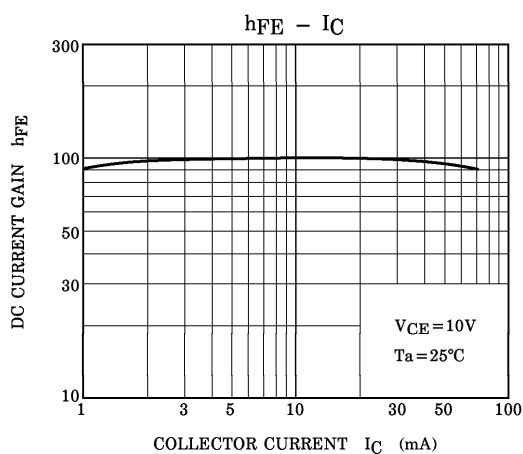
ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

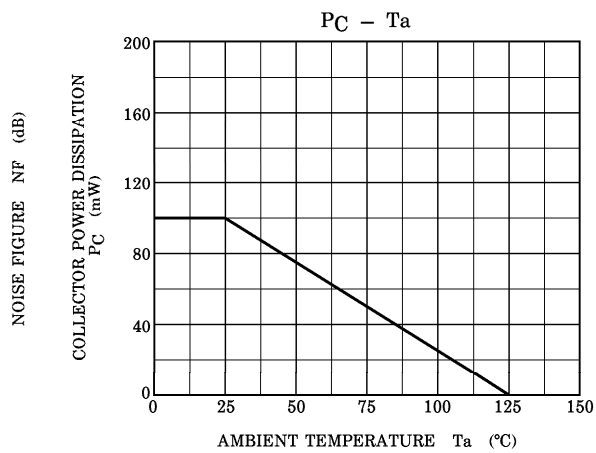
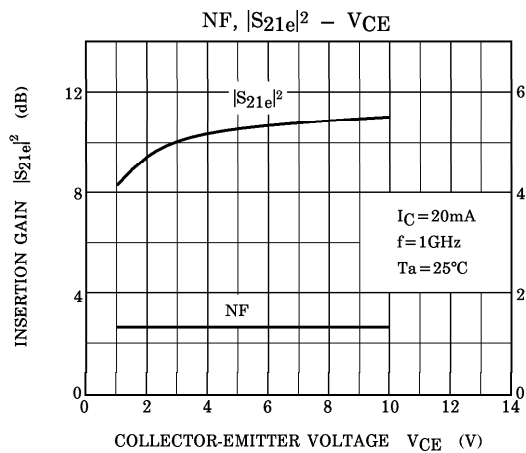
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	I_{CBO}	$V_{CB} = 10\text{V}$, $I_E = 0$	—	—	1	μA
Emitter Cut-off Current	I_{EBO}	$V_{EB} = 1\text{V}$, $I_C = 0$	—	—	1	μA
DC Current Gain	h_{FE}	$V_{CE} = 10\text{V}$, $I_C = 20\text{mA}$	30	—	250	—
Output Capacitance	C_{ob}	$V_{CB} = 10\text{V}$, $I_E = 0$, $f = 1\text{MHz}$ (Note)	—	1.0	—	pF
Reverse Transfer Capacitance	C_{re}		—	0.7	1.15	pF

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

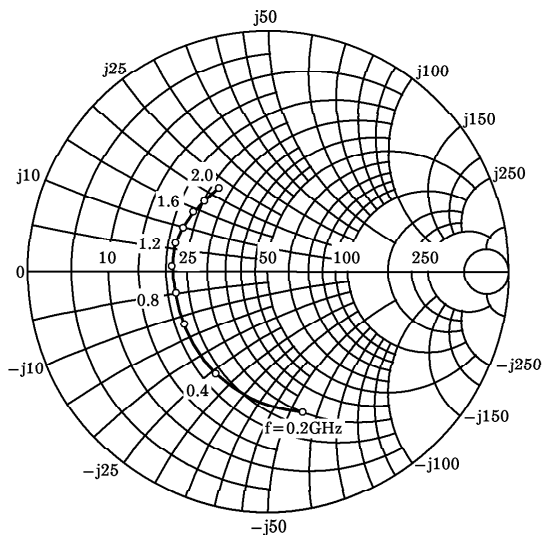
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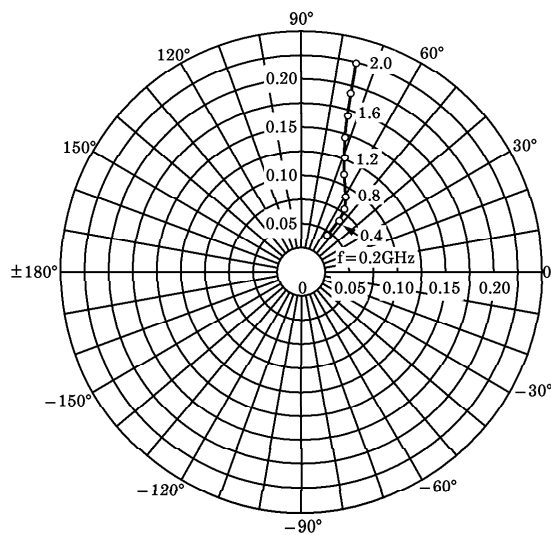




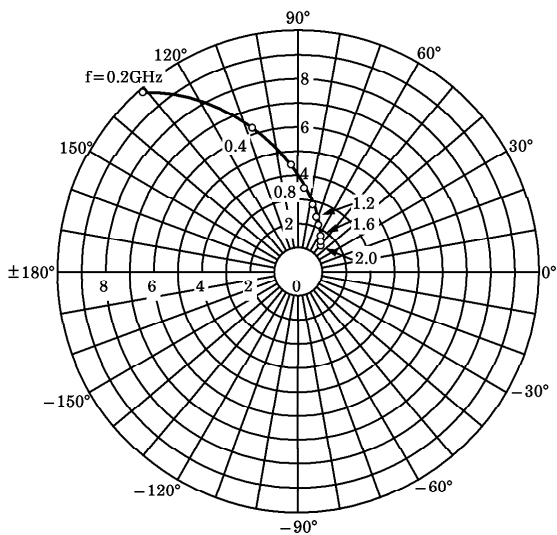
S_{11e}
 V_{CE} = 10V
 I_C = 5mA
 T_a = 25°C
 (UNIT : Ω)



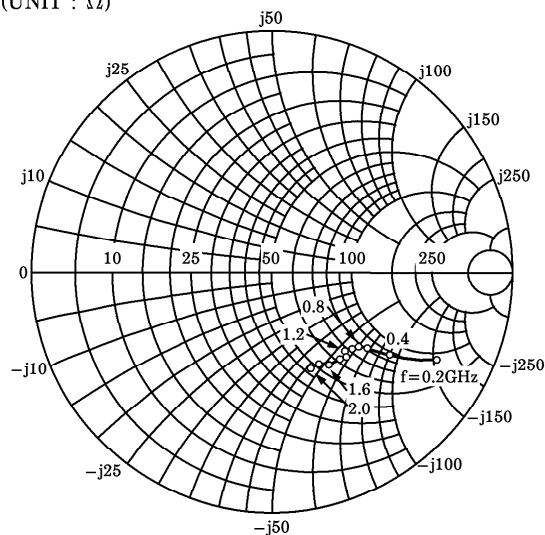
S_{12e}
 V_{CE} = 10V
 I_C = 5mA
 T_a = 25°C



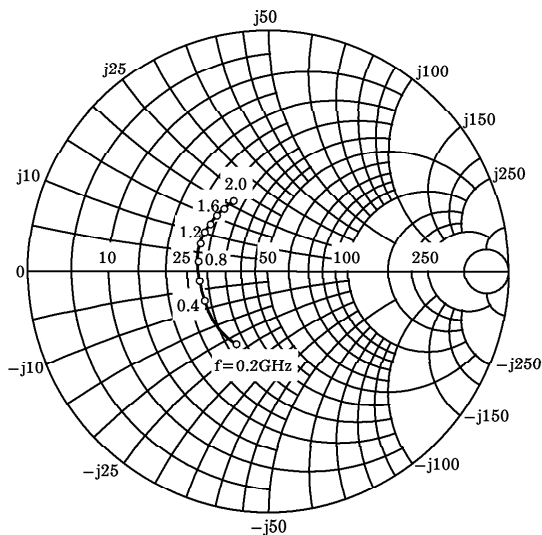
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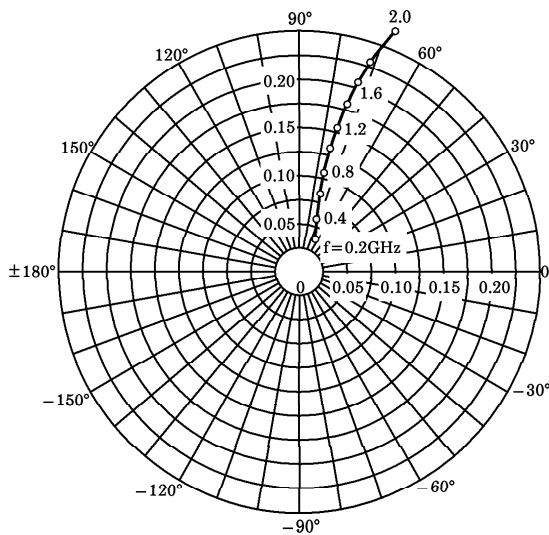
S_{22e}
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 I_C = 5mA
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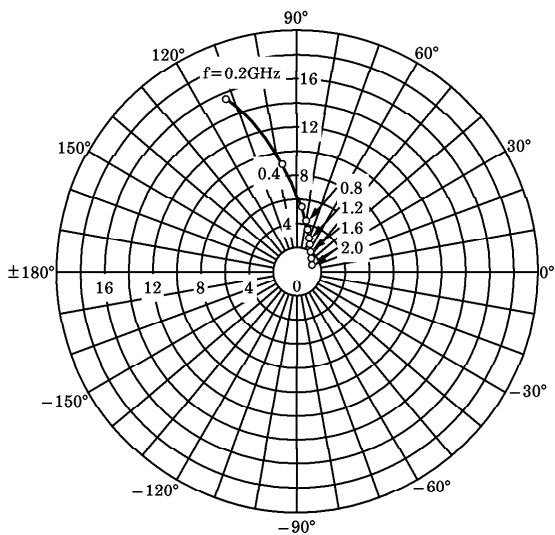
S_{11e}
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S_{12e}
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S_{21e}
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 I_C = 20mA
 T_a = 25°C



S_{22e}
 V_{CE} = 10V
 I_C = 20mA
 T_a = 25°C
 (UNIT : Ω)

