

TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL PLANAR TYPE

# 2SC3605

VHF~UHF BAND LOW NOISE AMPLIFIER APPLICATIONS

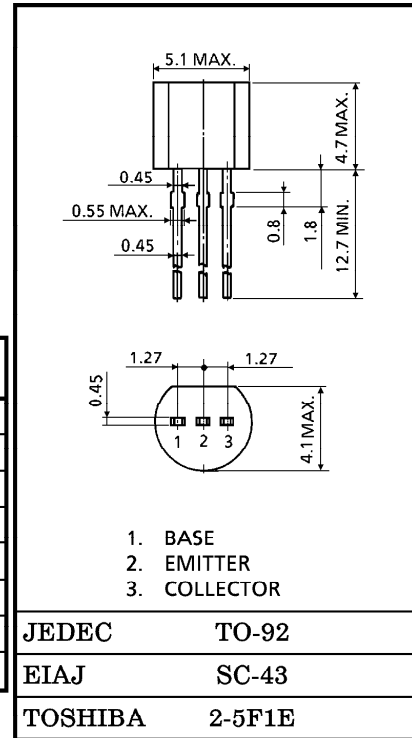
Unit in mm

**FEATURES :**

- Low Noise Figure, High Gain
- $NF = 1.1dB, |S_{21e}|^2 = 10dB (f = 1GHz)$

**MAXIMUM RATINGS (Ta = 25°C)**

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	V <sub>CBO</sub>	20	V
Collector-Emitter Voltage	V <sub>CEO</sub>	12	V
Emitter-Base Voltage	V <sub>EBO</sub>	3	V
Collector Current	I <sub>C</sub>	80	mA
Base Current	I <sub>B</sub>	40	mA
Collector Power Dissipation	P <sub>C</sub>	600	mW
Junction Temperature	T <sub>j</sub>	150	°C
Storage Temperature Range	T <sub>stg</sub>	-55~150	°C



Weight : 0.21g

**ELECTRICAL CHARACTERISTICS (Ta = 25°C)**

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Transition Frequency	f <sub>T</sub>	V <sub>CE</sub> = 10V, I <sub>C</sub> = 20mA	5	6.5	—	GHz
Insertion Gain	S <sub>21e</sub>   <sup>2</sup> (1)	V <sub>CE</sub> = 10V, I <sub>C</sub> = 20mA, f = 500MHz	—	16	—	dB
	S <sub>21e</sub>   <sup>2</sup> (2)	V <sub>CE</sub> = 10V, I <sub>C</sub> = 20mA, f = 1GHz	7.5	10	—	
Noise Figure	NF (1)	V <sub>CE</sub> = 10V, I <sub>C</sub> = 5mA, f = 1GHz	—	1.1	—	dB
	NF (2)	V <sub>CE</sub> = 10V, I <sub>C</sub> = 40mA, f = 1GHz	—	1.8	3	

**ELECTRICAL CHARACTERISTICS (Ta = 25°C)**

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	I <sub>CBO</sub>	V <sub>CE</sub> = 10V, I <sub>E</sub> = 0	—	—	1	μA
Emitter Cut-off Current	I <sub>EBO</sub>	V <sub>EB</sub> = 1V, I <sub>E</sub> = 0	—	—	1	μA
DC Current Gain	h <sub>FE</sub>	V <sub>CE</sub> = 10V, I <sub>C</sub> = 20mA	30	—	250	—
Output Capacitance	C <sub>ob</sub>	V <sub>CB</sub> = 10V, I <sub>E</sub> = 0, f = 1MHz	—	1.2	—	pF
Reverse Transfer Capacitance	C <sub>re</sub>	(Note)	—	0.75	1.2	pF

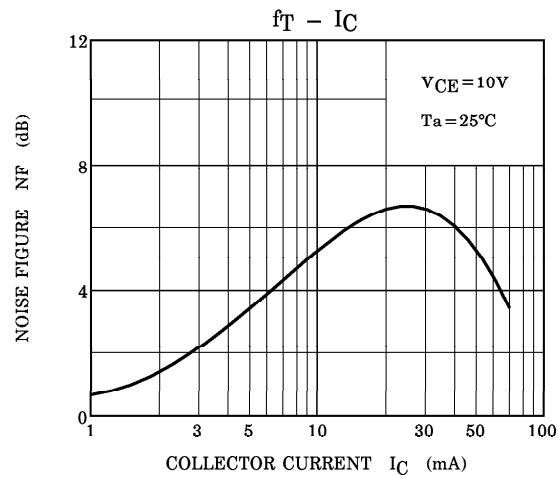
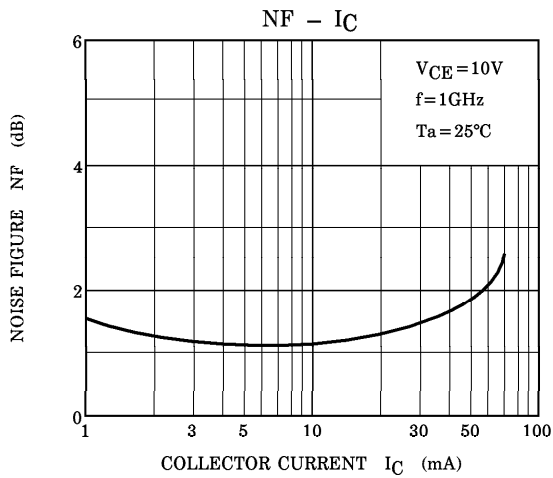
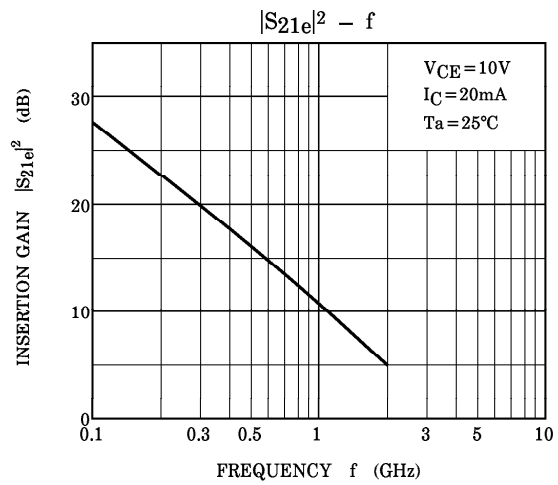
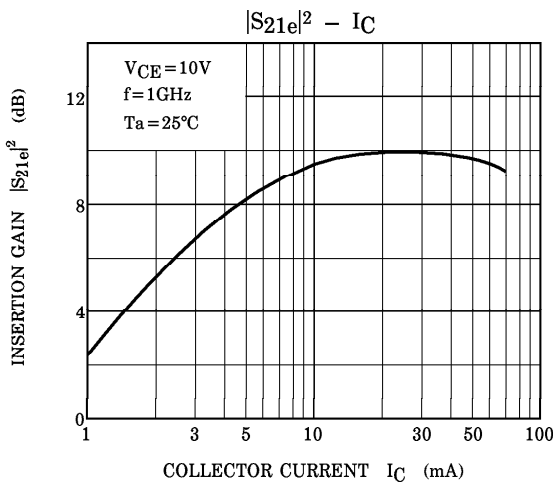
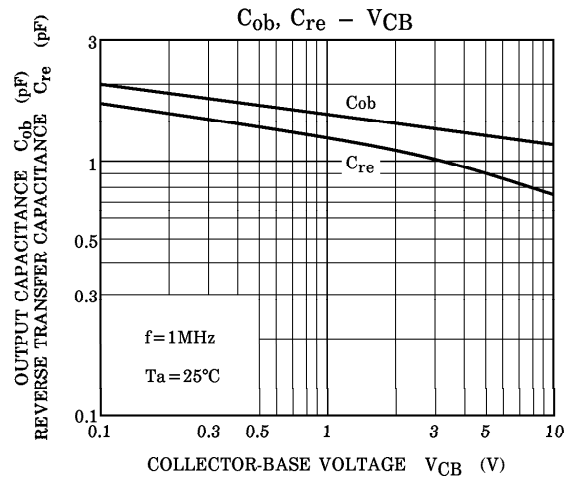
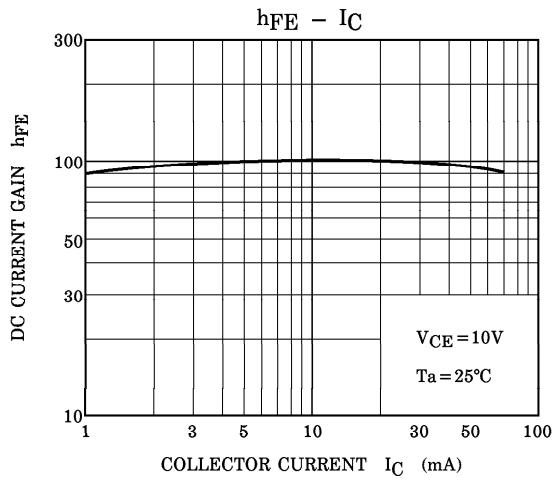
(Note) C<sub>re</sub> is measured by 3-terminal method with Capacitance Bridge.

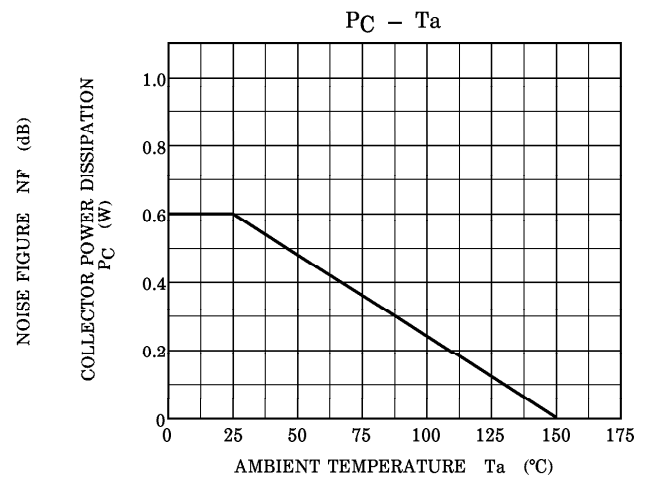
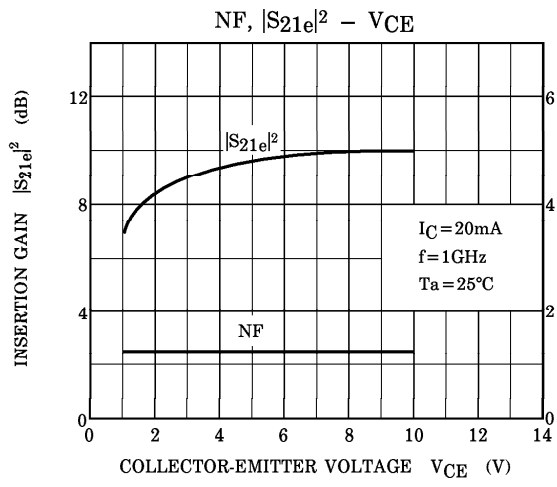
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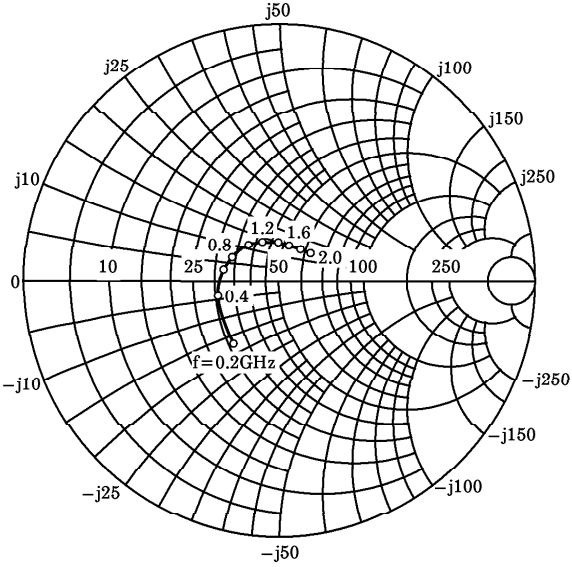
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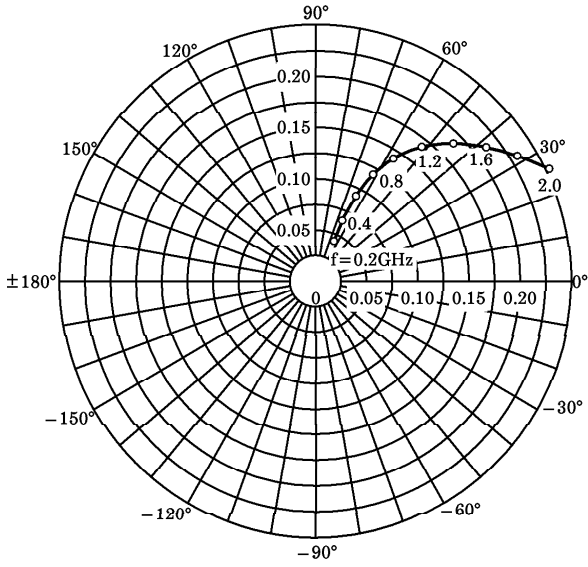




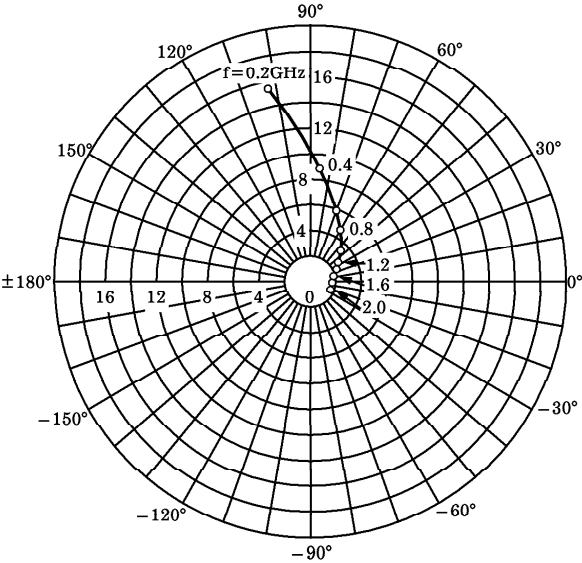
S<sub>11e</sub>  
V<sub>CE</sub> = 10V  
I<sub>C</sub> = 20mA  
T<sub>a</sub> = 25°C  
(UNIT : Ω)



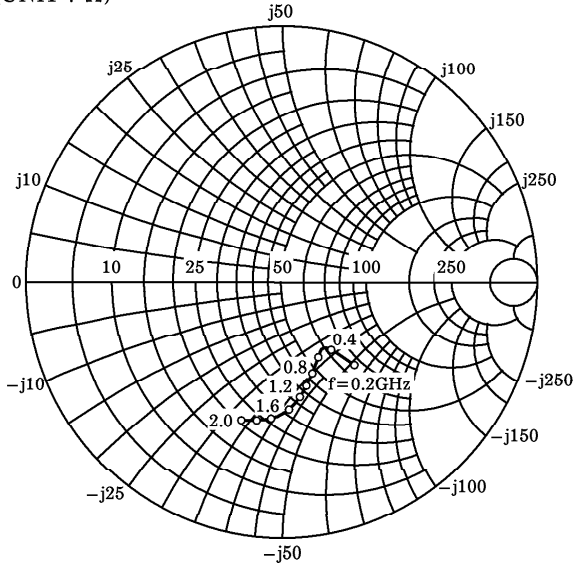
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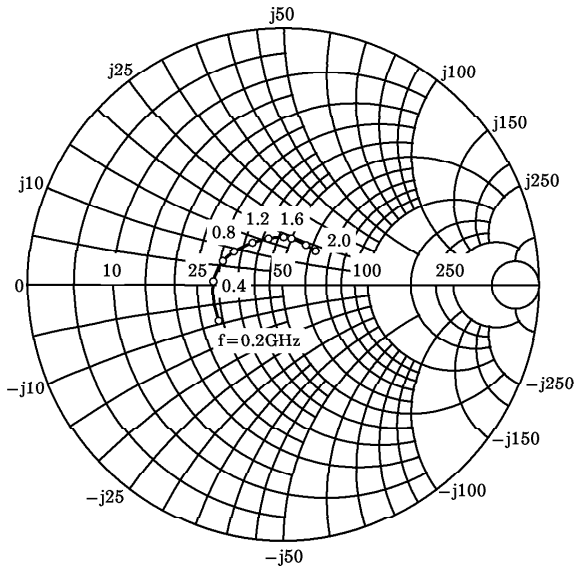
S<sub>21e</sub>  
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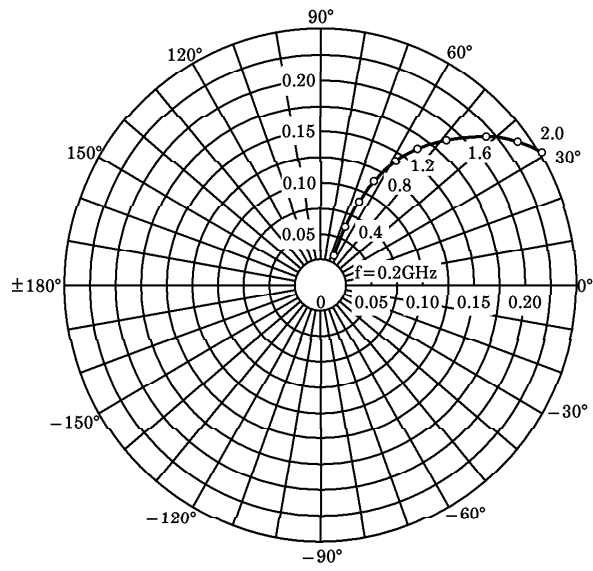
S<sub>22e</sub>  
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(UNIT : Ω)



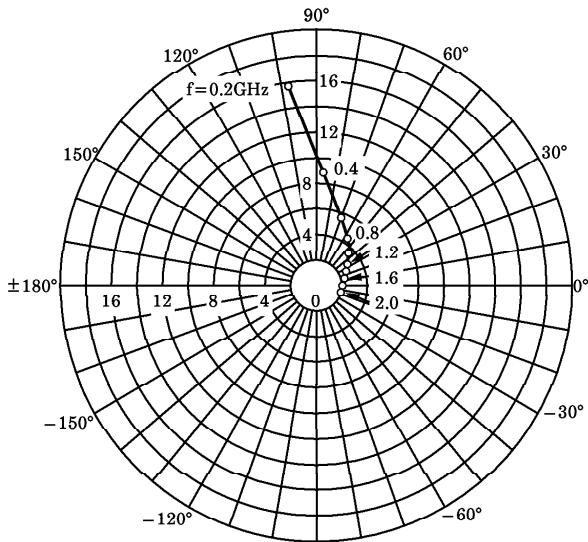
**S<sub>11e</sub>**  
 V<sub>CE</sub> = 10V  
 I<sub>C</sub> = 40mA  
 T<sub>a</sub> = 25°C  
 (UNIT : Ω)



**S<sub>12e</sub>**  
 V<sub>CE</sub> = 10V  
 I<sub>C</sub> = 40mA  
 T<sub>a</sub> = 25°C



**S<sub>21e</sub>**  
 V<sub>CE</sub> = 10V  
 I<sub>C</sub> = 40mA  
 T<sub>a</sub> = 25°C



**S<sub>22e</sub>**  
 V<sub>CE</sub> = 10V  
 I<sub>C</sub> = 40mA  
 T<sub>a</sub> = 25°C  
 (UNIT : Ω)

