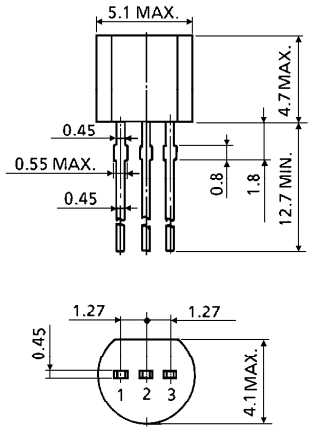
TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL PLANAR TYPE

2SC3605

VHF~UHF BAND LOW NOISE AMPLIFIER APPLICATIONS

Unit in mm



1. BASE
2. EMITTER
3. COLLECTOR

JEDEC	TO-92
EIAJ	SC-43
TOSHIBA	2-5F1E

Weight : 0.21g

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_{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	600	mW
Junction Temperature	T_j	150	°C
Storage Temperature Range	T_{stg}	−55~150	°C

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Transition Frequency	f_T	V_{CE} = 10V, I_C = 20mA	5	6.5	—	GHz
Insertion Gain	$\|S_{21e}\|^2$ (1)	V_{CE} = 10V, I_C = 20mA, f = 500MHz	—	16	—	dB
	$\|S_{21e}\|^2$ (2)	V_{CE} = 10V, I_C = 20mA, f = 1GHz	7.5	10	—	
Noise Figure	NF (1)	V_{CE} = 10V, I_C = 5mA, f = 1GHz	—	1.1	—	dB
	NF (2)	V_{CE} = 10V, I_C = 40mA, f = 1GHz	—	1.8	3	

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	I_{CBO}	V_{CE} = 10V, I_E = 0	—	—	1	μA
Emitter Cut-off Current	I_{EBO}	V_{EB} = 1V, I_E = 0	—	—	1	μA
DC Current Gain	h_{FE}	V_{CE} = 10V, I_C = 20mA	30	—	250	—
Output Capacitance	C_{ob}	V_{CB} = 10V, I_E = 0, f = 1MHz	—	1.2	—	pF
Reverse Transfer Capacitance	C_{re}	(Note)	—	0.75	1.2	pF

(Note) C_{re} is measured by 3-terminal method with Capacitance Bridge.

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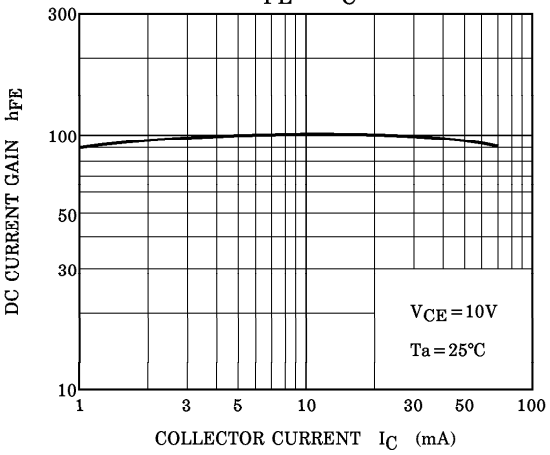
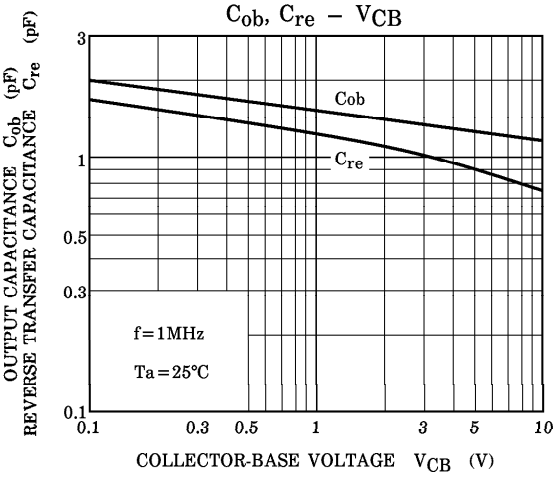
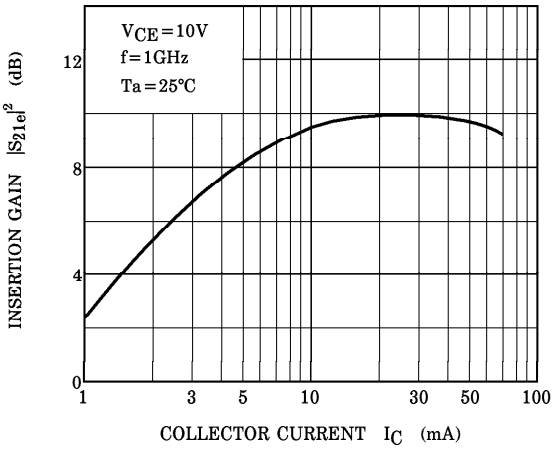
h_{FE} – I_C



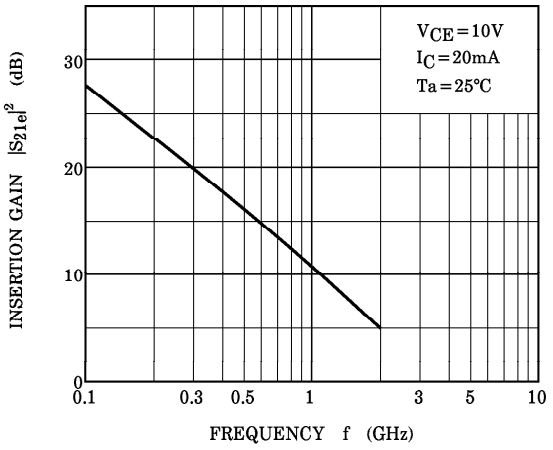
C_{ob}, C_{re} – V_{CB}



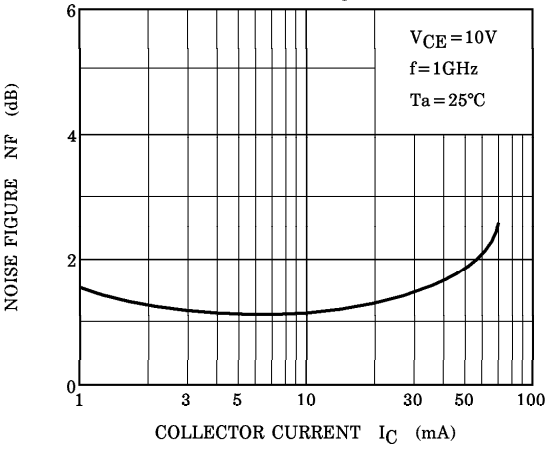
$|S_{21e}|^2$ – I_C



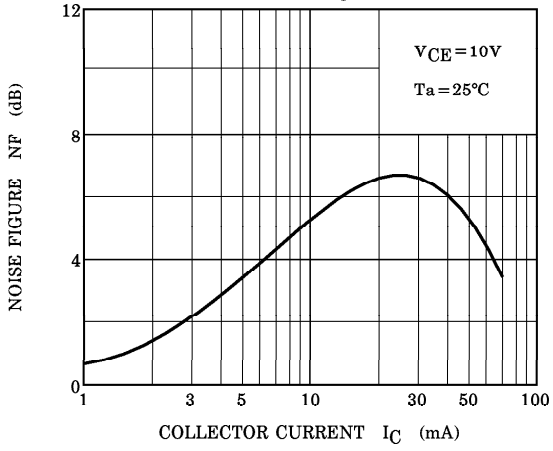
$|S_{21e}|^2$ – f

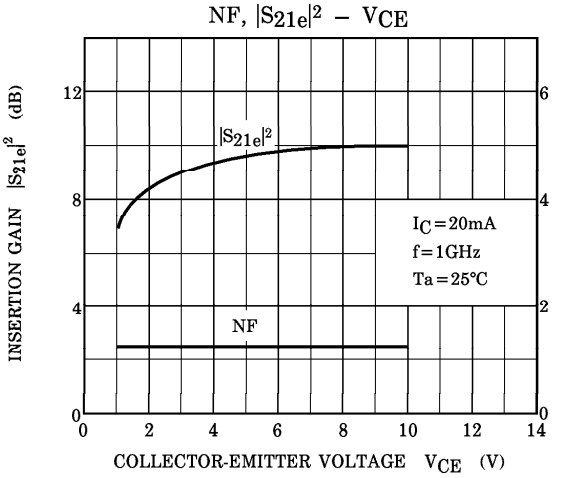


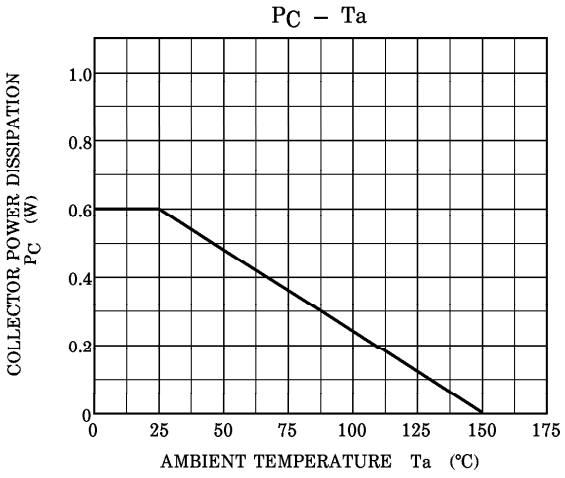
NF – I_C



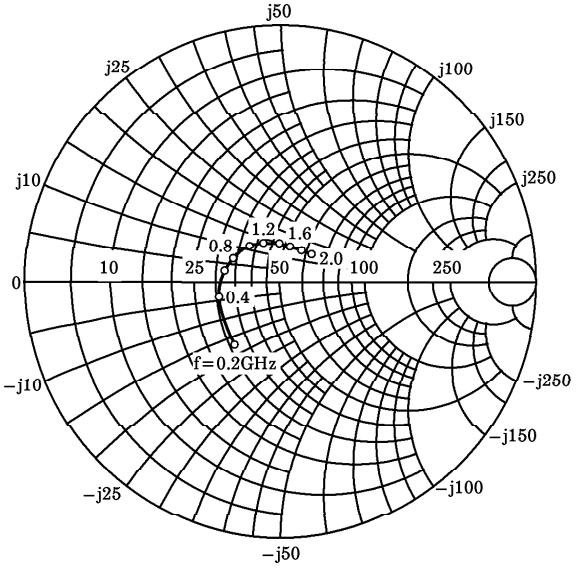
f_T – I_C



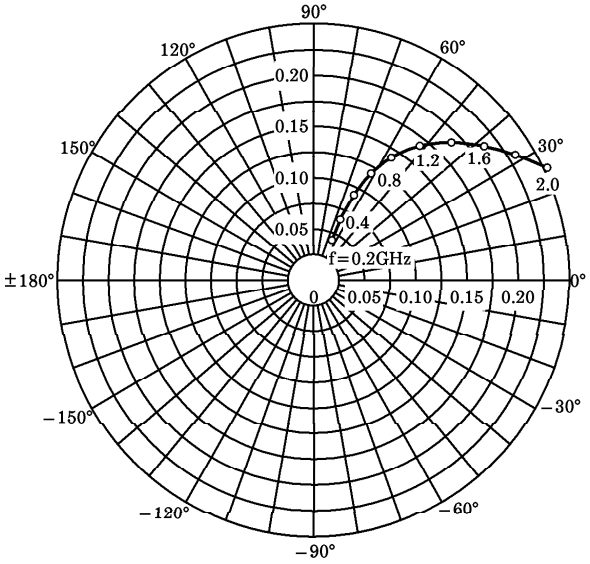

NF, |S21e|2 – VCE
INSERTION GAIN |S21e|2 (dB)
NOISE FIGURE NF (dB)
|S21e|2
NF
IC=20mA
f=1GHz
Ta=25°C
12
8
4
0
6
4
2
0
0
2
4
6
8
10
12
14
COLLECTOR-EMITTER VOLTAGE VCE (V)


PC – Ta
COLLECTOR POWER DISSIPATION PC (W)
1.0
0.8
0.6
0.4
0.2
0
0
25
50
75
100
125
150
175
AMBIENT TEMPERATURE Ta (°C)

S_{11e}
V_{CE} = 10V
I_C = 20mA
Ta = 25°C
(UNIT : Ω)



S_{12e}
V_{CE} = 10V
I_C = 20mA
Ta = 25°C



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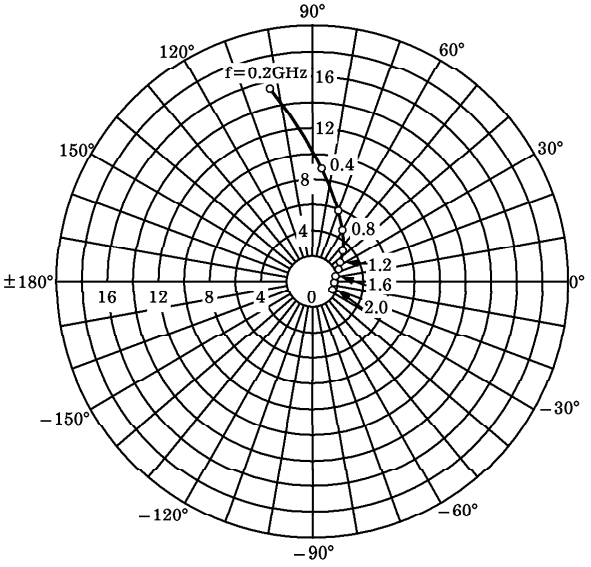

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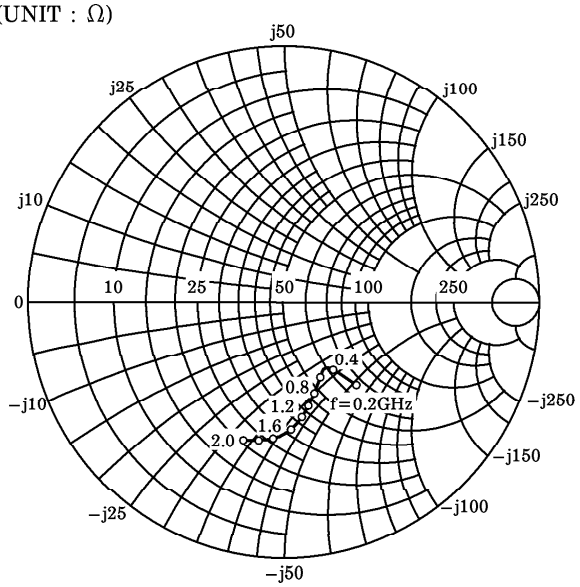

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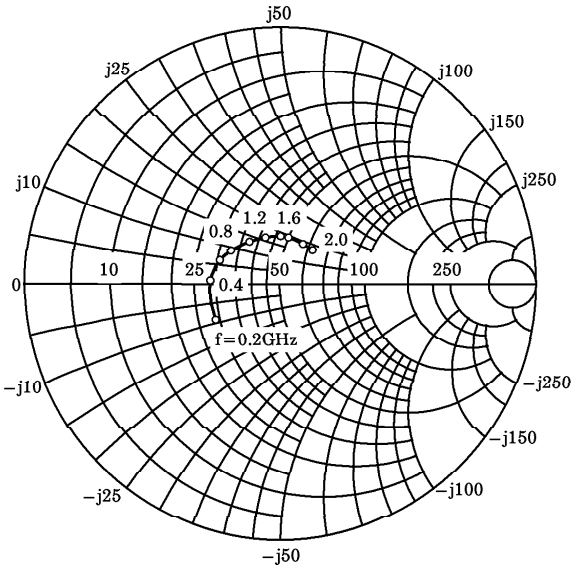

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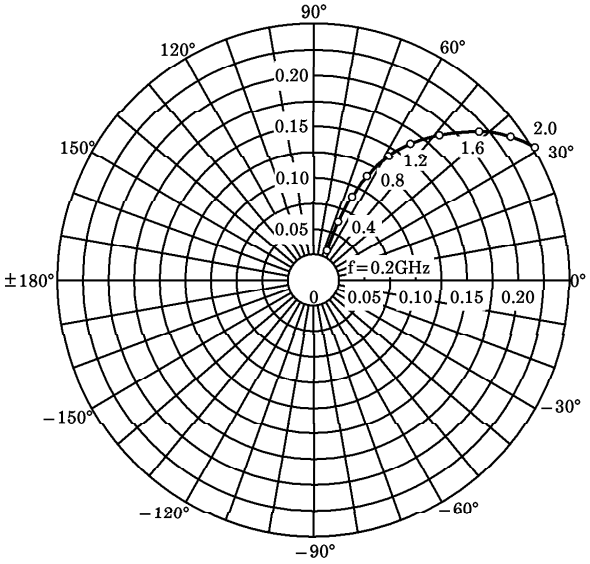

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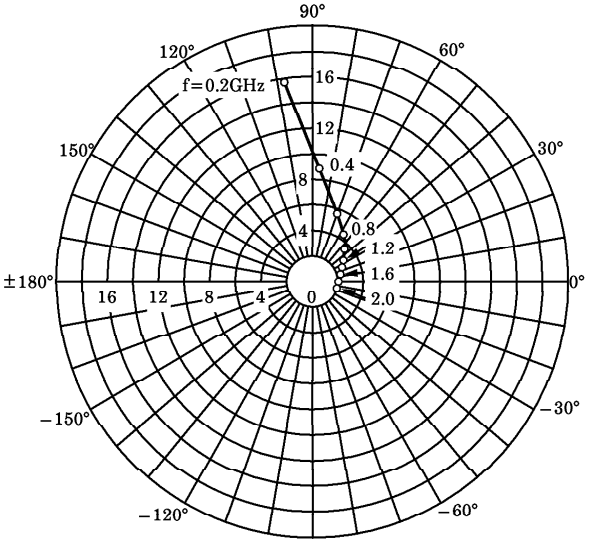

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