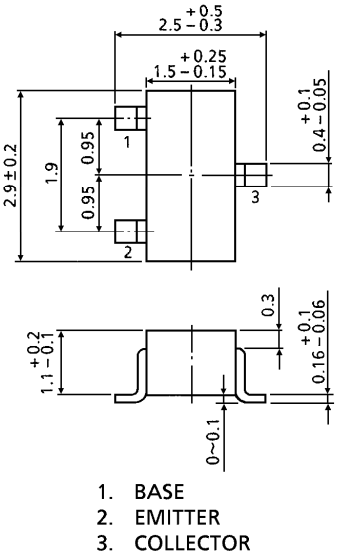
TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL PLANAR TYPE

2SC3011

UHF~C BAND LOW NOISE AMPLIFIER APPLICATIONS

Unit in mm



JEDEC	—
EIAJ	SC-59
TOSHIBA	2-3F1A

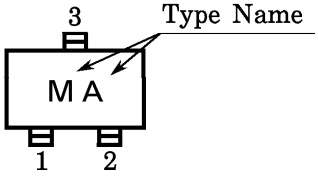
Weight : 0.012g

- High Gain : $|S_{21e}|^2 = 12dB$ (Typ.)
- Low Noise Figure : NF = 2.3dB (Typ.), f = 1GHz
- High f_T : $f_T = 6.5GHz$

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	V_{CBO}	20	V
Collector-Emitter Voltage	V_{CEO}	7	V
Emitter-Base Voltage	V_{EBO}	3	V
Collector Current	I_C	30	mA
Emitter Current	I_E	10	mA
Collector Power Dissipation	P_C	150	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} = 5V, I_C = 10mA	—	6.5	—	GHz
Insertion Gain	$\|S_{21e}\|^2$	V_{CE} = 5V, I_C = 10mA, f = 1GHz	—	12	—	dB
Noise Figure	NF	V_{CE} = 5V, I_C = 5mA, f = 1GHz	—	2.3	—	dB

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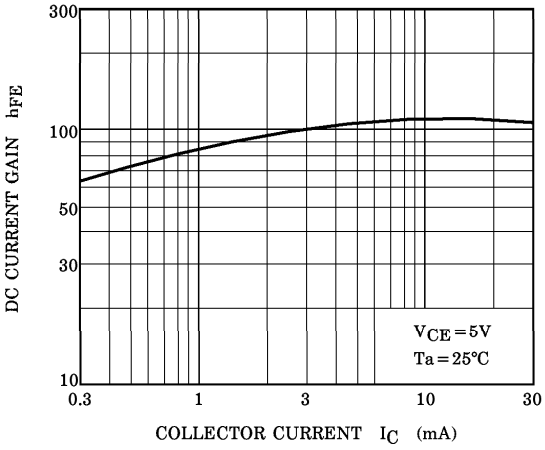
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

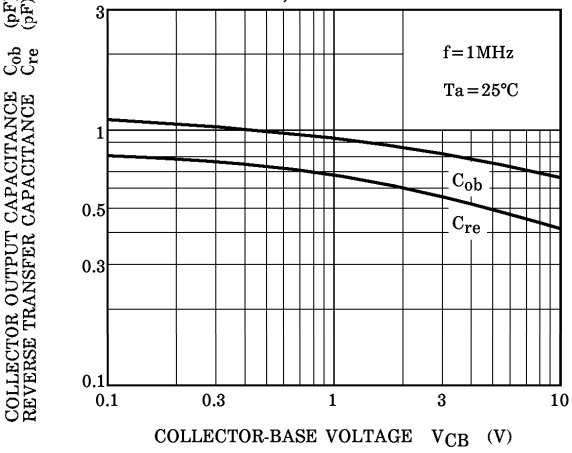
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	I_{CBO}	V_{CB} = 10V, I_E = 0	—	—	1.0	μA
Emitter Cut-off Current	I_{EBO}	V_{EB} = 1.0V, I_C = 0	—	—	1.0	μA
Collecter-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C = 0.5mA, I_B = 0	7	—	—	V
DC Current Gain	h_{FE}	V_{CE} = 5V, I_C = 10mA	30	120	—	—
Collector-Emitter Saturation Voltage	$V_{CE\ (sat)}$	I_C = 10mA, I_B = 1mA	—	0.1	—	V
Base-Emitter Saturation Voltage	$V_{BE\ (sat)}$		—	0.87	—	
Collecter Output Capacitance	C_{ob}	V_{CB} = 5V, I_E = 0, f = 1MHz (Note)	—	0.7	0.9	pF
Reverse Transfer Capacitance	C_{re}		—	0.5	—	
Input Capacitance	C_{ib}	V_{EB} = 0, I_C = 0, f = 1MHz	—	0.8	—	pF

(Note) Cre is measured by 3-terminal method with Capacitance Bridge.

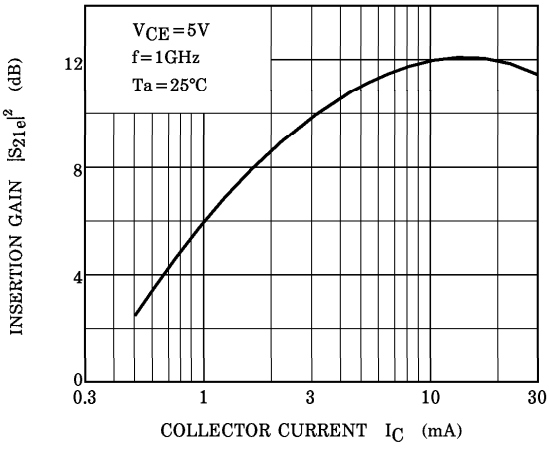
h_{FE} – I_C



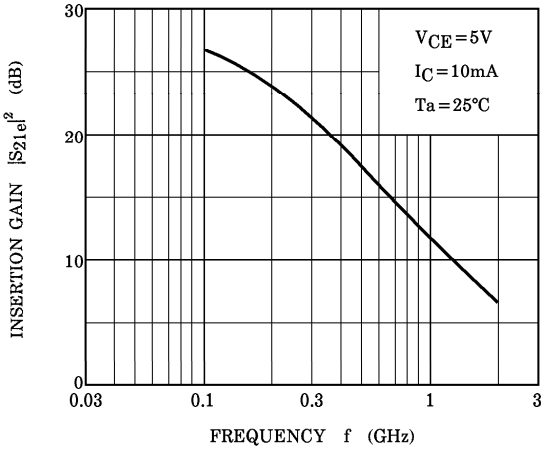
C_{ob}, C_{re} – V_{CB}



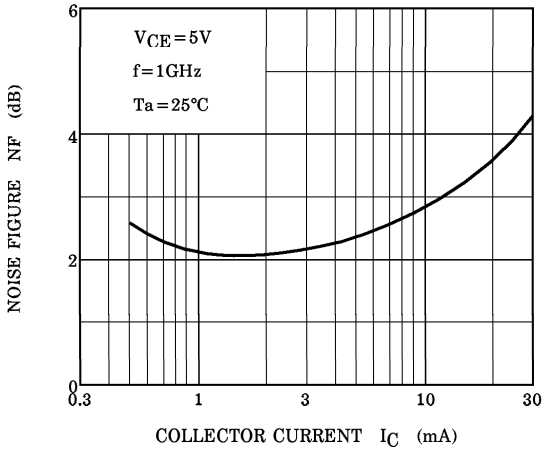
$|S_{21e}|^2$ – I_C



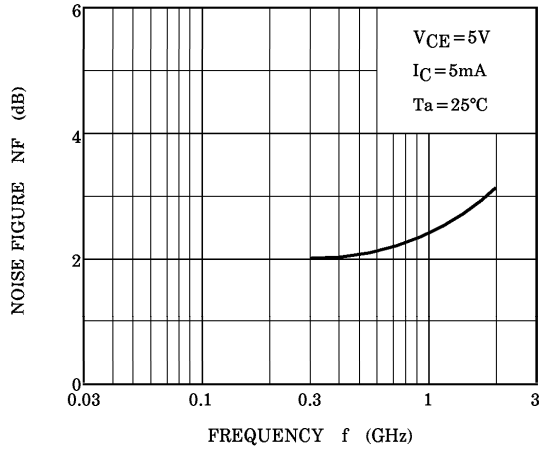
$|S_{21e}|^2$ – f



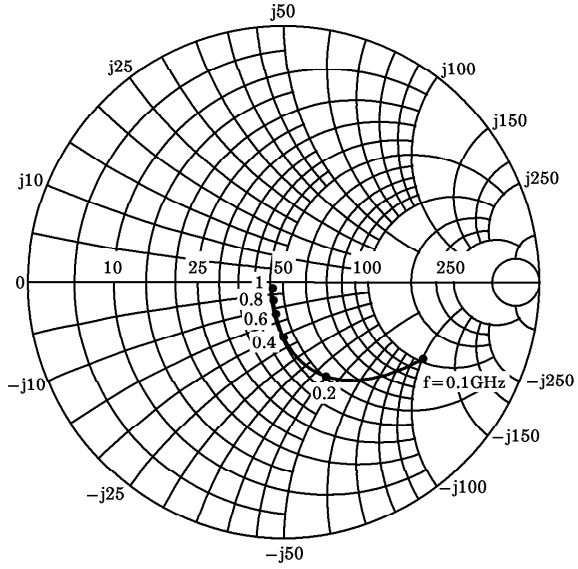
NF – I_C



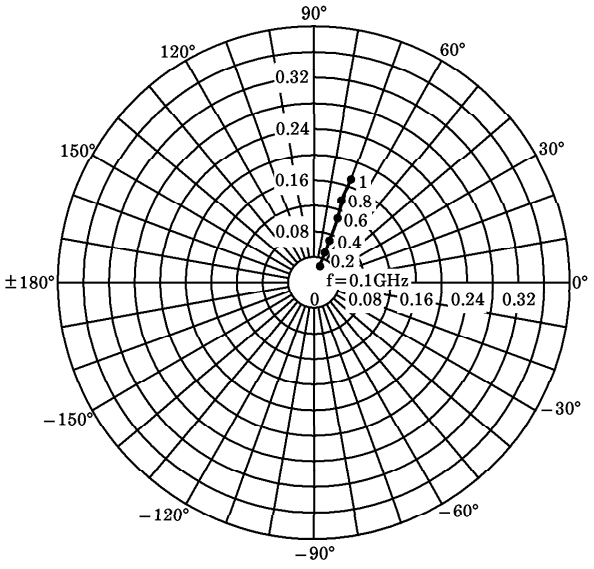
NF – f



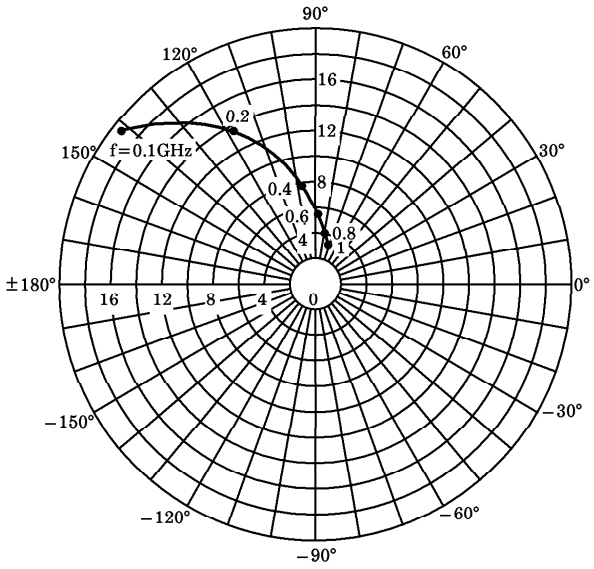
S_{11e}
V_{CE} = 5V
I_C = 10mA
Ta = 25°C
(UNIT : Ω)



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



S_{21e}
V_{CE} = 5V
I_C = 10mA
Ta = 25°C



S_{22e}
V_{CE} = 5V
I_C = 10mA
Ta = 25°C
(UNIT : Ω)