

TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL PLANAR TYPE

2SC3011

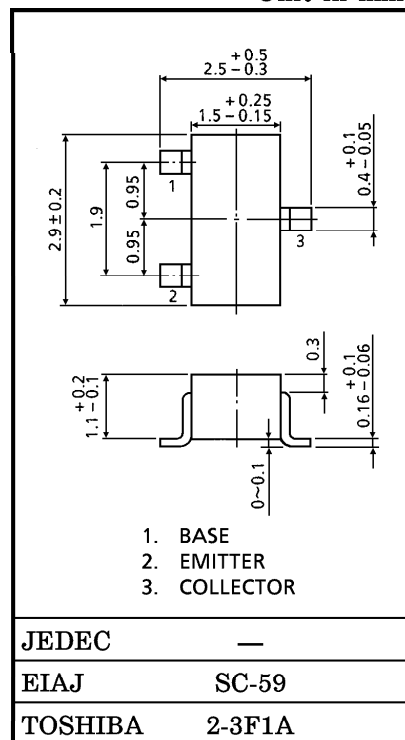
UHF~C BAND LOW NOISE AMPLIFIER APPLICATIONS

Unit in mm

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

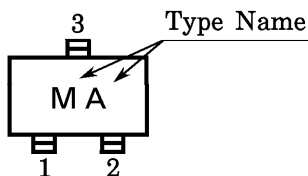
MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	V_{CBO}	20	V
Collector-Emitter Voltage	V_{CEO}	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	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55~125	$^\circ\text{C}$



Weight : 0.012g

Marking



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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Transition Frequency	f_T	$V_{CE} = 5\text{V}$, $I_C = 10\text{mA}$	—	6.5	—	GHz
Insertion Gain	$ S_{21e} ^2$	$V_{CE} = 5\text{V}$, $I_C = 10\text{mA}$, $f = 1\text{GHz}$	—	12	—	dB
Noise Figure	NF	$V_{CE} = 5\text{V}$, $I_C = 5\text{mA}$, $f = 1\text{GHz}$	—	2.3	—	dB

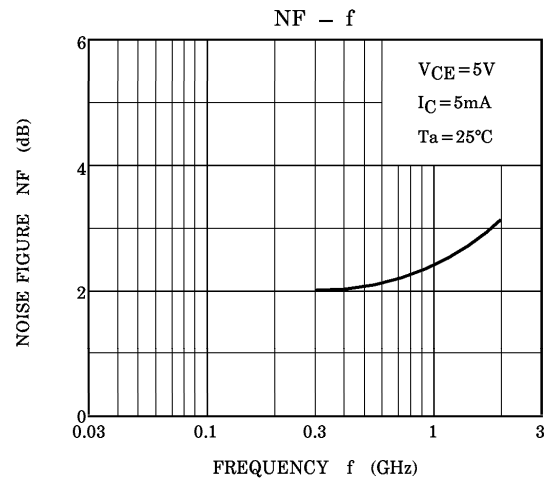
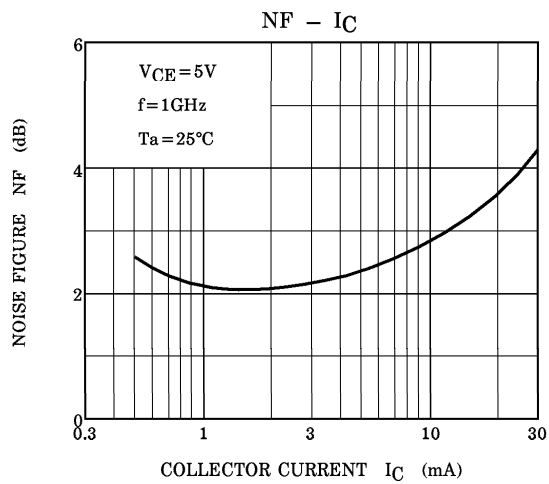
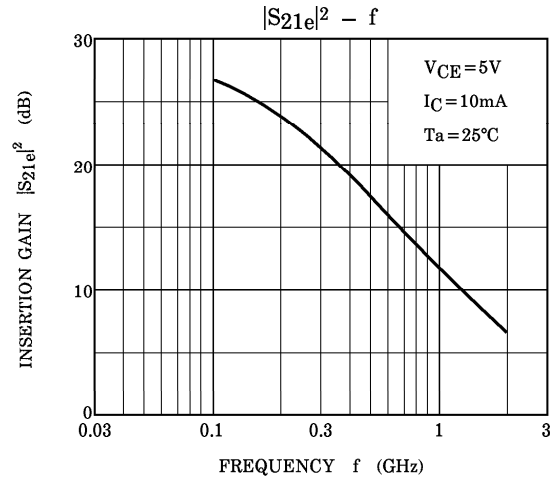
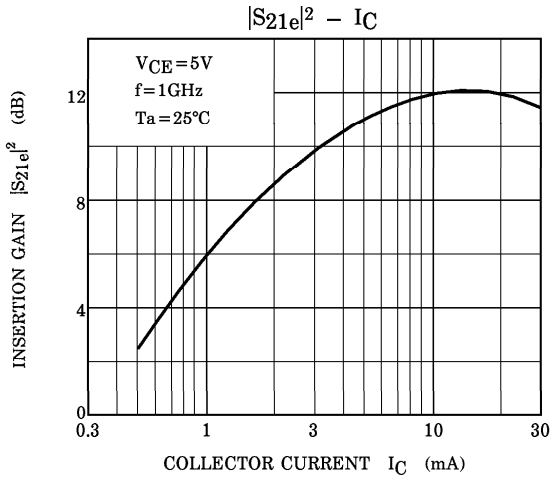
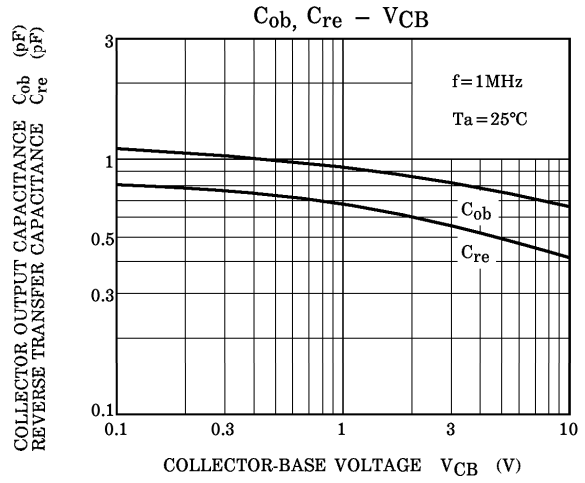
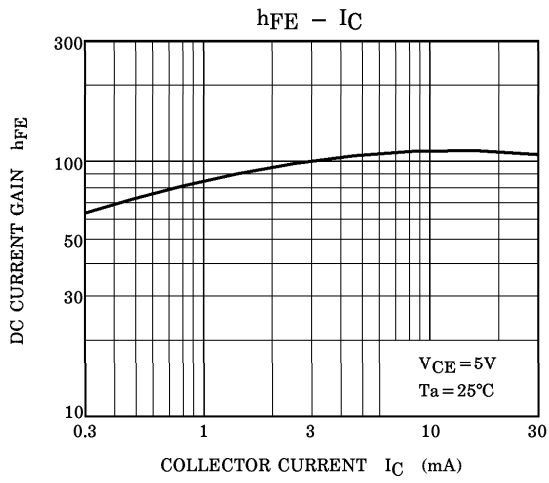
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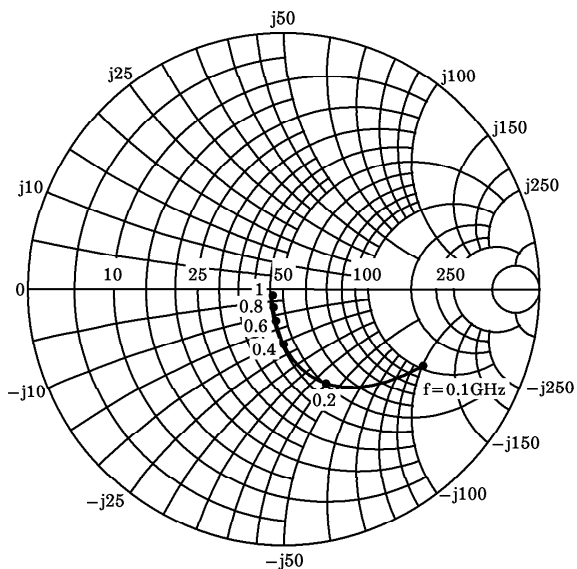
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

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
Collector-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	—	
Collector 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

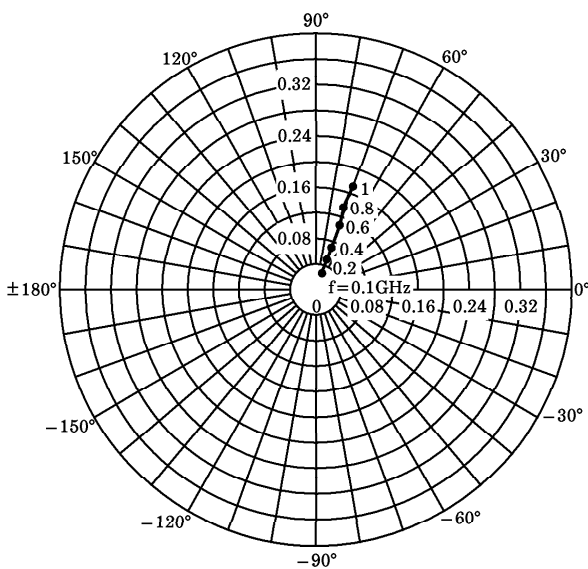
(Note) C_{re} is measured by 3-terminal method with Capacitance Bridge.



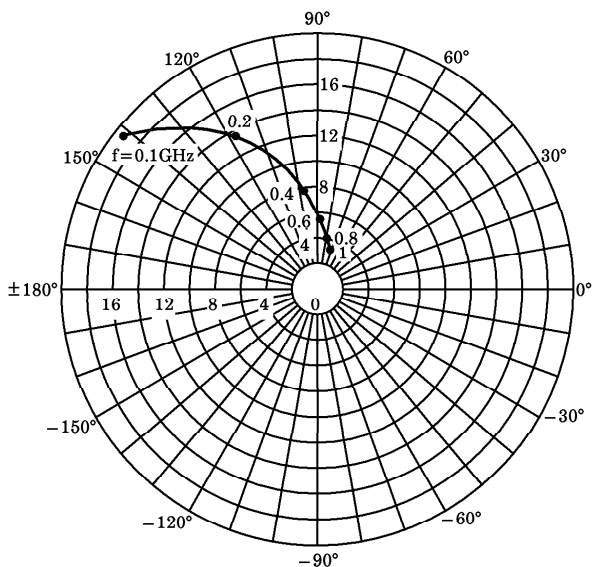
S_{11e}
 V_{CE} = 5V
 I_C = 10mA
 T_a = 25°C
 (UNIT: Ω)



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



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



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

