

TOSHIBA Transistor Silicon NPN Epitaxial Planar Type

2SC3011

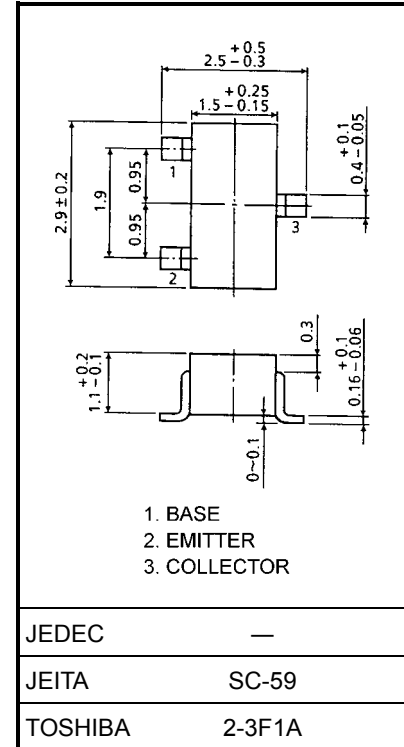
UHF~C Band Low Noise Amplifier Applications

Unit: 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 ($T_a = 25^\circ\text{C}$)

Characteristics	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}	$-55\sim 125$	$^\circ\text{C}$



Microwave Characteristics ($T_a = 25^\circ\text{C}$)

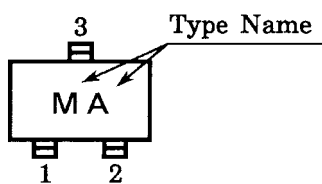
Weight: 0.012 g (typ.)

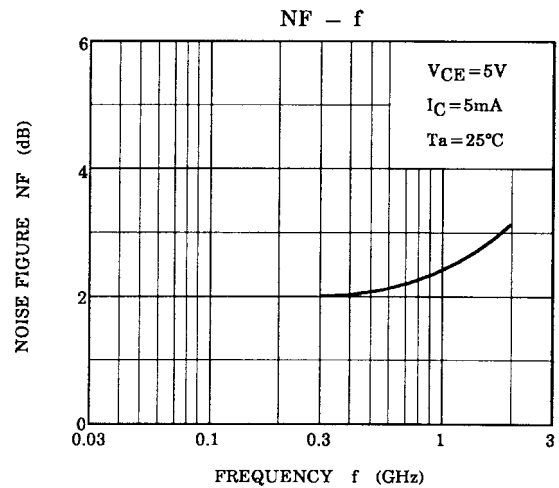
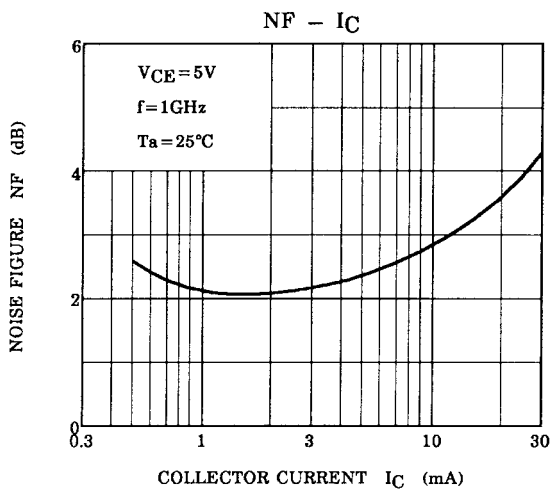
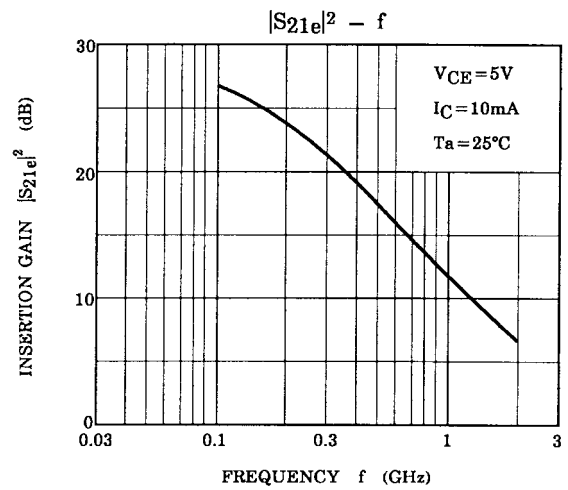
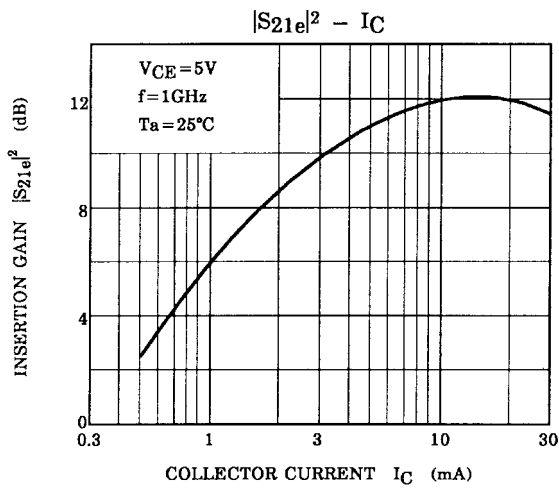
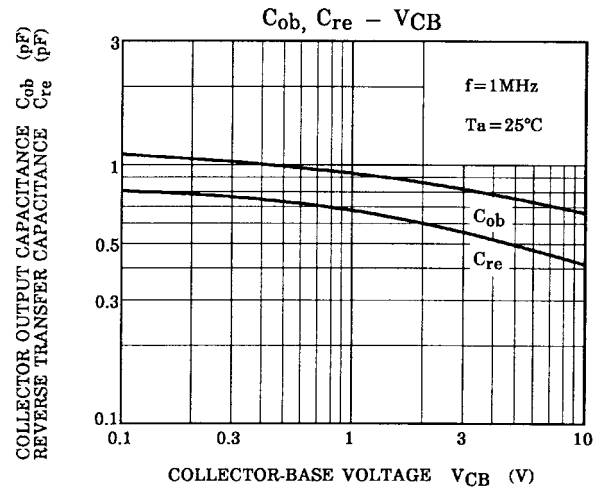
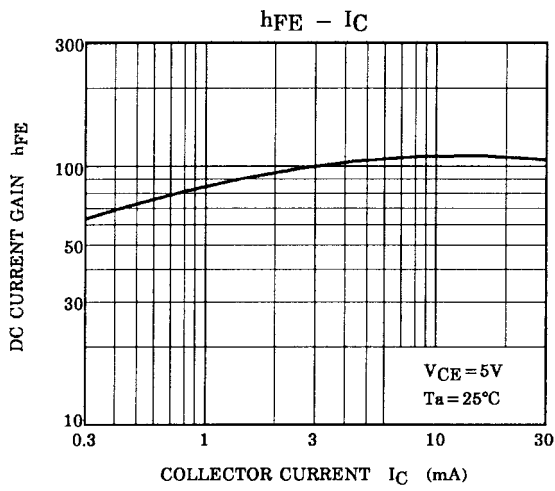
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Transition frequency	f_T	$V_{CE} = 5\text{ V}, I_C = 10\text{ mA}$	—	6.5	—	GHz
Insertion gain	$ S_{21e} ^2$	$V_{CE} = 5\text{ V}, I_C = 10\text{ mA}, f = 1\text{ GHz}$	—	12	—	dB
Noise figure	NF	$V_{CE} = 5\text{ V}, I_C = 5\text{ mA}, f = 1\text{ GHz}$	—	2.3	—	dB

Electrical Characteristics ($T_a = 25^\circ\text{C}$)

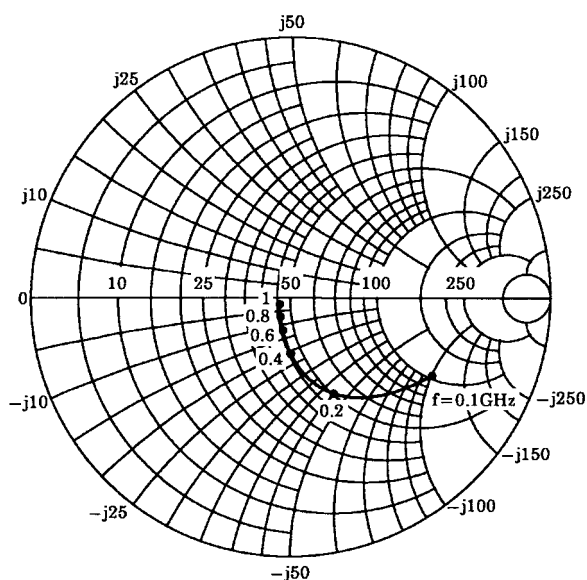
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}	$V_{CB} = 10\text{ V}, I_E = 0$	—	—	1.0	μA
Emitter cut-off current	I_{EBO}	$V_{EB} = 1.0\text{ V}, I_C = 0$	—	—	1.0	μA
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C = 0.5\text{ mA}, I_B = 0$	7	—	—	V
DC current gain	h_{FE}	$V_{CE} = 5\text{ V}, I_C = 10\text{ mA}$	30	120	—	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 10\text{ mA}, I_B = 1\text{ mA}$	—	0.1	—	V
Base-emitter saturation voltage	$V_{BE(sat)}$		—	0.87	—	V
Collector output capacitance	C_{ob}	$V_{CB} = 5\text{ V}, I_E = 0, f = 1\text{ MHz}$ (Note)	—	0.7	0.9	pF
Reverse transfer capacitance	C_{re}		—	0.5	—	pF
Input capacitance	C_{ib}	$V_{EB} = 0, I_C = 0, f = 1\text{ MHz}$	—	0.8	—	pF

Note: C_{re} is measured by 3-terminal method with capacitance bridge.

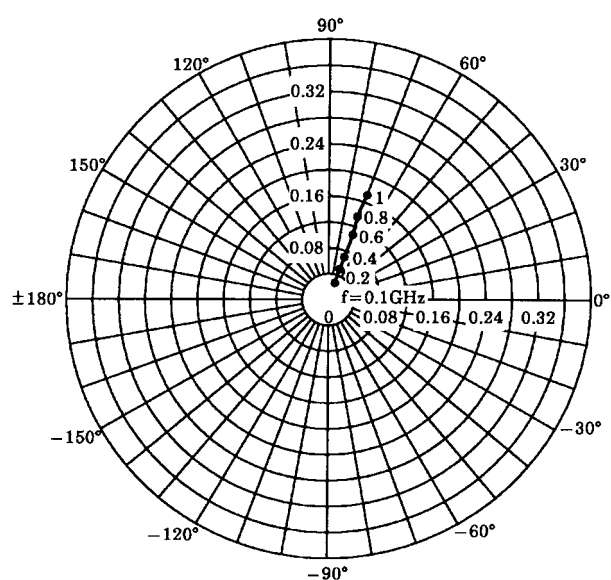
Marking



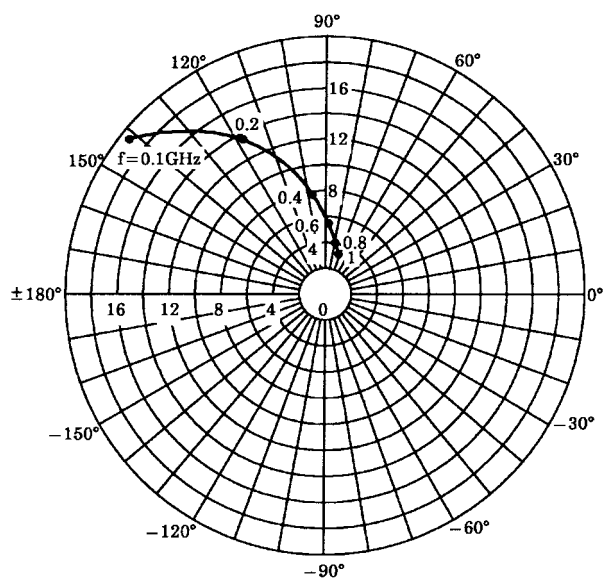
S_{11e}
 $V_{CE} = 5V$
 $I_C = 10mA$
 $T_a = 25^\circ C$
 (UNIT: Ω)



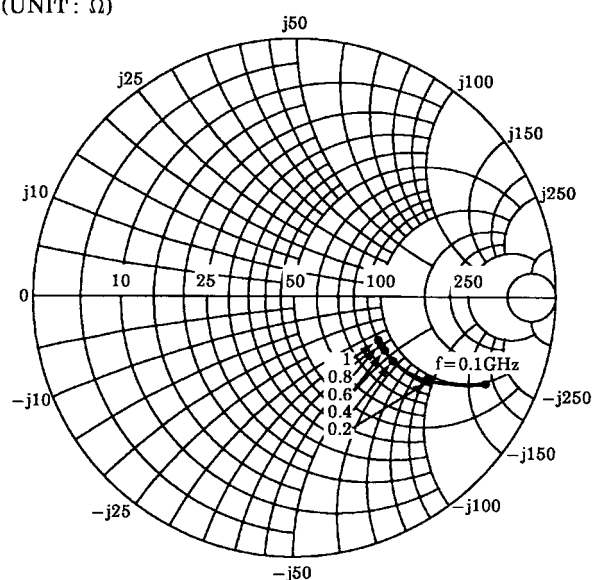
S_{12e}
 $V_{CE} = 5V$
 $I_C = 10mA$
 $T_a = 25^\circ C$



S_{21e}
 $V_{CE} = 5V$
 $I_C = 10mA$
 $T_a = 25^\circ C$



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



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