

TOSHIBA Transistor Silicon NPN Epitaxial Planar Type

2SC4315

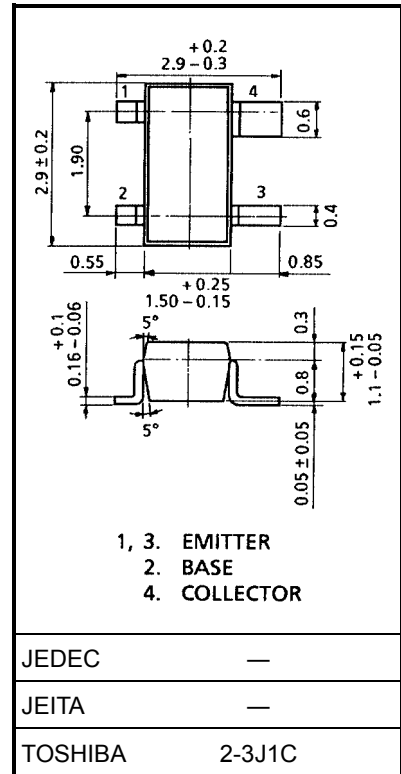
VHF~UHF Band Low Noise Amplifier Applications

Unit: mm

- Low noise figure, high gain.
- $NF = 1.1\text{dB}$, $|S_{21e}|^2 = 14\text{dB}$ ($f = 1\text{GHz}$)

Maximum Ratings ($T_a = 25^\circ\text{C}$)

Characteristics	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	20	V
Collector-emitter voltage	V_{CEO}	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	150	mW
Junction temperature	T_j	125	$^\circ\text{C}$
Storage temperature range	T_{stg}	-55~125	$^\circ\text{C}$



Weight: 0.012 g (typ.)

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

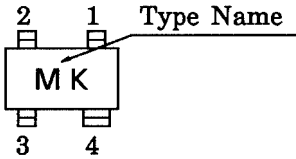
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Transition frequency	f_T	$V_{CE} = 10\text{V}$, $I_C = 20\text{mA}$	5	7	—	GHz
Insertion gain	$ S_{21e} ^2 (1)$	$V_{CE} = 10\text{V}$, $I_C = 20\text{mA}$, $f = 500\text{MHz}$	—	19.5	—	dB
	$ S_{21e} ^2 (2)$	$V_{CE} = 10\text{V}$, $I_C = 20\text{mA}$, $f = 1\text{GHz}$	10.5	14	—	
Noise figure	NF (1)	$V_{CE} = 10\text{V}$, $I_C = 5\text{mA}$, $f = 500\text{MHz}$	—	1	—	dB
	NF (2)	$V_{CE} = 10\text{V}$, $I_C = 5\text{mA}$, $f = 1\text{GHz}$	—	1.1	2	

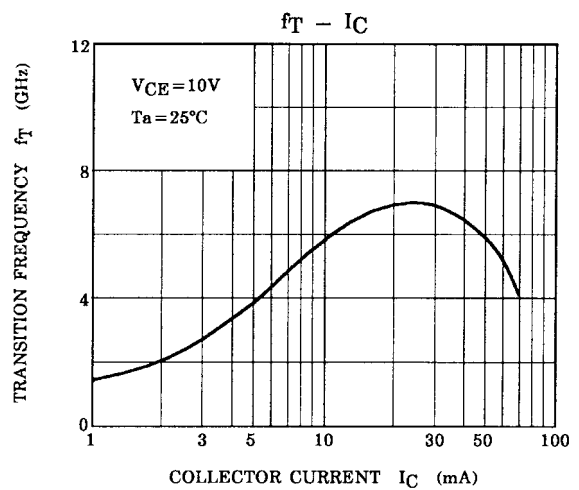
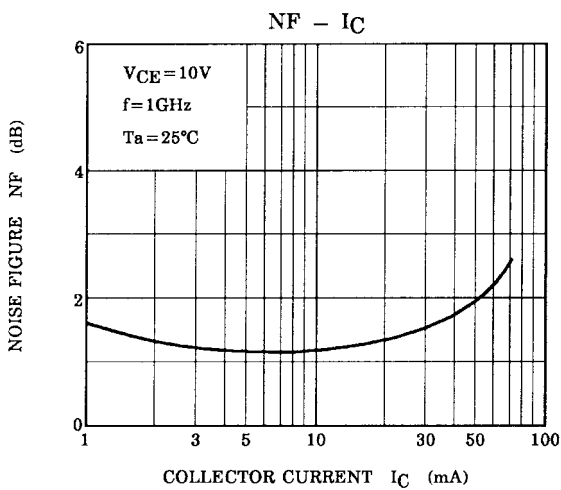
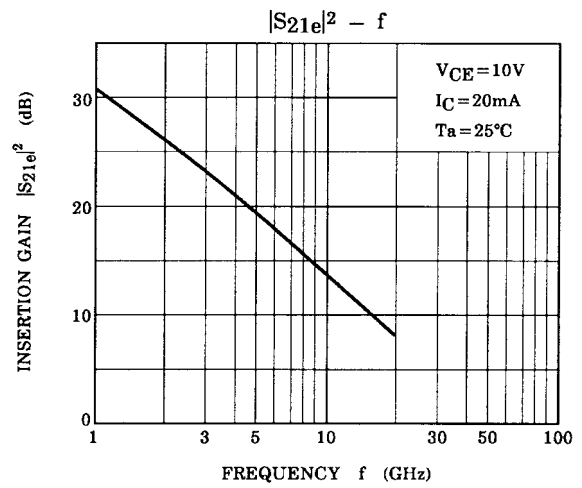
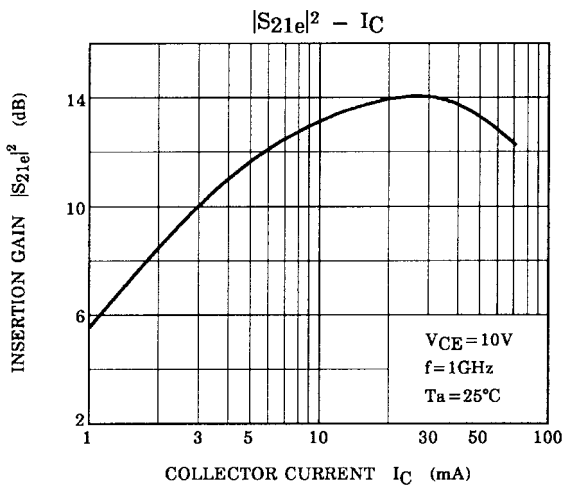
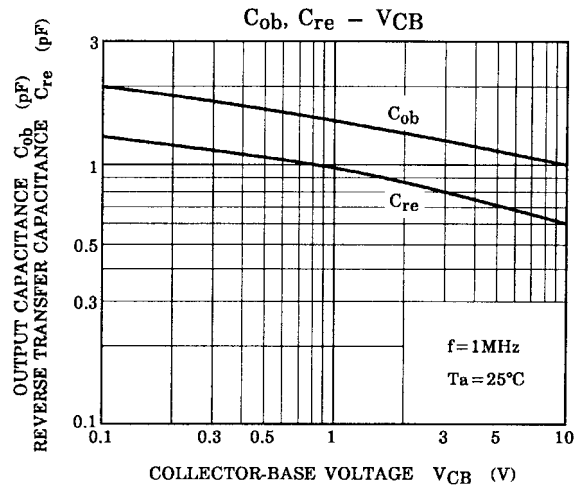
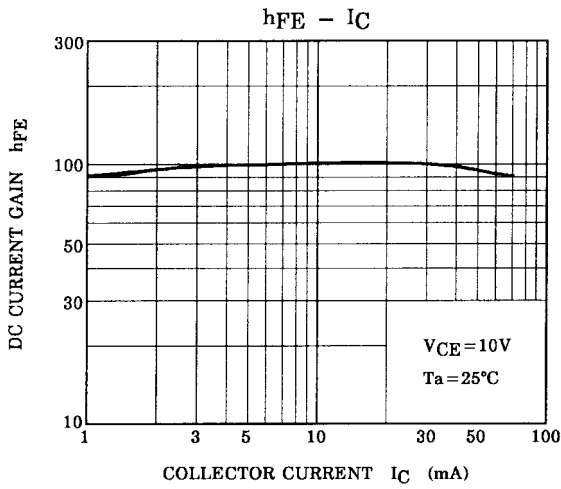
Electrical Characteristics ($T_a = 25^\circ\text{C}$)

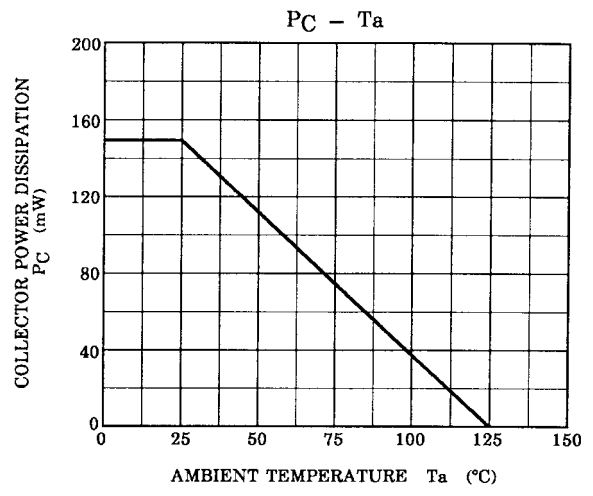
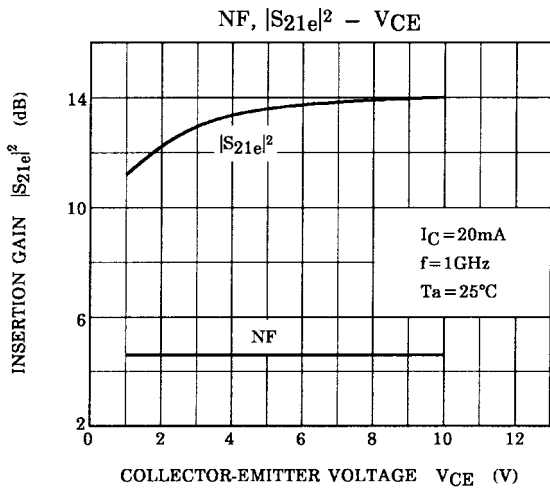
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}	$V_{CB} = 10\text{V}$, $I_E = 0$	—	—	1	μA
Emitter cut-off current	I_{EBO}	$V_{EB} = 1\text{V}$, $I_C = 0$	—	—	1	μA
DC current gain	h_{FE}	$V_{CE} = 10\text{V}$, $I_C = 20\text{mA}$	30	—	250	
Output capacitance	C_{ob}	$V_{CB} = 10\text{V}$, $I_E = 0$, $f = 1\text{MHz}$ (Note)	—	1	—	pF
Reverse transfer capacitance	C_{re}		—	0.55	1	pF

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

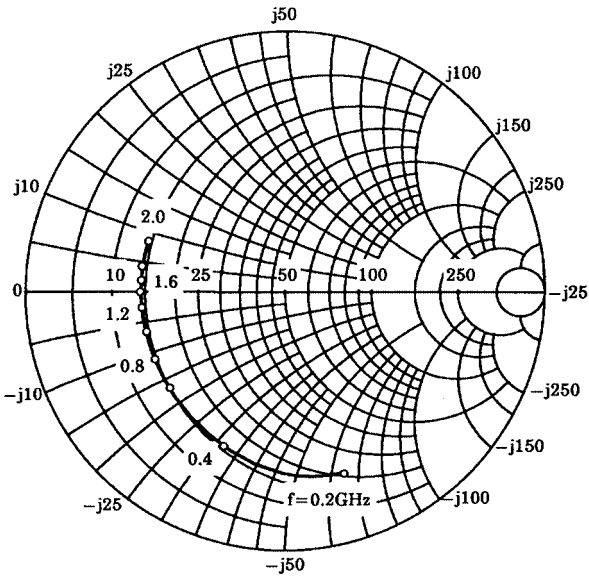
Marking



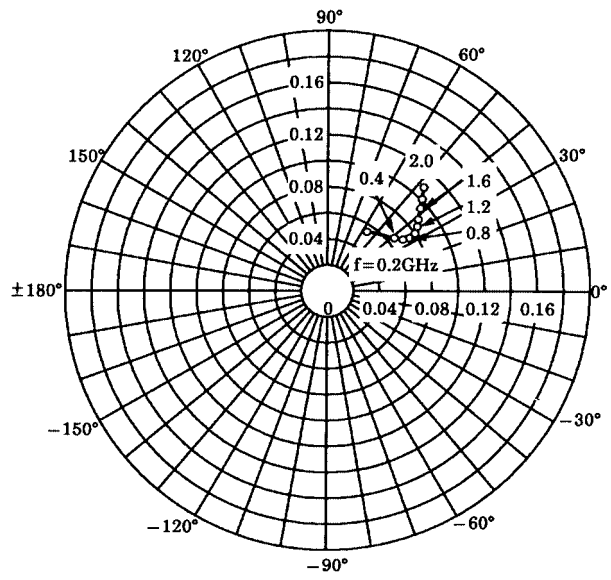




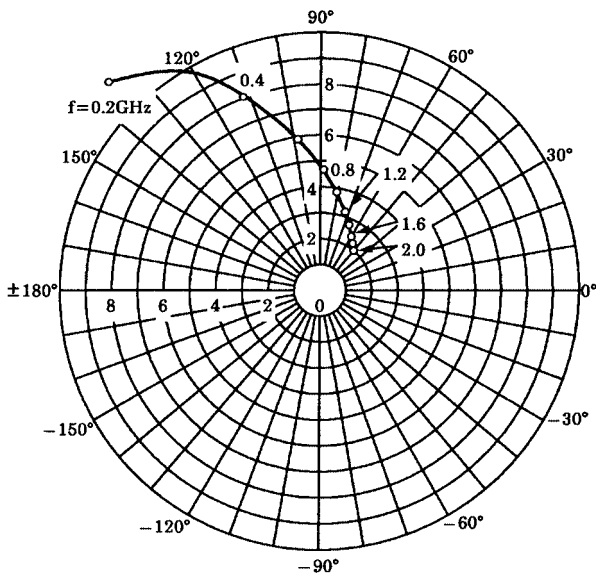
S11e
 VCE = 10V
 IC = 5mA
 Ta = 25°C
 (UNIT : Ω)



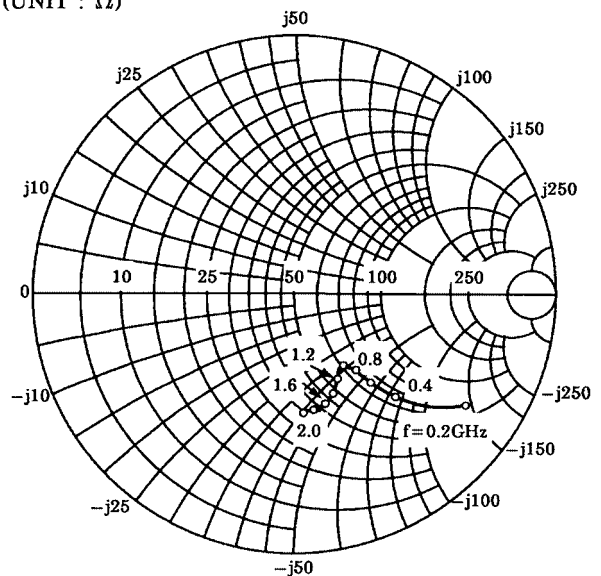
S12e
 VCE = 10V
 IC = 5mA
 Ta = 25°C



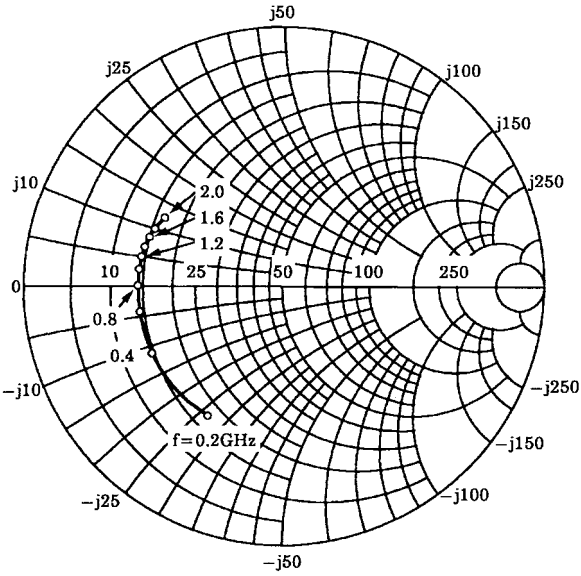
S21e
 VCE = 10V
 IC = 5mA
 Ta = 25°C



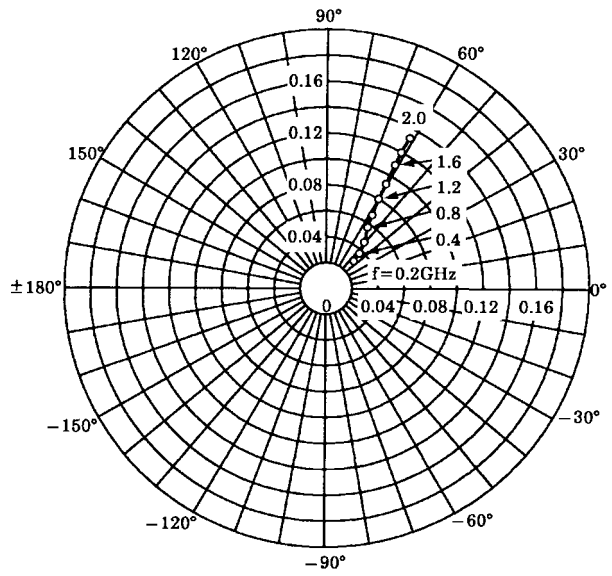
S22e
 VCE = 10V
 IC = 5mA
 Ta = 25°C
 (UNIT : Ω)



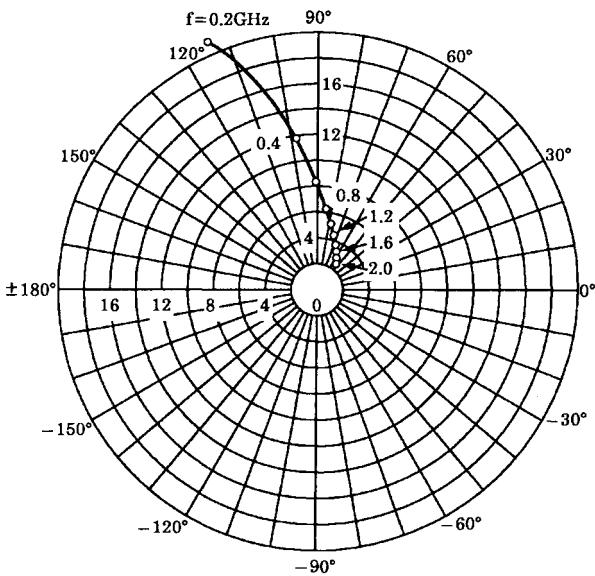
S11e
 VCE = 10V
 IC = 20mA
 Ta = 25°C
 (UNIT : Ω)



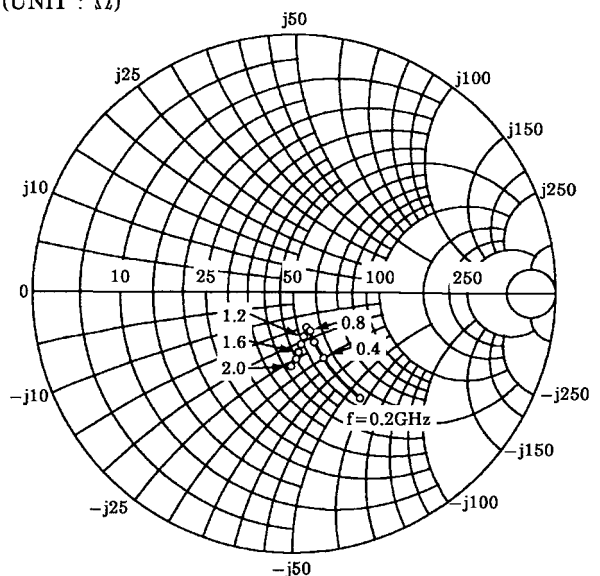
S12e
 VCE = 10V
 IC = 20mA
 Ta = 25°C



S21e
 VCE = 10V
 IC = 20mA
 Ta = 25°C



S22e
 VCE = 10V
 IC = 20mA
 Ta = 25°C
 (UNIT : Ω)



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