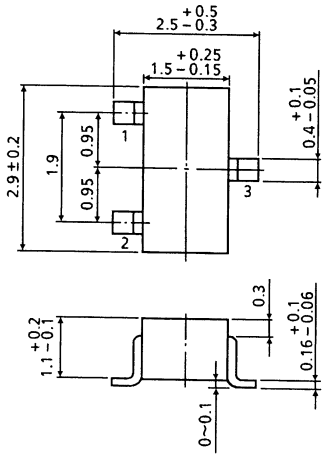
TOSHIBA Transistor Silicon NPN Epitaxial Planar Type

2SC3099

VHF~UHF Band Low Noise Amplifier Applications

- Low noise figure
- NF = 1.7dB, $|S_{21e}|^2$ = 15dB (f = 500 MHz)
- NF = 2.5dB, $|S_{21e}|^2$ = 9.5dB (f = 1 GHz)

Unit: mm



1. BASE
2. EMITTER
3. COLLECTOR

JEDEC	—
JEITA	SC-59
TOSHIBA	2-3F1A

Weight: 0.012 g (typ.)

Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	20	V
Collector-emitter voltage	V_{CEO}	20	V
Emitter-base voltage	V_{EBO}	3	V
Collector current	I_C	30	mA
Base current	I_B	15	mA
Collector power dissipation	P_C	150	mW
Junction temperature	T_j	125	°C
Storage temperature range	T_{stg}	−55~125	°C

Microwave Characteristics (Ta = 25°C)

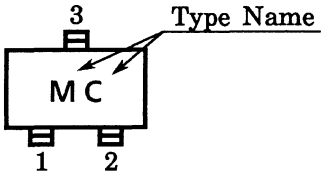
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Transition frequency	f_T	V_{CE} = 10 V, I_C = 10 mA	—	4.0	—	GHz
Insertion gain	$\|S_{21e}\|^2$ (1)	V_{CE} = 10 V, I_C = 10 mA, f = 500 MHz	—	15.0	—	dB
	$\|S_{21e}\|^2$ (2)	V_{CE} = 10 V, I_C = 10 mA, f = 1 GHz	—	9.5	—	
Noise figure	NF (1)	V_{CE} = 10 V, I_C = 3 mA, f = 500 MHz	—	1.7	—	dB
	NF (2)	V_{CE} = 10 V, I_C = 3 mA, f = 1 GHz	—	2.5	—	

Electrical Characteristics (Ta = 25°C)

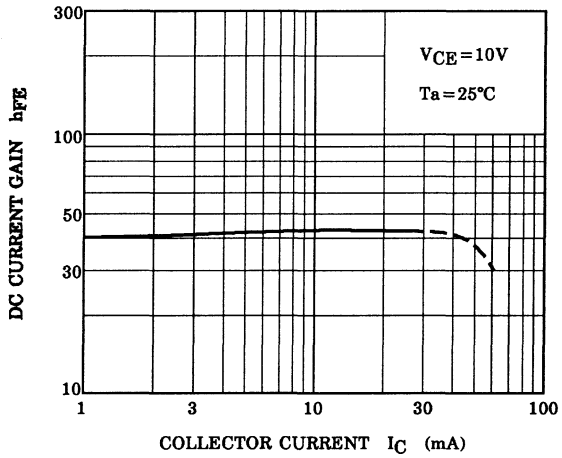
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}	V_{CB} = 10 V, I_E = 0	—	—	0.1	μA
Emitter cut-off current	I_{EBO}	V_{EB} = 1 V, I_C = 0	—	—	1.0	μA
DC current gain	h_{FE}	V_{CE} = 10 V, I_C = 5 mA	30	—	250	
Output capacitance	C_{ob}	V_{CB} = 10 V, I_E = 0, f = 1 MHz (Note)	—	0.9	—	pF
Reverse transfer capacitance	C_{re}		—	0.6	—	pF

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

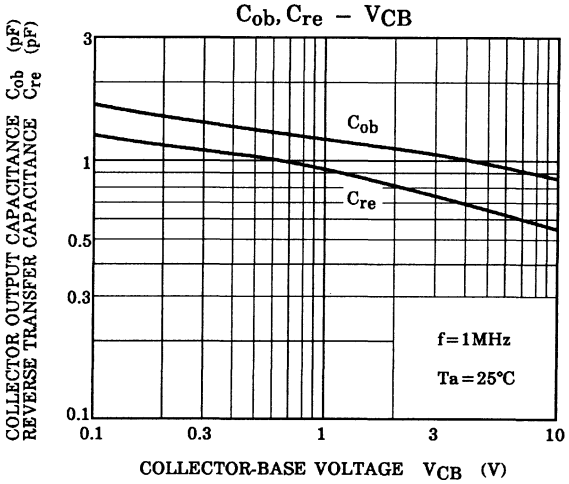
Marking



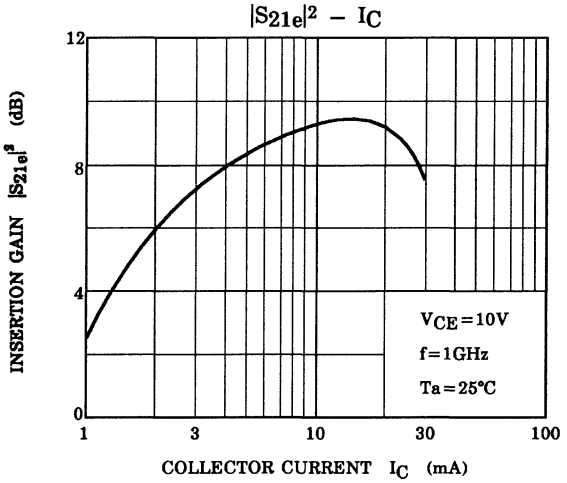
h_{FE} – I_C



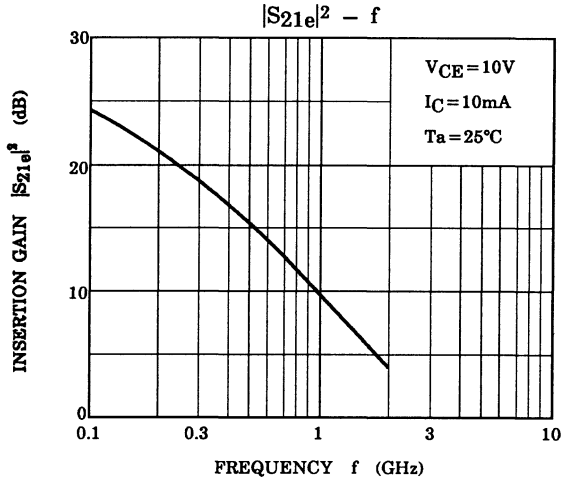
C_{ob}, C_{re} – V_{CB}



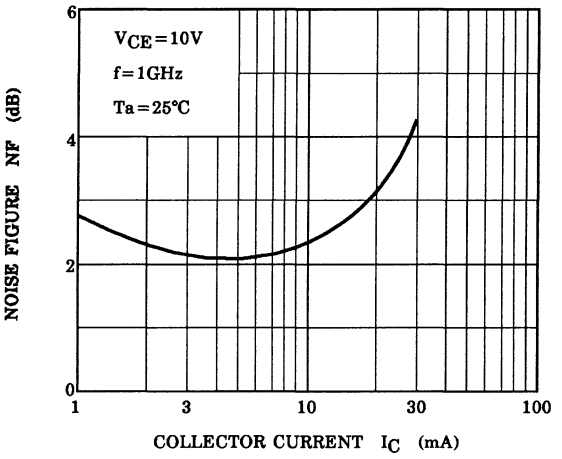
$|S_{21e}|^2$ – I_C



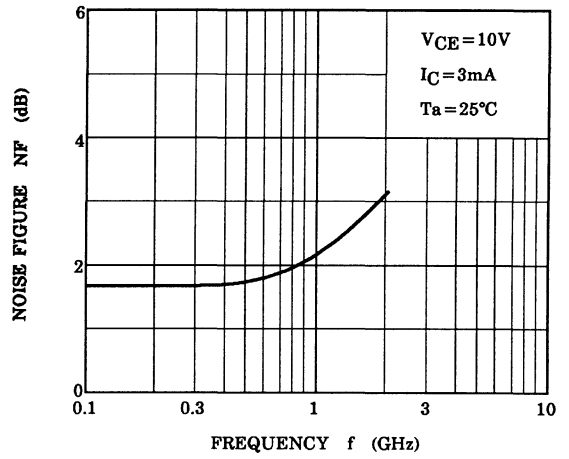
$|S_{21e}|^2$ – f



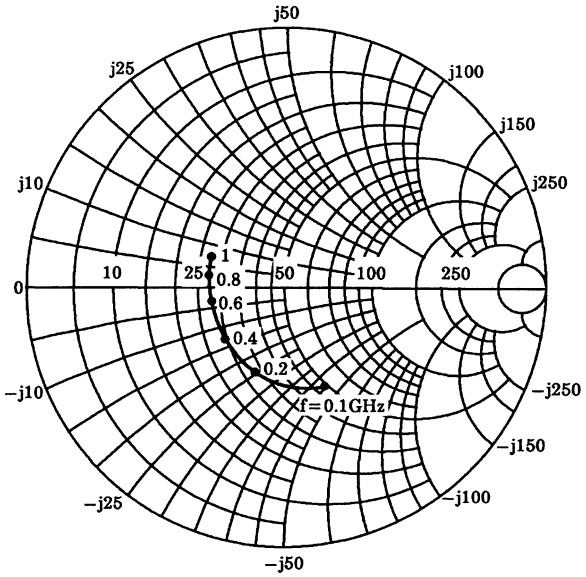
NF – I_C



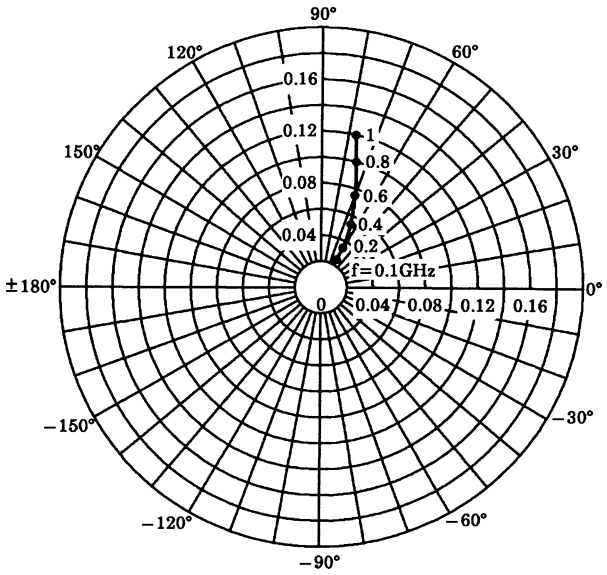
NF – f



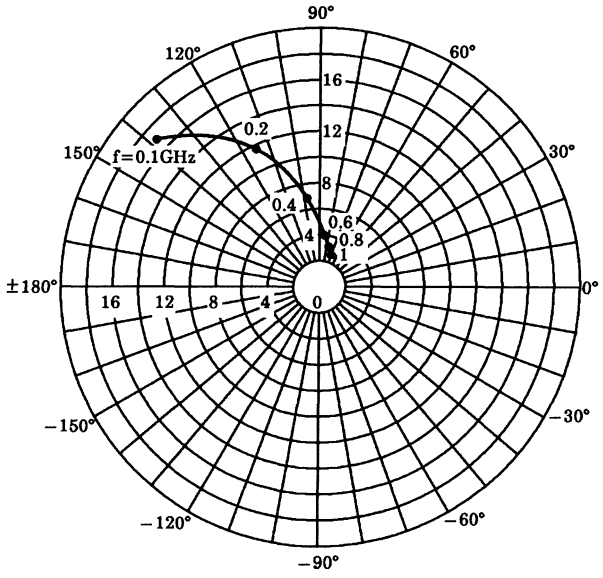
S_{11e}
V_{CE} = 10V
I_C = 10mA
Ta = 25°C
(UNIT : Ω)



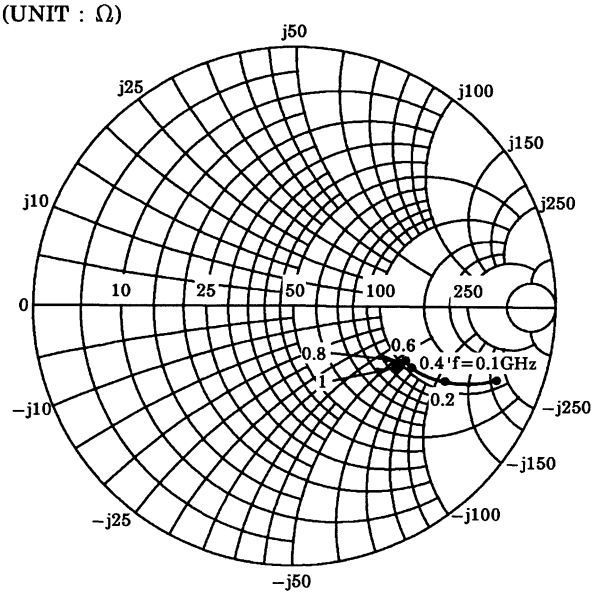
S_{12e}
V_{CE} = 10V
I_C = 10mA
Ta = 25°C



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



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



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