TOSHIBA Transistor Silicon NPN Epitaxial Planar Type

# 2SC3099

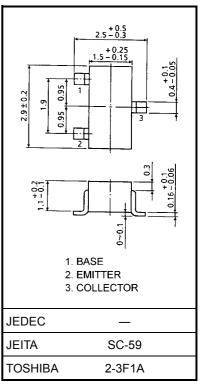
### VHF~UHF Band Low Noise Amplifier Applications

Unit: mm

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

### **Maximum Ratings (Ta = 25°C)**

Characteristics	Symbol	Rating	Unit
Collector-base voltage	$V_{CBO}$	20	V
Collector-emitter voltage	V <sub>CEO</sub>	20	V
Emitter-base voltage	V <sub>EBO</sub>	3	٧
Collector current	IC	30	mA
Base current	ΙΒ	15	mA
Collector power dissipation	P <sub>C</sub>	150	mW
Junction temperature	Tj	125	°C
Storage temperature range	T <sub>stg</sub>	-55~125	°C



#### Weight: 0.012 g (typ.)

### Microwave Characteristics (Ta = 25°C)

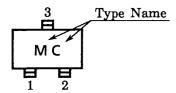
Characteristics	Symbol	Test Condition	Min	Тур.	Max	Unit
Transition frequency	f <sub>T</sub>	$V_{CE} = 10 \text{ V}, I_{C} = 10 \text{ mA}$	_	4.0	_	GHz
Insertion gain	S <sub>21e</sub>   <sup>2</sup> (1)	V <sub>CE</sub> = 10 V, I <sub>C</sub> = 10 mA, f = 500 MHz	_	15.0	_	dB
	S <sub>21e</sub>   <sup>2</sup> (2)	$V_{CE} = 10 \text{ V}, I_{C} = 10 \text{ mA}, f = 1 \text{ GHz}$	_	9.5	_	
Noise figure -	NF (1)	$V_{CE} = 10 \text{ V}, I_C = 3 \text{ mA}, f = 500 \text{ MHz}$	_	1.7	_	dB
	NF (2)	$V_{CE} = 10 \text{ V}, I_{C} = 3 \text{ mA}, f = 1 \text{ GHz}$	_	2.5	_	

### **Electrical Characteristics (Ta = 25°C)**

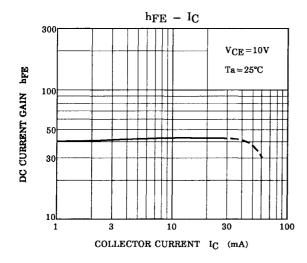
Characteristics	Symbol	Test Condition	Min	Тур.	Max	Unit
Collector cut-off current	I <sub>CBO</sub>	$V_{CB} = 10 \text{ V}, I_{E} = 0$	_	_	0.1	μА
Emitter cut-off current	I <sub>EBO</sub>	$V_{EB} = 1 \text{ V, } I_{C} = 0$	_	_	1.0	μА
DC current gain	h <sub>FE</sub>	$V_{CE} = 10 \text{ V}, I_C = 5 \text{ mA}$	30	_	250	
Output capacitance	C <sub>ob</sub>	$V_{CB} = 10 \text{ V}, I_E = 0, f = 1 \text{ MHz}$ (Note)	_	0.9	_	pF
Reverse transfer capacitance	C <sub>re</sub>		_	0.6	_	pF

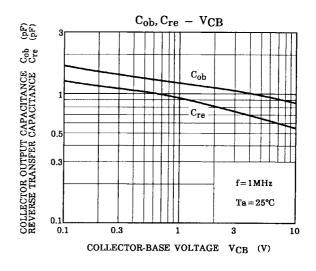
Note: C<sub>re</sub> is measured by 3 terminal method with capacitance bridge.

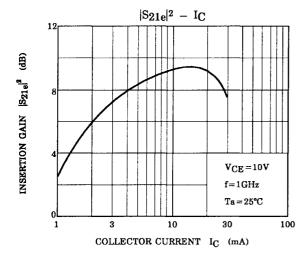
## Marking

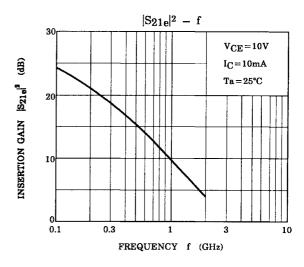


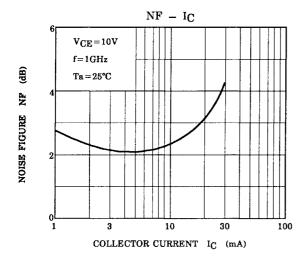
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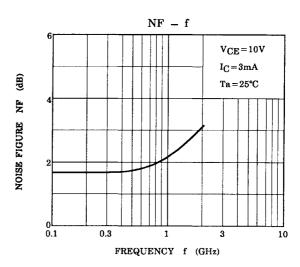








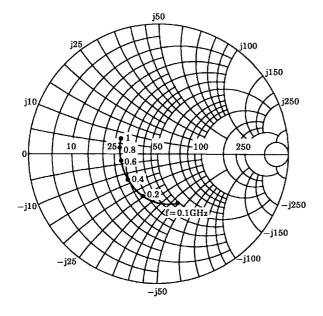


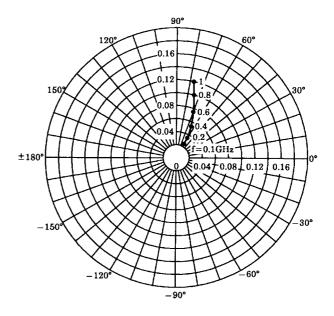


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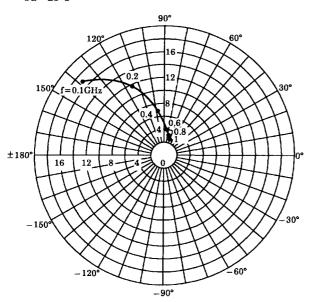
 $\begin{array}{l} S_{11e} \\ V_{CE} = 10V \\ I_{C} = 10mA \\ Ta = 25^{\circ}C \\ (UNIT:\Omega) \end{array}$ 



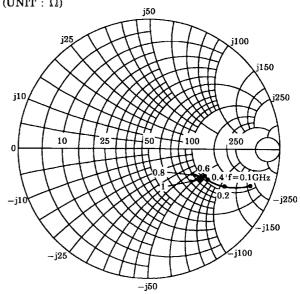




 $\begin{array}{l} S_{21e} \\ V_{CE} = 10V \\ I_{C} = 10 \text{mA} \\ Ta = 25^{\circ}C \end{array}$ 



 $\begin{array}{l} S_{22e} \\ V_{CE} = 10V \\ I_{C} = 10mA \\ T_{a} = 25^{\circ}C \\ (UNIT: \Omega) \end{array}$ 



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