

TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL PLANAR TYPE

2SC3099

VHF ~ UHF BAND LOW NOISE AMPLIFIER APPLICATIONS

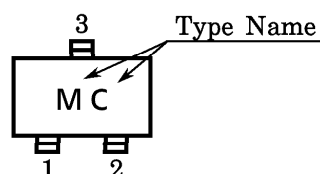
Unit in mm

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

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

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

Marking



		1. BASE
		2. EMITTER
		3. COLLECTOR
JEDEC	—	
EIAJ	SC-59	
TOSHIBA	2-3F1A	

Weight : 0.012g

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Transition Frequency	f_T	$V_{CE} = 10\text{V}$, $I_C = 10\text{mA}$	—	4.0	—	GHz
Insertion Gain	$ S_{21e} ^2 (1)$	$V_{CE} = 10\text{V}$, $I_C = 10\text{mA}$, $f = 500\text{MHz}$	—	15.0	—	dB
	$ S_{21e} ^2 (2)$	$V_{CE} = 10\text{V}$, $I_C = 10\text{mA}$, $f = 1\text{GHz}$	—	9.5	—	dB
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	—	dB

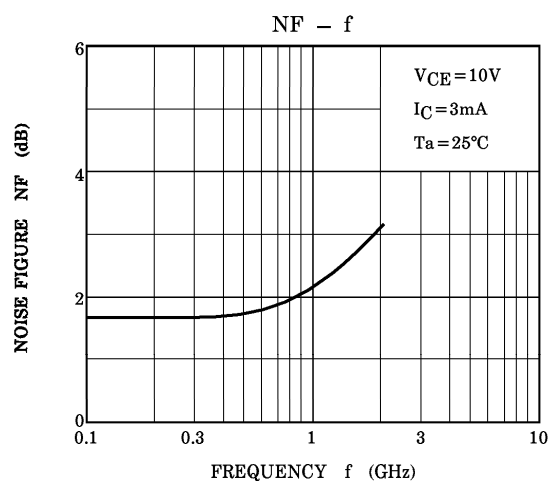
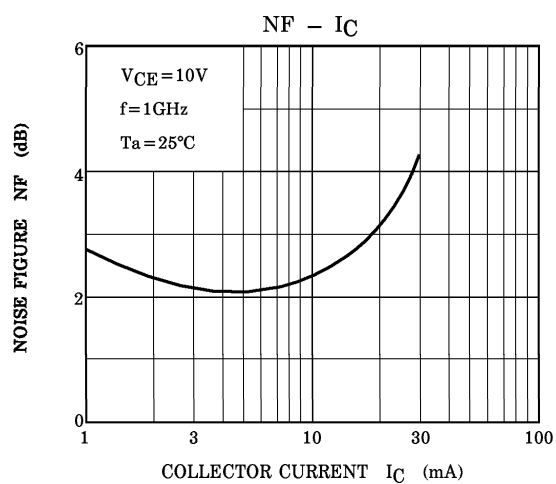
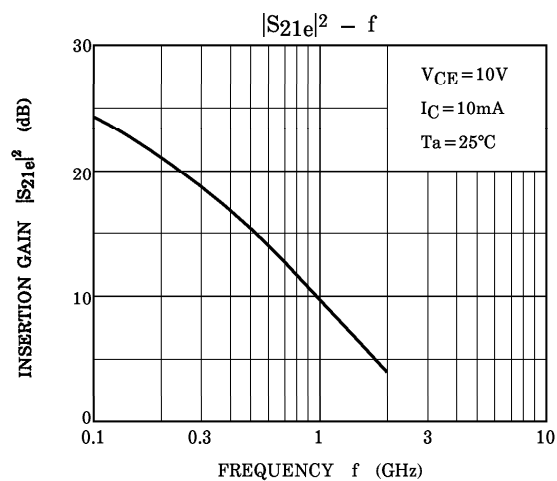
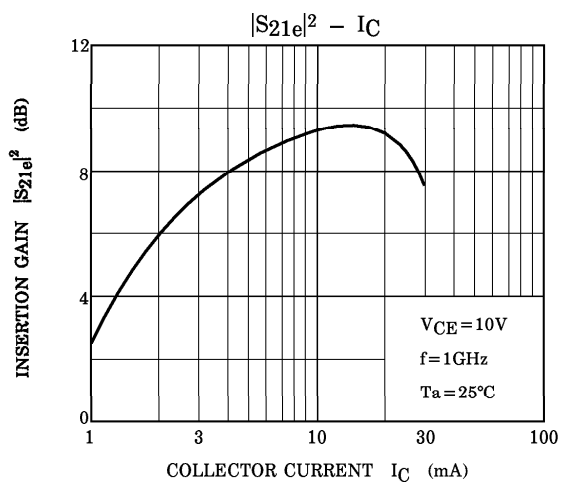
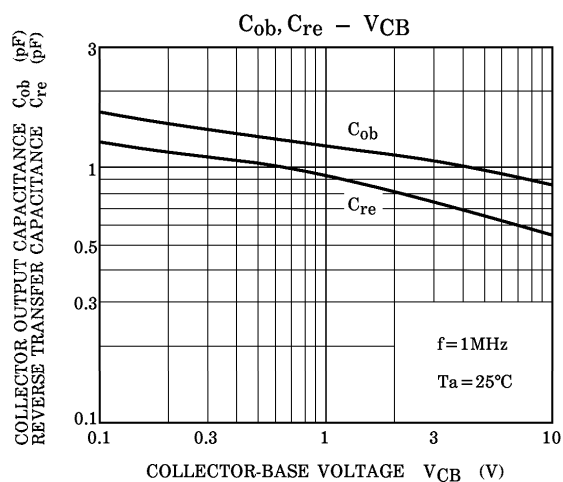
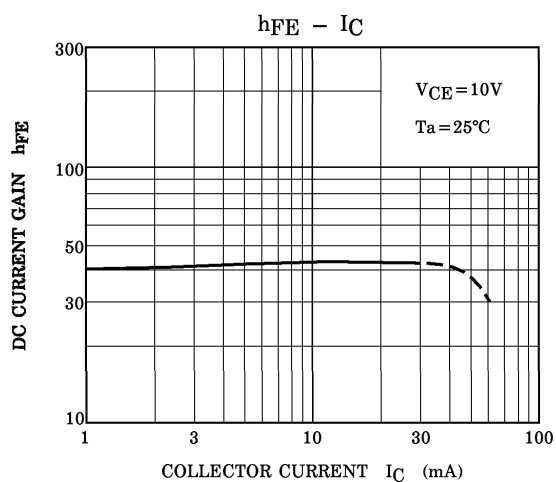
ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	I_{CBO}	$V_{CB} = 10\text{V}$, $I_E = 0$	—	—	0.1	μA
Emitter Cut-off Current	I_{EBO}	$V_{EB} = 1\text{V}$, $I_C = 0$	—	—	1.0	μA
DC Current Gain	h_{FE}	$V_{CE} = 10\text{V}$, $I_C = 5\text{mA}$	30	—	250	—
Output Capacitance	C_{ob}	$V_{CB} = 10\text{V}$, $I_E = 0$, $f = 1\text{MHz}$	—	0.9	—	pF
Reverse Transfer Capacitance	C_{re}	(Note)	—	0.6	—	pF

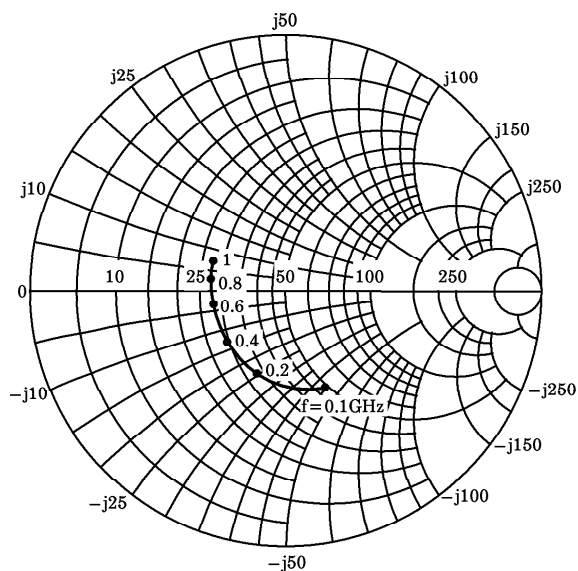
(Note) C_{re} is measured by 3 terminal method with Capacitance Bridge.

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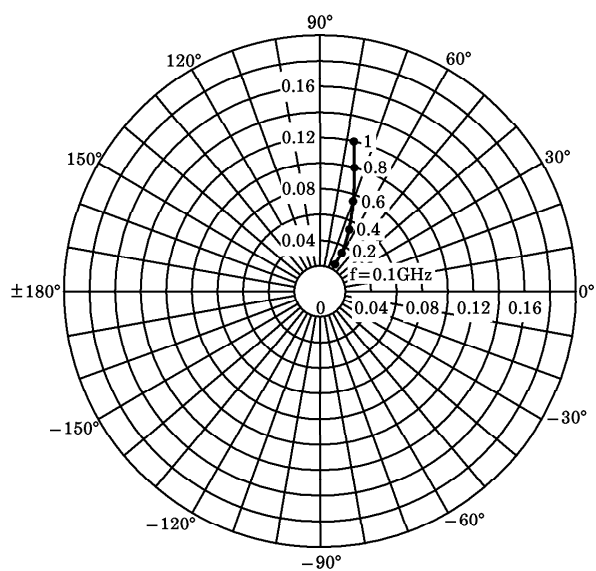
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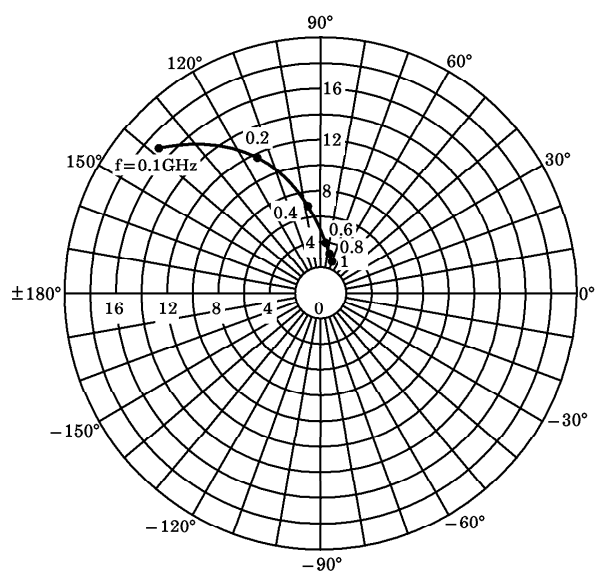
S11e
V_{CE} = 10V
I_C = 10mA
T_a = 25°C
(UNIT : Ω)



S12e
V_{CE} = 10V
I_C = 10mA
T_a = 25°C



S21e
V_{CE} = 10V
I_C = 10mA
T_a = 25°C



S22e
V_{CE} = 10V
I_C = 10mA
T_a = 25°C
(UNIT : Ω)

