

TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL PLANAR TYPE

# 2SC3099

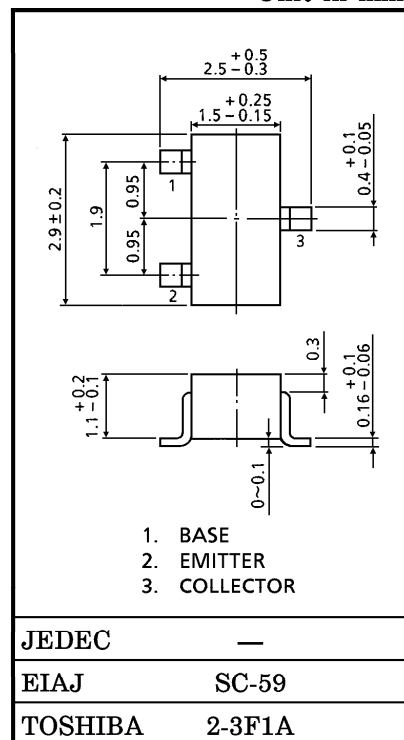
VHF ~ UHF BAND LOW NOISE AMPLIFIER APPLICATIONS

Unit in mm

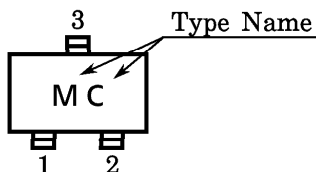
- Low Noise Figure
- $NF = 1.7dB, |S_{21e}|^2 = 15dB$  ( $f = 500MHz$ )
- $NF = 2.5dB, |S_{21e}|^2 = 9.5dB$  ( $f = 1GHz$ )

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

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	$^\circ C$
Storage Temperature Range	$T_{stg}$	-55~125	$^\circ C$



Marking



Weight : 0.012g

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Transition Frequency	$f_T$	$V_{CE} = 10V, I_C = 10mA$	—	4.0	—	GHz
Insertion Gain	$ S_{21e} ^2$ (1)	$V_{CE} = 10V, I_C = 10mA, f = 500MHz$	—	15.0	—	dB
	$ S_{21e} ^2$ (2)	$V_{CE} = 10V, I_C = 10mA, f = 1GHz$	—	9.5	—	dB
Noise Figure	NF (1)	$V_{CE} = 10V, I_C = 3mA, f = 500MHz$	—	1.7	—	dB
	NF (2)	$V_{CE} = 10V, I_C = 3mA, f = 1GHz$	—	2.5	—	dB

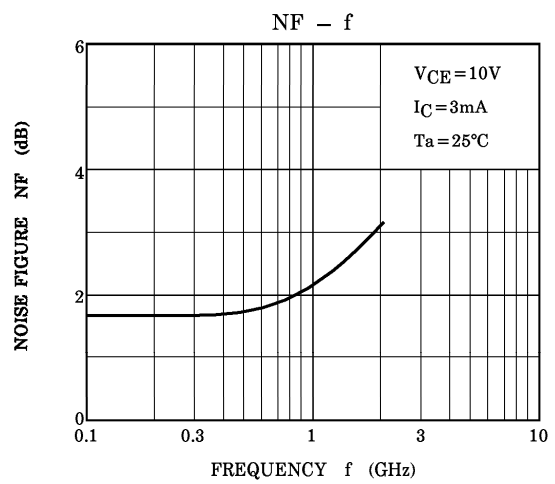
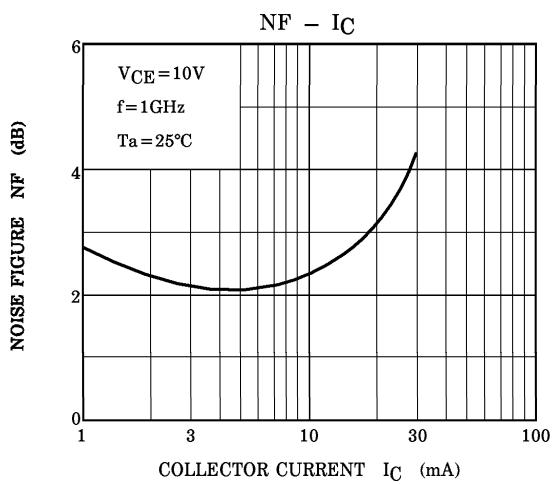
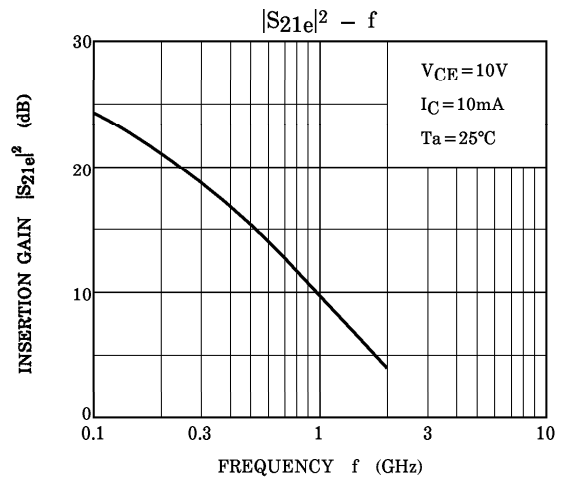
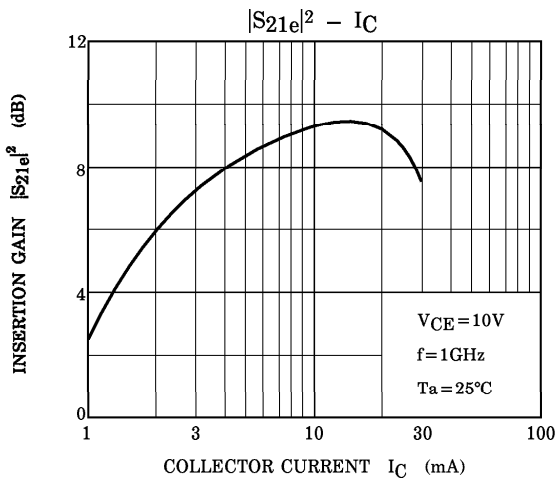
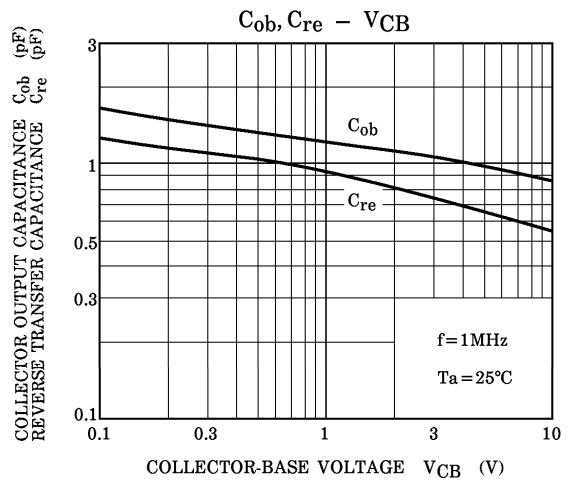
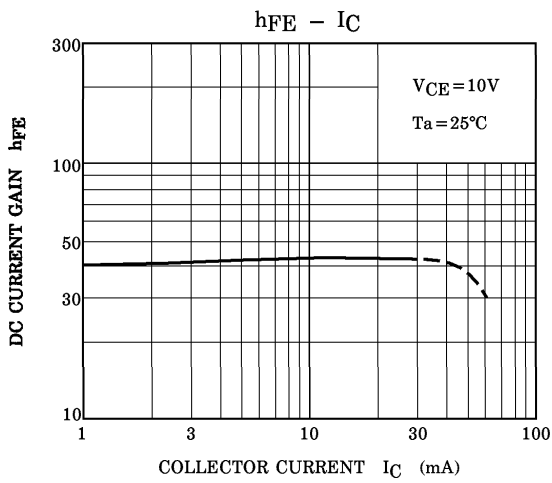
ELECTRICAL CHARACTERISTICS ( $T_a = 25^\circ C$ )

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

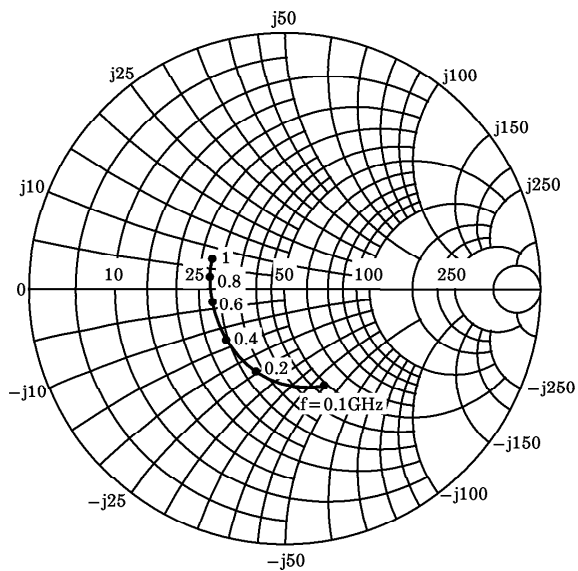
(Note)  $C_{re}$  is measured by 3 terminal method with Capacitance Bridge.

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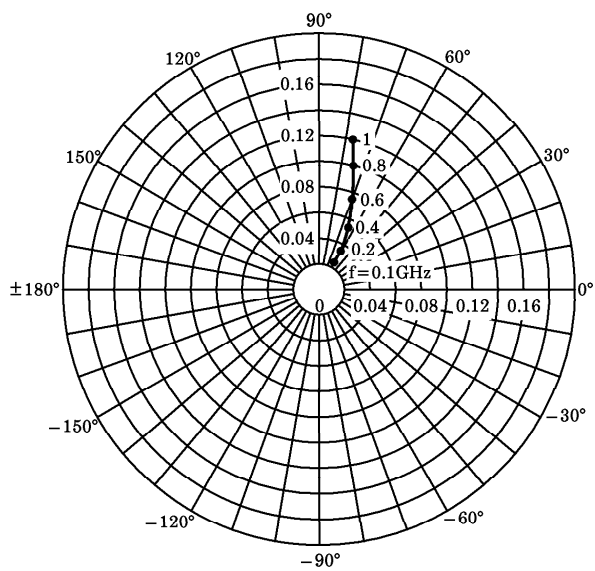
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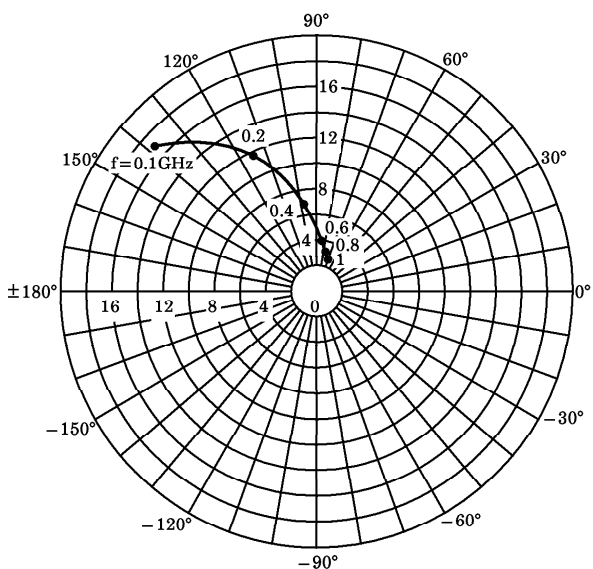
S11e  
 VCE = 10V  
 IC = 10mA  
 Ta = 25°C  
 (UNIT : Ω)



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



S21e  
 VCE = 10V  
 IC = 10mA  
 Ta = 25°C



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

