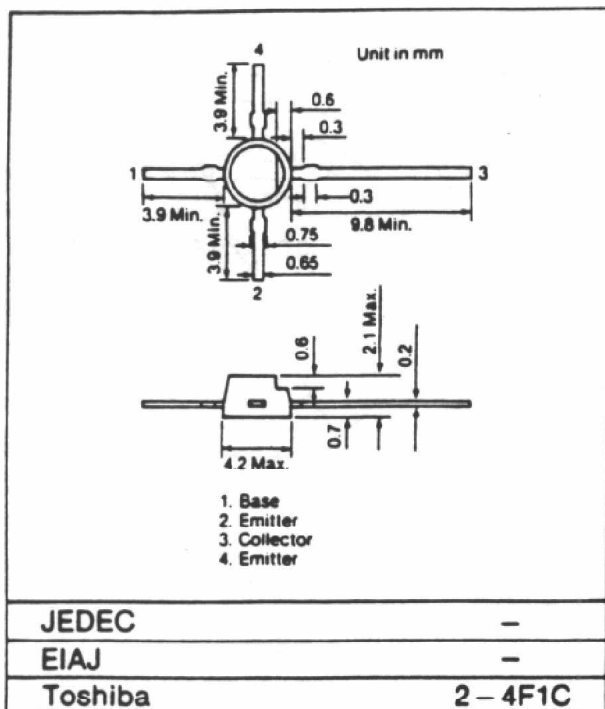


TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL PLANAR TYPE VHF-UHF BAND LOW NOISE AMPLIFIER APPLICATIONS



Marking: ME Weight: 0.08 g

Features:

- $NF = 1.5 \text{ dB}$, $S_{21e}^2 = 16.5 \text{ dB}$ ($f = 500 \text{ MHz}$)
- $NF = 1.7 \text{ dB}$, $S_{21e}^2 = 11 \text{ dB}$ ($f = 1000 \text{ MHz}$)

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

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage	V_{CBO}	17	V
Collector-Emitter Voltage	V_{CEO}	12	V
Emitter-Base Voltage	V_{EBO}	3	V
Base Current	I_B	30	mA
Collector Current	I_C	70	mA
Collector Power Dissipation	P_C	200	mW
Junction Temperature	T_J	125	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55~125	$^\circ\text{C}$

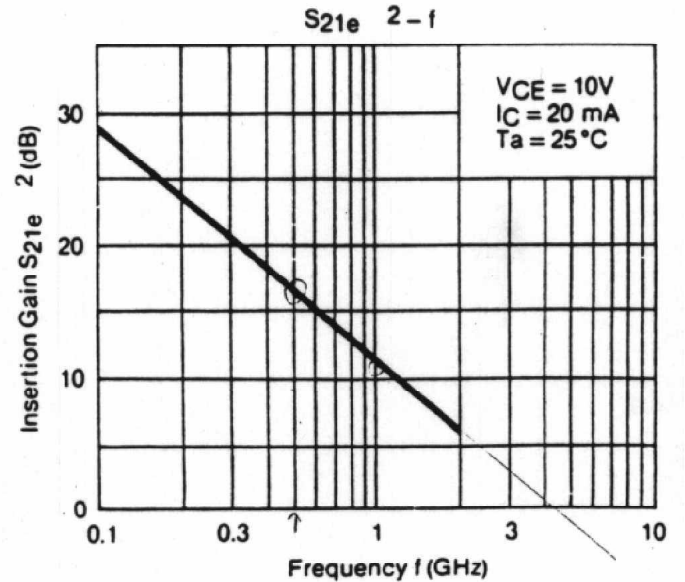
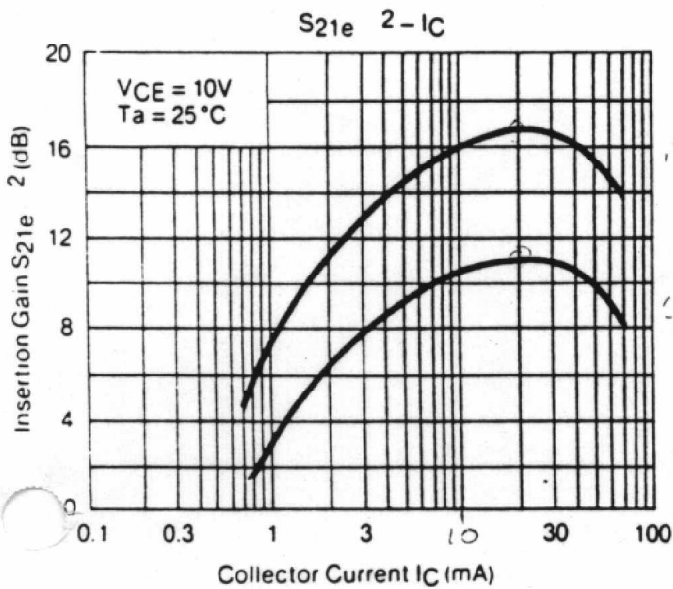
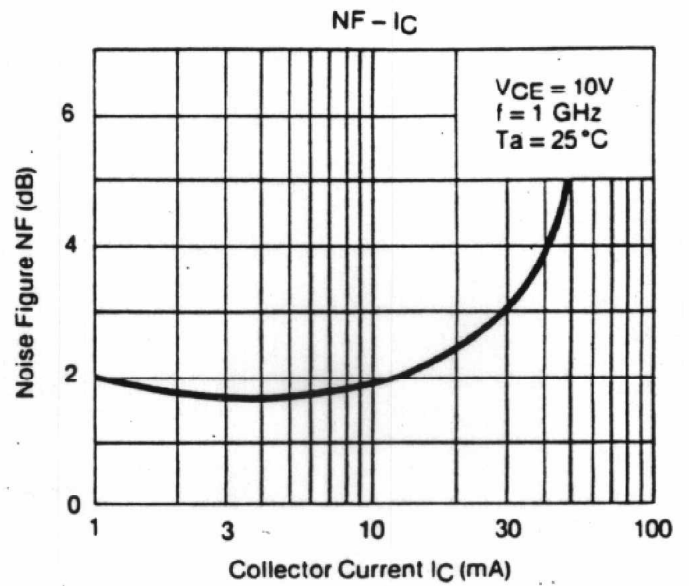
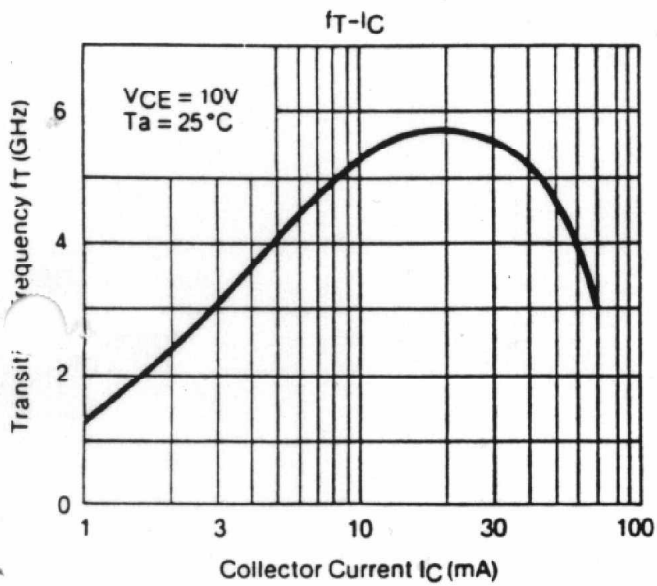
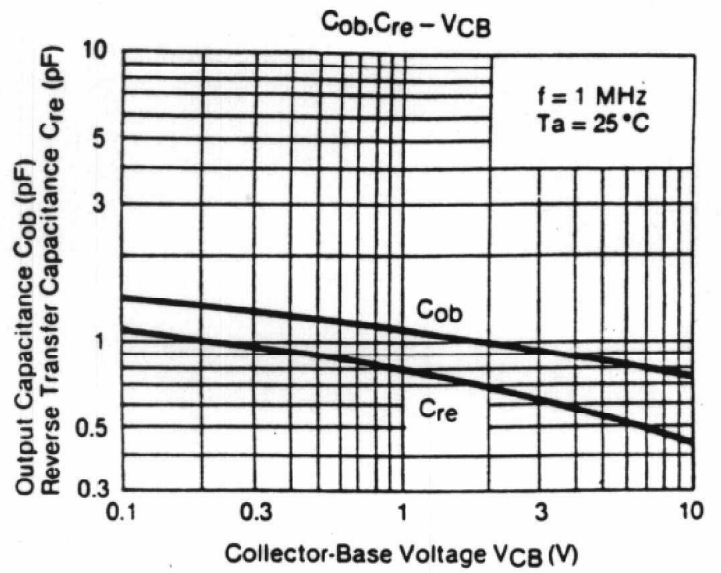
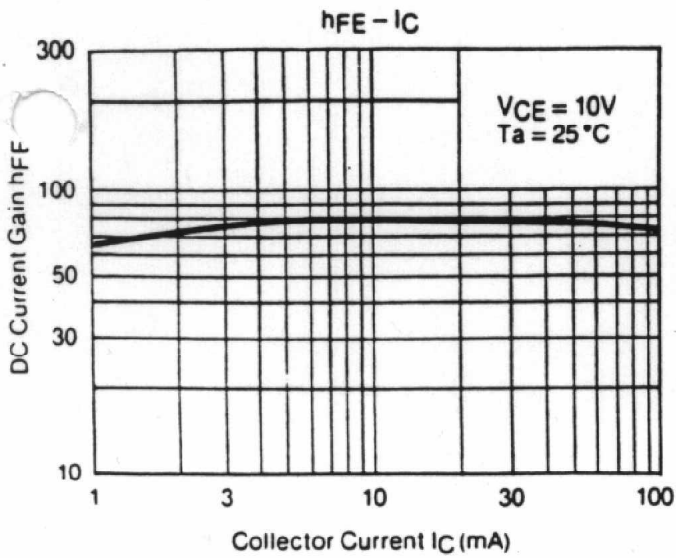
Microwave Characteristics ($T_a = 25^\circ\text{C}$)

Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Transition Frequency	f_T	$V_{CE} = 10\text{V}$, $I_C = 20 \text{ mA}$	-	5	-	GHz
Insertion Gain	$S_{21e}^2(1)$	$V_{CE} = 10\text{V}$, $I_C = 20 \text{ mA}$, $f = 500 \text{ MHz}$	-	16.5	-	dB
	$S_{21e}^2(2)$	$V_{CE} = 10\text{V}$, $I_C = 20 \text{ mA}$, $f = 1 \text{ GHz}$	-	11	-	dB
Noise Figure	NF (1)	$V_{CE} = 10\text{V}$, $I_C = 5 \text{ mA}$, $f = 500 \text{ MHz}$	-	1.5	-	dB
	NF (2)	$V_{CE} = 10\text{V}$, $I_C = 5 \text{ mA}$, $f = 1 \text{ GHz}$	-	1.7	-	dB

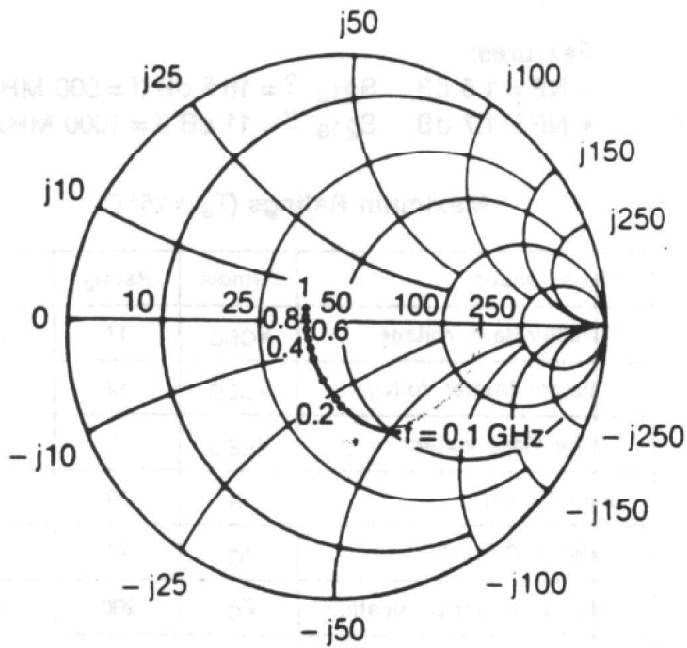
Electrical Characteristics ($T_a = 25^\circ\text{C}$)

Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Collector Cut-off Current	I_{CBO}	$V_{CB} = 10\text{V}$, $I_E = 0$	-	-	1	μA
Emitter Cut-off Current	I_{EBO}	$V_{EB} = 1\text{V}$, $I_C = 0$	-	-	1	μA
DC Current Gain	h_{FE}	$V_{CE} = 10\text{V}$, $I_C = 20\text{mA}$	25	-	-	
Output Capacitance	C_{ob}	$V_{CB} = 10\text{V}$, $I_C = 0$, $f = 1 \text{ MHz}$	-	0.8	-	pF
Reverse Transfer Capacitance	C_{re}	(Note)	-	0.45	-	pF

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

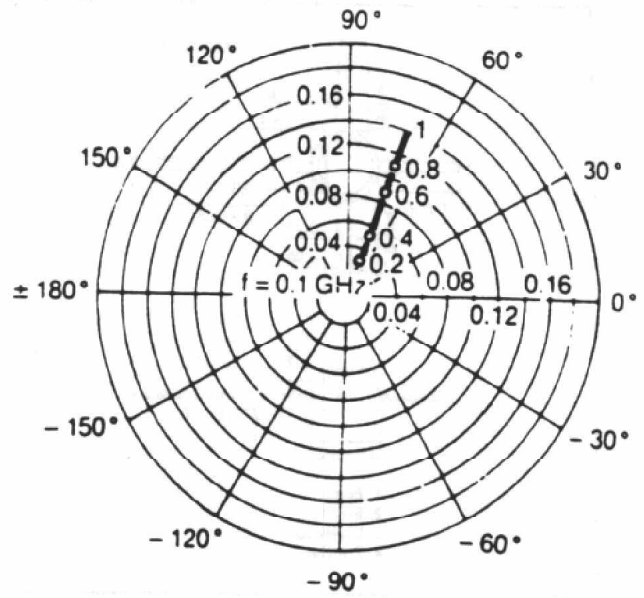


VCE = 10V
 IC = 20 mA
 Ta = 25°C



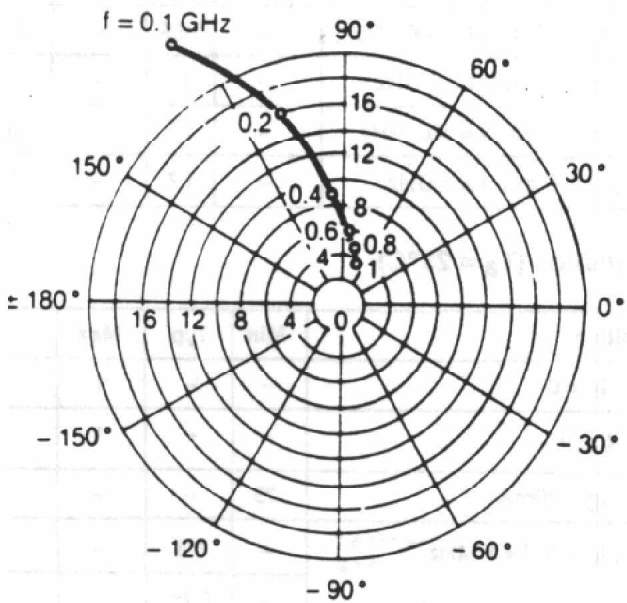
S11e
 (Unit: Ω)

VCE = 10V
 IC = 20 mA
 Ta = 25°C



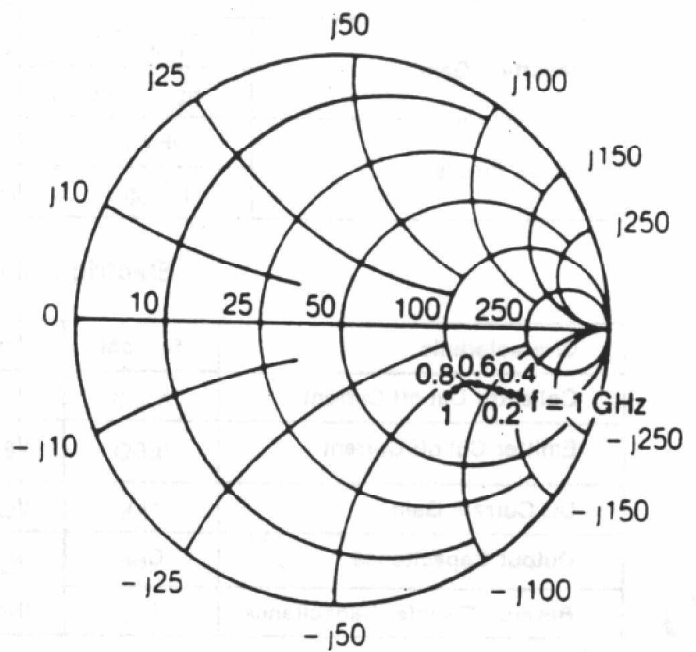
S12e

VCE = 10V
 IC = 20 mA
 Ta = 25°C



S21e

VCE = 10V
 IC = 20 mA
 Ta = 25°C



S22e
 (Unit: Ω)