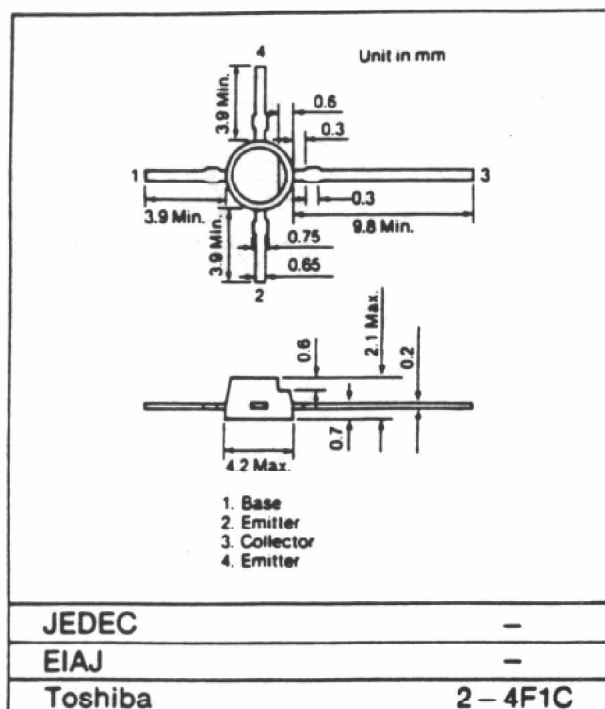


TOSHIBA TRANSISTOR

SILICON NPN EPITAXIAL PLANAR TYPE

VHF-UHF BAND LOW NOISE AMPLIFIER APPLICATIONS



Marking: ME Weight: 0.08 g

Features:

- NF = 1.5 dB, $S_{21e}^2 = 16.5$ dB ($f = 500$ MHz)
- NF = 1.7 dB, $S_{21e}^2 = 11$ dB ($f = 1000$ 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}	$-55 \sim 125$	$^\circ\text{C}$

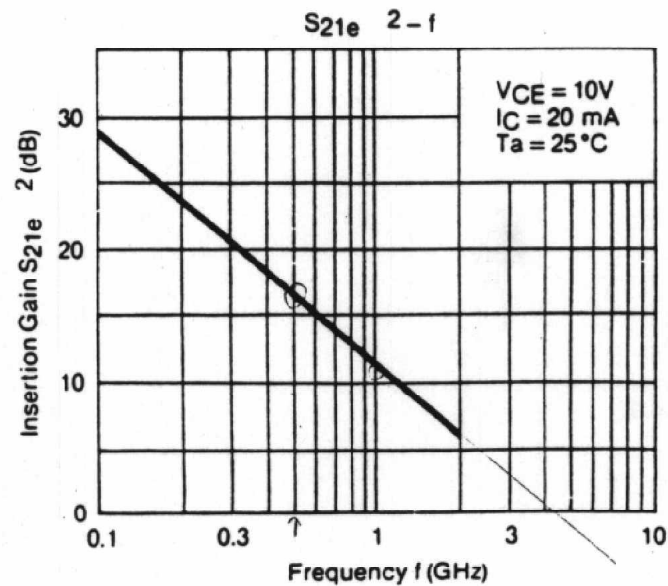
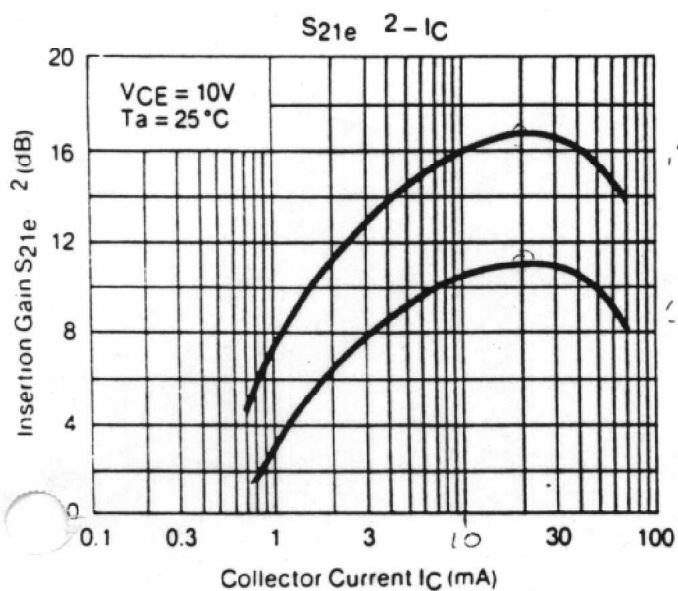
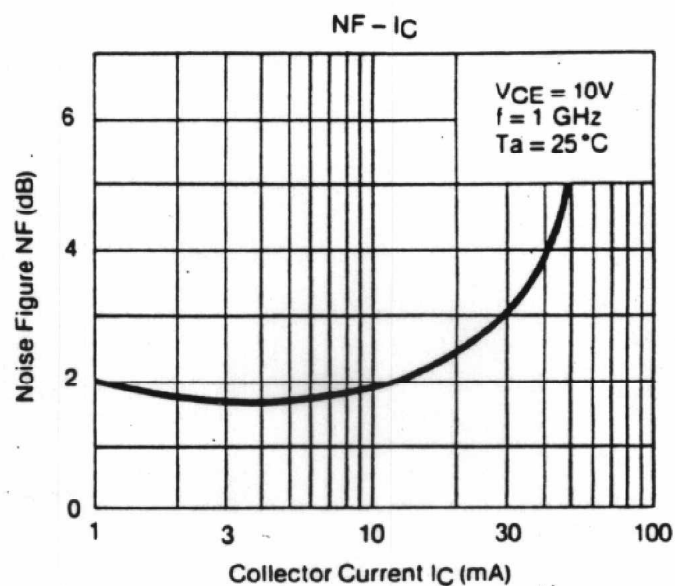
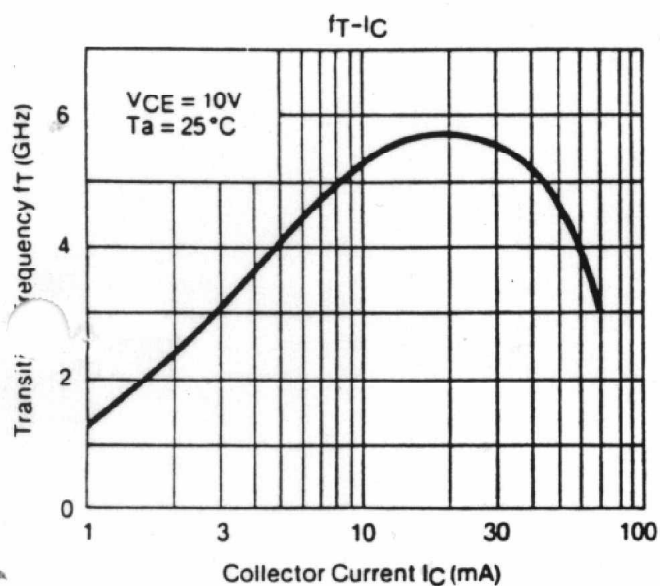
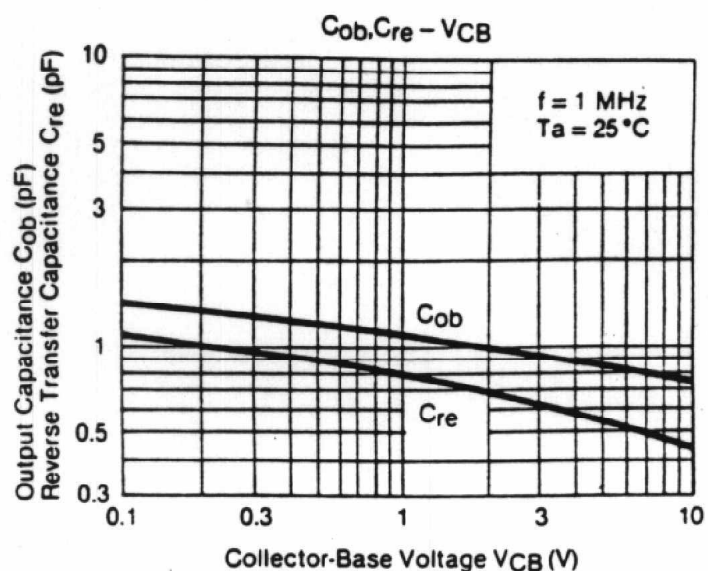
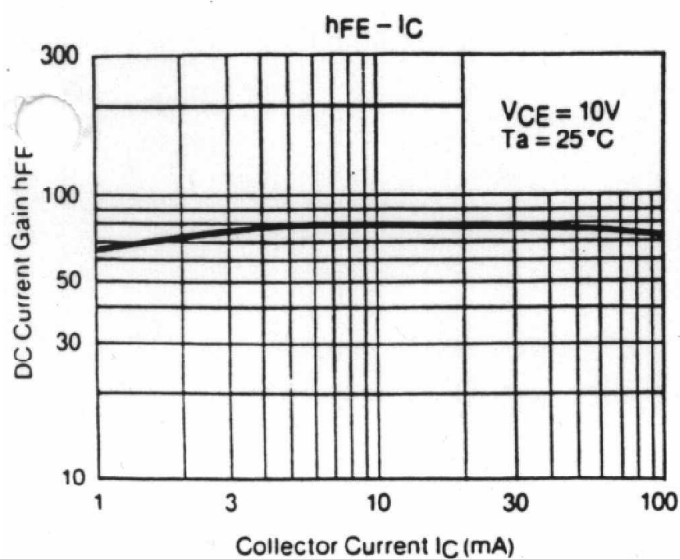
Microwave Characteristics ($T_a = 25^\circ\text{C}$)

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	$S_{21e}^2(1)$	$V_{CE} = 10\text{V}, I_C = 20\text{ mA}, f = 500\text{ GHz}$	—	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

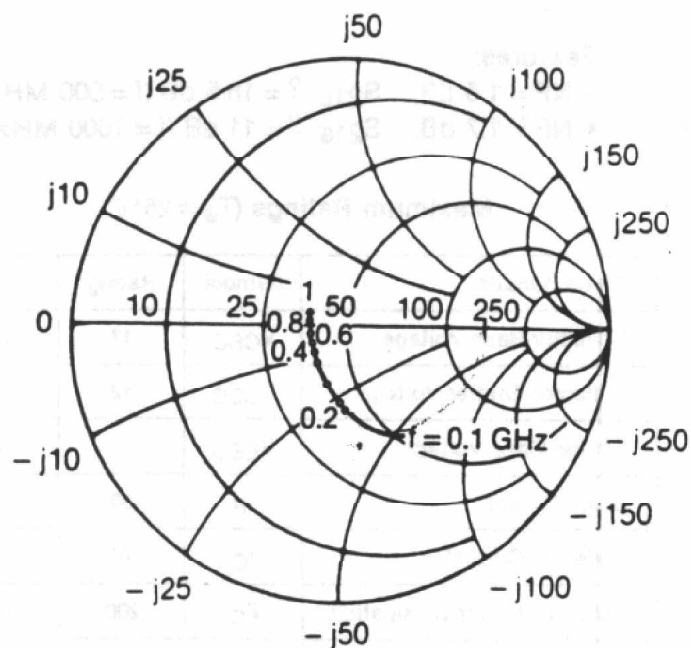
Electrical Characteristics ($T_a = 25^\circ\text{C}$)

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}	$V_{CB} = 10\text{V}, I_C = 0, f = 1\text{ MHz}$ $C_{ex} + C_{CB} + C_{CE}$	—	0.8	—	pF
Reverse Transfer Capacitance	C_{re}	(Note) C_{μ}	—	0.45	—	pF

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

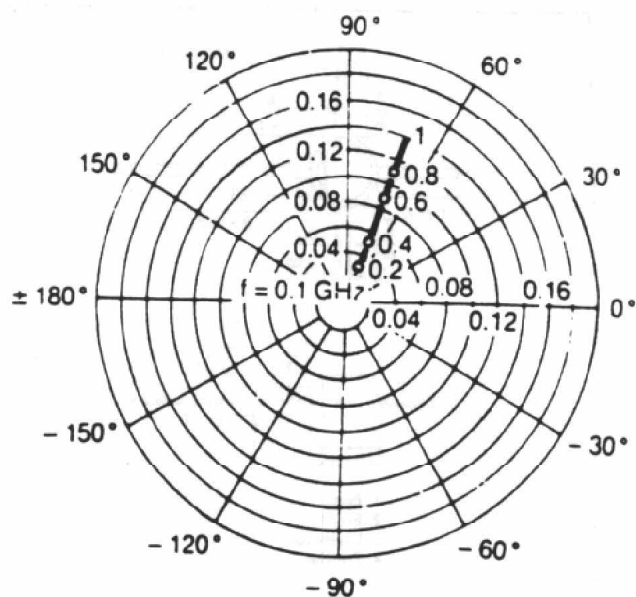


$V_{CE} = 10V$
 $I_C = 20\text{ mA}$
 $T_a = 25^\circ\text{C}$



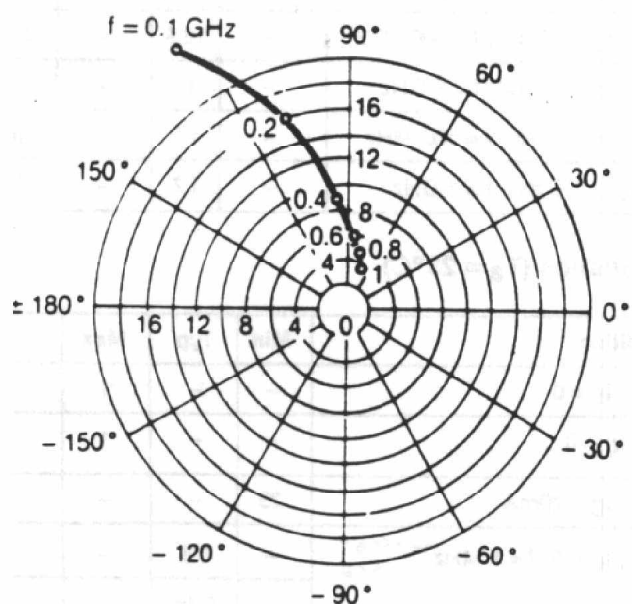
S_{11e}
 (Unit: Ω)

$V_{CE} = 10V$
 $I_C = 20\text{ mA}$
 $T_a = 25^\circ\text{C}$



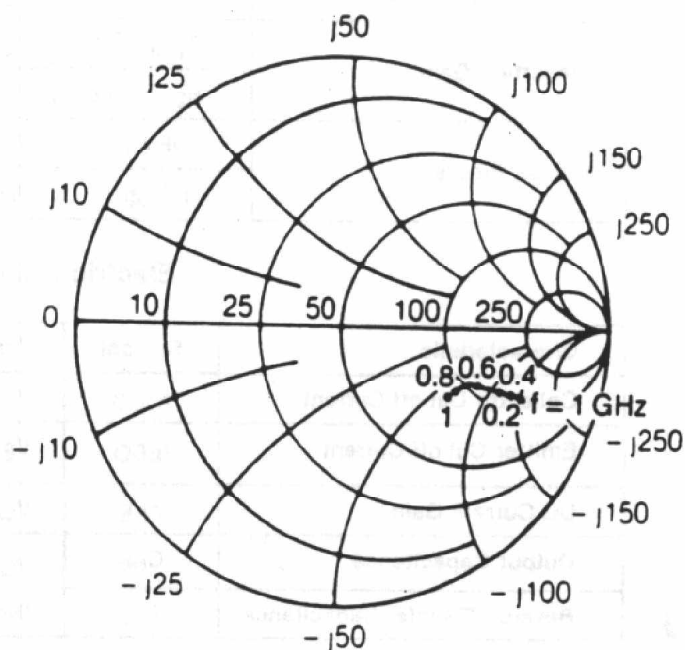
S_{12e}

$V_{CE} = 10V$
 $I_C = 20\text{ mA}$
 $T_a = 25^\circ\text{C}$



S_{21e}

$V_{CE} = 10V$
 $I_C = 20\text{ mA}$
 $T_a = 25^\circ\text{C}$



S_{22e}
 (Unit: Ω)