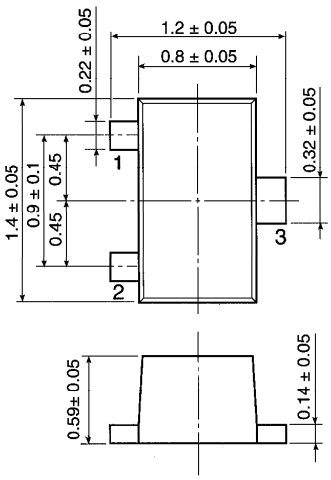
TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL PLANAR TYPE

MT3S06T

VHF~UHF BAND LOW NOISE AMPLIFIER APPLICATIONS

Unit in mm



1. BASE
2. EMITTER
3. COLLECTOR

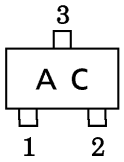
JEDEC	—
EIAJ	—
TOSHIBA	2-1B1A

- Low Noise Figure : $NF = 1.6\,dB$
  ($V_{CE} = 3\,V$, $I_C = 3\,mA$, $f = 2\,GHz$)
- High Gain : $|S_{21e}|^2 = 9.5\,dB$
  ($V_{CE} = 3\,V$, $I_C = 7\,mA$, $f = 2\,GHz$)

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	V_{CBO}	10	V
Collector-Emitter Voltage	V_{CEO}	5	V
Emitter-Base Voltage	V_{EBO}	1.5	V
Base Current	I_C	15	mA
Collector Current	I_B	7	mA
Collector Power Dissipation	P_C	60	mW
Junction Temperature	T_j	125	°C
Storage Temperature Range	T_{stg}	−55~125	°C

MARKING



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MICROWAVE CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Transition Frequency	f_T	V_{CE} = 3 V, I_C = 5 mA	7	10	—	GHz
Insertion Gain	$\|S_{21e}\|^2$ (1)	V_{CE} = 1 V, I_C = 5 mA, f = 2 GHz	—	8.5	—	dB
	$\|S_{21e}\|^2$ (2)	V_{CE} = 3 V, I_C = 7 mA, f = 2 GHz	6.5	9.5	—	
Noise Figure	NF (1)	V_{CE} = 1 V, I_C = 3 mA, f = 2 GHz	—	1.7	3	dB
	NF (2)	V_{CE} = 3 V, I_C = 3 mA, f = 2 GHz	—	1.6	3	

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

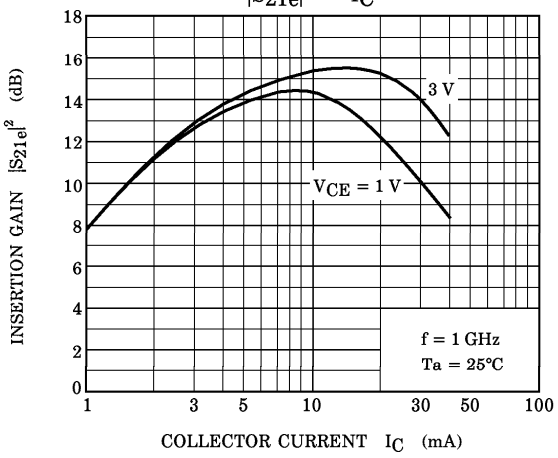
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	I_{CBO}	V_{CB} = 5 V, I_E = 0	—	—	0.1	μA
Emitter Cut-off Current	I_{EBO}	V_{EB} = 1 V, I_C = 0	—	—	1	μA
DC Current Gain	h_{FE}	V_{CE} = 1 V, I_C = 5 mA	70	—	140	—
Reverse Transfer Capacitance	C_{re}	V_{CB} = 1 V, I_E = 0, f = 1 MHz (Note)	—	0.25	0.7	pF

(Note) : C_{re} is measured by 3 terminal method with capacitance bridge.

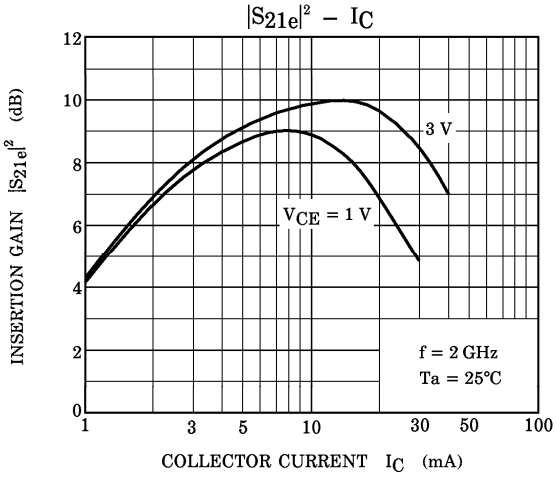
CAUTION

This device electrostatic sensitivity. Please handle with caution.

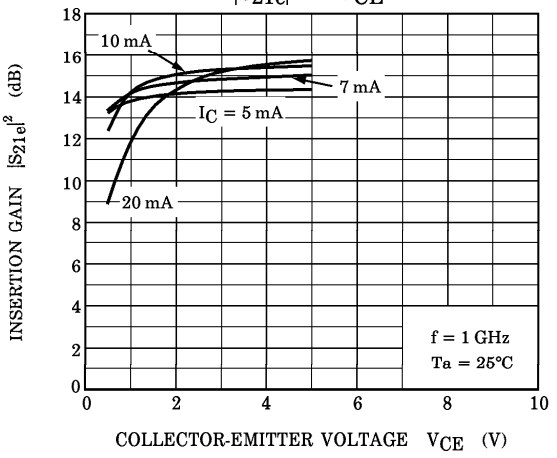
$|S_{21e}|^2$ – I_C



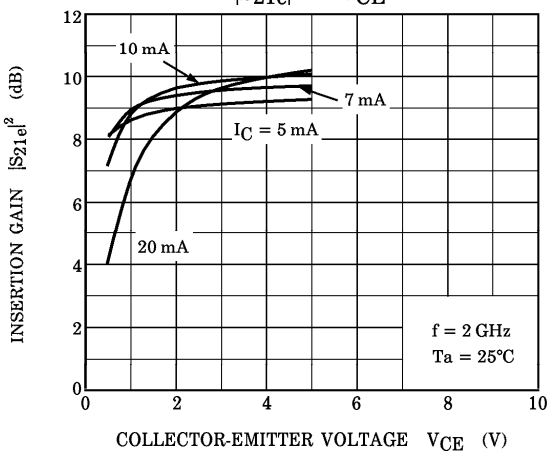
$|S_{21e}|^2$ – I_C



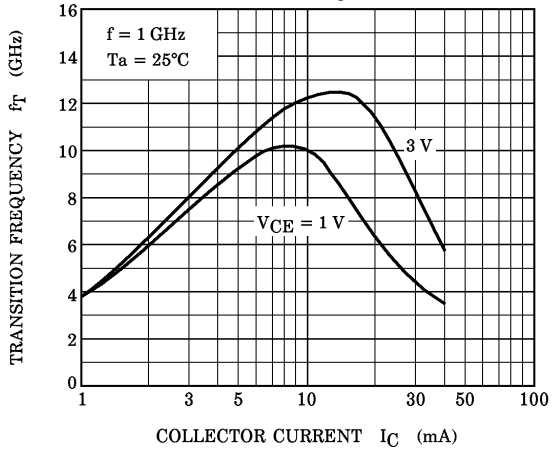
$|S_{21e}|^2$ – V_{CE}



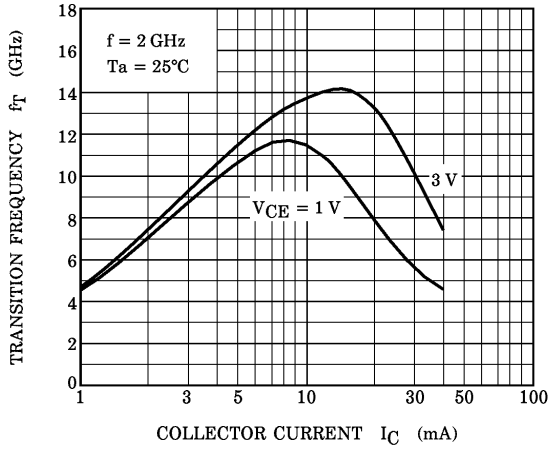
$|S_{21e}|^2$ – V_{CE}

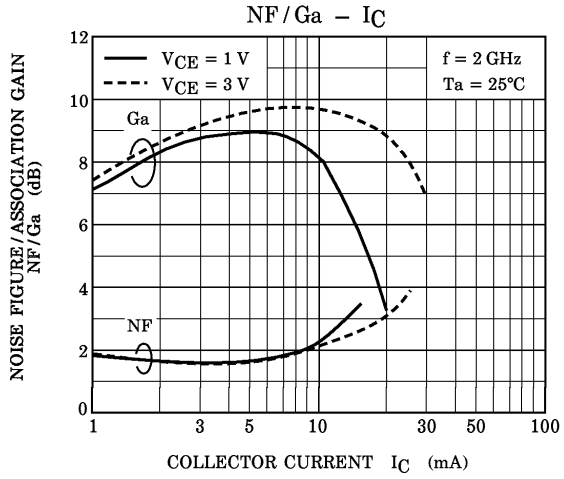


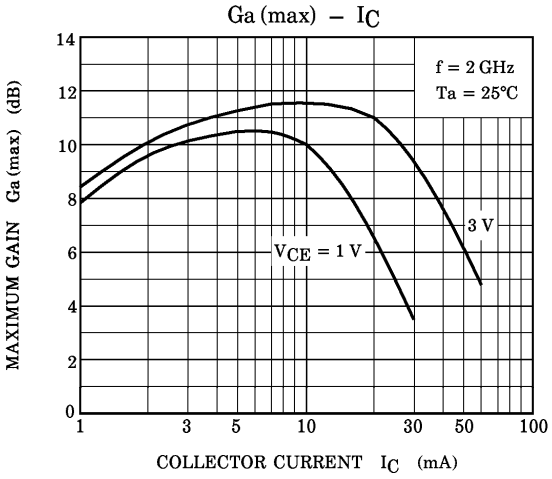
f_T – I_C

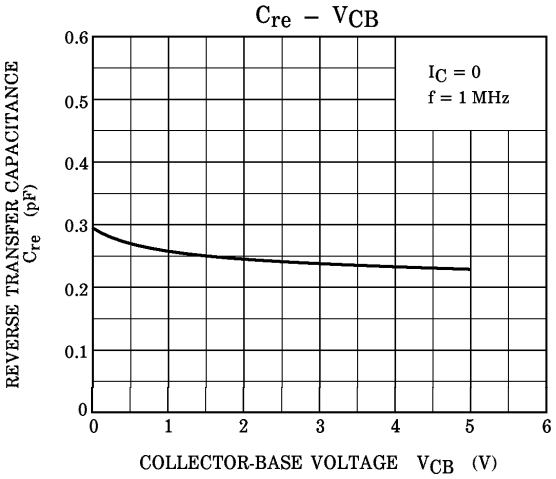


f_T – I_C




NF / Ga – IC
NOISE FIGURE / ASSOCIATION GAIN NF / Ga (dB)
VCE = 1 V
VCE = 3 V
f = 2 GHz
Ta = 25°C
Ga
NF
COLLECTOR CURRENT IC (mA)


Ga (max) – IC
MAXIMUM GAIN Ga (max) (dB)
f = 2 GHz
Ta = 25°C
3 V
VCE = 1 V
COLLECTOR CURRENT IC (mA)


Cre – VCB
REVERSE TRANSFER CAPACITANCE Cre (pF)
IC = 0
f = 1 MHz
COLLECTOR-BASE VOLTAGE VCB (V)