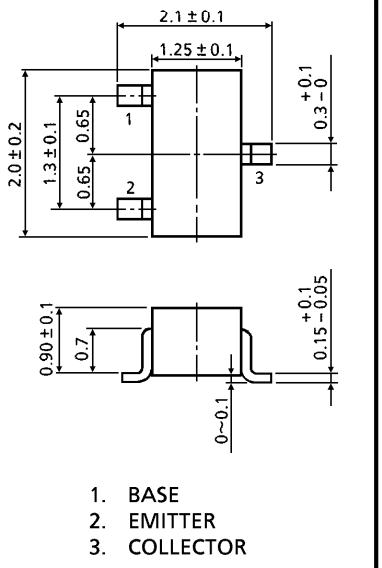
TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL PLANAR TYPE

2SC4244

UHF TV TUNER RF AMPLIFIER APPLICATIONS

Unit in mm

- Low Noise Figure : NF = 4dB (Typ.)
- High Power Gain : Gpb = 17dB (Typ.)
- Excellent Forward AGC Characteristics



1. BASE
2. EMITTER
3. COLLECTOR

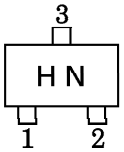
JEDEC	—
EIAJ	SC-70
TOSHIBA	2-2E1A

Weight : 0.006g

MAXIMUM RATINGS (Ta = 25°C)

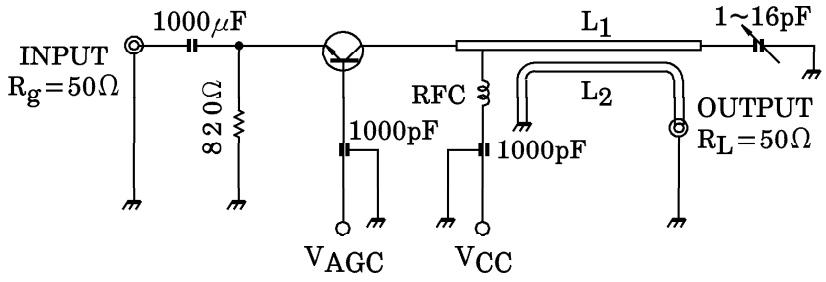
CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	V_{CBO}	25	V
Collector-Emitter Voltage	V_{CEO}	20	V
Emitter-Base Voltage	V_{EBO}	2	V
Base Current	I_B	4	mA
Collector Current	I_C	20	mA
Collector Power Dissipation	P_C	100	mW
Junction Temperature	T_j	125	°C
Storage Temperature Range	T_{stg}	−55~125	°C

Marking



ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	I_{CBO}	V_{CB} = 10V, I_E = 0	—	—	0.1	μA
Emitter Cut-off Current	I_{EBO}	V_{EB} = 2V, I_C = 0	—	—	1	μA
Collector Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C = 1mA, I_B = 0	20	—	—	V
DC Current Gain	h_{FE}	V_{CE} = 3V, I_C = 1mA	40	100	—	—
Transition Frequency	f_T	V_{CE} = 3V, I_C = 1mA	500	850	—	MHz
Reverse Transfer Capacitance	C_{rb}	V_{CE} = 2V, I_B = 0, f = 1MHz	—	0.4	0.55	pF
Power Gain	G_{pb}	V_{CC} = 4.5V, V_{AGC} = 2V	12	17	—	dB
Noise Figure	NF	f = 800MHz (Fig.1)	—	4	6	dB
AGC Voltage	V_{AGC}	V_{CC} = 4.5V, G.R. = −20dB, f = 800MHz	2.5	3.2	4.0	V

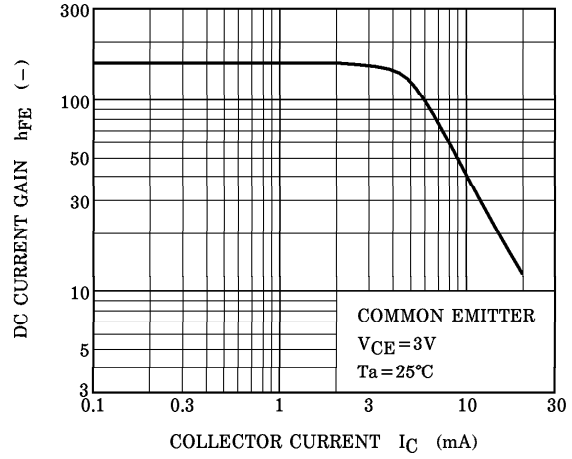


L_1, L_2 : ϕ1.0mm SILVER PLATED COPPER WIRE

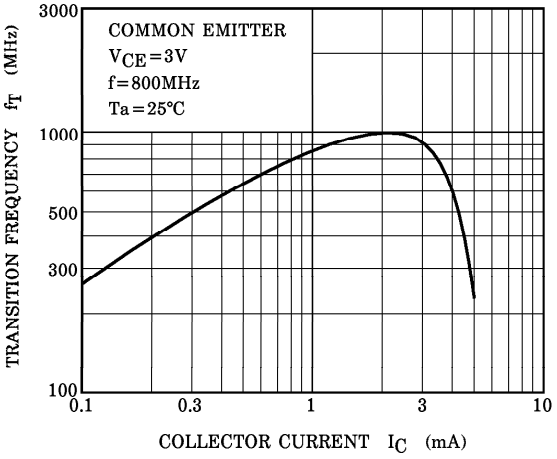
(Note) V_{AGC} measured by the test circuit shown in Fig.1, when the power gain is reduced to 20dB compared with G_{pb} shown above Table.

Fig.1 800MHz G_{pb}, NF TEST CIRCUIT

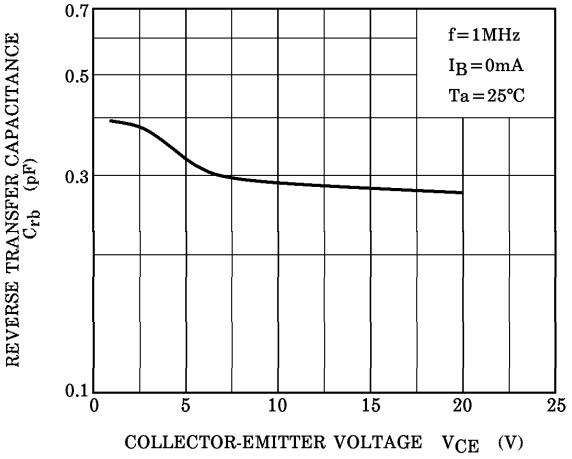
h_{FE} – I_C



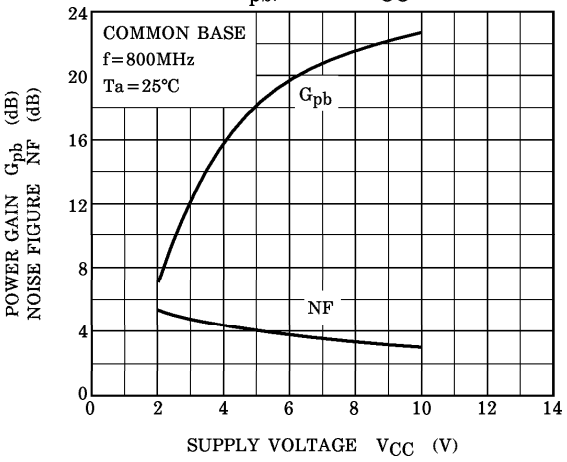
f_T – I_C



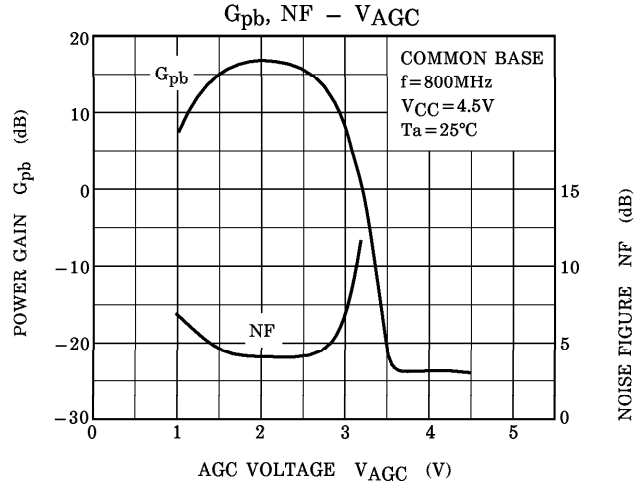
C_{rb} – V_{CE}



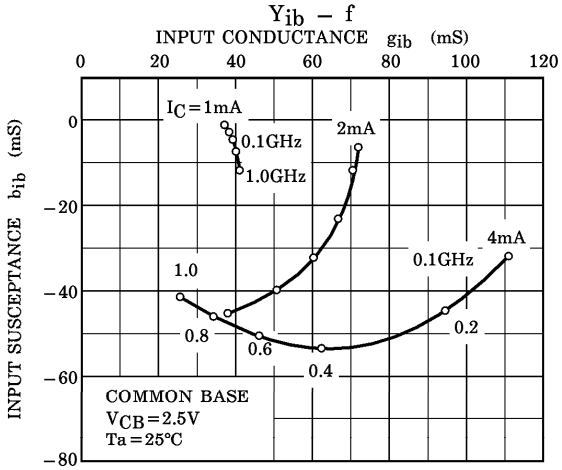
G_{pb}, NF – V_{CC}

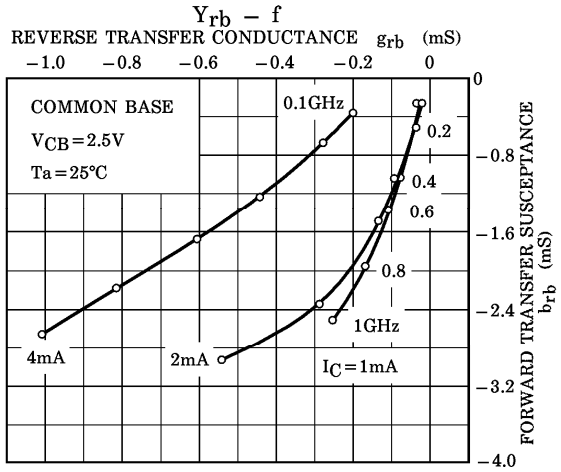


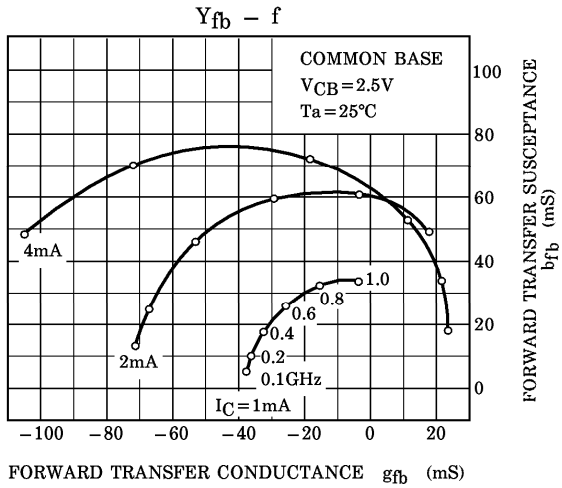
G_{pb}, NF – V_{AGC}

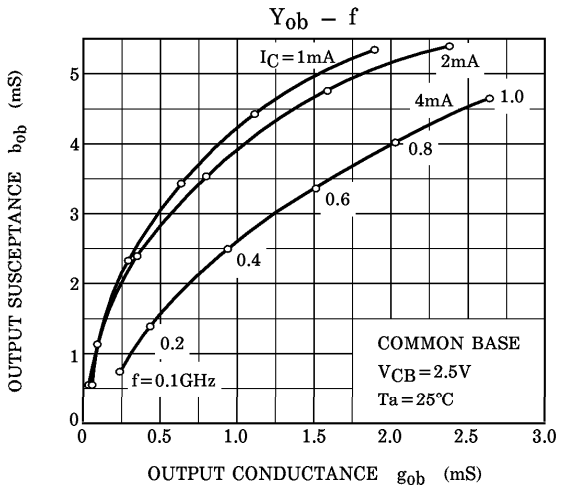


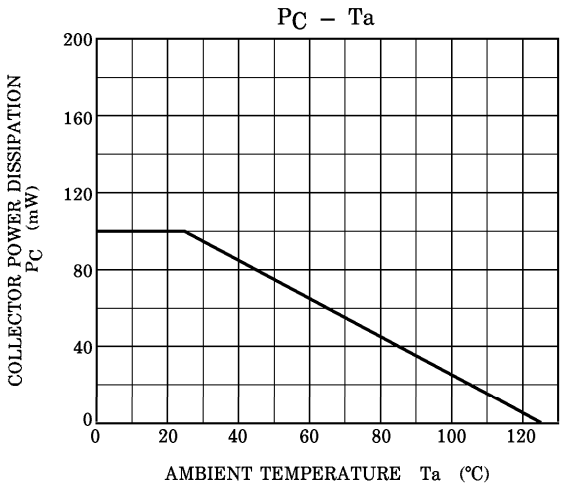
Y_{ib} – f




Y_{rb} – f
REVERSE TRANSFER CONDUCTANCE g_{rb} (mS)
−1.0 −0.8 −0.6 −0.4 −0.2 0
COMMON BASE
V_{CB} = 2.5V
Ta = 25°C
0.1GHz
0.2
0.4
0.6
0.8
1GHz
4mA
2mA
I_C = 1mA
0 −0.8 −1.6 −2.4 −3.2 −4.0
FORWARD TRANSFER SUSCEPTANCE b_{rb} (mS)


Y_{fb} – f
COMMON BASE
V_{CB} = 2.5V
Ta = 25°C
4mA
2mA
1.0
0.8
0.6
0.4
0.2
0.1GHz
I_C = 1mA
100 80 60 40 20 0
FORWARD TRANSFER SUSCEPTANCE b_{fb} (mS)
−100 −80 −60 −40 −20 0 20
FORWARD TRANSFER CONDUCTANCE g_{fb} (mS)


Y_{ob} – f
I_C = 1mA
2mA
4mA
1.0
0.8
0.6
0.4
0.2
f = 0.1GHz
COMMON BASE
V_{CB} = 2.5V
Ta = 25°C
OUTPUT SUSCEPTANCE b_{ob} (mS)
0 1 2 3 4 5
0 0.5 1.0 1.5 2.0 2.5 3.0
OUTPUT CONDUCTANCE g_{ob} (mS)


P_C – Ta
COLLECTOR POWER DISSIPATION P_C (mW)
200 160 120 80 40 0
0 20 40 60 80 100 120
AMBIENT TEMPERATURE Ta (°C)

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000707EAA

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