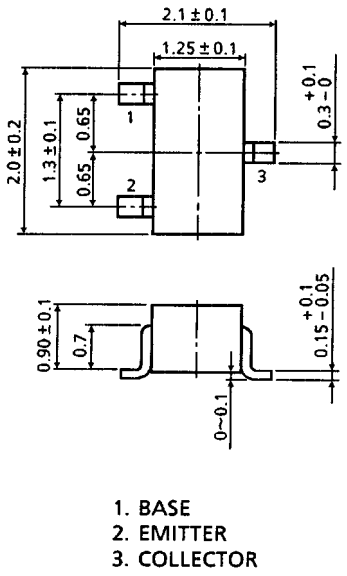
TOSHIBA Transistor Silicon NPN Epitaxial Planar Type

2SC4244

UHF TV Tuner RF Amplifier Applications

- Low noise figure: NF = 4dB (typ.)
- High power gain: Gpb = 17dB (typ.)
- Excellent forward AGC characteristics

Unit: mm



JEDEC	—
JEITA	SC-70
TOSHIBA	2-2E1A

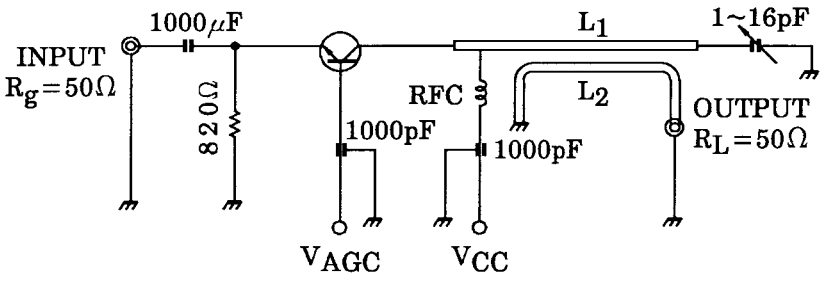
Weight: 0.006 g (typ.)

Maximum Ratings (Ta = 25°C)

Characteristics	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

Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}	V_{CB} = 10 V, I_E = 0	—	—	0.1	μA
Emitter cut-off current	I_{EBO}	V_{EB} = 2 V, I_C = 0	—	—	1	μA
Collector-emitter breakdown voltage	$V_{(BR)\ CEO}$	I_C = 1 mA, I_B = 0	20	—	—	V
DC current gain	h_{FE}	V_{CE} = 3 V, I_C = 1 mA	40	100	—	
Transition frequency	f_T	V_{CE} = 3 V, I_C = 1 mA	500	850	—	MHz
Reverse transfer capacitance	C_{rb}	V_{CE} = 2 V, I_B = 0, f = 1 MHz	—	0.4	0.55	pF
Power gain	G_{pe}	V_{CC} = 4.5 V, V_{AGC} = 2.0 V	12	17	—	dB
Noise figure	NF	f = 800 MHz (Figure 1)	—	4	6	dB
AGC voltage	V_{AGC}	V_{CC} = 4.5 V, G.R. = −20dB, f = 800 MHz (Note)	2.5	3.2	4.0	V

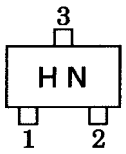


L_1, L_2: ϕ1.0 mm silver plated copper wire

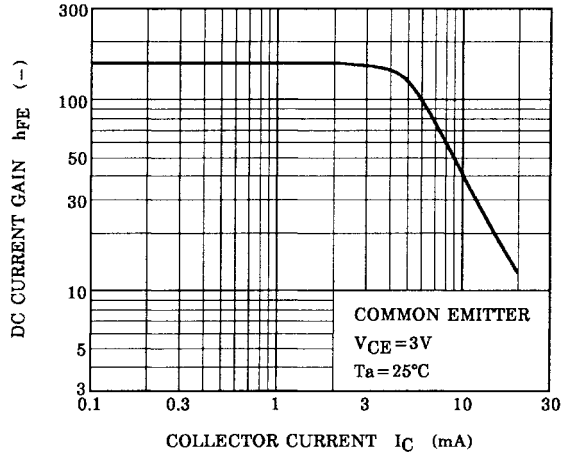
Note: V_{AGC} measured by the test circuit shown in Figure 1, when the power gain is reduced to 20dB compared with G_{pb} shown above table.

Figure 1 800 MHz G_{pe}, NF Test Circuit

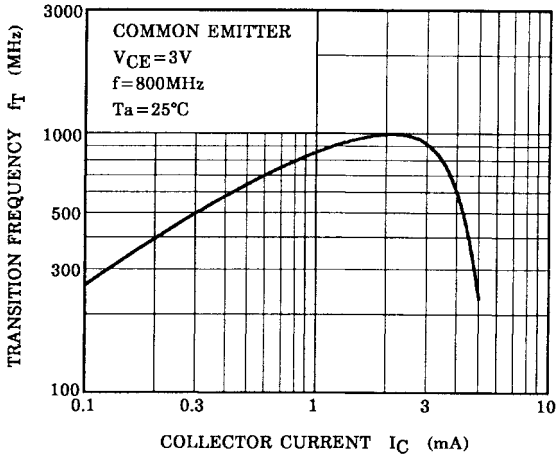
Marking



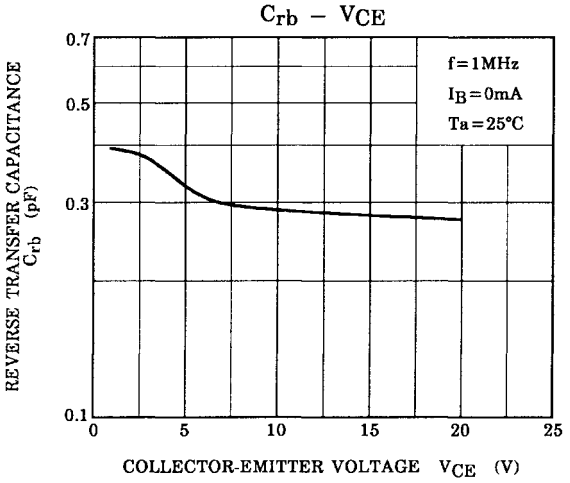
h_{FE} – I_C



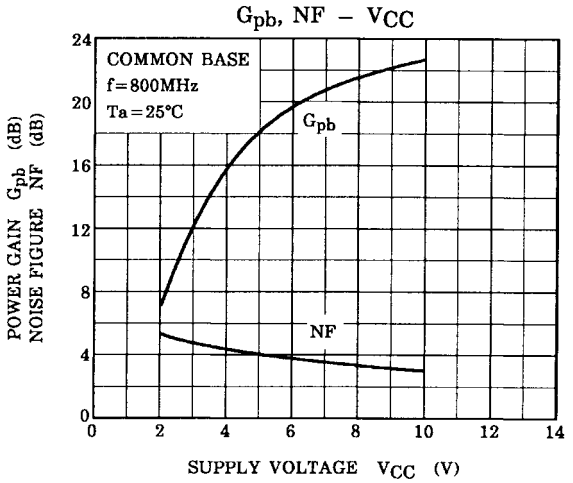
f_T – I_C



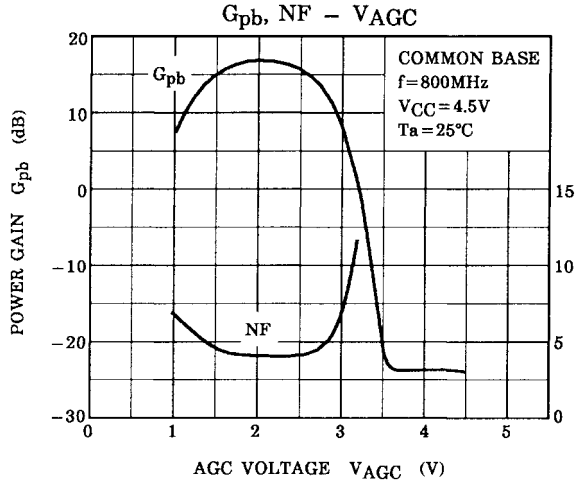
C_{rb} – V_{CE}



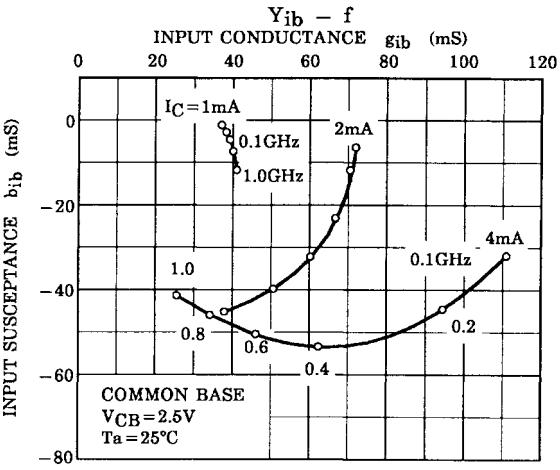
G_{pb}, NF – V_{CC}

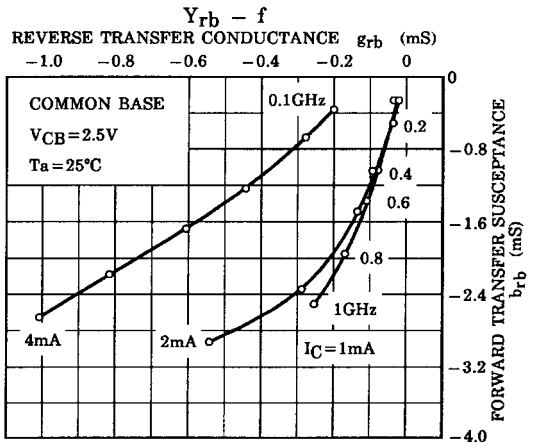


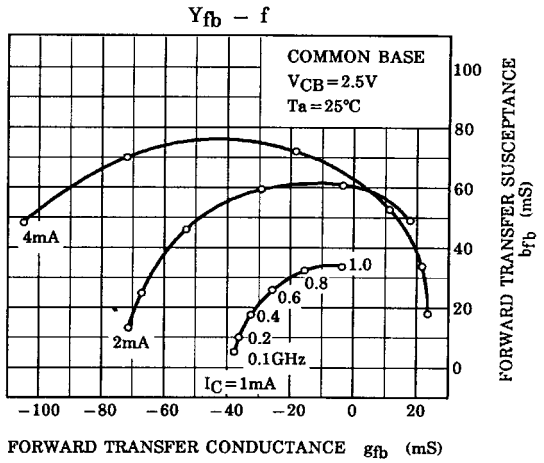
G_{pb}, NF – V_{AGC}

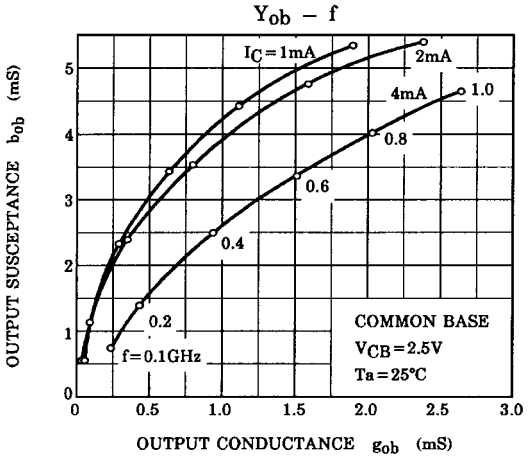


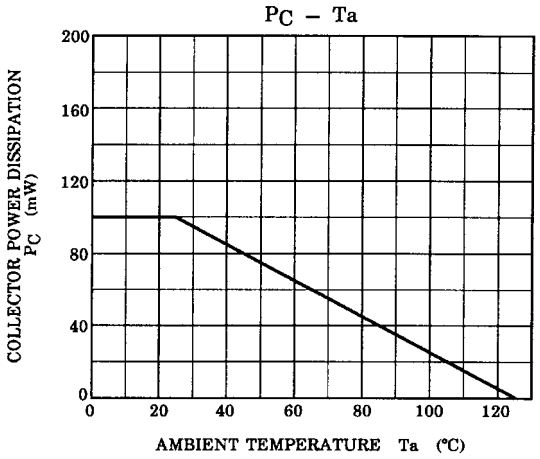
Y_{ib} – f




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
0.1GHz
0.2
0.4
0.6
0.8
1.0
I_C=1mA
100
80
60
40
20
0
−100 −80 −60 −40 −20 0 20
FORWARD TRANSFER CONDUCTANCE g_{fb} (mS)
FORWARD TRANSFER SUSCEPTANCE b_{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
5
4
3
2
1
0
0 0.5 1.0 1.5 2.0 2.5 3.0
OUTPUT CONDUCTANCE g_{ob} (mS)
OUTPUT SUSCEPTANCE b_{ob} (mS)


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

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