

TOSHIBA Transistor Silicon NPN Planar Type

# 2SC4214

## UHF TV Tuner RF Amplifier Applications

- Low noise figure: NF = 2.8dB (typ.)
- High power gain  $V_{CC} = 4.5\text{ V}$ :  $G_{pb} = 15\text{ dB}$  (typ.)
- Excellent forward AGC characteristics

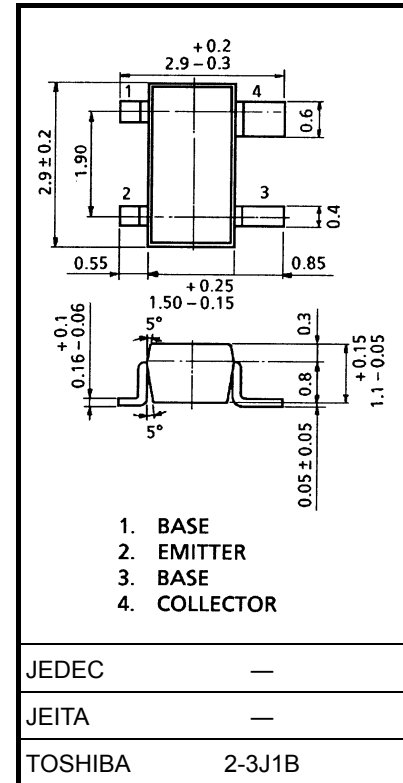
## Absolute Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Collector-base voltage	$V_{CB0}$	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	$P_C$	150	mW
Junction temperature	$T_j$	125	°C
Storage temperature range	$T_{stg}$	-55~125	°C

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

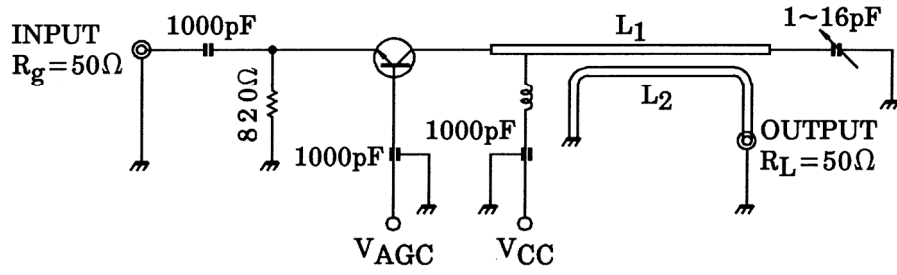
Unit: mm



Weight: 0.013 g (typ.)

## Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	$I_{CBO}$	$V_{CB} = 10\text{ V}$ , $I_E = 0$	—	—	0.1	μA
Emitter cut-off current	$I_{EBO}$	$V_{EB} = 2\text{ V}$ , $I_C = 0$	—	—	1	μA
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C = 1\text{ mA}$ , $I_B = 0$	20	—	—	V
DC current gain	$h_{FE}$	$V_{CE} = 3.0\text{ V}$ , $I_C = 1\text{ mA}$	40	100	—	
Transition frequency	$f_T$	$V_{CE} = 3.0\text{ V}$ , $I_C = 1\text{ mA}$	500	850	—	MHz
Reverse transfer capacitance	$C_{rb}$	$V_{CE} = 2.0\text{ V}$ , $I_B = 0$ , $f = 1\text{ MHz}$	—	0.3	0.5	pF
Power gain	$G_{pb}$	$V_{CC} = 4.5\text{ V}$ , $V_{AGC} = 2.0\text{ V}$	10	15	—	dB
Noise figure	NF	$f = 800\text{ MHz}$ (Figure 1)	—	2.8	4.5	dB
AGC voltage	$V_{AGC}$	$V_{CC} = 4.5\text{ V}$ , G.R. = -20dB $f = 800\text{ MHz}$ (Note)	2.5	3.2	4.0	V

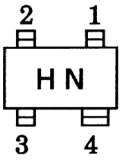


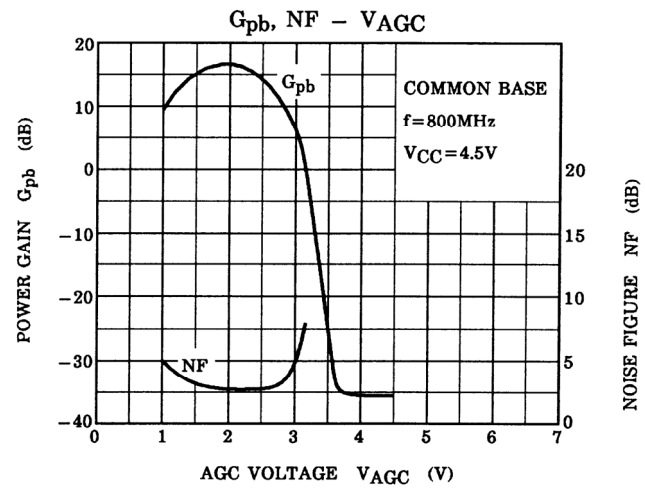
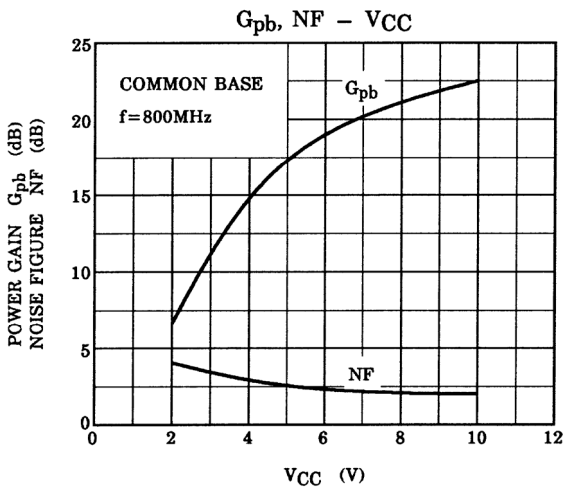
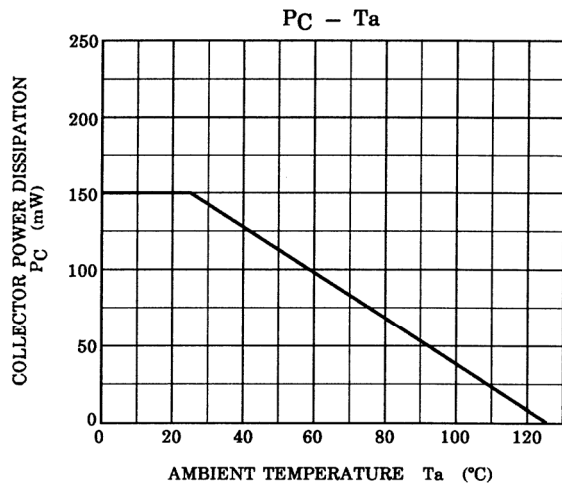
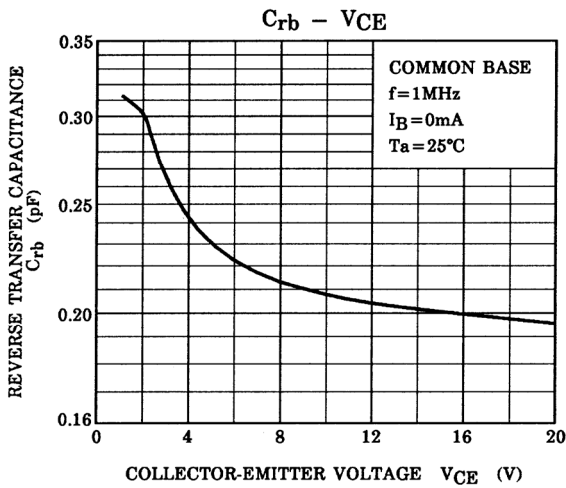
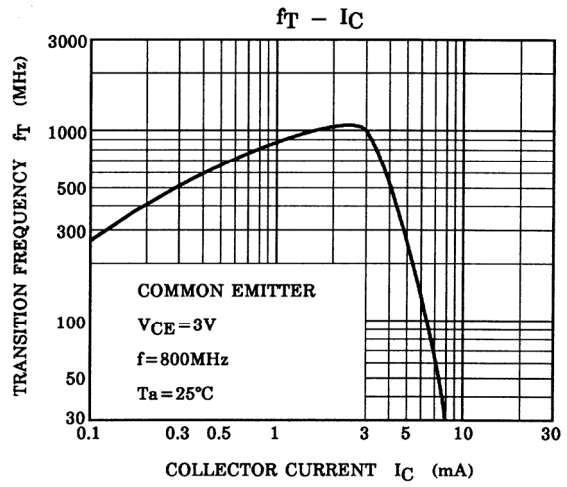
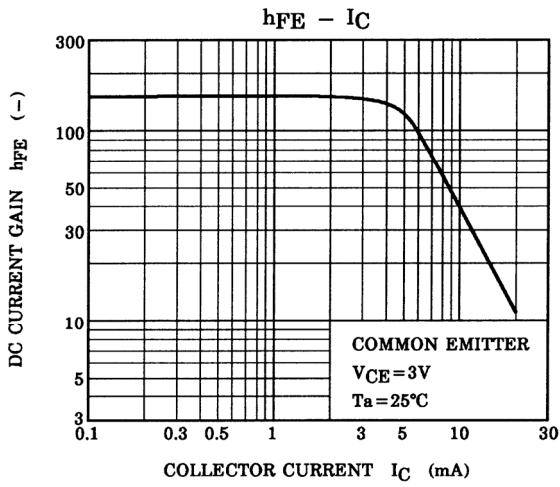
L<sub>1</sub>, L<sub>2</sub>: φ1.0 mm silver plated copper wire

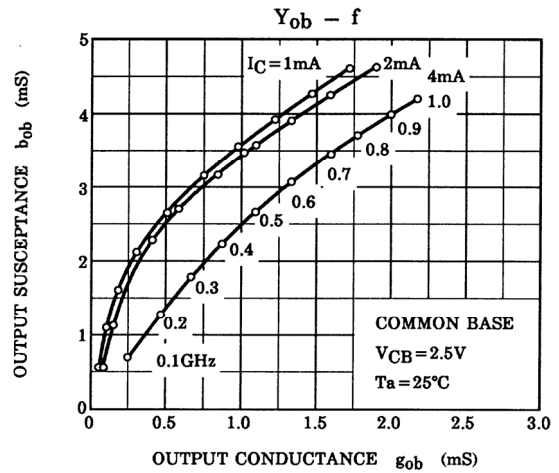
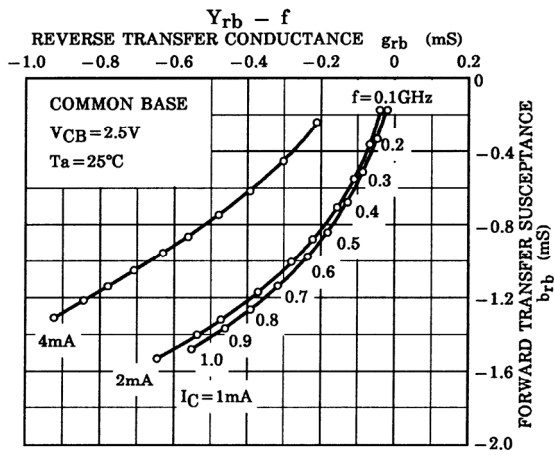
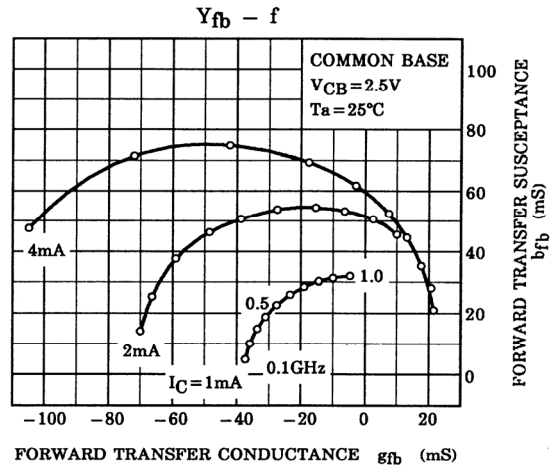
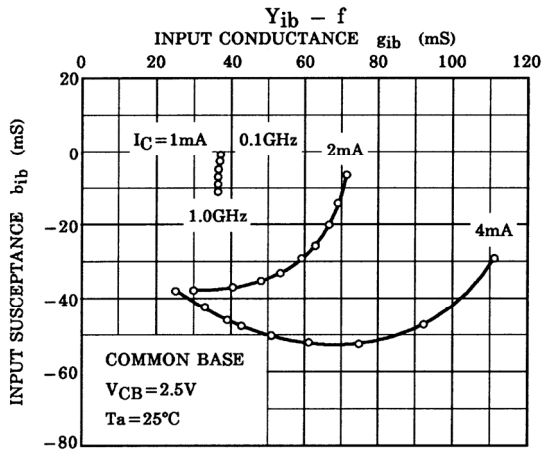
Note: V<sub>AGC</sub> measured by the test circuit shown in Figure 1, when the power gain is reduced to 20dB compared with G<sub>pb</sub> shown above table.

**Figure 1 800 MHz G<sub>pb</sub>, NF Test Circuit**

**Marking**







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20070701-EN GENERAL

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