

TOSHIBA Transistor Silicon NPN Epitaxial Planar Type

# 2SC4215

High Frequency Amplifier Applications

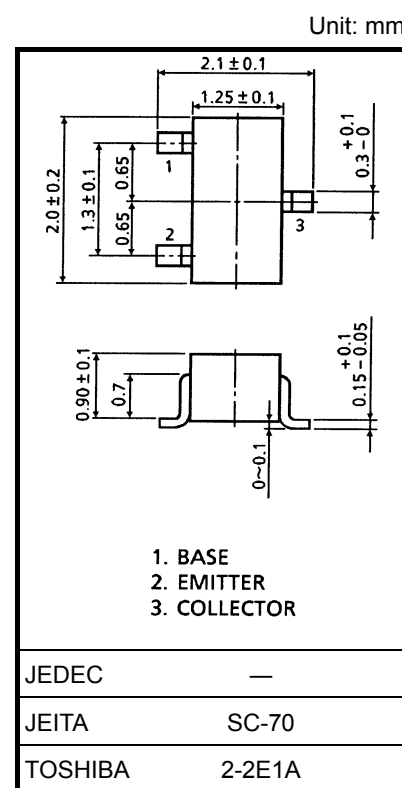
FM, RF, MIX, IF Amplifier Applications

- Small reverse transfer capacitance:  $C_{re} = 0.55$  pF (typ.)
- Low noise figure:  $NF = 2$  dB (typ.) ( $f = 100$  MHz)

## Absolute Maximum Ratings ( $T_a = 25^\circ\text{C}$ )

Characteristics	Symbol	Rating	Unit
Collector-base voltage	$V_{CBO}$	40	V
Collector-emitter voltage	$V_{CEO}$	30	V
Emitter-base voltage	$V_{EBO}$	4	V
Collector current	$I_C$	20	mA
Base current	$I_B$	4	mA
Collector power dissipation	$P_C$	100	mW
Junction temperature	$T_j$	125	$^\circ\text{C}$
Storage temperature range	$T_{stg}$	-55~125	$^\circ\text{C}$

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).

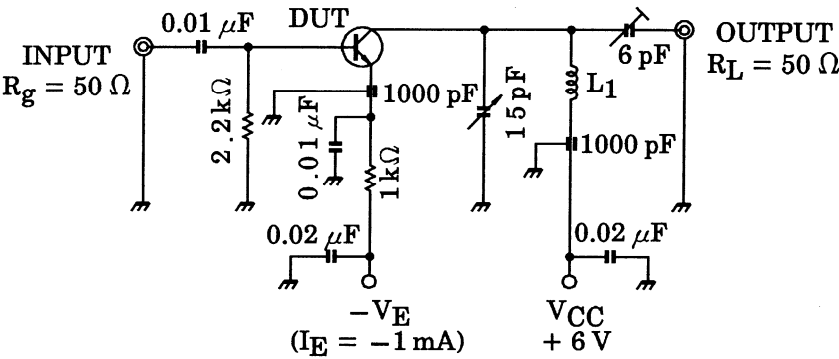


Weight: 0.006 g (typ.)

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

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	$I_{CBO}$	$V_{CB} = 40$ V, $I_E = 0$	—	—	0.1	$\mu\text{A}$
Emitter cut-off current	$I_{EBO}$	$V_{EB} = 4$ V, $I_C = 0$	—	—	0.5	$\mu\text{A}$
DC current gain	$h_{FE}$ (Note)	$V_{CE} = 6$ V, $I_C = 1$ mA	40	—	200	
Reverse transfer capacitance	$C_{re}$	$V_{CB} = 10$ V, $f = 1$ MHz	—	0.55	—	pF
Transition frequency	$f_T$	$V_{CE} = 6$ V, $I_C = 1$ mA	260	550	—	MHz
Collector-base time constant	$C_c \cdot f_{bb'}$	$V_{CE} = 6$ V, $I_E = -1$ mA, $f = 30$ MHz	—	—	25	ps
Noise figure	NF	$V_{CC} = 6$ V, $I_E = -1$ mA, $f = 100$ MHz, Figure 1	—	2	5.0	dB
Power gain	$G_{pe}$		17	23	—	dB

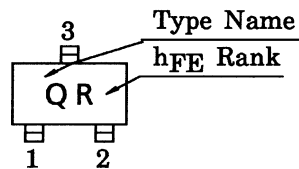
Note:  $h_{FE}$  classification R: 40~80, O: 70~140, Y: 100~200

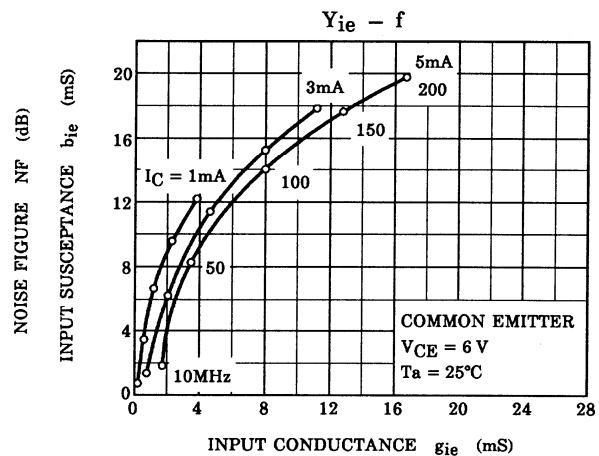
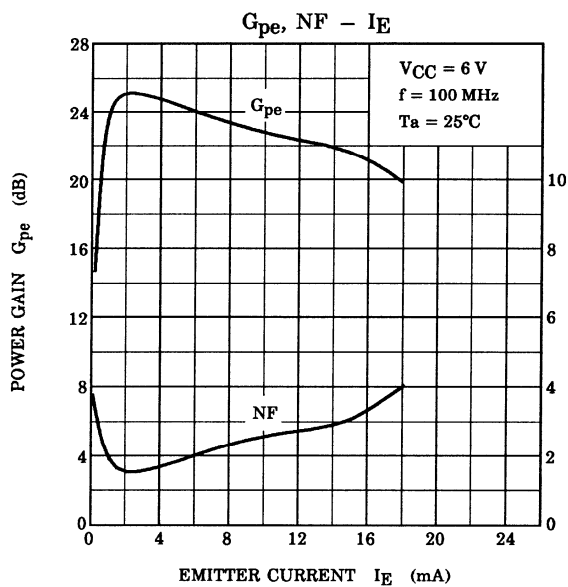
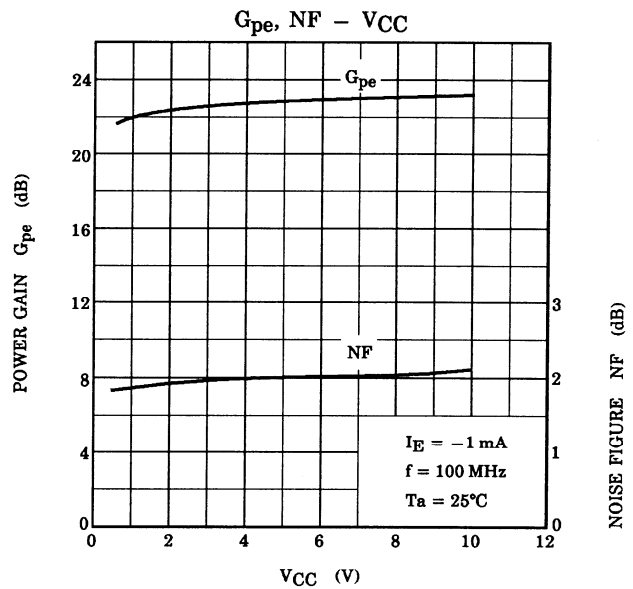
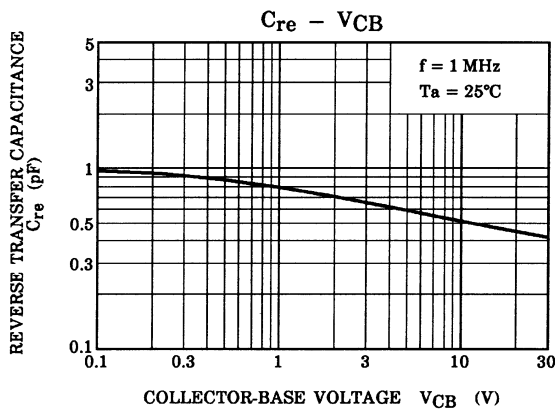
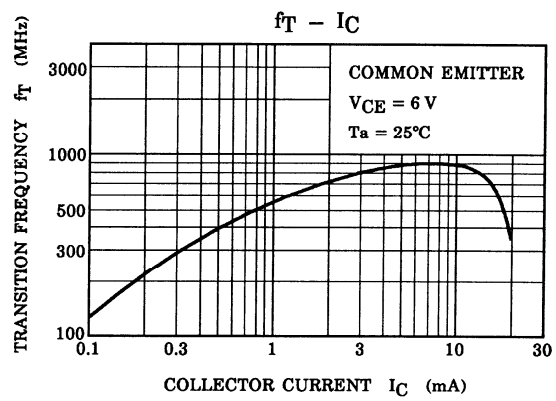
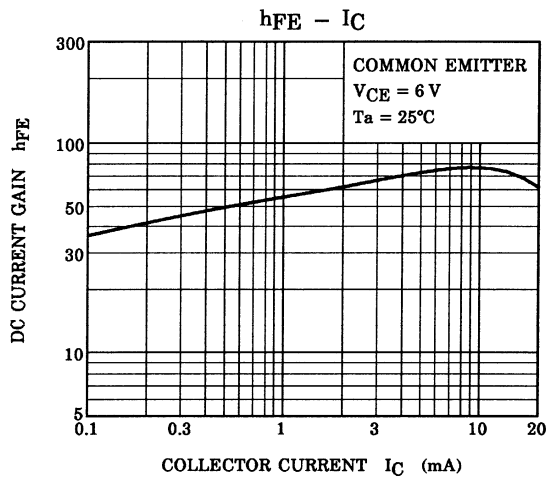


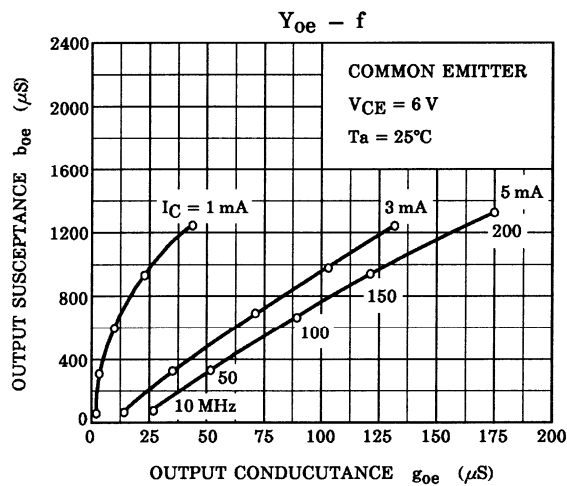
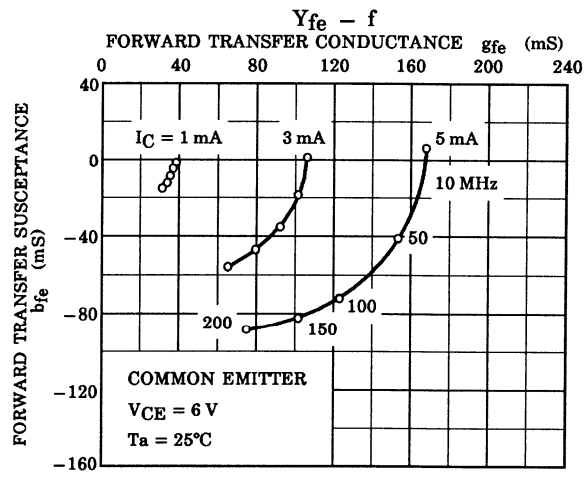
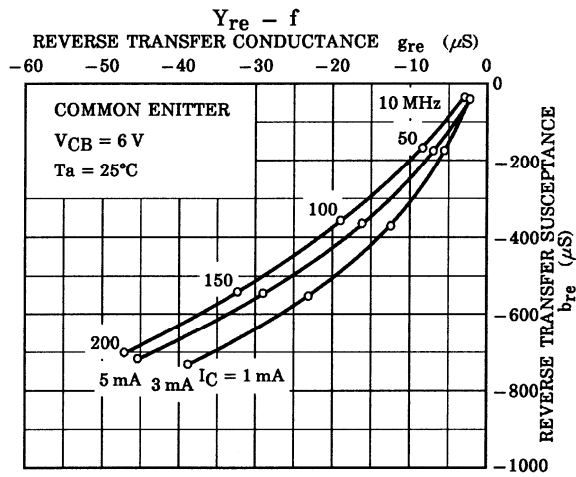
L1: 0.8 mm $\phi$  silver plated copper wire, 4 T, 10 mm ID, 8 mm length

Figure 1 NF,  $G_{pe}$  Test Circuit

Marking







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