

TOSHIBA Transistor Silicon NPN Epitaxial Planar Type

2SC4215

High Frequency Amplifier Applications

FM, RF, MIX, IF Amplifier Applications

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

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}	$-55 \sim 125$	$^\circ\text{C}$

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).

Unit: mm

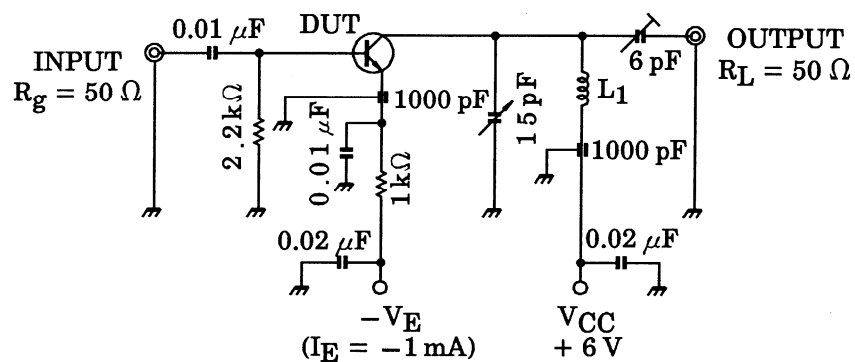
JEDEC	—
JEITA	SC-70
TOSHIBA	2-2E1A

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

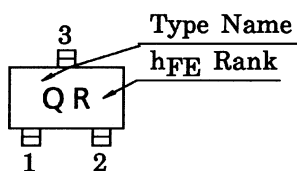
Note: h_{FE} classification R: 40~80, O: 70~140, Y: 100~200

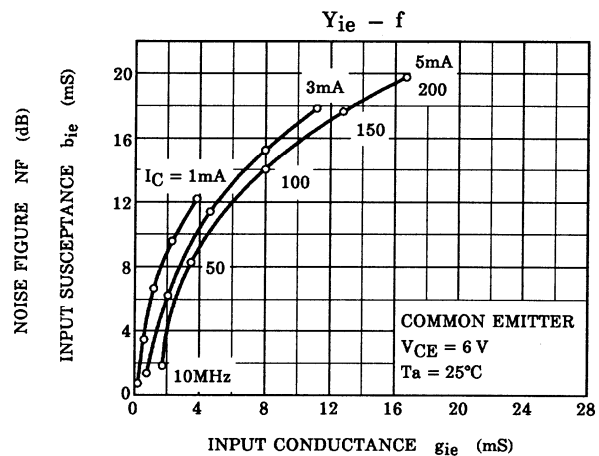
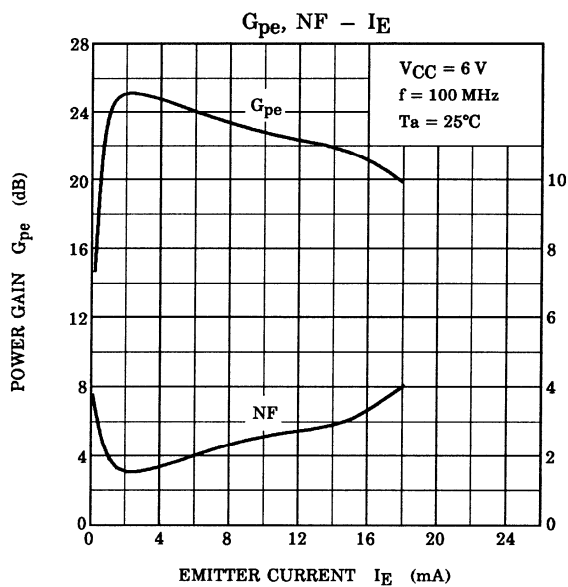
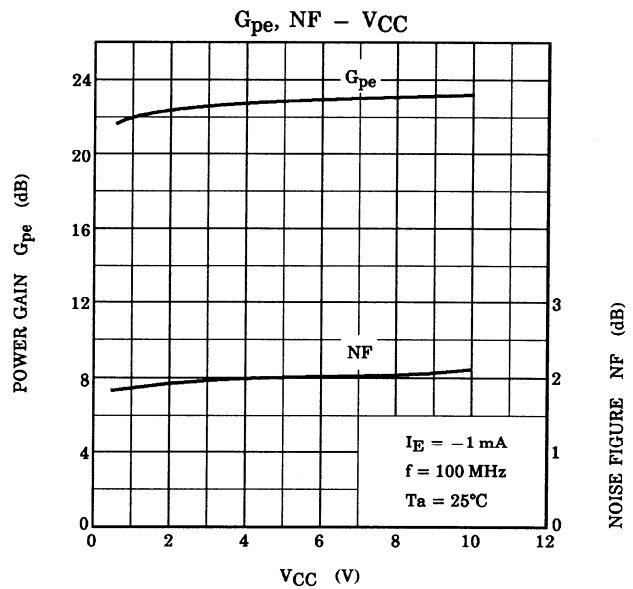
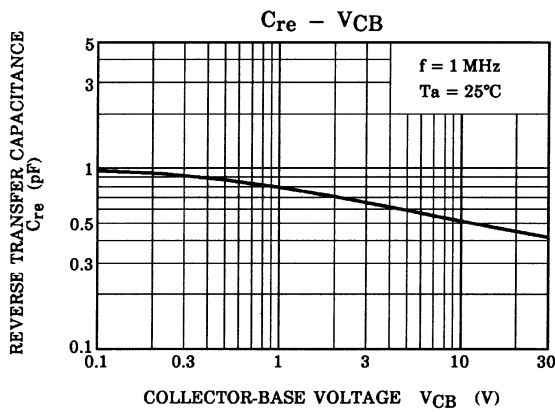
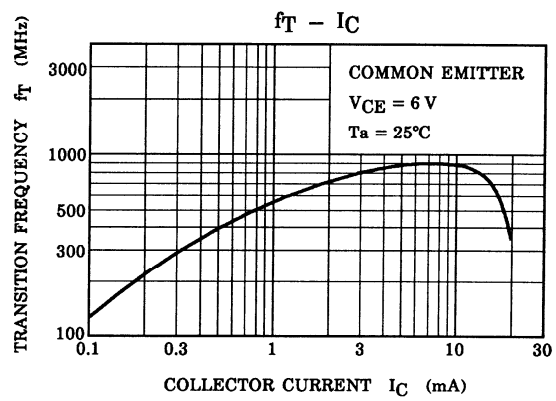
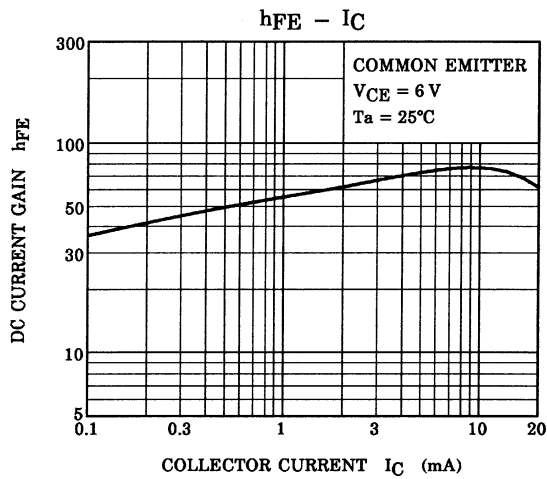


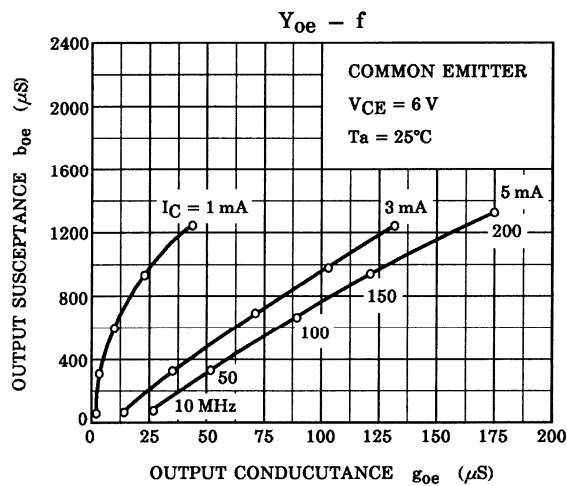
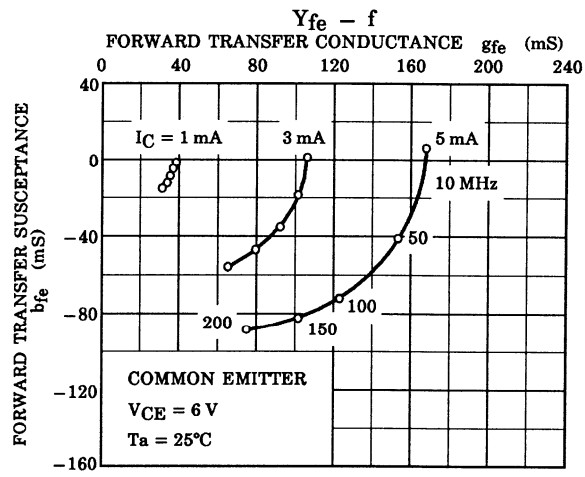
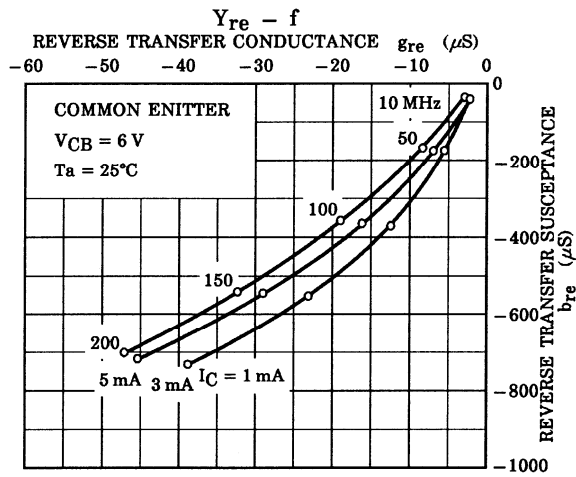
L₁: 0.8 mm ϕ silver plated copper wire, 4 T, 10 mm ID, 8 mm length

Figure 1 NF, G_{pe} Test Circuit

Marking







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