

TOSHIBA Transistor Silicon NPN Epitaxial Planar Type

2SC3123

TV VHF Mixer Applications

Unit: mm

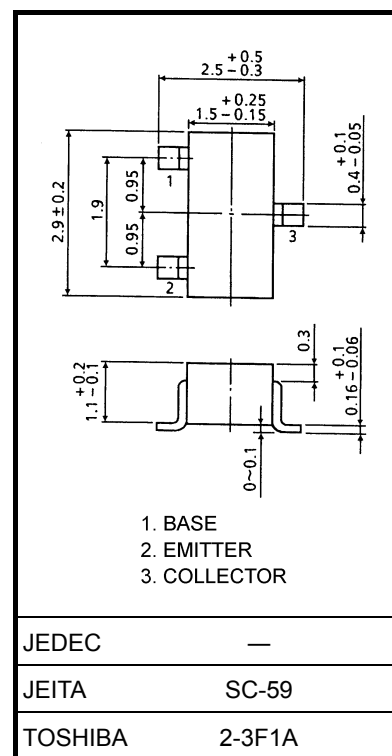
- High conversion gain: $G_{ce} = 23\text{dB}$ (typ.)
- Low reverse transfer capacitance: $C_{re} = 0.4\text{ pF}$ (typ.)

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

Characteristics	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	30	V
Collector-emitter voltage	V_{CEO}	20	V
Emitter-base voltage	V_{EBO}	3	V
Collector current	I_C	50	mA
Base current	I_B	25	mA
Collector power dissipation	P_C	150	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).



Weight: 0.012 g (typ.)

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

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}	$V_{CB} = 25\text{ V}, I_E = 0$	—	—	100	nA
Emitter cut-off current	I_{EBO}	$V_{EB} = 3\text{ V}, I_C = 0$	—	—	1000	nA
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C = 1\text{ mA}, I_B = 0$	20	—	—	V
DC current gain	h_{FE}	$V_{CE} = 10\text{ V}, I_C = 5\text{ mA}$	40	150	300	
Reverse transfer capacitance	C_{re}	$V_{CB} = 10\text{ V}, I_E = 0, f = 1\text{ MHz}$	—	0.4	0.5	pF
Transition frequency	f_T	$V_{CE} = 10\text{ V}, I_C = 5\text{ mA}$	900	1400	—	MHz
Conversion gain	G_{ce}	$V_{CC} = 12\text{ V}, f = 200\text{ MHz}$	20	23	—	dB
Noise figure	NF	$f_L = 260\text{ MHz}$	—	3.8	5.5	dB

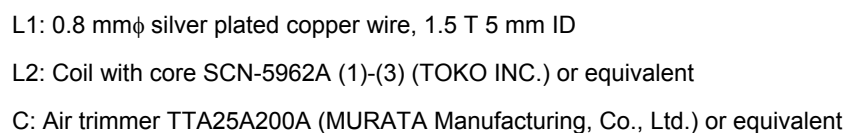
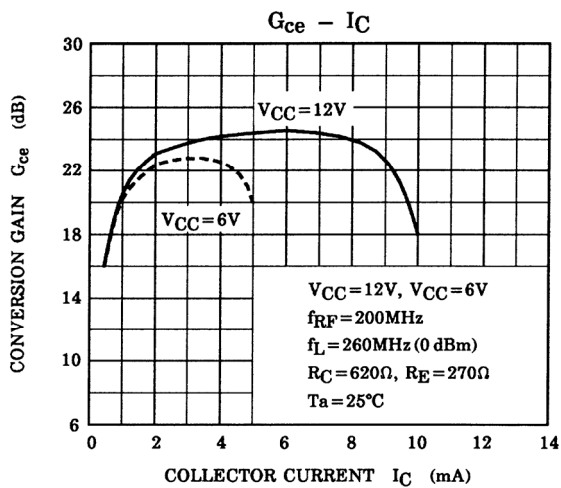
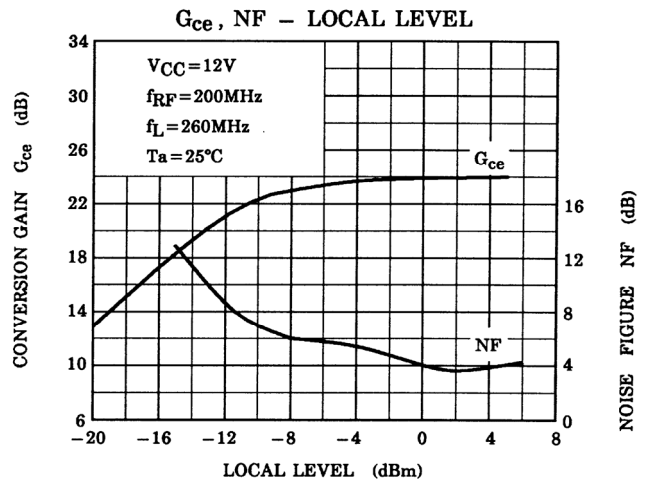
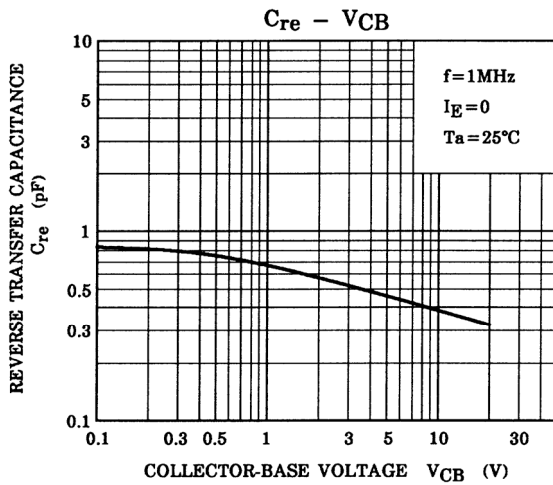
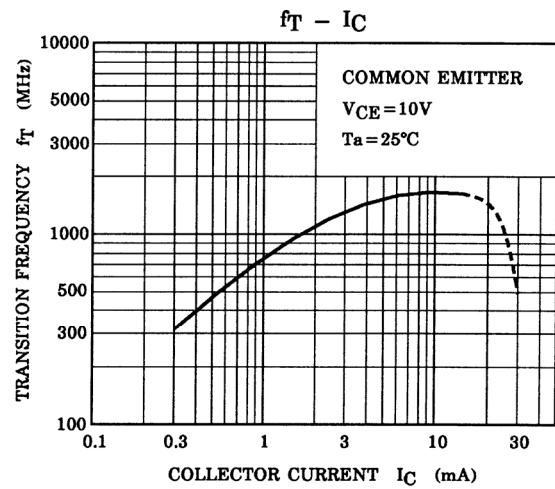
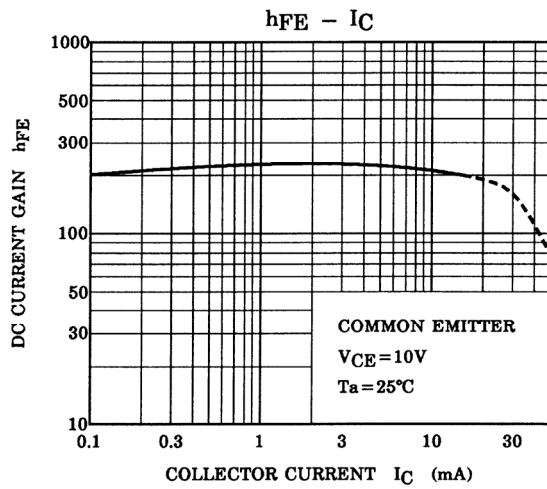
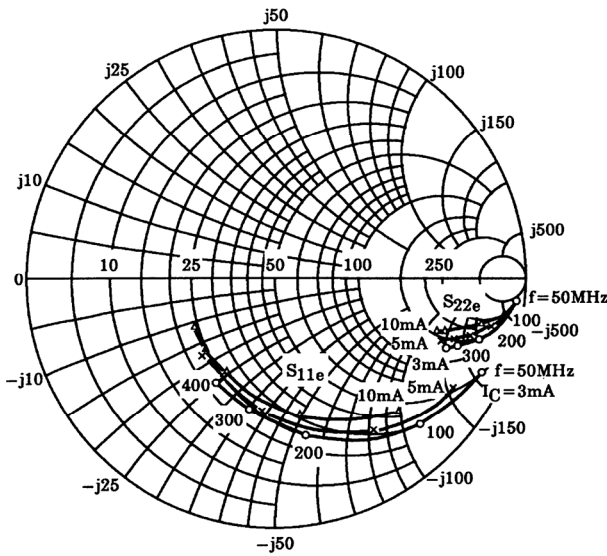


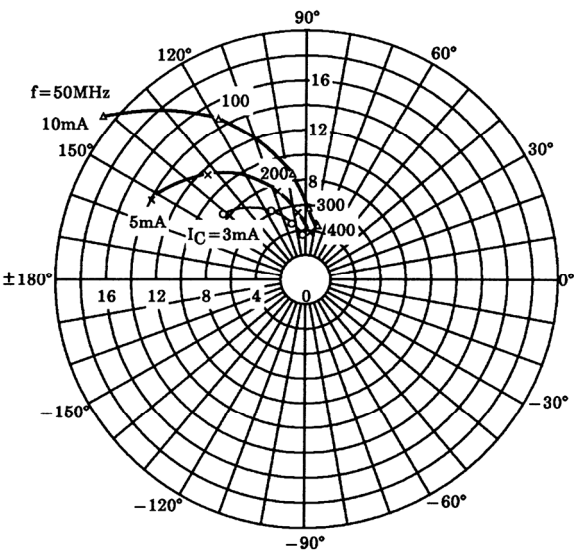
Figure 1 200 MHz G_{ce} , NF Test Circuit



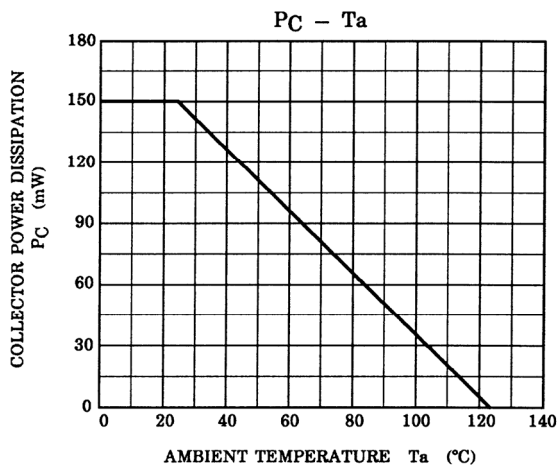
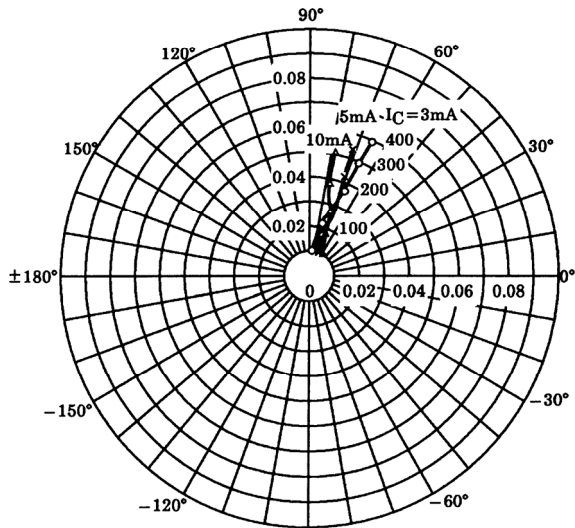
S11e, S22e
VCE = 10V
Ta = 25°C
(UNIT : Ω)



S21e
VCE = 10V
Ta = 25°C



S12e
VCE = 10V
Ta = 25°C



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20070701-EN GENERAL

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