

TOSHIBA Transistor Silicon NPN Epitaxial Planar Type

2SC3123

TV VHF Mixer Applications

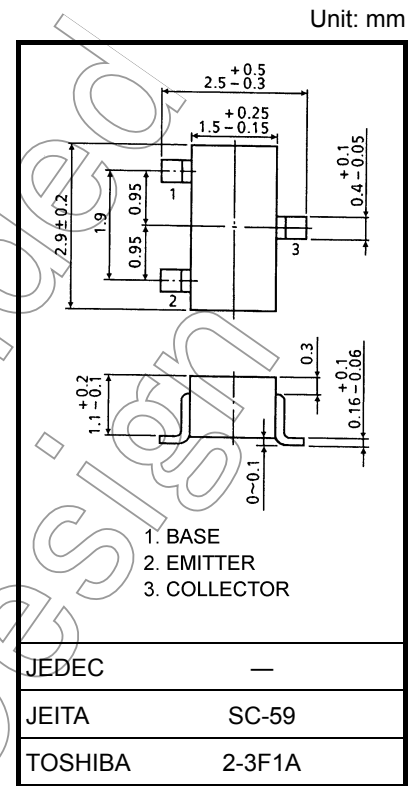
- High conversion gain: $G_{ce} = 23\text{dB}$ (typ.)
- Low reverse transfer capacitance: $C_{re} = 0.4\text{ pF}$ (typ.)

Absolute Maximum Ratings (Ta = 25°C)

Characteristics S	ymbol	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		°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.

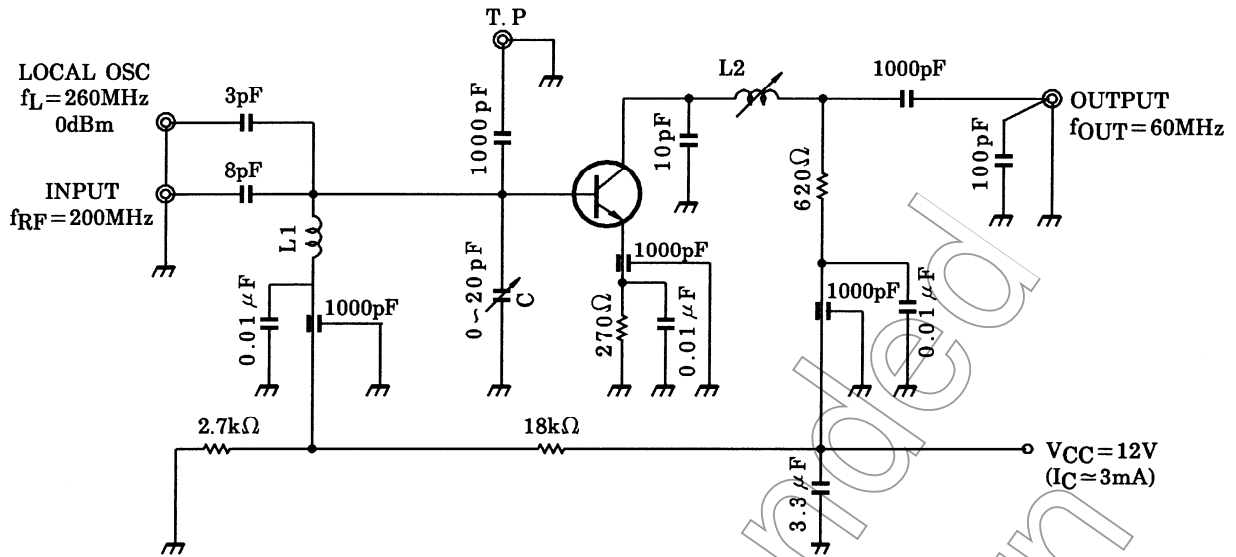
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).



Weight: 0.012 g (typ.)

Electrical Characteristics (Ta = 25°C)

Characteristics S	ymbol	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} 20	$V_{CC} = 12\text{ V}, f = 200\text{ MHz}$		23	—	dB
Noise figure	NF	$f_L = 260\text{ MHz}$	— 3.8		5.5	dB



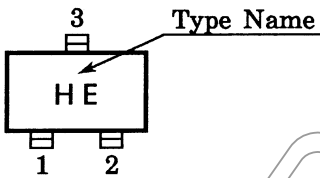
L1: 0.8 mm ϕ silver plated copper wire, 1.5 T 5 mm ID

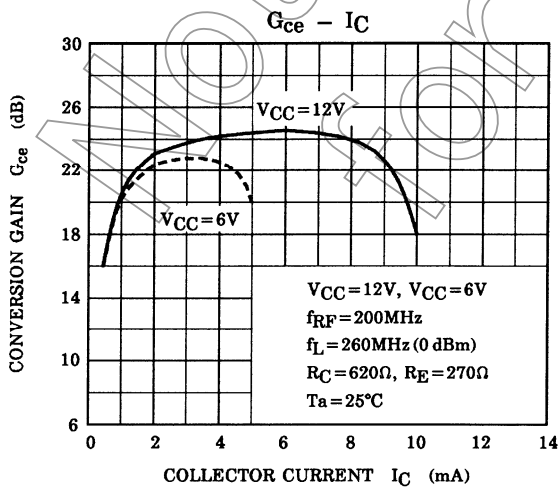
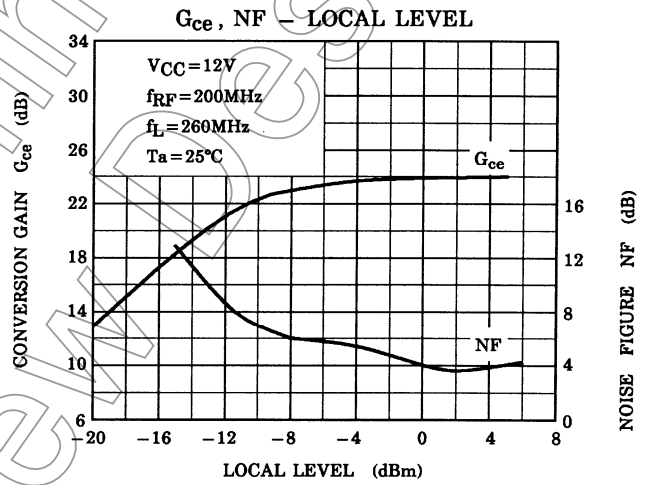
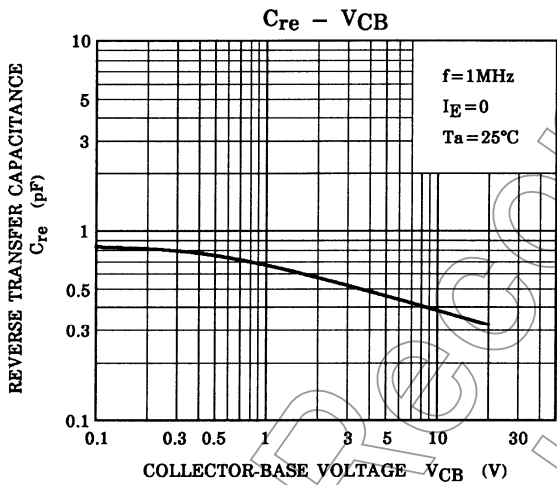
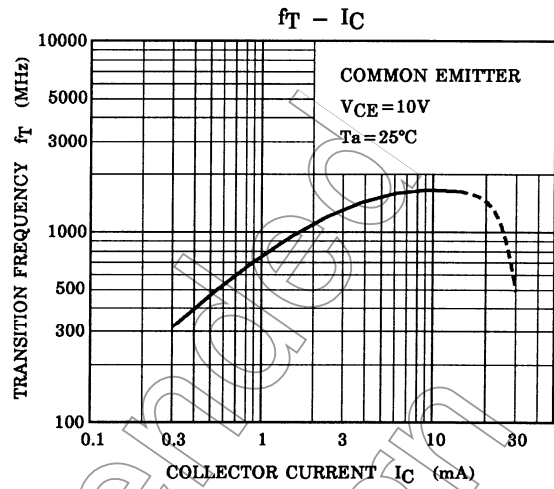
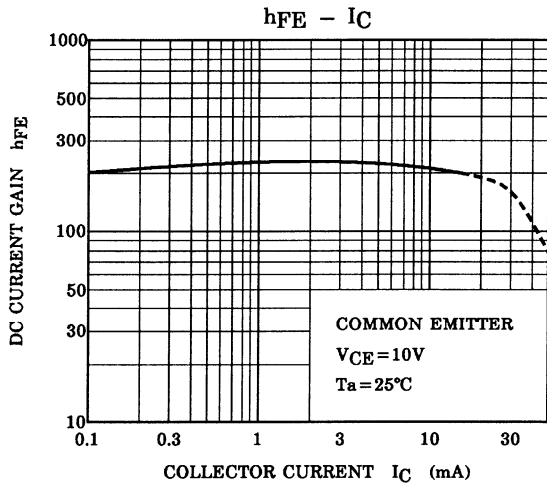
L2: Coil with core SCN-5962A (1)-(3) (TOKO INC.) or equivalent

C: Air trimmer TTA25A200A (MURATA Manufacturing, Co., Ltd.) or equivalent

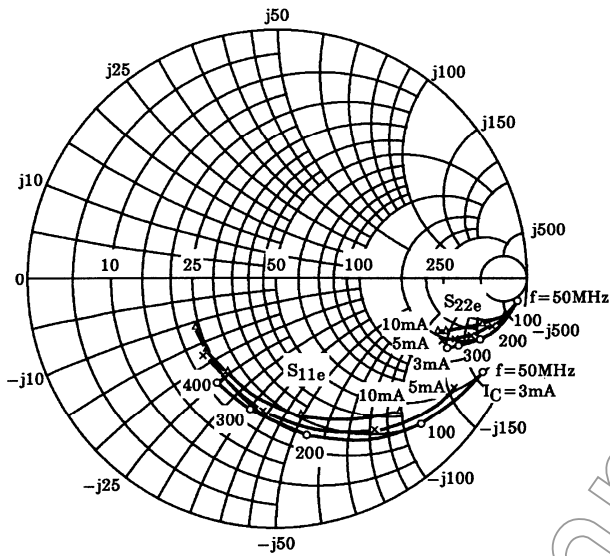
Figure 1 200 MHz G_{ce}, NF Test Circuit

Marking

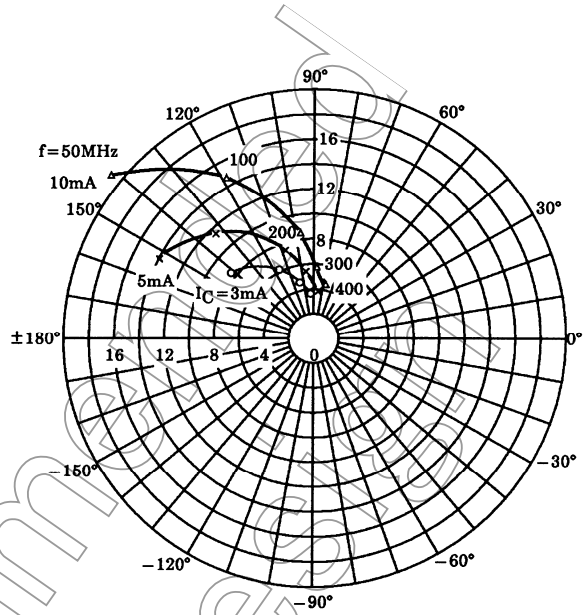




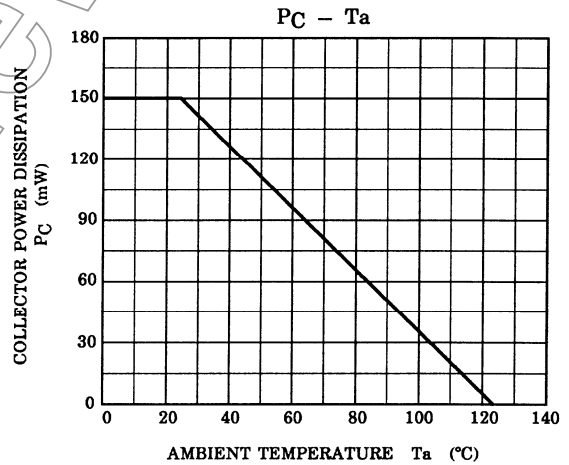
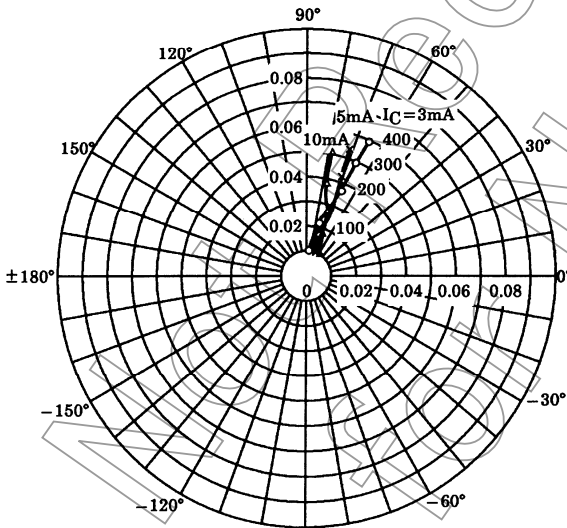
S_{11e}, S_{22e}
 $V_{CE} = 10V$
 $T_a = 25^\circ C$
 (UNIT: Ω)



S_{21e}
 $V_{CE} = 10V$
 $T_a = 25^\circ C$



S_{12e}
 $V_{CE} = 10V$
 $T_a = 25^\circ C$



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