TOSHIBA Transistor Silicon NPN Epitaxial Planar Type

2SC4250

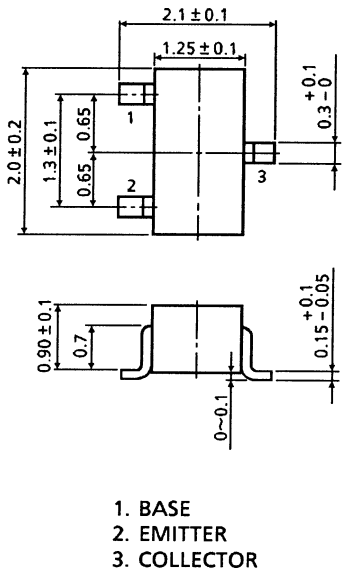
TV VHF Mixer Applications

- High conversion gain: G_{ce} = 25dB (typ.)
- Low reverse transfer capacitance: C_{re} = 0.45 pF (typ.)

Maximum Ratings (Ta = 25°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	100	mW
Junction temperature	T_j	125	°C
Storage temperature range	T_{stg}	−55~125	°C

Unit: mm

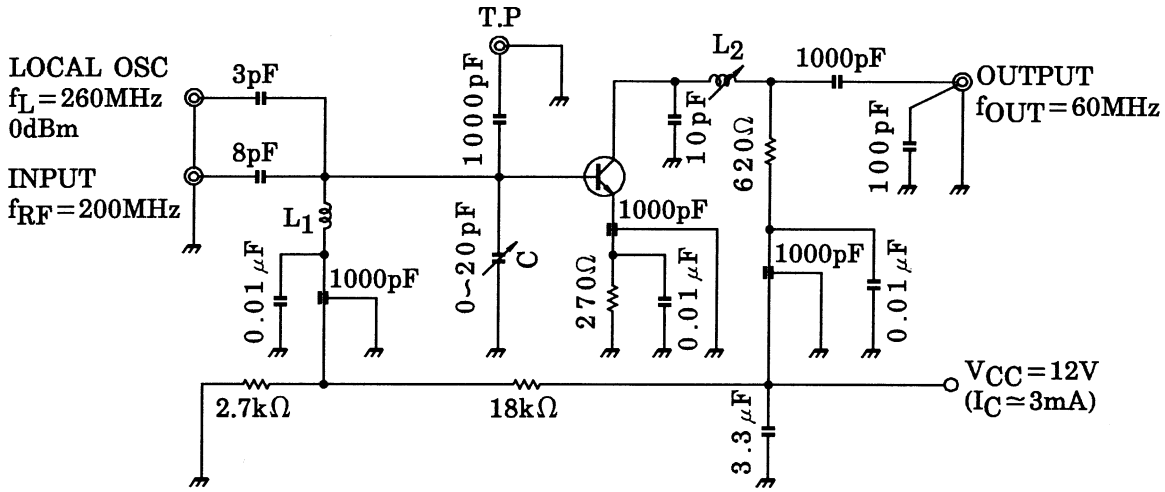


JEDEC	—
JEITA	SC-70
TOSHIBA	2-2E1A

Weight: 0.006 g (typ.)

Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}	V_{CB} = 25 V, I_E = 0	—	—	100	nA
Emitter cut-off current	I_{EBO}	V_{EB} = 3 V, I_C = 0	—	—	1000	nA
Collector-emitter breakdown voltage	$V_{(BR)\ CEO}$	I_C = 1 mA, I_B = 0	20	—	—	V
DC current gain	h_{FE}	V_{CE} = 10 V, I_C = 5 mA	40	150	300	
Reverse transfer capacitance	C_{re}	V_{CB} = 10 V, I_E = 0, f = 1 MHz	—	0.45	0.6	pF
Transition frequency	f_T	V_{CE} = 10 V, I_C = 5 mA	900	1400	—	MHz
Conversion gain	G_{ce}	V_{CC} = 12 V, f = 200 MHz, f_L = 260 MHz	20	25	—	dB
Noise figure	NF	(Figure 1)	—	4.3	6	dB



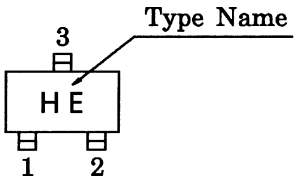
L_1: 0.8 mmϕ silver plated copper wire, 1.5 T 5 mm ID

L_2: Coil with core SCN-5962A (1)-(3) (TOKO Inc.) or equivalent

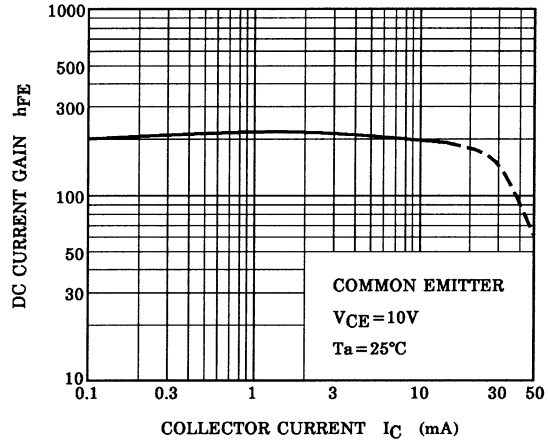
C: Air trimmer TTA25A200A (MURATA Manufacturing. Co., Ltd.) or equivalent

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

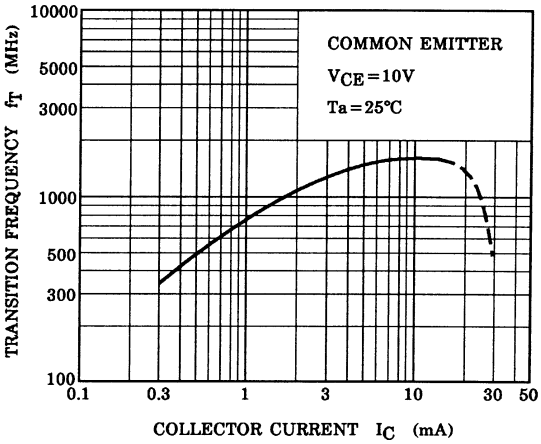
Marking



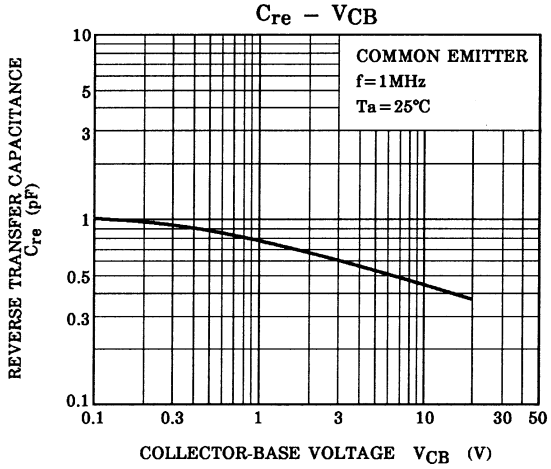
h_{FE} – I_C



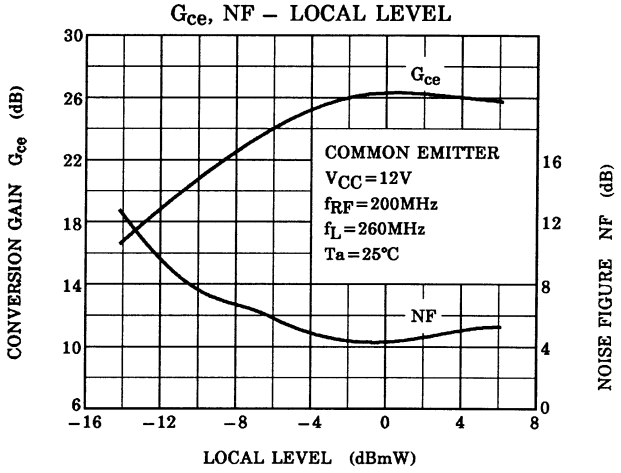
f_T – I_C



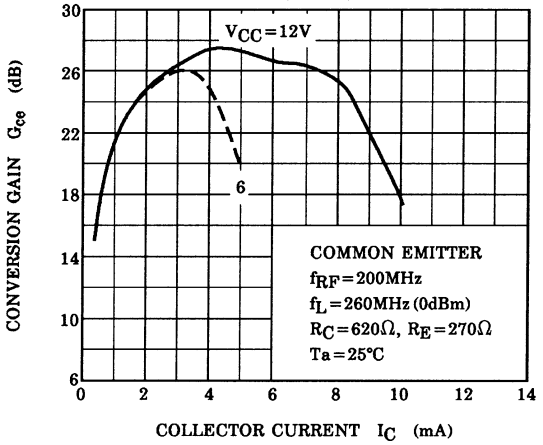
C_{re} – V_{CB}



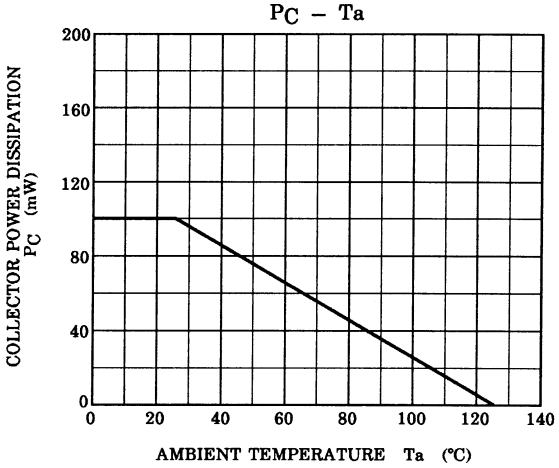
G_{ce}, NF – LOCAL LEVEL



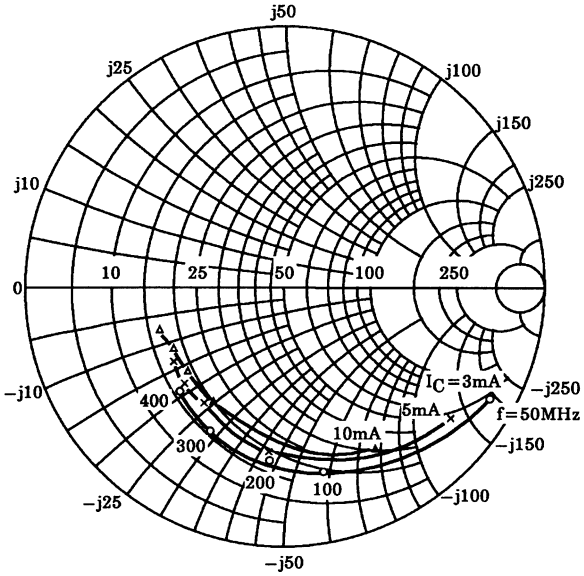
G_{ce} – I_C



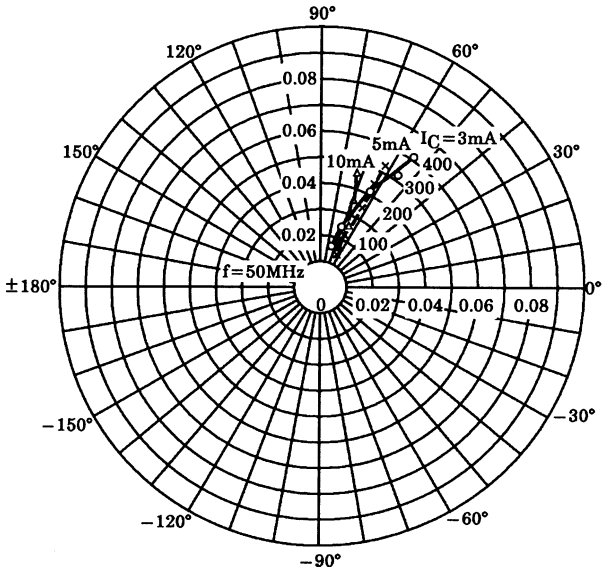
P_C – Ta



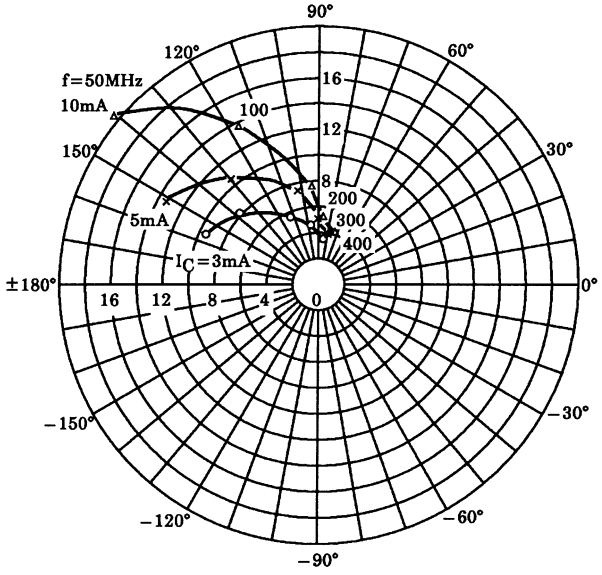
S_{11e}
V_{CE} = 10V
Ta = 25°C
(UNIT : Ω)



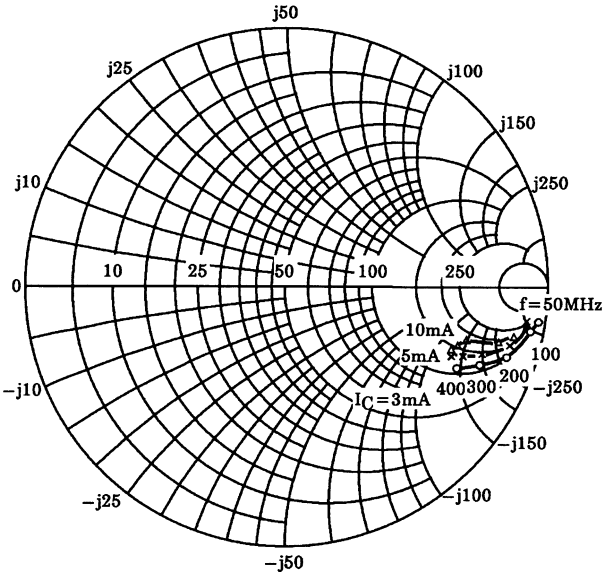
S_{12e}
V_{CE} = 10V
Ta = 25°C



S_{21e}
V_{CE} = 10V
Ta = 25°C



S_{22e}
V_{CE} = 10V
Ta = 25°C
(UNIT : Ω)



RESTRICTIONS ON PRODUCT USE

000707EAA

- TOSHIBA is continually working to improve the quality and reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such TOSHIBA products could cause loss of human life, bodily injury or damage to property.
  In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent TOSHIBA products specifications. Also, please keep in mind the precautions and conditions set forth in the “Handling Guide for Semiconductor Devices,” or “TOSHIBA Semiconductor Reliability Handbook” etc..
- The TOSHIBA products listed in this document are intended for usage in general electronics applications (computer, personal equipment, office equipment, measuring equipment, industrial robotics, domestic appliances, etc.). These TOSHIBA products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury (“Unintended Usage”). Unintended Usage include atomic energy control instruments, airplane or spaceship instruments, transportation instruments, traffic signal instruments, combustion control instruments, medical instruments, all types of safety devices, etc.. Unintended Usage of TOSHIBA products listed in this document shall be made at the customer’s own risk.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
- The information contained herein is subject to change without notice.