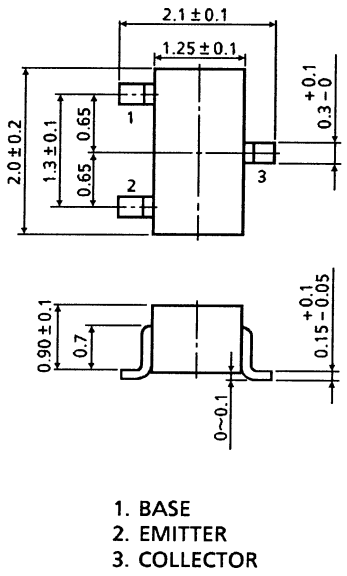
TOSHIBA Transistor Silicon NPN Epitaxial Planar Type

2SC4249

TV VHF RF Amplifier Applications

- High gain: G_{pe} = 24dB (typ.) (f = 200 MHz)
- Low noise: NF = 2.0dB (typ.) (f = 200 MHz)
- Excellent forward AGC characteristics

Unit: mm



JEDEC	—
JEITA	SC-70
TOSHIBA	2-2E1A

Weight: 0.006 g (typ.)

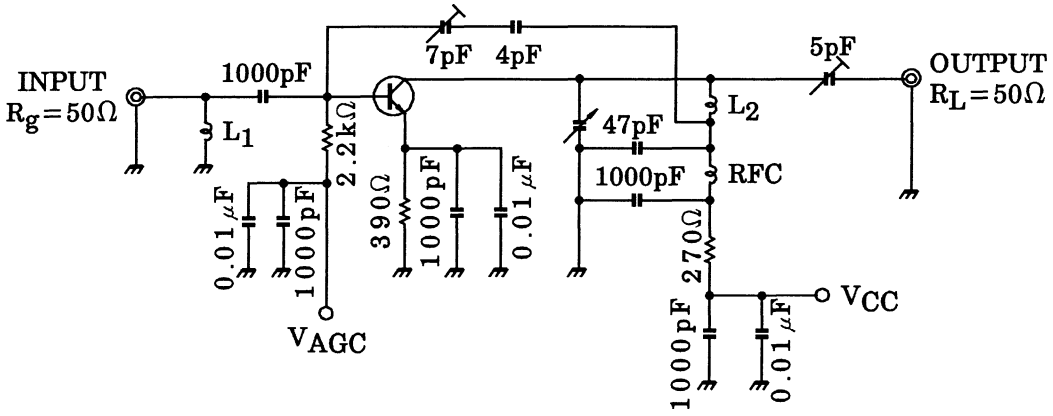
Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	30	V
Collector-emitter voltage	V_{CEO}	30	V
Emitter-base voltage	V_{EBO}	3	V
Collector current	I_C	20	mA
Base current	I_B	10	mA
Collector power dissipation	P_C	100	mW
Junction temperature	T_j	125	°C
Storage temperature range	T_{stg}	−55~125	°C

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} = 2 V, I_C = 0	—	—	100	nA
Collector-emitter breakdown voltage	$V_{(BR)\ CEO}$	I_C = 1 mA, I_B = 0	30	—	—	V
DC current gain	h_{FE}	V_{CE} = 10 V, I_C = 2 mA	60	150	300	
Reverse transfer capacitance	C_{re}	V_{CB} = 10 V, I_E = 0, f = 1 MHz	—	0.35	0.5	pF
Transition frequency	f_T	V_{CE} = 10 V, I_C = 2 mA	400	650	—	MHz
Power gain	G_{pe}	V_{CC} = 12 V, V_{AGC} = 1.4 V	20	24	28	dB
Noise figure	NF	f = 200 MHz (Figure 1)	—	2.0	3.2	dB
AGC voltage (Note)	V_{AGC}	V_{CC} = 12 V, GR = 30dB f = 200 MHz	3.6	4.4	5.1	V

Note: V_{AGC} measured by test circuit shown in Figure 1 when power gain is reduced to 30dB compared that of V_{AGC} at 1.4 V.

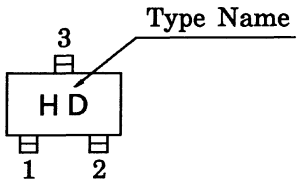


L_1: RF coil M-15 T (TOKO Inc.) or equivalent

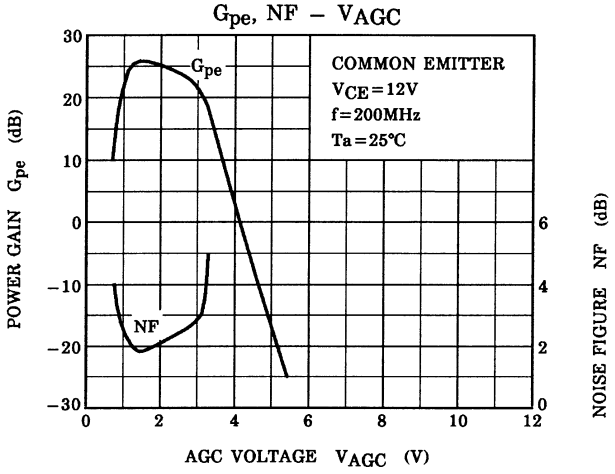
L_2: RF coil M-25 T (TOKO Inc.) or equivalent

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

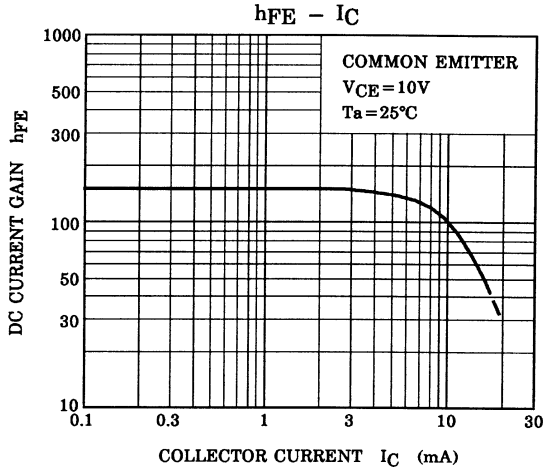
Marking



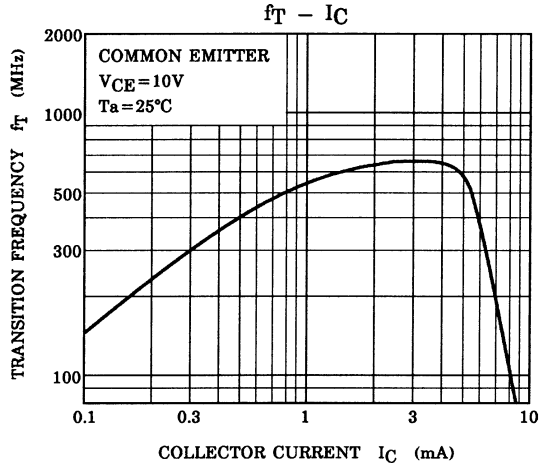
G_{pe}, NF – V_{AGC}



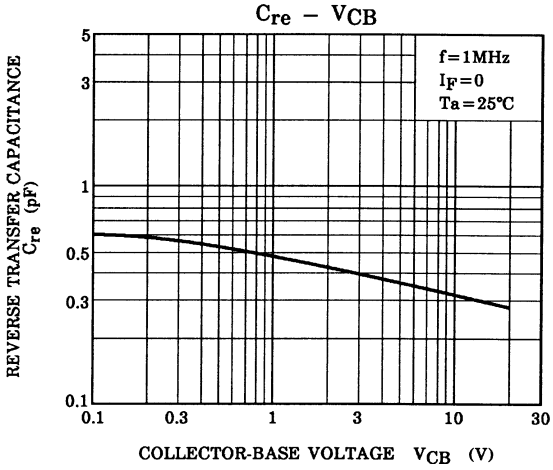
h_{FE} – I_C



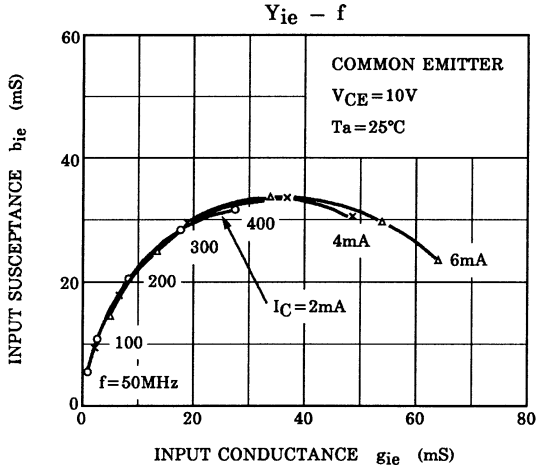
f_T – I_C



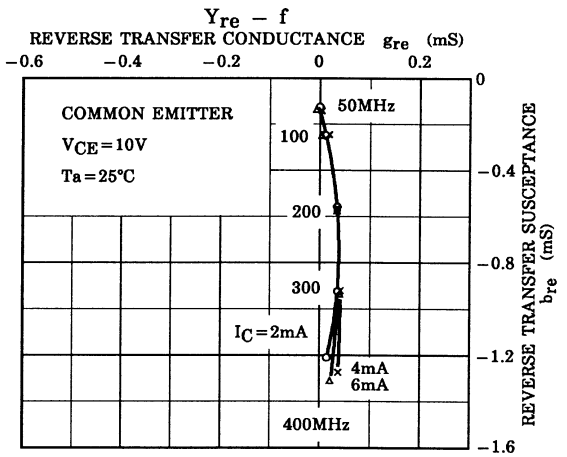
C_{re} – V_{CB}

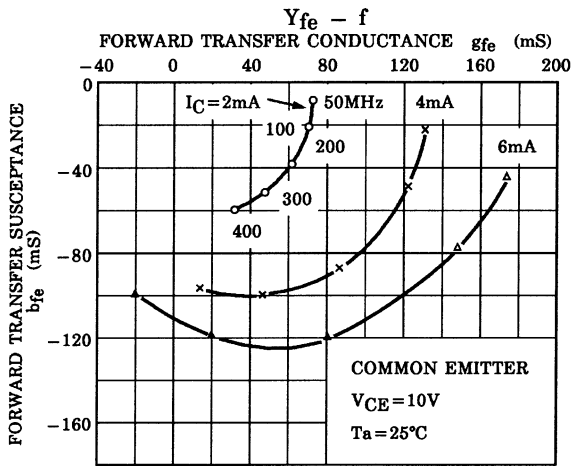


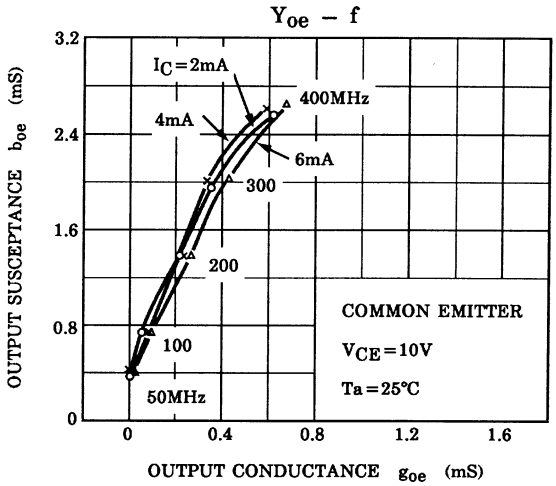
Y_{ie} – f

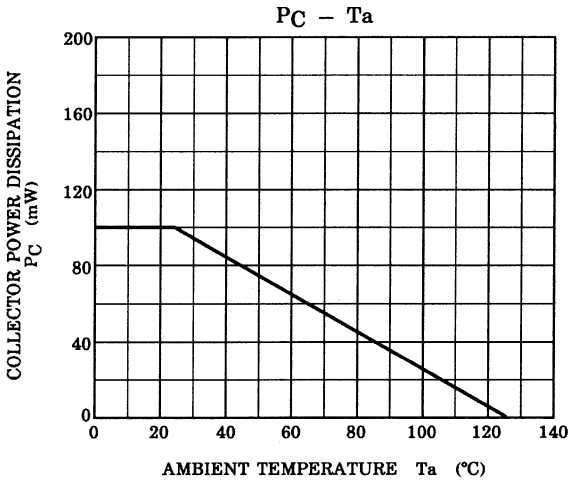


Y_{re} – f




Y_{fe} – f
FORWARD TRANSFER CONDUCTANCE g_{fe} (mS)
−40 0 40 80 120 160 200
0 −40 −80 −120 −160
FORWARD TRANSFER SUSCEPTANCE b_{fe} (mS)
I_C=2mA
50MHz
4mA
6mA
100
200
300
400
COMMON EMITTER
V_{CE}=10V
Ta=25°C


Y_{oe} – f
3.2 2.4 1.6 0.8 0
OUTPUT SUSCEPTANCE b_{oe} (mS)
I_C=2mA
400MHz
4mA
6mA
300
200
100
50MHz
COMMON EMITTER
V_{CE}=10V
Ta=25°C
0 0.4 0.8 1.2 1.6
OUTPUT CONDUCTANCE g_{oe} (mS)


P_C – Ta
200 160 120 80 40 0
COLLECTOR POWER DISSIPATION P_C (mW)
0 20 40 60 80 100 120 140
AMBIENT TEMPERATURE Ta (°C)

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