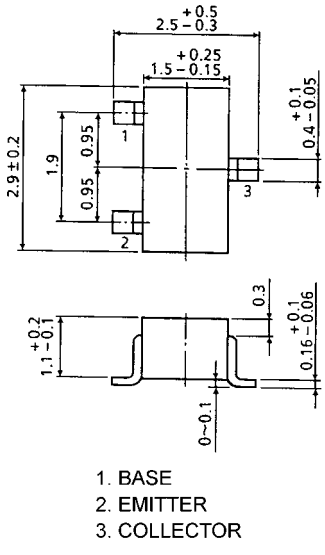
TOSHIBA Transistor Silicon NPN Epitaxial Planar Type

2SC5254

VHF~UHF Band Low Noise Amplifier Applications

- Low noise figure: NF = 1.5dB (f = 2 GHz)
- High gain: Gain = 8.5dB (f = 2 GHz)

Unit: mm



JEDEC	—
JEITA	—
TOSHIBA	2-3F1A

Weight: 0.012 g (typ.)

Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	15	V
Collector-emitter voltage	V_{CEO}	7	V
Emitter-base voltage	V_{EBO}	1.5	V
Collector current	I_C	40	mA
Base current	I_B	20	mA
Collector power dissipation	P_C	150	mW
Junction temperature	T_j	125	°C
Storage temperature range	T_{stg}	−55~125	°C

Microwave Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Transition frequency	f_T	V_{CE} = 5 V, I_C = 20 mA	9	12	—	GHz
Insertion gain	$\|S_{21e}\|^2$ (1)	V_{CE} = 5 V, I_C = 20 mA, f = 1 GHz	11.5	14.5	—	dB
	$\|S_{21e}\|^2$ (2)	V_{CE} = 5 V, I_C = 20 mA, f = 2 GHz	5.5	8.5	—	
Noise figure	NF (1)	V_{CE} = 5 V, I_C = 5 mA, f = 1 GHz	—	1.1	—	dB
	NF (2)	V_{CE} = 5 V, I_C = 5 mA, f = 2 GHz	—	1.5	3	

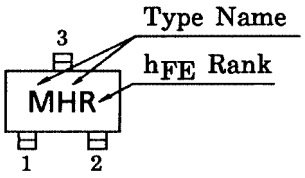
Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}	V_{CB} = 10 V, I_E = 0	—	—	1	μA
Emitter cut-off current	I_{EBO}	V_{EB} = 1 V, I_C = 0	—	—	1	μA
DC current gain	h_{FE} (Note 1)	V_{CE} = 5 V, I_C = 20 mA	50	—	160	
Output capacitance	C_{ob}	V_{CB} = 5 V, I_E = 0, f = 1 MHz (Note 2)	—	0.5	—	pF
Reverse transfer capacitance	C_{re}		—	0.4	0.8	pF

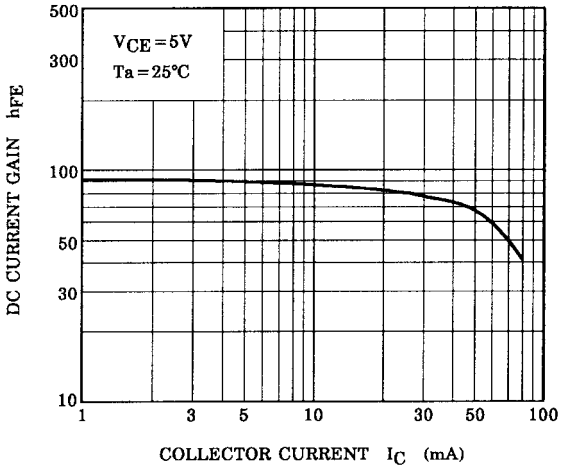
Note 1: h_{FE} classification R: 50~100, O: 80~160

Note 2: C_{re} is measured by 3 terminal method with capacitance bridge.

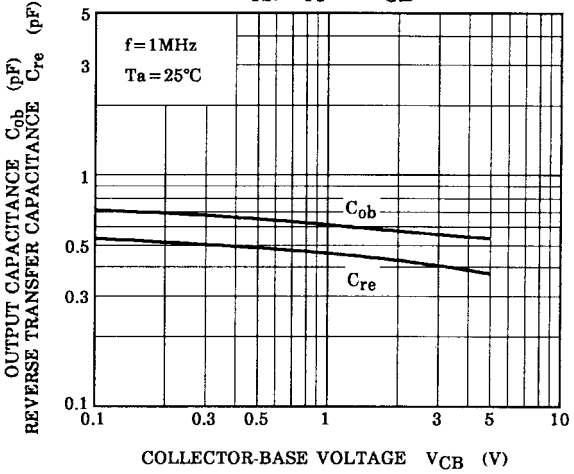
Marking



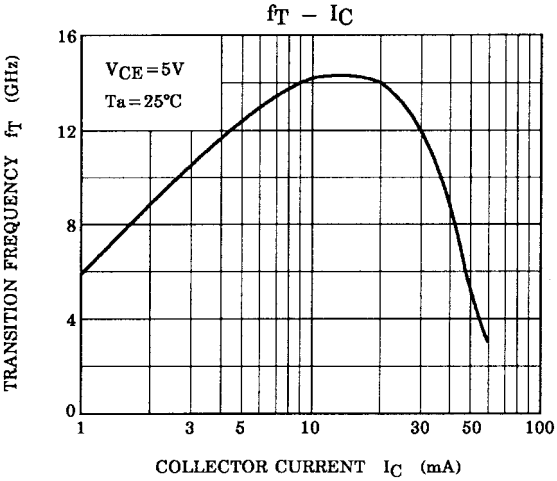
h_{FE} – I_C



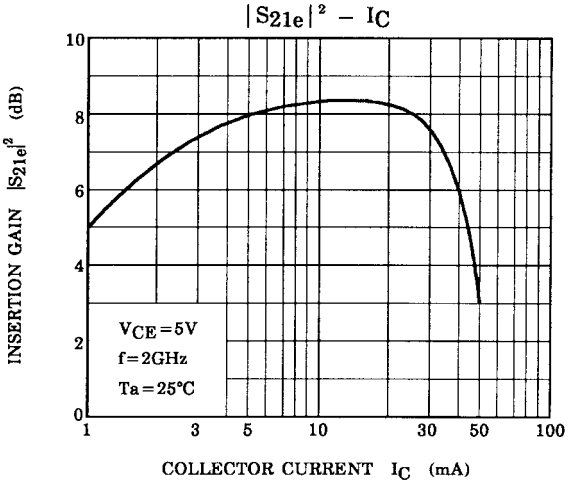
C_{ob}, C_{re} – V_{CB}



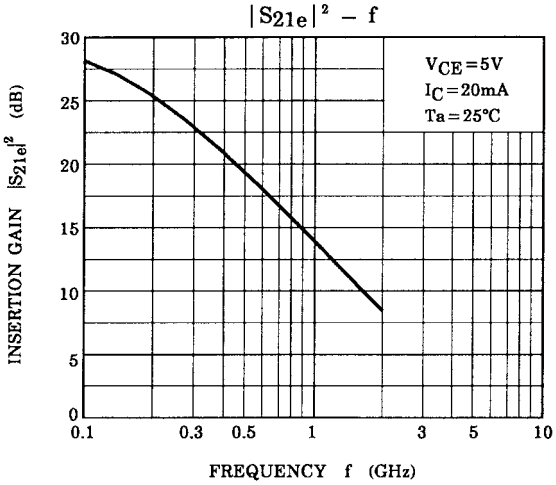
f_T – I_C



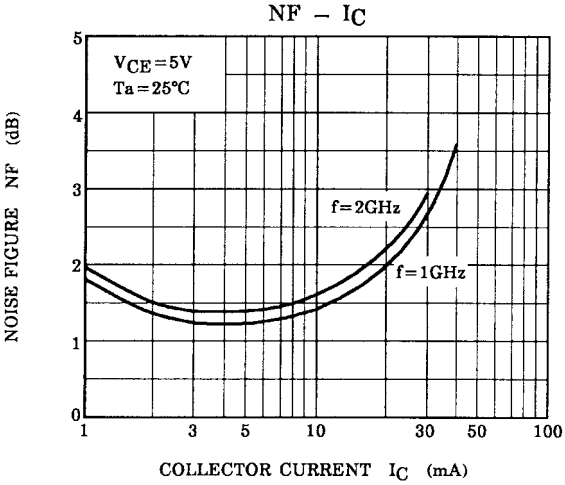
$|S_{21e}|^2$ – I_C

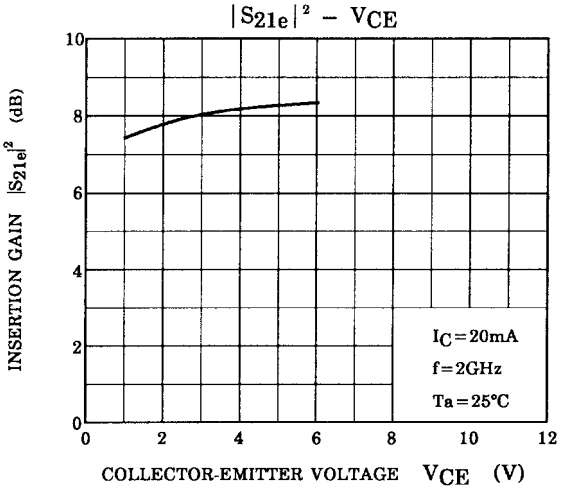


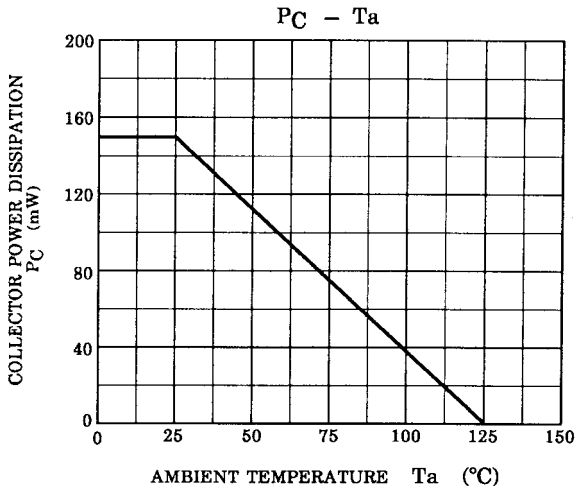
$|S_{21e}|^2$ – f



NF – I_C




$|S_{21e}|^2$ – V_{CE}
INSERTION GAIN $|S_{21e}|^2$ (dB)
10
8
6
4
2
0
0
2
4
6
8
10
12
I_C = 20mA
f = 2GHz
Ta = 25°C
COLLECTOR-EMITTER VOLTAGE V_{CE} (V)


P_C – Ta
COLLECTOR POWER DISSIPATION P_C (mW)
200
160
120
80
40
0
0
25
50
75
100
125
150
AMBIENT TEMPERATURE Ta (°C)

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