

TOSHIBA Transistor Silicon NPN Epitaxial Planar Type

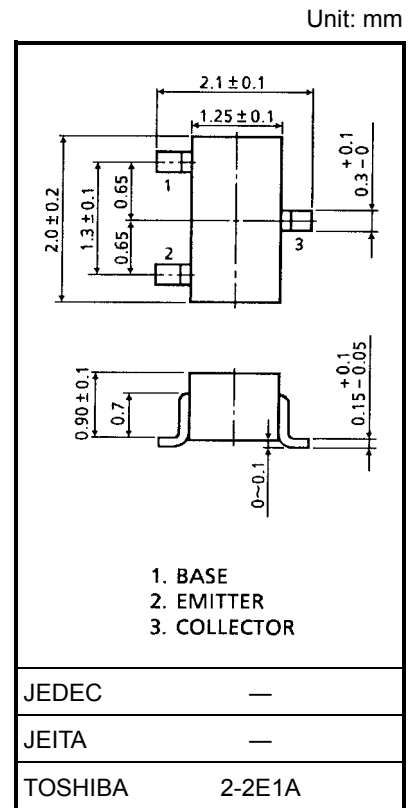
2SC5255

VHF~UHF Band Low Noise Amplifier Applications

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

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	100	mW
Junction temperature	T _j	125	°C
Storage temperature range	T _{stg}	-55~125	°C



Microwave Characteristics (Ta = 25°C)

Weight: 0.006 g (typ.)

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	

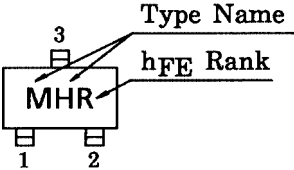
Electrical Characteristics (Ta = 25°C)

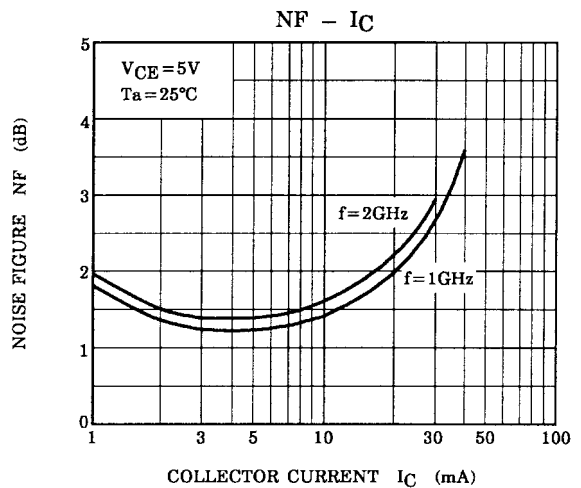
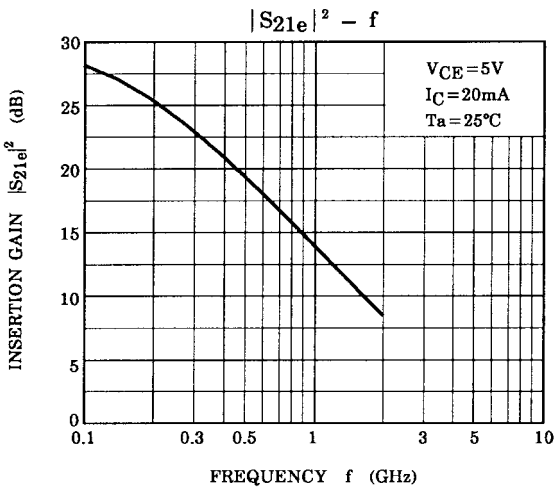
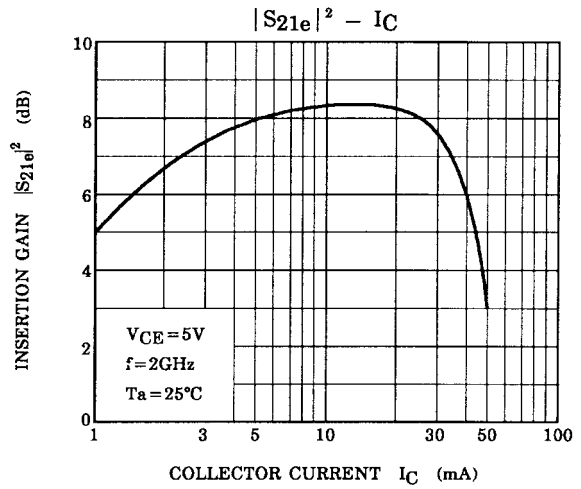
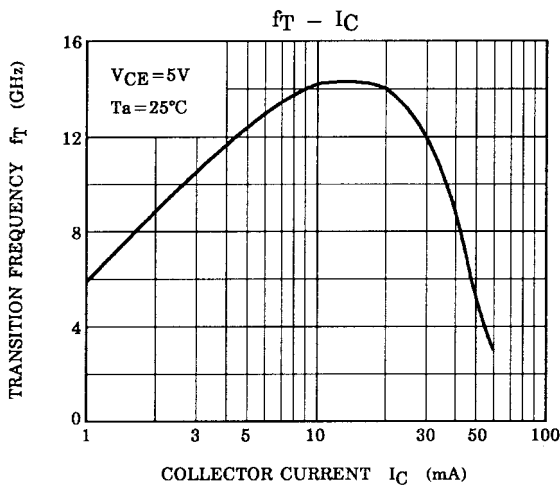
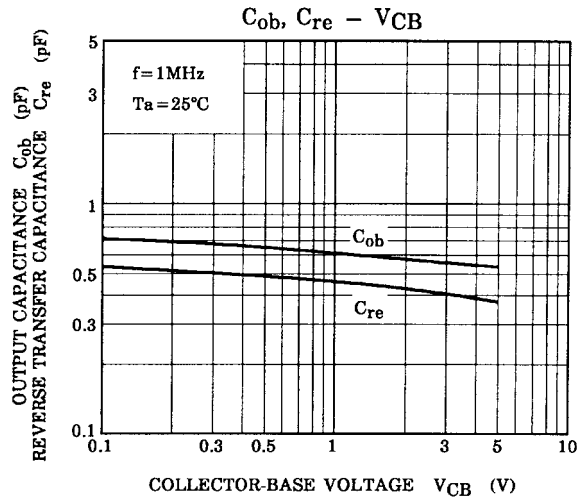
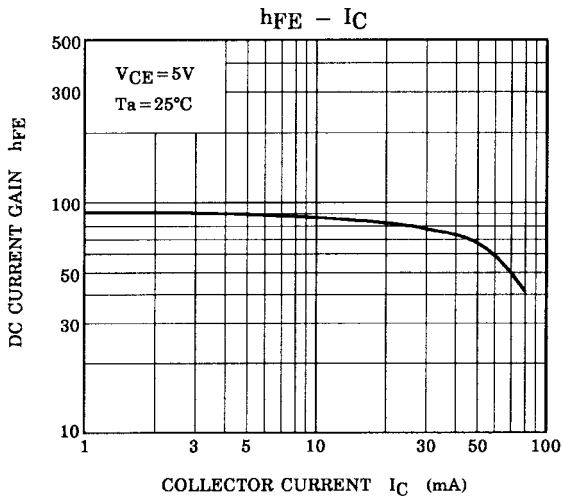
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I _{CBO}	V _{CB} = 10 V, I _E = 0	—	—	1	μA
Emitter cut-off current	I _{EBO}	V _{EB} = 1 V, I _C = 0	—	—	1	μA
DC current gain	h _{FE} (Note 1)	V _{CE} = 5 V, I _C = 20 mA	50	—	160	
Output capacitance	C _{ob}	V _{CB} = 5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

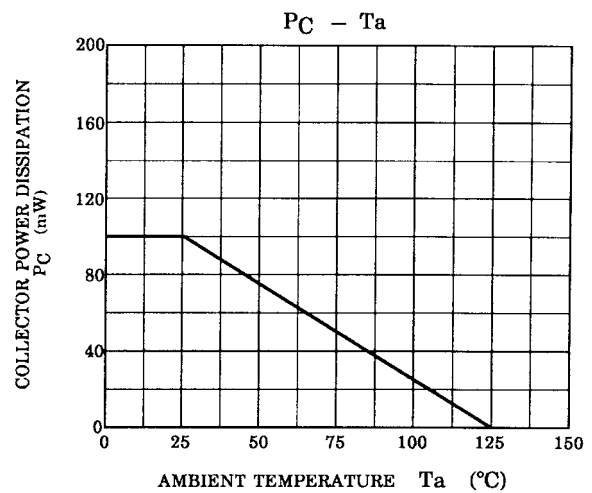
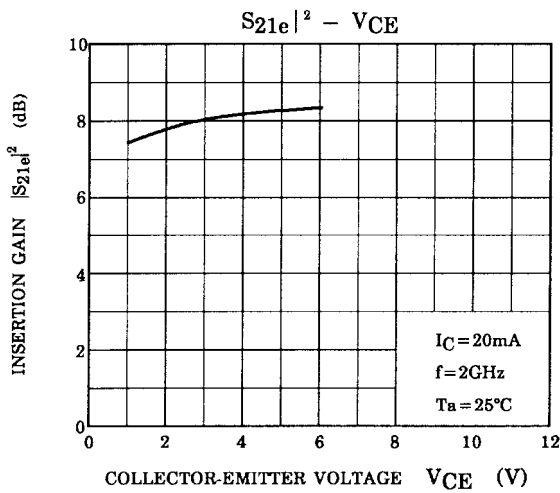
Note 1: h_{FE} classification R: 50~100, O: 80~160

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

Marking







S-Parameter $Z_O = 50 \Omega, T_a = 25^\circ\text{C}$

$V_{CE} = 5 \text{ V}, I_C = 5 \text{ mA}$

Frequency (MHz)	S11		S21		S12		S22	
	Mag.	Ang.	Mag.	Ang.	Mag.	Ang.	Mag.	Ang.
200	0.739	-36.1	11.765	147.6	0.041	74.9	0.866	-25.5
400	0.579	-64	9.129	125.5	0.069	67.8	0.701	-41.9
600	0.454	-84.9	7.039	111	0.09	66.2	0.581	-51.6
800	0.375	-102.5	5.703	100.4	0.11	66.5	0.501	-58.5
1000	0.316	-116.3	4.713	92.5	0.128	67	0.442	-64.8
1200	0.272	-130.2	4.022	85.8	0.147	67.4	0.398	-70
1400	0.247	-144.6	3.492	80	0.166	68.2	0.361	-74.8
1600	0.216	-158.8	3.094	75.4	0.186	68.3	0.332	-78.8
1800	0.194	-173	2.765	71.1	0.208	68.5	0.308	-82.1
2000	0.173	175.4	2.508	67	0.228	68.6	0.288	-84

$V_{CE} = 5 \text{ V}, I_C = 20 \text{ mA}$

Frequency (MHz)	S11		S21		S12		S22	
	Mag.	Ang.	Mag.	Ang.	Mag.	Ang.	Mag.	Ang.
200	0.407	-61.6	18.832	126.4	0.031	73.9	0.671	-34.0
400	0.271	-92.4	11.34	106.5	0.053	74.7	0.496	-41.9
600	0.211	-113.2	7.947	96.4	0.075	76.6	0.425	-45.8
800	0.19	-131.4	6.139	89.3	0.097	77.3	0.386	-50.1
1000	0.179	-146.5	4.975	83.6	0.12	77.3	0.355	-55.2
1200	0.172	-164	4.193	78.6	0.142	77	0.331	-59.8
1400	0.169	-175.6	3.627	74.3	0.166	76.5	0.311	-64.3
1600	0.165	168.7	3.215	70.4	0.189	76	0.292	-68.2
1800	0.16	155.5	2.866	66.7	0.213	75.2	0.278	-71.1
2000	0.157	143.6	2.587	63.4	0.236	74.2	0.267	-72.7

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