TOSHIBA Transistor Silicon NPN Epitaxial Planar Type

2SC4322

VHF~UHF Band Low Noise Amplifier Applications

- Low noise figure, high gain.
- NF = 1.8dB, $|S_{21e}|^2 = 7.5dB$ (f = 2 GHz)

Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit	
Collector-base voltage	V _{CBO}	20	V	
Collector-emitter voltage	V _{CEO}	10	V	
Emitter-base voltage	V _{EBO}	1.5	V	
Base current	Ι _Β	7	mA	
Collector current	Ι _C	15	mA	
Collector power dissipation	P _C	150	mW	
Junction temperature	Tj	125	°C	
Storage temperature range	T _{stg}	-55~125	°C	



Microwave Characteristics (Ta = 25°C)

Weight: 0.012 g (typ.)

Characteristics Sym		Test Condition	Min	Тур.	Max	Unit		
Transition frequency	f _T	$V_{CE} = 6 V, I_C = 7 mA$	7	10	_	GHz		
Insertion gain	S _{21e} ² (1)	$V_{CE} = 6 \text{ V}, \text{ I}_{C} = 7 \text{ mA}, \text{ f} = 1 \text{ GHz}$	—	13	_	dB		
	S _{21e} ² (2)	$V_{CE} = 6 \text{ V}, \text{ I}_{C} = 7 \text{ mA}, \text{ f} = 2 \text{ GHz}$	4.5	7.5	_	uD		
Noise figure	NF (1)	$V_{CE} = 6 \text{ V}, \text{ I}_{C} = 3 \text{ mA}, \text{ f} = 1 \text{ GHz}$	6 V, I _C = 3 mA, f = 1 GHz — 1.4		_	dB		
	NF (2)	$V_{CE} = 6 V, I_C = 3 mA, f = 2 GHz$	_	1.8	3.0	uр		

Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Тур.	Max	Unit
Collector cut-off current	I _{CBO}	$V_{CB} = 10 \text{ V}, \text{ I}_{E} = 0$	_		1	μA
Emitter cut-off current	I _{EBO}	$V_{EB} = 1 \text{ V}, \text{ I}_{C} = 0$			1	μA
DC current gain	h _{FE}	$V_{CE} = 6 V, I_C = 7 mA$	50	_	250	
Output capacitance	C _{ob}	$V_{00} = 10 V_{0} = 0$ f = 1 MHz (Note)	_	0.45	_	pF
Reverse transfer capacitance	C _{re}	$VCB = 10^{\circ}$, $IE = 0, I = 10^{\circ}$ (1000)	_	0.35	0.8	pF

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

Marking









S-Parameter $Z_O = 50 \Omega$, Ta = 25°C

$V_{CE}=6~V,~I_C=3~mA$

Frequency	S	11	S2	21	S1	2	S2	22
MHz	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
200	0.764	-25.0	7.758	153.8	0.037	76.2	0.934	-16.4
400	0.613	-44.9	6.493	132.9	0.065	67.0	0.808	-27.7
600	0.473	-57.9	5.331	117.9	0.085	62.8	0.702	-34.3
800	0.356	-66.9	4.433	106.2	0.102	61.2	0.623	-38.0
1000	0.261	-70.4	3.738	97.7	0.117	60.4	0.575	-40.6
1200	0.198	-71.7	3.266	90.1	0.132	60.2	0.544	-42.4
1400	0.147	-66.3	2.853	83.0	0.147	60.1	0.529	-44.1
1600	0.129	-54.9	2.555	78.2	0.163	60.3	0.519	-46.4
1800	0.114	-41.8	2.348	72.8	0.179	60.0	0.514	-49.0
2000	0.124	-34.5	2.108	69.2	0.192	60.1	0.513	-52.4

$V_{CE} = 6 V, I_C = 7 mA$

Frequency	S	11	S2	21	S1	2	Sź	22
MHz	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
200	0.560	-35.3	12.525	142.0	0.032	74.2	0.853	-21.5
400	0.367	-54.1	8.958	118.8	0.055	69.5	0.678	-30.1
600	0.248	-63.4	6.693	105.3	0.073	68.4	0.581	-32.7
800	0.158	-62.4	5.270	95.5	0.091	68.6	0.530	-33.6
1000	0.101	-47.8	4.319	88.5	0.110	68.4	0.506	-34.7
1200	0.088	-27.3	3.687	82.1	0.128	67.9	0.493	-36.0
1400	0.099	-4.3	3.188	76.2	0.146	67.0	0.491	-37.8
1600	0.131	-0.7	2.813	71.9	0.165	66.2	0.492	-40.5
1800	0.152	0.4	2.563	67.4	0.183	65.2	0.498	-43.7
2000	0.167	-1.7	2.276	64.5	0.198	64.5	0.500	-47.5

30°

-30°















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