TOSHIBA Transistor Silicon NPN Epitaxial Planar Type

2SC5066

VHF~UHF Band Low Noise Amplifier Applications

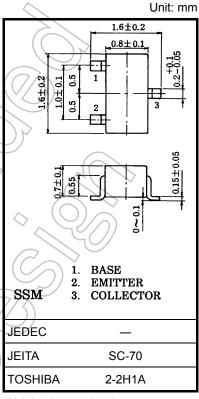
- Low noise figure, high gain.
- NF = 1.1dB, $|S_{21e}|^2 = 12dB$ (f = 1 GHz)

Absolute Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit	
Collector-base voltage	V_{CBO}	20	V	
Collector-emitter voltage	V_{CEO}	12	V (
Emitter-base voltage	V_{EBO}	3	M	
Base current	lΒ	15	mA	
Collector current	IC	30	((mA <	
Collector power dissipation	PC	100	mW	
Junction temperature	Tj	125	Ş	
Storage temperature range	T _{stg}	-55 to 125	ပ္	

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).



Weight: 2.4 mg (typ.)

Microwave Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Тур.	Max	Unit
Transition frequency	fT	V _{CE} = 5 V, I _C = 10 mA	5	7	_	GHz
Insertion gain	S _{21e} ² (1)	V _{CE} = 5 V, I _C = 10 mA, f = 500 MHz	_	17	_	dB
	S _{21e} ² (2)	$V_{CE} = 5 \text{ V}, I_{C} = 10 \text{ mA}, f = 1 \text{ GHz}$	8.5	12	_	
Noise figure	NF (1)	$V_{CE} = 5 \text{ V}, I_{C} = 3 \text{ mA}, f = 500 \text{ MHz}$	_	1	_	dB
Noise ligure	NF (2)	V _{CE} = 5 V, I _C = 3 mA, f = 1 GHz —		1.1	2.0	QD.

Electrical Characteristics (Ta = 25°C)

Characteristics	Test Condition	Min	Тур.	Max	Unit	
Collector cut-off current	I _{CBO}	V _{CB} = 10 V, I _E = 0	_	_	1	μА
Emitter cut-off current	I _{EBO}	V _{EB} = 1 V, I _C = 0		_	1	μΑ
DC current gain	h _{FE} (Note 1)	V _{CE} = 5 V, I _C = 10 mA	80	_	240	
Output capacitance	C _{ob}	V _{CB} = 5 V, I _F = 0, f = 1 MHz (Note 2)	_	0.7	_	pF
Reverse transfer capacitance	C _{re}	VCB = 3 V, IE = 0, I = 1 WILLZ (NOTE 2)	_	0.45	0.9	pF

Note 1: hFE classification O: 80 to 160, Y: 120 to 240

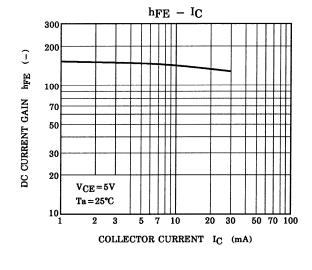
Note 2: C_{re} is measured by 3 terminal method with capacitance bridge.

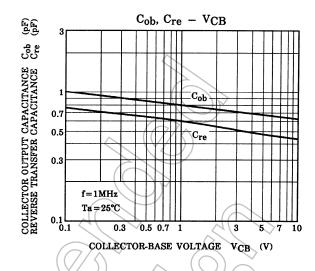
Start of commercial production 1993-07

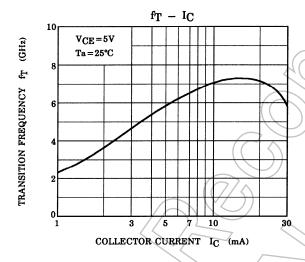
Marking

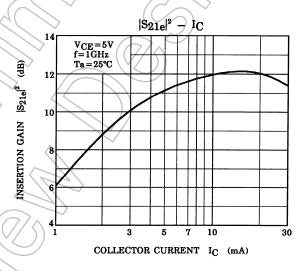


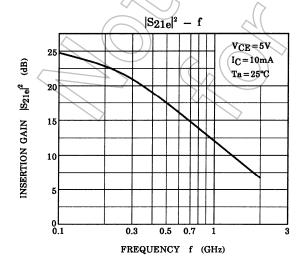
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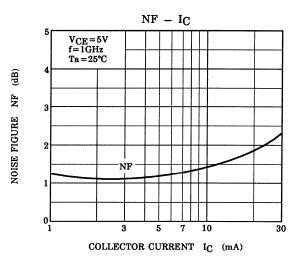




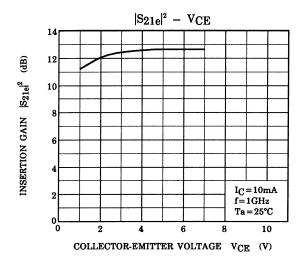


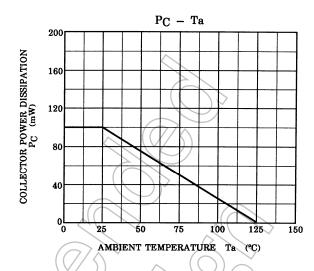






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S-Parameter $Z_O = 50 \Omega$, $Ta = 25^{\circ}C$

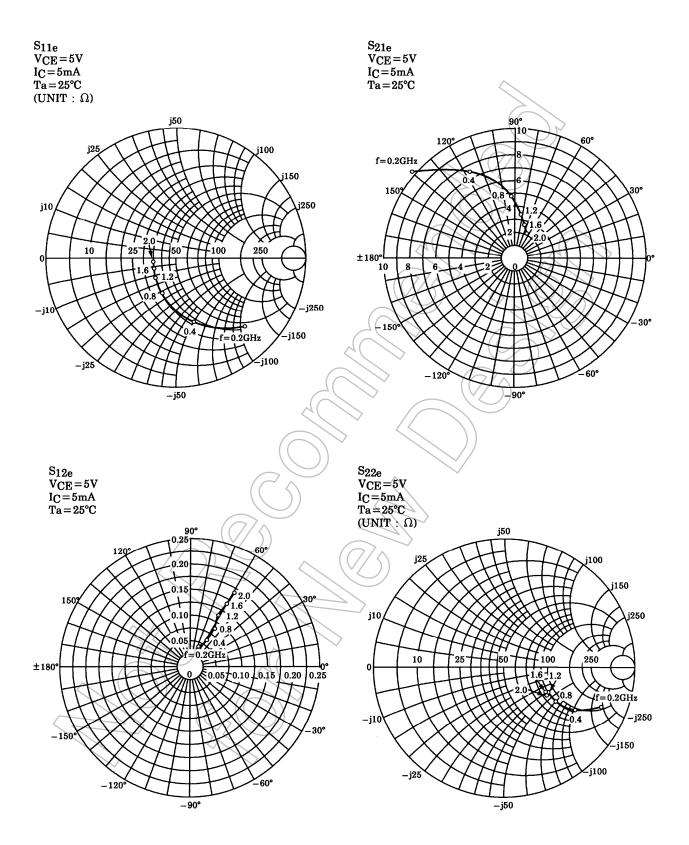
$V_{CE} = 5 V$, $I_C = 5 mA$

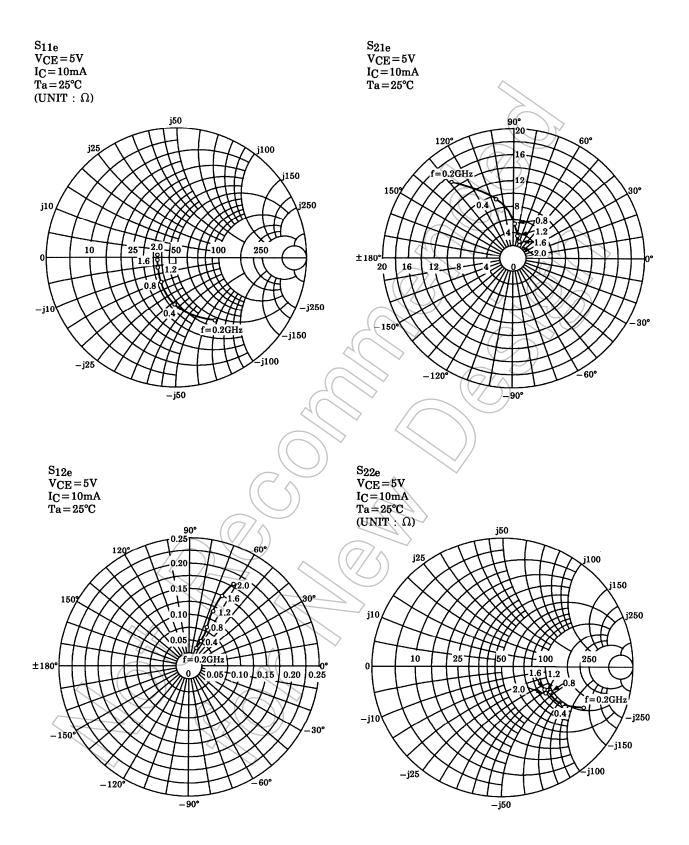
Frequency	S	11	S2	1	S ₁	2	S	22
(MHz)	Mag.	Ang.	Mag.	Ang.	Mag.	Ang.	Mag.	Ang.
200	0.753	-43.7	10.247	140.6	0.040	65.6	0.827	-22.6
400	0.531	-75.1	7.684	117.1	0.060	57.1	0.648	-30.3
600	0.384	-96.4	5.815	103.0	0.074	56.1	0.551	-32.0
800	0.305	-112.6	4.523	93.6	0.086	57.0	0.500	-32.3
1000	0.255	-126.5 ((3.788	86.3	0.099	58.9	0.472	-32.4
1200	0.224	-138.4	3.244	80.7	0,112	60.2	0.455	-32.2
1400	0.203	-150.1/	2.833	75.4	0.127	60.3	0.442	-32.6
1600	0.187	-159.4	2.529	70.6	0.139	60.0	0.434	-33.0
1800	0.174	_166.5	2.283	66.7	0.150	60.3	0.429	-32.6
2000	0.176	-171.2	2.107	63.0	0.164	59.2	0.428	-32.2

$V_{CE} = 5 \text{ V, } I_{C} = 10 \text{ mA}$

Frequency	⟨\\\s	11	\wedge	S21	S1	2	S2	22
(MHz)	Mag.	Ang.	Mag.	Ang.	Mag.	Ang.	Mag.	Ang.
200	0.591	-58.0	14.955	129.6	0.034	64.3	0.714	-27.5
400	0.367	-90.3	9.581	107.5	0.052	61.9	0.534	-30.8
600	0.260	-110.7	6.781	96.1	0.067	63.9	0.462	-30.1
800	0.209	-126.9	5.207	88.6	0.083	65.2	0.428	-29.2
1000	0.178	-141.8	4.269	82.5	0.100	66.4	0.412	-28.6
1200	0.160	-153.7	3.618	77.7	0.117	66.7	0.403	-28.3
1400	0.150	-166.3	3.152	72.7	0.135	65.4	0.398	-28.8
1600	0.141	-175.2	2.801	68.7	0.149	64.0	0.393	-29.4
1800	0.130	178.2	2.521	65.0	0.163	63.4	0.392	-29.0
2000	0.133	174.0	2.314	61.7	0.179	61.3	0.395	-28.6

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