

TOSHIBA Transistor Silicon NPN Epitaxial Planar Type

2SC5096FT

VHF~UHF Band Low Noise Amplifier Applications

Unit: mm

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

Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

Characteristics	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	20	V
Collector-emitter voltage	V_{CEO}	8	V
Emitter-base voltage	V_{EBO}	1.5	V
Base current	I_B	7	mA
Collector current	I_C	15	mA
Collector power dissipation	P_C	100	mW
Junction temperature	T_j	125	$^\circ\text{C}$
Storage temperature range	T_{stg}	-55~125	$^\circ\text{C}$

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).

		1. BASE
		2. EMITTER
		3. COLLECTOR
JEDEC	—	
JEITA	—	
TOSHIBA	2-1B1A	

Weight: 0.0022 g (typ.)

Microwave Characteristics ($T_a = 25^\circ\text{C}$)

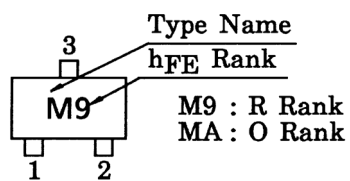
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Transition frequency	f_T	$V_{CE} = 6\text{ V}$, $I_C = 7\text{ mA}$	7	10	—	GHz
Insertion gain	$ S_{21e} ^2 (1)$	$V_{CE} = 6\text{ V}$, $I_C = 7\text{ mA}$, $f = 1\text{ GHz}$	—	13	—	dB
	$ S_{21e} ^2 (2)$	$V_{CE} = 6\text{ V}$, $I_C = 7\text{ mA}$, $f = 2\text{ GHz}$	4.5	7.5	—	
Noise figure	NF (1)	$V_{CE} = 6\text{ V}$, $I_C = 3\text{ mA}$, $f = 1\text{ GHz}$	—	1.4	—	dB
	NF (2)	$V_{CE} = 6\text{ V}$, $I_C = 3\text{ mA}$, $f = 2\text{ GHz}$	—	1.8	3.0	

Electrical Characteristics ($T_a = 25^\circ\text{C}$)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}	$V_{CB} = 10\text{ V}$, $I_E = 0$	—	—	1	μA
Emitter cut-off current	I_{EBO}	$V_{EB} = 1\text{ V}$, $I_C = 0$	—	—	1	μA
DC current gain	h_{FE} (Note 1)	$V_{CE} = 6\text{ V}$, $I_C = 7\text{ mA}$	50	—	160	
Output capacitance	C_{ob}	$V_{CB} = 10\text{ V}$, $I_E = 0$, $f = 1\text{ MHz}$ (Note 2)	—	0.5	—	pF
Reverse transfer capacitance	C_{re}		—	0.4	0.85	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

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20070701-EN GENERAL

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