

TOSHIBA Transistor Silicon NPN Epitaxial Planar Type

MT4S03A

VHF~UHF Band Low Noise Amplifier Applications

Unit: mm

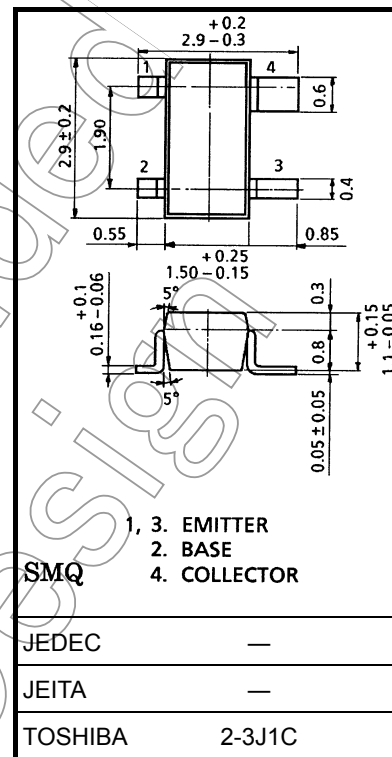
- Low noise figure: $NF = 1.4\text{dB}$ ($f = 2\text{ GHz}$)
- High gain: $\text{Gain} = 9\text{dB}$ ($f = 2\text{ GHz}$)

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

Characteristics	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	10	V
Collector-emitter voltage	V_{CEO}	5	V
Emitter-base voltage	V_{EBO}	2	V
Base current	I_{C}	40	mA
Collector current	I_{B}	10	mA
Collector power dissipation	P_{C}	150	mW
Junction temperature	T_{j}	125	$^\circ\text{C}$
Storage temperature range	T_{stg}	-55~125	$^\circ\text{C}$

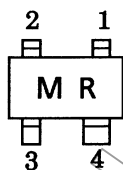
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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



Weight: 0.012 g (typ.)

Marking



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

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Transition frequency	$f_{\text{T}} (1)$	$V_{\text{CE}} = 1\text{ V}, I_{\text{C}} = 5\text{ mA}$	2	4.5	—	GHz
	$f_{\text{T}} (2)$	$V_{\text{CE}} = 3\text{ V}, I_{\text{C}} = 10\text{ mA}$	7	10	—	
Insertion gain	$ S_{21e} ^2 (1)$	$V_{\text{CE}} = 1\text{ V}, I_{\text{C}} = 5\text{ mA}, f = 2\text{ GHz}$	3.5	5.5	—	dB
	$ S_{21e} ^2 (2)$	$V_{\text{CE}} = 3\text{ V}, I_{\text{C}} = 20\text{ mA}, f = 2\text{ GHz}$	7	9	—	
Noise figure	$NF (1)$	$V_{\text{CE}} = 1\text{ V}, I_{\text{C}} = 5\text{ mA}, f = 2\text{ GHz}$	—	1.7	3	dB
	$NF (2)$	$V_{\text{CE}} = 3\text{ V}, I_{\text{C}} = 7\text{ mA}, f = 2\text{ GHz}$	—	1.4	2.2	

Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}	$V_{CB} = 5\text{ V}, I_E = 0$	—	—	0.1	μA
Emitter cut-off current	I_{EBO}	$V_{EB} = 1\text{ V}, I_C = 0$	—	—	1	μA
DC current gain	h_{FE}	$V_{CE} = 1\text{ V}, I_C = 5\text{ mA}$	80	—	160	
Reverse transfer capacitance	C_{re}	$V_{CB} = 1\text{ V}, I_E = 0, f = 1\text{ MHz}$ (Note)	—	0.7	1.05	pF

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

Caution

This device is sensitive to electrostatic discharge. Please handle with caution.

Not Recommended
for New Design

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