

TOSHIBA Transistor Silicon NPN Epitaxial Planar Type

MT3S08T

VHF~UHF Band Low Noise Amplifier Applications

Unit: mm

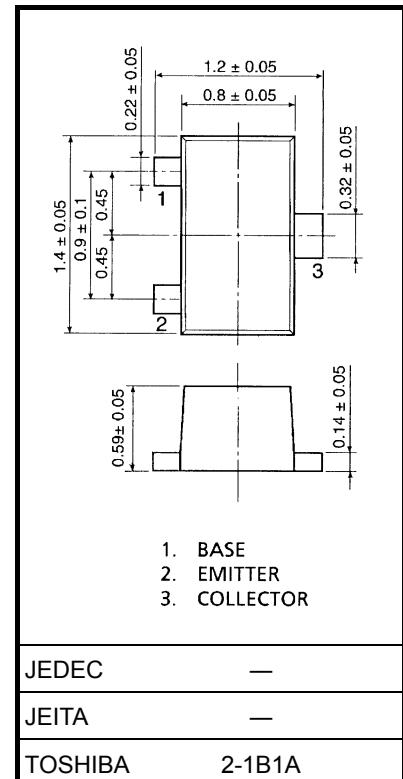
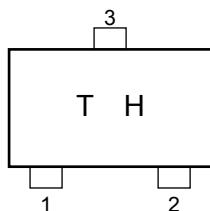
- Suitable for use in an OSC
- Low noise figure
NF = 1.4dB
 $|S_{21e}|^2 = 10.5\text{dB}$ (@1 V/5 mA/1 GHz)

Absolute Maximum Ratings (Ta = 25°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
Collector current	I _C	40	mA
Base current	I _B	10	mA
Collector power dissipation	P _C	100	mW
Junction temperature	T _j	125	°C
Storage temperature range	T _{stg}	-55~125	°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.).

Marking

Weight: 2.2 mg (typ.)

Microwave Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Transition frequency	f_T	$V_{CE} = 1 \text{ V}, I_C = 5 \text{ mA}$	2	4.5	—	GHz
Insertion gain	$ S21e ^2(1)$	$V_{CE} = 1 \text{ V}, I_C = 5 \text{ mA}, f = 1 \text{ GHz}$	—	10.5	—	dB
	$ S21e ^2(2)$	$V_{CE} = 3 \text{ V}, I_C = 20 \text{ mA}, f = 1 \text{ GHz}$	10.5	13.5	—	
Noise figure	NF	$V_{CE} = 1 \text{ V}, I_C = 5 \text{ mA}, f = 1 \text{ GHz}$	—	1.4	2.5	dB

Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}	$V_{CB} = 10 \text{ V}, I_E = 0$	—	—	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	—	140	—
Reverse transfer capacitance	C_{re}	$V_{CB} = 1 \text{ V}, I_E = 0, f = 1 \text{ MHz}$ (Note)	—	0.55	0.95	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.

RESTRICTIONS ON PRODUCT USE

20070701-EN GENERAL

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In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent TOSHIBA products specifications. Also, please keep in mind the precautions and conditions set forth in the "Handling Guide for Semiconductor Devices," or "TOSHIBA Semiconductor Reliability Handbook" etc.
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