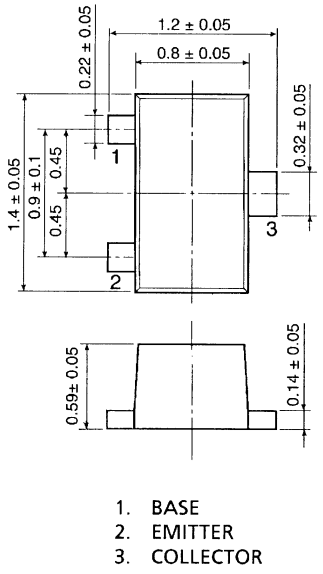
TOSHIBA Transistor Silicon NPN Epitaxial Planar Type

MT3S05T

VHF~UHF Band Low Noise Amplifier Applications

- Suitable for use in an OSC
- Low noise figure
  NF = 1.4dB
- Excellent collector current linearity
  $|S21e|^2$ = 8.5dB (@1 V/5 mA/1 GHz)

Unit: mm



1. BASE
2. EMITTER
3. COLLECTOR

JEDEC	—
JEITA	—
TOSHIBA	2-1B1A

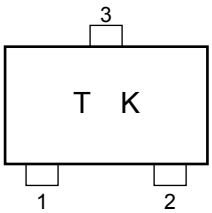
Weight: 2.2 mg (typ.)

Absolute Maximum Ratings (Ta = 25°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
Collector current	I_C	40	mA
Base current	I_B	10	mA
Collector power dissipation	P_C	100	mW
Junction temperature	Tj	125	°C
Storage temperature range	Tstg	−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



Microwave Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Transition frequency	f_T	V_{CE} = 1 V, I_C = 5 mA	2	4.5	—	GHz
Insertion gain	$\|S21e\|^2$(1)	V_{CE} = 1 V, I_C = 5 mA, f = 1 GHz	—	8.5	—	dB
	$\|S21e\|^2$(2)	V_{CE} = 3 V, I_C = 20 mA, f = 1 GHz	8.5	11.5	—	
Noise figure	NF	V_{CE} = 1 V, I_C = 5 mA, f = 1 GHz	—	1.4	2.2	dB

Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}	V_{CB} = 5 V, I_E = 0	—	—	0.1	μA
Emitter cut-off current	I_{EBO}	V_{EB} = 1 V, I_C = 0	—	—	1	μA
DC current gain	h_{FE}	V_{CE} = 1 V, I_C = 5 mA	80	—	140	—
Reverse transfer capacitance	C_{re}	V_{CB} = 1 V, I_E = 0, f = 1 MHz (Note)	—	0.9	1.25	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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