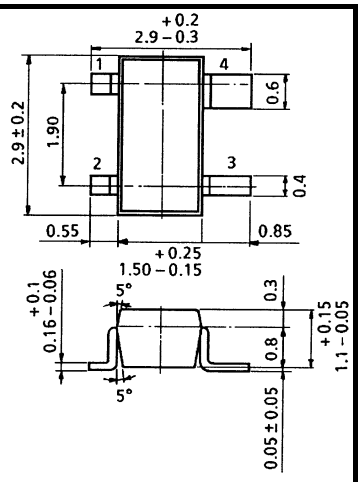
TOSHIBA Transistor Silicon NPN Epitaxial Planar Type

MT4S04A

VHF~UHF Band Low Noise Amplifier Applications

- Low noise figure: NF = 1.2dB (typ.) (f = 1 GHz)
- High gain: Gain = 13.5dB (typ.) (f = 1 GHz)

Unit: mm



JEDEC	—
JEITA	—
TOSHIBA	2-3J1C

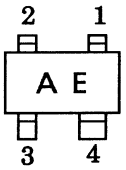
Weight: 12mg (typ.)

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	150	mW
Junction temperature	T_j	125	°C
Storage temperature range	T_{stg}	−55 to 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 (1)	V_{CE} = 1 V, I_C = 5 mA	2	4.5	—	GHz
	f_T (2)	V_{CE} = 3 V, I_C = 7 mA	5	7	—	
Insertion gain	$\|S_{21e}\|^2$ (1)	V_{CE} = 1 V, I_C = 5 mA, f = 1 GHz	6	10	—	dB
	$\|S_{21e}\|^2$ (2)	V_{CE} = 3 V, I_C = 20 mA, f = 1 GHz	9.5	13.5	—	
Noise figure	NF (1)	V_{CE} = 1 V, I_C = 5 mA, f = 1 GHz	—	1.3	2.2	dB
	NF (2)	V_{CE} = 3 V, I_C = 7 mA, f = 1 GHz	—	1.2	2	

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	—	160	
Reverse transfer capacitance	C_{re}	V_{CB} = 1 V, I_E = 0, f = 1 MHz (Note)	—	0.75	1.1	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.

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