

TOSHIBA Transistor Silicon NPN Epitaxial Planar Type

# 2SC5086FT

## VHF~UHF Band Low Noise Amplifier Applications

- Low noise figure, high gain.
- $NF = 1.1\text{dB}$ ,  $|S_{21e}|^2 = 11\text{dB}$  ( $f = 1\text{GHz}$ )

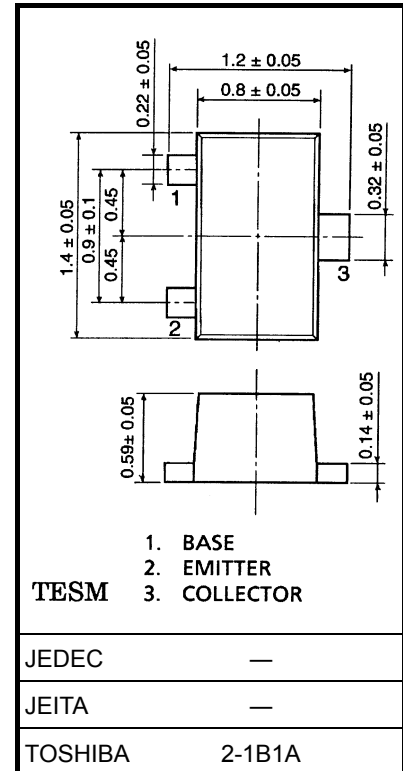
### Absolute Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Collector-base voltage	V <sub>CBO</sub>	20	V
Collector-emitter voltage	V <sub>CEO</sub>	12	V
Emitter-base voltage	V <sub>EBO</sub>	3	V
Base current	I <sub>B</sub>	40	mA
Collector current	I <sub>C</sub>	80	mA
Collector power dissipation	P <sub>C</sub>	100	mW
Junction temperature	T <sub>j</sub>	125	°C
Storage temperature range	T <sub>stg</sub>	-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).

Unit: mm



Weight: 0.0022 g (typ.)

### Microwave Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Transition frequency	f <sub>T</sub>	V <sub>CE</sub> = 10 V, I <sub>C</sub> = 20 mA	5	7	—	GHz
Insertion gain	S <sub>21e</sub>   <sup>2</sup> (1)	V <sub>CE</sub> = 10 V, I <sub>C</sub> = 20 mA, f = 500 MHz	—	16.5	—	dB
	S <sub>21e</sub>   <sup>2</sup> (2)	V <sub>CE</sub> = 10 V, I <sub>C</sub> = 20 mA, f = 1 GHz	7.5	11	—	
Noise figure	NF (1)	V <sub>CE</sub> = 10 V, I <sub>C</sub> = 5 mA, f = 500 MHz	—	1	—	dB
	NF (2)	V <sub>CE</sub> = 10 V, I <sub>C</sub> = 5 mA, f = 1 GHz	—	1.1	2	

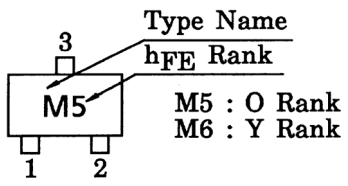
### Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I <sub>CBO</sub>	V <sub>CB</sub> = 10 V, I <sub>E</sub> = 0	—	—	1	μA
Emitter cut-off current	I <sub>EBO</sub>	V <sub>EB</sub> = 1 V, I <sub>C</sub> = 0	—	—	1	μA
DC current gain	h <sub>FE</sub> (Note 1)	V <sub>CE</sub> = 10 V, I <sub>C</sub> = 20 mA	80	—	240	
Output capacitance	C <sub>ob</sub>	V <sub>CB</sub> = 10 V, I <sub>E</sub> = 0, f = 1 MHz (Note 2)	—	1.0	—	pF
Reverse transfer capacitance	C <sub>re</sub>		—	0.65	1.15	pF

Note 1: h<sub>FE</sub> classification O: 80~160, Y: 120~240

Note 2: C<sub>re</sub> is measured by 3 terminal method with capacitance bridge.

## Marking



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20070701-EN GENERAL

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