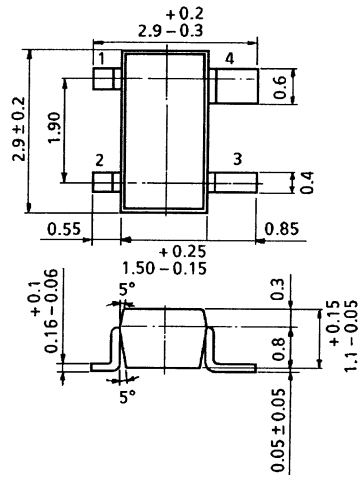
TOSHIBA Transistor Silicon NPN Epitaxial Planar Type

2SC5087R

VHF to UHF Band Low Noise Amplifier Applications

- Low noise figure, high gain.
- NF = 1.1dB, $|S_{21e}|^2$ = 13.5dB (f = 1 GHz)

Unit: mm



1.Base(B)
2.Emitter1(E1)
3.Collector(C)
4.Emitter(E2)

SMQ

JEDEC	—
JEITA	—
TOSHIBA	—

Weight: 12 mg (typ.)

Absolute Maximum Ratings (Ta = 25°C)

Characteristic	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	20	V
Collector-emitter voltage	V_{CEO}	12	V
Emitter-base voltage	V_{EBO}	3	V
Base current	I_B	40	mA
Collector current	I_C	80	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).

Microwave Characteristics (Ta = 25°C)

Characteristic	Symbol	Condition	Min	Typ.	Max	Unit
Transition frequency	f_T	V_{CE} = 10 V, I_C = 30 mA	6	8	—	GHz
Insertion gain	$\|S_{21e}\|^2$ (1)	V_{CE} = 5 V, I_C = 20 mA, f = 1 GHz	—	12.5	—	dB
	$\|S_{21e}\|^2$ (2)	V_{CE} = 10 V, I_C = 30 mA, f = 1 GHz	11	13.5	—	
Noise figure	NF	V_{CE} = 10 V, I_C = 7 mA, f = 1 GHz	—	1.1	2	

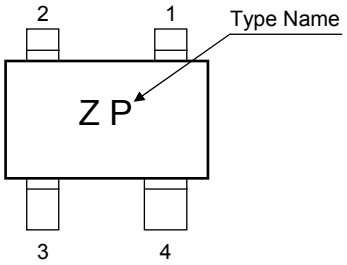
Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Condition	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}	V_{CB} = 10 V, I_E = 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} = 10 V, I_C = 20 mA	120	—	240	—
Output capacitance	C_{ob}	V_{CB} = 10 V, I_E = 0, f = 1 MHz(Note 1)	—	1.1	1.6	pF
Reverse transfer capacitance	C_{re}		—	0.65	1	pF

Note 1: C_{re} is measured with a three-terminal method using a capacitance bridge.

Start of commercial production
2005-05

Marking



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