

TOSHIBA Transistor Silicon NPN Epitaxial Planar Type

## 2SC5317

VHF~UHF Band Low Noise Amplifier Applications

(chip:  $f_T = 16$  GHz series)

Unit: mm

- Low noise figure:  $NF = 1.3\text{dB}$  ( $f = 2$  GHz)
- High gain:  $G_a = 9\text{dB}$  ( $f = 2$  GHz)

Maximum Ratings ( $T_a = 25^\circ\text{C}$ )

Characteristics	Symbol	Rating	Unit
Collector-base voltage	$V_{CBO}$	8	V
Collector-emitter voltage	$V_{CEO}$	5	V
Emitter-base voltage	$V_{EBO}$	1.5	V
Collector current	$I_C$	20	mA
Base current	$I_B$	10	mA
Collector power dissipation	$P_C$	100	mW
Junction temperature	$T_j$	125	$^\circ\text{C}$
Storage temperature range	$T_{stg}$	$-55\sim 125$	$^\circ\text{C}$

1. BASE	
2. EMITTER	
3. COLLECTOR	
JEDEC	—
JEITA	—
TOSHIBA	2-2H1A

Microwave Characteristics ( $T_a = 25^\circ\text{C}$ )

Weight: 2.4 mg (typ.)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Transition frequency	$f_T$	$V_{CE} = 3\text{ V}, I_C = 15\text{ mA}$	9	—	—	GHz
Insertion gain	$ S_{21e} ^2 (1)$	$V_{CE} = 3\text{ V}, I_C = 15\text{ mA}, f = 1\text{ GHz}$	12	15	—	dB
	$ S_{21e} ^2 (2)$	$V_{CE} = 3\text{ V}, I_C = 15\text{ mA}, f = 2\text{ GHz}$	6	9	—	
Noise figure	NF (1)	$V_{CE} = 3\text{ V}, I_C = 5\text{ mA}, f = 1\text{ GHz}$	—	0.9	1.8	dB
	NF (2)	$V_{CE} = 3\text{ V}, I_C = 5\text{ mA}, f = 2\text{ GHz}$	—	1.3	2.2	

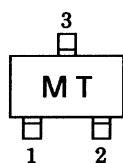
Electrical Characteristics ( $T_a = 25^\circ\text{C}$ )

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	$I_{CBO}$	$V_{CB} = 8\text{ V}, I_E = 0$	—	—	1	$\mu\text{A}$
Emitter cut-off current	$I_{EBO}$	$V_{EB} = 1\text{ V}, I_C = 0$	—	—	1	$\mu\text{A}$
DC current gain	$h_{FE}$	$V_{CE} = 3\text{ V}, I_C = 15\text{ mA}$	50	—	250	
Output capacitance	$C_{ob}$	$V_{CB} = 2.5\text{ V}, I_E = 0, f = 1\text{ MHz}$ (Note)	—	0.6	—	pF
Reverse transfer capacitance	$C_{re}$		—	0.4	0.85	pF

Note:  $C_{re}$  is measured by 3 terminal method with capacitance bridge.

**Caution**

This device electrostatic sensitivity. Please handle with caution.

**Marking**

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