

TOSHIBA Transistor Silicon NPN Epitaxial Planar Type

# MT6L61AE

VHF-UHF Band Low Noise Amplifier Application

VHF-UHF Band Oscillator Application

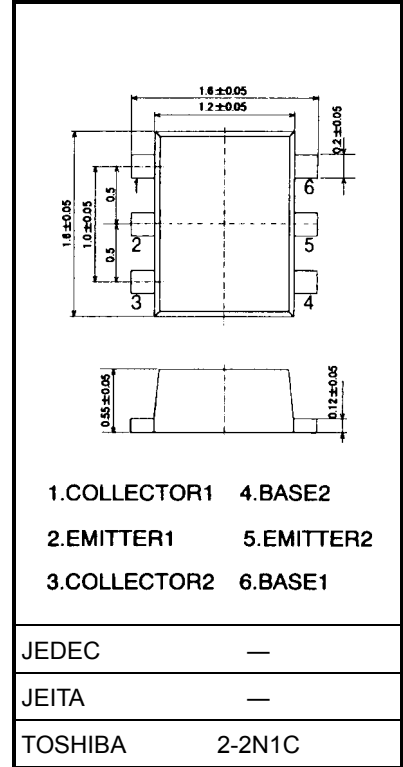
Unit: mm

### Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating		Unit
		Q1	Q2	
Collector-base voltage	V <sub>CB0</sub>	10	10	V
Collector-emitter voltage	V <sub>CEO</sub>	5	5	V
Emitter-base voltage	V <sub>EB0</sub>	1.5	2	V
Collector current	I <sub>C</sub>	25	40	mA
Base current	I <sub>B</sub>	10	10	mA
Collector power dissipation	P <sub>C</sub> (Note1)	100		mW
Junction temperature	T <sub>j</sub>	125		°C
Storage temperature range	T <sub>stg</sub>	-55~125		°C

Note1: Total power dissipation of Q1 and Q2

	Q1	Q2
Three pin SSM type part No.	MT3S07S	MT3S04AS



Weight: 3 mg (typ.)

## Electrical Characteristics Q1-Side (Ta = 25°C)

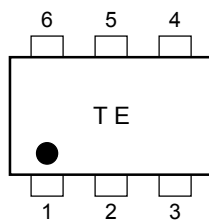
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	$I_{CBO}$	$V_{CB} = 5\text{ V}, I_E = 0$	—	—	0.1	$\mu\text{A}$
Emitter cut-off current	$I_{EBO}$	$V_{EB} = 1\text{ V}, I_C = 0$	—	—	1	$\mu\text{A}$
DC current gain	$h_{FE}$	$V_{CE} = 1\text{ V}, I_C = 5\text{ mA}$	70	—	140	—
Transition frequency	$f_T$	$V_{CE} = 3\text{ V}, I_C = 10\text{ mA}$	10	12	—	GHz
Insertion gain	$ S_{21e} ^2 (1)$	$V_{CE} = 1\text{ V}, I_C = 5\text{ mA}, f = 2\text{ GHz}$	—	7	—	dB
	$ S_{21e} ^2 (2)$	$V_{CE} = 3\text{ V}, I_C = 15\text{ mA}, f = 2\text{ GHz}$	6.5	8.5	—	
Noise figure	NF (1)	$V_{CE} = 1\text{ V}, I_C = 5\text{ mA}, f = 2\text{ GHz}$	—	1.6	3	dB
	NF (2)	$V_{CE} = 3\text{ V}, I_C = 5\text{ mA}, f = 2\text{ GHz}$	—	1.5	3	
Reverse transfer capacitance	$C_{re}$	$V_{CB} = 1\text{ V}, I_E = 0, f = 1\text{ MHz}$ (Note2)	—	0.45	0.85	pF

## Electrical Characteristics Q2-Side (Ta = 25°C)

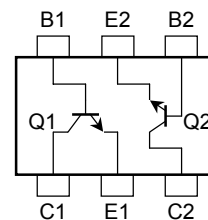
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	$I_{CBO}$	$V_{CB} = 5\text{ V}, I_E = 0$	—	—	0.1	$\mu\text{A}$
Emitter cut-off current	$I_{EBO}$	$V_{EB} = 1\text{ V}, I_C = 0$	—	—	1	$\mu\text{A}$
DC current gain	$h_{FE}$	$V_{CE} = 1\text{ V}, I_C = 5\text{ mA}$	80	—	160	—
Transition frequency	$f_T (1)$	$V_{CE} = 1\text{ V}, I_C = 5\text{ mA}$	2	4.5	—	GHz
	$f_T (2)$	$V_{CE} = 3\text{ V}, I_C = 7\text{ mA}$	5	7	—	
Insertion gain	$ S_{21e} ^2 (1)$	$V_{CE} = 1\text{ V}, I_C = 5\text{ mA}, f = 1\text{ GHz}$	—	8.5	—	dB
	$ S_{21e} ^2 (2)$	$V_{CE} = 3\text{ V}, I_C = 20\text{ mA}, f = 1\text{ GHz}$	7.5	11	—	
Noise figure	NF (1)	$V_{CE} = 1\text{ V}, I_C = 5\text{ mA}, f = 1\text{ GHz}$	—	1.3	2.2	dB
	NF (2)	$V_{CE} = 3\text{ V}, I_C = 7\text{ mA}, f = 1\text{ GHz}$	—	1.2	2	
Reverse transfer capacitance	$C_{re}$	$V_{CB} = 1\text{ V}, I_E = 0, f = 1\text{ MHz}$ (Note2)	—	0.9	1.25	pF

Note2:  $C_{re}$  is measured by 3 terminal method with capacitance bridge.

## Marking



## Pin Assignment (top view)



## Caution

This device electrostatic sensitivity. Please handle with caution.

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