

TOSHIBA Transistor Silicon NPN Epitaxial Planar Type

MT6L61AE

VHF-UHF Band Low Noise Amplifier Application

VHF-UHF Band Oscillator Application

Unit: mm

Absolute Maximum Ratings (Ta = 25°C)

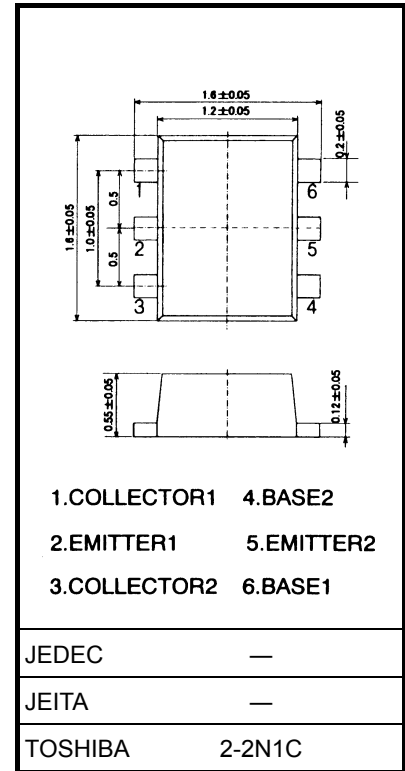
Characteristics	Symbol	Rating		Unit
		Q1	Q2	
Collector-base voltage	V _{CB0}	10	10	V
Collector-emitter voltage	V _{CE0}	5	5	V
Emitter-base voltage	V _{EB0}	1.5	2	V
Collector current	I _C	25	40	mA
Base current	I _B	10	10	mA
Collector power dissipation	P _C (Note1)	100		mW
Junction temperature	T _j	125		°C
Storage temperature range	T _{stg}	-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).

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)

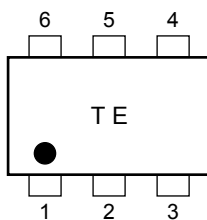
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}	$V_{CB} = 5\text{ V}, I_E = 0$	—	—	0.1	μA
Emitter cut-off current	I_{EBO}	$V_{EB} = 1\text{ V}, I_C = 0$	—	—	1	μA
DC current gain	h_{FE}	$V_{CE} = 1\text{ V}, I_C = 5\text{ mA}$	70	—	140	—
Transition frequency	f_T	$V_{CE} = 3\text{ V}, I_C = 10\text{ mA}$	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)

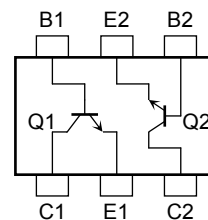
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}	$V_{CB} = 5\text{ V}, I_E = 0$	—	—	0.1	μA
Emitter cut-off current	I_{EBO}	$V_{EB} = 1\text{ V}, I_C = 0$	—	—	1	μA
DC current gain	h_{FE}	$V_{CE} = 1\text{ V}, I_C = 5\text{ mA}$	80	—	160	—
Transition frequency	$f_T (1)$	$V_{CE} = 1\text{ V}, I_C = 5\text{ mA}$	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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20070701-EN GENERAL

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