

Preliminary TOSHIBA Transistor Silicon NPN Epitaxial Planar Type

MT6L57AS

VHF-UHF Band Low Noise Amplifier Application
VHF-UHF Band Oscillator Application

- Two devices are built into the sES6 package, which is smaller and thinner than the super-thin and ultra-super mini (6-pin) ES6 package.

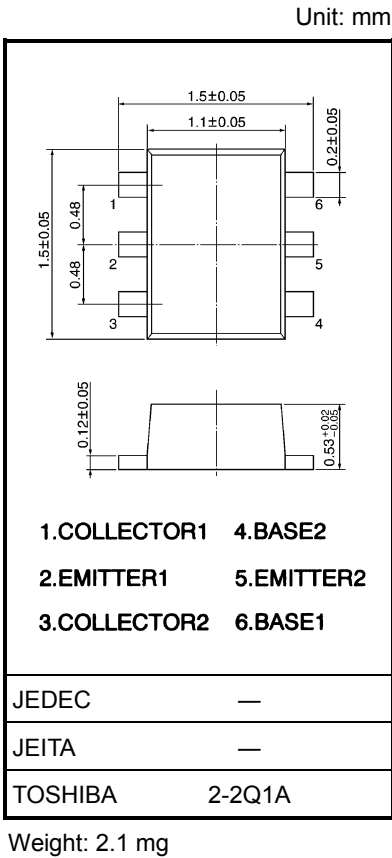
Mounted Devices

	Q1: SSM (TESM)	Q2: SSM (TESM)
Three pin (SSM/TESM) type part No.	MT3S06S (MT3S06T)	MT3S04AS (MT3S04AT)

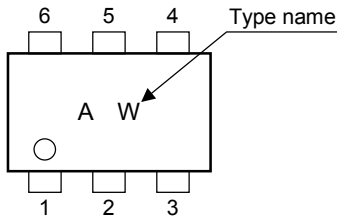
Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Q1	Q2	Unit
Collector-base voltage	V _{CBO}	10	10	V
Collector-emitter voltage	V _{CEO}	5	5	V
Emitter-base voltage	V _{EBO}	1.5	2	V
Collector current	I _C	15	40	mA
Base current	I _B	7	10	mA
Collector power dissipation	P _C (Note 1)	150		mW
Junction temperature	T _j	125		°C
Storage temperature range	T _{stg}	-55~125		°C

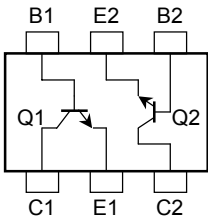
Note 1: Total power dissipation of Q1 and Q2 mounted on the circuit board.



Marking



Pin Assignment



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	$V_{CE} = 3\text{ V}, I_C = 5\text{ mA}$	7	10	—	GHz
Insertion gain	$ S_{21e} ^2 (1)$	$V_{CE} = 1\text{ V}, I_C = 5\text{ mA}, f = 2\text{ GHz}$	—	7.5	—	dB
	$ S_{21e} ^2 (2)$	$V_{CE} = 3\text{ V}, I_C = 7\text{ mA}, f = 2\text{ GHz}$	4.5	8.3	—	
Noise figure	NF (1)	$V_{CE} = 1\text{ V}, I_C = 3\text{ mA}, f = 2\text{ GHz}$	—	1.7	3	dB
	NF (2)	$V_{CE} = 3\text{ V}, I_C = 3\text{ mA}, f = 2\text{ GHz}$	—	1.6	3	
Reverse transfer capacitance	C_{re}	$V_{CB} = 1\text{ V}, I_E = 0, f = 1\text{ MHz}$ (Note 2)	—	0.35	0.75	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	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}	$V_{CB} = 1\text{ V}, I_E = 0, f = 1\text{ MHz}$ (Note 2)	—	0.9	1.25	pF

Note 2: C_{re} is measured by 3 terminal method with capacitance bridge.

Handling Precaution

When handling individual devices (which are not yet mounted on a circuit board), be sure that the environment is protected against electrostatic electricity. Operators should wear anti-static clothing, and containers and other objects that come into direct contact with devices should be made of anti-static materials.

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