

**Preliminary** TOSHIBA Transistor Silicon NPN Epitaxial Planar Type

MT6L58AS

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

Unit: mm

- 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.

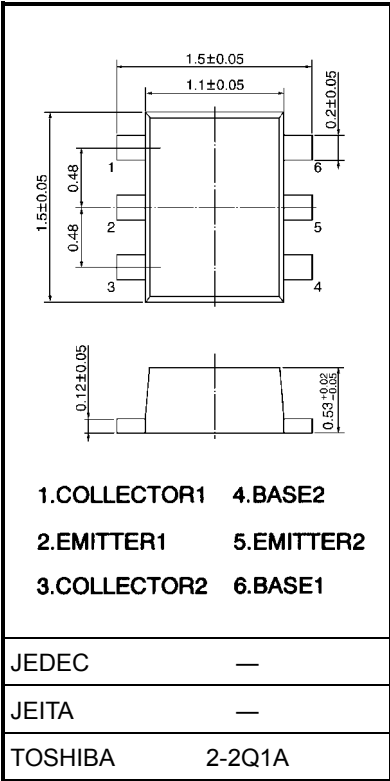
Mounted Devices

	Q1: SSM (TESM)	Q2: SSM (TESM)
Three pin (SSM/TESM) type part No.	MT3S06S (MT3S06T)	MT3S03AS (MT3S03AT)

Maximum Ratings (Ta = 25°C)

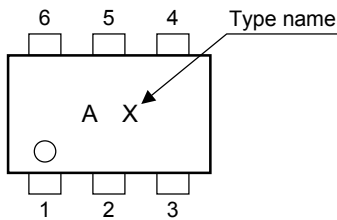
Characteristics	Symbol	Q1	Q2	Unit
Collector-base voltage	V <sub>CBO</sub>	10	10	V
Collector-emitter voltage	V <sub>CEO</sub>	5	5	V
Emitter-base voltage	V <sub>EBO</sub>	1.5	2	V
Collector current	I <sub>C</sub>	15	40	mA
Base current	I <sub>B</sub>	7	10	mA
Collector power dissipation	P <sub>C</sub> (Note 1)	150		mW
Junction temperature	T <sub>j</sub>	125		°C
Storage temperature range	T <sub>stg</sub>	-55~125		°C

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

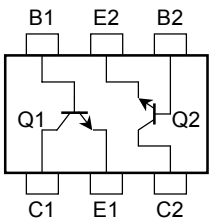


Weight: 2.1 mg

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	$\mu\text{A}$
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	$f_T$	$V_{CE} = 3\text{ V}, I_C = 5\text{ mA}$	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	$\mu\text{A}$
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	$f_T (1)$	$V_{CE} = 1\text{ V}, I_C = 5\text{ mA}$	5	7	—	GHz
	$f_T (2)$	$V_{CE} = 3\text{ V}, I_C = 10\text{ mA}$	7	10	—	
Insertion gain	$ S_{21e} ^2 (1)$	$V_{CE} = 1\text{ V}, I_C = 5\text{ mA}, f = 2\text{ GHz}$	—	5	—	dB
	$ S_{21e} ^2 (2)$	$V_{CE} = 3\text{ V}, I_C = 20\text{ mA}, f = 20\text{ GHz}$	3	6.8	—	
Noise figure	NF (1)	$V_{CE} = 1\text{ V}, I_C = 5\text{ mA}, f = 2\text{ GHz}$	—	1.7	3	dB
	NF (2)	$V_{CE} = 3\text{ V}, I_C = 7\text{ mA}, f = 2\text{ GHz}$	—	1.4	2.2	
Reverse transfer capacitance	$C_{re}$	$V_{CB} = 1\text{ V}, I_E = 0, f = 1\text{ MHz}$ (Note 2)	—	0.8	1.15	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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