

TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL PLANAR TYPE

# MT6L59E

VHF~UHF BAND LOW NOISE AMPLIFIER APPLICATIONS

Unit in mm

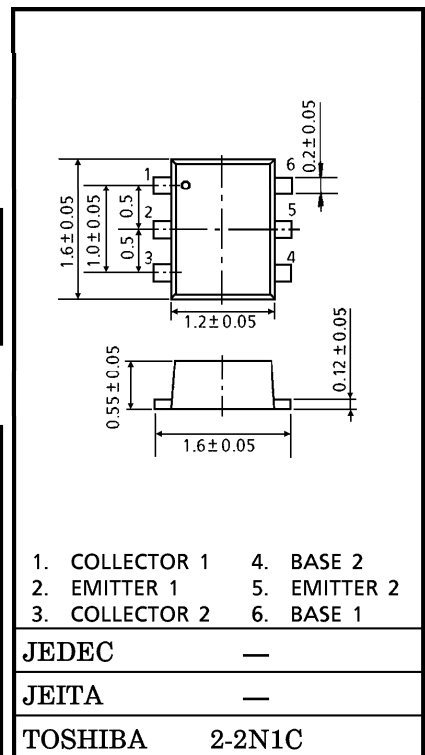
- Two devices are built in to the super-thin and ultra super mini (6 pins) package : ES6

**MOUNTED DEVICES**

	Q1 : SSM (TESM)	Q2 : SSM (TESM)
Three-pins (SSM/ TESM) mold products are corresponded.	MT3S06S (MT3S06T)	MT3S07S (MT3S07T)

**MAXIMUM RATINGS (Ta = 25°C)**

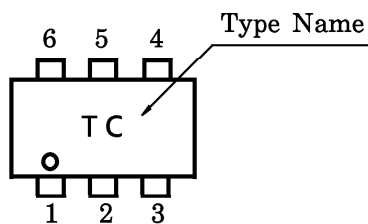
CHARACTERISTIC	SYMBOL	Q1	Q2	UNIT
Collector-Base Voltage	V <sub>CBO</sub>	10	10	V
Collector-Emitter Voltage	V <sub>CEO</sub>	5	5	V
Emitter-Base Voltage	V <sub>EBO</sub>	1.5	1.5	V
Collector Current	I <sub>C</sub>	15	25	mA
Base Current	I <sub>B</sub>	7	10	mA
Collector Power Dissipation	P <sub>C</sub> (Note 1)	100		mW
Junction Temperature	T <sub>j</sub>	125		°C
Storage Temperature Range	T <sub>stg</sub>	-55~125		°C



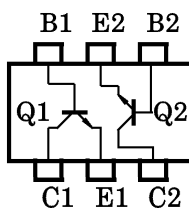
Weight : 0.003 g

(Note 1) : Total power dissipation of Q1 and Q2.

**MARKING**



**PIN ASSIGNMENT (TOP VIEW)**



## ELECTRICAL CHARACTERISTICS Q1 (Ta = 25°C)

CHARACTERISTIC	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	—	dB
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	dB
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 (Ta = 25°C)

CHARACTERISTIC	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	—	dB
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	dB
Reverse Transfer Capacitance	$C_{re}$	$V_{CB} = 1\text{ V}, I_E = 0, f = 1\text{ MHz}$ (Note 2)	—	0.45	0.85	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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