

TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL PLANAR TYPE

MT6L57AT

VHF~UHF BAND LOW NOISE AMPLIFIER APPLICATIONS

Unit in mm

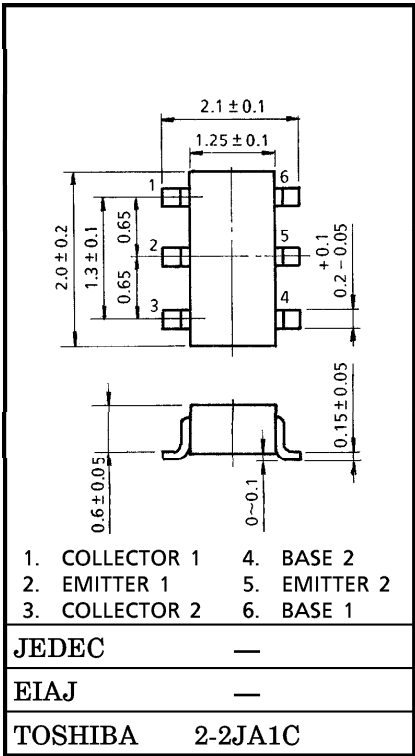
- TWO devices are built in to the super-thin and ultra super mini (6 pins) package : TU6

MOUNTED DEVICES

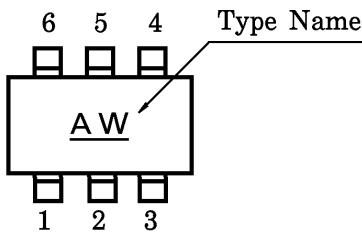
	Q1 : SSM (TESM)	Q2 : SSM (TESM)
Three-pins (SSM / TESSM) mold products are corresponded.	MT3S06S (MT3S06T)	MT3S04AS (MT3S04AT)

MAXIMUM RATINGS (Ta = 25°C)

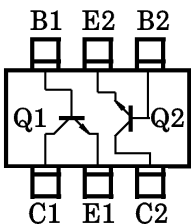
CHARACTERISTIC	SYMBOL	Q1	Q2	UNIT
Collector-Base Voltage	V _{CBO}	10	10	V
Collector-Emitter Voltage	V _{CEO}	5	5	V
Emitter-Base Voltage	V _{EBO}	1.5	2	V
Collector Current	I _C	15	40	mA
Base Current	I _B	7	10	mA
Collector Power Dissipation	P _C	150		mW
Junction Temperature	T _j	125		°C
Storage Temperature Range	T _{stg}	-55~125		°C



MARKING



PIN ASSIGNMENT (TOP VIEW)



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- TOSHIBA is continually working to improve the quality and the reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to observe standards of safety, and to avoid situations in which a malfunction or failure of a TOSHIBA product could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent products specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbook.
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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	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	—	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}	$V_{CB} = 1\text{ V}, I_E = 0, f = 1\text{ MHz (Note)}$	—	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	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	—	GHz
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	—	dB
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	dB
Reverse Transfer Capacitance	C_{re}	$V_{CB} = 1\text{ V}, I_E = 0, f = 1\text{ MHz (Note)}$	—	0.9	1.25	pF

(Note) : 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.