TOSHIBA Transistor Silicon NPN Epitaxial Planar Type

MT6L03AE

VHF~UHF Band Low Noise Amplifier Applications

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

Mounted Devices

	Q1/Q2: SSM (TESM)
Three-pins (SSM/TESM) mold products are corresponded.	MT3S03AS (MT3S03AT)

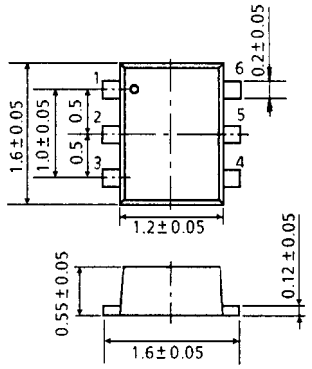
Absolute Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Q1/Q2	Unit
Collector-base voltage	V_{CBO}	10	V
Collector-emitter voltage	V_{CEO}	5	V
Emitter-base voltage	V_{EBO}	2	V
Collector current	I_C	40	mA
Base current	I_B	10	mA
Collector power dissipation	P_C (Note 1)	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).

Note 1: Total power dissipation of Q1 and Q2.

Unit: mm

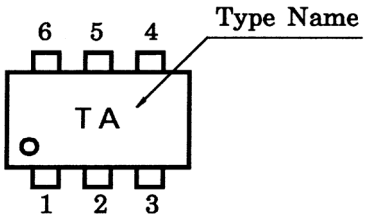


1. COLLECTOR 1
2. EMITTER 1
3. COLLECTOR 2
4. BASE 2
5. EMITTER 2
6. BASE 1

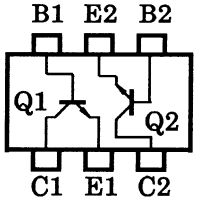
JEDEC	—
JEITA	—
TOSHIBA	2-2N1C

Weight: 0.003 g (typ.)

Marking



Pin Assignment (top view)



Electrical Characteristics Q1/Q2 (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}	V_{CB} = 5 V, I_E = 0	—	—	0.1	μA
Emitter cut-off current	I_{EBO}	V_{EB} = 1 V, I_C = 0	—	—	1	μA
DC current gain	h_{FE}	V_{CE} = 1 V, I_C = 5 mA	80	—	160	
Transition frequency	f_T (1)	V_{CE} = 1 V, I_C = 5 mA	5	7	—	GHz
	f_T (2)	V_{CE} = 3 V, I_C = 10 mA	7	10	—	
Insertion gain	$\|S_{21e}\|^2$ (1)	V_{CE} = 1 V, I_C = 5 mA, f = 2 GHz	—	5	—	dB
	$\|S_{21e}\|^2$ (2)	V_{CE} = 3 V, I_C = 20 mA, f = 2 GHz	3	6.5	—	
Noise figure	NF (1)	V_{CE} = 1 V, I_C = 5 mA, f = 2 GHz	—	1.7	3	dB
	NF (2)	V_{CE} = 3 V, I_C = 7 mA, f = 2 GHz	—	1.4	2.2	
Reverse transfer capacitance	C_{re}	V_{CB} = 1 V, I_E = 0, f = 1 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 mounting 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.

RESTRICTIONS ON PRODUCT USE

20070701-EN GENERAL

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- TOSHIBA is continually working to improve the quality and 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 comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such TOSHIBA products could cause loss of human life, bodily injury or damage to property.
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