

TOSHIBA Transistor Silicon NPN Epitaxial Planar Type

MT6C03AE

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) |

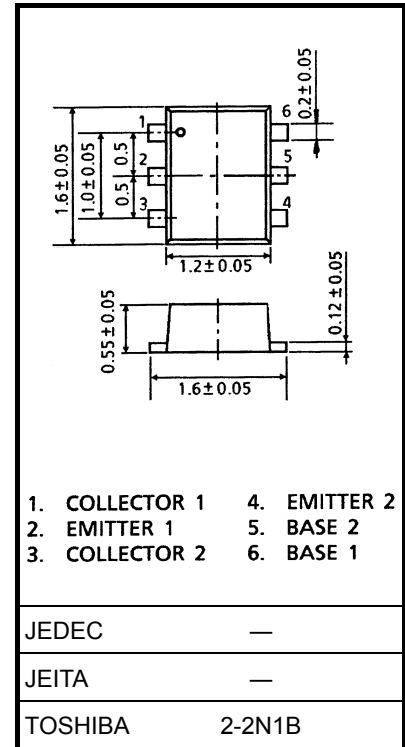
Absolute Maximum Ratings (Ta = 25°C)

| 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).

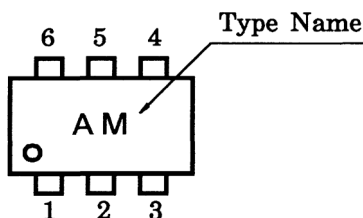
Note 1: Total power dissipation of Q1 and Q2.

Unit: mm

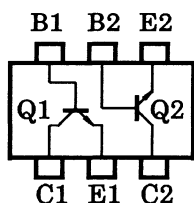


Weight: 0.003 g (typ.)

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} | $V_{CB} = 5\text{ V}, I_E = 0$ | — | — | 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 | $f_T(1)$ | $V_{CE} = 1\text{ V}, I_C = 5\text{ mA}$ | 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)$ | $V_{CE} = 3\text{ V}, I_C = 20\text{ mA}, f = 2\text{ GHz}$ | 3 | 6.5 | — | |
| 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 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.

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20070701-EN GENERAL

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