

TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL PLANAR TYPE

# MT3S07U

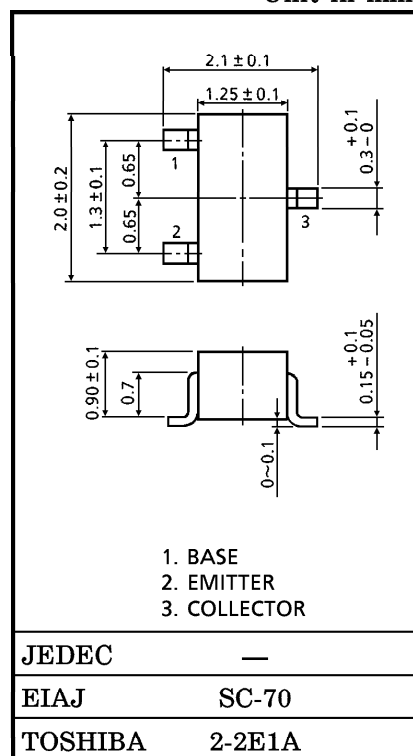
VHF~UHF BAND LOW NOISE AMPLIFIER APPLICATIONS

Unit in mm

- Low Noise Figure :  $NF = 1.5 \text{ dB}$   
 $(V_{CE} = 3 \text{ V}, I_C = 5 \text{ mA}, f = 2 \text{ GHz})$
- High Gain :  $|S_{21e}|^2 = 9.5 \text{ dB}$   
 $(V_{CE} = 3 \text{ V}, I_C = 15 \text{ mA}, f = 2 \text{ GHz})$

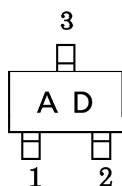
MAXIMUM RATINGS ( $T_a = 25^\circ\text{C}$ )

| CHARACTERISTIC              | SYMBOL    | RATING  | UNIT             |
|-----------------------------|-----------|---------|------------------|
| Collector-Base Voltage      | $V_{CBO}$ | 10      | V                |
| Collector-Emitter Voltage   | $V_{CEO}$ | 5       | V                |
| Emitter-Base Voltage        | $V_{EBO}$ | 1.5     | V                |
| Collector Current           | $I_C$     | 25      | mA               |
| Base Current                | $I_B$     | 10      | mA               |
| Collector Power Dissipation | $P_C$     | 100     | mW               |
| Junction Temperature        | $T_j$     | 125     | $^\circ\text{C}$ |
| Storage Temperature Range   | $T_{stg}$ | -55~125 | $^\circ\text{C}$ |



Weight : 0.006 g

MARKING



MICROWAVE CHARACTERISTICS ( $T_a = 25^\circ\text{C}$ )

| CHARACTERISTIC       | SYMBOL            | TEST CONDITION   | MIN. | TYP. | MAX. | UNIT |
|----------------------|-------------------|--|------|------|------|------|
| Transition Frequency | $f_T$             | $V_{CE} = 3 \text{ V}, I_C = 10 \text{ mA}$                    | 10   | 12   | —    | GHz  |
| Insertion Gain       | $ S_{21e} ^2 (1)$ | $V_{CE} = 1 \text{ V}, I_C = 5 \text{ mA}, f = 2 \text{ GHz}$  | —    | 7.5  | —    | dB   |
|                      | $ S_{21e} ^2 (2)$ | $V_{CE} = 3 \text{ V}, I_C = 15 \text{ mA}, f = 2 \text{ GHz}$ | 6.5  | 9.5  | —    |      |
| 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    |      |

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## ELECTRICAL CHARACTERISTICS (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  | —             |
| Reverse Transfer Capacitance | $C_{re}$  | $V_{CB} = 1\text{ V}, I_E = 0, f = 1\text{ MHz}$<br>(Note) | —    | 0.4  | 0.85 | $\text{pF}$   |

(Note) :  $C_{re}$  is measured by 3 terminal method with capacitance bridge.

## CAUTION

This device electrostatic sensitivity. Please handle with caution.