

TOSHIBA Transistor Silicon NPN Epitaxial Planar Type

MT3S07T

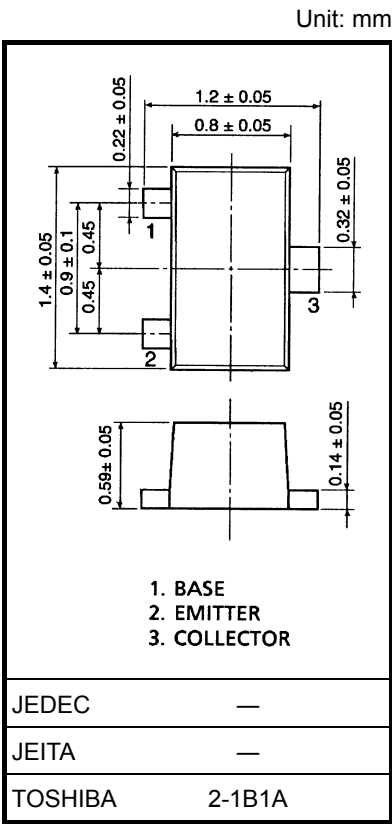
VHF~UHF Band Low Noise Amplifier Applications

- Low noise figure: NF = 1.5dB (V_{CE} = 3 V, I_C = 5 mA, f = 2 GHz)
- High gain: |S_{21e}|² = 9.5dB (V_{CE} = 3 V, I_C = 15 mA, f = 2 GHz)

Absolute Maximum Ratings (Ta = 25°C)

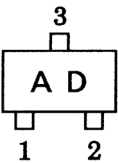
| Characteristics | Symbol | Rating | Unit |
|-----------------------------|------------------|---------|------|
| Collector-base voltage | V _{CBO} | 10 | V |
| Collector-emitter voltage | V _{CEO} | 5 | V |
| Emitter-base voltage | V _{EBO} | 1.5 | V |
| Collector current | I _C | 25 | mA |
| Base current | I _B | 10 | mA |
| Collector power dissipation | P _C | 100 | mW |
| Junction temperature | T _j | 125 | °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).



Weight: 0.0022 g (typ.)

Marking



Microwave Characteristics (Ta = 25°C)

| Characteristics | 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 | |

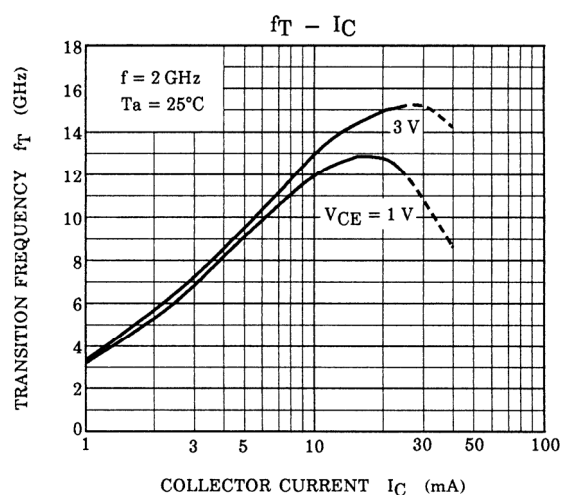
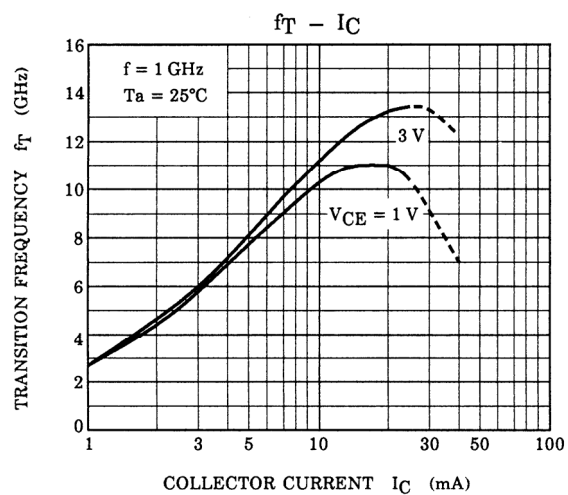
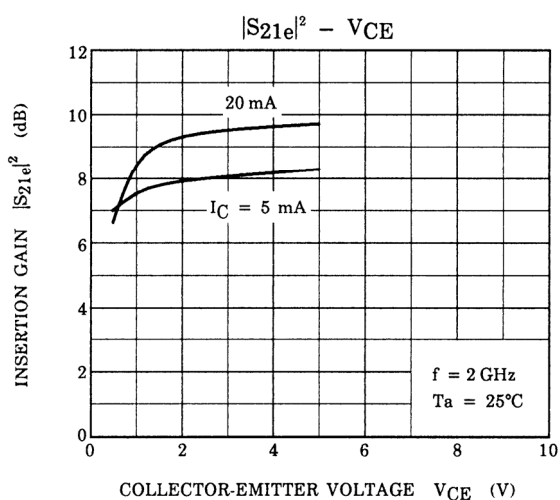
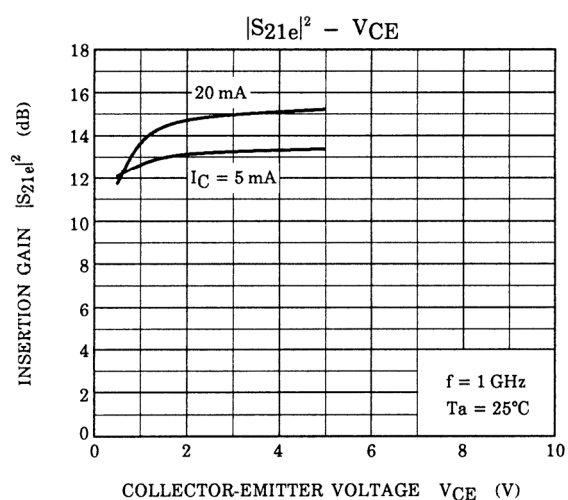
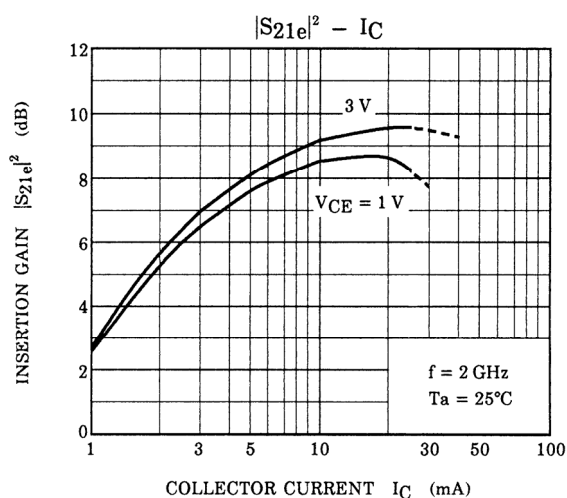
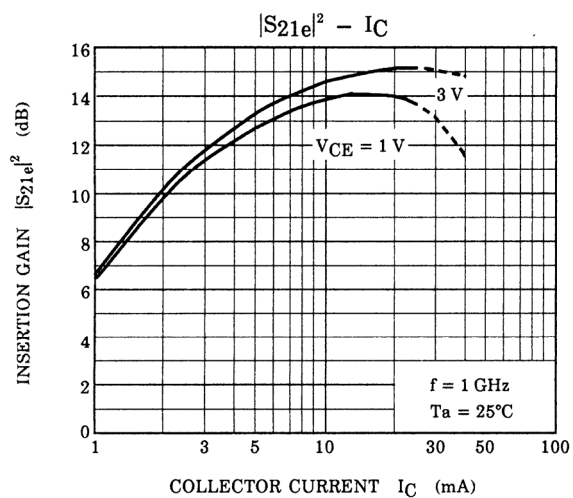
Electrical Characteristics (Ta = 25°C)

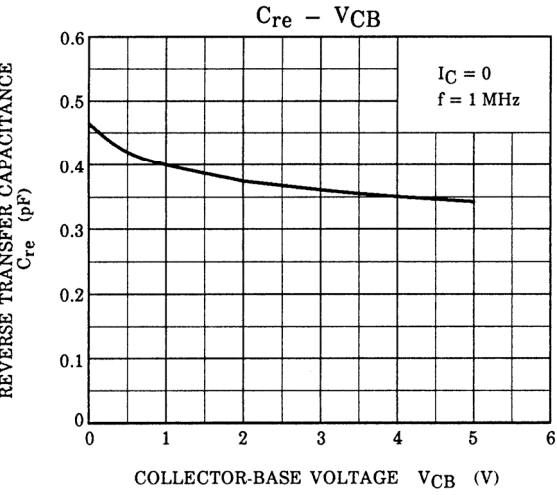
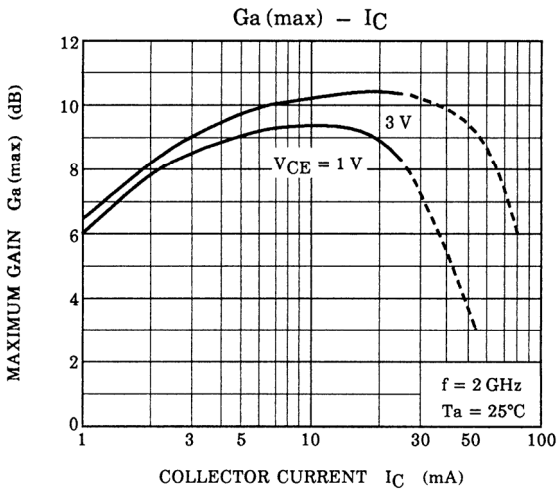
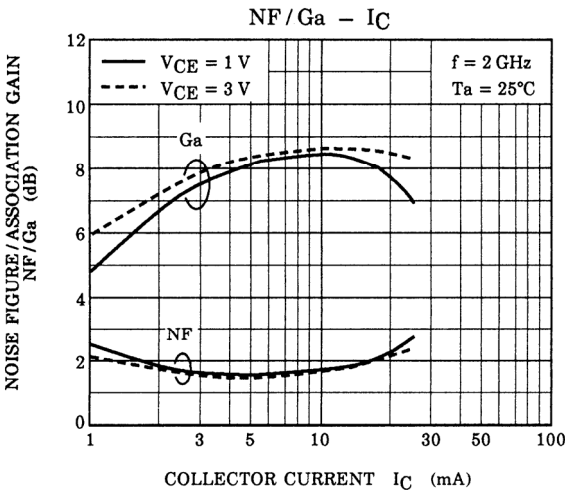
| Characteristics | Symbol | Test Condition | Min | Typ. | Max | Unit |
|------------------------------|-----------|---|-----|------|------|---------------|
| Collector cut-off current | I_{CBO} | $V_{CB} = 5\text{ V}$, $I_E = 0$ | — | — | 0.1 | μA |
| Emitter cut-off current | I_{EBO} | $V_{EB} = 1\text{ V}$, $I_C = 0$ | — | — | 1 | μA |
| DC current gain | h_{FE} | $V_{CE} = 1\text{ V}$, $I_C = 5\text{ mA}$ | 70 | — | 140 | |
| Reverse transfer capacitance | C_{re} | $V_{CB} = 1\text{ V}$, $I_E = 0$, $f = 1\text{ MHz}$ (Note) | — | 0.4 | 0.85 | pF |

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

Caution

This device is sensitive to electrostatic discharge. Please handle with caution.





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20070701-EN GENERAL

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