

TENTATIVE

TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL PLANAR TYPE

# HN3C17FU

VHF~UHF LOW NOISE AMPLIFIER APPLICATIONS

Unit in mm

(CHIP :  $f_T=16\text{GHz}$  series)

- Low Noise Figure :  $NF=1.3\text{dB}$  ( $f=2\text{GHz}$ )
- High Gain :  $|S_{21e}|^2=9.0\text{dB}$  ( $f=2\text{GHz}$ )

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

| CHARACTERISTIC              | SYMBOL    | RATING        | UNIT             |
|-----------------------------|-----------|---------------|------------------|
| Collector-Base Voltage      | $V_{CBO}$ | 8             | V                |
| Collector-Emitter Voltage   | $V_{CEO}$ | 5             | V                |
| Emitter-Base Voltage        | $V_{EBO}$ | 1.5           | V                |
| Collector Current           | $I_C$     | 20            | mA               |
| Base Current                | $I_B$     | 10            | mA               |
| Collector Power Dissipation | $P_C^*$   | 200           | mW               |
| Junction Temperature        | $T_j$     | 125           | $^\circ\text{C}$ |
| Storage Temperature Range   | $T_{stg}$ | $-55\sim 125$ | $^\circ\text{C}$ |

\* : Total

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

| CHARACTERISTIC                     | SYMBOL           | TEST CONDITION                                              | MIN. | TYP. | MAX. | UNIT          |
|------------------------------------|------------------|-------------------------------------------------------------|------|------|------|---------------|
| Collector Cut-off Current          | $I_{CBO}$        | $V_{CB}=10\text{V}$ , $I_E=0$                               | —    | —    | 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                    | $h_{FE}$         | $V_{CE}=3\text{V}$ , $I_C=15\text{mA}$                      | 50   | —    | 250  | —             |
| Transition Frequency               | $f_T$            | $V_{CE}=3\text{V}$ , $I_C=15\text{mA}$ ,                    | 9    | —    | —    | GHz           |
| Insertion Gain                     | $ S_{21e} ^2(1)$ | $V_{CE}=3\text{V}$ , $I_C=15\text{mA}$ ,<br>$f=1\text{GHz}$ | 12   | 15   | —    | dB            |
| Insertion Gain                     | $ S_{21e} ^2(2)$ | $V_{CE}=3\text{V}$ , $I_C=15\text{mA}$ ,<br>$f=2\text{GHz}$ | 6    | 9.0  | —    | dB            |
| Noise Figure                       | NF               | $V_{CE}=3\text{V}$ , $I_C=5\text{mA}$ ,<br>$f=2\text{GHz}$  | —    | 1.3  | 2.2  | dB            |
| Reverse Transfer Capacitance $Q_1$ | $C_{re}(1)$      | $V_{CB}=2.5\text{V}$ , $I_E=0$                              | —    | 0.45 | 0.9  | pF            |
| Reverse Transfer Capacitance $Q_2$ | $C_{re}(2)$      | $f=1\text{MHz}$ (Note)                                      | —    | 0.4  | 0.85 | pF            |

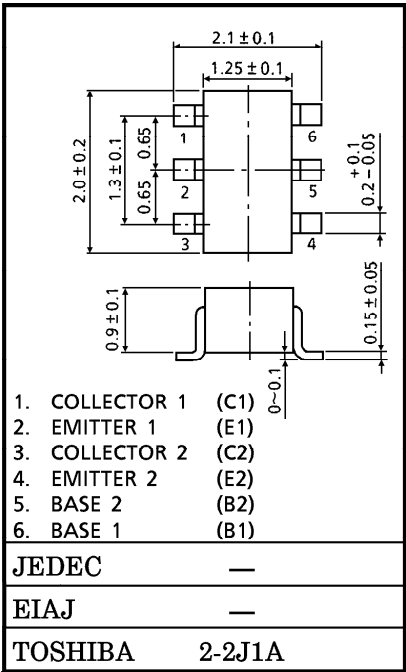
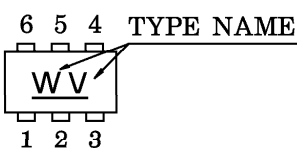
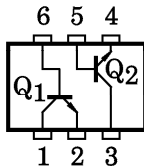
(Note)  $C_{re}$  is measured by 3 terminal method with Capacitance Bridge.

## CAUTION

This device electrostatic sensitivity. Please handle with caution.

PIN ASSIGNMENT (TOP VIEW)

MARKING



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