

TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL PLANAR TYPE

# HN9C01FE

VHF~UHF BAND LOW NOISE AMPLIFIER APPLICATIONS

Unit in mm

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

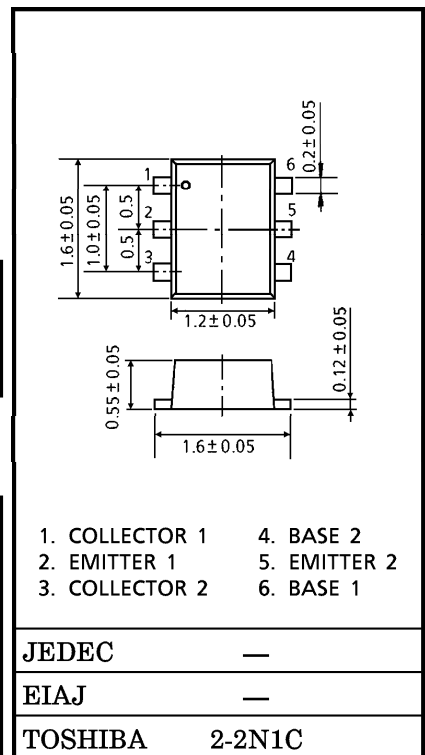
**MOUNTED DEVICES**

|   |         |         |
|---|---------|---------|
|   | Q1      | Q2      |
| Three-pins (SSM) mold products are corresponded | 2SC5096 | 2SC5086 |

**MAXIMUM RATINGS (Ta = 25°C)**

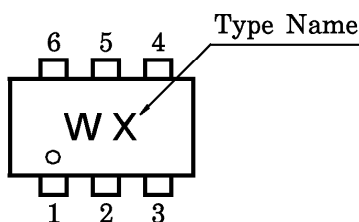
| CHARACTERISTIC              | SYMBOL                     | Q1      | Q2 | UNIT |
|-----------------------------|----------------------------|---------|----|------|
| Collector-Base Voltage      | V <sub>CB0</sub>           | 20      |    | V    |
| Collector-Emitter Voltage   | V <sub>CEO</sub>           | 8       | 12 | V    |
| Emitter-Base Voltage        | V <sub>EBO</sub>           | 1.5     | 3  | V    |
| Collector Current           | I <sub>C</sub>             | 15      | 80 | mA   |
| Base Current                | I <sub>B</sub>             | 7       | 40 | mA   |
| Collector Power Dissipation | P <sub>C</sub><br>(Note 1) | 100     |    | mW   |
| Junction Temperature        | T <sub>j</sub>             | 125     |    | °C   |
| Storage Temperature Range   | T <sub>stg</sub>           | -55~125 |    | °C   |

(Note 1) : Total power dissipation of Q1 and Q2.

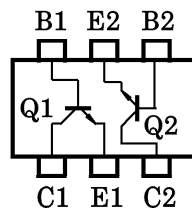


Weight : 0.003g

**MARKING**



**PIN ASSIGNMENT (TOP VIEW)**



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## ELECTRICAL CHARACTERISTICS Q1 (Ta = 25°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           | $h_{FE}$          | $V_{CE} = 6\text{ V}, I_C = 7\text{ mA}$                           | 50   | —    | 160  | —             |
| Transition Frequency      | $f_T$             | $V_{CE} = 6\text{ V}, I_C = 7\text{ mA}$                           | 7    | 10   | —    | GHz           |
| Insertion Gain            | $ S_{21e} ^2$ (2) | $V_{CE} = 6\text{ V}, I_C = 7\text{ mA},$<br>$f = 2000\text{ MHz}$ | 4.5  | 7    | —    | dB            |
| Noise Figure              | NF (2)            | $V_{CE} = 6\text{ V}, I_C = 3\text{ mA},$<br>$f = 2000\text{ MHz}$ | —    | 1.8  | 3    | dB            |

## ELECTRICAL CHARACTERISTICS Q2 (Ta = 25°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           | $h_{FE}$          | $V_{CE} = 10\text{ V}, I_C = 20\text{ mA}$                           | 80   | —    | 240  | —             |
| Transition Frequency      | $f_T$             | $V_{CE} = 10\text{ V}, I_C = 20\text{ mA}$                           | 5    | 7    | —    | GHz           |
| Insertion Gain            | $ S_{21e} ^2$ (2) | $V_{CE} = 10\text{ V}, I_C = 20\text{ mA},$<br>$f = 1000\text{ MHz}$ | 8    | 11   | —    | dB            |
| Noise Figure              | NF (2)            | $V_{CE} = 10\text{ V}, I_C = 5\text{ mA},$<br>$f = 1000\text{ MHz}$  | —    | 1.1  | 2    | dB            |