

# MT3S108FS

VCO OSCILLETOR STAGE  
VHF-SHF Low Noise Amplifier Application

## FEATURES

- Low Noise Figure :NF=0.9dB (@f=2GHz)
- High Gain:|S21e|<sup>2</sup>=11.5dB (@f=2GHz)

## Marking



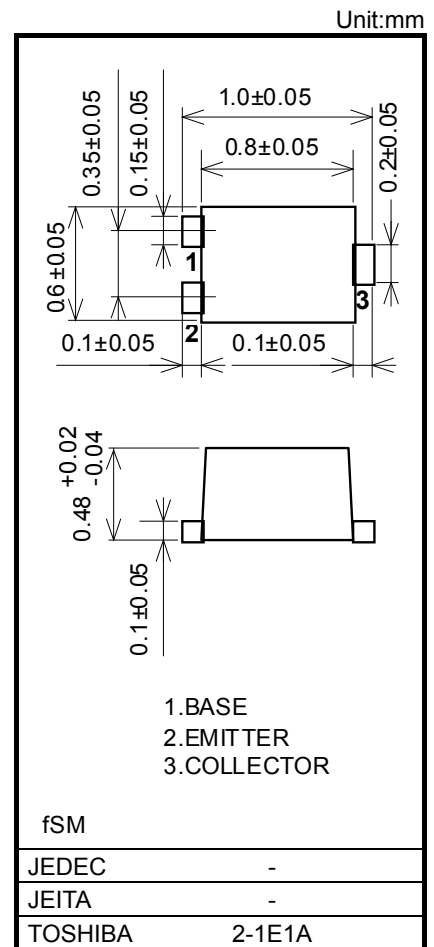
## Absolute Maximum Ratings (Ta = 25°C)

| Characteristics             | Symbol                  | Rating  | Unit |
|-----------------------------|-------------------------|---------|------|
| Collector-Base voltage      | V <sub>CBO</sub>        | 10      | V    |
| Collector-Emitter voltage   | V <sub>CEO</sub>        | 4.5     | V    |
| Emitter-Base voltage        | V <sub>EBO</sub>        | 1.5     | V    |
| Collector-Current           | I <sub>C</sub>          | 25      | mA   |
| Base-Current                | I <sub>B</sub>          | 12.5    | mA   |
| Collector Power dissipation | P <sub>C</sub> (Note 1) | 100     | mW   |
| Junction temperature        | T <sub>j</sub>          | 150     | °C   |
| Storage temperature Range   | T <sub>stg</sub>        | -55~150 | °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: Device mounted on a glass-epoxy PCB(1.0 cm<sup>2</sup> x 1.0 mm (t))



Weight: 0.0006 g

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**Microwave Characteristics (Ta = 25°C)**

| Characteristics      | Symbol                              | Test Condition                                    | Min  | Typ. | Max | Unit |
|----------------------|-------------------------------------|---|------|------|-----|------|
| Transition Frequency | fT                                  | V <sub>CE</sub> =1V, I <sub>C</sub> =10mA         | 10.5 | 13   | -   | GHz  |
| Insertion Gain       | S <sub>21e</sub>   <sup>2</sup> (1) | V <sub>CE</sub> =1V, I <sub>C</sub> =5mA, f=2GHz  | -    | 9    | -   | dB   |
|                      | S <sub>21e</sub>   <sup>2</sup> (2) | V <sub>CE</sub> =3V, I <sub>C</sub> =10mA, f=2GHz | 9.5  | 11.5 | -   | dB   |
| Noise Figure         | NF                                  | V <sub>CE</sub> =1V, I <sub>C</sub> =7mA, f=2GHz  | -    | 0.9  | 1.5 | dB   |

**Electrical Characteristics (Ta = 25°C)**

| Characteristics                | Symbol           | Test Condition  | Min | Typ. | Max  | Unit |
|--------------------------------|------------------|---|-----|------|------|------|
| Collector Cut-off Current      | I <sub>CBO</sub> | V <sub>CB</sub> =5V, I <sub>E</sub> =0                  | -   | -    | 0.1  | μA   |
| Emitter Cut-off Current        | I <sub>EBO</sub> | V <sub>EB</sub> =1V, I <sub>C</sub> =0                  | -   | -    | 0.5  | μA   |
| DC Current Gain                | hFE              | V <sub>CE</sub> =1V, I <sub>C</sub> =5mA                | 75  | -    | 125  | -    |
| Reverse Transistor Capacitance | C <sub>re</sub>  | V <sub>CB</sub> =1V, I <sub>E</sub> =0, f=1MHz (Note 1) | -   | 0.3  | 0.45 | pF   |

**Note 1:** C<sub>re</sub> is measured by 3 terminal method with capacitance Bridge.

**Caution:**

This device is sensitive to electrostatic discharge due to applied the high frequency transistor process of fT=60GHz class is used for this product.

Please make enough tool and equipment earthed when you handle.

**RESTRICTIONS ON PRODUCT USE**

20070701-EN GENERAL

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