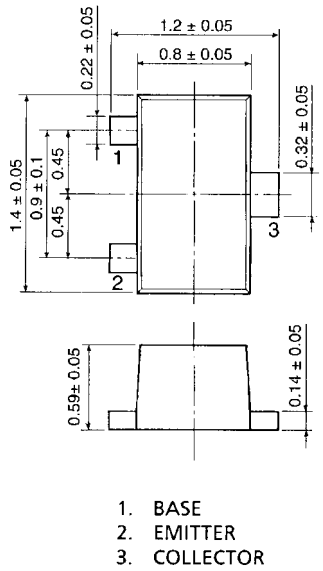
TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL PLANER TYPE

# MT3S45T

VCO OSCILLETOR STAGE
UHF LOW NOISE AMPLIFIER APPLICATION

Unit: mm




1. BASE
2. EMITTER
3. COLLECTOR

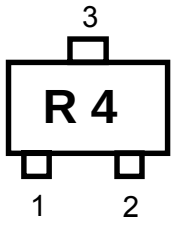
| | |
|---|---|
| TESM | |
| JEDEC | — |
| JEITA | — |
| TOSHIBA | 2-1B1A |

Weight:0.0022g (typ.)

## FEATURES

- Low Noise Figure :NF=1.1dB (@f=2GHz)
- High Gain:$|S21e|^2$=12.0dB (@f=2GHz)

## Marking




## Maximum Ratings (Ta = 25°C)

| Characteristics | Symbol | Rating | Unit |
|---|---|---|---|
| Collector-Base voltage | $V_{CBO}$ | 8 | V |
| Collector-Emitter voltage | $V_{CEO}$ | 4.5 | V |
| Emitter-Base voltage | $V_{EBO}$ | 1.5 | V |
| Collector-Current | $I_C$ | 30 | mA |
| Base-Current | $I_B$ | 15 | mA |
| Collector Power dissipation | $P_C$ | 100 | mW |
| Junction temperature | $T_j$ | 150 | °C |
| Storage temperature Range | $T_{stg}$ | −55~150 | °C |

## Microwave Characteristics (Ta = 25°C)

| Characteristics | Symbol | Test Condition | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|---|
| Transition Frequency | fT | $V_{CE}$=3V, $I_C$=20mA, f=2GHz | 13.5 | 18 | - | GHz |
| Insertion Gain | $\|S21e\|^2$(1) | $V_{CE}$=3V, $I_C$=20mA, f=1GHz | - | 17.5 | - | dB |
| | $\|S21e\|^2$(2) | $V_{CE}$=3V, $I_C$=20mA, f=2GHz | 9.5 | 12 | - | dB |
| Noise Figure | NF(1) | $V_{CE}$=3V, $I_C$=6mA, f=1GHz | - | 0.9 | - | dB |
| | NF(2) | $V_{CE}$=3V, $I_C$=6mA, f=2GHz | - | 1.1 | 1.6 | dB |

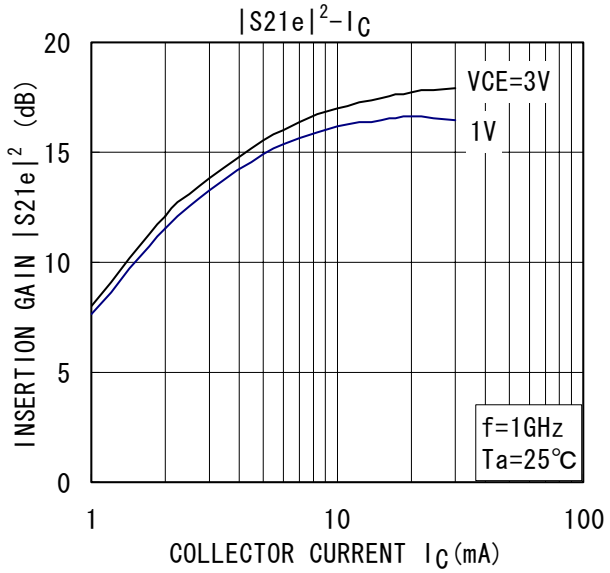
## Electrical Characteristics (Ta = 25°C)

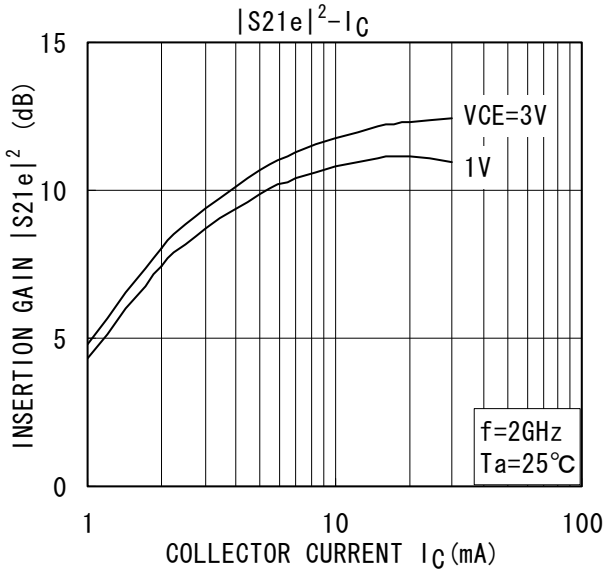
| Characteristics | Symbol | Test Condition | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|---|
| Collector Cut-off Current | $I_{CBO}$ | $V_{CB}$=8V, $I_E$=0 | - | - | 1 | μA |
| Emitter Cut-off Current | $I_{EBO}$ | $V_{EB}$=1V, $I_C$=0 | - | - | 1 | μA |
| DC Current Gain | hFE | $V_{CE}$=3V, $I_C$=10mA | 70 | - | 140 | - |
| Output Capacitance | $C_{ob}$ | $V_{CB}$=1V, $I_E$=0, f=1MHz | - | 0.66 | 1.10 | pF |
| Reverse Transistor Capacitance | $C_{re}$ | $V_{CB}$=1V, $I_E$=0, f=1MHz (Note 1) | - | 0.33 | 0.55 | pF |

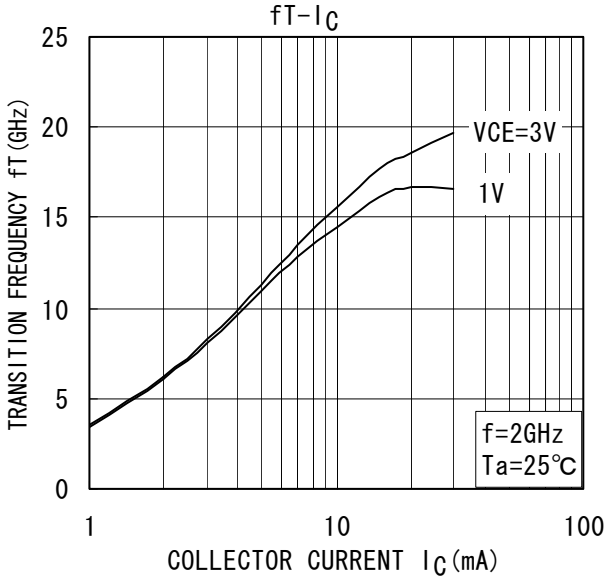
**Note 1:** Cre is measured by 3 terminal method with capacitance bridge.

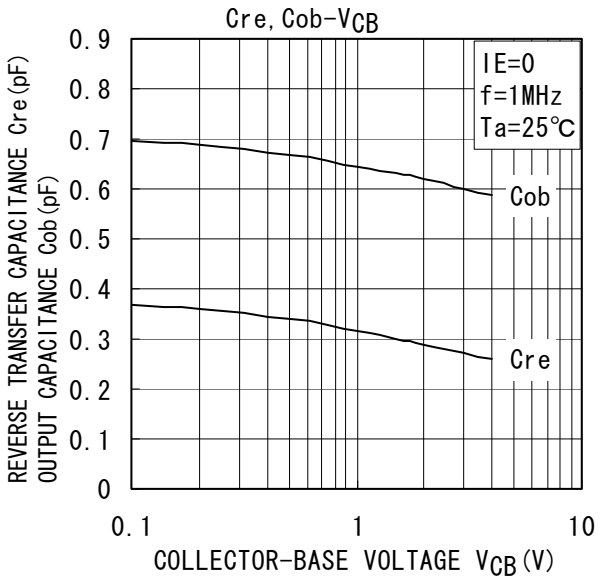
**Caution:** This device is sensitive to electrostatic discharge.

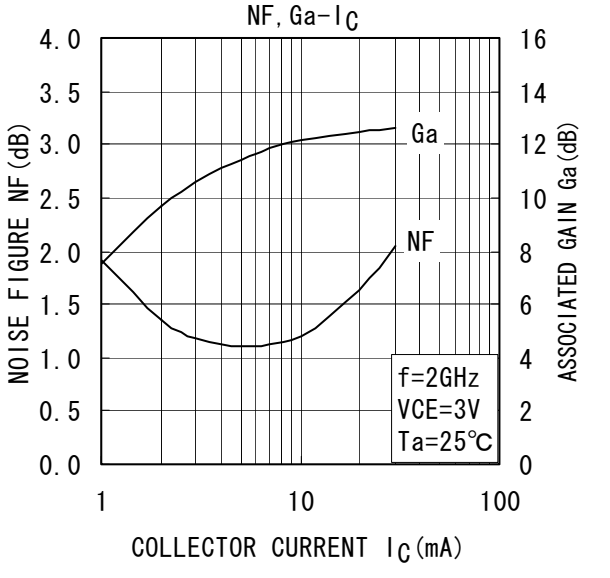
Please make enough tool and equipment earthed when you handle.

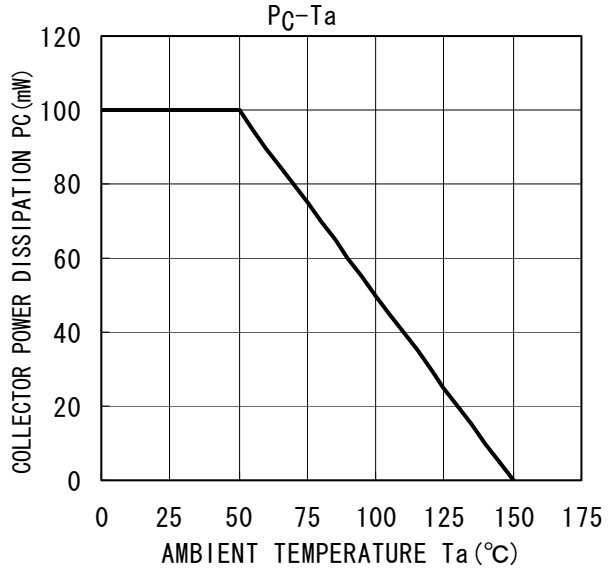


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