

**TOSHIBA**

**2SC941TM**

TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL TYPE (PCT PROCESS)

# 2SC941TM

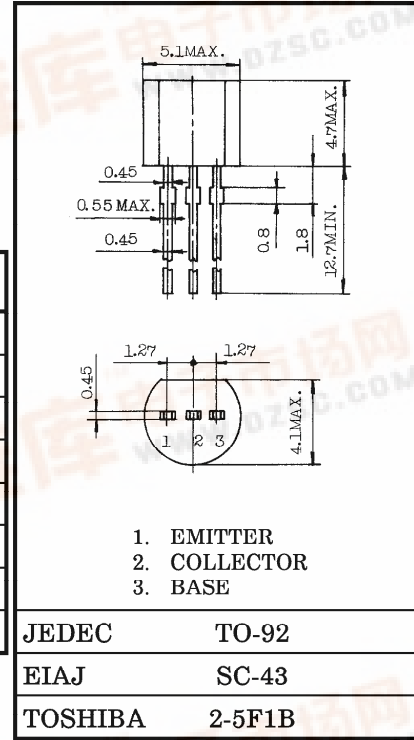
HIGH FREQUENCY AMPLIFIER APPLICATIONS.  
AM HIGH FREQUENCY AMPLIFIER APPLICATIONS.  
AM FREQUENCY CONVERTER APPLICATIONS.

Unit in mm

- Low Noise Figure : NF=3.5dB (Max.) (f=1MHz)

MAXIMUM RATINGS (Ta = 25°C)

| CHARACTERISTIC              | SYMBOL           | RATING  | UNIT |
|-----------------------------|------------------|---------|------|
| Collector-Base Voltage      | V <sub>CB0</sub> | 35      | V    |
| Collector-Emitter Voltage   | V <sub>CEO</sub> | 30      | V    |
| Emitter-Base Voltage        | V <sub>EB0</sub> | 4       | V    |
| Collector Current           | I <sub>C</sub>   | 100     | mA   |
| Base Current                | I <sub>B</sub>   | 20      | mA   |
| Collector Power Dissipation | P <sub>C</sub>   | 400     | mW   |
| Junction Temperature        | T <sub>j</sub>   | 125     | °C   |
| Storage Temperature Range   | T <sub>stg</sub> | -55~125 | °C   |



ELECTRICAL CHARACTERISTICS (Ta = 25°C)

Weight : 0.21g

| CHARACTERISTIC                       | SYMBOL                    | TEST CONDITION   | MIN. | TYP. | MAX. | UNIT |
|--------------------------------------|---------------------------|--|------|------|------|------|
| Collector Cut-off Current            | I <sub>CBO</sub>          | V <sub>CB</sub> = 20V, I <sub>E</sub> = 0                                    | —    | —    | 0.1  | μA   |
| Emitter Cut-off Current              | I <sub>EB0</sub>          | V <sub>EB</sub> = 2V, I <sub>C</sub> = 0                                     | —    | —    | 1.0  | μA   |
| DC Current Gain                      | h <sub>FE</sub><br>(Note) | V <sub>CE</sub> = 12V, I <sub>C</sub> = 2mA                                  | 40   | —    | 240  | —    |
| Collector-Emitter Saturation Voltage | V <sub>CE(sat)</sub>      | I <sub>C</sub> = 10mA, I <sub>B</sub> = 1mA                                  | —    | —    | 0.4  | V    |
| Base-Emitter Saturation Voltage      | V <sub>BE(sat)</sub>      | I <sub>C</sub> = 10mA, I <sub>B</sub> = 1mA                                  | —    | —    | 1.0  | V    |
| Transition Frequency                 | f <sub>T</sub>            | V <sub>CE</sub> = 10V, I <sub>C</sub> = 2mA                                  | 80   | 120  | —    | MHz  |
| Reverse Transfer Capacitance         | C <sub>re</sub>           | V <sub>CB</sub> = 10V, I <sub>E</sub> = 0, f = 1MHz                          | —    | 2.2  | 3.0  | pF   |
| Collector-Base Time Constant         | C <sub>c·rbb'</sub>       | V <sub>CE</sub> = 10V, I <sub>E</sub> = -1mA, f = 30MHz                      | —    | 30   | 50   | ps   |
| Noise Figure                         | NF                        | V <sub>CE</sub> = 10V, I <sub>E</sub> = -1mA, f = 1MHz, R <sub>g</sub> = 50Ω | —    | 2.0  | 3.5  | dB   |

Note : h<sub>FE</sub> classification R : 40~80, O : 70~140, Y : 120~240

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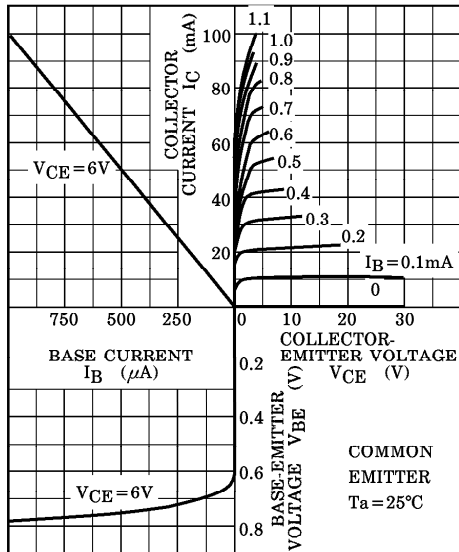
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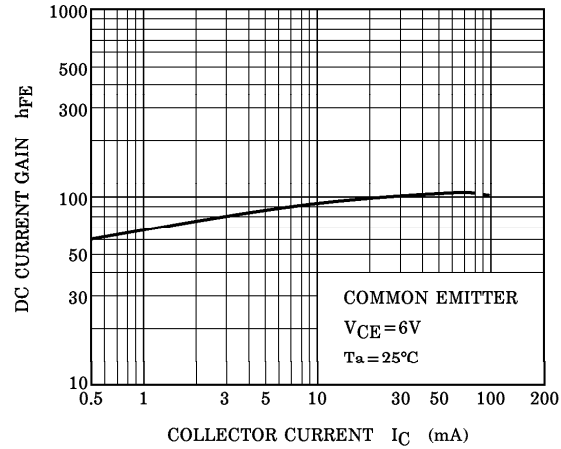
y PARAMETERS (Typ.) (COMMON EMITTER  $V_{CE} = 6V$ ,  $I_E = -1mA$ ,  $f = 1MHz$ )

| CHARACTERISTIC                             | SYMBOL        | 2SC941-R | 2SC941-O | 2SC941-Y | UNIT    |
|--|---------------|----------|----------|----------|---------|
| Input Conductance                          | $g_{ie}$      | 0.5      | 0.35     | 0.22     | mS      |
| Input Capacitance                          | $C_{ie}$      | 50       | 48       | 46       | pF      |
| Output Conductance                         | $g_{oe}$      | 4        | 5        | 6.5      | $\mu$ S |
| Output Capacitance                         | $C_{oe}$      | 3.7      | 3.4      | 3.2      | pF      |
| Forward Transfer Admittance                | $ y_{fe} $    | 36       | 36       | 36       | mS      |
| Phase Angle of Forward Transfer Admittance | $\theta_{fe}$ | -1.6     | -1.6     | -1.6     | °       |
| Reverse Transfer Admittance                | $ y_{re} $    | 14       | 14       | 14       | $\mu$ S |
| Phase Angle of Reverse Transfer Admittance | $\theta_{re}$ | -90      | -90      | -90      | °       |

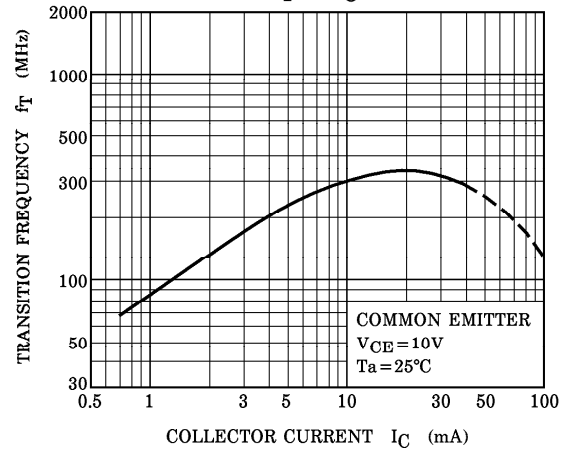
STATIC CHARACTERISTICS



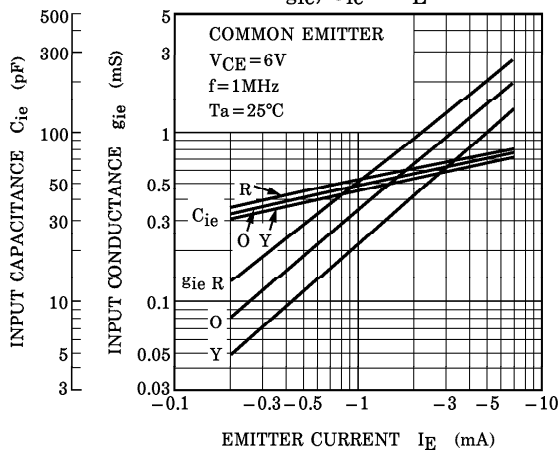
$h_{FE} - I_C$



$f_T - I_C$



$g_{ie}, C_{ie} - I_E$



$|Y_{re}| - I_E$

