

TOSHIBA

2SC2669

TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL PLANAR TYPE (PCT PROCESS)

2SC2669

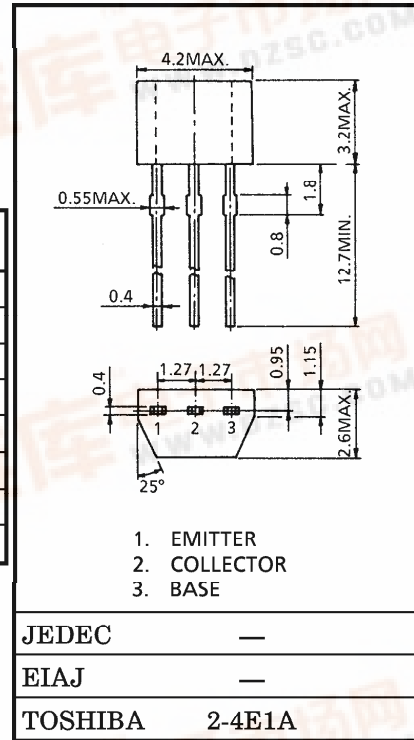
HIGH FREQUENCY AMPLIFIER APPLICATIONS

Unit in mm

- High Power Gain : $G_{pe} = 30\text{dB}$ (Typ.) ($f = 10.7\text{MHz}$)
- Recommended for FM IF, OSC Stage and AM CONV, IF Stage.

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

| CHARACTERISTIC | SYMBOL | RATING | UNIT |
|-----------------------------|-----------|---------|------------------|
| Collector-Base Voltage | V_{CBO} | 35 | V |
| Collector-Emitter Voltage | V_{CEO} | 30 | V |
| Emitter-Base Voltage | V_{EBO} | 4 | V |
| Collector Current | I_C | 50 | 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} | -55~125 | $^\circ\text{C}$ |



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

Weight : 0.13g

| CHARACTERISTIC | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|--------------------------------------|---------------------|--|------|------|------|---------------|
| Collector Cut-off Current | I_{CBO} | $V_{CB} = 35\text{V}, I_E = 0$ | — | — | 0.1 | μA |
| Emitter Cut-off Current | I_{EBO} | $V_{EB} = 4\text{V}, I_C = 0$ | — | — | 1.0 | μA |
| DC Current Gain | h_{FE} (Note) | $V_{CE} = 12\text{V}, I_C = 2\text{mA}$ | 40 | — | 240 | — |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C = 10\text{mA}, I_B = 1\text{mA}$ | — | — | 0.4 | V |
| Base-Emitter Voltage | V_{BE} | $I_C = 10\text{mA}, I_B = 1\text{mA}$ | — | — | 1.0 | V |
| Transition Frequency | f_T | $V_{CE} = 10\text{V}, I_C = 1\text{mA}$ | 100 | — | — | MHz |
| Collector Output Capacitance | C_{ob} | $V_{CB} = 10\text{V}, I_E = 0, f = 1\text{MHz}$ | — | 2.0 | 3.2 | pF |
| Collector-Base Time Constant | $C_c \cdot r_{bb'}$ | $V_{CE} = 10\text{V}, I_E = -1\text{mA}, f = 30\text{MHz}$ | — | — | 50 | ps |
| Power Gain | G_{pe} | $V_{CC} = 6\text{V}, I_E = -1\text{mA}, f = 10.7\text{MHz}$ (Fig.) | 27 | 30 | 33 | dB |

Note : h_{FE} Classification R : 40~80, O : 70~140, Y : 120~240

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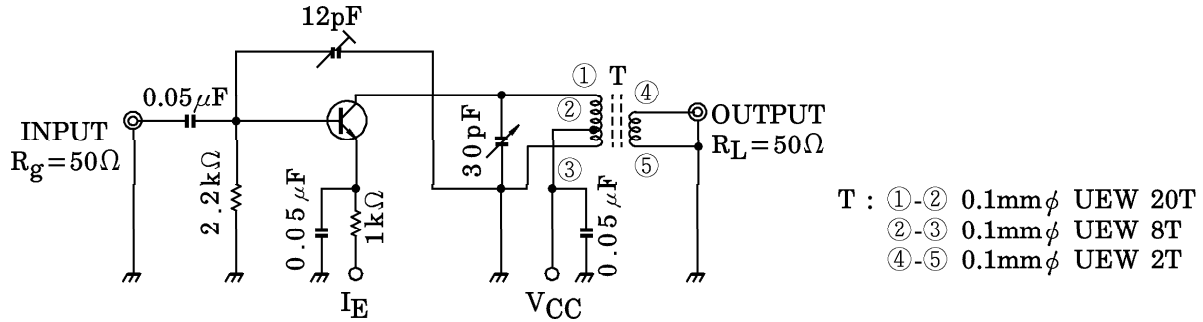


Fig.1 G_{pe} TEST CIRCUIT

Y PARAMETERS (Typ.)

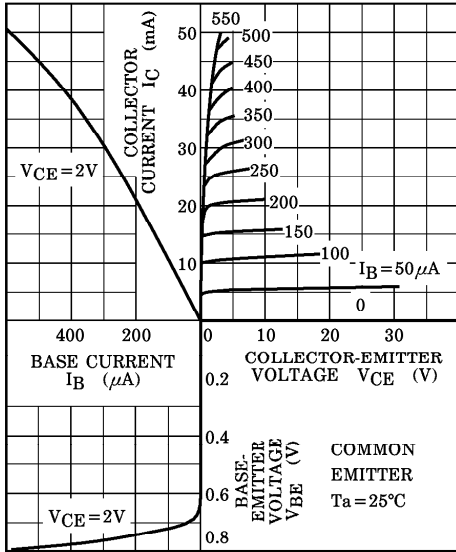
(1) (COMMON EMITTER f = 455kHz, Ta = 25°C)

| CHARACTERISTIC | SYMBOL | 2SC2669-R | 2SC2669-O | 2SC2669-Y | UNIT |
|--|-----------------|-----------|-----------|-----------|------|
| Collector-Emitter Voltage | V _{CE} | 6 | 6 | 6 | V |
| Emitter Current | I _E | -1 | -1 | -1 | mA |
| Input Conductance | g _{ie} | 0.58 | 0.41 | 0.26 | mS |
| Input Capacitance | C _{ie} | 53 | 46 | 38 | pF |
| Output Conductance | g _{oe} | 1.9 | 2.7 | 4.8 | μS |
| Output Capacitance | C _{oe} | 2.6 | 2.8 | 3.6 | pF |
| Forward Transfer Admittance | y _{fe} | 38 | 38 | 38 | mS |
| Phase Angle of Forward Transfer Admittance | θ _{fe} | -0.79 | -0.83 | -0.92 | ° |
| Reverse Transfer Admittance | y _{re} | 5.7 | 5.7 | 6.2 | μS |
| Phase Angle of Reverse Transfer Admittance | θ _{re} | -90 | -90 | -90 | ° |

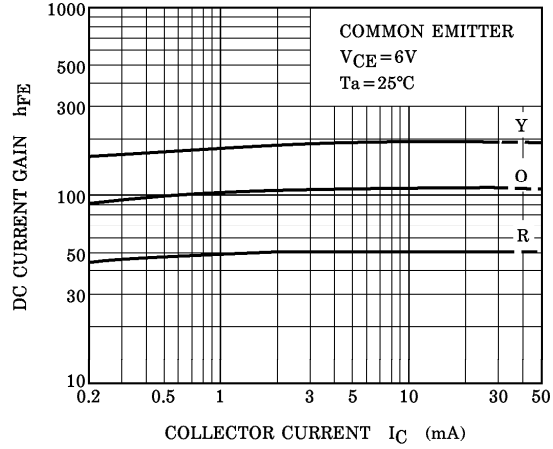
(2) (COMMON EMITTER f = 10.7MHz, Ta = 25°C)

| CHARACTERISTIC | SYMBOL | 2SC2669-R | 2SC2669-O | 2SC2669-Y | UNIT |
|--|-----------------|-----------|-----------|-----------|------|
| Collector-Emitter Voltage | V _{CE} | 6 | 6 | 6 | V |
| Emitter Current | I _E | -1 | -1 | -1 | mA |
| Input Conductance | g _{ie} | 1.04 | 0.85 | 0.65 | mS |
| Input Capacitance | C _{ie} | 49 | 43 | 36 | pF |
| Output Conductance | g _{oe} | 10 | 15 | 28 | μS |
| Output Capacitance | C _{oe} | 2.7 | 2.9 | 3.6 | pF |
| Forward Transfer Admittance | y _{fe} | 37 | 37 | 37 | mS |
| Phase Angle of Forward Transfer Admittance | θ _{fe} | -9.6 | -10.4 | -11.5 | ° |
| Reverse Transfer Admittance | y _{re} | 120 | 120 | 140 | μS |
| Phase Angle of Reverse Transfer Admittance | θ _{re} | -90 | -90 | -90 | ° |

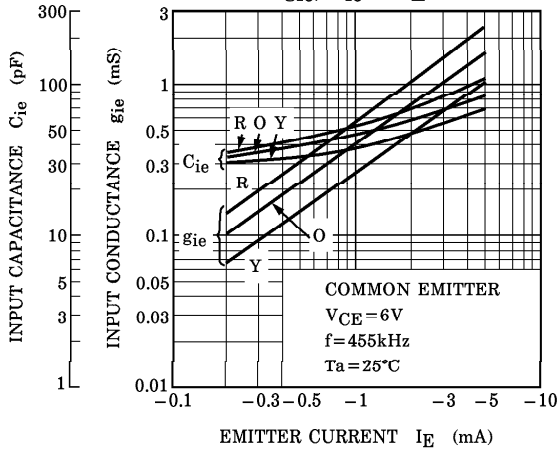
STATIC CHARACTERISTICS



$h_{FE} - I_C$



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



$g_{ie}, C_{ie} - V_{CE}$

