

TOSHIBA TRANSISTOR SILICON PNP EPITAXIAL TYPE (PCT PROCESS)

# 2SA1015

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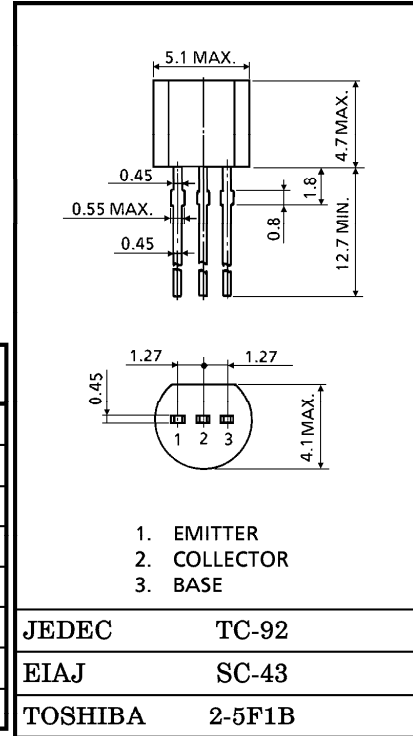
AUDIO FREQUENCY AMPLIFIER APPLICATIONS  
 LOW NOISE AMPLIFIER APPLICATIONS

Unit in mm

- High Voltage and High Current  
 :  $V_{CEO} = -50V$  (Min.),  $I_C = -150mA$  (Max.)
- Excellent  $h_{FE}$  Linearity  
 :  $h_{FE}(2) = 80$  (Typ.) at  $V_{CE} = -6V$ ,  $I_C = -150mA$   
 :  $h_{FE}(I_C = -0.1mA) / h_{FE}(I_C = -2mA) = 0.95$  (Typ.)
- Low Noise :  $NF = 0.2dB$  (Typ.) ( $f = 1kHz$ )
- Complementary to 2SC1815Ⓛ

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

| CHARACTERISTIC              | SYMBOL    | RATING  | UNIT       |
|-----------------------------|-----------|---------|------------|
| Collector-Base Voltage      | $V_{CBO}$ | -50     | V          |
| Collector-Emitter Voltage   | $V_{CEO}$ | -50     | V          |
| Emitter-Base Voltage        | $V_{EBO}$ | -5      | V          |
| Collector Current           | $I_C$     | -150    | mA         |
| Base Current                | $I_B$     | -50     | mA         |
| Collector Power Dissipation | $P_C$     | 400     | mW         |
| Junction Temperature        | $T_j$     | 125     | $^\circ C$ |
| Storage Temperature Range   | $T_{stg}$ | -55~125 | $^\circ C$ |



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

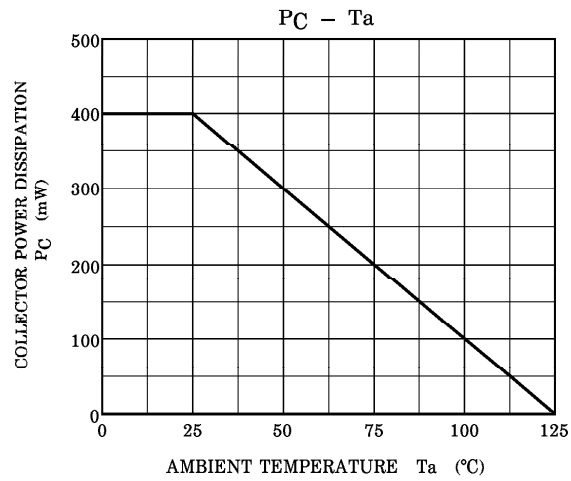
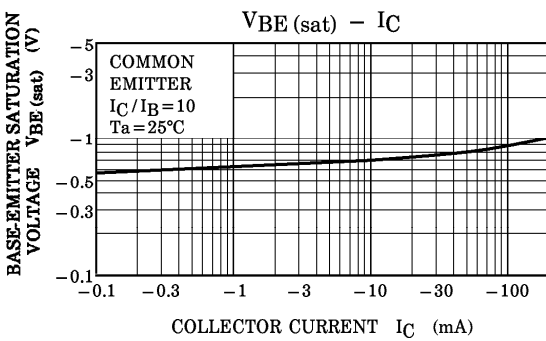
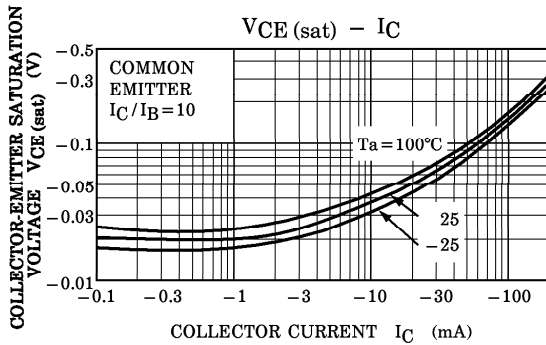
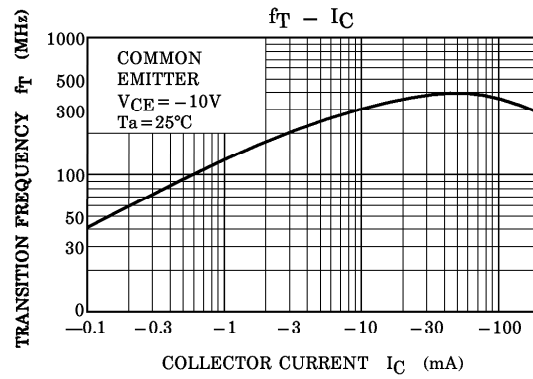
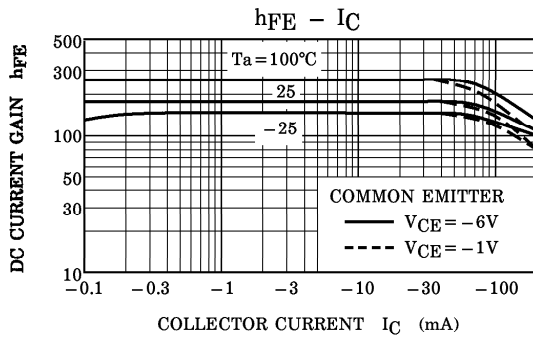
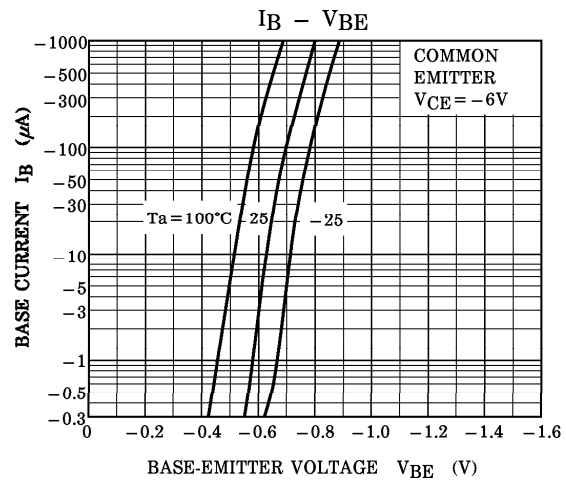
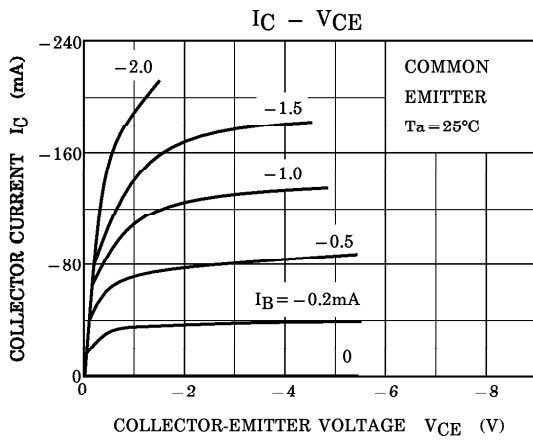
Weight : 0.21g

| CHARACTERISTIC                       | SYMBOL                | TEST CONDITION   | MIN. | TYP. | MAX. | UNIT     |
|--------------------------------------|-----------------------|--|------|------|------|----------|
| Collector Cut-off Current            | $I_{CBO}$             | $V_{CB} = -50V, I_E = 0$                                     | —    | —    | -0.1 | $\mu A$  |
| Emitter Cut-off Current              | $I_{EBO}$             | $V_{EB} = -5V, I_C = 0$                                      | —    | —    | -0.1 | $\mu A$  |
| DC Current Gain                      | $h_{FE}(1)$<br>(Note) | $V_{CE} = -6V, I_C = -2mA$                                   | 70   | —    | 400  |          |
|                                      | $h_{FE}(2)$           | $V_{CE} = -6V, I_C = -150mA$                                 | 25   | 80   | —    |          |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$         | $I_C = -100mA, I_B = -10mA$                                  | —    | -0.1 | -0.3 | V        |
| Base-Emitter Saturation Voltage      | $V_{BE(sat)}$         | $I_C = -100mA, I_B = -10mA$                                  | —    | —    | -1.1 | V        |
| Transition Frequency                 | $f_T$                 | $V_{CE} = -10V, I_C = -1mA$                                  | 80   | —    | —    | MHz      |
| Collector Output Capacitance         | $C_{ob}$              | $V_{CB} = -10V, I_E = 0$<br>$f = 1MHz$                       | —    | 4    | 7    | pF       |
| Base Intrinsic Resistance            | $r_{bb'}$             | $V_{CB} = -10V, I_E = 1mA$<br>$f = 30MHz$                    | —    | 30   | —    | $\Omega$ |
| Noise Figure                         | NF (1)                | $V_{CE} = -6V, I_C = -0.1mA$<br>$f = 100Hz, R_G = 10k\Omega$ | —    | 0.5  | 6    | dB       |
|                                      | NF (2)                | $V_{CE} = -6V, I_C = -0.1mA$<br>$f = 1kHz, R_G = 10k\Omega$  | —    | 0.2  | 3    |          |

Note :  $h_{FE}$  (1) Classification    0 : 70~140,    Y : 120~240,    GR : 200~400

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