

TOSHIBA Transistor Silicon PNP Diffused Type (PCT process)

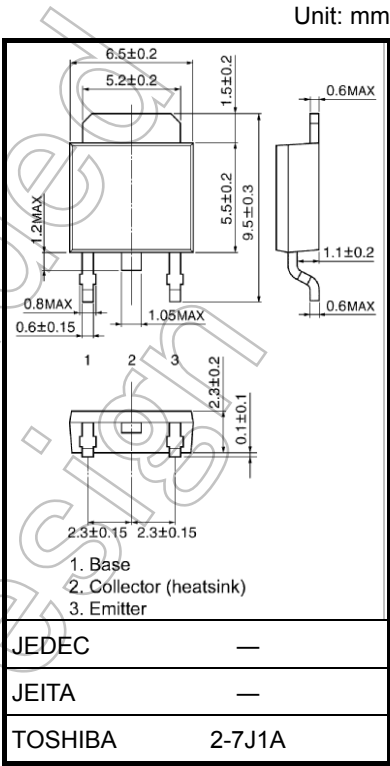
2SB906

Audio Frequency Power Amplifier Application

- Low collector saturation voltage  
:  $V_{CE(sat)} = -1.0\text{ V (typ.)}$  ( $I_C = -3\text{ A}$ ,  $I_B = -0.3\text{ A}$ )
- High power dissipation:  $P_C = 20\text{ W}$  ( $T_c = 25^\circ\text{C}$ )
- Complementary to 2SD1221

Absolute Maximum Ratings ( $T_a = 25^\circ\text{C}$ )

| Characteristics             |                          | Symbol    | Rating     | Unit             |
|-----------------------------|--------------------------|-----------|------------|------------------|
| Collector-base voltage      |                          | $V_{CBO}$ | -60        | V                |
| Collector-emitter voltage   |                          | $V_{CEO}$ | -60        | V                |
| Emitter-base voltage        |                          | $V_{EBO}$ | -7         | V                |
| Collector current           |                          | $I_C$     | -3         | A                |
| Base current                |                          | $I_B$     | -0.5       | A                |
| Collector power dissipation | $T_a = 25^\circ\text{C}$ | $P_C$     | 1.0        | W                |
|                             | $T_c = 25^\circ\text{C}$ |           | 20         |                  |
| Junction temperature        |                          | $T_j$     | 150        | $^\circ\text{C}$ |
| Storage temperature range   |                          | $T_{stg}$ | -55 to 150 | $^\circ\text{C}$ |

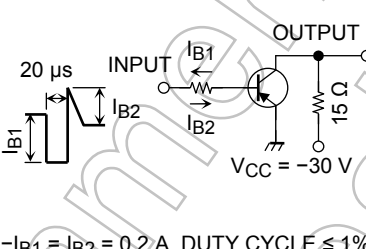


Weight: 0.36 g (typ.)

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).

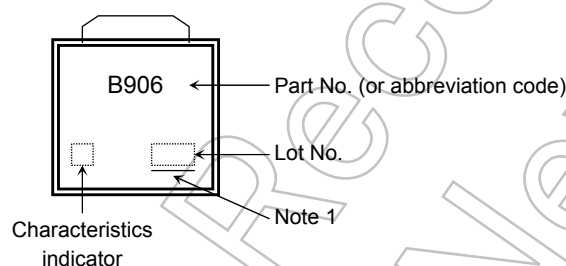
Start of commercial production  
1985-11

## Electrical Characteristics (Ta = 25°C)

| Characteristics                      |                        | Symbol         | Test Condition                                                                                                                                                     | Min | Typ. | Max  | Unit          |
|--------------------------------------|------------------------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|------|---------------|
| Collector cut-off current            |                        | $I_{CBO}$      | $V_{CB} = -60\text{ V}, I_E = 0$                                                                                                                                   | —   | —    | -100 | $\mu\text{A}$ |
| Emitter cut-off current              |                        | $I_{EBO}$      | $V_{EB} = -7\text{ V}, I_C = 0$                                                                                                                                    | —   | —    | -100 | $\mu\text{A}$ |
| Collector-emitter breakdown voltage  |                        | $V_{(BR) CEO}$ | $I_C = -50\text{ mA}, I_B = 0$                                                                                                                                     | -60 | —    | —    | V             |
| DC current gain                      | $h_{FE} (1)$<br>(Note) |                | $V_{CE} = -5\text{ V}, I_C = -0.5\text{ A}$                                                                                                                        | 60  | —    | 200  |               |
|                                      | $h_{FE} (2)$           |                | $V_{CE} = -5\text{ V}, I_C = -3\text{ A}$                                                                                                                          | 20  | —    | —    |               |
| Collector-emitter saturation voltage |                        | $V_{CE (sat)}$ | $I_C = -3\text{ A}, I_B = -0.3\text{ A}$                                                                                                                           | —   | -1.0 | -1.7 | V             |
| Base-emitter voltage                 |                        | $V_{BE}$       | $V_{CE} = -5\text{ V}, I_C = -0.5\text{ A}$                                                                                                                        | —   | -1.0 | -1.5 | V             |
| Transition frequency                 |                        | $f_T$          | $V_{CE} = -5\text{ V}, I_C = -0.5\text{ A}$                                                                                                                        | —   | 9    | —    | MHz           |
| Collector output capacitance         |                        | $C_{ob}$       | $V_{CB} = -10\text{ V}, I_E = 0, f = 1\text{ MHz}$                                                                                                                 | —   | 90   | —    | pF            |
| Switching time                       | Turn-on time           | $t_{on}$       |  <p><math>-I_{B1} = I_{B2} = 0.2\text{ A}, \text{DUTY CYCLE} \leq 1\%</math></p> | —   | 0.4  | —    | $\mu\text{s}$ |
|                                      | Storage time           | $t_{stg}$      |                                                                                                                                                                    | —   | 1.7  | —    |               |
|                                      | Fall time              | $t_f$          |                                                                                                                                                                    | —   | 0.5  | —    |               |

Note:  $h_{FE} (1)$  classification O: 60 to 120, Y: 100 to 200

## Marking

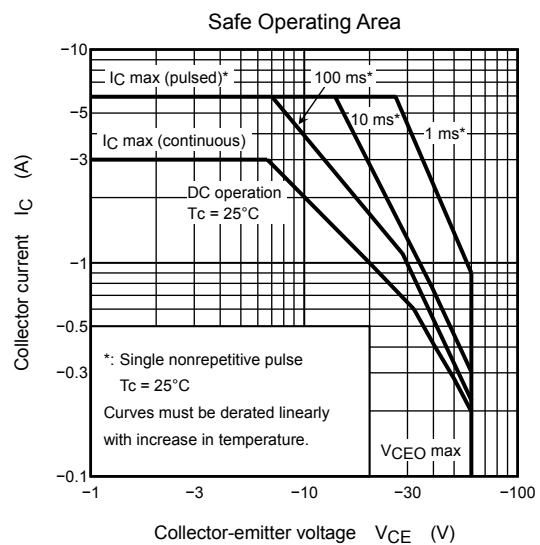
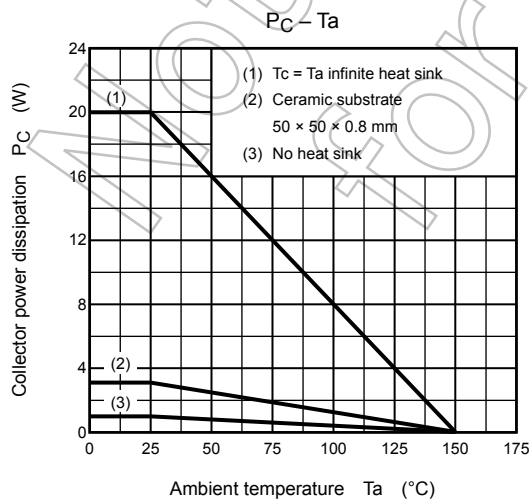
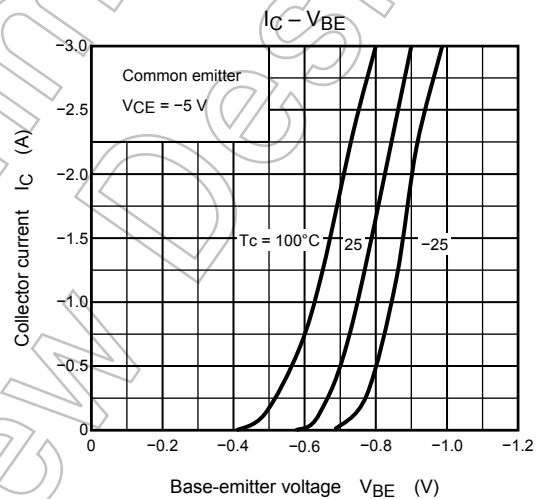
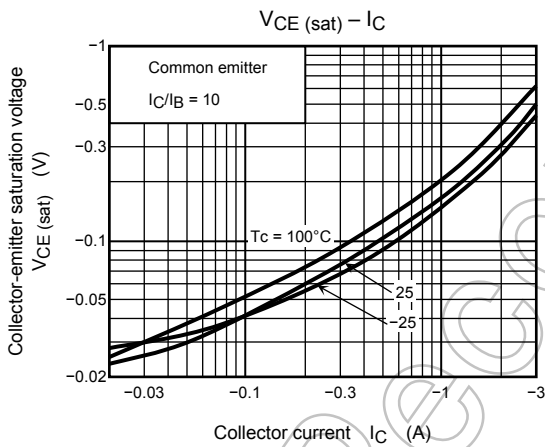
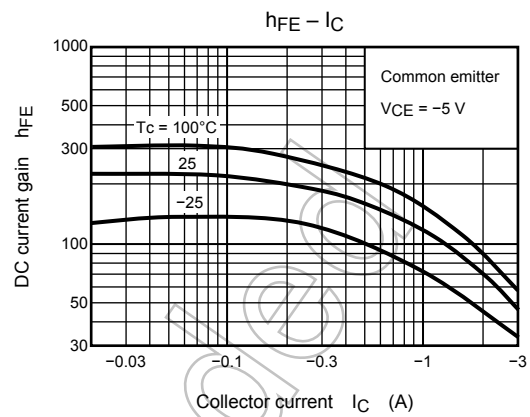
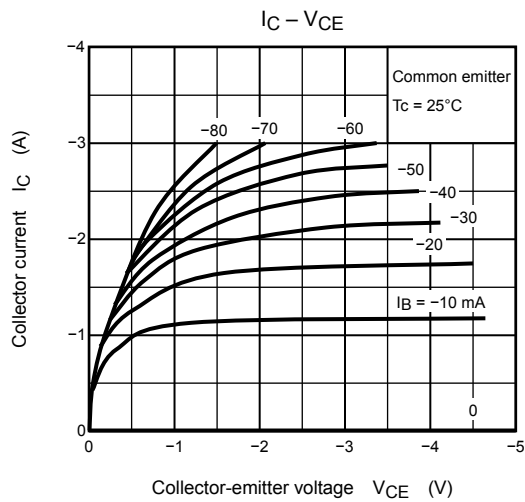


Note 1: A line under a Lot No. identifies the indication of product Labels.

Not underlined:  $[[Pb]]/INCLUDES > MCV$

Underlined:  $[[G]]/RoHS COMPATIBLE$  or  $[[G]]/RoHS [[Pb]]$

Please contact your TOSHIBA sales representative for details as to environmental matters such as the RoHS compatibility of Product. The RoHS is the Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.



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