

TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT process)

# 2SA1314

Strobe Flash Applications

Audio Power Applications

- High DC current gain and excellent linearity  
 :  $h_{FE(1)} = 140$  to  $600$  ( $V_{CE} = -1$  V,  $I_C = -0.5$  A)  
 :  $h_{FE(2)} = 60$  (min),  $120$  (typ.), ( $V_{CE} = -1$  V,  $I_C = -4$  A)
- Low saturation voltage  
 :  $V_{CE(sat)} = -0.5$  V (max) ( $I_C = -2$  A,  $I_B = -50$  mA)
- Small package
- Complementary to 2SC2982

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

| Characteristics             |                    | Symbol            | Rating     | Unit             |
|-----------------------------|--------------------|-------------------|------------|------------------|
| Collector-base voltage      |                    | $V_{CBO}$         | -20        | V                |
| Collector-emitter voltage   |                    | $V_{CEO}$         | -10        | V                |
| Emitter-base voltage        |                    | $V_{EBO}$         | -6         | V                |
| Collector current           | DC                 | $I_C$             | -2         | A                |
|                             | Pulsed<br>(Note 1) | $I_{CP}$          | -4         |                  |
| Base current                |                    | $I_B$             | -2         | A                |
| Collector power dissipation |                    | $P_C$             | 500        | mW               |
|                             |                    | $P_C$<br>(Note 2) | 1000       |                  |
| Junction temperature        |                    | $T_j$             | 150        | $^\circ\text{C}$ |
| Storage temperature range   |                    | $T_{stg}$         | -55 to 150 | $^\circ\text{C}$ |

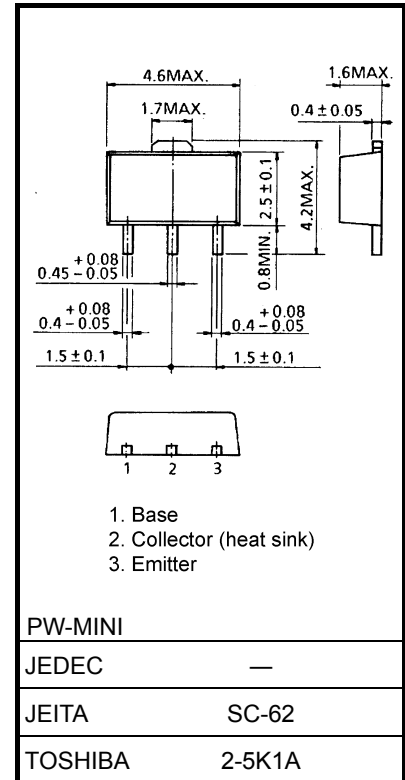
Note 1: Pulse test: pulse width = 10 mS (max), duty cycle = 30% (max)

Note 2: Mounted on a ceramic substrate ( $250\text{ mm}^2 \times 0.8\text{ t}$ )

Note 3: 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).

Unit: mm



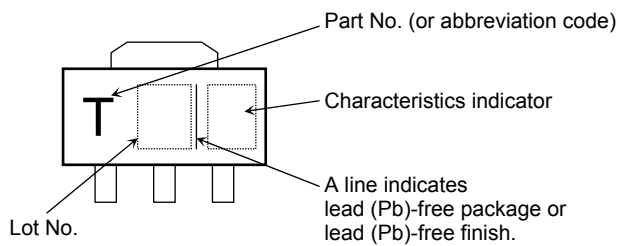
Weight: 0.05 g (typ.)

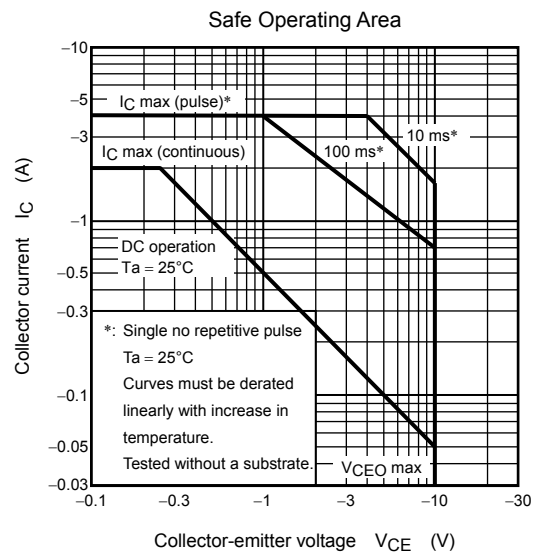
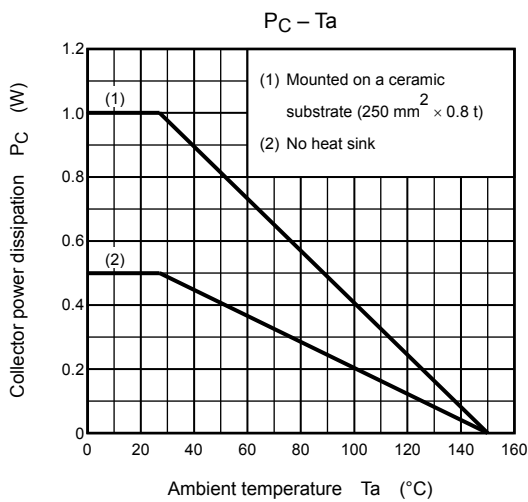
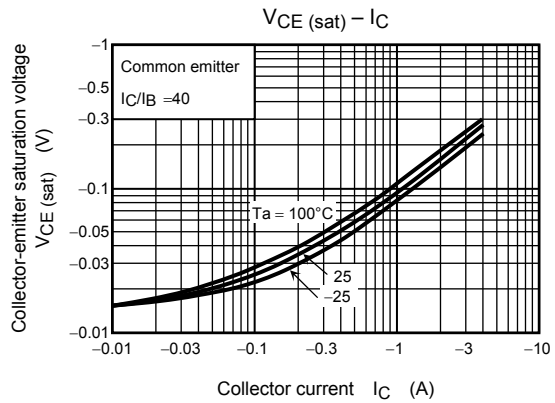
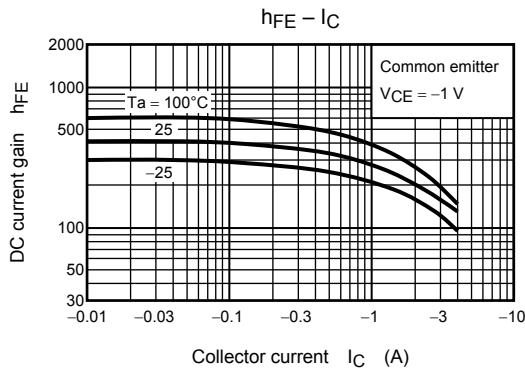
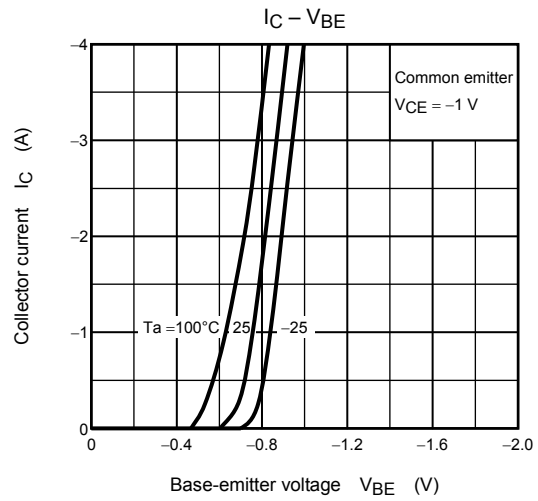
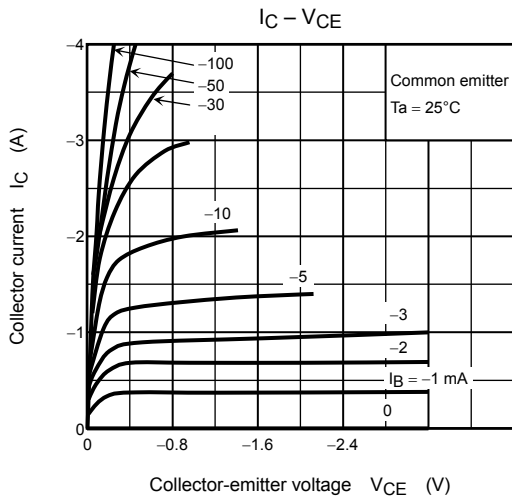
## Electrical Characteristics (Ta = 25°C)

| Characteristics                      | Symbol                   | Test Condition                                     | Min | Typ.  | Max  | Unit |
|--------------------------------------|--------------------------|--|-----|-------|------|------|
| Collector cut-off current            | $I_{CBO}$                | $V_{CB} = -20\text{ V}, I_E = 0$                   | —   | —     | -100 | nA   |
| Emitter cut-off current              | $I_{EBO}$                | $V_{EB} = -6\text{ V}, I_C = 0$                    | —   | —     | -100 | nA   |
| Collector-emitter breakdown voltage  | $V_{(BR) CEO}$           | $I_C = -10\text{ mA}, I_B = 0$                     | -10 | —     | —    | V    |
| Emitter-base breakdown voltage       | $V_{(BR) EBO}$           | $I_E = -1\text{ mA}, I_C = 0$                      | -6  | —     | —    | V    |
| DC current gain                      | $h_{FE} (1)$<br>(Note 4) | $V_{CE} = -1\text{ V}, I_C = -0.5\text{ A}$        | 140 | —     | 600  |      |
|                                      | $h_{FE} (2)$             | $V_{CE} = -1\text{ V}, I_C = -4\text{ A}$          | 60  | 120   | —    |      |
| Collector-emitter saturation voltage | $V_{CE (sat)}$           | $I_C = -2\text{ A}, I_B = -50\text{ mA}$           | —   | -0.2  | -0.5 | V    |
| Base-emitter voltage                 | $V_{BE}$                 | $V_{CE} = -1\text{ V}, I_C = -2\text{ A}$          | —   | -0.83 | -1.5 | V    |
| Transition frequency                 | $f_T$                    | $V_{CE} = -1\text{ V}, I_C = -0.5\text{ A}$        | —   | 140   | —    | MHz  |
| Collector output capacitance         | $C_{ob}$                 | $V_{CB} = -10\text{ V}, I_E = 0, f = 1\text{ MHz}$ | —   | 50    | —    | pF   |

Note 4:  $h_{FE} (1)$  classification A: 140 to 280, B: 200 to 400, C: 300 to 600

## Marking





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20070701-EN

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