**EN:** This Datasheet/Document is presented by the manufacturer.

Please visit our website for pricing and availability at www.hestore.hu.

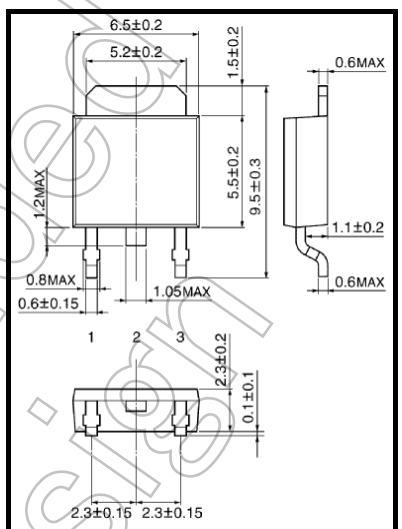
TOSHIBA Transistor Silicon PNP Epitaxial Type

# 2SA2097

High-Speed Swtching Applications
DC-DC Converter Applications

- High DC current gain: $h_{FE}$ = 200 to 500 ($I_C$ = −0.5 A)
- Low collector-emitter saturation: $V_{CE\ (sat)}$ = −0.27 V (max)
- High-speed switching: $t_f$ = 55 ns (typ.)

Unit: mm




| | |
|---|---|
| JEDEC | — |
| JEITA | — |
| TOSHIBA | 2-7J1A |

Weight: 0.36 g (typ.)

## Absolute Maximum Ratings (Ta = 25°C)

| Characteristics | | Symbol | Rating | Unit |
|---|---|---|---|---|
| Collector-base voltage | | $V_{CBO}$ | −50 | V |
| Collector-emitter voltage | | $V_{CEO}$ | −50 | V |
| Emitter-base voltage | | $V_{EBO}$ | −7 | V |
| Collector current | DC | $I_C$ | −5 | A |
| | Pulse | $I_{CP}$ | −10 | |
| Base current | | $I_B$ | −0.5 | A |
| Collector power dissipation | Ta = 25°C | $P_C$ | 1 | W |
| | Tc = 25°C | | 20 | |
| Junction temperature | | $T_j$ | 150 | °C |
| Storage temperature range | | $T_{stg}$ | −55 to 150 | °C |

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).

Not Recommended for New Design

Start of commercial production
2002-04

## Electrical Characteristics (Ta = 25°C)

| Characteristics | | Symbol | Test Condition | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|---|---|
| Collector cut-off current | | $I_{CBO}$ | $V_{CB}$ = −50 V, $I_E$ = 0 | — | — | −100 | nA |
| Emitter cut-off current | | $I_{EBO}$ | $V_{EB}$ = −7 V, $I_C$ = 0 | — | — | −100 | nA |
| Collector-emitter breakdown voltage | | $V_{(BR)\ CEO}$ | $I_C$ = −10 mA, $I_B$ = 0 | −50 | — | — | V |
| DC current gain | | $h_{FE}$ (1) | $V_{CE}$ = −2 V, $I_C$ = −0.5 A | 200 | — | 500 | |
| | | $h_{FE}$ (2) | $V_{CE}$ = −2 V, $I_C$ = −1.6 A | 100 | — | — | |
| Collector-emitter saturation voltage | | $V_{CE\ (sat)}$ | $I_C$ = −1.6 A, $I_B$ = −53 mA | — | — | −0.27 | V |
| Base-emitter saturation voltage | | $V_{BE\ (sat)}$ | $I_C$ = −1.6 A, $I_B$ = −53 mA | — | — | −1.10 | V |
| Switching time | Rise time | $t_r$ | See Figure 1. $V_{CC}$ ≃ −24 V, $R_L$ = 15 Ω $I_{B1}$ = −$I_{B2}$ = −53 mA | — | 63 | — | ns |
| | Storage time | $t_{stg}$ | | — | 280 | — | |
| | Fall time | $t_f$ | | — | 55 | — | |

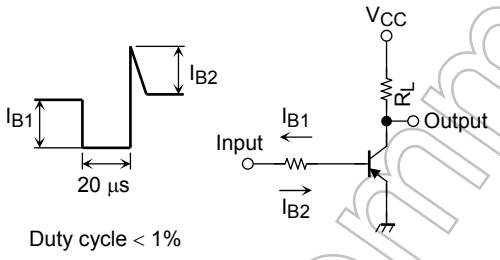
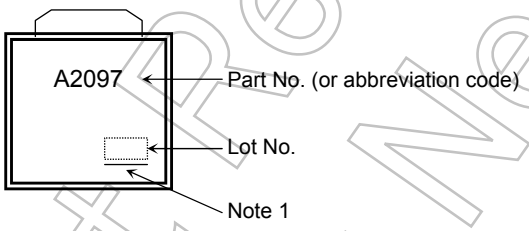



**Figure 1 Switching Time Test Circuit & Timing Chart**

## Marking

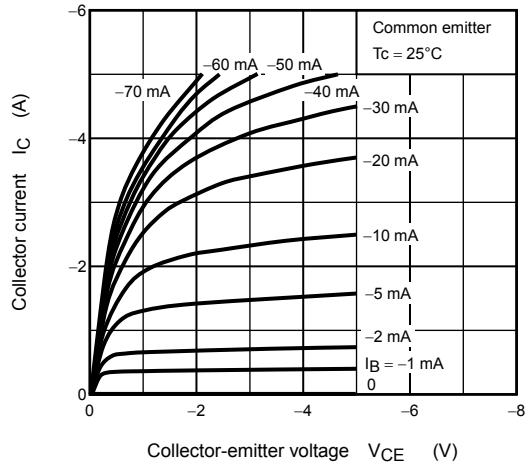



Note 1: A line under a Lot No. identifies the indication of product Labels.
Not underlined : [[Pb]]/INCLUDES > MCV
Underlined : [[G]]/RoHS COMPATIBLE or [[G]]/RoHS [[Pb]]

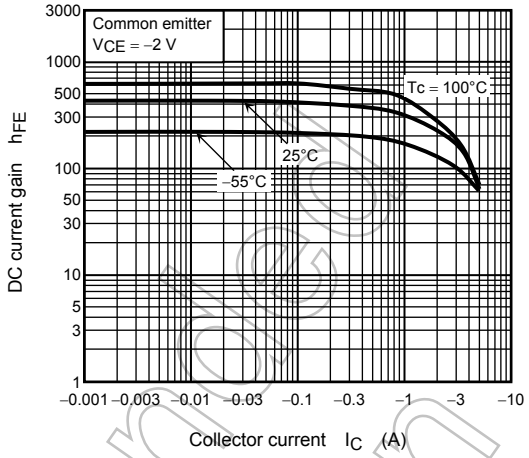
Please contact your TOSHIBA sales representative for details as to environmental matters such as the RoHS compatibility of Product.
The RoHS is the Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical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

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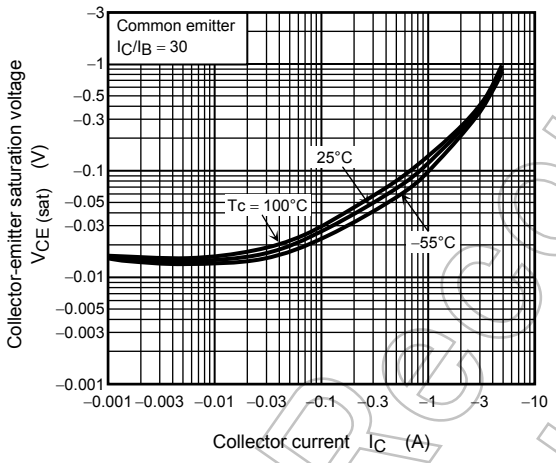
$I_C - V_{CE}$



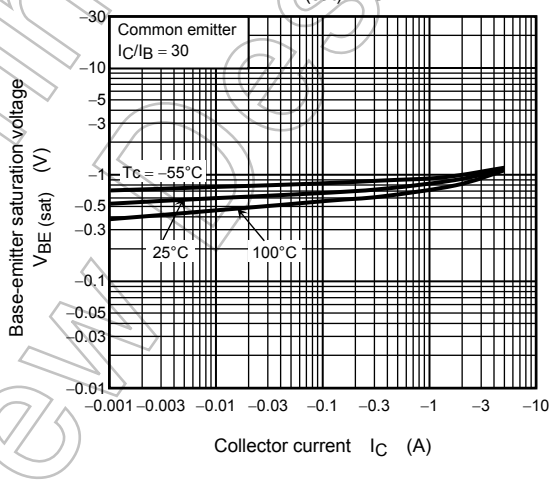

$h_{FE} - I_C$



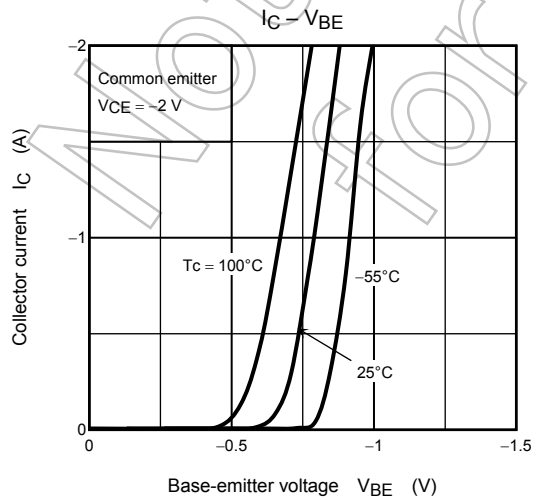

$V_{CE\ (sat)} - I_C$



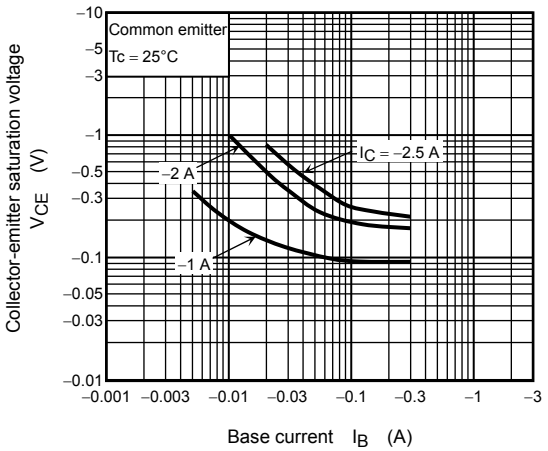

$V_{BE\ (sat)} - I_C$



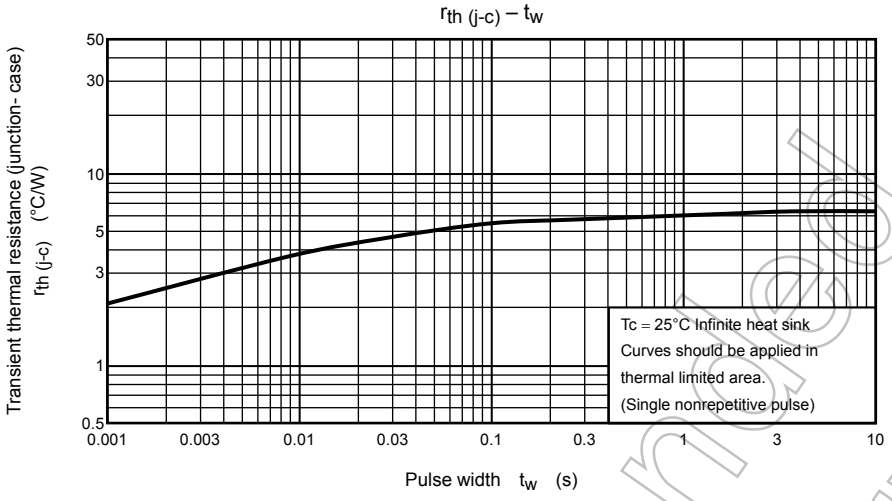

$I_C - V_{BE}$

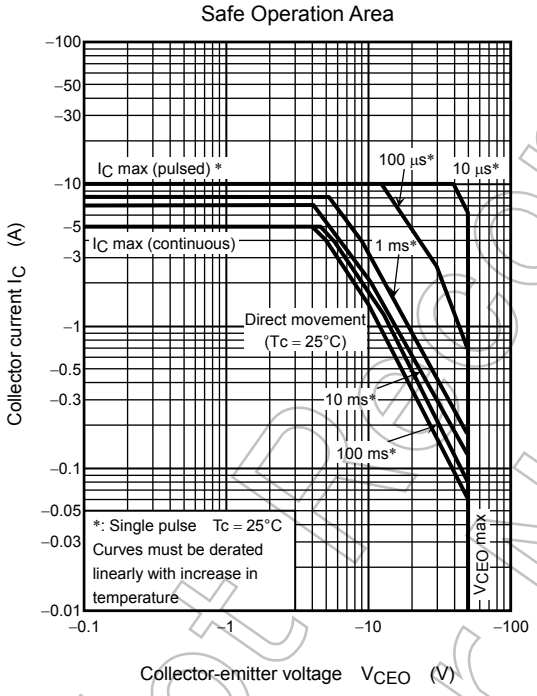



$V_{CE} - I_B$




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Not Recommended for New Design

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