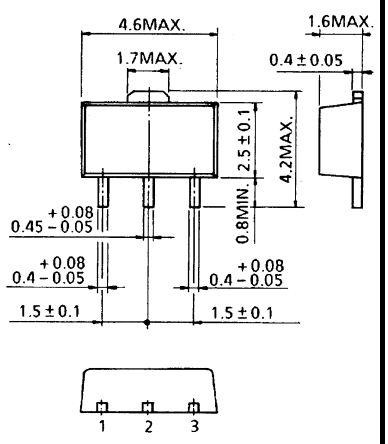
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT process)

# 2SC2881

Voltage Amplifier Applications
Power Amplifier Applications

- High voltage: $V_{CEO}$ = 120 V
- High transition frequency: $f_T$ = 120 MHz (typ.)
- Small flat package
- $P_C$ = 1.0 to 2.0 W (mounted on ceramic substrate)
- Complementary to 2SA1201

Unit: mm




1. Base
2. Collector (heat sink)
3. Emitter

| | |
|---|---|
| PW-MINI | |
| JEDEC | — |
| JEITA | SC-62 |
| TOSHIBA | 2-5K1A |

Weight: 0.05 g (typ.)

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

| Characteristics | Symbol | Rating | Unit |
|---|---|---|---|
| Collector-base voltage | $V_{CBO}$ | 120 | V |
| Collector-emitter voltage | $V_{CEO}$ | 120 | V |
| Emitter-base voltage | $V_{EBO}$ | 5 | V |
| Collector current | $I_C$ | 800 | mA |
| Base current | $I_B$ | 160 | mA |
| Collector power dissipation | $P_C$ | 500 | mW |
| | $P_C$ (Note 1) | 1000 | |
| Junction temperature | $T_j$ | 150 | °C |
| Storage temperature range | $T_{stg}$ | −55 to 150 | °C |

Note 1: Mounted on a ceramic substrate (250 $mm^2$ × 0.8 t)

Note 2: 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).

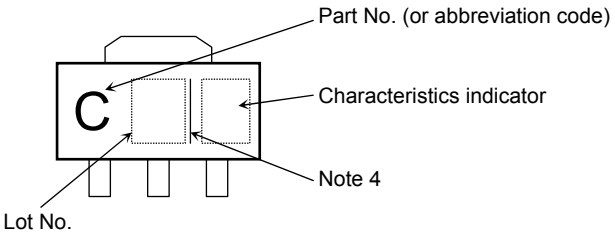
Start of commercial production
1980-07

## Electrical Characteristics (Ta = 25°C)

| Characteristics | Symbol | Test Condition | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|---|
| Collector cut-off current | $I_{CBO}$ | $V_{CB}$ = 120 V, $I_E$ = 0 | — | — | 0.1 | μA |
| Emitter cut-off current | $I_{EBO}$ | $V_{EB}$ = 5 V, $I_C$ = 0 | — | — | 0.1 | μA |
| Collector-emitter breakdown voltage | $V_{(BR)\ CEO}$ | $I_C$ = 10 mA, $I_B$ = 0 | 120 | — | — | V |
| Emitter-base breakdown voltage | $V_{(BR)\ EBO}$ | $I_E$ = 1 mA, $I_C$ = 0 | 5 | — | — | V |
| DC current gain | $h_{FE}$ (Note 3) | $V_{CE}$ = 5 V, $I_C$ = 100 mA | 80 | — | 240 | — |
| Collector-emitter saturation voltage | $V_{CE\ (sat)}$ | $I_C$ = 500 mA, $I_B$ = 50 mA | — | — | 1.0 | V |
| Base-emitter voltage | $V_{BE}$ | $V_{CE}$ = 5 V, $I_C$ = 500 mA | — | — | 1.0 | V |
| Transition frequency | $f_T$ | $V_{CE}$ = 5 V, $I_C$ = 100 mA | — | 120 | — | MHz |
| Collector output capacitance | $C_{ob}$ | $V_{CB}$ = 10 V, $I_E$ = 0, f = 1 MHz | — | — | 30 | pF |

Note 3: $h_{FE}$ classification O: 80 to 160, Y: 120 to 240

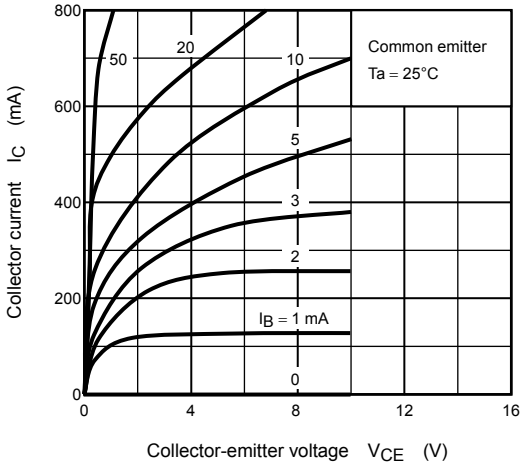
## Marking



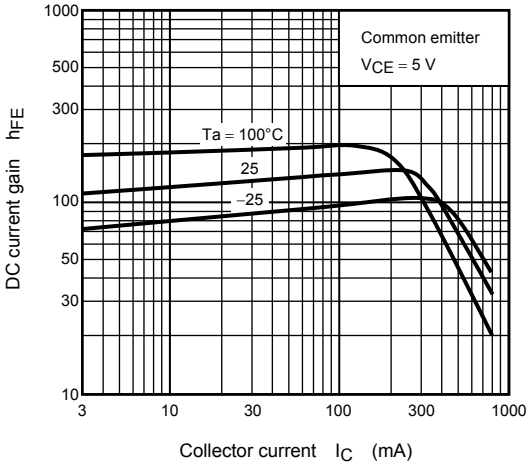

Note 4: A line under a Lot No. identifies the indication of product Labels.
Not underlined: [[Pb]]/INCLUDES > MCV
Underlined: [[G]]/RoHS COMPATIBLE or [[G]]/RoHS [[Pb]]

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.

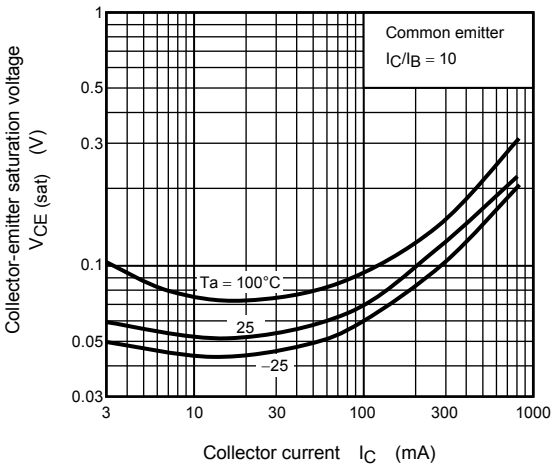
$I_C - V_{CE}$



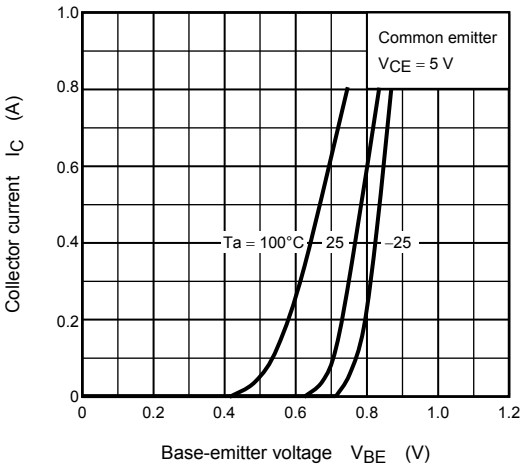

$h_{FE} - I_C$



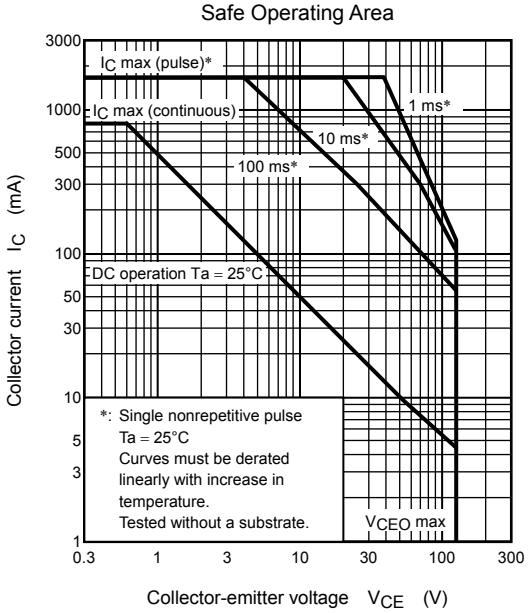

$V_{CE\ (sat)} - I_C$



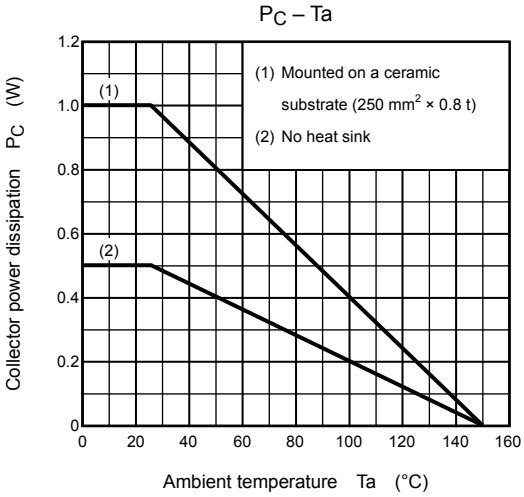

$I_C - V_{BE}$




Safe Operating Area




$P_C - Ta$



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