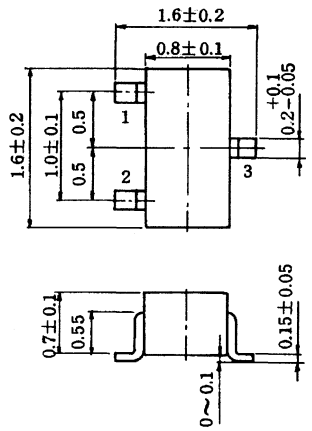
TOSHIBA Transistor Silicon NPN Epitaxial Type

# 2SC5376

Audio Frequency General Purpose Amplifier Applications
For Muting and Switching Applications

- Low collector saturation voltage: $V_{CE\ (sat)}$ (1) = 15 mV (typ.)
  @$I_C$ = 10 mA/$I_B$ = 0.5 mA
- High collector current: $I_C$ = 400 mA (max)

Unit: mm




1. BASE
2. EMITTER
3. COLLECTOR

SSM

| | |
|---|---|
| JEDEC | — |
| JEITA | — |
| TOSHIBA | 2-2H1A |

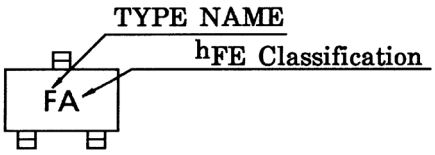
Weight: 2.4 mg (typ.)

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

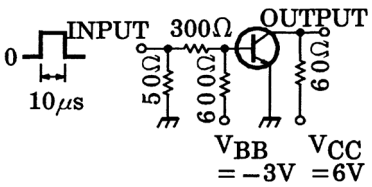
| Characteristics | Symbol | Rating | Unit |
|---|---|---|---|
| Collector-base voltage | $V_{CBO}$ | 15 | V |
| Collector-emitter voltage | $V_{CEO}$ | 12 | V |
| Emitter-base voltage | $V_{EBO}$ | 5 | V |
| Collector current | $I_C$ | 400 | mA |
| Base current | $I_B$ | 50 | mA |
| Collector power dissipation | $P_C$ | 100 | mW |
| Junction temperature | $T_j$ | 125 | °C |
| Storage temperature range | $T_{stg}$ | −55~125 | °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).

## Marking

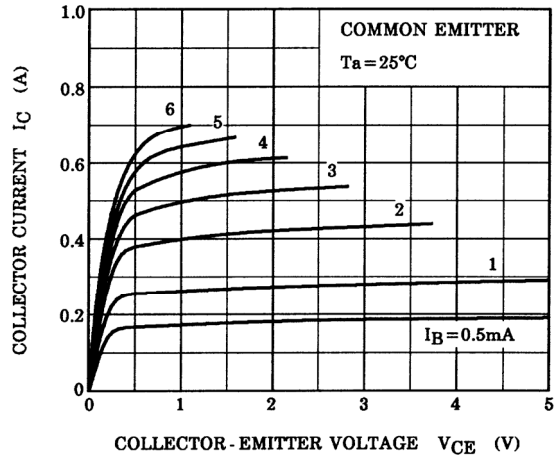


## Electrical Characteristics (Ta = 25°C)

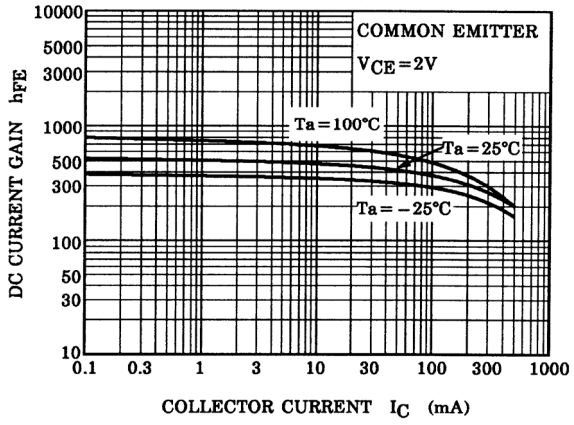
| Characteristics | | Symbol | Test Condition | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|---|---|
| Collector cut-off current | | $I_{CBO}$ | $V_{CB}$ = 15 V, $I_E$ = 0 | — | — | 0.1 | μA |
| Emitter cut-off current | | $I_{EBO}$ | $V_{EB}$ = 5 V, $I_C$ = 0 | — | — | 0.1 | μA |
| DC current gain | | $h_{FE}$ (Note) | $V_{CE}$ = 2 V, $I_C$ = 10 mA | 300 | — | 1000 | |
| Collector-emitter saturation voltage | | $V_{CE\ (sat)}$ (1) | $I_C$ = 10 mA, $I_B$ = 0.5 mA | — | 15 | 30 | mV |
| | | $V_{CE\ (sat)}$ (2) | $I_C$ = 200 mA, $I_B$ = 10 mA | — | 110 | 250 | |
| Base-emitter voltage | | $V_{BE\ (sat)}$ | $I_C$ = 200 mA, $I_B$ = 10 mA | — | 0.87 | 1.2 | V |
| Transition frequency | | $f_T$ | $V_{CE}$ = 2 V, $I_C$ = 10 mA | 80 | 130 | — | MHz |
| Collector output capacitance | | $C_{ob}$ | $V_{CB}$ = 10 V, $I_E$ = 0, f = 1 MHz | — | 4.2 | — | pF |
| Collector-emitter on resistance | | $R_{on}$ | $I_B$ = 1 mA, $V_{in}$ = 1 $V_{rms}$, f = 1 kHz | — | 0.9 | — | Ω |
| Switching time | Turn-on time | $t_{on}$ |  | — | 85 | — | ns |
| | Storage time | $t_{stg}$ | | — | 170 | — | |
| | Fall time | $t_f$ | Duty cycle ≦ 2%<br>$I_{B1} = -I_{B2}$ = 5 mA | — | 40 | — | |

Note: $h_{FE}$ classification A: 300~600, B: 500~1000

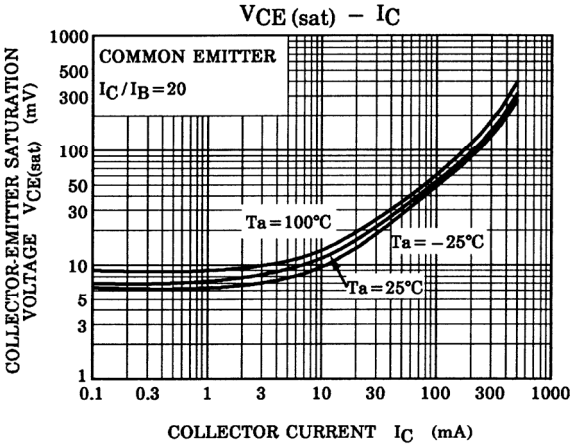
$I_C - V_{CE}$



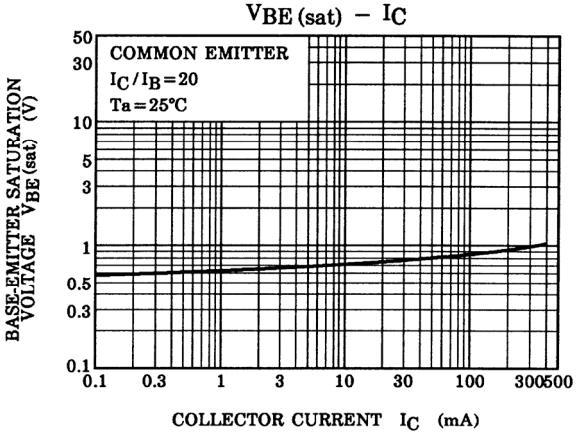

$h_{FE} - I_C$



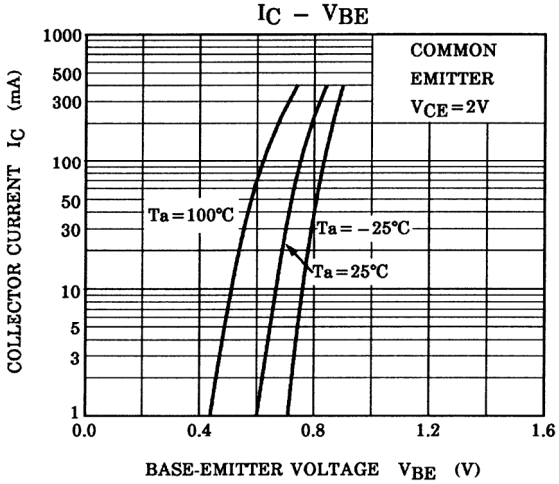

$V_{CE\,(sat)} - I_C$



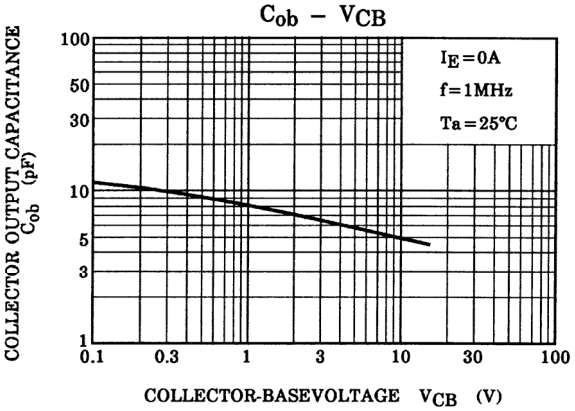

$V_{BE\,(sat)} - I_C$

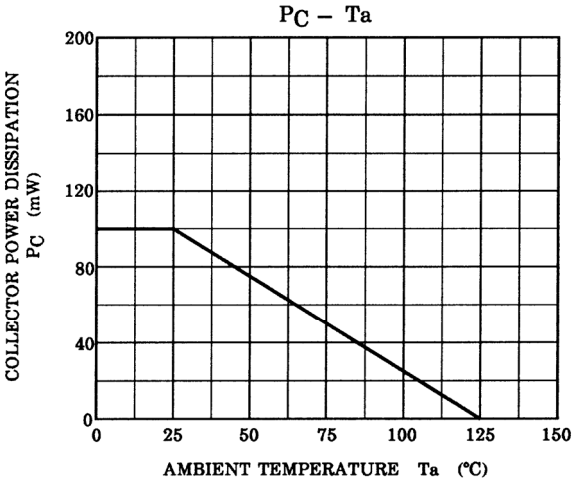



$I_C - V_{BE}$




$C_{ob} - V_{CB}$




$P_C$ – Ta
COLLECTOR POWER DISSIPATION $P_C$ (mW)
200
160
120
80
40
0
0
25
50
75
100
125
150
AMBIENT TEMPERATURE Ta (°C)

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20070701-EN GENERAL

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