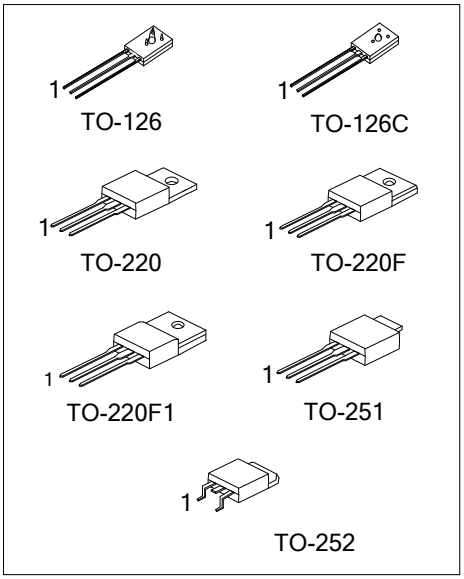
# 2SC5353B

**NPN SILICON TRANSISTOR**

## HIGH VOLTAGE NPN TRANSISTOR



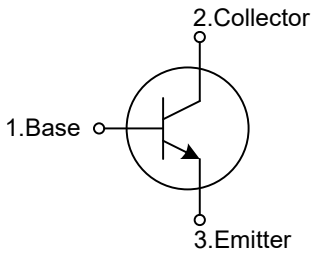

### ■ DESCRIPTION

Switching Regulator and High Voltage Switching Applications High-Speed DC-DC Converter Applications.

### ■ FEATURES

* Excellent switching times: $t_R$ = 0.7μs(MAX), $t_F$ = 0.5μs (MAX)
* High collectors breakdown voltage: $V_{CEO}$ = 700V

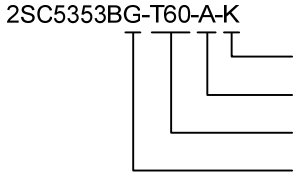
### ■ SYMBOL




### ■ ORDERING INFORMATION

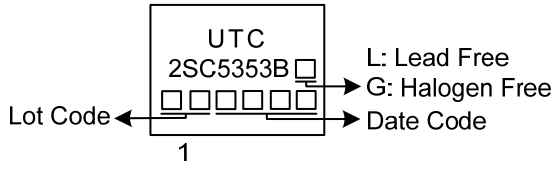
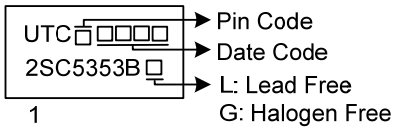
| Ordering Number | | Package | Pin Assignment | | | Packing |
|---|---|---|---|---|---|---|
| Lead Free | Halogen Free | | 1 | 2 | 3 | |
| 2SC5353BL-TA3-T | 2SC5353BG-TA3-T | TO-220 | B | C | E | Tube |
| 2SC5353BL-TF3-T | 2SC5353BG-TF3-T | TO-220F | B | C | E | Tube |
| 2SC5353BL-TF1-T | 2SC5353BG-TF1-T | TO-220F1 | B | C | E | Tube |
| 2SC5353BL-TM3-T | 2SC5353BG-TM3-T | TO-251 | B | C | E | Tube |
| 2SC5353BL-TN3-R | 2SC5353BG-TN3-R | TO-252 | B | C | E | Tape Reel |
| 2SC5353BL-T60-K | 2SC5353BG-T60-K | TO-126 | B | C | E | Bulk |
| 2SC5353BL-T60-A-K | 2SC5353BG-T60-A-K | TO-126 | E | C | B | Bulk |
| 2SC5353BL-T6C-K | 2SC5353BG-T6C-K | TO-126C | B | C | E | Bulk |

Note: Pin Assignment: B: Base C: Collector E: Emitter




(1) K: Bulk, T: Tube, R: Tape Reel
(2) refer to Pin Assignment
(3) TA3: TO-220, TF3: TO-220F, TF1: TO-220F1, TM3: TO-251, TN3: TO-252, T60: TO-126, T6C: TO-126C
(3) G: Halogen Free and Lead Free, L: Lead Free

## ■ MARKING

| TO-220 / TO-220F<br>TO-220F1 / TO-251 / TO-252 | TO-126 / TO-126C |
|---|---|
|  |  |

## ■ ABSOLUTE MAXIMUM RATINGS ($T_C$=25°C unless otherwise specified)

| PARAMETER | | SYMBOL | RATINGS | UNIT |
|---|---|---|---|---|
| Collector-Base Voltage | | $V_{CBO}$ | 900 | V |
| Collector-Emitter Voltage | | $V_{CEO}$ | 700 | V |
| Emitter-Base Voltage | | $V_{EBO}$ | 7 | V |
| Collector Current | DC | $I_C$ | 3 | A |
| | Pulse | $I_{CP}$ | 5 | A |
| Base Current | | $I_B$ | 1 | A |
| Power Dissipation | TO-126/TO-126C<br>TO-220F/TO-220F1 | $P_D$ | 20 | W |
| | TO-220 | | 25 | W |
| | TO-251/TO-252 | | 22 | W |
| Junction Temperature | | $T_J$ | +150 | °C |
| Storage Temperature | | $T_{STG}$ | -40 ~ +150 | °C |

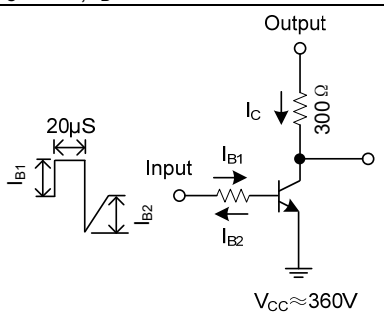
Notes: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

## ■ THERMAL DATA

| PARAMETER | | SYMBOL | RATINGS | UNIT |
|---|---|---|---|---|
| Junction to Ambient | TO-126/TO-126C | $\theta_{JA}$ | 89.3 (Note) | °C/W |
| | TO-220F/TO-220F1 | | 62.5 | °C/W |
| | TO-220 | | | °C/W |
| | TO-251/TO-252 | | 80.1 (Note) | °C/W |
| Junction to Case | TO-126/TO-126C | $\theta_{JC}$ | 6.25 (Note) | °C/W |
| | TO-220F/TO-220F1 | | 6.25 | °C/W |
| | TO-220 | | 5 | °C/W |
| | TO-251/TO-252 | | 5.68 (Note) | °C/W |

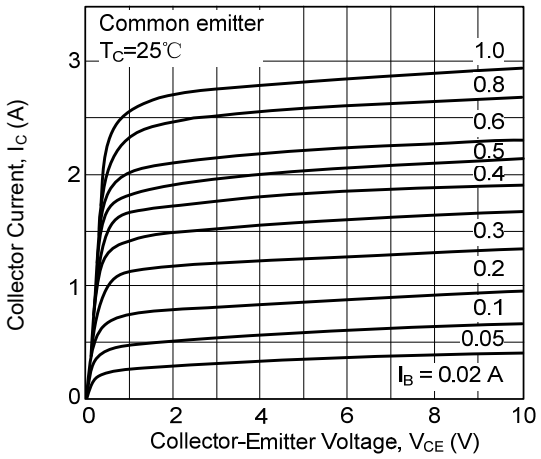
Note: Device mounted on FR-4 substrate $P_C$ board, 2oz copper, with 1inch square copper plate.

## ■ ELECTRICAL CHARACTERISTICS ($T_C$=25°C unless otherwise specified)

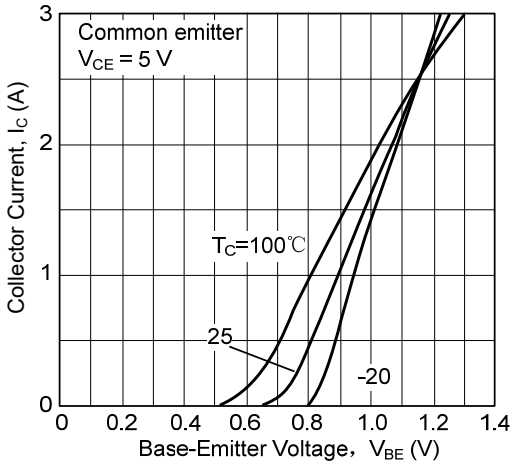
| PARAMETER | | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|---|
| Collector-Base Breakdown Voltage | | $BV_{CBO}$ | $I_C$=1mA, $I_E$=0 | 900 | | | V |
| Collector-Emitter Breakdown Voltage | | $BV_{CEO}$ | $I_C$=10mA, $I_B$=0 | 700 | | | V |
| Emitter to Base Breakdown Voltage | | $BV_{EBO}$ | $I_E$=100μA, $I_C$=0 | 7 | | | V |
| Collector Cut-off Current | | $I_{CBO}$ | $V_{CB}$=720V, $I_E$=0 | | | 100 | μA |
| Collector Cutoff Current | | $I_{CEO}$ | $V_{CE}$=700V, $I_B$=0 | | | 100 | μA |
| Emitter Cut-off Current | | $I_{EBO}$ | $V_{EB}$=7V, $I_C$=0 | | | 10 | μA |
| DC Current Gain | | $h_{FE1}$ | $V_{CE}$=5V, $I_C$=1mA | 10 | | | |
| | | $h_{FE2}$ | $V_{CE}$=5V, $I_C$=0.15A | 15 | | | |
| Collector-Emitter Saturation Voltage | | $V_{CE(SAT)}$ | $I_C$=1.2A, $I_B$=0.24A | | | 1.0 | V |
| Base-Emitter Saturation Voltage | | $V_{BE(SAT)}$ | $I_C$=1.2A, $I_B$=0.24A | | | 1.3 | V |
| Switching Time | Rise Time | $t_R$ |  $I_{B1}$ = 0.24 A, $I_{B2}$ = −0.48 A, duty cycle ≤ 1% | | | 0.7 | μS |
| | Storage Time | $t_{STG}$ | | | | 4.0 | μS |
| | Fall Time | $t_F$ | | | | 0.5 | μS |

## ■ TYPICAL CHARACTERISTICS

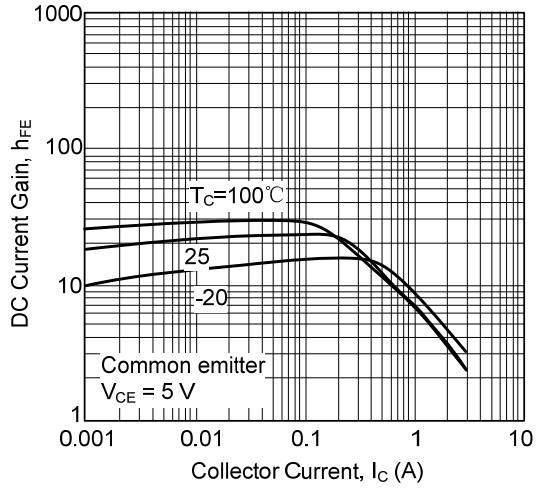
Collector Current vs. Collector-Emitter Voltage



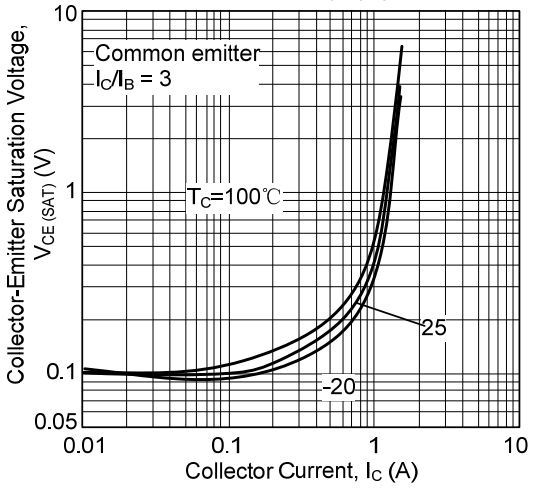

Collector Current vs. Base-Emitter Voltage



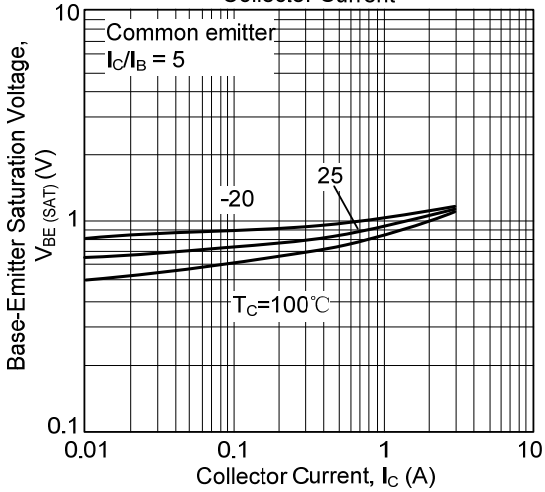

DC Current Gain vs. Collector Current



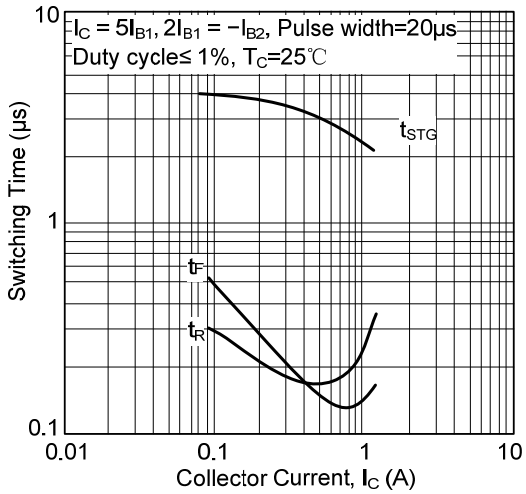

Collector-Emitter Saturation Voltage vs. Collector Current




Base-Emitter Saturation Voltage vs. Collector Current




Switching Characteristics



## ■ TYPICAL CHARACTERISTICS (Cont.)