

## Features

- Complementary Types: BCP51 (PNP)
- Halogen Free. "Green" Device (Note 1)
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

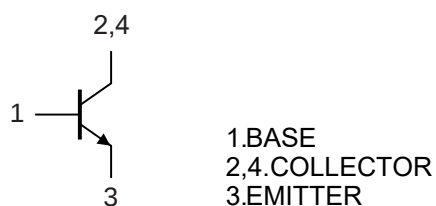
## Maximum Ratings @ 25°C Unless Otherwise Specified

- Operating Junction Temperature Range: -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 83.3°C/W Junction to Ambient

| Parameter                 | Symbol    | Rating | Unit |
|---------------------------|-----------|--------|------|
| Collector-Base Voltage    | $V_{CBO}$ | 45     | V    |
| Collector-Emitter Voltage | $V_{CEO}$ | 45     | V    |
| Emitter-Base Voltage      | $V_{EBO}$ | 5      | V    |
| Collector Current         | $I_C$     | 1      | A    |
| Power Dissipation         | $P_D$     | 1.5    | W    |

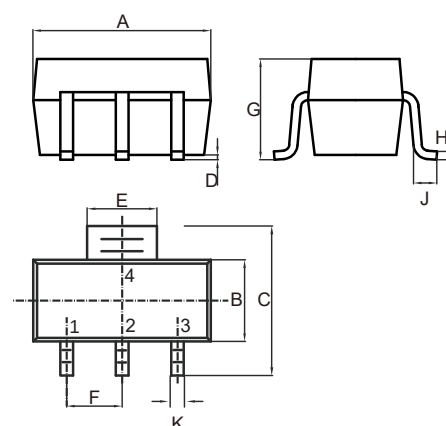
Note: 1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

## Internal Structure



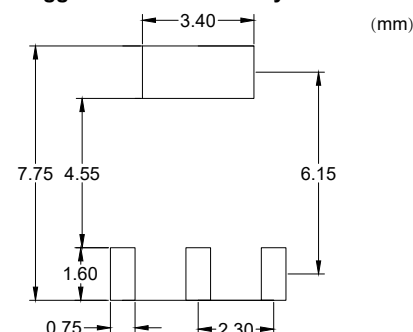
# NPN Plastic-Encapsulate Transistors

## SOT-223



| DIMENSIONS |        |       |      |      |      |
|------------|--------|-------|------|------|------|
| DIM        | INCHES |       | MM   |      | NOTE |
|            | MIN    | MAX   | MIN  | MAX  |      |
| A          | 0.248  | 0.264 | 6.30 | 6.70 |      |
| B          | 0.130  | 0.146 | 3.30 | 3.70 |      |
| C          | 0.264  | 0.287 | 6.70 | 7.30 |      |
| D          | 0.001  | 0.004 | 0.02 | 0.10 |      |
| E          | 0.114  | 0.122 | 2.90 | 3.10 |      |
| F          | 0.091  |       | 2.30 |      | TYP. |
| G          | ---    | 0.071 | ---  | 1.80 |      |
| H          | 0.009  | 0.014 | 0.23 | 0.35 |      |
| J          | 0.030  | ---   | 0.75 | ---  |      |
| K          | 0.026  | 0.033 | 0.66 | 0.84 |      |

## Suggested Solder Pad Layout



**Electrical Characteristics @  $T_A = 25^\circ\text{C}$  Unless Otherwise Specified**

| Parameter                            | Symbol        | Min | Typ | Max | Units | Conditions                                                        |
|--------------------------------------|---------------|-----|-----|-----|-------|-------------------------------------------------------------------|
| Collector-Base Breakdown Voltage     | $V_{(BR)CBO}$ | 45  |     |     | V     | $I_C = 100\mu\text{A}$ , $I_E = 0$                                |
| Collector-Emitter Breakdown Voltage  | $V_{(BR)CEO}$ | 45  |     |     | V     | $I_C = 10\text{mA}$ , $I_B = 0$                                   |
| Emitter-Base Breakdown Voltage       | $V_{(BR)EBO}$ | 5   |     |     | V     | $I_E = 10\mu\text{A}$ , $I_C = 0$                                 |
| Collector-Base Cutoff Current        | $I_{CBO}$     |     |     | 100 | nA    | $V_{CB} = 30\text{V}$ , $I_E = 0$                                 |
| DC Current Gain                      | $h_{FE1}$     | 25  |     |     |       | $V_{CE} = 2\text{V}$ , $I_C = 5\text{mA}$                         |
|                                      | $h_{FE2}$     | 63  |     | 250 |       | $V_{CE} = 2\text{V}$ , $I_C = 150\text{mA}$                       |
|                                      | $h_{FE3}$     | 25  |     |     |       | $V_{CE} = 2\text{V}$ , $I_C = 500\text{mA}$                       |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ |     |     | 0.5 | V     | $I_C = -500\text{mA}$ , $I_B = 50\text{mA}$                       |
| Base-Emitter Voltage                 | $V_{BE}$      |     |     | 1   | V     | $V_{CE} = 2\text{V}$ , $I_C = 500\text{mA}$                       |
| Transition Frequency                 | $f_T$         | 100 |     |     | MHz   | $V_{CE} = 10\text{V}$ , $I_C = 50\text{mA}$ , $f = 100\text{MHz}$ |

**Classification of  $h_{FE(2)}$**

|       |          |          |
|-------|----------|----------|
| Rank  | BCP54-10 | BCP54-16 |
| Range | 63~160   | 100~250  |

## Curve Characteristics

Fig. 1 - Static Characteristics

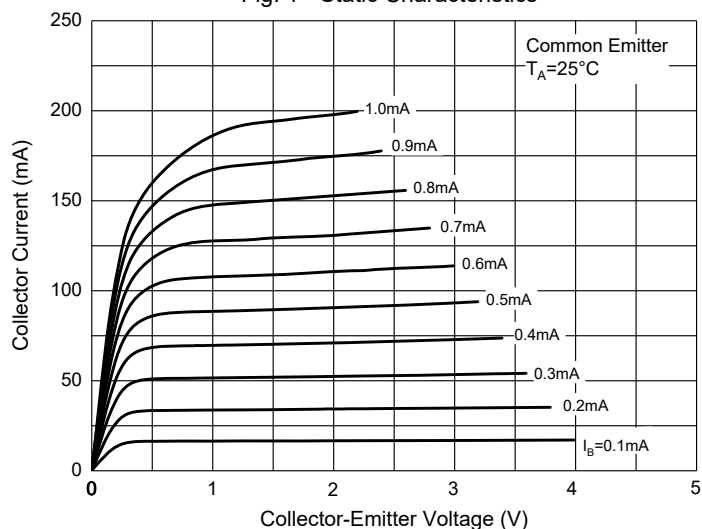


Fig. 2 - DC Current Gain Characteristics

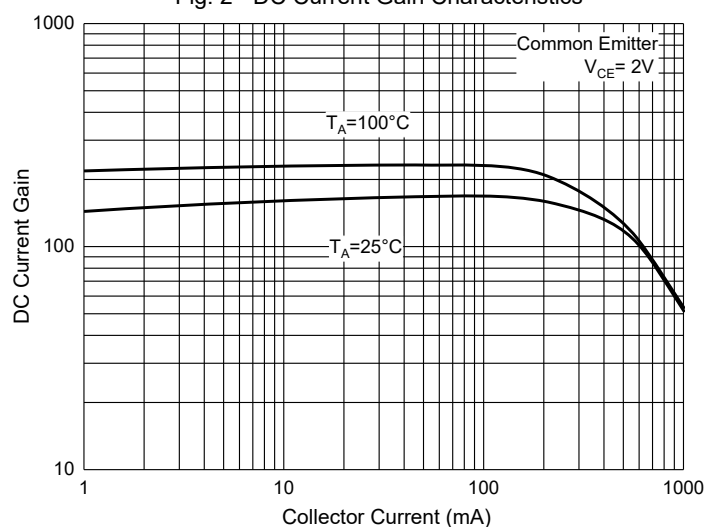


Fig. 3 - Collector-Emitter Saturation Voltage Characteristics

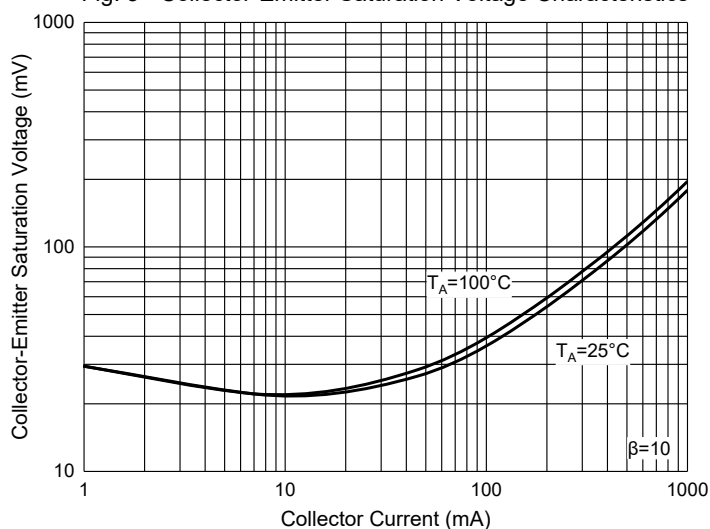


Fig. 4 - Base-Emitter Saturation Voltage Characteristics

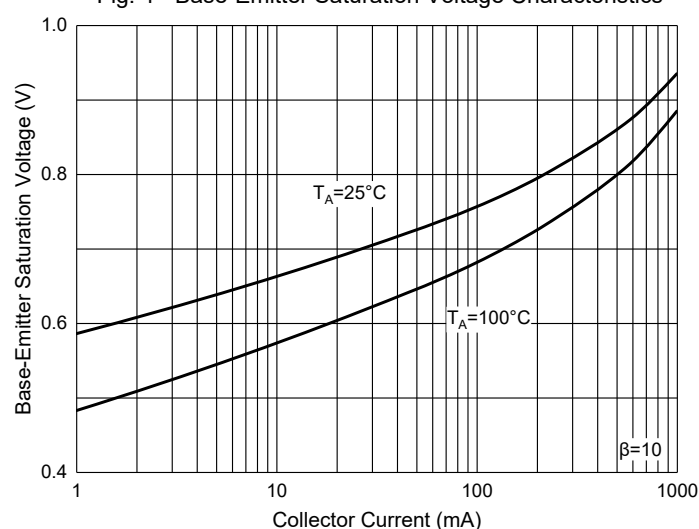


Fig. 5 - Base-Emitter Voltage Characteristics

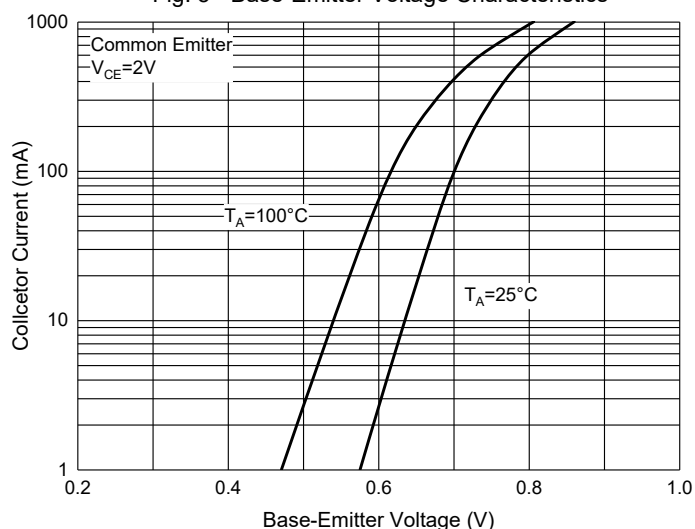
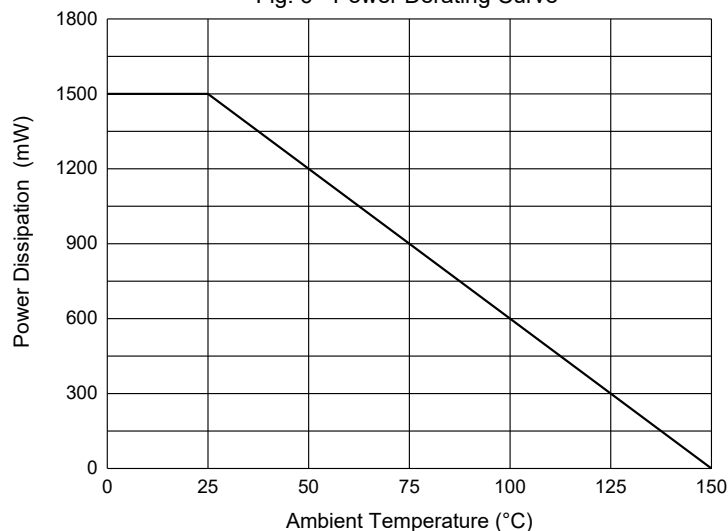


Fig. 6 - Power Derating Curve



## Ordering Information

| Device         | Packing                 |
|----------------|-------------------------|
| Part Number-TP | Tape&Reel: 2.5Kpcs/Reel |

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