# PNP Plastic-Encapsulate Transistors

## Features

- Complementary Types: BCP54 (NPN)
- 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)

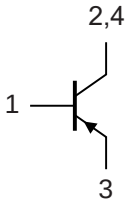
## Maximum Ratings @ 25°C Unless Otherwise Specified

- Operating Junction Temperature Range: -55℃ to +150℃
- Storage Temperature Range: -55℃ to +150℃
- Thermal Resistance: 83.3℃/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 |

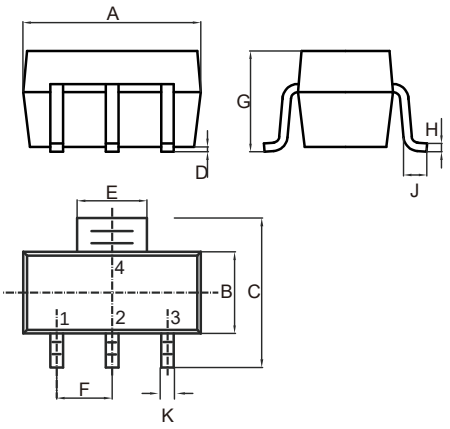
Note: 1. Halogen free "Green” products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

### Internal Structure



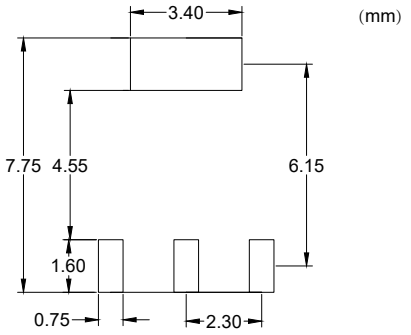

1.BASE
2,4.COLLECTOR
3.EMITTER

## 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°C Unless Otherwise Specified

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

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

| Rank | BCP51-10 | BCP51-16 |
|---|---|---|
| Range | 63~160 | 100~250 |

## Curve Characteristics

Fig. 1 - Static Characteristics

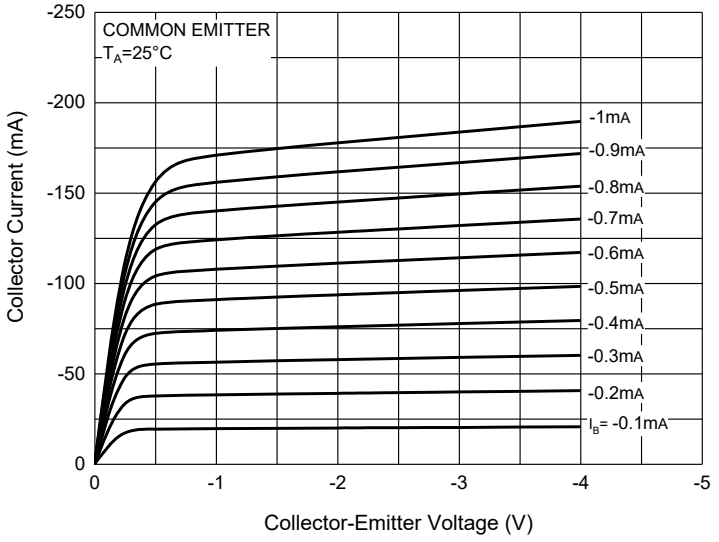



Fig. 2 - DC Current Gain Characteristics

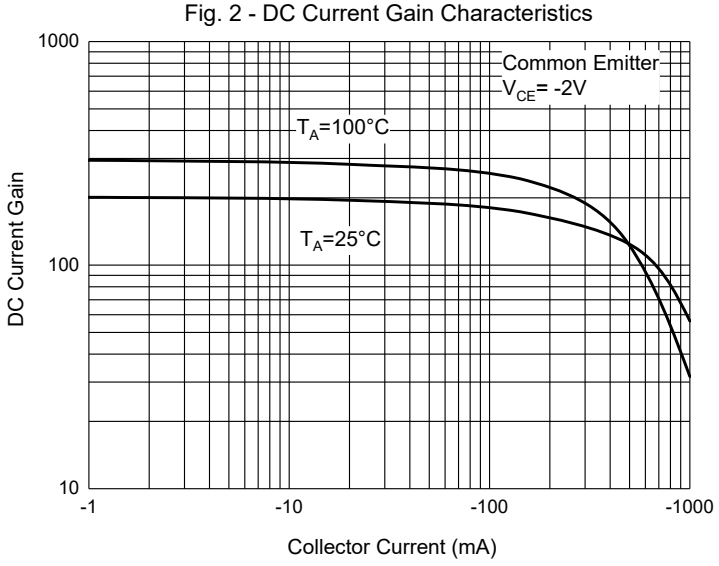



Fig. 3 - Collector-Emitter Saturation Voltage Characteristics

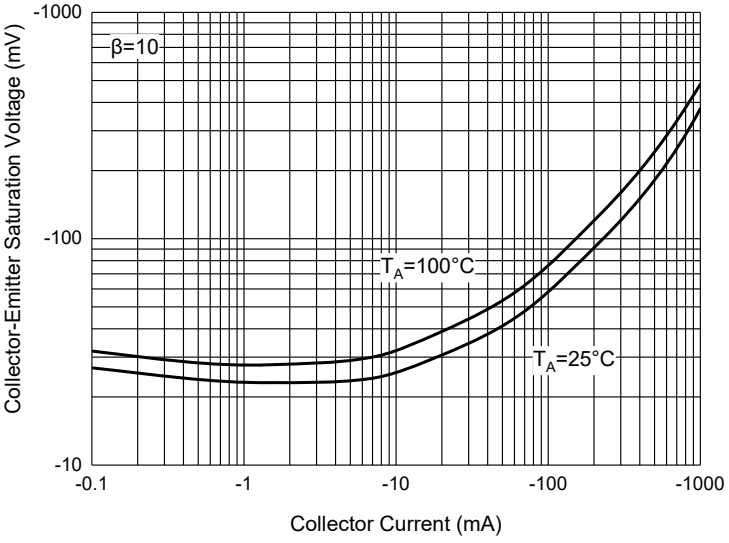



Fig. 4 - Base-Emitter Saturation Voltage Characteristics

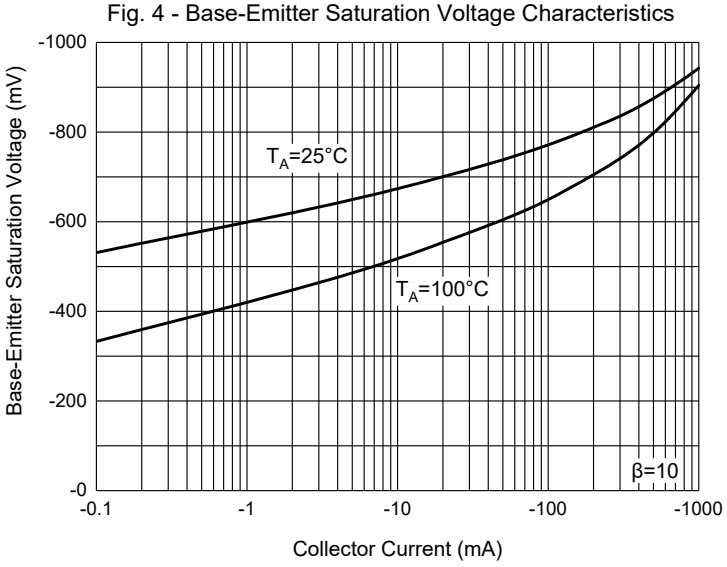



Fig. 5 - Base-Emitter Voltage Characteristics

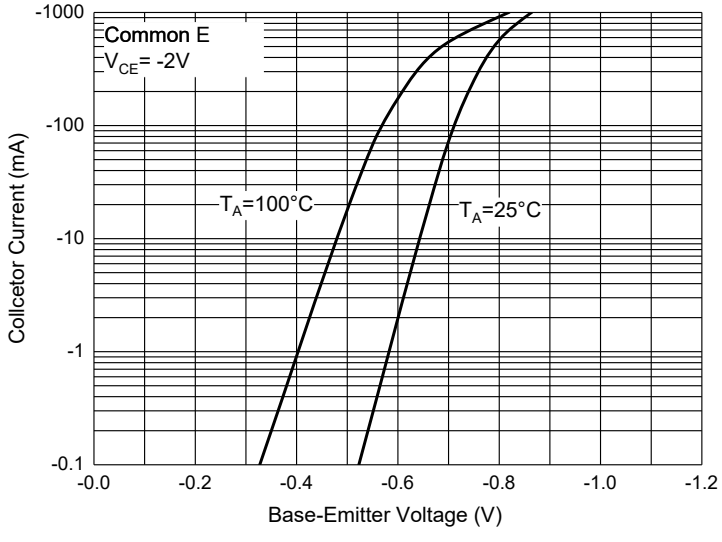
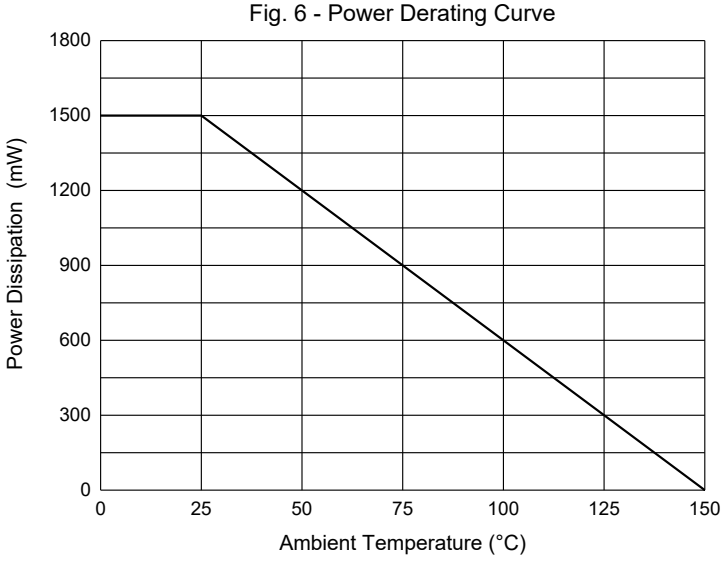



Fig. 6 - Power Derating Curve



## Ordering Information

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