

## Features

- Ultra-Small Surface Mount Package
- 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

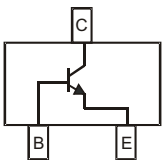
- Operating Junction Temperature Range: -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C

| Parameter                   | Symbol    | Rating | Unit |
|-----------------------------|-----------|--------|------|
| Collector-Base Voltage      | $V_{CBO}$ | 75     | V    |
| Collector-Emitter Voltage   | $V_{CEO}$ | 40     | V    |
| Emitter-Base Voltage        | $V_{EBO}$ | 6      | V    |
| Maximum Collector Current   | $I_{CM}$  | 0.6    | A    |
| Collector Power Dissipation | $P_C$     | 200    | mW   |

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

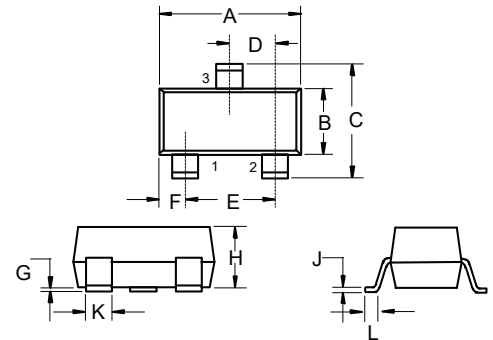
Marking: K3P

## Internal Structure



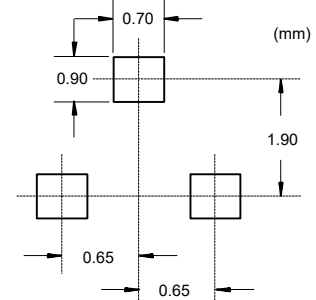
# NPN Plastic Encapsulate Transistors

## SOT-323



| DIM | INCHES |       | MM   |      | NOTE |
|-----|--------|-------|------|------|------|
|     | MIN    | MAX   | MIN  | MAX  |      |
| A   | 0.071  | 0.087 | 1.80 | 2.20 |      |
| B   | 0.045  | 0.053 | 1.15 | 1.35 |      |
| C   | 0.083  | 0.096 | 2.10 | 2.45 |      |
| D   | 0.026  |       | 0.65 |      | TYP. |
| E   | 0.047  | 0.055 | 1.20 | 1.40 |      |
| F   | 0.012  | 0.016 | 0.30 | 0.40 |      |
| G   | 0.000  | 0.004 | 0.00 | 0.10 |      |
| H   | 0.035  | 0.044 | 0.90 | 1.10 |      |
| J   | 0.002  | 0.010 | 0.05 | 0.25 |      |
| K   | 0.006  | 0.016 | 0.15 | 0.40 |      |
| L   | 0.010  | 0.018 | 0.26 | 0.46 |      |

### Suggested Solder Pad Layout



**Electrical Characteristics @ 25°C Unless Otherwise Specified**

| Parameter                            | Symbol        | Min | Typ | Max | Units | Conditions                       |
|--------------------------------------|---------------|-----|-----|-----|-------|----------------------------------|
| Collector-Base Breakdown Voltage     | $V_{(BR)CBO}$ | 75  |     |     | V     | $I_C=10\mu A, I_E=0$             |
| Collector-Emitter Breakdown Voltage  | $V_{(BR)CEO}$ | 40  |     |     | V     | $I_C=10mA, I_B=0$                |
| Emitter-Base Breakdown Voltage       | $V_{(BR)EBO}$ | 6   |     |     | V     | $I_E=10\mu A, I_C=0$             |
| Collector-Base Cutoff Current        | $I_{CBO}$     |     |     | 100 | nA    | $V_{CB}=70V, I_E=0$              |
| Collector Cutoff Current             | $I_{CEX}$     |     |     | 10  | nA    | $V_{CE}=60V, V_{BE}=3V$          |
| Emitter Cutoff Current               | $I_{EBO}$     |     |     | 100 | nA    | $V_{EB}=3V, I_C=0$               |
| DC Current Gain (Note2)              | $h_{FE1}$     | 50  |     |     |       | $V_{CE}=10V, I_C=1mA$            |
|                                      | $h_{FE2}$     | 100 |     | 300 |       | $V_{CE}=10V, I_C=150mA$          |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ |     |     | 0.6 | V     | $I_C=500mA, I_B=50mA$            |
| Base-Emitter Saturation Voltage      | $V_{BE(sat)}$ | 0.6 |     | 1.2 | V     | $I_C=500mA, I_B=50mA$            |
| Transition Frequency                 | $f_T$         | 300 |     |     | MHz   | $V_{CE}=20V, I_C=20mA, f=100MHz$ |
| Output Capacitance                   | $C_{ob}$      |     |     | 8   | pF    | $V_{CB}=10V, I_E=0, f=1MHz,$     |
| Delay Time                           | $t_d$         |     |     | 10  | ns    | $V_{CC}=30V, V_{BE(off)}=0.5V$   |
| Rise Time                            | $t_r$         |     |     | 25  | ns    | $I_C=150mA, I_{B1}=15mA$         |
| Storage Time                         | $t_s$         |     |     | 225 | ns    | $V_{CC}=30V, I_C=150mA$          |
| Fall Time                            | $t_f$         |     |     | 60  | ns    | $I_{B1}=I_{B2}=15mA$             |

 Note: 2.Pluse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2.0\%$

**Curve Characteristics**

Fig. 1 - Static Characteristics

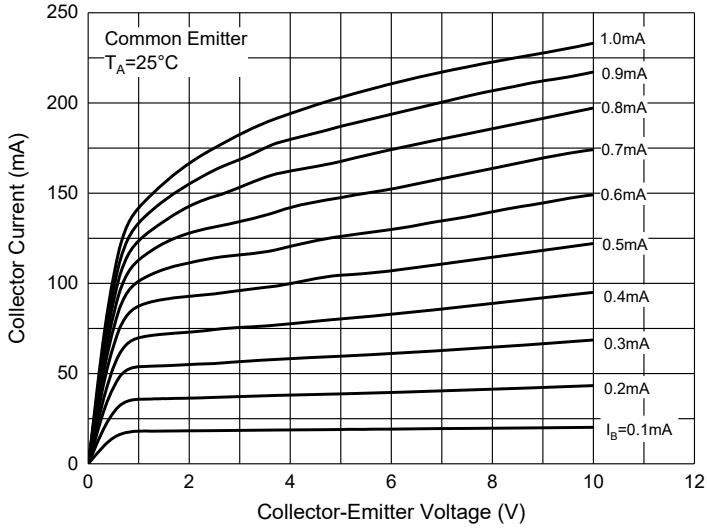


Fig. 2 - DC Current Gain Characteristics

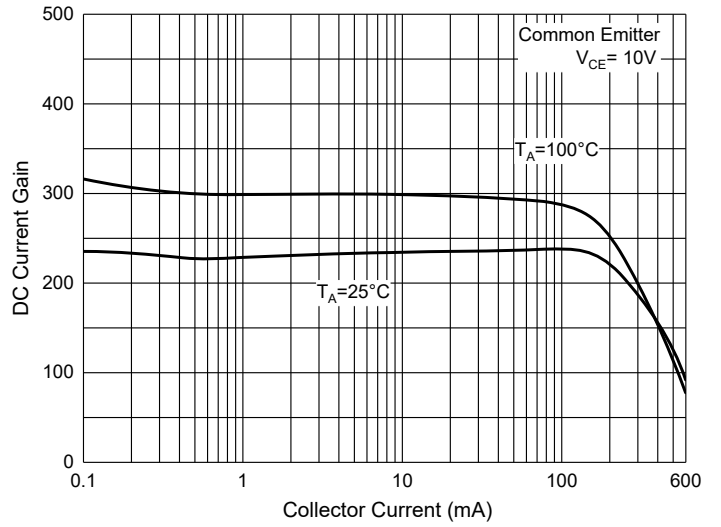


Fig. 3 - Collector-Emitter Saturation Voltage Characteristics

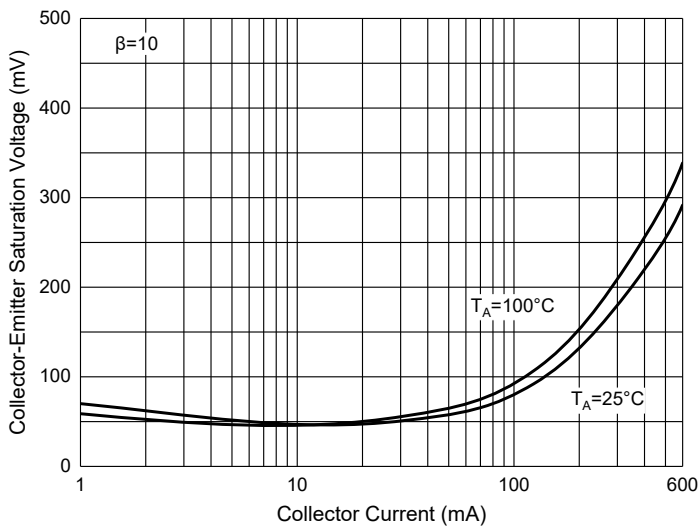


Fig. 4 - Base-Emitter Saturation Voltage Characteristics

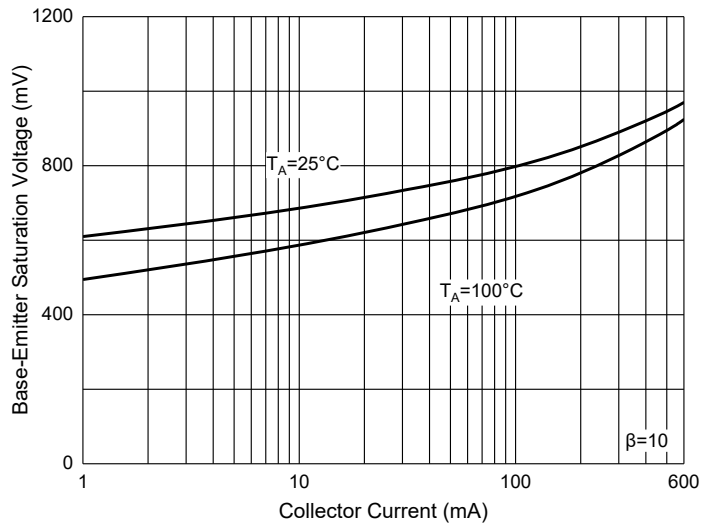


Fig. 5 - Base-Emitter Voltage Characteristics

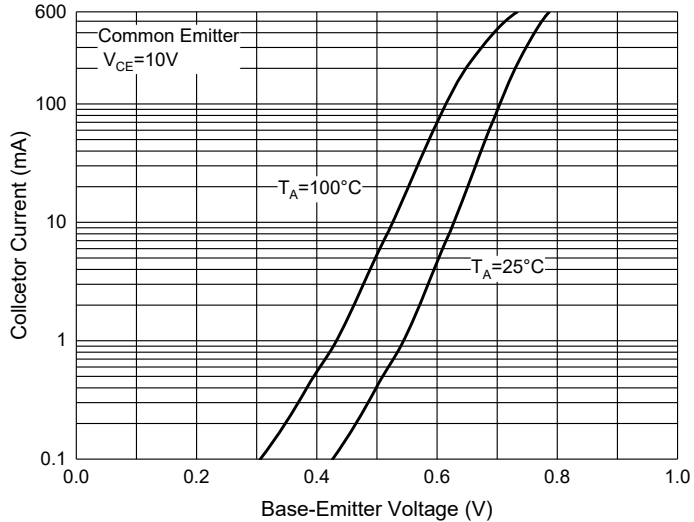
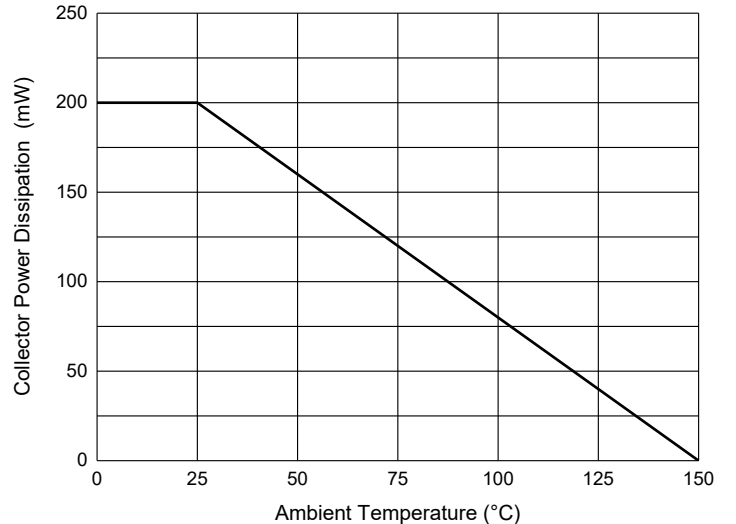


Fig. 6 - Collector Power Derating Curve



## Ordering Information

| Device         | Packing               |
|----------------|-----------------------|
| Part Number-TP | Tape&Reel; 3Kpcs/Reel |

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