

Features

- 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

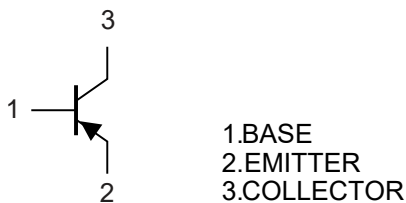
- Operating Junction Temperature Range: -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 250°C/W Junction to Ambient

| Parameter | Symbol | Rating | Unit |
|------------------------------|-----------|--------|------|
| Collector-Base Voltage | V_{CBO} | -80 | V |
| Collector-Emitter Voltage | V_{CEO} | -60 | V |
| Emitter-Base Voltage | V_{EBO} | -5 | V |
| Continuous Collector Current | I_C | -1 | A |
| Power Dissipation | P_D | 500 | 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.

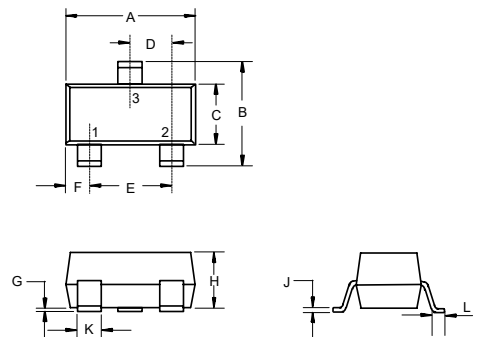
Marking: 591

Internal Structure



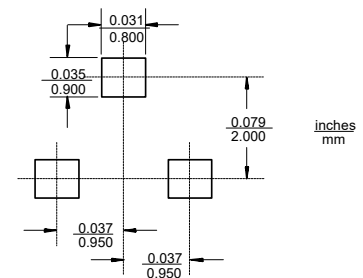
**PNP
Plastic-Encapsulate
Transistor**

SOT-23



| DIM | DIMENSIONS | | | | NOTE |
|-----|------------|-------|------|------|------|
| | INCHES | | MM | | |
| | MIN | MAX | MIN | MAX | |
| A | 0.110 | 0.120 | 2.80 | 3.04 | |
| B | 0.083 | 0.104 | 2.10 | 2.64 | |
| C | 0.047 | 0.055 | 1.20 | 1.40 | |
| D | 0.034 | 0.041 | 0.85 | 1.05 | |
| E | 0.067 | 0.083 | 1.70 | 2.10 | |
| F | 0.018 | 0.024 | 0.45 | 0.60 | |
| G | 0.0004 | 0.006 | 0.01 | 0.15 | |
| H | 0.035 | 0.043 | 0.90 | 1.10 | |
| J | 0.003 | 0.007 | 0.08 | 0.18 | |
| K | 0.012 | 0.020 | 0.30 | 0.51 | |
| L | 0.007 | 0.020 | 0.20 | 0.50 | |

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 | $V_{(BR)CBO}$ | -80 | | | V | $I_C=-100\mu\text{A}, I_E=0$ |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | -60 | | | V | $I_C=-10\text{mA}, I_B=0$ |
| Emitter-Base Breakdown Voltage | $V_{(BR)EBO}$ | -5 | | | V | $I_E=-100\mu\text{A}, I_C=0$ |
| Collector-Base Cutoff Current | I_{CBO} | | | -0.1 | μA | $V_{CB}=-60\text{V}, I_E=0$ |
| Emitter-Base Cutoff Current | I_{EBO} | | | -0.1 | μA | $V_{EB}=-4\text{V}, I_C=0$ |
| DC Current Gain | $h_{FE(1)}$ | 100 | | | | $V_{CE}=-5\text{V}, I_C=-1\text{mA}$ |
| | $h_{FE(2)}$ | 100 | | 300 | | $V_{CE}=-5\text{V}, I_C=-500\text{mA}$ |
| | $h_{FE(3)}$ | 80 | | | | $V_{CE}=-5\text{V}, I_C=-1\text{A}$ |
| | $h_{FE(4)}$ | 15 | | | | $V_{CE}=-5\text{V}, I_C=-2\text{A}$ |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | | | -0.3 | V | $I_C=-500\text{mA}, I_B=-50\text{mA}$ |
| | | | | -0.6 | V | $I_C=-1\text{A}, I_B=-100\text{mA}$ |
| Base-Emitter Saturation Voltage | $V_{BE(sat)}$ | | | -1.2 | V | $I_C=-1\text{A}, I_B=-100\text{mA}$ |
| Base-Emitter Voltage | V_{BE} | | | -1.0 | V | $V_{CE}=-5\text{V}, I_C=-1\text{A}$ |
| Transition Frequency | f_T | 150 | | | MHz | $V_{CE}=-10\text{V}, I_C=-50\text{mA}, f=100\text{MHz}$ |
| Output Capacitance | C_{ob} | | | 10 | pF | $V_{CB}=-10\text{V}, I_E=0, f=1\text{MHz}$ |

Curve Characteristics

Fig. 1 - Static Characteristics

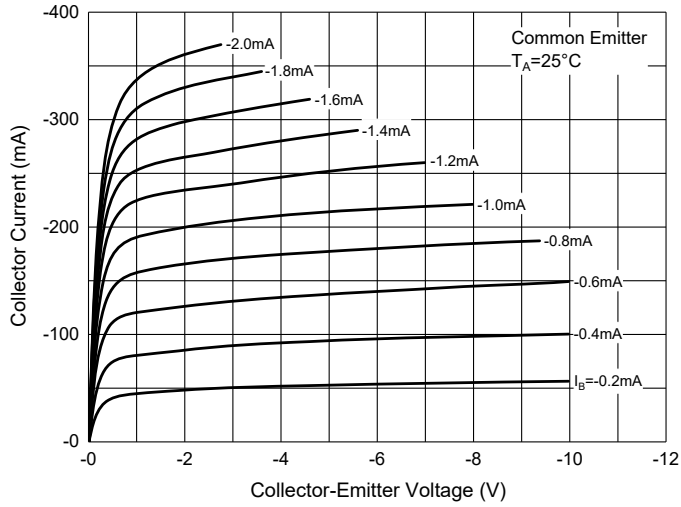


Fig. 2 - DC Current Gain Characteristics

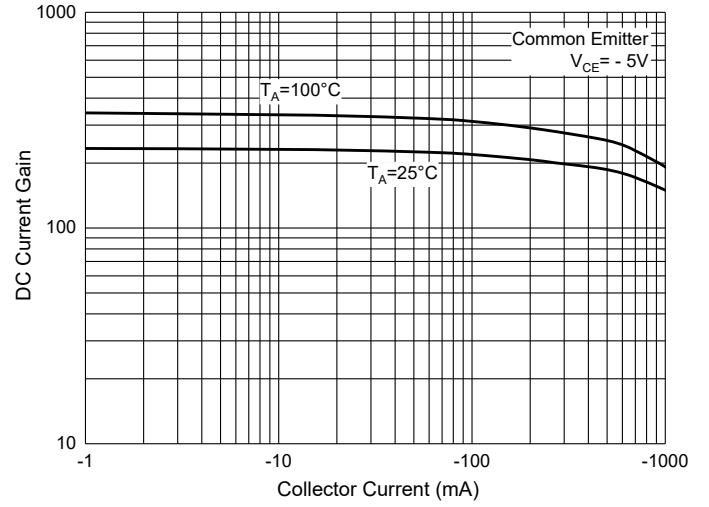


Fig. 3 - Collector-Emitter Saturation Voltage Characteristics

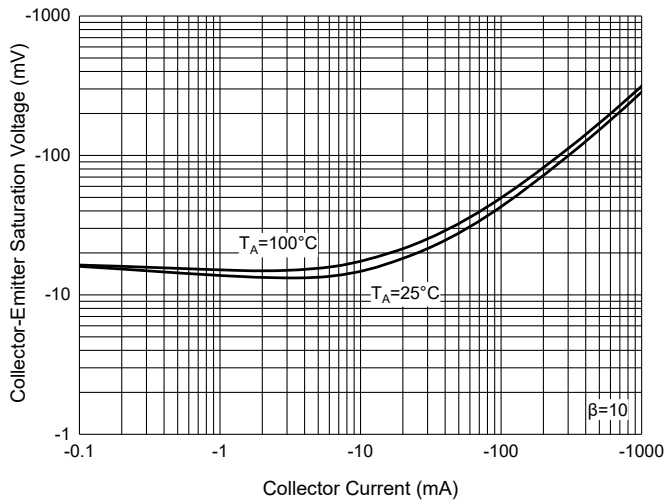


Fig. 4 - Base-Emitter Saturation Voltage Characteristics

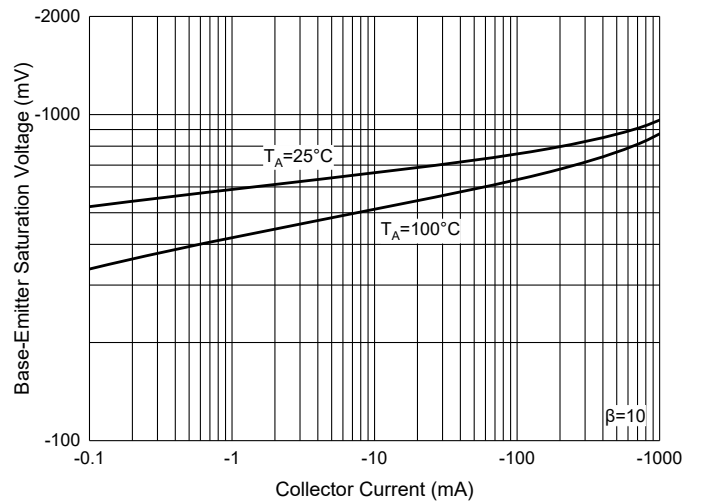


Fig. 5 - Base-Emitter Voltage Characteristics

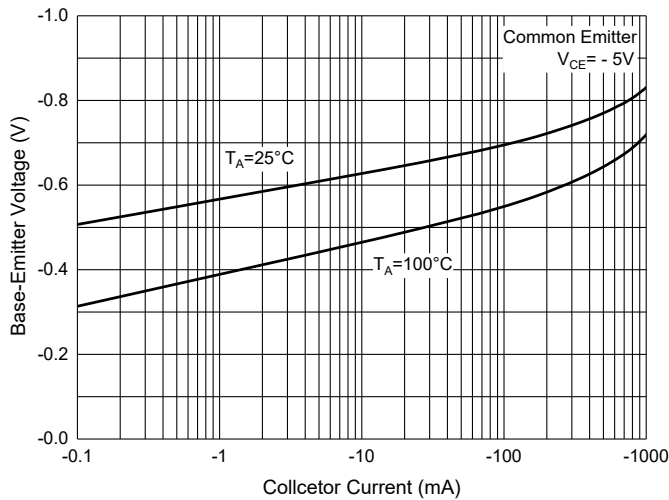
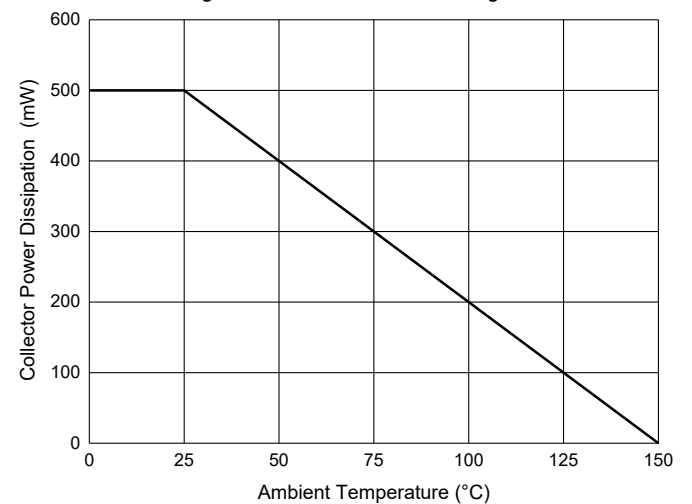


Fig. 6 - Collector Power Derating Curve



Ordering Information

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

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