

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)

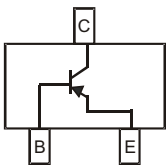
Maximum Ratings @ 25°C Unless Otherwise Specified

- Operating Junction Temperature Range: -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Typical Thermal Resistance: 417°C/W Junction to Ambient

| Parameter | Symbol | Rating | Unit |
|---------------------------|-----------|--------|------|
| Collector-Base Voltage | V_{CBO} | -40 | V |
| Collector-Emitter Voltage | V_{CEO} | -40 | V |
| Emitter-Base Voltage | V_{EBO} | -5 | V |
| Collector Current | I_C | -200 | mA |
| Power Dissipation | P_D | 300 | mW |

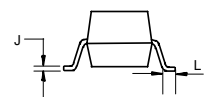
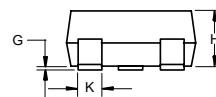
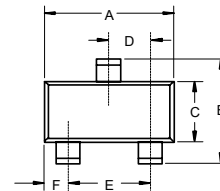
Note: 1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

Internal Structure



PNP General Purpose Amplifier

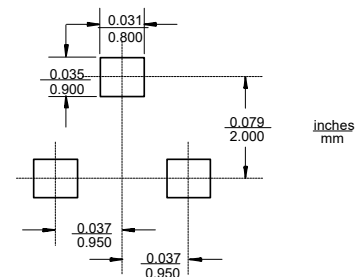
SOT-23



DIMENSIONS

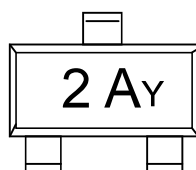
| DIM | INCHES | | MM | | NOTE |
|-----|--------|-------|------|------|------|
| | MIN | MAX | MIN | MAX | |
| A | 0.110 | 0.120 | 2.80 | 3.04 | |
| B | 0.083 | 0.104 | 2.10 | 2.64 | |
| C | 0.047 | 0.055 | 1.20 | 1.40 | |
| D | 0.034 | 0.041 | 0.85 | 1.05 | |
| E | 0.067 | 0.083 | 1.70 | 2.10 | |
| 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 | 0.014 | 0.020 | 0.35 | 0.51 | |
| L | 0.007 | 0.020 | 0.20 | 0.50 | |

Suggested Solder Pad Layout



Electrical Characteristics @ 25°C Unless Otherwise Specified

| Parameter | Symbol | Min | Typ | Max | Units | Conditions |
|--|---------------|-------|-----|-------|-------|--|
| Collector-Base Breakdown Voltage | $V_{(BR)CBO}$ | -40 | | | V | $I_C=-10\mu A, I_E=0$ |
| Collector-Emitter Breakdown Voltage ⁽²⁾ | $V_{(BR)CEO}$ | -40 | | | V | $I_C=-1mA, I_B=0$ |
| Emitter-Base Breakdown Voltage | $V_{(BR)EBO}$ | -5 | | | V | $I_E=-10\mu A, I_C=0$ |
| Collector-Base Cutoff Current | I_{CBO} | | | -100 | nA | $V_{CB}=-40V, I_E=0$ |
| Collector Cutoff Current | I_{CEX} | | | -50 | nA | $V_{CE}=-30V, V_{BE}=-3V$ |
| Emitter-Base Cutoff Current | I_{EBO} | | | -100 | nA | $V_{EB}=-5V, I_C=0$ |
| DC Current Gain ⁽²⁾ | $h_{FE(1)}$ | 100 | | 300 | | $V_{CE}=-1V, I_C=-10mA$ |
| | $h_{FE(2)}$ | 60 | | | | $V_{CE}=-1V, I_C=-50mA$ |
| | $h_{FE(3)}$ | 30 | | | | $V_{CE}=-1V, I_C=-100mA$ |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | | | -0.25 | V | $I_C=-10mA, I_B=-1mA$ |
| | | | | -0.4 | V | $I_C=-50mA, I_B=-5mA$ |
| Base-Emitter Saturation Voltage | $V_{BE(sat)}$ | -0.65 | | -0.85 | V | $I_C=-10mA, I_B=-1mA$ |
| | | | | -0.95 | V | $I_C=-50mA, I_B=-5mA$ |
| Transition Frequency | f_T | 250 | | | MHz | $V_{CE}=-20V, I_C=-10mA, f=100MHz$ |
| Output Capacitance | C_{cbo} | | | 4.5 | pF | $V_{CB}=-5V, I_E=0, f=1MHz$ |
| Input Capacitance | C_{ibo} | | | 10 | pF | $V_{BE}=-0.5V, I_C=0, f=1MHz$ |
| Noise Figure | NF | | | 4 | dB | $V_{CE}=-5V, I_C=100\mu A, R_S=1K, f=1KHz$ |
| Delay Time | t_d | | | 35 | ns | $V_{CC}=-3V, I_C=-10mA$ |
| Rise Time | t_r | | | 35 | ns | $V_{BE}=-0.5V, I_{B1}=I_{B2}=-1mA$ |
| Storage Time | t_s | | | 225 | ns | $V_{CC}=-3V, I_C=-10mA$ |
| Fall Time | t_f | | | 75 | ns | $I_{B1}=I_{B2}=-1mA$ |

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

 2A = Product Type Marking Code
 Y = Date Code Marking

Date code Key (2 years a cycle)

| Year | 2011 | | | | | | | | | | | |
|-------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| Code | J | O | L | C | K | B | P | D | M | E | G | F |

| Year | 2012 | | | | | | | | | | | |
|-------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| Code | W | N | Y | T | R | H | A | I | U | X | Z | S |

Curve Characteristics

Fig. 1 - Static Characteristics

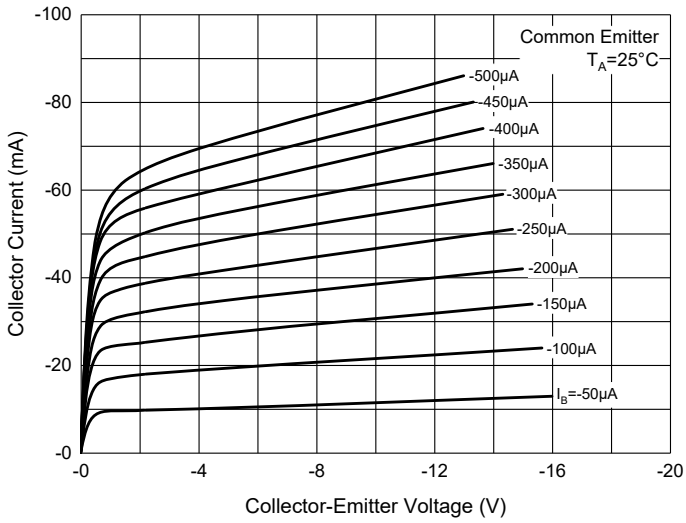


Fig. 2 - DC Current Gain Characteristics

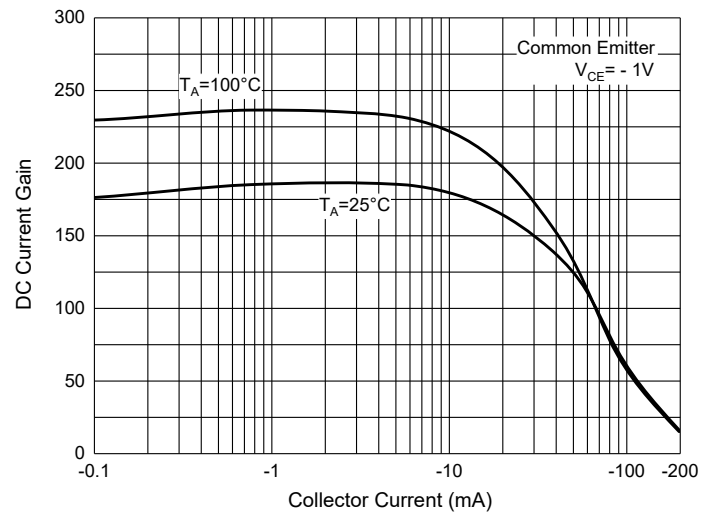


Fig. 3 - Collector-Emitter Saturation Voltage Characteristics

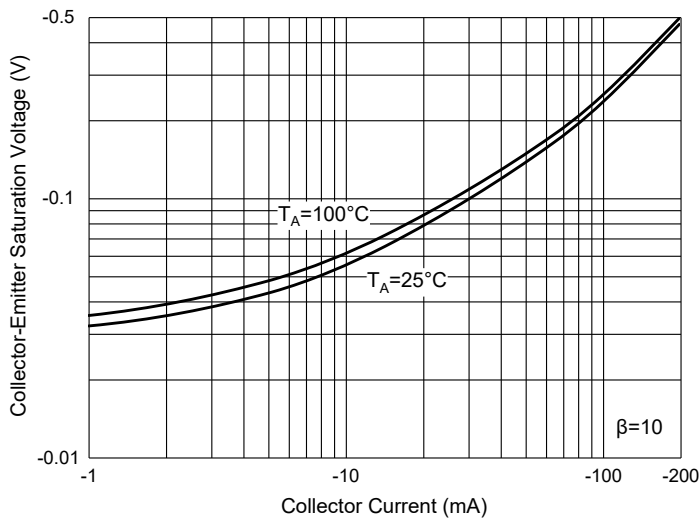


Fig. 4 - Base-Emitter Saturation Voltage Characteristics

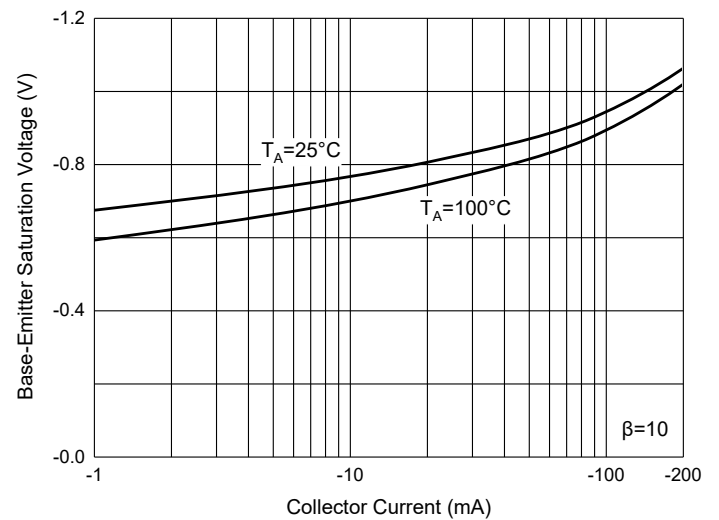


Fig. 5 - Base-Emitter Voltage Characteristics

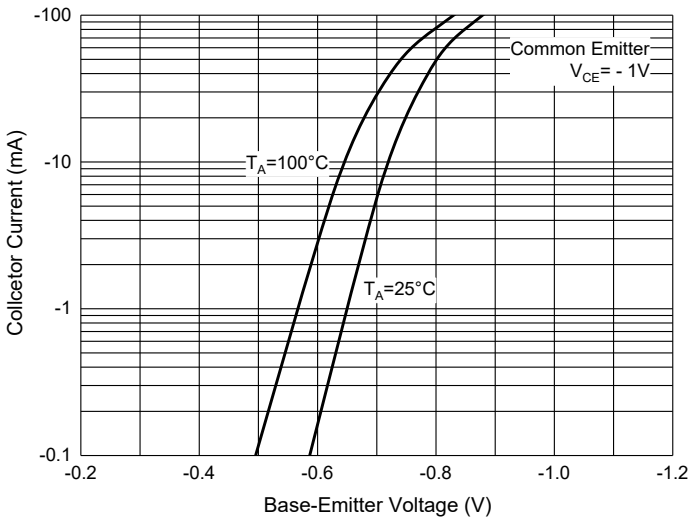
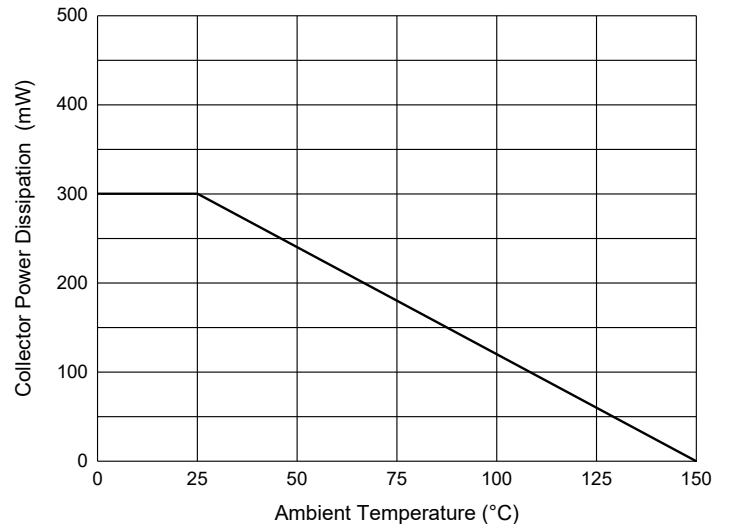


Fig. 6 - Collector Power Derating Curve



Ordering Information

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

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