

Absolute Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Value | Unit |
|------------------------------|------------------|-------|------|
| Collector-Base Voltage | V _{CBO} | 60 | V |
| Collector-Emitter Voltage | V _{CEO} | 40 | V |
| Emitter-Base Voltage | V _{EBO} | 6.0 | V |
| Continuous Collector Current | I _C | 200 | mA |
| Peak Pulse Collector Current | I _{CM} | 500 | mA |

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

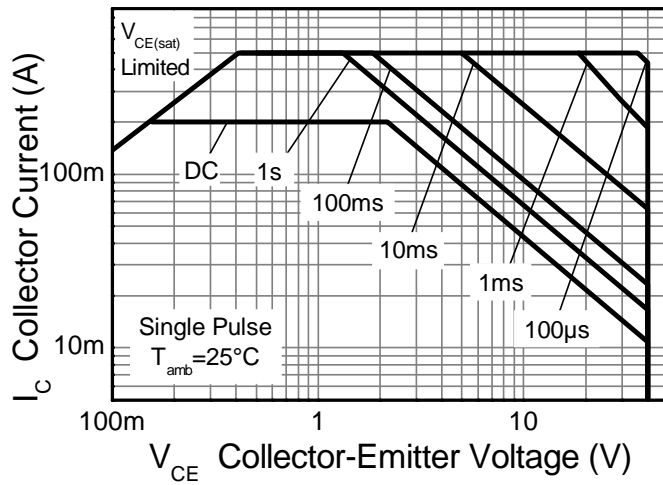
| Characteristic | Symbol | Value | Unit |
|--------------------------------------------------|-----------------------------------|-------------|------|
| Power Dissipation (Note 5) | P _D | 435 | mW |
| Thermal Resistance, Junction to Ambient (Note 5) | R _{θJA} | 287 | °C/W |
| Thermal Resistance, Junction to Lead (Note 6) | R _{θJL} | 150 | °C/W |
| Operating and Storage and Temperature Range | T _J , T _{STG} | -55 to +150 | °C |

ESD Ratings (Note 7)

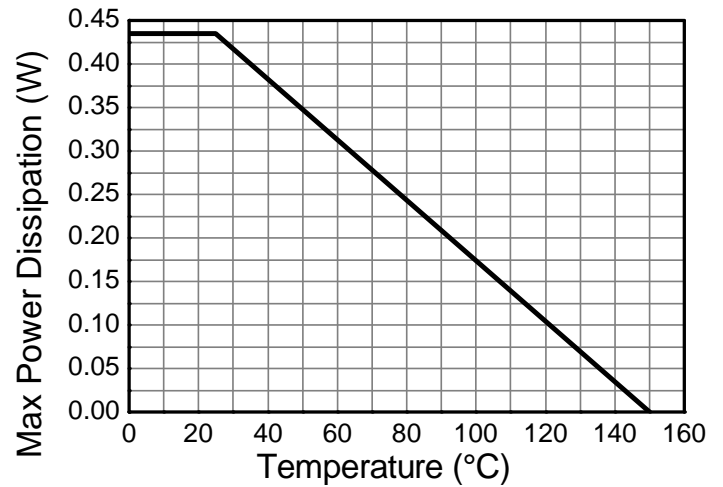
| Characteristic | Symbol | Value | Unit | JEDEC Class |
|--------------------------------------------|---------|-------|------|-------------|
| Electrostatic Discharge - Human Body Model | ESD HBM | 4,000 | V | 3A |
| Electrostatic Discharge - Machine Model | ESD MM | 200 | V | B |

- Notes:
5. For the device mounted on minimum recommended pad layout 1oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in steady state condition. The entire exposed collector pad is attached to the heatsink.
 6. Thermal resistance from junction to solder-point (on the exposed collector pad).
 7. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

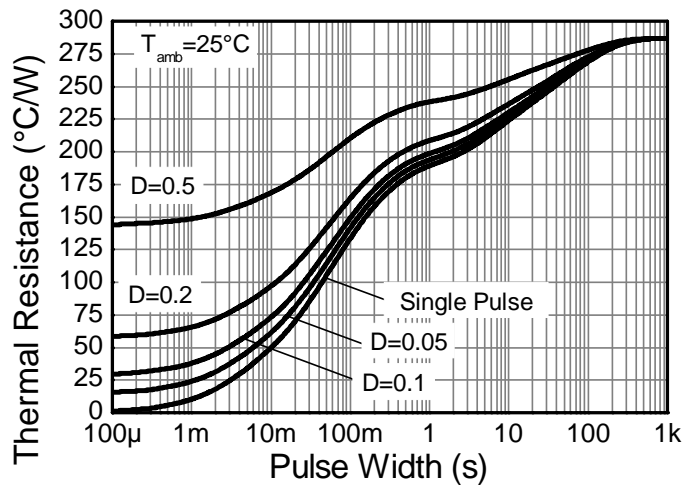
Thermal Characteristics and Derating Curves



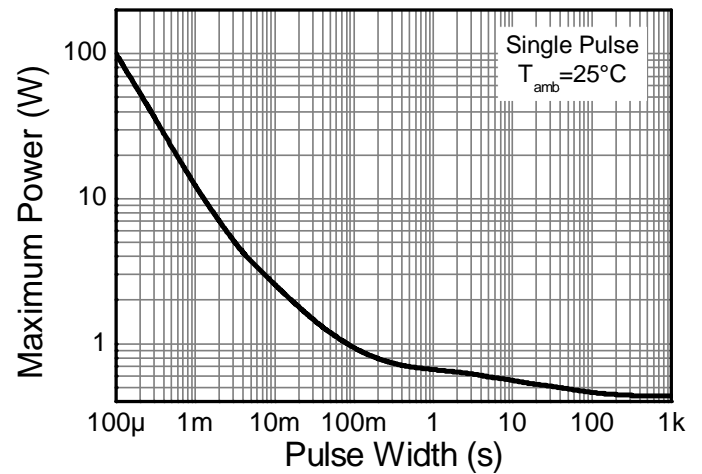
Safe Operating Area



Derating Curve



Transient Thermal Impedance



Pulse Power Dissipation

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Min | Max | Unit | Test Condition |
|----------------------------------------------|----------------------|-----------------------------|-------------------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| OFF CHARACTERISTICS | | | | | |
| Collector-Base Breakdown Voltage | BV _{CBO} | 60 | — | V | I _C = 10μA, I _E = 0 |
| Collector-Emitter Breakdown Voltage (Note 8) | BV _{CEO} | 40 | — | V | I _C = 1.0mA, I _B = 0 |
| Emitter-Base Breakdown Voltage | BV _{EBO} | 6.0 | — | V | I _E = 10μA, I _C = 0 |
| Collector Cutoff Current | I _{CEX} | — | 50 | nA | V _{CE} = 30V, V _{EB(OFF)} = 3.0V |
| Base Cutoff Current | I _{BL} | — | 50 | nA | V _{CE} = 30V, V _{EB(OFF)} = 3.0V |
| ON CHARACTERISTICS (Note 8) | | | | | |
| DC Current Gain | h _{FE} | 40 70 100 60 30 | — — 300 — — | — | I _C = 100μA, V _{CE} = 1.0V I _C = 1.0mA, V _{CE} = 1.0V I _C = 10mA, V _{CE} = 1.0V I _C = 50mA, V _{CE} = 1.0V I _C = 100mA, V _{CE} = 1.0V |
| Collector-Emitter Saturation Voltage | V _{CE(sat)} | — | 0.20 0.30 | V | I _C = 10mA, I _B = 1.0mA I _C = 50mA, I _B = 5.0mA |
| Base-Emitter Saturation Voltage | V _{BE(sat)} | 0.65 — | 0.85 0.95 | V | I _C = 10mA, I _B = 1.0mA I _C = 50mA, I _B = 5.0mA |
| SMALL SIGNAL CHARACTERISTICS | | | | | |
| Output Capacitance | C _{obo} | — | 4.0 | pF | V _{CB} = 5.0V, f = 1.0MHz, I _E = 0 |
| Input Capacitance | C _{ibo} | — | 8.5 | pF | V _{EB} = 0.5V, f = 1.0MHz, I _C = 0 |
| Input Impedance | h _{ie} | 1.0 | 10 | kΩ | V _{CE} = 10V, I _C = 1.0mA, f = 1.0kHz |
| Voltage Feedback Ratio | h _{re} | 0.5 | 8.0 | x 10 ⁻⁴ | |
| Small Signal Current Gain | h _{fe} | 100 | 400 | — | |
| Output Admittance | h _{oe} | 1.0 | 40 | μS | |
| Current Gain-Bandwidth Product | f _T | 300 | — | MHz | V _{CE} = 20V, I _C = 10mA, f = 100MHz |
| SWITCHING CHARACTERISTICS | | | | | |
| Delay Time | t _d | — | 35 | ns | V _{CC} = 3.0V, I _C = 10mA, V _{BE(off)} = - 0.5V, I _{B1} = 1.0mA |
| Rise Time | t _r | — | 35 | ns | |
| Storage Time | t _s | — | 200 | ns | V _{CC} = 3.0V, I _C = 10mA, I _{B1} = I _{B2} = 1.0mA |
| Fall Time | t _f | — | 50 | ns | |

Note: 8. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

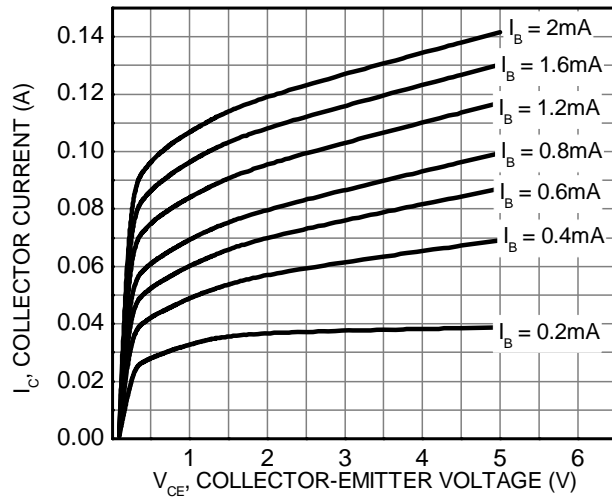


Fig. 4 Typical Collector Current vs. Collector-Emitter Voltage

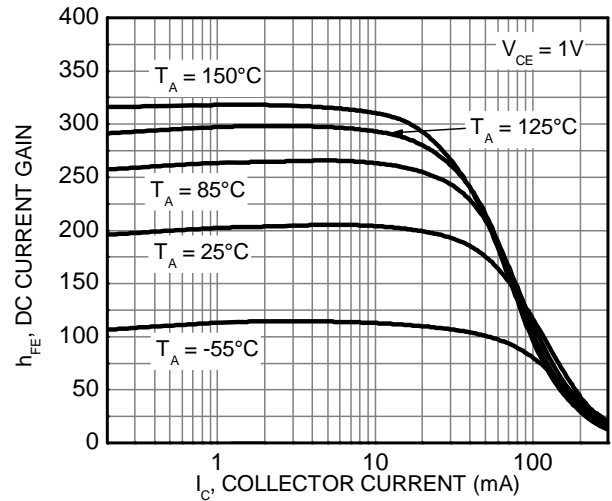


Fig. 5 Typical DC Current Gain vs. Collector Current

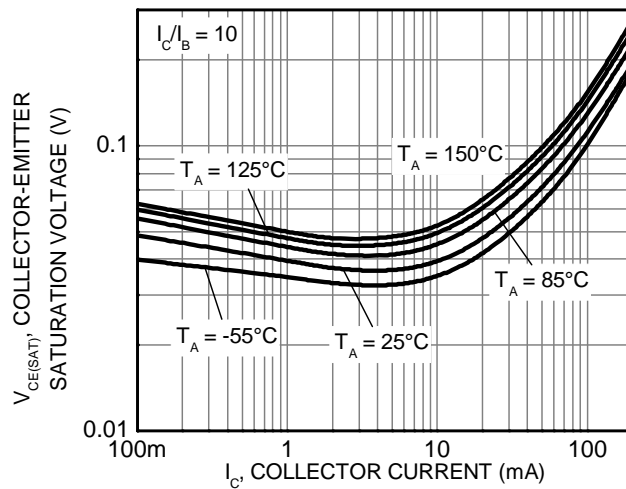


Fig. 6 Typical Collector-Emitter Saturation Voltage vs. Collector Current

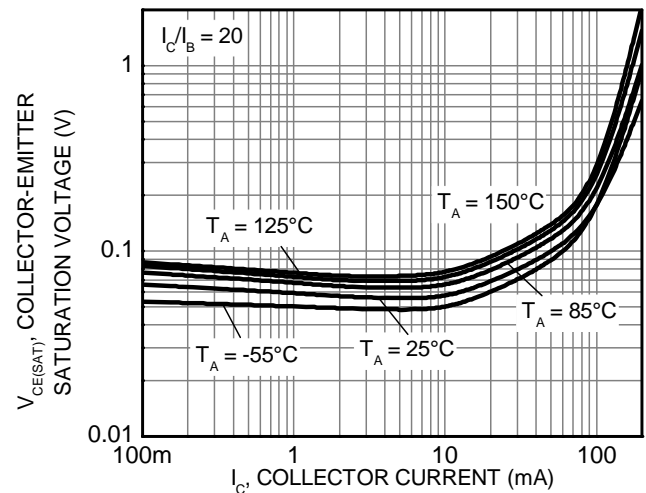


Fig. 7 Typical Collector-Emitter Saturation Voltage vs. Collector Current

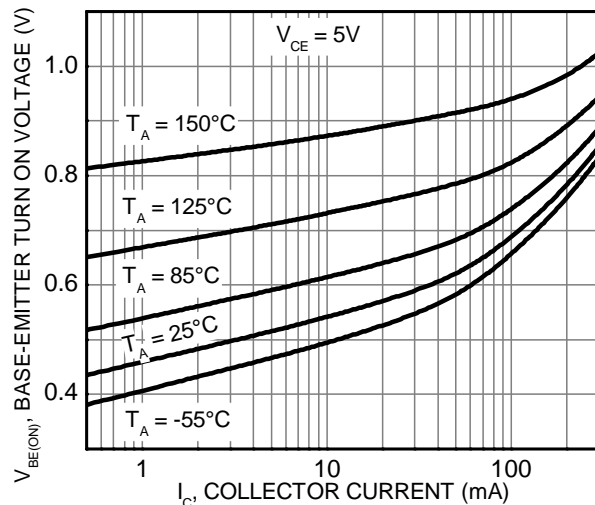


Fig. 8 Typical Base-Emitter Turn On Voltage vs. Collector Current

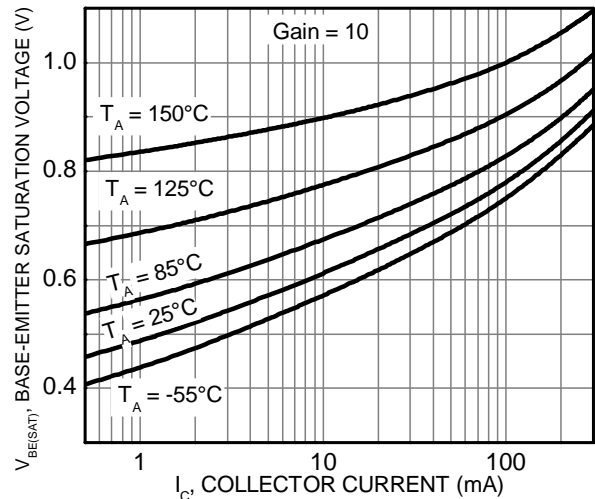
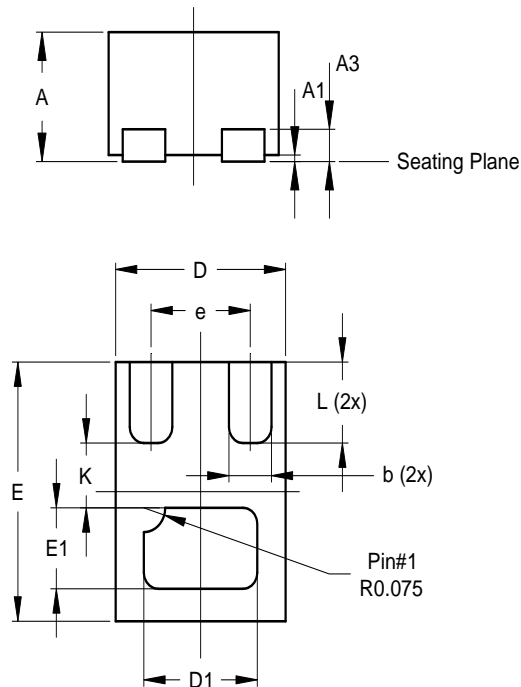


Fig. 9 Typical Base-Emitter Saturation Voltage vs. Collector Current

Package Outline Dimensions

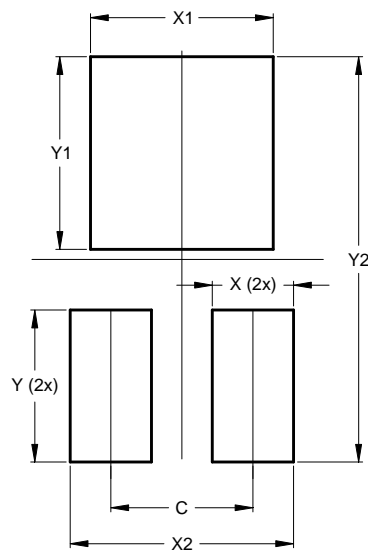
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



| X2-DFN0806-3 | | | |
|----------------------|-------|------|------|
| Dim | Min | Max | Typ |
| A | 0.375 | 0.40 | 0.39 |
| A1 | 0 | 0.05 | 0.02 |
| A3 | - | - | 0.10 |
| b | 0.10 | 0.20 | 0.15 |
| D | 0.55 | 0.65 | 0.60 |
| D1 | 0.35 | 0.45 | 0.40 |
| E | 0.75 | 0.85 | 0.80 |
| E1 | 0.20 | 0.30 | 0.25 |
| e | - | - | 0.35 |
| K | - | - | 0.20 |
| L | 0.20 | 0.30 | 0.25 |
| All Dimensions in mm | | | |

Suggested Pad Layout

Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



| Dimensions | Value (in mm) |
|------------|---------------|
| C | 0.350 |
| X | 0.200 |
| X1 | 0.450 |
| X2 | 0.550 |
| Y | 0.375 |
| Y1 | 0.475 |
| Y2 | 1.000 |

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