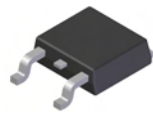


## Features

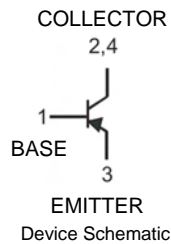
- Epitaxial Planar Die Construction
- High Collector-Emitter Voltage
- Ideally Suited for Automated Assembly Processes
- Ideal for Power Switching or Amplification Applications
- **Lead Free By Design/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**

## Mechanical Data

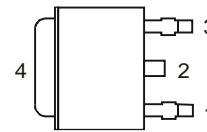
- Case: TO252-3L
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish — Matte Tin annealed over Copper Leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208
- Marking Information: See Page 4
- Ordering Information: See Page 4
- Weight: 0.34 grams (approximate)



Top View



Device Schematic



Pin Out Configuration

## Maximum Ratings @ $T_A = 25^\circ\text{C}$ unless otherwise specified

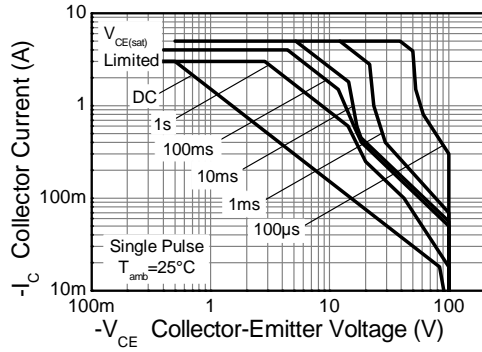
| Characteristic               | Symbol    | Value | Unit |
|------------------------------|-----------|-------|------|
| Collector-Base Voltage       | $V_{CBO}$ | -100  | V    |
| Collector-Emitter Voltage    | $V_{CEO}$ | -100  | V    |
| Emitter-Base Voltage         | $V_{EBO}$ | -5    | V    |
| Continuous Collector Current | $I_C$     | -3    | A    |
| Peak Pulse Collector Current | $I_{CM}$  | -5    | A    |
| Continuous Base Current      | $I_B$     | -1    | A    |

## Thermal Characteristics

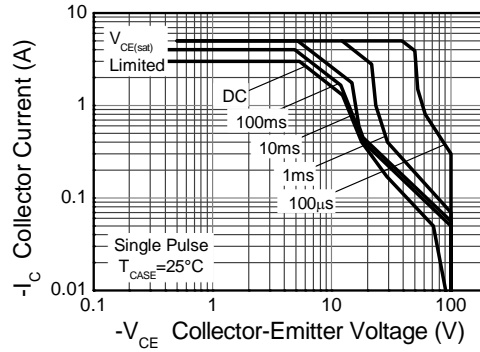
| Characteristic                                        | Symbol          | Value       | Unit               |
|-------------------------------------------------------|-----------------|-------------|--------------------|
| Power Dissipation @ $T_C = 25^\circ\text{C}$          | $P_D$           | 15          | W                  |
| Thermal Resistance, Junction to Case                  | $R_{\theta JC}$ | 8.33        | $^\circ\text{C/W}$ |
| Power Dissipation @ $T_A = 25^\circ\text{C}$ (Note 3) | $P_D$           | 1.5         | W                  |
| Thermal Resistance, Junction to Ambient               | $R_{\theta JA}$ | 80          | $^\circ\text{C/W}$ |
| Operating and Storage Temperature Range               | $T_J, T_{STG}$  | -55 to +150 | $^\circ\text{C}$   |

- Notes:
1. No purposefully added lead.
  2. Diodes Inc.'s "Green" policy can be found on our website at [http://www.diodes.com/products/lead\\_free/index.php](http://www.diodes.com/products/lead_free/index.php).
  3. Device mounted on FR-4 PCB with minimum recommended pad layout.

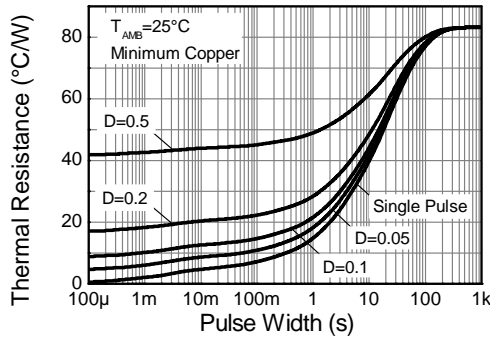
**Typical Characteristics**



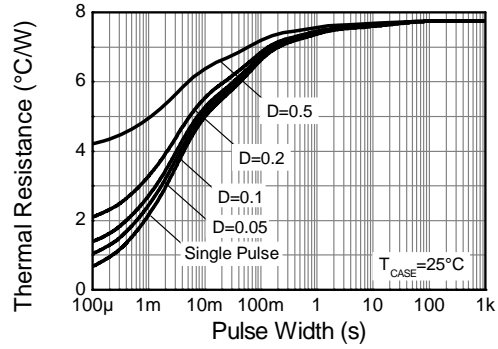
**Safe Operating Area**



**Safe Operating Area**



**Transient Thermal Impedance**



**Transient Thermal Impedance**

**Electrical Characteristics** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

| Characteristic                       | Symbol         | Min      | Typ | Max     | Unit          | Test Conditions                                                                        |
|--------------------------------------|----------------|----------|-----|---------|---------------|----------------------------------------------------------------------------------------|
| <b>OFF CHARACTERISTICS (Note 4)</b>  |                |          |     |         |               |                                                                                        |
| Collector-Emitter Sustaining Voltage | $V_{(SUS)CEO}$ | -100     | —   | —       | V             | $I_C = -30\text{mA}, I_B = 0$                                                          |
| Collector Cut-off Current            | $I_{CEO}$      | —        | —   | -50     | $\mu\text{A}$ | $V_{CB} = -60\text{V}, I_B = 0$                                                        |
| Collector Cut-off Current            | $I_{CES}$      | —        | —   | -20     | $\mu\text{A}$ | $V_{CE} = -100\text{V}, V_{EB} = 0$                                                    |
| Emitter Cut-off Current              | $I_{EBO}$      | —        | —   | -1.0    | mA            | $V_{EB} = -5.0\text{V}, I_C = 0$                                                       |
| <b>ON CHARACTERISTICS (Note 4)</b>   |                |          |     |         |               |                                                                                        |
| Collector-Emitter Saturation Voltage | $V_{CE(SAT)}$  | —        | —   | -1.2    | V             | $I_C = -3.0\text{A}, I_B = -375\text{mA}$                                              |
| Base-Emitter Turn-On Voltage         | $V_{BE(ON)}$   | —        | —   | -1.8    | V             | $V_{CE} = -4.0\text{V}, I_C = -3\text{A}$                                              |
| DC Current Gain                      | $h_{FE}$       | 25<br>10 | —   | —<br>50 | —             | $V_{CE} = -4.0\text{V}, I_C = -1\text{A}$<br>$V_{CE} = -4.0\text{V}, I_C = -3\text{A}$ |
| <b>SMALL SIGNAL CHARACTERISTICS</b>  |                |          |     |         |               |                                                                                        |
| Current Gain-Bandwidth Product       | $f_T$          | 3.0      | —   | —       | MHz           | $I_C = -500\text{mA}, V_{CE} = -10\text{V}, f = 1\text{MHz}$                           |
| Small Signal Current Gain            | $h_{fe}$       | 20       | —   | —       | —             | $V_{CE} = -10\text{V}, I_C = -0.5\text{A}, f = 1\text{KHz}$                            |

- Notes:
1. No purposefully added lead.
  2. Diodes Inc.'s "Green" policy can be found on our website at [http://www.diodes.com/products/lead\\_free/index.php](http://www.diodes.com/products/lead_free/index.php).
  3. Device mounted on FR-4 PCB with minimum recommended pad layout.
  4. Measured under pulsed conditions. Pulse width = 300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

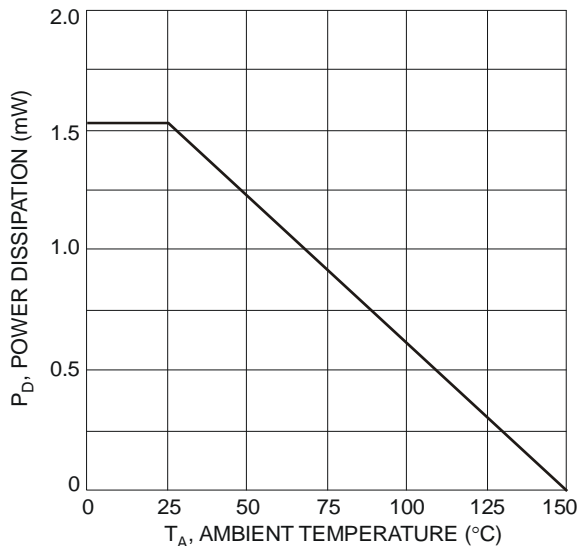


Fig. 1 Power Dissipation vs. Ambient Temperature

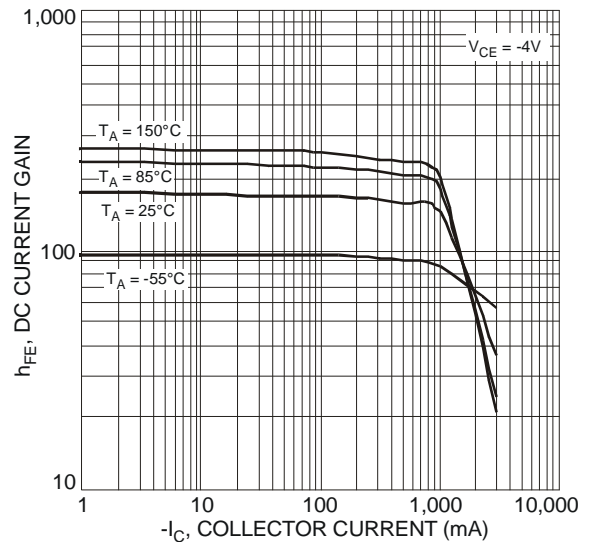


Fig. 2 Typical DC Current Gain vs. Collector Current

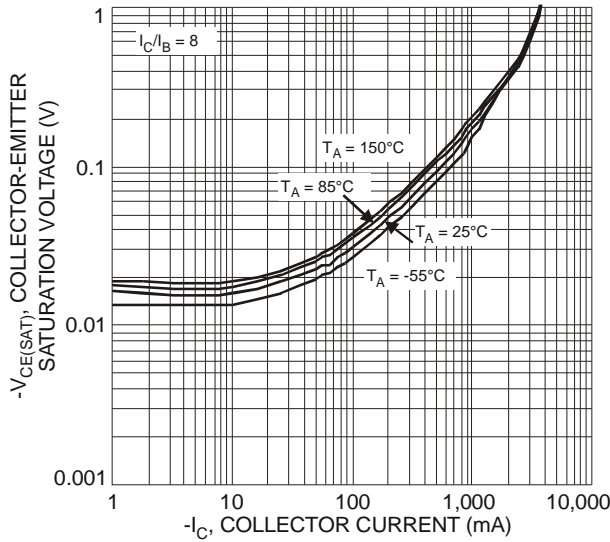


Fig. 3 Typical Collector-Emitter Saturation Voltage vs. Collector Current

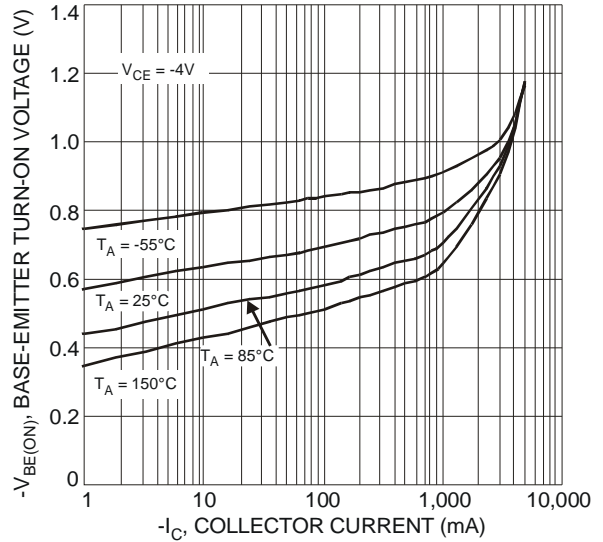


Fig. 4 Typical Base-Emitter Turn-On Voltage vs. Collector Current

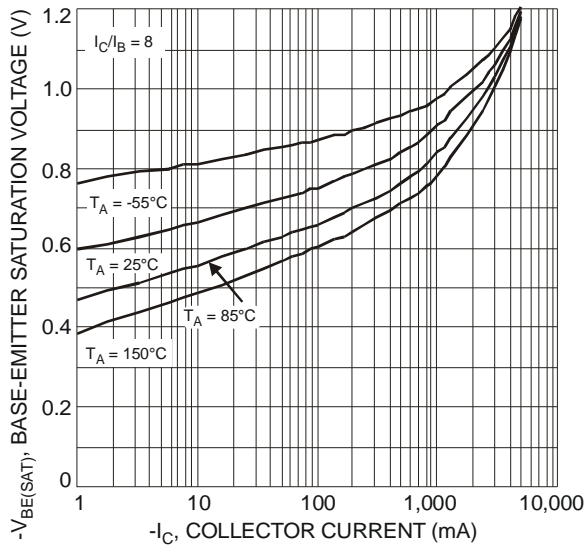


Fig. 5 Typical Base-Emitter Saturation Voltage vs. Collector Current

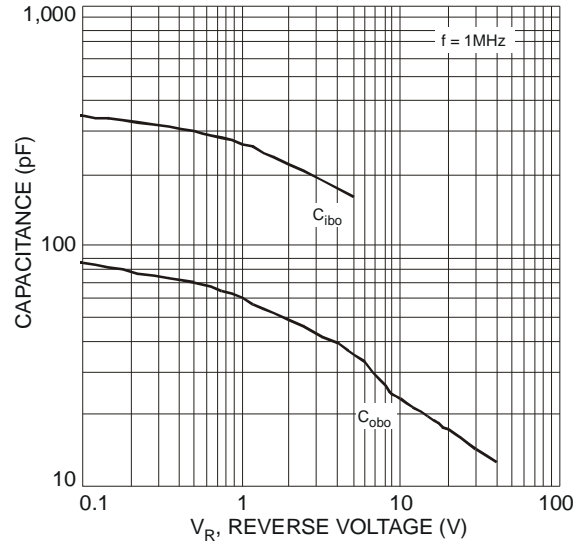


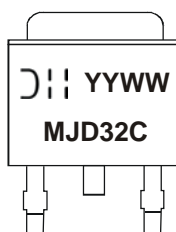
Fig. 6 Typical Capacitance Characteristics

**Ordering Information** (Note 5)

| Part Number | Case     | Packaging        |
|-------------|----------|------------------|
| MJD32C-13   | TO252-3L | 2500/Tape & Reel |

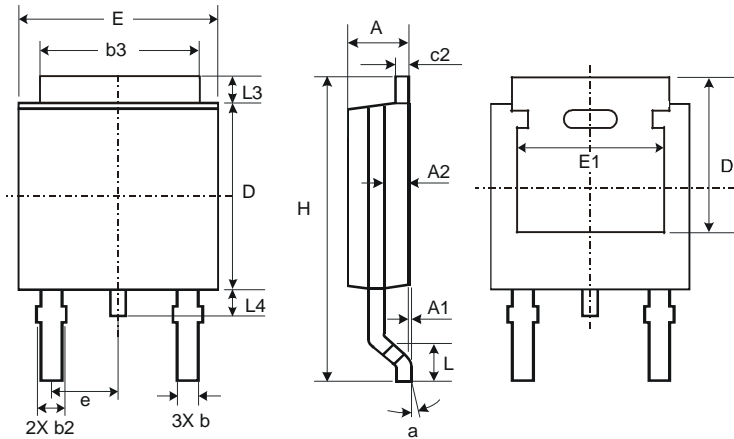
Notes: 5. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

**Marking Information**



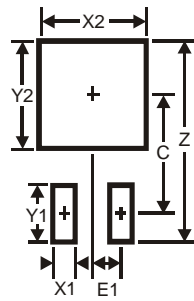
MJD32C = Product Type Marking Code  
 DI = Manufacturers' code marking  
 YYWW = Date Code Marking  
 YY = Last Digit of Year, (ex: 08 = 2008)  
 WW = Week Code (01 – 53)

**Package Outline Dimensions**



| TO252-3L             |      |       |       |
|----------------------|------|-------|-------|
| Dim                  | Min  | Max   | Typ   |
| A                    | 2.19 | 2.39  | 2.29  |
| A1                   | 0.00 | 0.13  | 0.08  |
| A2                   | 0.97 | 1.17  | 1.07  |
| b                    | 0.64 | 0.88  | 0.783 |
| b2                   | 0.76 | 1.14  | 0.95  |
| b3                   | 5.21 | 5.46  | 5.33  |
| c2                   | 0.45 | 0.58  | 0.531 |
| D                    | 6.00 | 6.20  | 6.10  |
| D1                   | 5.21 | -     | -     |
| e                    | -    | -     | 2.286 |
| E                    | 6.45 | 6.70  | 6.58  |
| E1                   | 4.32 | -     | -     |
| H                    | 9.40 | 10.41 | 9.91  |
| L                    | 1.40 | 1.78  | 1.59  |
| L3                   | 0.88 | 1.27  | 1.08  |
| L4                   | 0.64 | 1.02  | 0.83  |
| a                    | 0°   | 10°   | -     |
| All Dimensions in mm |      |       |       |

**Suggested Pad Layout**



| Dimensions | Value (in mm) |
|------------|---------------|
| Z          | 11.6          |
| X1         | 1.5           |
| X2         | 7.0           |
| Y1         | 2.5           |
| Y2         | 7.0           |
| C          | 6.9           |
| E1         | 2.3           |

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