



MJD32C

#### 100V PNP HIGH VOLTAGE TRANSISTOR IN TO252

#### **Features**

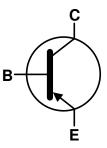
- BV<sub>CEO</sub> > -100V
- I<sub>C</sub> = -3A high Continuous Collector Current
- I<sub>CM</sub> = -5A Peak Pulse Current
- Ideal for Power Switching or Amplification Applications
- Complementary NPN Type: MJD31C
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability

### **Mechanical Data**

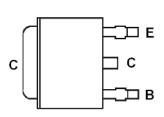
- Case: TO252 (DPAK)
- Case Material: Molded Plastic, "Green" Molding Compound UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 <sup>®</sup>
- Weight: 0.34 grams (Approximate)







**Device Schematic** 



Pin Out Configuration Top View

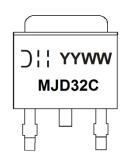
#### Ordering Information (Note 4)

| Product   | Compliance | Marking | Reel size (inches) | Tape width (mm) | Quantity per reel |
|-----------|------------|---------|--------------------|-----------------|-------------------|
| MJD32C-13 | AEC-Q101   | MJD32C  | 13                 | 16              | 2,500             |

Notes:

- 1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
- 2. See http://www.diodes.com/quality/lead\_free.html for more information about Diodes Incorporated's definitions of Halogen and Antimony free, "Green" and Lead-Free.
- 3. Halogen and Antimony free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
- 4. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

### **Marking Information**





# **Absolute Maximum Ratings** (@ $T_A = +25^{\circ}C$ , unless otherwise specified.)

| Characteristic               | Symbol          | Value | Unit |
|------------------------------|-----------------|-------|------|
| Collector-Base Voltage       | $V_{CBO}$       | -100  | V    |
| Collector-Emitter Voltage    | $V_{\sf CEO}$   | -100  | V    |
| Emitter-Base Voltage         | $V_{EBO}$       | -6    | V    |
| Continuous Collector Current | Ic              | -3    | A    |
| Peak Pulse Collector Current | I <sub>CM</sub> | -5    | Α    |
| Continuous Base Current      | I <sub>B</sub>  | -1    | A    |
| Power Dissipation            | $P_{D}$         | 15    | W    |

# Thermal Characteristics (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                              | Symbol                            | Value          | Unit |      |  |
|---|-----------------------------------|----------------|------|------|--|
|   | (Note 5)                          |                | 3.9  |      |  |
| Power Dissipation                           | (Note 6)                          | $P_D$          | 2.1  | W    |  |
|   | (Note 7)                          |                | 1.6  |      |  |
|   | (Note 5)                          |                | 32   |      |  |
| Thermal Resistance, Junction to Ambient Air | (Note 6)                          | $R_{	heta JA}$ | 59   | 0000 |  |
|   | (Note 7)                          |                | 80   | °C/W |  |
| Thermal Resistance, Junction to Leads       | (Note 8)                          | $R_{	heta JL}$ | 3.6  |      |  |
| Operating and Storage Temperature Range     | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150    | °C   |      |  |

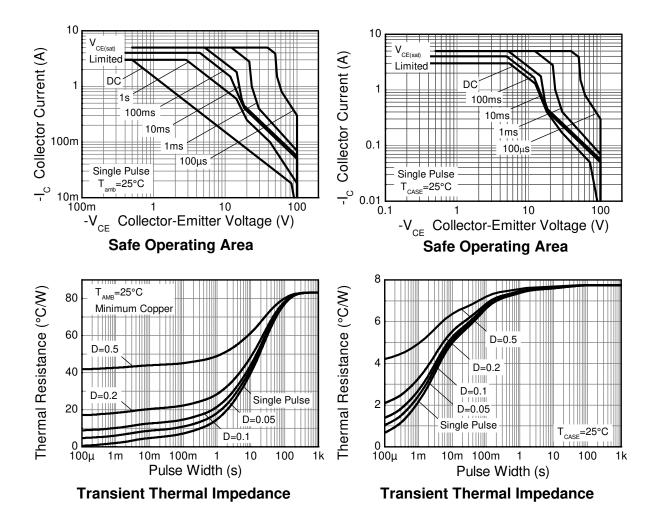
# ESD Ratings (Note 9)

| Characteristic                             | Symbol  | Value | Unit | JEDEC Class |
|--|---------|-------|------|-------------|
| Electrostatic Discharge - Human Body Model | ESD HBM | 4,000 | V    | 3A          |
| Electrostatic Discharge - Machine Model    | ESD MM  | 400   | V    | С           |

- 5. For a device mounted with the exposed collector pad on 50mm x 50mm 2oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured For a device induitions whilst operating in a steady-state.
   Same as note (5), except mounted on 25mm x 25mm 1oz copper.
   Same as note (5), except mounted on minimum recommended pad (MRP) layout.
   Thermal resistance from junction to solder-point (on the exposed collector pad).
   Refer to JEDEC specification JESD22-A114 and JESD22-A115.



### **Thermal Characteristics**





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| Characteristic                                 | Symbol               | Min  | Тур | Max  | Unit | Test Condition  |
|--|----------------------|------|-----|------|------|---|
| Collector-Emitter Breakdown Voltage (Note 10)  | BV <sub>CEO</sub>    | -100 | _   | _    | V    | $I_C = -30 \text{mA}, I_B = 0$                                  |
| Collector Cut-off Current                      | I <sub>CEO</sub>     | _    | _   | -1   | μΑ   | $V_{CB} = -60V, I_B = 0$  |
| Collector Cut-off Current                      | I <sub>CES</sub>     | _    | _   | -1   | μΑ   | $V_{CE} = -100V, V_{EB} = 0$                                    |
| Emitter Cut-off Current                        | I <sub>EBO</sub>     | _    | _   | -1   | μΑ   | $V_{EB} = -5V, I_C = 0$   |
| Collector-Emitter Saturation Voltage (Note 10) | V <sub>CE(sat)</sub> | _    | _   | -1.2 | V    | $I_C = -3.0A$ , $I_B = -375mA$                                  |
| Base-Emitter Turn-On Voltage (Note 10)         | V <sub>BE(on)</sub>  | _    | _   | -1.8 | V    | $I_{C} = -3A$ , $V_{CE} = -4V$                                  |
| DC Current Gain (Note 10)                      | h                    | 25   |     | _    |      | $V_{CE} = -4V, I_{C} = -1A$                                     |
| Do Current Gain (Note 10)                      | h <sub>FE</sub>      | 10   | -   | 50   | 50   | $V_{CE} = -4V, I_{C} = -3A$                                     |
| Current Signal Current Gain                    | H <sub>fe</sub>      | 20   | _   | _    | _    | $V_{CE} = -10V$ , $I_{C} = -0.5A$ , $f = 1KHz$                  |
| Current Gain-Bandwidth Product                 | f <sub>T</sub>       | 3.0  | _   | _    | MHz  | $I_C = -500 \text{mA}, V_{CE} = -10 \text{V}, f = 1 \text{MHz}$ |

Note: 10. Measured under pulsed conditions. Pulse width  $\leq 300 \mu s$ . Duty cycle  $\leq 2\%$ .



### Typical Electrical Characteristics (@TA = +25°C, unless otherwise specified.)

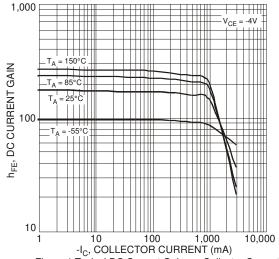


Figure 1 Typical DC Current Gain vs. Collector Current

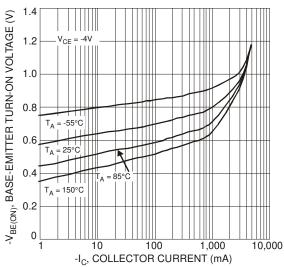


Figure 3 Typical Base-Emitter Turn-On Voltage
vs. Collector Current

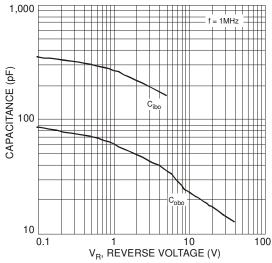


Figure 5 Typical Capacitance Characteristics

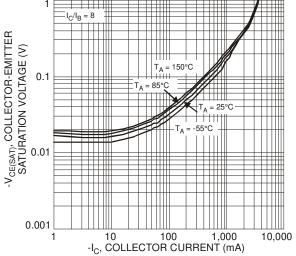


Figure 2 Typical Collector-Emitter Saturation Voltage vs. Collector Current

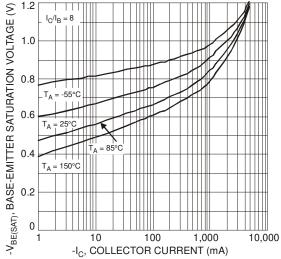
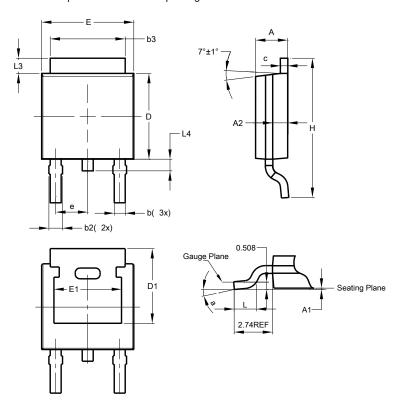


Figure 4 Typical Base-Emitter Saturation Voltage vs. Collector Current



## **Package Outline Dimensions**

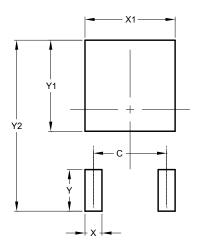
 $Please see \ http://www.diodes.com/package-outlines.html \ for \ the \ latest \ version.$ 



| TO252 (DPAK)         |      |       |       |  |  |
|----------------------|------|-------|-------|--|--|
| Dim                  | Min  | Max   | Тур   |  |  |
| Α                    | 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  |  |  |
| C                    | 0.45 | 0.58  | 0.531 |  |  |
| D                    | 6.00 | 6.20  | 6.10  |  |  |
| D1                   | 5.21 | -     | -     |  |  |
| е                    | -    | -     | 2.286 |  |  |
| Е                    | 6.45 | 6.70  | 6.58  |  |  |
| E1                   | 4.32 | -     | -     |  |  |
| Н                    | 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  |  |  |
| а                    | 0°   | 10°   | -     |  |  |
| All Dimensions in mm |      |       |       |  |  |

# **Suggested Pad Layout**

Please see http://www.diodes.com/package-outlines.html for the latest version.



| Dimensions | Value (in mm) |  |  |
|------------|---------------|--|--|
| С          | 4.572         |  |  |
| Χ          | 1.060         |  |  |
| X1         | 5.632         |  |  |
| Υ          | 2.600         |  |  |
| Y1         | 5.700         |  |  |
| Y2         | 10.700        |  |  |

Note: For high voltage applications, the appropriate industry sector guidelines should be considered with regards to creepage and clearance distances between device Terminals and PCB tracking.



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