

## 20V PNP LOW SATURATION SWITCHING TRANSISTOR IN SOT26

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**Features**


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- $BVCEO > -20V$
- $I_C = -2.5A$  Continuous Collector Current
- $I_{CM} = -6A$  Peak Pulse Current
- $R_{CE(sat)} = 96m\Omega$  for a low equivalent On-Resistance
- Low Saturation Voltage (-220mV max @ 1A)
- $h_{FE}$  characterized up to -6A for high current gain hold up
- **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

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**Mechanical Data**


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- Case: SOT26
- 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 (E3)
- Weight: 0.015 grams (approximate)

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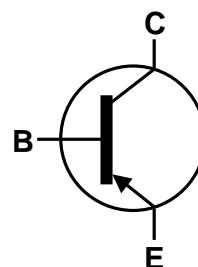
**Applications**


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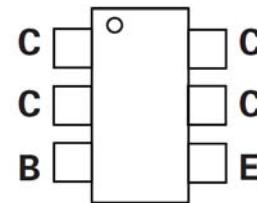
- DC – DC Converters
- Power Management Functions
- Power Switches
- Motor Control



Top View



Device Symbol



Pin-Out Top

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**Ordering Information** (Note 4)

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| Product       | Marking | Reel size (inches) | Tape width (mm) | Quantity per reel |
|---------------|---------|--------------------|-----------------|-------------------|
| ZXT10P20DE6TA | 718     | 7                  | 8               | 3,000             |
| ZXT10P20DE6TC | 718     | 13                 | 8               | 10,000            |

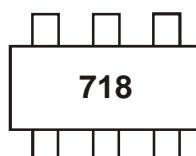
Notes:

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](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>.

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**Marking Information**


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718 = Product Type Marking Code

**Absolute Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic               | Symbol           | Value | Unit |
|------------------------------|------------------|-------|------|
| Collector-Base Voltage       | V <sub>CBO</sub> | -20   | V    |
| Collector-Emitter Voltage    | V <sub>CEO</sub> | -20   | V    |
| Emitter-Base Voltage         | V <sub>EBO</sub> | -7    | V    |
| Base Current                 | I <sub>B</sub>   | -500  | mA   |
| Continuous Collector Current | I <sub>C</sub>   | -2.5  | A    |
| Peak Pulse Collector Current | I <sub>CM</sub>  | -6    | A    |

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

| Characteristic                              | Symbol   | Value                             | Unit        |
|---|----------|-----------------------------------|-------------|
| Power Dissipation<br>Linear Derating Factor | (Note 5) | 1.1                               | W<br>mW/°C  |
|   |          | 8.8                               |             |
| Thermal Resistance, Junction to Ambient     | (Note 5) | 1.7                               | °C/W        |
|   |          | 13.6                              |             |
| Thermal Resistance, Junction to Leads       | (Note 6) | 113                               | °C/W        |
|   |          | 73                                |             |
| Operating and Storage Temperature Range     | (Note 7) | R <sub>θJL</sub>                  | 30.01       |
|   |          | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150 |
|   |          |                                   | °C          |

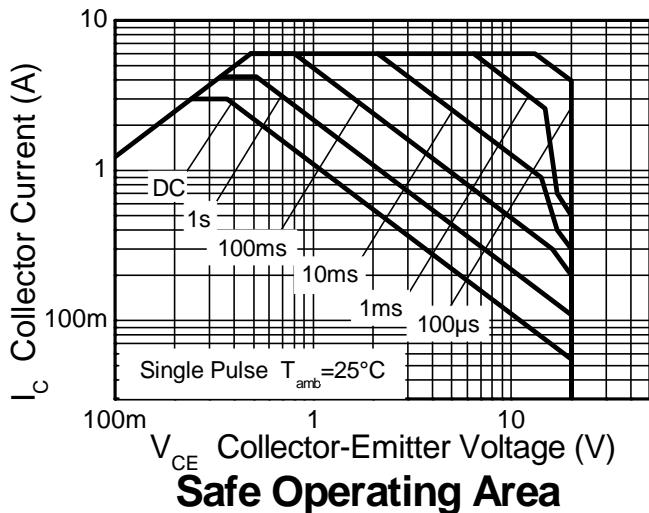
**ESD Ratings** (Note 8)

| 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    | C           |

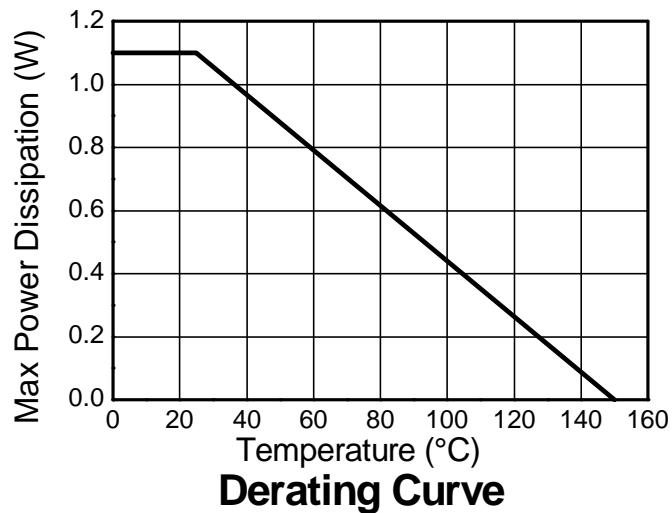
Notes:

- 5. For a device mounted with collector leads on 25mm x 25mm 1oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
- 6. Same as note (5), except the device is measured at t ≤ 5secs.
- 7. Thermal resistance from junction to solder-point (at the end of the collector leads).
- 8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

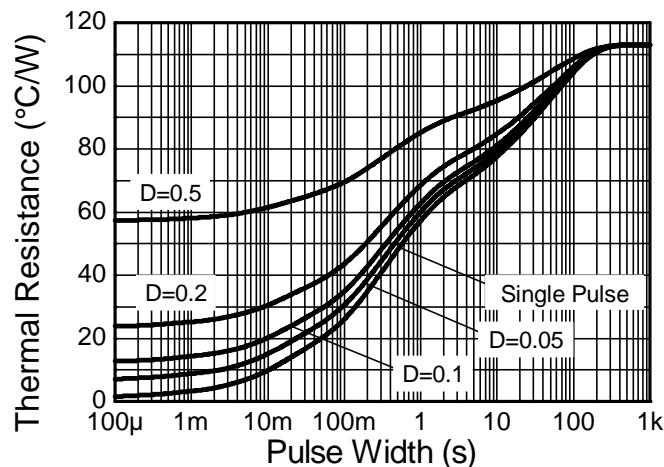
## Thermal Characteristics and Derating Information



**Safe Operating Area**



**Derating Curve**



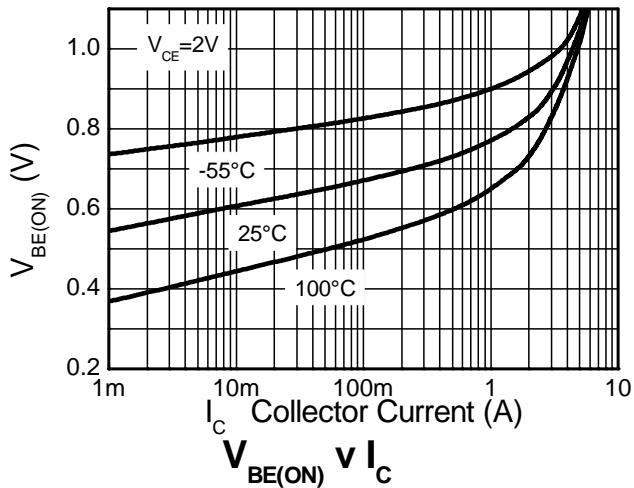
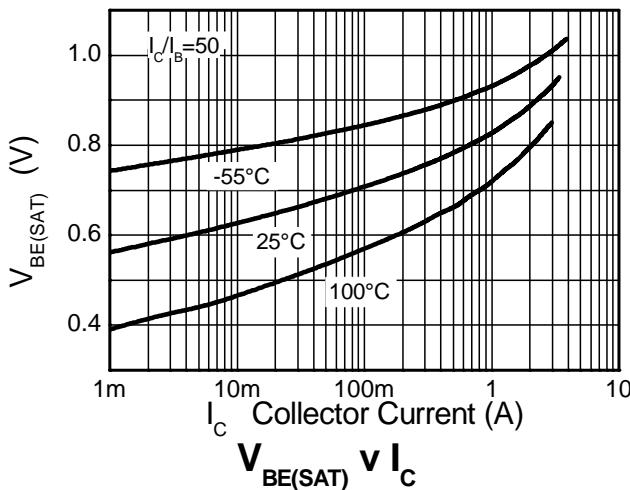
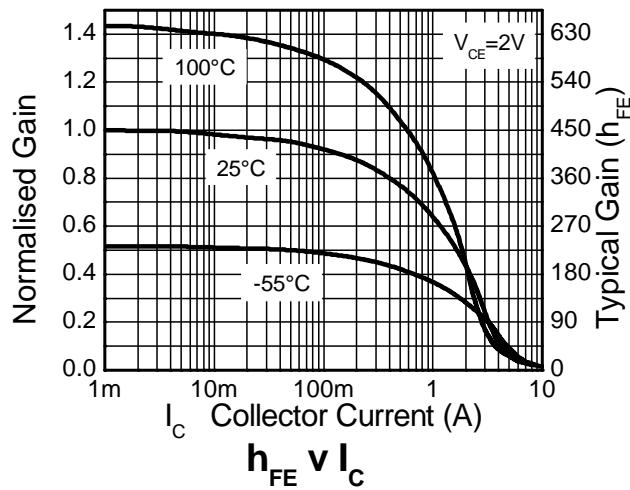
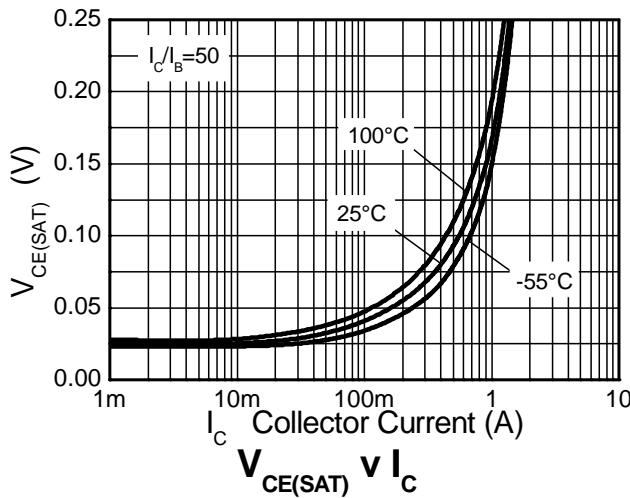
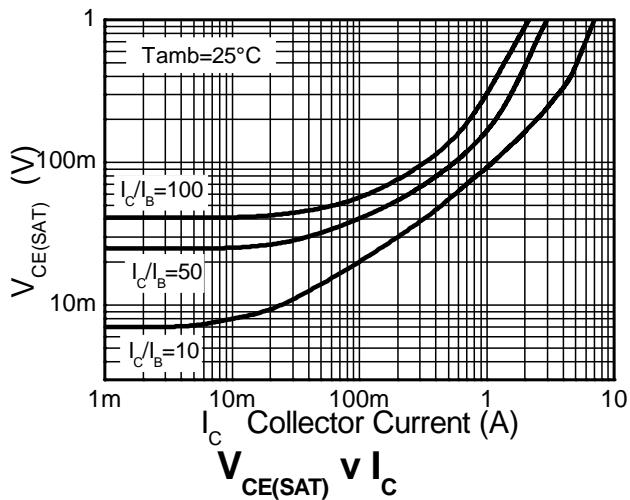
**Transient Thermal Impedance**

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

| Characteristic                               | Symbol                      | Min | Typ   | Max   | Unit | Test Condition   |
|--|-----------------------------|-----|-------|-------|------|--|
| <b>OFF CHARACTERISTICS</b>                   |                             |     |       |       |      |  |
| Collector-Base Breakdown Voltage             | $\text{BV}_{\text{CBO}}$    | -20 | -65   | —     | V    | $I_C = -100\mu\text{A}$  |
| Collector-Emitter Breakdown Voltage (Note 9) | $\text{BV}_{\text{CEO}}$    | -20 | -53   | —     | V    | $I_C = -10\text{mA}$   |
| Emitter-Base Breakdown Voltage               | $\text{BV}_{\text{EBO}}$    | -7  | -8.8  | —     | V    | $I_E = -100\mu\text{A}$  |
| Collector-Base Cutoff Current                | $I_{\text{CBO}}$            | —   | <1    | -100  | nA   | $V_{\text{CB}} = -15\text{V}$  |
| Emitter Cutoff Current                       | $I_{\text{EBO}}$            | —   | <1    | -100  | nA   | $V_{\text{EB}} = -5\text{V}$   |
| Collector-Emitter Cutoff Current             | $I_{\text{CES}}$            | —   | <1    | -100  | nA   | $V_{\text{CES}} = -15\text{V}$                                       |
| <b>ON CHARACTERISTICS</b> (Note 9)           |                             |     |       |       |      |  |
| DC Current Gain                              | $h_{\text{FE}}$             | 300 | 475   | —     | —    | $I_C = -10\text{mA}, V_{\text{CE}} = -2\text{V}$                     |
|  |                             | 300 | 450   | —     | —    | $I_C = -0.1\text{A}, V_{\text{CE}} = -2\text{V}$                     |
|  |                             | 150 | 230   | —     | —    | $I_C = -2\text{A}, V_{\text{CE}} = -2\text{V}$                       |
|  |                             | 15  | 30    | —     | —    | $I_C = -6\text{A}, V_{\text{CE}} = -2\text{V}$                       |
| Collector-Emitter Saturation Voltage         | $V_{\text{CE}(\text{sat})}$ | —   | -19   | -30   | mV   | $I_C = -0.1\text{A}, I_B = -10\text{mA}$                             |
|  |                             | —   | -170  | -220  |      | $I_C = -1\text{A}, I_B = -20\text{mA}$                               |
|  |                             | —   | -190  | -250  |      | $I_C = -1.5\text{A}, I_B = -50\text{mA}$                             |
|  |                             | —   | -240  | -350  |      | $I_C = -2.5\text{A}, I_B = -150\text{mA}$                            |
| Base-Emitter Saturation Voltage              | $V_{\text{BE}(\text{sat})}$ | —   | -0.97 | -1.05 | V    | $I_C = -2.5\text{A}, I_B = -150\text{mA}$                            |
| Base-Emitter Turn-On Voltage                 | $V_{\text{BE}(\text{on})}$  | —   | -0.85 | -0.95 | V    | $I_C = -2.5\text{A}, V_{\text{CE}} = -2\text{V}$                     |
| <b>SMALL SIGNAL CHARACTERISTICS</b>          |                             |     |       |       |      |  |
| Current Gain-Bandwidth Product               | $f_T$                       | 150 | 180   | —     | MHz  | $V_{\text{CE}} = -10\text{V}, I_C = -50\text{mA}, f = 100\text{MHz}$ |
| Output Capacitance                           | $C_{\text{obo}}$            | —   | 21    | 30    | pF   | $V_{\text{CB}} = -10\text{V}, f = 1\text{MHz}$                       |
| Turn-On Time                                 | $t_{(\text{on})}$           | —   | 40    | —     | ns   | $V_{\text{CC}} = -10\text{V}, I_C = -1\text{A}$                      |
| Turn-Off Time                                | $t_{(\text{off})}$          | —   | 670   | —     | ns   |  |
|  |                             |     |       |       |      | $I_{B1} = -I_{B2} = -20\text{mA}$                                    |

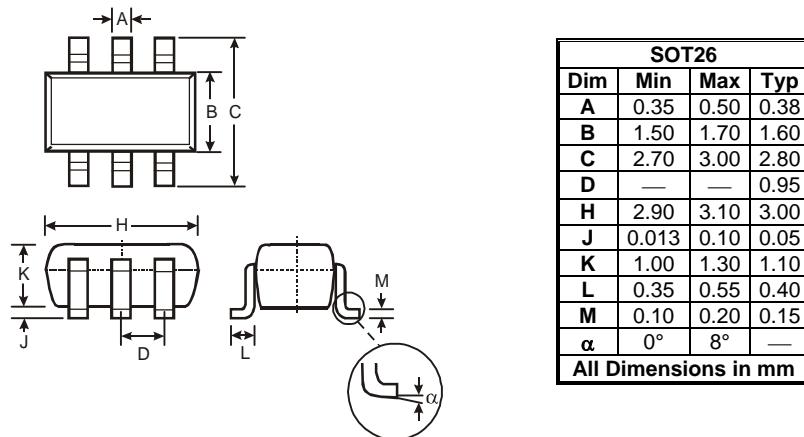
Note: 9. Measured under pulsed conditions. Pulse width  $\leq 300\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

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



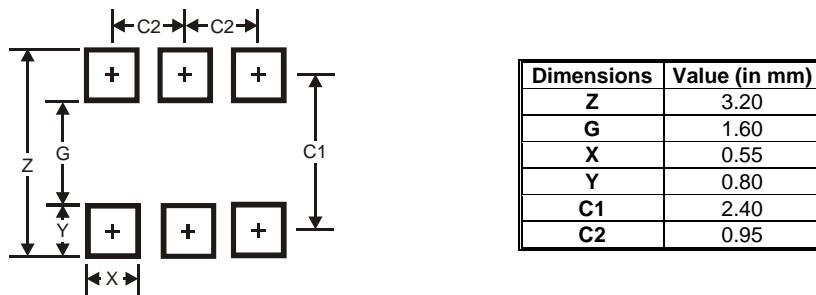
## Package Outline Dimensions

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



## Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



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