

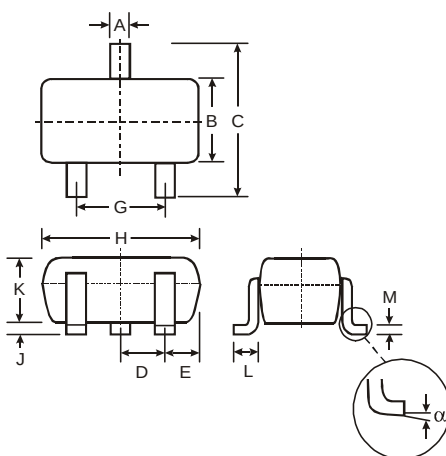
### Features

- Epitaxial Planar Die Construction
- Complementary PNP Types Available (DDTA)
- Built-In Biasing Resistors, R1≠R2
- **Lead Free/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2 & 3)**

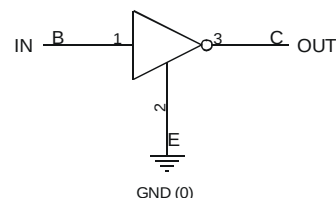
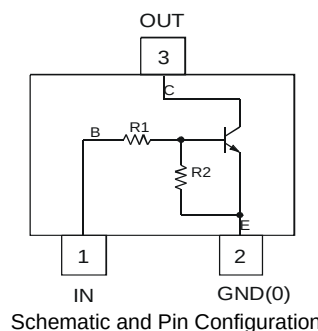
### Mechanical Data

- Case: SOT-323
- Case Material: Molded Plastic, "Green" Molding Compound, Note 3. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminal Connections: See Diagram
- Terminals: Solderable per MIL-STD-202, Method 208
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe).
- Marking Information: See Page 4
- Type Code: See Table Below
- Ordering Information: See Page 4
- Weight: 0.006 grams (approximate)

| P/N        | R1 (NOM) | R2 (NOM) | Type Code |
|------------|----------|----------|-----------|
| DDTC113ZUA | 1KΩ      | 10KΩ     | N02       |
| DDTC123YUA | 2.2KΩ    | 10KΩ     | N05       |
| DDTC123JUA | 2.2KΩ    | 47KΩ     | N06       |
| DDTC143XUA | 4.7KΩ    | 10KΩ     | N09       |
| DDTC143FUA | 4.7KΩ    | 22KΩ     | N10       |
| DDTC143ZUA | 4.7KΩ    | 47KΩ     | N11       |
| DDTC114YUA | 10KΩ     | 47KΩ     | N14       |
| DDTC114WUA | 10KΩ     | 4.7KΩ    | N15       |
| DDTC124XUA | 22KΩ     | 47KΩ     | N18       |
| DDTC144VUA | 47KΩ     | 10KΩ     | N21       |
| DDTC144WUA | 47KΩ     | 22KΩ     | N22       |



| SOT-323              |              |      |
|----------------------|--------------|------|
| Dim                  | Min          | Max  |
| A                    | 0.25         | 0.40 |
| B                    | 1.15         | 1.35 |
| C                    | 2.00         | 2.20 |
| D                    | 0.65 Nominal |      |
| E                    | 0.30         | 0.40 |
| G                    | 1.20         | 1.40 |
| H                    | 1.80         | 2.20 |
| J                    | 0.0          | 0.10 |
| K                    | 0.90         | 1.00 |
| L                    | 0.25         | 0.40 |
| M                    | 0.10         | 0.18 |
| α                    | 0°           | 8°   |
| All Dimensions in mm |              |      |



### Maximum Ratings @T<sub>A</sub> = 25°C unless otherwise specified

| Characteristic             | Symbol               | Value                                                                                                                                           | Unit |
|----------------------------|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|------|
| Supply Voltage, (3) to (2) | V <sub>CC</sub>      | 50                                                                                                                                              | V    |
| Input Voltage, (1) to (2)  | V <sub>IN</sub>      | -5 to +10<br>-5 to +12<br>-5 to +12<br>-7 to +20<br>-6 to +30<br>-5 to +30<br>-6 to +40<br>-10 to +30<br>-10 to +40<br>-15 to +40<br>-10 to +40 | V    |
| Output Current             | I <sub>O</sub>       | 100<br>100<br>100<br>100<br>100<br>100<br>70<br>100<br>50<br>30<br>30                                                                           | mA   |
| Output Current             | I <sub>C</sub> (Max) | 100                                                                                                                                             | mA   |

- 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. Product manufactured with Date Code 0627 (week 27, 2006) and newer are built with Green Molding Compound. Product manufactured prior to Date Code 0627 are built with Non-Green Molding Compound and may contain Halogens or Sb2O3 Fire Retardants.

## Maximum Ratings (continued) @T<sub>A</sub> = 25°C unless otherwise specified

| Characteristic                                       | Symbol                            | Value       | Unit |
|------------------------------------------------------|-----------------------------------|-------------|------|
| Output Current                                       | I <sub>C</sub> (Max)              | 100         | mA   |
| Power Dissipation                                    | P <sub>d</sub>                    | 200         | mW   |
| Thermal Resistance, Junction to Ambient Air (Note 4) | R <sub>θJA</sub>                  | 625         | °C/W |
| Operating and Storage Temperature Range              | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150 | °C   |

Notes: 4. Mounted on FR4 PC Board with recommended pad layout at <http://www.diodes.com/datasheets/ap02001.pdf>.

## Electrical Characteristics @T<sub>A</sub> = 25°C unless otherwise specified

| Characteristic             | Symbol                          | Min                                                                       | Typ | Max                                                                            | Unit | Test Condition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------------|---------------------------------|---------------------------------------------------------------------------|-----|--------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Input Voltage              | V <sub>I(off)</sub>             | 0.3<br>0.3<br>0.5<br>0.3<br>0.3<br>0.5<br>0.3<br>0.8<br>0.4<br>1.0<br>0.8 | —   | —                                                                              | V    | V <sub>CC</sub> = 5V, I <sub>O</sub> = 100μA                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Input Voltage              | V <sub>I(on)</sub>              | —                                                                         | —   | 3.0<br>3.0<br>1.1<br>2.5<br>1.3<br>1.3<br>1.4<br>3.0<br>2.5<br>5.0<br>4.0      | V    | V <sub>O</sub> = 0.3V, I <sub>O</sub> = 20mA<br>V <sub>O</sub> = 0.3V, I <sub>O</sub> = 20mA<br>V <sub>O</sub> = 0.3V, I <sub>O</sub> = 5mA<br>V <sub>O</sub> = 0.3V, I <sub>O</sub> = 20mA<br>V <sub>O</sub> = 0.3V, I <sub>O</sub> = 3mA<br>V <sub>O</sub> = 0.3V, I <sub>O</sub> = 5mA<br>V <sub>O</sub> = 0.3V, I <sub>O</sub> = 1mA<br>V <sub>O</sub> = 0.3V, I <sub>O</sub> = 2mA<br>V <sub>O</sub> = 0.3V, I <sub>O</sub> = 2mA<br>V <sub>O</sub> = 0.3V, I <sub>O</sub> = 2mA                             |
| Output Voltage             | V <sub>O(on)</sub>              | —                                                                         | 0.1 | 0.3                                                                            | V    | I <sub>O</sub> /I <sub>I</sub> = 5mA/0.25mA DDTC123JUA<br>I <sub>O</sub> /I <sub>I</sub> = 5mA/0.25mA DDTC143ZUA<br>I <sub>O</sub> /I <sub>I</sub> = 5mA/0.25mA DDTC114YUA<br>I <sub>O</sub> /I <sub>I</sub> = 10mA/0.5mA All Others                                                                                                                                                                                                                                                                              |
| Input Current              | I <sub>I</sub>                  | —                                                                         | —   | 7.2<br>3.8<br>3.6<br>1.8<br>1.8<br>1.8<br>0.88<br>0.88<br>0.36<br>0.16<br>0.16 | mA   | V <sub>I</sub> = 5V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Output Current             | I <sub>O(off)</sub>             | —                                                                         | —   | 0.5                                                                            | μA   | V <sub>CC</sub> = 50V, V <sub>I</sub> = 0V                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| DC Current Gain            | G <sub>I</sub>                  | 33<br>33<br>80<br>30<br>68<br>80<br>68<br>24<br>68<br>33<br>56            | —   | —                                                                              | —    | V <sub>O</sub> = 5V, I <sub>O</sub> = 5mA<br>V <sub>O</sub> = 5V, I <sub>O</sub> = 10mA<br>V <sub>O</sub> = 5V, I <sub>O</sub> = 10mA<br>V <sub>O</sub> = 5V, I <sub>O</sub> = 10mA<br>V <sub>O</sub> = 5V, I <sub>O</sub> = 10mA<br>V <sub>O</sub> = 5V, I <sub>O</sub> = 10mA<br>V <sub>O</sub> = 5V, I <sub>O</sub> = 5mA<br>V <sub>O</sub> = 5V, I <sub>O</sub> = 10mA<br>V <sub>O</sub> = 5V, I <sub>O</sub> = 5mA<br>V <sub>O</sub> = 5V, I <sub>O</sub> = 5mA<br>V <sub>O</sub> = 5V, I <sub>O</sub> = 5mA |
| Input Resistor Tolerance   | ΔR <sub>1</sub>                 | -30                                                                       | —   | +30                                                                            | %    | —                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Resistance Ratio Tolerance | ΔR <sub>2</sub> /R <sub>1</sub> | -20                                                                       | —   | +20                                                                            | %    | —                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Gain-Bandwidth Product*    | f <sub>T</sub>                  | —                                                                         | 250 | —                                                                              | MHz  | V <sub>CE</sub> = 10V, I <sub>E</sub> = 5mA,<br>f = 100MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

\* Transistor - For Reference Only

## Typical Curves – DDTC123JUA

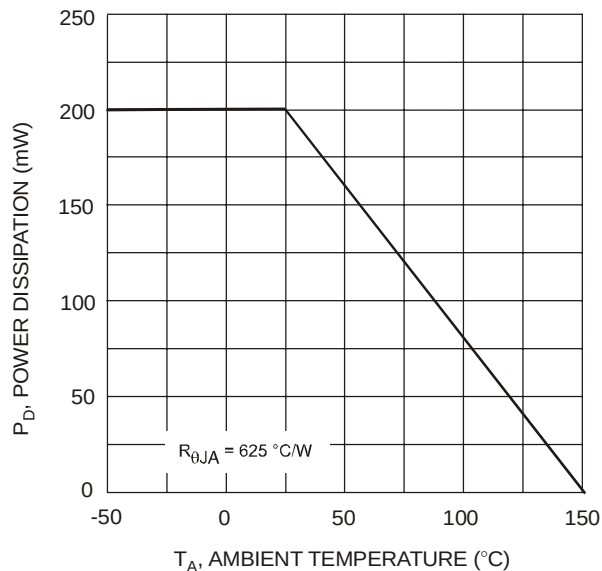


Fig. 1 Derating Curve

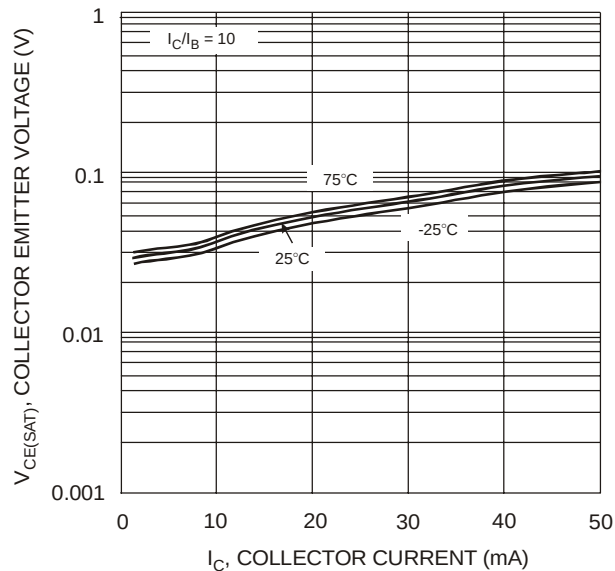


Fig. 2  $V_{CE(SAT)}$  vs.  $I_C$

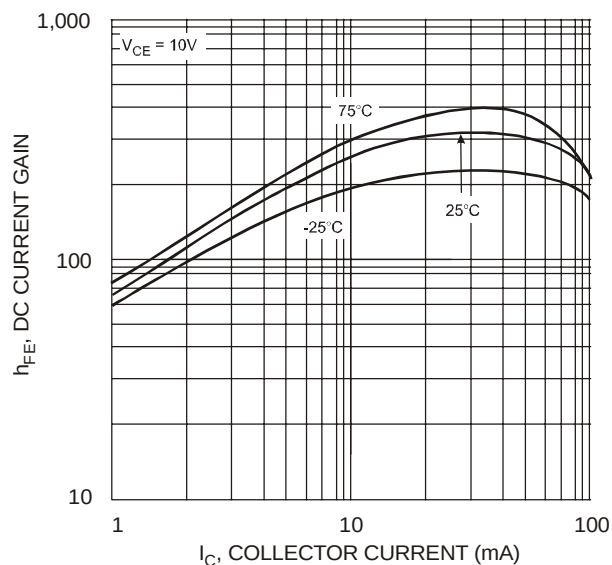


Fig. 3 DC Current Gain

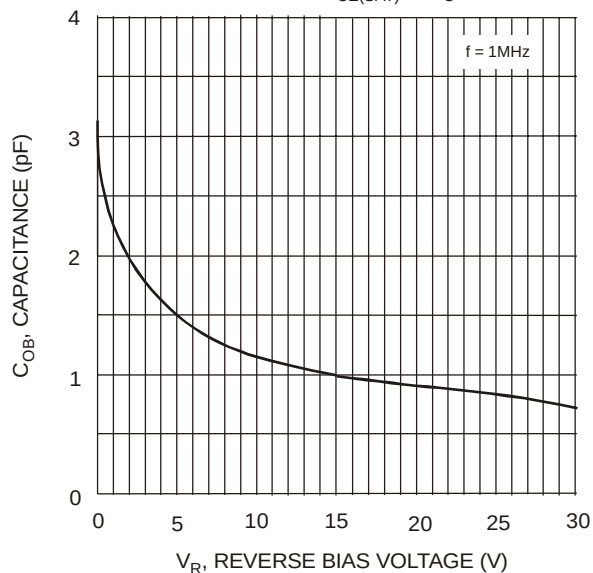


Fig. 4 Output Capacitance

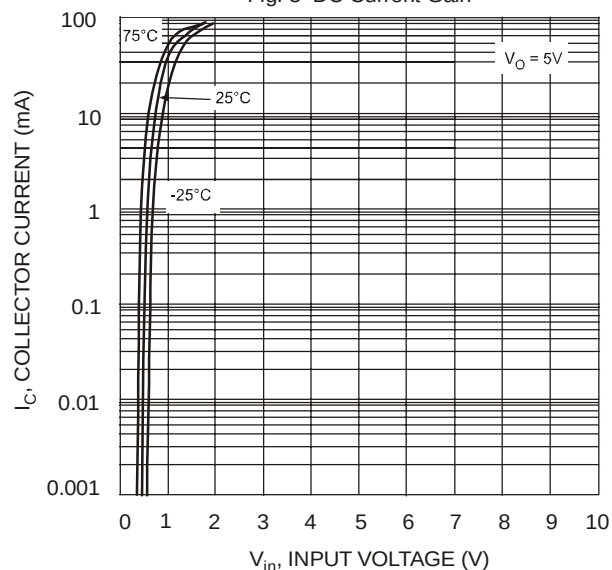


Fig. 5 Collector Current vs. Input Voltage

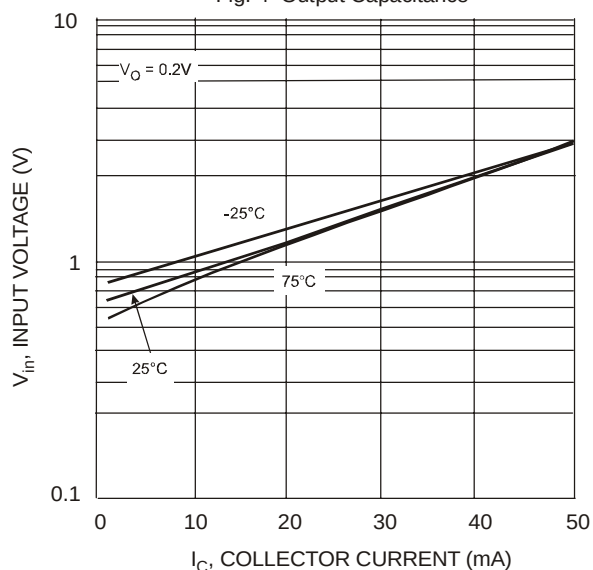


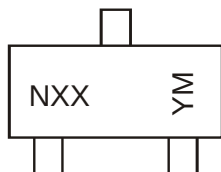
Fig. 6 Input Voltage vs. Collector Current

## Ordering Information (Note 3 & 5)

| Device         | Packaging | Shipping         |
|----------------|-----------|------------------|
| DDTC113ZUA-7-F | SOT-323   | 3000/Tape & Reel |
| DDTC123YUA-7-F | SOT-323   | 3000/Tape & Reel |
| DDTC123JUA-7-F | SOT-323   | 3000/Tape & Reel |
| DDTC143XUA-7-F | SOT-323   | 3000/Tape & Reel |
| DDTC143FUA-7-F | SOT-323   | 3000/Tape & Reel |
| DDTC143ZUA-7-F | SOT-323   | 3000/Tape & Reel |
| DDTC114YUA-7-F | SOT-323   | 3000/Tape & Reel |
| DDTC114WUA-7-F | SOT-323   | 3000/Tape & Reel |
| DDTC124XUA-7-F | SOT-323   | 3000/Tape & Reel |
| DDTC144VUA-7-F | SOT-323   | 3000/Tape & Reel |
| DDTC144WUA-7-F | SOT-323   | 3000/Tape & Reel |

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

## Marking Information



NXX = Product Type Marking Code

See Page 1 Diagrams

YM = Date Code Marking

Y = Year ex: T = 2006

M = Month ex: 9 = September

### Date Code Key

| Year | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------|------|------|------|------|------|------|------|------|------|------|------|
| Code | N    | P    | R    | S    | T    | U    | V    | W    | X    | Y    | Z    |

| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Code  | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | O   | N   | D   |

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- Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.
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- Техническую поддержку проекта.
- Защиту от снятия компонента с производства.
- Оценку стоимости проекта по компонентам.
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