

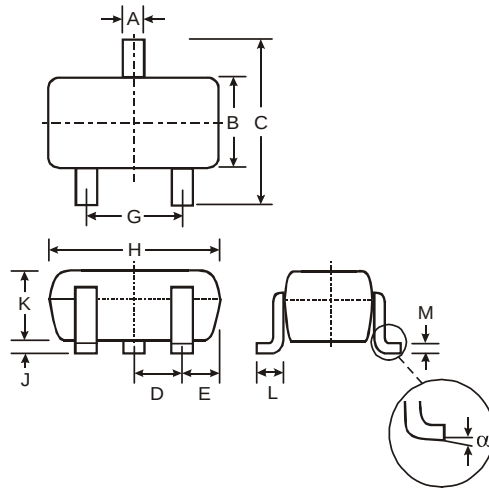
#### Features

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

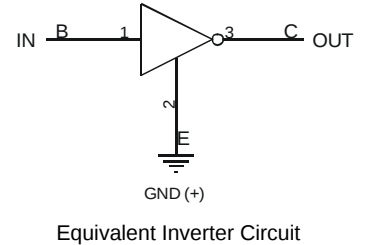
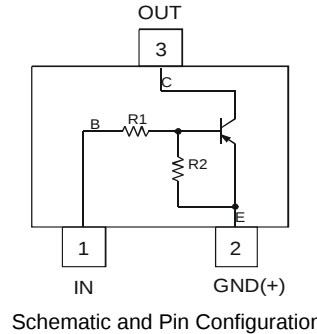
#### Mechanical Data

- 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 |
|------------|----------|----------|-----------|
| DDTA113ZUA | 1KΩ      | 10KΩ     | P02       |
| DDTA123YUA | 2.2KΩ    | 10KΩ     | P05       |
| DDTA123JUA | 2.2KΩ    | 47KΩ     | P06       |
| DDTA143XUA | 4.7KΩ    | 10KΩ     | P09       |
| DDTA143FUA | 4.7KΩ    | 22KΩ     | P10       |
| DDTA143ZUA | 4.7KΩ    | 47KΩ     | P11       |
| DDTA114YUA | 10KΩ     | 47KΩ     | P14       |
| DDTA114WUA | 10KΩ     | 4.7KΩ    | P15       |
| DDTA124XUA | 22KΩ     | 47KΩ     | P18       |
| DDTA144VUA | 47KΩ     | 10KΩ     | P21       |
| DDTA144WUA | 47KΩ     | 22KΩ     | P22       |



| 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   |

- 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 All                                   | 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 as shown on Diodes Inc., suggested pad layout document AP02001, which can be found on our website 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              | DDTA113ZUA<br>DDTA123YUA<br>DDTA123JUA<br>DDTA143XUA<br>DDTA143FUA<br>DDTA143ZUA<br>DDTA114YUA<br>DDTA114WUA<br>DDTA124XUA<br>DDTA144VUA<br>DDTA144WUA | -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 <sub>CC</sub> = 5V, I <sub>O</sub> = 100μA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                            | DDTA113ZUA<br>DDTA123YUA<br>DDTA123JUA<br>DDTA143XUA<br>DDTA143FUA<br>DDTA143ZUA<br>DDTA114YUA<br>DDTA114WUA<br>DDTA124XUA<br>DDTA144VUA<br>DDTA144WUA | —                                                                                    | —    | -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<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 DDTA123JUA<br>I <sub>O</sub> /I <sub>I</sub> = -5mA/-0.25mA DDTA143ZUA<br>I <sub>O</sub> /I <sub>I</sub> = -5mA/-0.25mA DDTA114YUA<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> = -10mA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 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 – DDTA123JUA

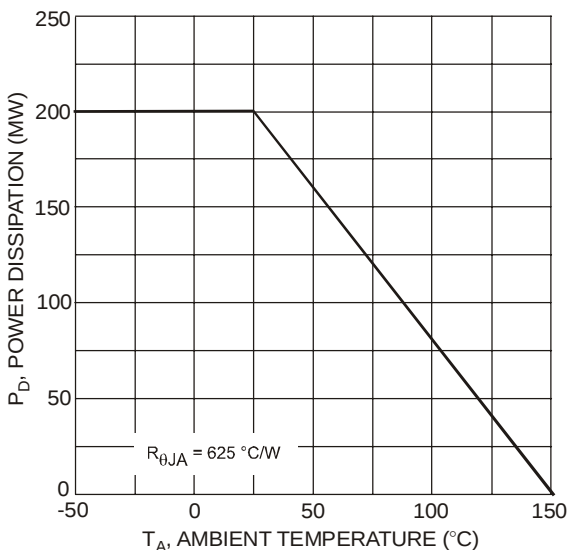


Fig. 1 Derating Curve

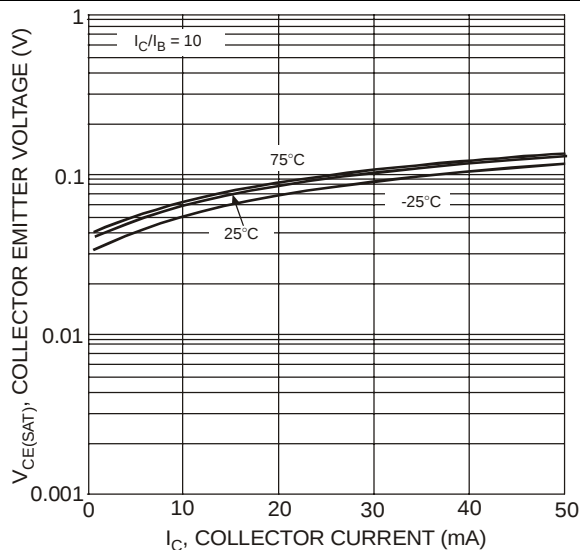


Fig. 2  $V_{CE(SAT)}$  vs.  $I_C$

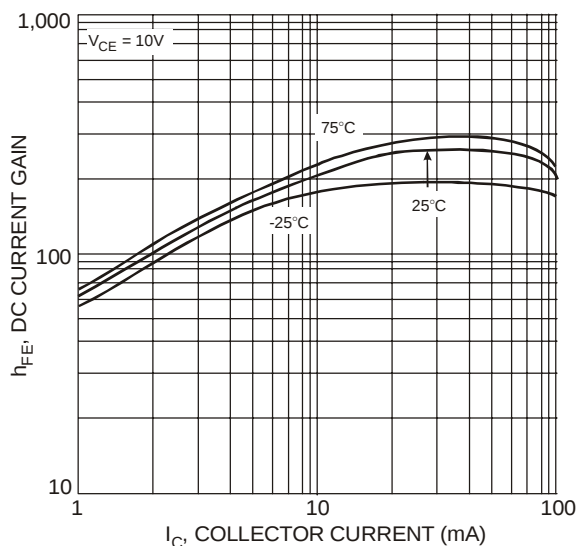


Fig. 3 DC Current Gain

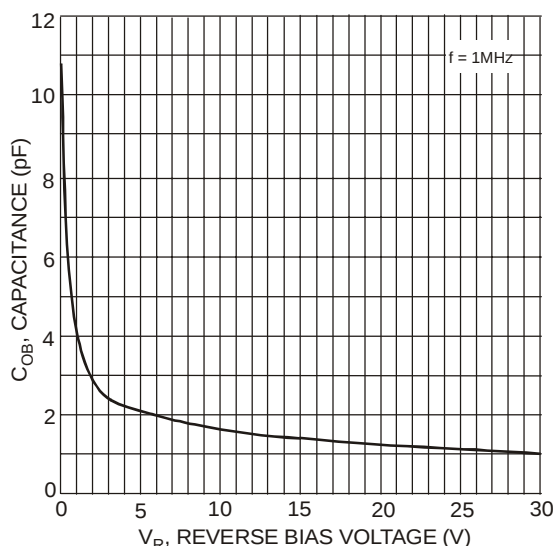


Fig. 4 Output Capacitance

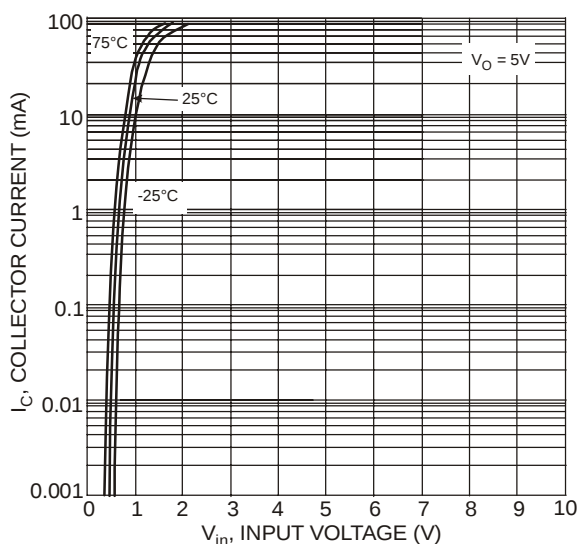


Fig. 5 Collector Current vs. Input Voltage

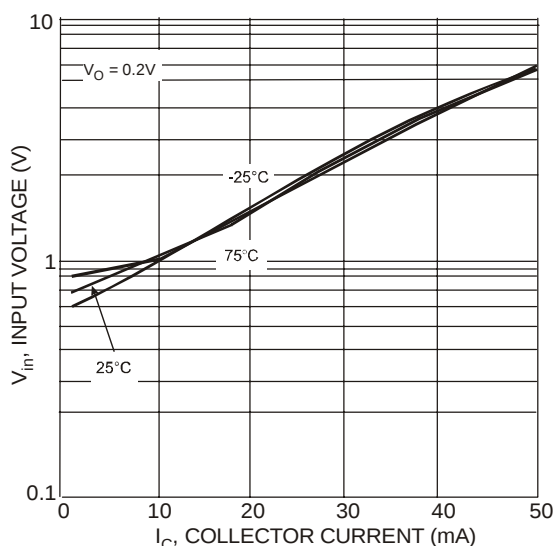


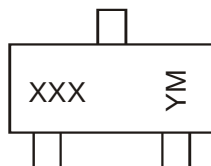
Fig. 6 Input Voltage vs. Collector Current

## Ordering Information (Note 3 & 5)

| Device         | Packaging | Shipping         |
|----------------|-----------|------------------|
| DDTA113ZUA-7-F | SOT-323   | 3000/Tape & Reel |
| DDTA123YUA-7-F | SOT-323   | 3000/Tape & Reel |
| DDTA123JUA-7-F | SOT-323   | 3000/Tape & Reel |
| DDTA143XUA-7-F | SOT-323   | 3000/Tape & Reel |
| DDTA143FUA-7-F | SOT-323   | 3000/Tape & Reel |
| DDTA143ZUA-7-F | SOT-323   | 3000/Tape & Reel |
| DDTA114YUA-7-F | SOT-323   | 3000/Tape & Reel |
| DDTA114WUA-7-F | SOT-323   | 3000/Tape & Reel |
| DDTA124XUA-7-F | SOT-323   | 3000/Tape & Reel |
| DDTA144VUA-7-F | SOT-323   | 3000/Tape & Reel |
| DDTA144WUA-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



XXX = Product Type Marking Code, See Table on Page 1

YM = Date Code Marking

Y = Year ex: T = 2006

M = Month ex: 9 = September

### Date Code Key

| Year | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------|------|------|------|------|------|------|------|
| Code | 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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