

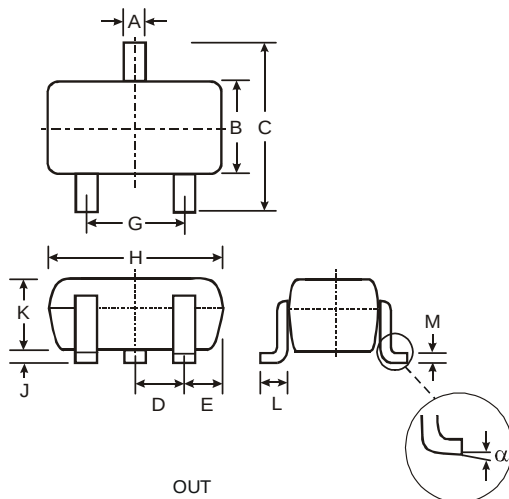
### Features

- Epitaxial Planar Die Construction
- Complementary PNP Types Available (DDTB)
- Built-In Biasing Resistors, R1, R2
- **Lead Free/RoHS Compliant Version (Note 2)**
- "Green" Device, Note 3 and 4

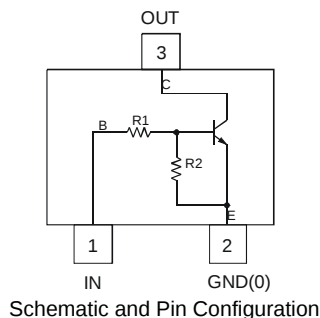
### Mechanical Data

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

| P/N       | R1 (NOM) | R2 (NOM) | MARKING |
|-----------|----------|----------|---------|
| DDTD113EU | 1K       | 1K       | N60     |
| DDTD123EU | 2.2K     | 2.2K     | N61     |
| DDTD143EU | 4.7K     | 4.7K     | N62     |
| DDTD114EU | 10K      | 10K      | N63     |
| DDTD122JU | 0.22K    | 4.7K     | N64     |
| DDTD113ZU | 1K       | 10K      | N65     |
| DDTD123YU | 2.2K     | 10K      | N66     |
| DDTD133HU | 3.3K     | 10K      | N67     |
| DDTD123TU | 2.2K     | OPEN     | N69     |
| DDTD143TU | 4.7K     | OPEN     | N70     |
| DDTD114TU | 10K      | OPEN     | N71     |
| DDTD114GU | 0        | 10K      | N72     |



| 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 |
| $\alpha$             | 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)                   | DDTD113EU<br>DDTD123EU<br>DDTD143EU<br>DDTD114EU<br>DDTD122JU<br>DDTD113ZU<br>DDTD123YU<br>DDTD133HU | V <sub>IN</sub>                   | -10 to +10<br>-10 to +12<br>-10 to +30<br>-10 to +40<br>-5 to +5<br>-5 to +10<br>-5 to +12<br>-6 to +20 | V    |
| Input Voltage, (2) to (1)                   | DDTD123TU<br>DDTD143TU<br>DDTD114TU<br>DDTD114GU                                                     | V <sub>EBO</sub> (MAX)            | 5                                                                                                       | V    |
| Output Current                              | All                                                                                                  | I <sub>C</sub>                    | 500                                                                                                     | mA   |
| Power Dissipation                           |                                                                                                      | P <sub>d</sub>                    | 200                                                                                                     | mW   |
| Thermal Resistance, Junction to Ambient Air | (Note 1)                                                                                             | 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:
1. Mounted on FR4 PC Board with recommended pad layout at <http://www.diodes.com/datasheets/ap02001.pdf>.
  2. No purposefully added lead.
  3. 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).
  4. 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.

## Electrical Characteristics

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

## R1, R2 Types

| Characteristic          | Symbol                                                                                               | Min                                                  | Typ | Max                                                  | Unit | Test Condition                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------|------------------------------------------------------------------------------------------------------|------------------------------------------------------|-----|------------------------------------------------------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Input Voltage           | DDTD113EU<br>DDTD123EU<br>DDTD143EU<br>DDTD114EU<br>DDTD122JU<br>DDTD113ZU<br>DDTD123YU<br>DDTD133HU | 0.5<br>0.5<br>0.5<br>0.5<br>0.5<br>0.3<br>0.3<br>0.3 | —   | —                                                    | V    | V <sub>CC</sub> = 5V, I <sub>O</sub> = 100μA                                                                                                                                                                                                                                                                                                                                                 |
|                         | DDTD113EU<br>DDTD123EU<br>DDTD143EU<br>DDTD114EU<br>DDTD122JU<br>DDTD113ZU<br>DDTD123YU<br>DDTD133HU | —                                                    | —   | 3.0<br>3.0<br>3.0<br>3.0<br>3.0<br>2.0<br>2.0<br>2.0 | 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> = 20mA<br>V <sub>O</sub> = 0.3V, I <sub>O</sub> = 10mA<br>V <sub>O</sub> = 0.3V, I <sub>O</sub> = 30mA<br>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> = 20mA |
| Output Voltage          | V <sub>O(on)</sub>                                                                                   | —                                                    | —   | 0.3V                                                 | V    | I <sub>O</sub> /I <sub>I</sub> = 50mA/2.5mA                                                                                                                                                                                                                                                                                                                                                  |
| Input Current           | DDTD113EU<br>DDTD123EU<br>DDTD143EU<br>DDTD114EU<br>DDTD122JU<br>DDTD113ZU<br>DDTD123YU<br>DDTD133HU | —                                                    | —   | 7.2<br>3.8<br>1.8<br>0.88<br>28<br>7.2<br>3.6<br>2.4 | 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         | DDTD113EU<br>DDTD123EU<br>DDTD143EU<br>DDTD114EU<br>DDTD122JU<br>DDTD113ZU<br>DDTD123YU<br>DDTD133HU | 33<br>39<br>47<br>56<br>47<br>56<br>56<br>56         | —   | —                                                    | —    | V <sub>O</sub> = 5V, I <sub>O</sub> = 50mA                                                                                                                                                                                                                                                                                                                                                   |
| Gain-Bandwidth Product* | f <sub>T</sub>                                                                                       | —                                                    | 200 | —                                                    | MHz  | V <sub>CE</sub> = 10V, I <sub>E</sub> = 5mA, f = 100MHz                                                                                                                                                                                                                                                                                                                                      |

\* Transistor - For Reference Only

## Electrical Characteristics

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

## R1-Only, R2-Only Types

| Characteristic                       | Symbol                                           | Min                     | Typ                    | Max                      | Unit | Test Condition                                                                                    |
|--------------------------------------|--------------------------------------------------|-------------------------|------------------------|--------------------------|------|---------------------------------------------------------------------------------------------------|
| Collector-Base Breakdown Voltage     | BV <sub>CBO</sub>                                | 50                      | —                      | —                        | V    | I <sub>C</sub> = 50μA                                                                             |
| Collector-Emitter Breakdown Voltage  | BV <sub>CEO</sub>                                | 40                      | —                      | —                        | V    | I <sub>C</sub> = 1mA                                                                              |
| Emitter-Base Breakdown Voltage       | DDTD123TU<br>DDTD143TU<br>DDTD114TU<br>DDTD114GU | 5                       | —                      | —                        | V    | I <sub>E</sub> = 50μA<br>I <sub>E</sub> = 50μA<br>I <sub>E</sub> = 50μA<br>I <sub>E</sub> = 720μA |
| Collector Cutoff Current             | I <sub>CBO</sub>                                 | —                       | —                      | 0.5                      | μA   | V <sub>CB</sub> = 50V                                                                             |
| Emitter Cutoff Current               | DDTD123TU<br>DDTD143TU<br>DDTD114TU<br>DDTD114GU | —<br>—<br>—<br>300      | —                      | 0.5<br>0.5<br>0.5<br>580 | μA   | V <sub>EB</sub> = 4V                                                                              |
| Collector-Emitter Saturation Voltage | V <sub>CE(sat)</sub>                             | —                       | —                      | 0.3                      | V    | I <sub>C</sub> = 50mA, I <sub>B</sub> = 2.5mA                                                     |
| DC Current Transfer Ratio            | DDTD123TU<br>DDTD143TU<br>DDTD114TU<br>DDTD114GU | 100<br>100<br>100<br>56 | 250<br>250<br>250<br>— | 600<br>600<br>600<br>—   | —    | I <sub>C</sub> = 5mA, V <sub>CE</sub> = 5V                                                        |
| Gain-Bandwidth Product*              | f <sub>T</sub>                                   | —                       | 200                    | —                        | MHz  | V <sub>CE</sub> = 10V, I <sub>E</sub> = -5mA, f = 100MHz                                          |

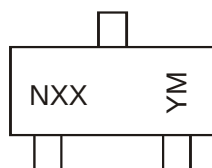
\* Transistor - For Reference Only

## Ordering Information (Note 4 & 5)

| Device        | Packaging | Shipping         |
|---------------|-----------|------------------|
| DDTD113EU-7-F | SOT-323   | 3000/Tape & Reel |
| DDTD123EU-7-F | SOT-323   | 3000/Tape & Reel |
| DDTD143EU-7-F | SOT-323   | 3000/Tape & Reel |
| DDTD114EU-7-F | SOT-323   | 3000/Tape & Reel |
| DDTD122JU-7-F | SOT-323   | 3000/Tape & Reel |
| DDTD113ZU-7-F | SOT-323   | 3000/Tape & Reel |
| DDTD123YU-7-F | SOT-323   | 3000/Tape & Reel |
| DDTD133HU-7-F | SOT-323   | 3000/Tape & Reel |
| DDTD123TU-7-F | SOT-323   | 3000/Tape & Reel |
| DDTD143TU-7-F | SOT-323   | 3000/Tape & Reel |
| DDTD114TU-7-F | SOT-323   | 3000/Tape & Reel |
| DDTD114GU-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  
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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