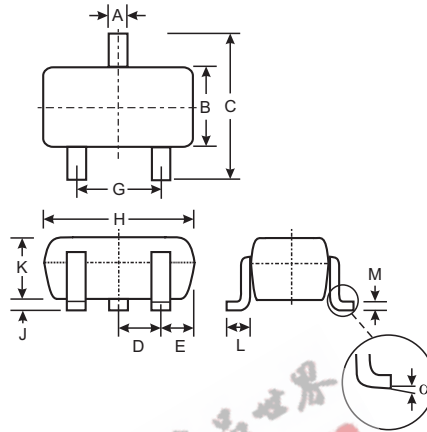


**Features**

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

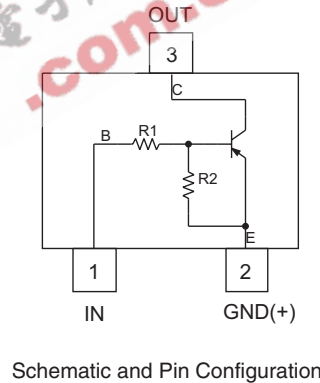
**Mechanical Data**

- 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
- Terminal Connections: See Diagram
- Terminals: Solderable per MIL-STD-202, Method 208
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe).
- Marking: Date Code and Type Code, See Page 3
- Marking Code: See Table Below
- Ordering Information (See Page 3)
- Weight: 0.006 grams (approximate)



| 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 |              |      |

| P/N       | R1 (NOM) | R2 (NOM) | Type Code |
|-----------|----------|----------|-----------|
| DDTB113EU | 1K       | 1K       | P60       |
| DDTB123EU | 2.2K     | 2.2K     | P61       |
| DDTB143EU | 4.7K     | 4.7K     | P62       |
| DDTB114EU | 10K      | 10K      | P63       |
| DDTB122JU | 0.22K    | 4.7K     | P64       |
| DDTB113ZU | 1K       | 10K      | P65       |
| DDTB123YU | 2.2K     | 10K      | P66       |
| DDTB133HU | 3.3K     | 10K      | P67       |
| DDTB123TU | 2.2K     | OPEN     | P69       |
| DDTB143TU | 4.7K     | OPEN     | P70       |
| DDTB114TU | 10K      | OPEN     | P71       |
| DDTB114GU | 0        | 10K      | P72       |



**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>                   | +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)                            | V <sub>EBO (MAX)</sub>            | -5                                                                                                      | V    |
| Output Current                                       | 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 and Temperature Range          | T <sub>j</sub> , T <sub>STG</sub> | -55 to +150                                                                                             | °C   |

- Note:
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 0609 (week 9, 2006) and newer are built with Green Molding Compound. Product manufactured prior Date Code 0609 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   | DDTB113EU<br>DDTB123EU<br>DDTB143EU<br>DDTB114EU<br>DDTB122JU<br>DDTB113ZU<br>DDTB123YU<br>DDTB133HU | V <sub>I(off)</sub> | -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                                                                                                                                                                                                                                                                                                                                                               |
|                 | DDTB113EU<br>DDTB123EU<br>DDTB143EU<br>DDTB114EU<br>DDTB122JU<br>DDTB113ZU<br>DDTB123YU<br>DDTB133HU | V <sub>I(on)</sub>  | —                                                            | —   | -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   | DDTB113EU<br>DDTB123EU<br>DDTB143EU<br>DDTB114EU<br>DDTB122JU<br>DDTB113ZU<br>DDTB123YU<br>DDTB133HU | I <sub>I</sub>      | —                                                            | —   | -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                                                                                                                                                                                                                                                                                                                                                                                                           |
| DC Current Gain | DDTB113EU<br>DDTB123EU<br>DDTB143EU<br>DDTB114EU<br>DDTB122JU<br>DDTB113ZU<br>DDTB123YU<br>DDTB133HU | G <sub>I</sub>      | 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                                                                                                                                                                                                                                                                                                                                                                                                          |

\* 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      | DDTB123TU<br>DDTB143TU<br>DDTB114TU<br>DDTB114GU | BV <sub>EBO</sub> | -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                                                                                                    |
| Emitter Cutoff Current              | DDTB123TU<br>DDTB143TU<br>DDTB114TU<br>DDTB114GU | I <sub>EBO</sub>  | —<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                                                                                                     |
| DC Current Transfer Ratio           | DDTB123TU<br>DDTB143TU<br>DDTB114TU<br>DDTB114GU | h <sub>FE</sub>   | 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                                                                                                   |

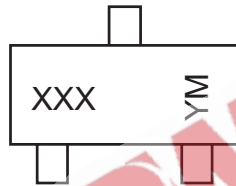
\* Transistor - For Reference Only

**Ordering Information** (Note 4 & 5)

| Device        | Packaging | Shipping         |
|---------------|-----------|------------------|
| DDTB113EU-7-F | SOT-323   | 3000/Tape & Reel |
| DDTB123EU-7-F | SOT-323   | 3000/Tape & Reel |
| DDTB143EU-7-F | SOT-323   | 3000/Tape & Reel |
| DDTB114EU-7-F | SOT-323   | 3000/Tape & Reel |
| DDTB122JU-7-F | SOT-323   | 3000/Tape & Reel |
| DDTB113ZU-7-F | SOT-323   | 3000/Tape & Reel |
| DDTB123YU-7-F | SOT-323   | 3000/Tape & Reel |
| DDTB133HU-7-F | SOT-323   | 3000/Tape & Reel |
| DDTB123TU-7-F | SOT-323   | 3000/Tape & Reel |
| DDTB143TU-7-F | SOT-323   | 3000/Tape & Reel |
| DDTB114TU-7-F | SOT-323   | 3000/Tape & Reel |
| DDTB114GU-7-F | SOT-323   | 3000/Tape & Reel |

- Notes: 4. Product manufactured with Date Code 0609 (week 9, 2006) and newer are built with Green Molding Compound. Product manufactured prior Date Code 0609 are built with Non-Green Molding Compound and may contain Halogens or Sb2O3 Fire Retardants.  
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: N = 2002  
M = Month ex: 9 = September

Date Code Key

| Year | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|------|------|------|------|------|------|------|------|------|
| Code | N    | P    | R    | S    | T    | U    | V    | W    |

| Month | Jan | Feb | March | 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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