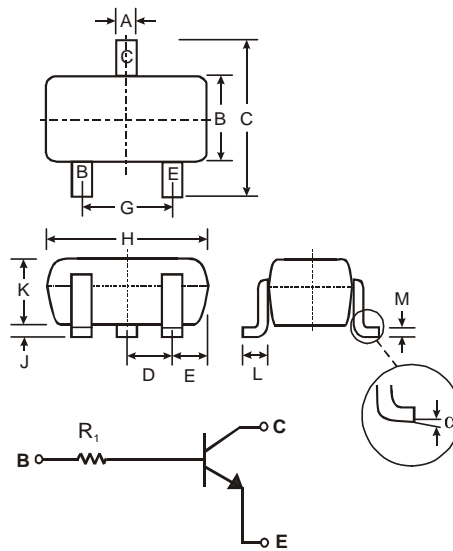


**Features**

- Epitaxial Planar Die Construction
- Complementary PNP Types Available (DDTA)
- Built-In Biasing Resistor, R1 only
- **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 Information: See Diagrams & Page 3
- Type 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 |              |      |

SCHEMATIC DIAGRAM

| P/N        | R1 (NOM)      | Type Code |
|------------|---------------|-----------|
| DDTC113TUA | 1K $\Omega$   | N01       |
| DDTC123TUA | 2.2K $\Omega$ | N03       |
| DDTC143TUA | 4.7K $\Omega$ | N07       |
| DDTC114TUA | 10K $\Omega$  | N12       |
| DDTC124TUA | 22K $\Omega$  | N16       |
| DDTC144TUA | 47K $\Omega$  | N19       |
| DDTC115TUA | 100K $\Omega$ | N23       |
| DDTC125TUA | 200K $\Omega$ | N25       |

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

| Characteristic                                       | Symbol                            | Value       | Unit |
|--|-----------------------------------|-------------|------|
| Collector-Base Voltage                               | V <sub>CBO</sub>                  | 50          | V    |
| Collector-Emitter Voltage                            | V <sub>CEO</sub>                  | 50          | V    |
| Emitter-Base Voltage                                 | V <sub>EBO</sub>                  | 5           | V    |
| Collector Current                                    | I <sub>C</sub> (Max)              | 100         | mA   |
| Power Dissipation                                    | P <sub>d</sub>                    | 200         | mW   |
| Thermal Resistance, Junction to Ambient Air (Note 1) | R <sub>θJA</sub>                  | 833         | °C/W |
| Operating and Storage Temperature Range              | T <sub>j</sub> , T <sub>STG</sub> | -55 to +150 | °C   |

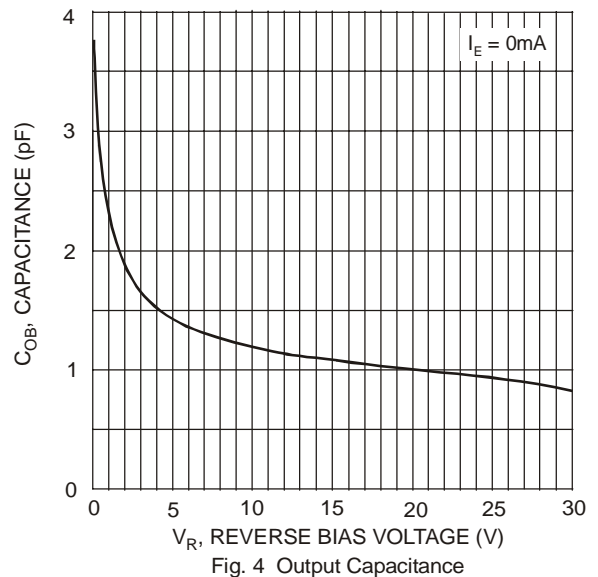
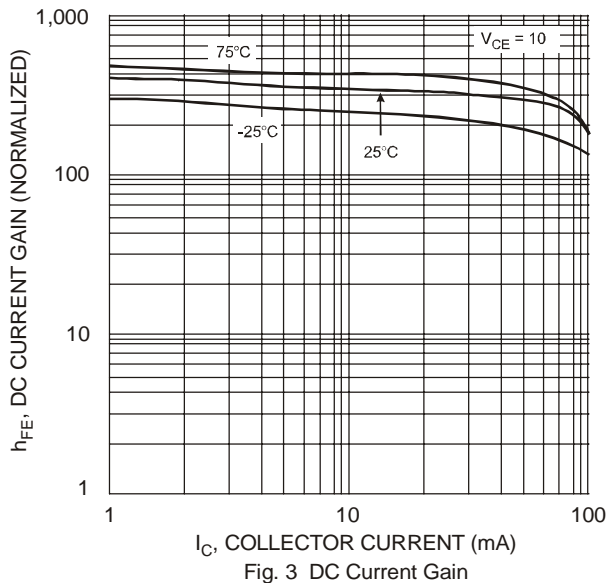
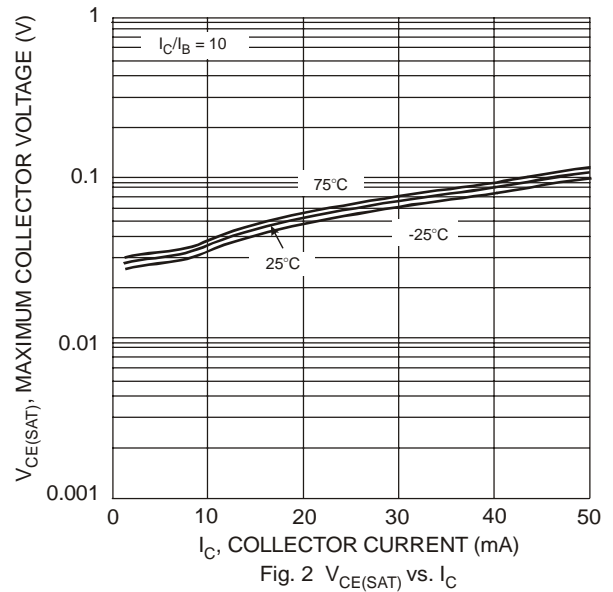
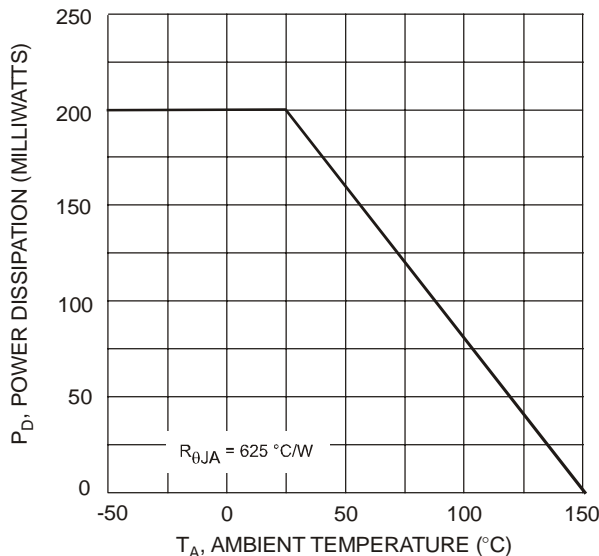
- Notes:
1. Mounted on FR4 PC Board with recommended pad layout as shown on Diodes Inc., suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>
  2. No purposefully added lead.
  3. Diodes Inc.'s "Green" Policy can be found on our website 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

| 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>    | 50  | —   | —   | V    | I <sub>C</sub> = 1mA  |
| Emitter-Base Breakdown Voltage             | BV <sub>EBO</sub>    | 5   | —   | —   | V    | I <sub>E</sub> = 50μA   |
| Collector Cutoff Current                   | I <sub>CB0</sub>     | —   | —   | 0.5 | μA   | V <sub>CB</sub> = 50V   |
| Emitter Cutoff Current                     | I <sub>E0</sub>      | —   | —   | 0.5 | μA   | V <sub>EB</sub> = 4V  |
| Collector-Emitter Saturation Voltage       | V <sub>CE(sat)</sub> | —   | —   | 0.3 | V    | I <sub>C</sub> /I <sub>B</sub> = 10mA/1mA DDTC113TUA<br>I <sub>C</sub> /I <sub>B</sub> = 5mA/0.5mA DDTC123TUA<br>I <sub>C</sub> /I <sub>B</sub> = 2.5mA/.25mA DDTC143TUA<br>I <sub>C</sub> /I <sub>B</sub> = 1mA/.1mA DDTC114TUA<br>I <sub>C</sub> /I <sub>B</sub> = 5mA/0.5mA DDTC124TUA<br>I <sub>C</sub> /I <sub>B</sub> = 2.5mA/.25mA DDTC144TUA<br>I <sub>C</sub> /I <sub>B</sub> = 1mA/0.1mA DDTC115TUA<br>I <sub>C</sub> /I <sub>B</sub> = .5mA/.05mA DDTC125TUA |
| DC Current Transfer Ratio                  | h <sub>FE</sub>      | 100 | 250 | 600 | —    | I <sub>C</sub> = 1mA, V <sub>CE</sub> = 5V  |
| Input Resistor (R <sub>1</sub> ) Tolerance | ΔR <sub>1</sub>      | -30 | —   | +30 | %    | —   |
| Gain-Bandwidth Product*                    | f <sub>T</sub>       | —   | 250 | —   | MHz  | V <sub>CE</sub> = 10V, I <sub>E</sub> = -5mA, f = 100MHz  |

\*Transistor - For Reference Only

## Typical Curves – DDTC114TUA



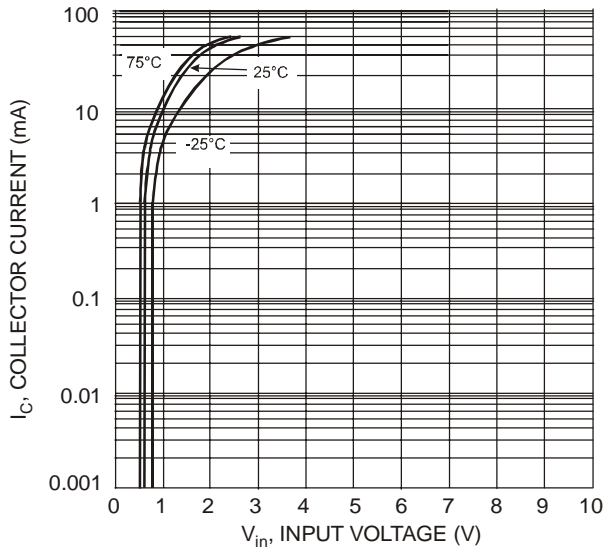


Fig. 5 Collector Current vs. Input Voltage

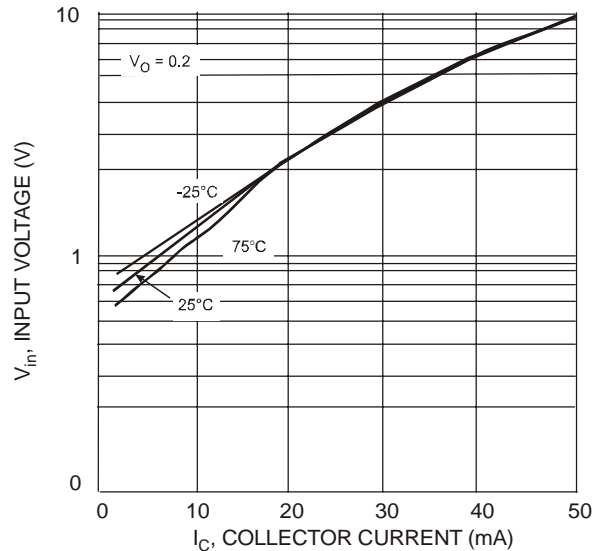


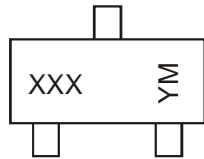
Fig. 6 Input Voltage vs. Collector Current

## Ordering Information (Note 4 & 5)

| Device          | Packaging | Shipping           |
|-----------------|-----------|--------------------|
| DDTC1xxTUA-7-F  | SOT-323   | 3000/Tape & Reel   |
| DDTC1xxTUA-13-F | SOT-323   | 10,000/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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