

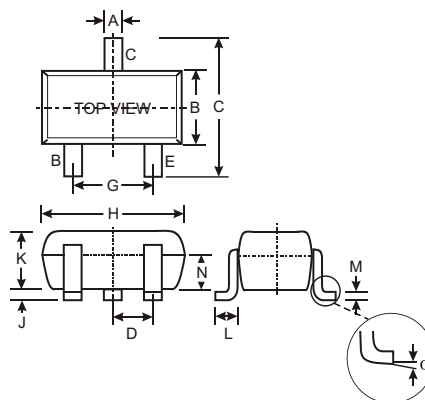
### Features

- Epitaxial Planar Die Construction
- Complementary NPN Types Available (DDTC)
- Built-In Biasing Resistor, R2 only
- Also Available in Lead Free Version

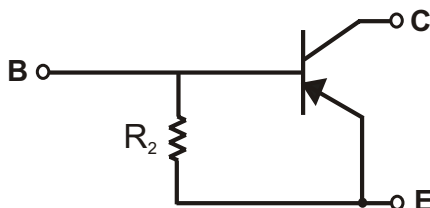
### Mechanical Data

- Case: SOT-523, Molded Plastic
- Case material - UL Flammability Rating 94V-0
- Moisture sensitivity: Level 1 per J-STD-020A
- Terminals: Solderable per MIL-STD-202, Method 208
- Also Available in Lead Free Plating (Matte Tin Finish). Please see Ordering Information, Note 3, on Page 2
- Terminal Connections: See Diagram
- Marking: Date Code and Marking Code (See Diagrams & Page 2)
- Weight: 0.002 grams (approx.)
- Ordering Information (See Page 2)

| P/N       | R2 (NOM)      | MARKING |
|-----------|---------------|---------|
| DDTA114GE | 10K $\Omega$  | P26     |
| DDTA124GE | 22K $\Omega$  | P27     |
| DDTA144GE | 47K $\Omega$  | P28     |
| DDTA115GE | 100K $\Omega$ | P29     |



| SOT-523              |      |      |      |
|----------------------|------|------|------|
| Dim                  | Min  | Max  | Typ  |
| A                    | 0.15 | 0.30 | 0.22 |
| B                    | 0.75 | 0.85 | 0.80 |
| C                    | 1.45 | 1.75 | 1.60 |
| D                    | —    | —    | 0.50 |
| G                    | 0.90 | 1.10 | 1.00 |
| H                    | 1.50 | 1.70 | 1.60 |
| J                    | 0.00 | 0.10 | 0.05 |
| K                    | 0.60 | 0.80 | 0.75 |
| L                    | 0.10 | 0.30 | 0.22 |
| M                    | 0.10 | 0.20 | 0.12 |
| N                    | 0.45 | 0.65 | 0.50 |
| $\alpha$             | 0°   | 8°   | —    |
| All Dimensions in mm |      |      |      |



SCHEMATIC DIAGRAM

### 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>                    | 150         | mW   |
| Thermal Resistance, Junction to Ambient Air (Note 1) | R <sub>θJA</sub>                  | 833         | °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>.

**Electrical Characteristics** @  $T_A = 25^\circ\text{C}$  unless otherwise specified

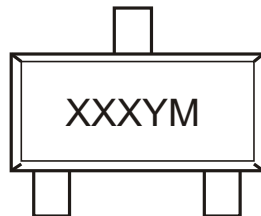
| Characteristic                       |                                                  | Symbol        | Min                        | Typ | Max                         | Unit          | Test Condition                                                                                                                                          |
|--------------------------------------|--------------------------------------------------|---------------|----------------------------|-----|-----------------------------|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| Collector-Base Breakdown Voltage     |                                                  | $BV_{CBO}$    | -50                        | —   | —                           | V             | $I_C = -50\mu\text{A}$                                                                                                                                  |
| Collector-Emitter Breakdown Voltage  |                                                  | $BV_{CEO}$    | -50                        | —   | —                           | V             | $I_C = -1\text{mA}$                                                                                                                                     |
| Emitter-Base Breakdown Voltage       |                                                  | $BV_{EBO}$    | 5                          | —   | —                           | V             | $I_E = -720\mu\text{A}$ , DDTA114GE<br>$I_E = -330\mu\text{A}$ , DDTA124GE<br>$I_E = -160\mu\text{A}$ , DDTA144GE<br>$I_E = -72\mu\text{A}$ , DDTA115GE |
| Collector Cutoff Current             |                                                  | $I_{CBO}$     | —                          | —   | -0.5                        | $\mu\text{A}$ | $V_{CB} = -50\text{V}$                                                                                                                                  |
| Emitter Cutoff Current               | DDTA114GE<br>DDTA124GE<br>DDTA144GE<br>DDTA115GE | $I_{EBO}$     | -300<br>-140<br>-65<br>-30 | —   | -580<br>-260<br>-130<br>-58 | $\mu\text{A}$ | $V_{EB} = -4\text{V}$                                                                                                                                   |
| Collector-Emitter Saturation Voltage |                                                  | $V_{CE(sat)}$ | —                          | —   | -0.3                        | V             | $I_C = -10\text{mA}$ , $I_B = -0.5\text{mA}$                                                                                                            |
| DC Current Transfer Ratio            | DDTA114GE<br>DDTA124GE<br>DDTA144GE<br>DDTA115GE | $h_{FE}$      | 30<br>56<br>68<br>82       | —   | —                           | —             | $I_C = -5\text{mA}$ , $V_{CE} = -5\text{V}$                                                                                                             |
| Bleeder Resistor ( $R_2$ ) Tolerance |                                                  | $DR_2$        | -30                        | —   | +30                         | %             | —                                                                                                                                                       |
| Gain-Bandwidth Product*              |                                                  | $f_T$         | —                          | 250 | —                           | MHz           | $V_{CE} = -10\text{V}$ , $I_E = 5\text{mA}$ ,<br>$f = 100\text{MHz}$                                                                                    |

\* Transistor - For Reference Only

**Ordering Information** (Note 2)

| Device      | Packaging | Shipping         |
|-------------|-----------|------------------|
| DDTA114GE-7 | SOT-523   | 3000/Tape & Reel |
| DDTA124GE-7 | SOT-523   | 3000/Tape & Reel |
| DDTA144GE-7 | SOT-523   | 3000/Tape & Reel |
| DDTA115GE-7 | SOT-523   | 3000/Tape & Reel |

- Notes: 2. For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.  
 3. For Lead Free version (with Lead Free terminal finish) part number, please add "-F" suffix to part number above.  
 Example: DDTA115GE-7-F.

**Marking Information**


XXX = Product Type Marking Code (See Page 1, e.g. P26 = DDTA114GE)  
 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   |

# TYPICAL CURVES - DDTA114GE

NEW PRODUCT

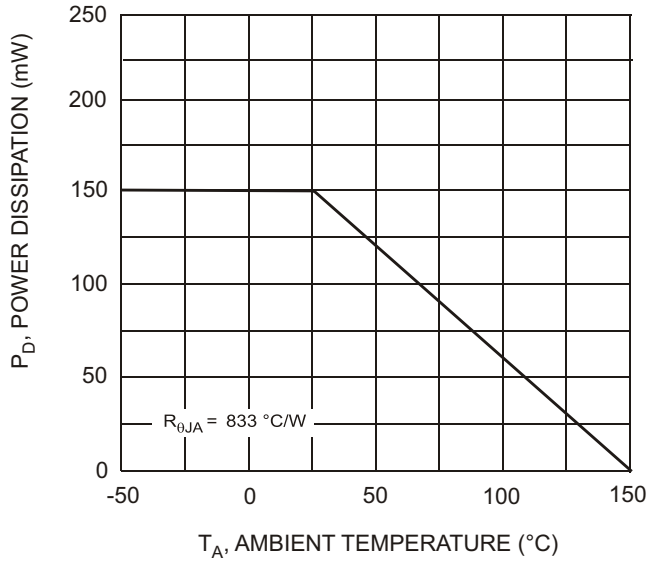


Fig. 1, Derating Curve

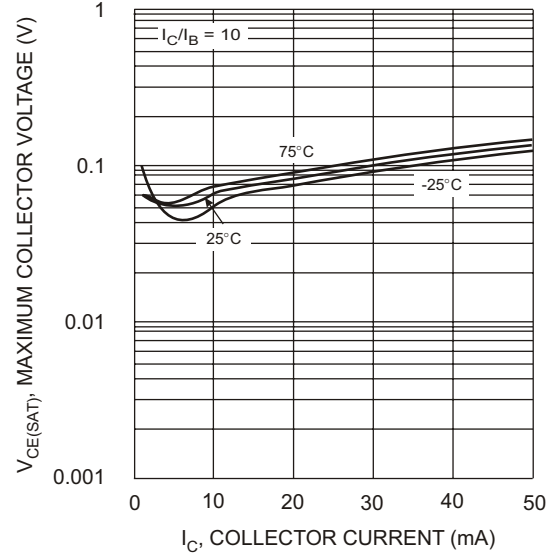


Fig. 2  $V_{CE(SAT)}$  vs.  $I_C$

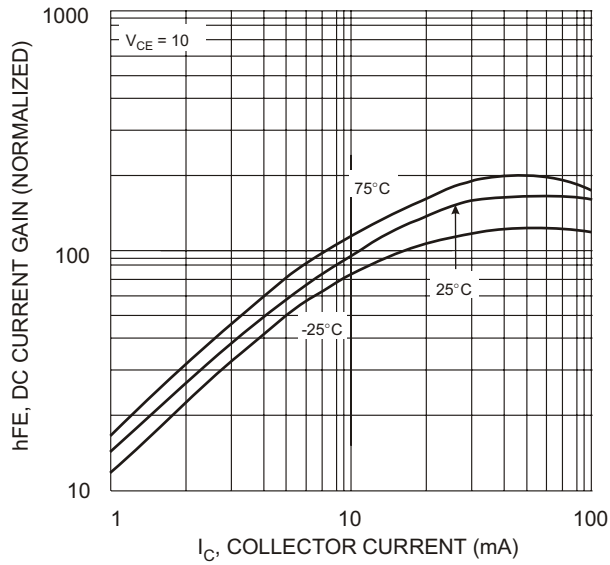


Fig. 3 DC Current Gain

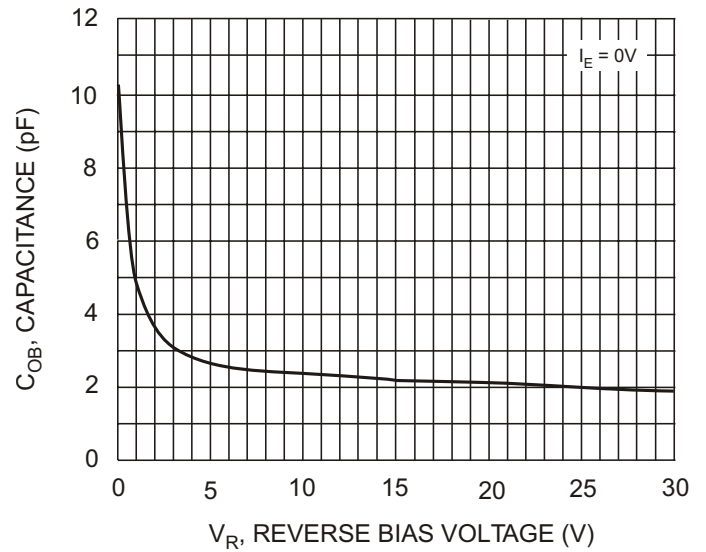


Fig. 4 Output Capacitance

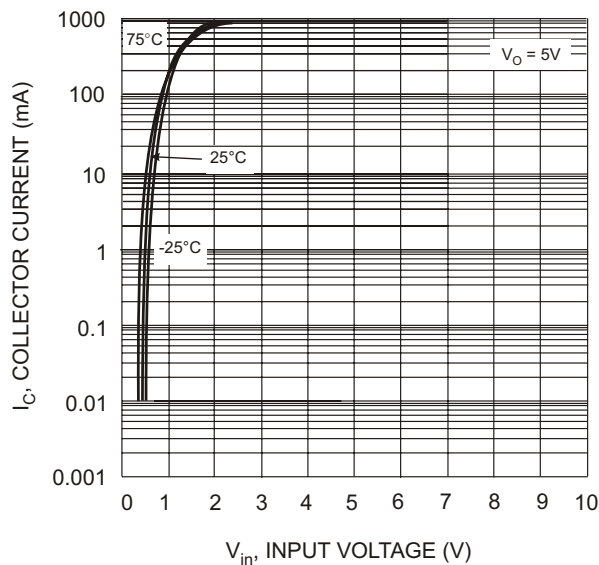


Fig. 5 Collector Current Vs. Input Voltage

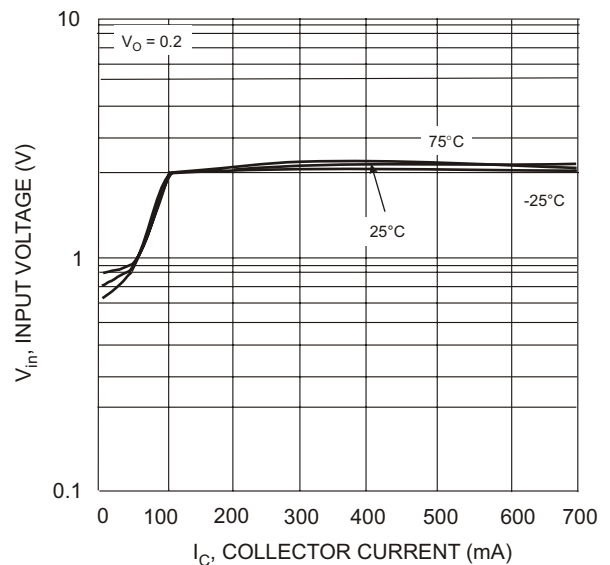


Fig. 6 Input Voltage vs. Collector Current