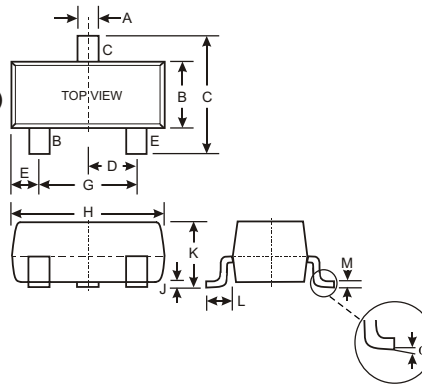


### Features

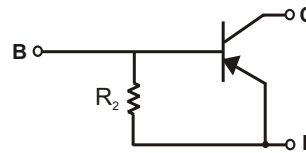
- Epitaxial Planar Die Construction
- Complementary NPN Types Available (DDTC)
- Built-In Biasing Resistor, R2 only
- **Available in Lead Free/RoHS Compliant Version (Note 2)**

### Mechanical Data

- Case: SOT-23
- Case Material: Molded Plastic. 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
- Also Available in Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe). Please see Ordering Information, Note 4, on Page 2
- Marking: Date Code and Type Code (See Table Below & Page 2)
- Ordering Information (See Page 2)
- Weight: 0.008 grams (approximate)



| SOT-23               |       |       |
|----------------------|-------|-------|
| Dim                  | Min   | Max   |
| A                    | 0.37  | 0.51  |
| B                    | 1.20  | 1.40  |
| C                    | 2.30  | 2.50  |
| D                    | 0.89  | 1.03  |
| E                    | 0.45  | 0.60  |
| G                    | 1.78  | 2.05  |
| H                    | 2.80  | 3.00  |
| J                    | 0.013 | 0.10  |
| K                    | 0.903 | 1.10  |
| L                    | 0.45  | 0.61  |
| M                    | 0.085 | 0.180 |
| $\alpha$             | 0°    | 8°    |
| All Dimensions in mm |       |       |



SCHEMATIC DIAGRAM

| P/N        | R2 (NOM)      | Type Code |
|------------|---------------|-----------|
| DDTA114GCA | 10K $\Omega$  | P26       |
| DDTA124GCA | 22K $\Omega$  | P27       |
| DDTA144GCA | 47K $\Omega$  | P28       |
| DDTA115GCA | 100K $\Omega$ | P29       |

### 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 (Max)</sub>              | -100        | 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.

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

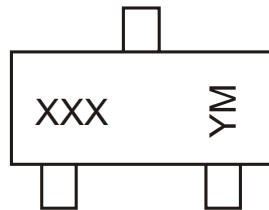
| Characteristic                       |  | Symbol        | Min                        | Typ | Max                         | Unit          | Test Condition  |
|--------------------------------------|--|---------------|----------------------------|-----|-----------------------------|---------------|---|
| 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             | $I_E = -720\mu\text{A}$ , DDTA114GCA<br>$I_E = -330\mu\text{A}$ , DDTA124GCA<br>$I_E = -160\mu\text{A}$ , DDTA144GCA<br>$I_E = -72\mu\text{A}$ , DDTA115GCA |
| Collector Cutoff Current             |  | $I_{CBO}$     | —                          | —   | -0.5                        | $\mu\text{A}$ | $V_{CB} = -50\text{V}$  |
| Emitter Cutoff Current               |  | $I_{EBO}$     | -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            |  | $h_{FE}$      | 30<br>56<br>68<br>82       | —   | —                           | —             | $I_C = -5\text{mA}$ , $V_{CE} = -5\text{V}$   |
| Bleeder Resistor ( $R_2$ ) Tolerance |  | $\Delta R_2$  | -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 3)

| Device       | Packaging | Shipping         |
|--------------|-----------|------------------|
| DDTA114GCA-7 | SOT-23    | 3000/Tape & Reel |
| DDTA124GCA-7 | SOT-23    | 3000/Tape & Reel |
| DDTA144GCA-7 | SOT-23    | 3000/Tape & Reel |
| DDTA115GCA-7 | SOT-23    | 3000/Tape & Reel |

- Notes: 3. For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.  
4. For Lead Free/RoHS Compliant version part numbers, please add "-F" suffix to the part numbers above. Example: DDTA115GCA-7-F.

**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   |

**TYPICAL CURVES - DDTA114GCA**

**NEW PRODUCT**

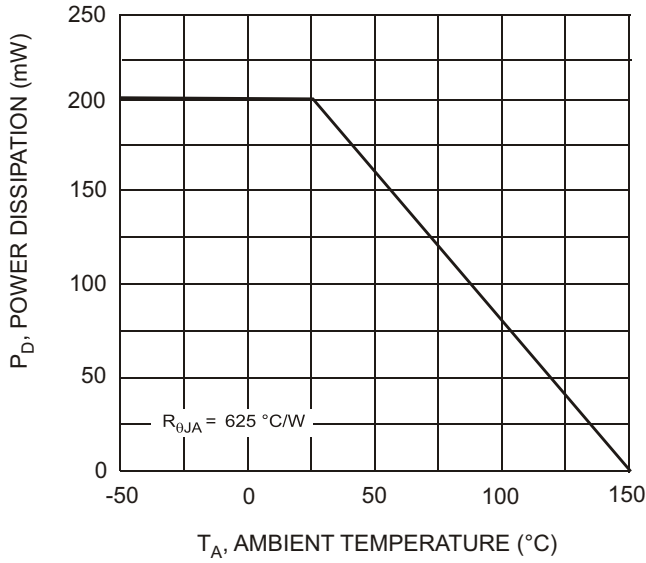


Fig. 1, Derating Curve

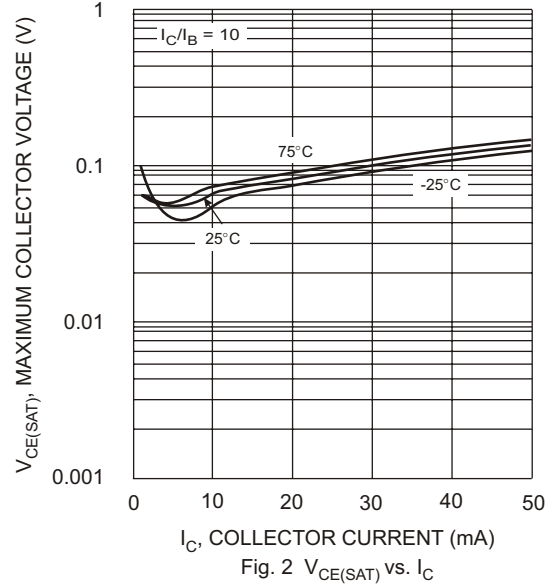


Fig. 2  $V_{CE(SAT)}$  vs.  $I_C$

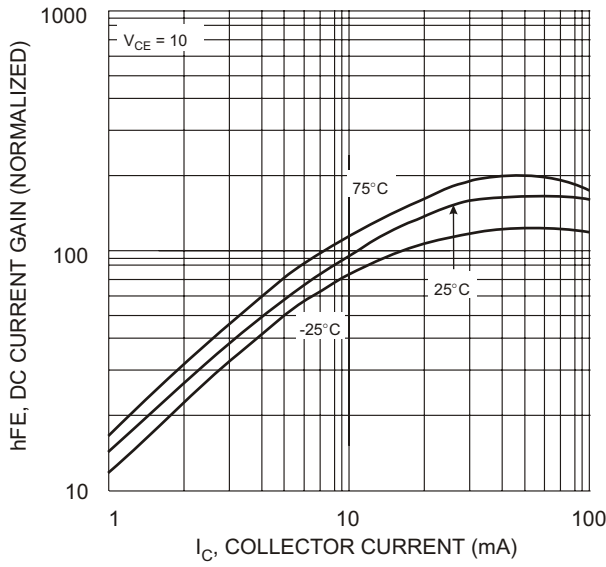


Fig. 3 DC CURRENT GAIN

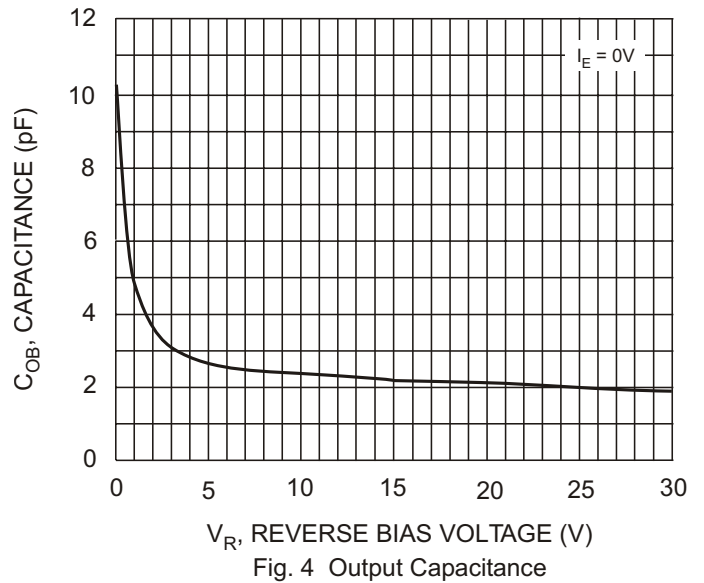


Fig. 4 Output Capacitance

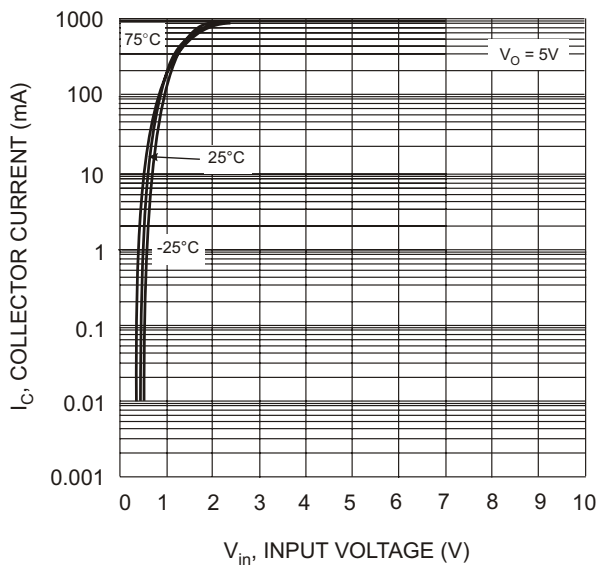


Fig. 5 Collector Current Vs. Input Voltage

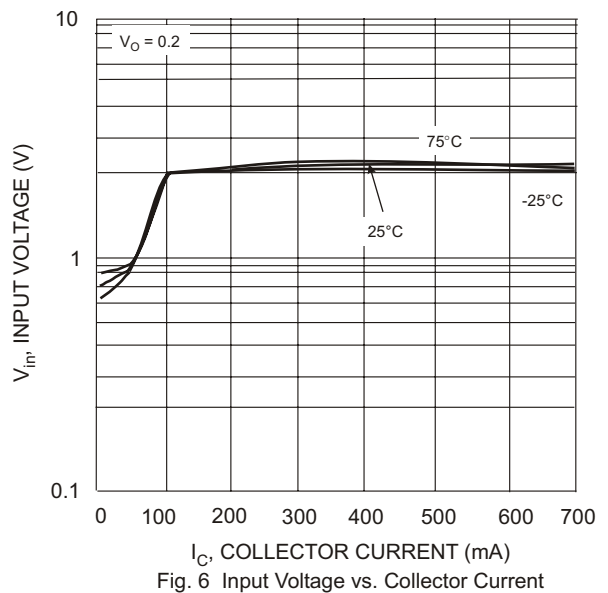


Fig. 6 Input Voltage vs. Collector Current