

DDTC (R2-ONLY SERIES) E

NPN PRE-BIASED SMALL SIGNAL SURFACE MOUNT TRANSISTOR

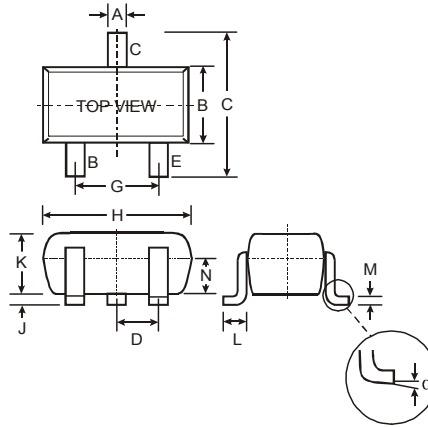
Features

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

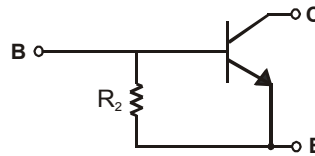
Mechanical Data

- Case: SOT-523
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminals: Solderable per MIL-STD-202, Method 208
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe).
- Terminal Connections: See Diagram
- Marking Information: See Table Below & Page 2
- Ordering Information: See Page 2
- Weight: 0.002 grams (approximate)

| P/N | R1 (NOM) | Marking |
|-----------|---------------|---------|
| DDTC114GE | 10K Ω | N26 |
| DDTC124GE | 22K Ω | N27 |
| DDTC144GE | 47K Ω | N28 |
| DDTC115GE | 100K Ω | N29 |



| 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 |
| α | 0° | 8° | — |
| All Dimensions in mm | | | |



SCHMATIC DIAGRAM

Maximum Ratings @ $T_A = 25^\circ\text{C}$ unless otherwise specified

| Characteristic | Symbol | Value | Unit |
|--|-----------------|-------------|--------------------|
| Collector Base Voltage | V_{CBO} | 50 | V |
| Collector-Emitter Voltage | V_{CEO} | 50 | V |
| Emitter-Base Voltage | V_{EBO} | 5 | V |
| Collector Current | I_C (Max) | 100 | mA |
| Power Dissipation | P_d | 150 | mW |
| Thermal Resistance, Junction to Ambient Air (Note 1) | $R_{\theta JA}$ | 833 | $^\circ\text{C/W}$ |
| Operating and Storage and Temperature Range | T_J, T_{STG} | -55 to +150 | $^\circ\text{C}$ |

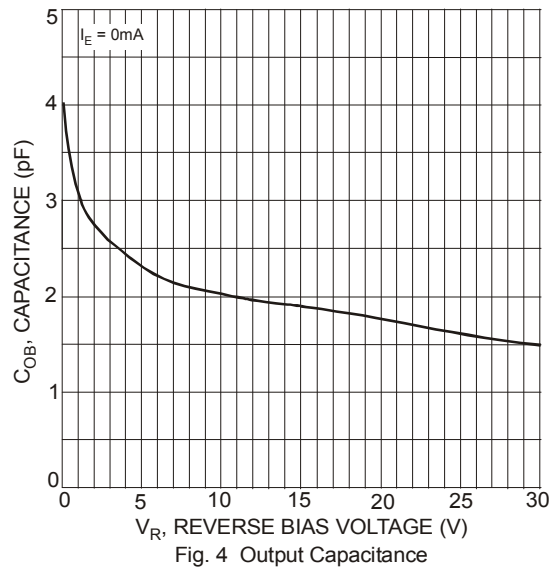
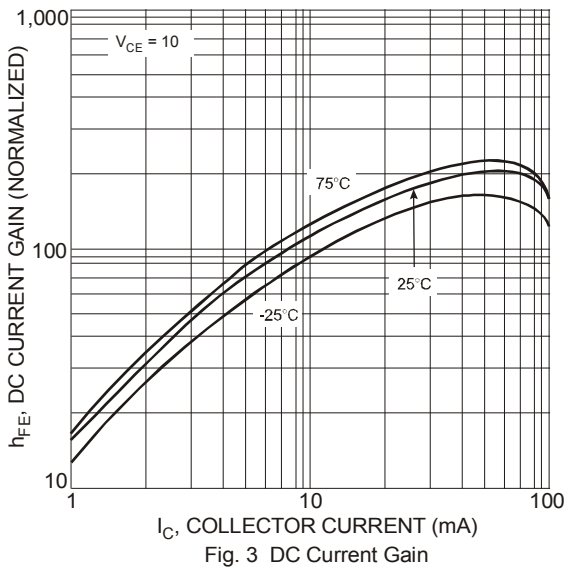
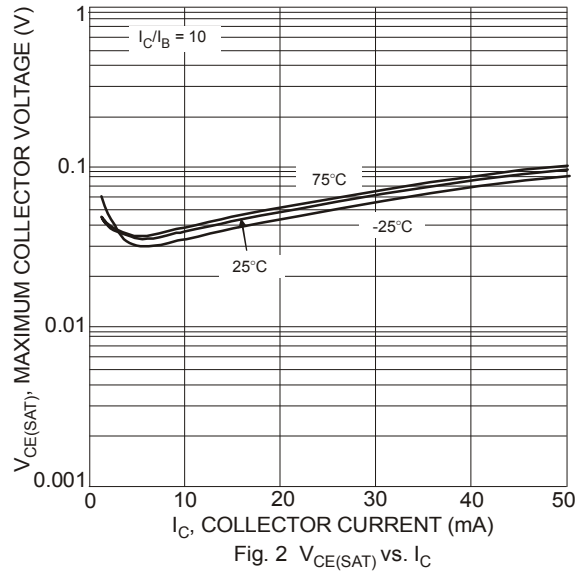
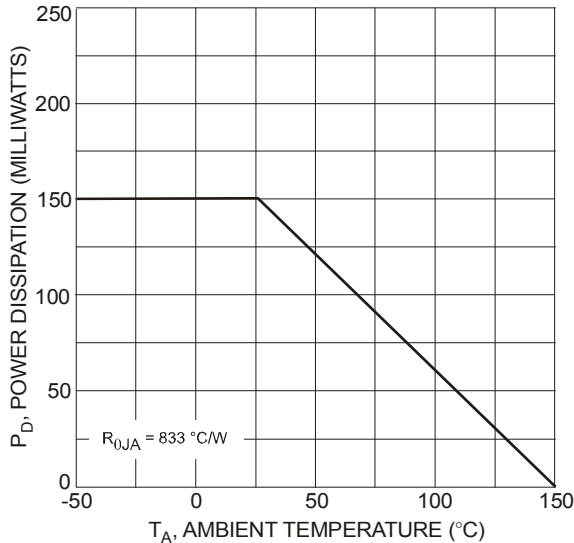
- Notes:
1. Mounted on FR4 PC Board with recommended pad layout, which can be found on our website at <http://www.diodes.com/datasheets/ap02001>.
 2. No purposefully added lead.
 3. Diodes Inc.'s "Green" policy can be found on our website at http://www.diodes.com/products/lead_free/index.php.
 4. Product manufactured with Date Code UO (week 40, 2007) and newer are built with Green Molding Compound. Product manufactured prior to Date Code UO are built with Non-Green Molding Compound and may contain Halogens or Sb2O3 Fire Retardants.

Electrical Characteristics @T_A = 25°C unless otherwise specified

| Characteristic | | Symbol | Min | Typ | Max | Unit | Test Condition |
|--|-----------|----------------------|-----|-----|-----|------|--|
| Collector-Base Breakdown Voltage | | BV _{CB0} | 50 | — | — | V | I _C = 50μA |
| Collector-Emitter Breakdown Voltage | | BV _{CEO} | 50 | — | — | V | I _C = 1mA |
| Emitter-Base Breakdown Voltage | | BV _{EBO} | 5 | — | — | V | I _E = 720μA, DDTC114GE I _E = 330 μA, DDTC124GE I _E = 160 μA, DDTC144GE I _E = 72 μA, DDTC115GE |
| Collector Cutoff Current | | I _{CBO} | — | — | 0.5 | μA | V _{CB} = 50V |
| Emitter Cutoff Current | DDTC114GE | I _{EBO} | 300 | — | 580 | μA | V _{EB} = 4V |
| | DDTC124GE | | 140 | | 260 | | |
| | DDTC144GE | | 65 | | 130 | | |
| | DDTC115GE | | 30 | | 58 | | |
| Collector-Emitter Saturation Voltage | | V _{CE(sat)} | — | — | 0.3 | V | I _C = 10mA, I _B = 0.5mA |
| DC Current Transfer Ratio | DDTC114GE | h _{FE} | 30 | — | — | — | I _C = 5mA, V _{CE} = 5V |
| | DDTC124GE | | 56 | | | | |
| | DDTC144GE | | 68 | | | | |
| | DDTC115GE | | 82 | | | | |
| Bleeder Resistor (R ₂) Tolerance | | ΔR ₂ | -30 | — | +30 | % | — |
| Gain-Bandwidth Product* | | f _T | — | 250 | — | MHz | V _{CE} = 10V, I _E = -5mA, f = 100MHz |

* Transistor – For Reference Only

TYPICAL CURVES – DDTC114GE



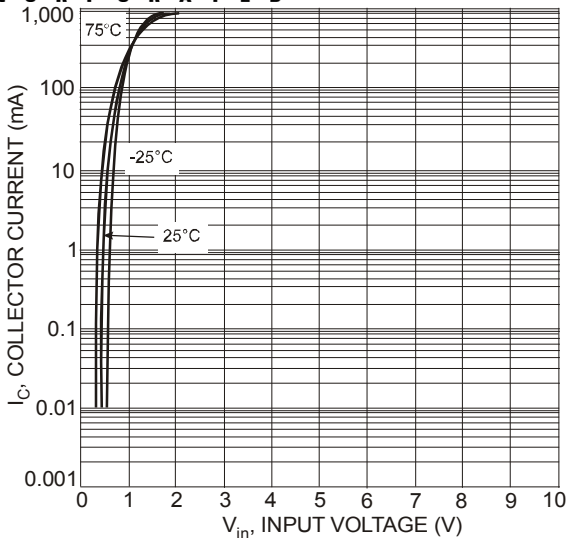


Fig. 5 Collector Current vs. Input Voltage

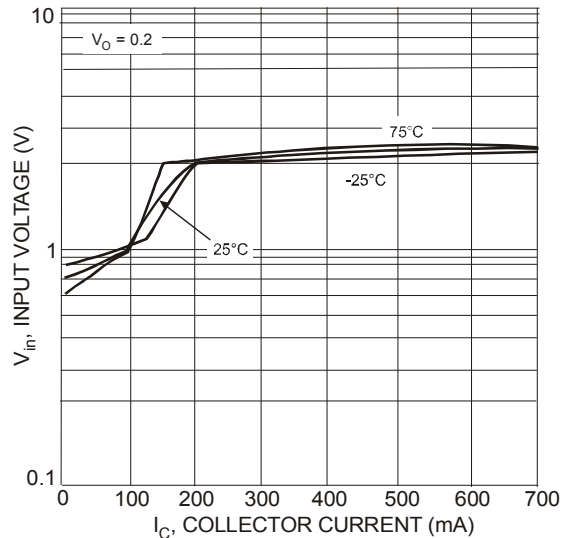


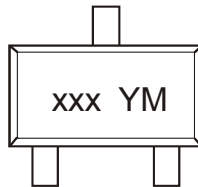
Fig. 6 Input Voltage vs. Collector Current

Ordering Information (Note 5)

| Device | Packaging | Shipping |
|----------------|-----------|--------------------|
| DDTC1xxGE-7-F | SOT-523 | 3000/Tape & Reel |
| DDTC1xxGE-13-F | SOT-523 | 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 Page 1, e.g. N26 = DDTC114GE)
 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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