

# DDTA (R1 = R2 SERIES) E

## PNP PRE-BIASED SMALL SIGNAL SURFACE MOUNT TRANSISTOR

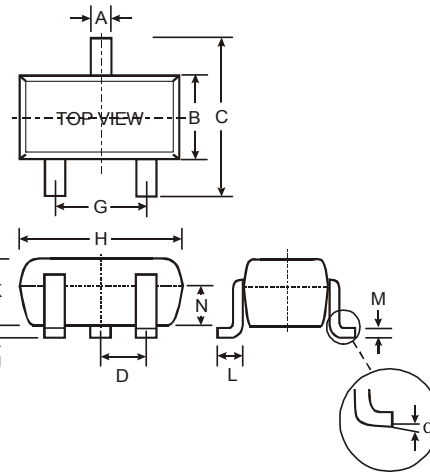
NEW PRODUCT

### Features

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

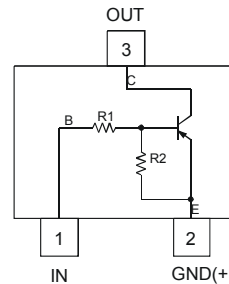
### Mechanical Data

- Case: SOT-523
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminals: Finish - Solderable per MIL-STD-202, Method 208
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe).
- Terminal Connections: See Diagram
- Marking & Date Code Information: See Table Below & Page 4
- Ordering Information: See Page 4
- Weight: 0.002 grams (approximate)

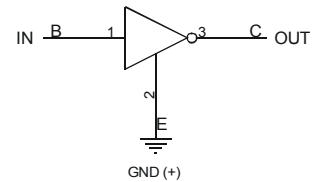


| SOT-523              |      |      |      |
|----------------------|------|------|------|
| Dim                  | Min  | Max  | Typ  |
| A                    | 0.15 | 0.30 | 0.22 |
| B                    | 0.75 | 0.85 | 0.80 |
| C                    | 1.45 | 1.75 | 1.60 |
| D                    | —    | —    | 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 |      |      |      |

| P/N       | R1, R2 (NOM)  | Marking |
|-----------|---------------|---------|
| DDTA123EE | 2.2K $\Omega$ | P04     |
| DDTA143EE | 4.7K $\Omega$ | P08     |
| DDTA114EE | 10K $\Omega$  | P13     |
| DDTA124EE | 22K $\Omega$  | P17     |
| DDTA144EE | 47K $\Omega$  | P20     |
| DDTA115EE | 100K $\Omega$ | P24     |



Schematic and Pin Configuration



Equivalent Inverter Circuit

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

| Characteristic                                       | Symbol                            | Value  | Unit |
|--|-----------------------------------|--|------|
| Supply Voltage, (2) to (3)                           | V <sub>CC</sub>                   | -50  | V    |
| Input Voltage, (1) to (2)                            | V <sub>IN</sub>                   | +10 to -12<br>+10 to -30<br>+10 to -40<br>+10 to -40<br>+10 to -40<br>+10 to -40 | V    |
| Output Current                                       | I <sub>O</sub>                    | -100<br>-100<br>-50<br>-30<br>-30<br>-20   | 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 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 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 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<sub>A</sub> = 25°C unless otherwise specified

| Characteristic                             |  | Symbol                         | Min                                    | Typ  | Max  | Unit | Test Condition  |
|--|--|--------------------------------|--|------|--|------|---|
| Input Voltage                              |  | V <sub>I(off)</sub>            | -0.5                                   | -1.1 | —  | V    | V <sub>CC</sub> = 5V, I <sub>O</sub> = 100μA  |
|  |  | V <sub>I(on)</sub>             | —                                      | -1.9 | -3   |      | V <sub>O</sub> = 0.3V, I <sub>O</sub> = 20mA, DDTA123EE<br>V <sub>O</sub> = 0.3V, I <sub>O</sub> = 20mA, DDTA143EE<br>V <sub>O</sub> = 0.3V, I <sub>O</sub> = 10mA, DDTA114EE<br>V <sub>O</sub> = 0.3V, I <sub>O</sub> = 5mA, DDTA124EE<br>V <sub>O</sub> = 0.3V, I <sub>O</sub> = 2mA, DDTA144EE<br>V <sub>O</sub> = 0.3V, I <sub>O</sub> = 1mA, DDTA115EE |
| Output Voltage                             |  | V <sub>O(on)</sub>             | —                                      | -0.1 | -0.3   | V    | I <sub>O</sub> /I <sub>I</sub> = 10mA/0.5mA, DDTA123EE<br>I <sub>O</sub> /I <sub>I</sub> = 10mA/0.5mA, DDTA143EE<br>I <sub>O</sub> /I <sub>I</sub> = 10mA/0.5mA, DDTA114EE<br>I <sub>O</sub> /I <sub>I</sub> = 10mA/0.5mA, DDTA124EE<br>I <sub>O</sub> /I <sub>I</sub> = 10mA/0.5mA, DDTA144EE<br>I <sub>O</sub> /I <sub>I</sub> = 5mA/0.25mA, DDTA115EE    |
| Input Current                              | DDTA123EE<br>DDTA143EE<br>DDTA114EE<br>DDTA124EE<br>DDTA144EE<br>DDTA115EE | I <sub>I</sub>                 | —                                      | —    | -3.8<br>-1.8<br>-0.88<br>-0.36<br>-0.18<br>-0.15 | mA   | V <sub>I</sub> = -5V  |
| Output Current                             |  | I <sub>O(off)</sub>            | —                                      | —    | 0.5  | μA   | V <sub>CC</sub> = -50V, V <sub>I</sub> = 0V   |
| DC Current Gain                            | DDTA123EE<br>DDTA143EE<br>DDTA114EE<br>DDTA124EE<br>DDTA144EE<br>DDTA115EE | G <sub>I</sub>                 | -20<br>-20<br>-30<br>-56<br>-68<br>-82 | —    | —  | —    | V <sub>O</sub> = -5V, I <sub>O</sub> = -20mA<br>V <sub>O</sub> = -5V, I <sub>O</sub> = -10mA<br>V <sub>O</sub> = -5V, I <sub>O</sub> = -5mA<br>V <sub>O</sub> = -5V, I <sub>O</sub> = -5mA<br>V <sub>O</sub> = -5V, I <sub>O</sub> = -5mA<br>V <sub>O</sub> = -5V, I <sub>O</sub> = -5mA  |
| Input Resistor (R <sub>1</sub> ) Tolerance |  | ΔR <sub>1</sub>                | -30                                    | —    | +30  | %    | —   |
| Resistance Ratio                           |  | R <sub>2</sub> /R <sub>1</sub> | 0.8                                    | 1    | 1.2  | —    | —   |
| Gain-Bandwidth Product*                    |  | f <sub>T</sub>                 | —                                      | 250  | —  | MHz  | V <sub>CE</sub> = -10V, I <sub>E</sub> = 5mA,<br>f = 100MHz   |

\* Transistor – For Reference Only

**TYPICAL CURVES – DDTA143E**

NEW PRODUCT

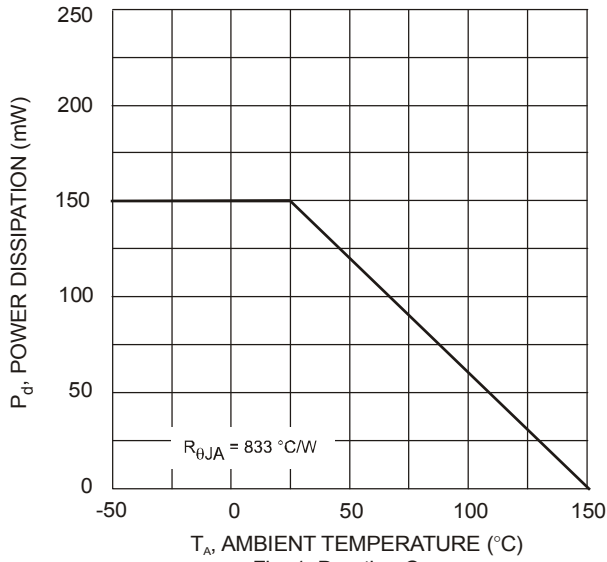


Fig. 1 Derating Curve

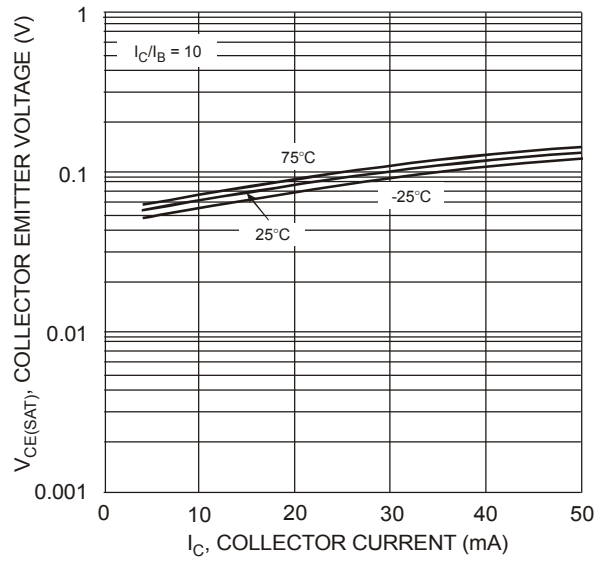


Fig. 2  $V_{CE(SAT)}$  vs.  $I_C$

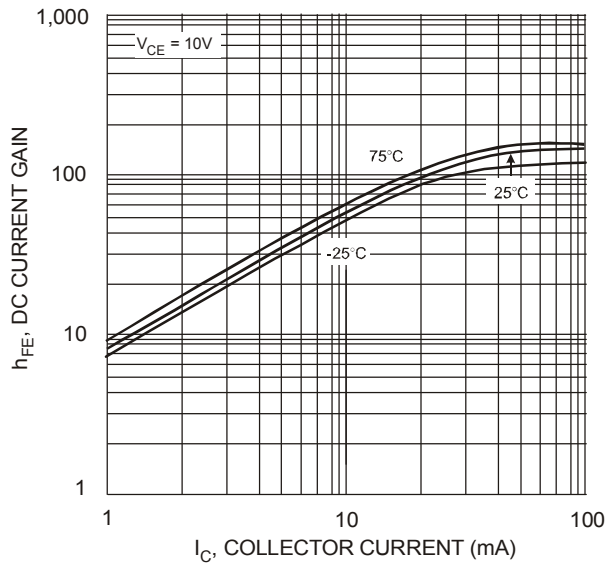


Fig. 3 DC Current Gain

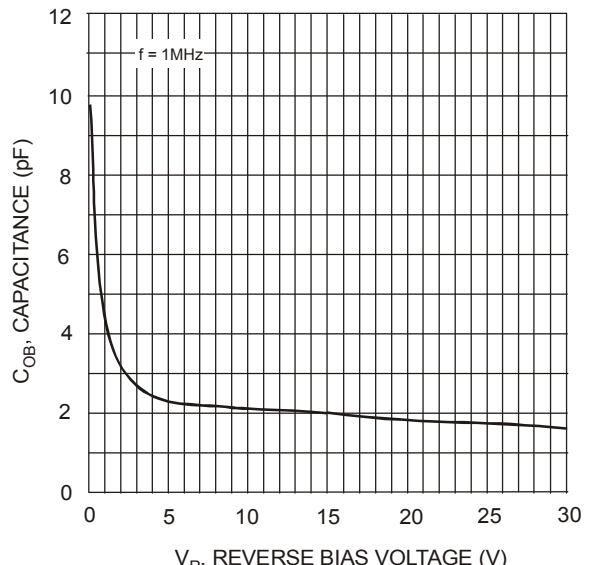


Fig. 4 Output Capacitance

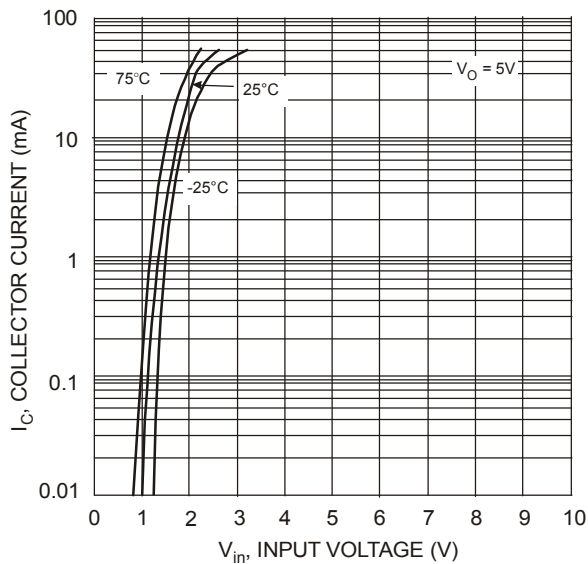


Fig. 5 Collector Current vs. Input Voltage

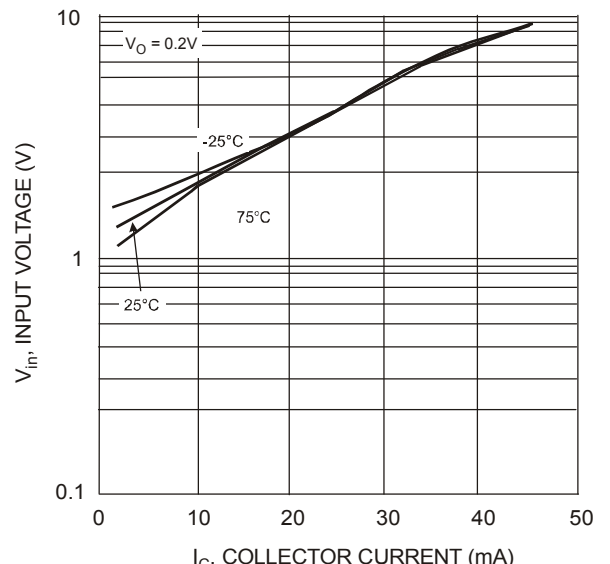


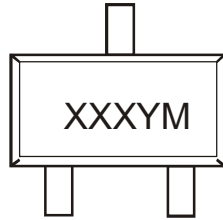
Fig. 6 Input Voltage vs. Collector Current

## Ordering Information (Note 5)

| Device        | Packaging | Shipping         |
|---------------|-----------|------------------|
| DDTA123EE-7-F | SOT-523   | 3000/Tape & Reel |
| DDTA143EE-7-F | SOT-523   | 3000/Tape & Reel |
| DDTA114EE-7-F | SOT-523   | 3000/Tape & Reel |
| DDTA124EE-7-F | SOT-523   | 3000/Tape & Reel |
| DDTA144EE-7-F | SOT-523   | 3000/Tape & Reel |
| DDTA115EE-7-F | SOT-523   | 3000/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. P04 = DDTA123EE)  
 YM = Date Code Marking  
 Y = Year ex: T = 2006  
 M = Month ex: 9 = September

### Date Code Key

| Year | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------|------|------|------|------|------|------|------|------|
| Code | S    | 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   |

### IMPORTANT NOTICE

Diodes Incorporated and its subsidiaries reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to any product herein. Diodes Incorporated does not assume any liability arising out of the application or use of any product described herein; neither does it convey any license under its patent rights, nor the rights of others. The user of products in such applications shall assume all risks of such use and will agree to hold Diodes Incorporated and all the companies whose products are represented on our website, harmless against all damages.

### LIFE SUPPORT

Diodes Incorporated products are not authorized for use as critical components in life support devices or systems without the expressed written approval of the President of Diodes Incorporated.



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.