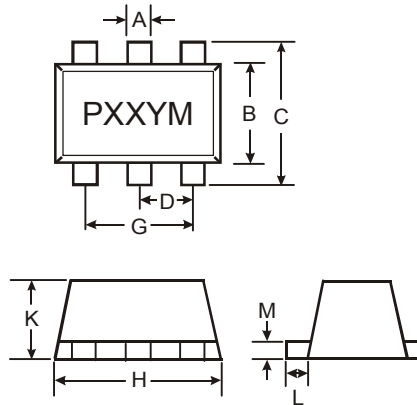


### Features

- Epitaxial Planar Die Construction
- Complementary NPN Types Available (DDC)
- Built-In Biasing Resistors
- **Lead Free By Design/RoHS Compliant (Note 3)**
- **"Green" Device (Note 4 and 5)**

### Mechanical Data

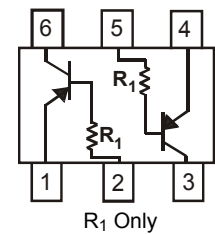
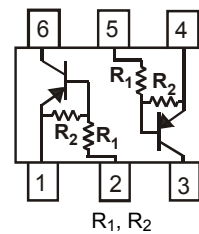
- Case: SOT-563
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminals: Finish - Matte Tin annealed over Alloy 42 leadframe. Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Weight: 0.005 grams (approximate)



| SOT-563              |      |      |      |
|----------------------|------|------|------|
| Dim                  | Min  | Max  | Typ  |
| A                    | 0.15 | 0.30 | 0.25 |
| B                    | 1.10 | 1.25 | 1.20 |
| C                    | 1.55 | 1.70 | 1.60 |
| D                    | 0.50 |      |      |
| G                    | 0.90 | 1.10 | 1.00 |
| H                    | 1.50 | 1.70 | 1.60 |
| K                    | 0.56 | 0.60 | 0.60 |
| L                    | 0.15 | 0.25 | 0.20 |
| M                    | 0.10 | 0.18 | 0.11 |
| All Dimensions in mm |      |      |      |

SEE NOTE 1

| P/N      | R1    | R2    | MARKING |
|----------|-------|-------|---------|
| DDA124EH | 22KΩ  | 22KΩ  | P17     |
| DDA144EH | 47KΩ  | 47KΩ  | P20     |
| DDA143EH | 4.7KΩ | 4.7KΩ | P08     |
| DDA114YH | 10KΩ  | 47KΩ  | P14     |
| DDA123JH | 2.2KΩ | 47KΩ  | P06     |
| DDA114EH | 10KΩ  | 10KΩ  | P13     |
| DDA143TH | 4.7KΩ | —     | P07     |
| DDA114TH | 10KΩ  | —     | P12     |



SCHEMATIC DIAGRAM, TOP VIEW

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

| Characteristic                                       | Symbol                            | Value                                                                                                                                                                        | Unit |
|------------------------------------------------------|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| Supply Voltage (6) to (1) and (3) to (4)             | V <sub>CC</sub>                   | -50                                                                                                                                                                          | V    |
| Input Voltage (2) to (1) and (5) to (4)              | V <sub>IN</sub>                   | DDA124EH +10 to -40<br>DDA144EH +10 to -40<br>DDA143EH +10 to -30<br>DDA114YH +6 to -40<br>DDA123JH +5 to -12<br>DDA114EH +10 to -40<br>DDA143TH +5V max<br>DDA114TH +5V max | V    |
| Output Current                                       | I <sub>O</sub>                    | DDA124EH -30<br>DDA144EH -30<br>DDA143EH -100<br>DDA114YH -70<br>DDA123JH -100<br>DDA114EH -50<br>DDA143TH -100<br>DDA114TH -100                                             | mA   |
| Output Current All                                   | I <sub>C</sub> (Max)              | -100                                                                                                                                                                         | mA   |
| Power Dissipation                                    | P <sub>d</sub>                    | 150                                                                                                                                                                          | mW   |
| Thermal Resistance, Junction to Ambient Air (Note 2) | 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. Package is non-polarized. Parts may be on reel in orientation illustrated, 180° rotated, or mixed (both ways).
  2. Mounted on FR4 Board with recommended pad layout at <http://www.diodes.com/datasheets/ap02001.pdf>.
  3. No purposefully added lead.
  4. 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).
  5. 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 (DDA143TH & DDA114TH only) | 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>CBO</sub>     | —   | —   | -0.5 | μA   | V <sub>CB</sub> = -50V                                                                                                |
| Emitter Cutoff Current                    | I <sub>EBO</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> = -2.5mA / -0.25mA DDA143TH<br>I <sub>C</sub> /I <sub>B</sub> = -1mA / -0.1mA DDA114TH |
| DC Current Transfer Ratio                 | h <sub>FE</sub>      | 100 | 250 | 600  | —    | I <sub>C</sub> = -1mA, V <sub>CE</sub> = -5V                                                                          |
| Gain-Bandwidth Product*                   | f <sub>T</sub>       | —   | 250 | —    | MHz  | V <sub>CE</sub> = -10V, I <sub>E</sub> = 5mA, f = 100MHz                                                              |

| 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            |
|                         |                     | -0.5 | -1.1 | —     |      |                                                           |
|                         |                     | -0.5 | -1.1 | —     |      |                                                           |
|                         |                     | -0.3 | —    | —     |      |                                                           |
|                         |                     | -0.5 | —    | —     |      |                                                           |
|                         |                     | -0.5 | -1.1 | —     |      |                                                           |
| Input Voltage           | V <sub>I(on)</sub>  | —    | -1.9 | -3.0  | V    | V <sub>O</sub> = -0.3V, I <sub>O</sub> = -5mA             |
|                         |                     | —    | -1.9 | -3.0  |      | V <sub>O</sub> = -0.3V, I <sub>O</sub> = -2mA             |
|                         |                     | —    | -1.9 | -3.0  |      | V <sub>O</sub> = -0.3V, I <sub>O</sub> = -20mA            |
|                         |                     | —    | —    | -1.4  |      | V <sub>O</sub> = -0.3V, I <sub>O</sub> = -1mA             |
|                         |                     | —    | —    | -1.1  |      | V <sub>O</sub> = -0.3V, I <sub>O</sub> = -5mA             |
|                         |                     | —    | -1.9 | -3.0  |      | V <sub>O</sub> = -0.3V, I <sub>O</sub> = -10mA            |
| Output Voltage          | V <sub>O(on)</sub>  | —    | -0.1 | -0.3  | V    | I <sub>O</sub> /I <sub>I</sub> = -10mA / -0.5mA           |
|                         |                     | —    | -0.1 | -0.3  |      | I <sub>O</sub> /I <sub>I</sub> = -10mA / -0.5mA           |
|                         |                     | —    | -0.1 | -0.3  |      | I <sub>O</sub> /I <sub>I</sub> = -10mA / -0.5mA           |
|                         |                     | —    | -0.1 | -0.3  |      | I <sub>O</sub> /I <sub>I</sub> = -5mA / -0.25mA           |
|                         |                     | —    | -0.1 | -0.3  |      | I <sub>O</sub> /I <sub>I</sub> = -5mA / -0.25mA           |
|                         |                     | —    | -0.1 | -0.3  |      | I <sub>O</sub> /I <sub>I</sub> = -10mA / -0.5mA           |
| Input Current           | I <sub>I</sub>      | —    | —    | -0.36 | mA   | V <sub>I</sub> = -5V                                      |
|                         |                     | —    | —    | -0.18 |      |                                                           |
|                         |                     | —    | —    | -1.8  |      |                                                           |
|                         |                     | —    | —    | -0.88 |      |                                                           |
|                         |                     | —    | —    | -3.6  |      |                                                           |
|                         |                     | —    | —    | -0.88 |      |                                                           |
| Output Current          | I <sub>O(off)</sub> | —    | —    | -0.5  | μA   | V <sub>CC</sub> = -50V, V <sub>I</sub> = -0V              |
| DC Current Gain         | G <sub>I</sub>      | 56   | —    | —     | —    | V <sub>O</sub> = -5V, I <sub>O</sub> = -5mA               |
|                         |                     | 68   | —    | —     |      | V <sub>O</sub> = -5V, I <sub>O</sub> = -5mA               |
|                         |                     | 20   | —    | —     |      | V <sub>O</sub> = -5V, I <sub>O</sub> = -10mA              |
|                         |                     | 68   | —    | —     |      | V <sub>O</sub> = -5V, I <sub>O</sub> = -10mA              |
|                         |                     | 80   | —    | —     |      | V <sub>O</sub> = -5V, I <sub>O</sub> = -10mA              |
|                         |                     | 30   | —    | —     |      | V <sub>O</sub> = -5V, I <sub>O</sub> = -5mA               |
| 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 - DDA143EH

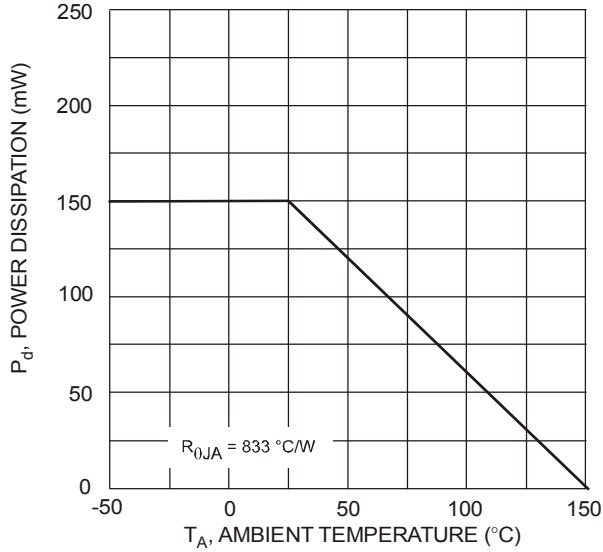


Fig. 1 Derating Curve

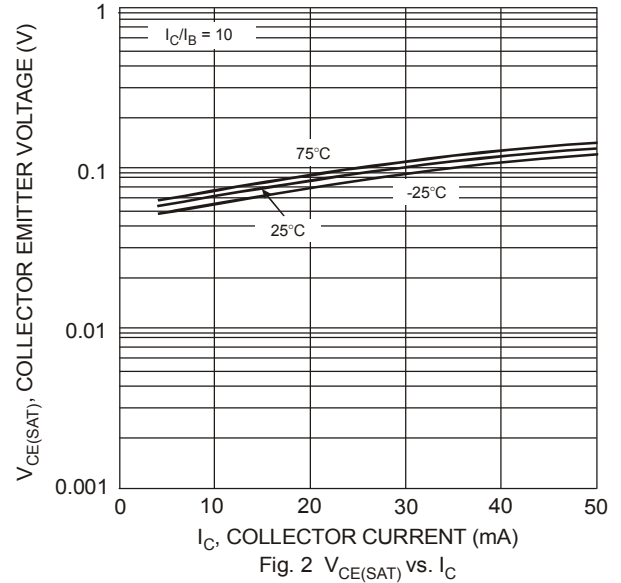


Fig. 2  $V_{CE(SAT)}$  vs.  $I_C$

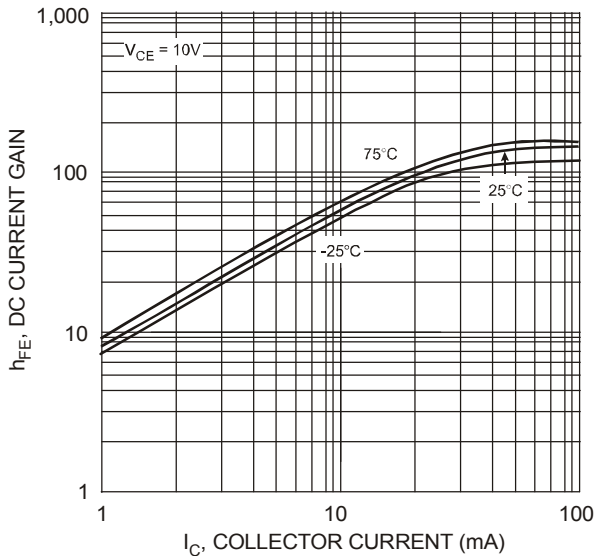


Fig. 3 DC Current Gain

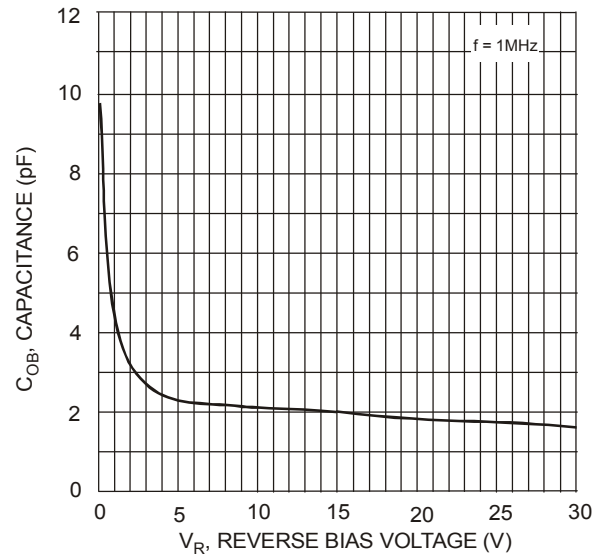


Fig. 4 Output Capacitance

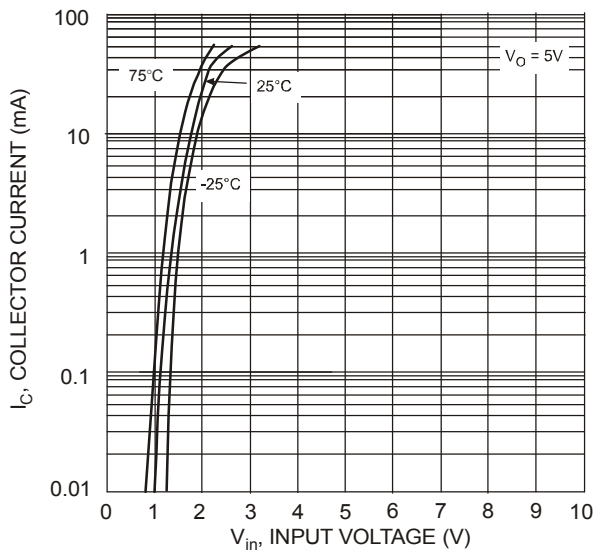


Fig. 5 Collector Current vs. Input Voltage

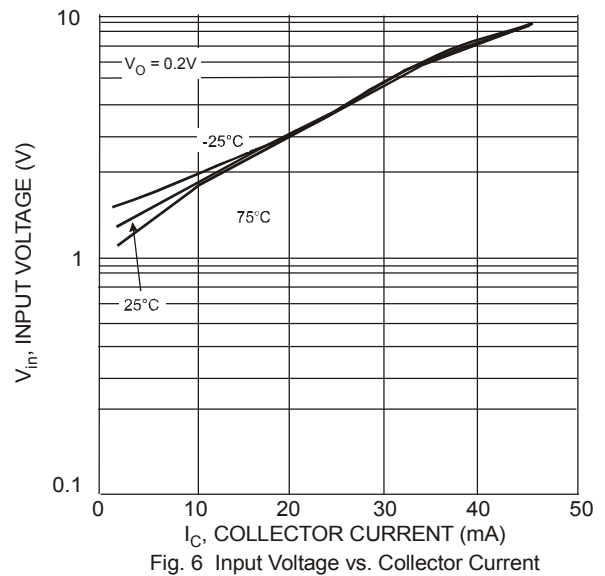


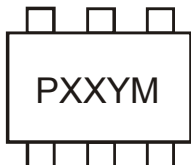
Fig. 6 Input Voltage vs. Collector Current

## Ordering Information (Note 6)

| Device     | Packaging | Shipping         |
|------------|-----------|------------------|
| DDA124EH-7 | SOT-563   | 3000/Tape & Reel |
| DDA144EH-7 | SOT-563   | 3000/Tape & Reel |
| DDA143EH-7 | SOT-563   | 3000/Tape & Reel |
| DDA114YH-7 | SOT-563   | 3000/Tape & Reel |
| DDA123JH-7 | SOT-563   | 3000/Tape & Reel |
| DDA114EH-7 | SOT-563   | 3000/Tape & Reel |
| DDA143TH-7 | SOT-563   | 3000/Tape & Reel |
| DDA114TH-7 | SOT-563   | 3000/Tape & Reel |

Notes: 6. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

## Marking Information



PXX = Product Type Marking Code (See Page 1)

YM = Date Code Marking

Y = Year ex: T = 2006

M = Month ex: 9 = September

### Date Code Key

| Year | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------|------|------|------|------|------|------|------|------|------|------|
| Code | P    | R    | 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   |

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