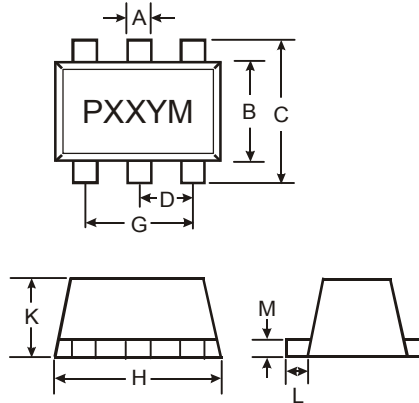


Features

- 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

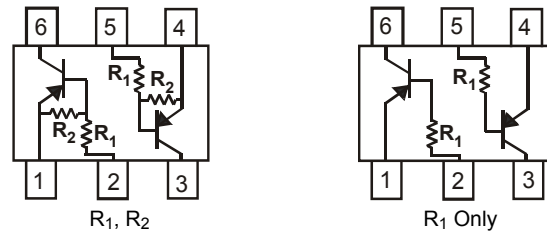
- Case: SOT-563
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminals: Finish - Matte Tin annealed over Alloy 42 leadframe. Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Weight: 0.005 grams (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_A = 25°C unless otherwise specified

| Characteristic | Symbol | Value | Unit |
|--|-----------------------------------|--|------|
| Supply Voltage (6) to (1) and (3) to (4) | V _{CC} | -50 | V |
| Input Voltage (2) to (1) and (5) to (4) | V _{IN} | DDA124EH: +10 to -40 DDA144EH: +10 to -40 DDA143EH: +10 to -30 DDA114YH: +6 to -40 DDA123JH: +5 to -12 DDA114EH: +10 to -40 DDA143TH: +5V max DDA114TH: +5V max | V |
| Output Current | I _O | DDA124EH: -30 DDA144EH: -30 DDA143EH: -100 DDA114YH: -70 DDA123JH: -100 DDA114EH: -50 DDA143TH: -100 DDA114TH: -100 | mA |
| Output Current | I _C (Max) | -100 | mA |
| Power Dissipation | P _d | 150 | mW |
| Thermal Resistance, Junction to Ambient Air (Note 2) | R _{θJA} | 833 | °C/W |
| Operating and Storage Temperature Range | T _J , T _{STG} | -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.
 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 @ $T_A = 25^\circ\text{C}$ unless otherwise specified

| Characteristic (DDA143TH & DDA114TH only) | 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 | $I_E = -50\mu\text{A}$ |
| Collector Cutoff Current | I_{CBO} | — | — | -0.5 | μA | $V_{CB} = -50\text{V}$ |
| Emitter Cutoff Current | I_{EBO} | — | — | -0.5 | μA | $V_{EB} = -4\text{V}$ |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | — | — | -0.3 | V | $I_C/I_B = -2.5\text{mA} / -0.25\text{mA}$ DDA143TH $I_C/I_B = -1\text{mA} / -0.1\text{mA}$ DDA114TH |
| DC Current Transfer Ratio | h_{FE} | 100 | 250 | 600 | — | $I_C = -1\text{mA}$, $V_{CE} = -5\text{V}$ |
| Gain-Bandwidth Product* | f_T | — | 250 | — | MHz | $V_{CE} = -10\text{V}$, $I_E = 5\text{mA}$, $f = 100\text{MHz}$ |

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|-------------------------|--------------|------|------|-------|---------------|--|
| Input Voltage | $V_{I(off)}$ | -0.5 | -1.1 | — | V | $V_{CC} = -5\text{V}$, $I_O = -100\mu\text{A}$ |
| | | -0.5 | -1.1 | — | | |
| -0.5 | | -1.1 | — | | | |
| -0.3 | | — | — | | | |
| -0.5 | | — | — | | | |
| -0.5 | | -1.1 | — | | | |
| Input Voltage | $V_{I(on)}$ | — | -1.9 | -3.0 | V | $V_O = -0.3\text{V}$, $I_O = -5\text{mA}$ $V_O = -0.3\text{V}$, $I_O = -2\text{mA}$ $V_O = -0.3\text{V}$, $I_O = -20\text{mA}$ $V_O = -0.3\text{V}$, $I_O = -1\text{mA}$ $V_O = -0.3\text{V}$, $I_O = -5\text{mA}$ $V_O = -0.3\text{V}$, $I_O = -10\text{mA}$ |
| | | — | -1.9 | -3.0 | | |
| | | — | -1.9 | -3.0 | | |
| | | — | -1.4 | -3.0 | | |
| | | — | -1.1 | -3.0 | | |
| | | -1.9 | -3.0 | -3.0 | | |
| Output Voltage | $V_{O(on)}$ | — | -0.1 | -0.3 | V | $I_O/I_I = -10\text{mA} / -0.5\text{mA}$ $I_O/I_I = -10\text{mA} / -0.5\text{mA}$ $I_O/I_I = -10\text{mA} / -0.5\text{mA}$ $I_O/I_I = -5\text{mA} / -0.25\text{mA}$ $I_O/I_I = -5\text{mA} / -0.25\text{mA}$ $I_O/I_I = -10\text{mA} / -0.5\text{mA}$ |
| | | — | -0.1 | -0.3 | | |
| | | — | -0.1 | -0.3 | | |
| | | — | -0.1 | -0.3 | | |
| | | — | -0.1 | -0.3 | | |
| | | — | -0.1 | -0.3 | | |
| Input Current | I_I | — | — | -0.36 | mA | $V_I = -5\text{V}$ |
| | | — | — | -0.18 | | |
| | | — | — | -1.8 | | |
| | | — | — | -0.88 | | |
| | | — | — | -3.6 | | |
| | | — | — | -0.88 | | |
| Output Current | $I_{O(off)}$ | — | — | -0.5 | μA | $V_{CC} = -50\text{V}$, $V_I = -0\text{V}$ |
| DC Current Gain | G_I | 56 | — | — | — | $V_O = -5\text{V}$, $I_O = -5\text{mA}$ $V_O = -5\text{V}$, $I_O = -5\text{mA}$ $V_O = -5\text{V}$, $I_O = -10\text{mA}$ $V_O = -5\text{V}$, $I_O = -10\text{mA}$ $V_O = -5\text{V}$, $I_O = -10\text{mA}$ $V_O = -5\text{V}$, $I_O = -5\text{mA}$ |
| | | 68 | — | — | | |
| | | 20 | — | — | | |
| | | 68 | — | — | | |
| | | 80 | — | — | | |
| | | 30 | — | — | | |
| Gain-Bandwidth Product* | f_T | — | 250 | — | MHz | $V_{CE} = -10\text{V}$, $I_E = -5\text{mA}$, $f = 100\text{MHz}$ |

* Transistor - For Reference Only

Typical Curves - DDA143EH

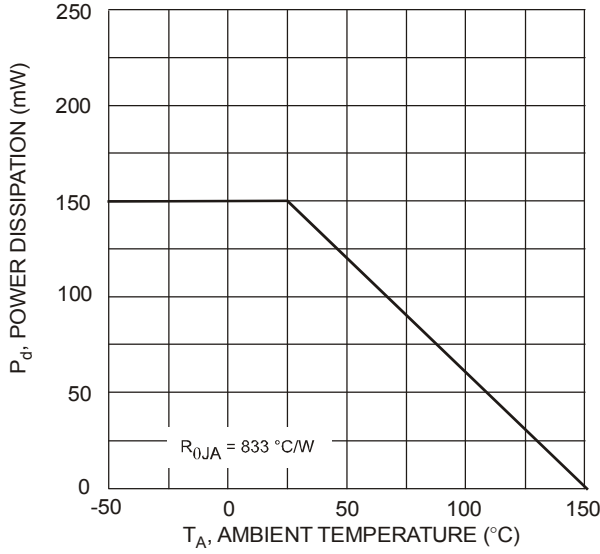


Fig. 1 Derating Curve

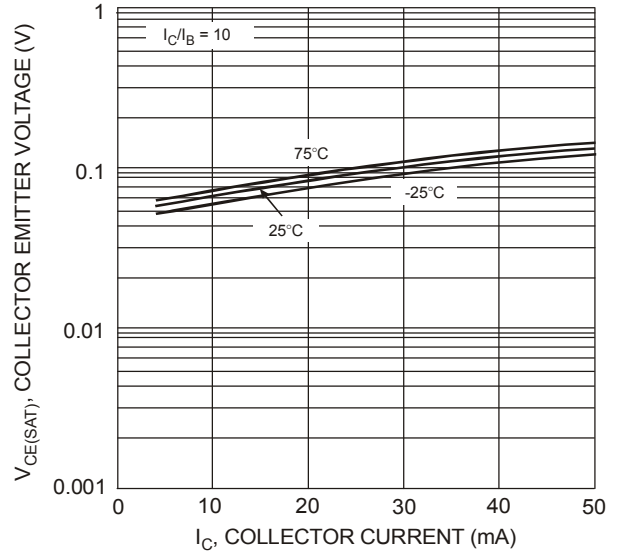


Fig. 2 $V_{CE(SAT)}$ vs. I_C

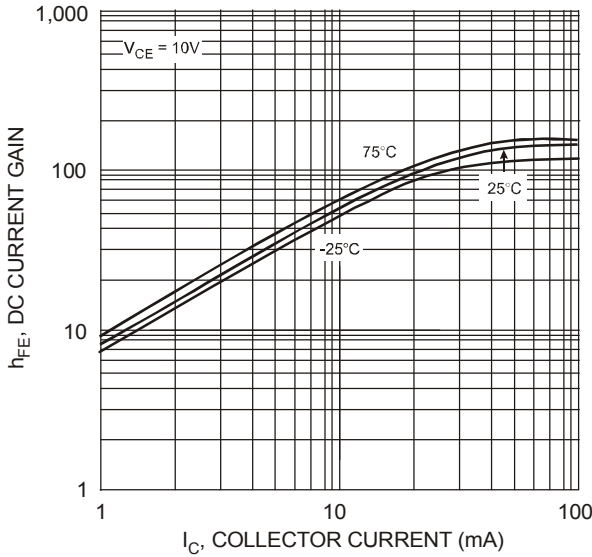


Fig. 3 DC Current Gain

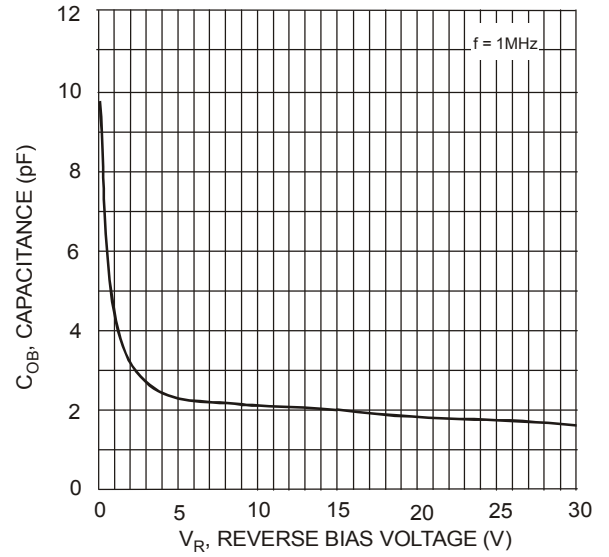


Fig. 4 Output Capacitance

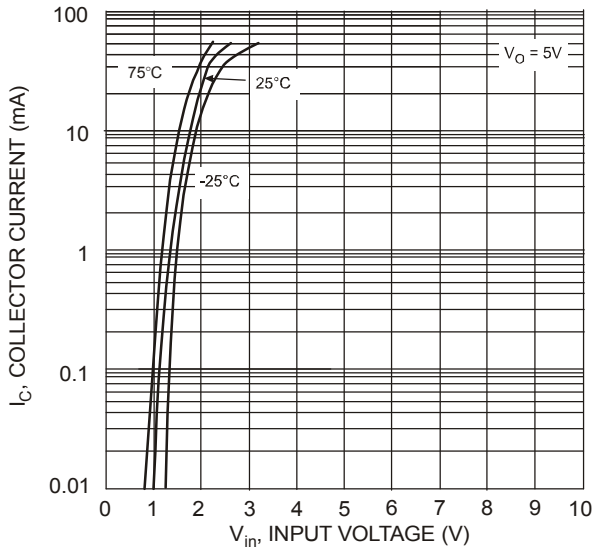


Fig. 5 Collector Current vs. Input Voltage

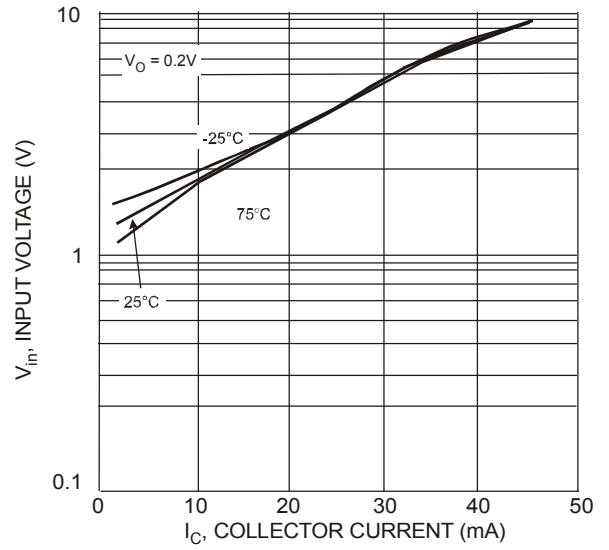


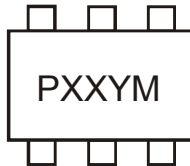
Fig. 6 Input Voltage vs. Collector Current

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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