

NPN PRE-BIASED SMALL SIGNAL SOT-563 DUAL SURFACE MOUNT TRANSISTOR

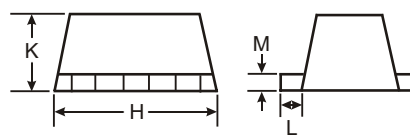
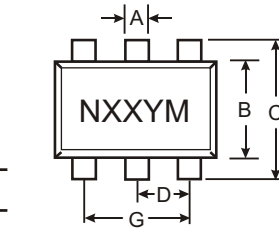
NEW PRODUCT

Features

- Epitaxial Planar Die Construction
- Complementary PNP Types Available (DDA)
- Built-In Biasing Resistors
- Lead-Free Device

Mechanical Data

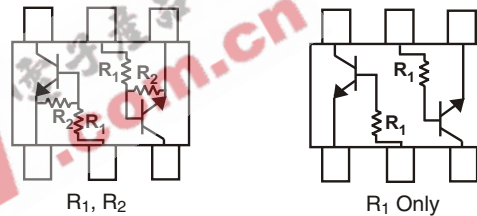
- Case: SOT-563, Molded Plastic
- Case material - UL Flammability Rating 94V-0
- Moisture sensitivity: Level 1 per J-STD-020A
- Terminals: Finish - Matte Tin Solderable per MIL-STD-202, Method 208 (Note 2)
- Terminal Connections: See Diagram
- Weight: 0.005 grams (approx.)



SEE NOTE 1

| 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 | | | |

| P/N | R1 | R2 | MARKING |
|----------|---------------|---------------|---------|
| DDC124EH | 22K Ω | 22K Ω | N17 |
| DDC144EH | 47K Ω | 47K Ω | N20 |
| DDC143EH | 4.7K Ω | 4.7K Ω | N08 |
| DDC114YH | 10K Ω | 47K Ω | N14 |
| DDC123JH | 2.2K Ω | 47K Ω | N06 |
| DDC114EH | 10K Ω | 10K Ω | N13 |
| DDC143TH | 4.7K Ω | - | N07 |
| DDC114TH | 10K Ω | - | N12 |



SCHEMATIC DIAGRAM, TOP VIEW

Maximum Ratings @ T_A = 25°C unless otherwise specified

| Characteristic | Symbol | Value | Unit |
|--|-----------------------------------|--|------|
| Supply Voltage | V _{CC} | 50 | V |
| Input Voltage | V _{IN} | -10 to +40 -10 to +40 -10 to +30 -6 to +40 -5 to +12 -10 to +40 -5 V _{max} -5 V _{max} | V |
| Output Current | I _O | 30 30 100 70 100 50 100 100 | mA |
| Output Current | I _C (Max) | 100 | mA |
| Power Dissipation | P _d | 150 | mW |
| Thermal Resistance, Junction to Ambient Air (Note 3) | R _{θJA} | 833 | °C/W |
| Operating and Storage and Temperature Range | T _J , T _{STG} | -55 to +150 | °C |

- Note:
1. Package is non-polarized. Parts may be on reel in orientation illustrated, 180° rotated, or mixed (both ways).
 2. If lead-bearing terminal plating is required, please contact your Diodes Inc. sales representative for availability and minimum order details.
 3. Mounted on FR4 Board with recommended pad layout at <http://www.diodes.com/datasheets/ap02001.pdf>.

Electrical Characteristics @ T_A = 25°C unless otherwise specified

| Characteristic (DDC143TH & DDC114TH only) | 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 = 50μA |
| Collector Cutoff Current | I _{CB0} | — | — | 0.5 | μA | V _{CB} = 50V |
| Emitter Cutoff Current | I _{EBO} | — | — | 0.5 | μA | V _{EB} = 4V |
| Collector-Emitter Saturation Voltage | V _{CE(sat)} | — | — | 0.3 | V | I _C /I _B = 2.5mA / 0.25mA I _C /I _B = 1mA / 0.1mA DDC143TH DDC114TH |
| DC Current Transfer Ratio | h _{FE} | 100 | 250 | 600 | — | I _C = 1mA, V _{CE} = 5V |
| Gain-Bandwidth Product* | f _T | — | 250 | — | MHz | V _{CE} = 10V, I _E = -5mA, f = 100MHz |

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|-------------------------|---------------------|-----|-----|-----|------|--|
| Input Voltage | V _{I(off)} | — | — | — | V | V _{CC} = 5V, I _O = 100μA |
| | | | | | | |
| Input Voltage | V _{I(on)} | — | — | — | V | V _O = 0.3V, I _O = 5mA V _O = 0.3V, I _O = 2mA V _O = 0.3V, I _O = 20mA V _O = 0.3V, I _O = 1mA V _O = 0.3V, I _O = 5mA V _O = 0.3V, I _O = 10mA |
| | | | | | | |
| Output Voltage | V _{O(on)} | — | 0.1 | 0.3 | V | I _O /I _I = 10mA / 0.5mA I _O /I _I = 10mA / 0.5mA I _O /I _I = 10mA / 0.5mA I _O /I _I = 5mA / 0.25mA I _O /I _I = 5mA / 0.25mA I _O /I _I = 10mA / 0.5mA |
| Input Current | I _I | — | — | — | mA | V _I = 5V |
| Input Current | I _I | — | — | — | mA | V _I = 5V |
| Output Current | I _{O(off)} | — | — | 0.5 | μA | V _{CC} = 50V, V _I = 0V |
| DC Current Gain | G _I | — | — | — | — | V _O = 5V, I _O = 5mA V _O = 5V, I _O = 5mA V _O = 5V, I _O = 10mA V _O = 5V, I _O = 10mA V _O = 5V, I _O = 10mA V _O = 5V, I _O = 5mA |
| DC Current Gain | G _I | — | — | — | — | V _O = 5V, I _O = 5mA V _O = 5V, I _O = 5mA V _O = 5V, I _O = 10mA V _O = 5V, I _O = 10mA V _O = 5V, I _O = 10mA V _O = 5V, I _O = 5mA |
| Gain-Bandwidth Product* | f _T | — | 250 | — | MHz | V _{CE} = 10V, I _E = 5mA, f = 100MHz |

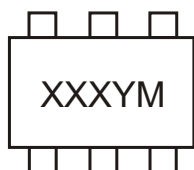
* Transistor - For Reference Only

Ordering Information (Note 4)

| Device | Packaging | Shipping |
|------------|-----------|------------------|
| DDC124EH-7 | SOT-563 | 3000/Tape & Reel |
| DDC144EH-7 | SOT-563 | 3000/Tape & Reel |
| DDC143EH-7 | SOT-563 | 3000/Tape & Reel |
| DDC114YH-7 | SOT-563 | 3000/Tape & Reel |
| DDC123JH-7 | SOT-563 | 3000/Tape & Reel |
| DDC114EH-7 | SOT-563 | 3000/Tape & Reel |
| DDC143TH-7 | SOT-563 | 3000/Tape & Reel |
| DDC114TH-7 | SOT-563 | 3000/Tape & Reel |

Notes: 4. For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

Marking Information

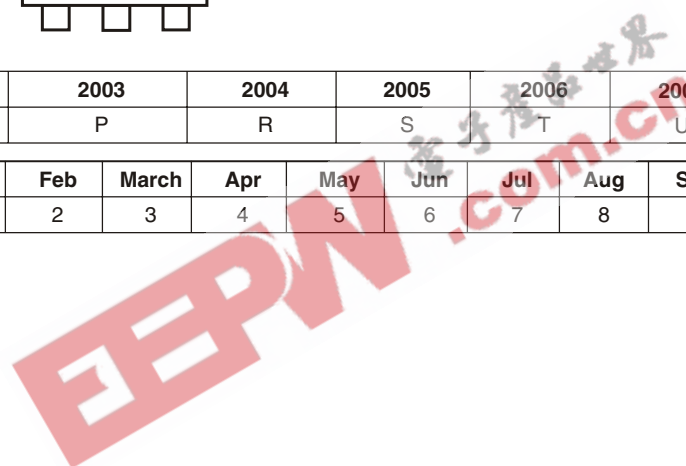


XXX = Product Type Marking Code (See Page 1)
 YM = Date Code Marking
 Y = Year ex: P = 2003
 M = Month ex: 9 = September

Date Code Key

| Year | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|------|------|------|------|------|------|------|------|
| Code | 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 - DDC143EH

NEW PRODUCT

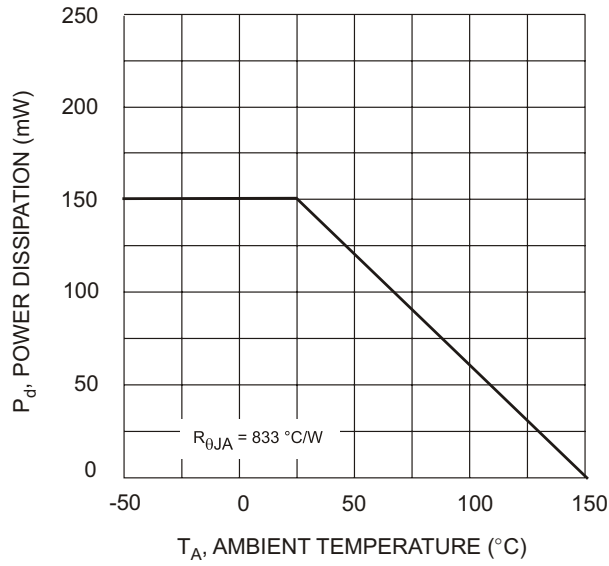


Fig. 1 Derating Curve

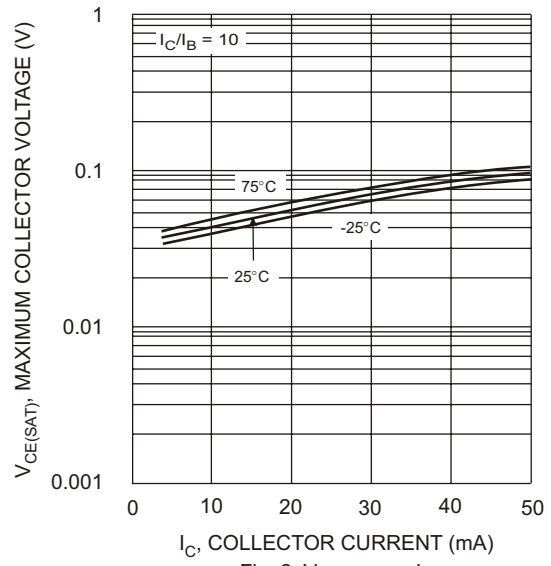


Fig. 2 $V_{CE(SAT)}$ vs. I_C

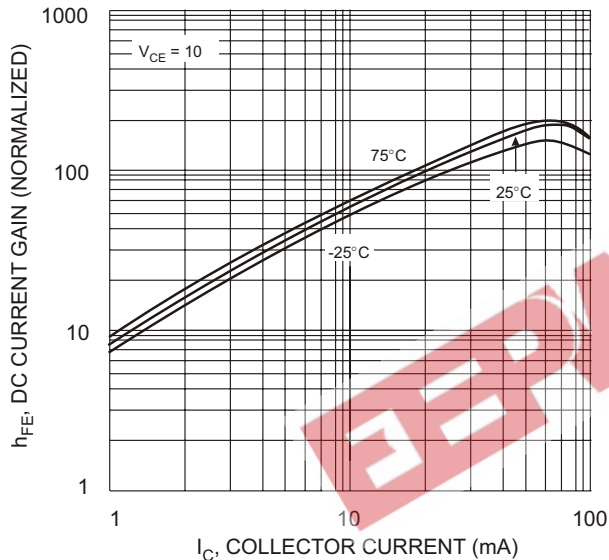


Fig. 3 DC Current Gain

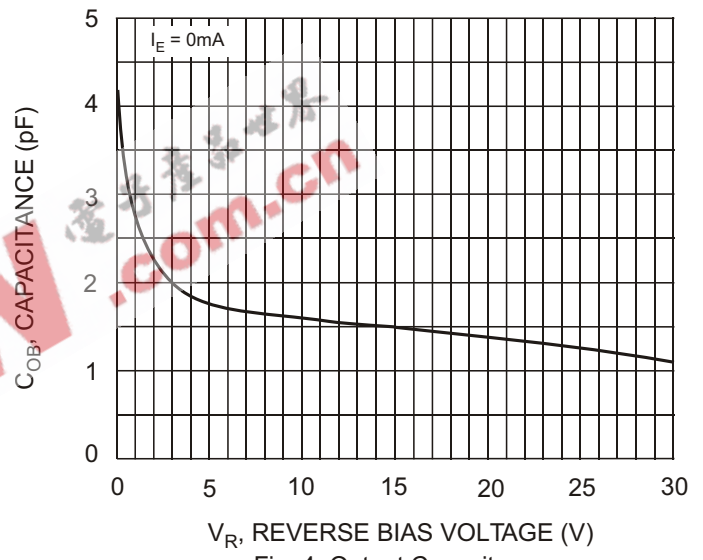


Fig. 4 Output Capacitance

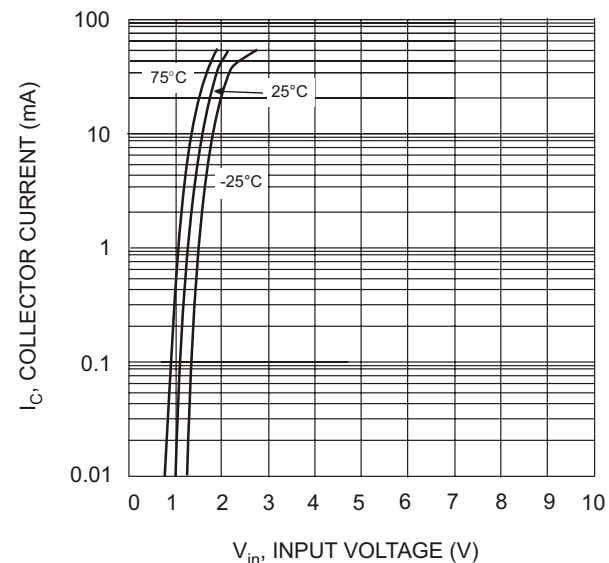


Fig. 5 Collector Current Vs. Input Voltage

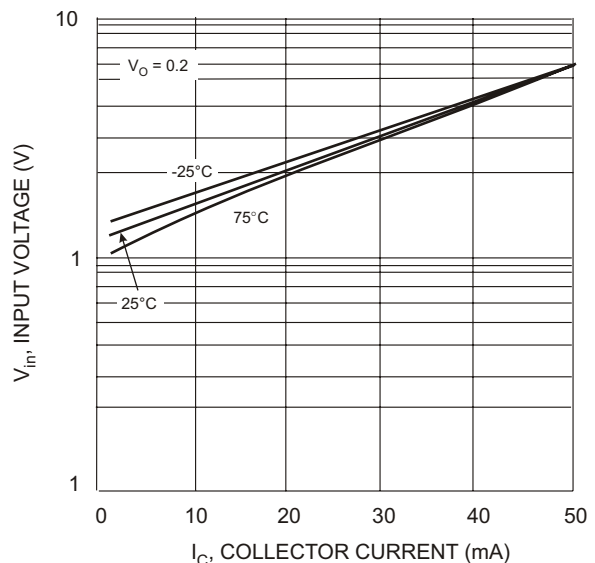


Fig. 6 Input Voltage vs. Collector Current