

NPN PRE-BIASED DUAL TRANSISTOR

Features

- Epitaxial Planar Die Construction
- Complementary PNP Types Available (DDA)
- Built-In Biasing Resistors
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

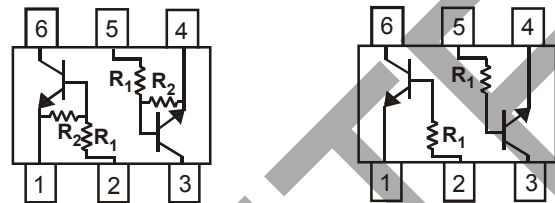
Product Summary

| P/N | R1 (NOM) | R2 (NOM) | MARKING |
|----------|----------|----------|---------|
| DDC122LH | 0.22KΩ | 10KΩ | N81 |
| DDC142JH | 0.47KΩ | 10KΩ | N82 |
| DDC122TH | 0.22KΩ | OPEN | N83 |
| DDC142TH | 0.47KΩ | OPEN | N84 |

Mechanical Data

- Case: SOT-563, Molded Plastic
- Case Material: Molded Plastic.
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminals: Finish - Matte Tin Annealed over Copper Leadframe.
Solderable per MIL-STD-202, Method 208 (E3)
- Terminal Connections: See Diagram
- Weight: 0.005 grams (Approximate)

Pin Assignments



R₁, R₂

R₁ Only

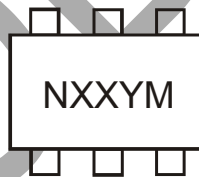
SCHEMATIC DIAGRAM, TOP VIEW

Ordering Information (Note 4)

| Device | Packaging | Shipping |
|------------|-----------|-------------------|
| DDC122LH-7 | SOT-563 | 3,000/Tape & Reel |
| DDC142JH-7 | SOT-563 | 3,000/Tape & Reel |
| DDC122TH-7 | SOT-563 | 3,000/Tape & Reel |
| DDC142TH-7 | SOT-563 | 3,000/Tape & Reel |

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
 2. See http://www.diodes.com/quality/lead_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 4. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

Marking Information



NXX = Product Type Marking Code (See Page 1)
 YM = Date Code Marking
 Y = Year ex: I = 2021
 M = Month ex: 9 = September

Date Code Key

| Year | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | |
|-------|------|------|------|------|------|------|------|------|------|------|------|-----|
| Code | I | J | K | L | M | N | O | P | S | T | U | |
| 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 |

Maximum Ratings (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

| Characteristic | Symbol | Value | Unit |
|---|-----------------|----------------------|--------------------|
| Supply Voltage (Note 4) to (Note 5) and (Note 1) to (Note 3) | V_{CC} | 50 | V |
| Input Voltage (Note 6) to (Note 5) and (Note 7) to (Note 3) DDC122LH DDC142JH | V_{IN} | -5 to +6 -5 to +6 | V |
| Input Voltage (Note 5) to (Note 6) and (Note 3) to (Note 7) DDC122TH DDC142TH | $V_{EBO (MAX)}$ | 5 | V |
| Output Current | All I_C | 100 | mA |
| Power Dissipation | P_d | 150 | mW |
| Thermal Resistance, Junction to Ambient Air (Note 6) | $R_{\theta JA}$ | 833 | $^\circ\text{C/W}$ |

- Notes:
- Package is non-polarized. Parts may be on reel in orientation illustrated, 180° rotated, or mixed (both ways).
 - Mounted on FR4 Board with recommended pad layout at <http://www.diodes.com/datasheets/ap02001.pdf>.
 - 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.) **R1, R2 Types**

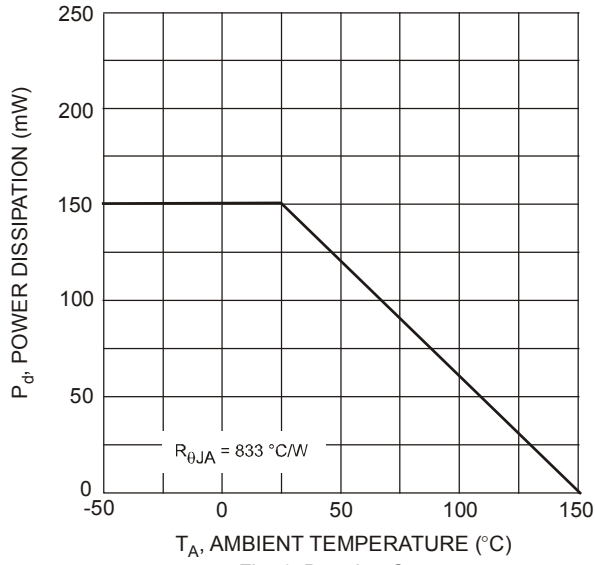
| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|-------------------------|----------------------|------------|-----|------------|---------------|--|
| Input Voltage | DDC122LH DDC142JH | 0.3 0.3 | — | — | V | $V_{CC} = 5V, I_O = 100\mu\text{A}$ |
| | DDC122LH DDC142JH | — | — | 2.0 2.0 | V | $V_O = 0.3V, I_O = 20\text{mA}$ $V_O = 0.3V, I_O = 20\text{mA}$ |
| Output Voltage | $V_{O(on)}$ | — | — | 0.3V | V | $I_O/I_I = 5\text{mA}/0.25\text{mA}$ |
| Input Current | DDC122LH DDC142JH | — | — | 28 13 | mA | $V_I = 5V$ |
| Output Current | $I_{O(off)}$ | — | — | 0.5 | μA | $V_{CC} = 50V, V_I = 0V$ |
| DC Current Gain | DDC122LH DDC142JH | 56 56 | — | — | — | $V_O = 5V, I_O = 10\text{mA}$ |
| Gain-Bandwidth Product* | f_T | — | 200 | — | MHz | $V_{CE} = 10V, I_E = 5\text{mA}, f = 100\text{MHz}$ |

* Transistor - For Reference Only

Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.) **R1-Only**

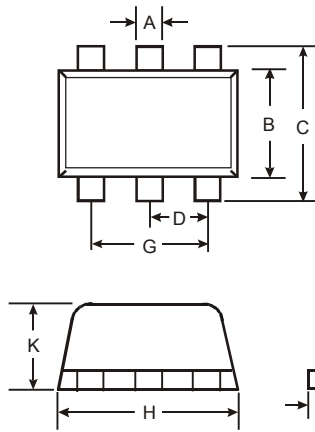
| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|--------------------------------------|----------------------|------------|------------|------------|---------------|--|
| Collector-Base Breakdown Voltage | BV_{CBO} | 50 | — | — | V | $I_C = 50\mu\text{A}$ |
| Collector-Emitter Breakdown Voltage | BV_{CEO} | 40 | — | — | V | $I_C = 1\text{mA}$ |
| Emitter-Base Breakdown Voltage | DDC122TH DDC142TH | 5 | — | — | V | $I_E = 50\mu\text{A}$ $I_E = 50\mu\text{A}$ |
| Collector Cutoff Current | I_{CBO} | — | — | 0.5 | μA | $V_{CB} = 50V$ |
| Emitter Cutoff Current | DDC122TH DDC142TH | — | — | 0.5 0.5 | μA | $V_{EB} = 4V$ |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | — | — | 0.3 | V | $I_C = 5\text{mA}, I_B = 0.25\text{mA}$ |
| DC Current Transfer Ratio | DDC122TH DDC142TH | 100 100 | 250 250 | 600 600 | — | $I_C = 1\text{mA}, V_{CE} = 5V$ |
| Gain-Bandwidth Product* | f_T | — | 200 | — | MHz | $V_{CE} = 10V, I_E = -5\text{mA}, f = 100\text{MHz}$ |

* Transistor - For Reference Only



Package Outline Dimensions

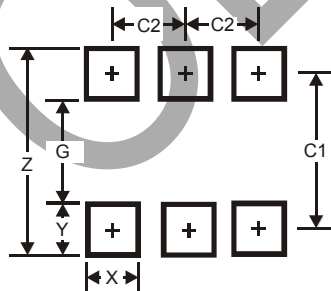
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



| SOT563 | | | |
|----------------------|------|------|------|
| Dim | Min | Max | Typ |
| A | 0.15 | 0.30 | 0.20 |
| 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 | 0.55 | 0.60 | 0.60 |
| L | 0.10 | 0.30 | 0.20 |
| M | 0.10 | 0.18 | 0.11 |
| All Dimensions in mm | | | |

Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



| Dimensions | Value (in mm) |
|------------|---------------|
| Z | 2.2 |
| G | 1.2 |
| X | 0.375 |
| Y | 0.5 |
| C1 | 1.7 |
| C2 | 0.5 |

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