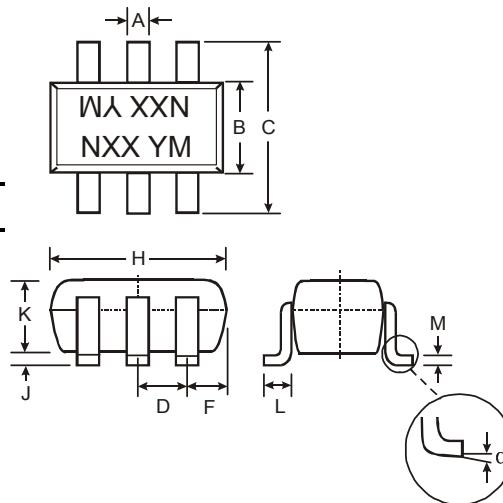


Features

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

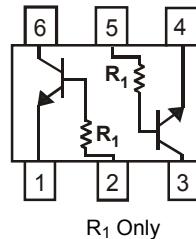
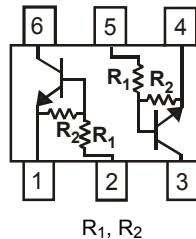
Mechanical Data

- Case: SOT-363
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminals: Finish - Matte Tin Solderable per MIL-STD-202, Method 208
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe)
- Terminal Connections: See Diagram
- Marking Information: See Diagrams & Page 3
- Ordering Information: See Page 3
- Weight: 0.006 grams (approximate)



| SOT-363 | | |
|----------------------|--------------|------|
| Dim | Min | Max |
| A | 0.10 | 0.30 |
| B | 1.15 | 1.35 |
| C | 2.00 | 2.20 |
| D | 0.65 Nominal | |
| F | 0.30 | 0.40 |
| H | 1.80 | 2.20 |
| J | — | 0.10 |
| K | 0.90 | 1.00 |
| L | 0.25 | 0.40 |
| M | 0.10 | 0.25 |
| α | 0° | 8° |
| All Dimensions in mm | | |

| P/N | R1 (NOM) | R2 (NOM) | MARKING |
|----------|----------|----------|---------|
| DDC122LU | 0.22K | 10K | N81 |
| DDC142JU | 0.47K | 10K | N82 |
| DDC122TU | 0.22K | OPEN | N83 |
| DDC142TU | 0.47K | OPEN | N84 |



SCHEMATIC DIAGRAM

Maximum Ratings

 @ $T_A = 25^\circ\text{C}$ 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} | -5 to +6 -5 to +6 | V |
| Input Voltage (1) to (2) and (4) to (5) | $V_{EBO} (\text{MAX})$ | 5 | V |
| Output Current All | I_C | 100 | mA |
| Power Dissipation (Note 1) | P_d | 200 | mW |
| Thermal Resistance, Junction to Ambient Air (Note 2) | $R_{\theta JA}$ | 625 | °C/W |

Notes:

- 150mW per element must not be exceeded.
2. Mounted on FR4 PC 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

R1, R2 Types

| Characteristic | | Symbol | Min | Typ | Max | Unit | Test Condition |
|-------------------------|----------------------|---------------------|------------|-----|------------|---------------|--|
| Input Voltage | DDC122LU DDC142JU | $V_{I(\text{off})}$ | 0.3 0.3 | — | — | V | $V_{CC} = 5\text{V}$, $I_O = 100\mu\text{A}$ |
| | DDC122LU DDC142JU | $V_{I(\text{on})}$ | — | — | 2.0 2.0 | V | $V_O = 0.3\text{V}$, $I_O = 20\text{mA}$ $V_O = 0.3\text{V}$, $I_O = 20\text{mA}$ |
| Output Voltage | | $V_{O(\text{on})}$ | — | — | 0.3V | V | $I_O/I_I = 5\text{mA}/0.25\text{mA}$ |
| Input Current | | I_I | — | — | 28 13 | mA | $V_I = 5\text{V}$ |
| Output Current | | $I_O(\text{off})$ | — | — | 0.5 | μA | $V_{CC} = 50\text{V}$, $V_I = 0\text{V}$ |
| DC Current Gain | DDC122LU DDC142JU | G_I | 56 56 | — | — | — | $V_O = 5\text{V}$, $I_O = 10\text{mA}$ |
| Gain-Bandwidth Product* | | f_T | — | 200 | — | MHz | $V_{CE} = 10\text{V}$, $I_E = 5\text{mA}$, $f = 100\text{MHz}$ |

* Transistor - For Reference Only

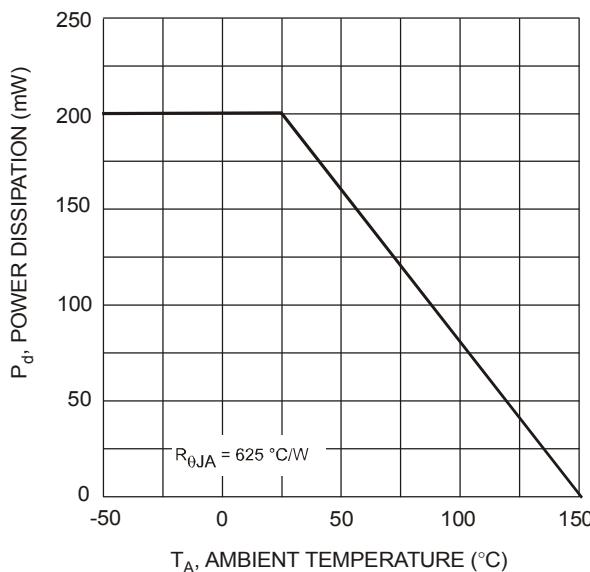
Electrical Characteristics

@ $T_A = 25^\circ\text{C}$ 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 | DDC122TU DDC142TU | BV_{EBO} | 5 | — | — | V | $I_E = 50\mu\text{A}$ $I_E = 50\mu\text{A}$ |
| Collector Cutoff Current | | I_{CBO} | — | — | 0.5 | μA | $V_{CB} = 50\text{V}$ |
| Emitter Cutoff Current | DDC122TU DDC142TU | I_{EBO} | — | — | 0.5 0.5 | μA | $V_{EB} = 4\text{V}$ |
| Collector-Emitter Saturation Voltage | | $V_{CE(\text{sat})}$ | — | — | 0.3 | V | $I_C = 5\text{mA}$, $I_B = 0.25\text{mA}$ |
| DC Current Transfer Ratio | DDC122TU DDC142TU | h_{FE} | 100 100 | 250 250 | 600 600 | — | $I_C = 1\text{mA}$, $V_{CE} = 5\text{V}$ |
| Gain-Bandwidth Product* | | f_T | — | 200 | — | MHz | $V_{CE} = 10\text{V}$, $I_E = -5\text{mA}$, $f = 100\text{MHz}$ |

* Transistor - For Reference Only



T_A, AMBIENT TEMPERATURE (°C)

Fig. 1 Power Derating Curve

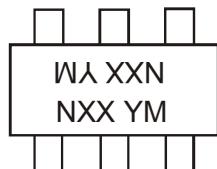
(150mW per element must not be exceeded).

Ordering Information (Note 6)

| Device | Packaging | Shipping |
|--------------|-----------|------------------|
| DDC122LU-7-F | SOT-363 | 3000/Tape & Reel |
| DDC142JU-7-F | SOT-363 | 3000/Tape & Reel |
| DDC122TU-7-F | SOT-363 | 3000/Tape & Reel |
| DDC142TU-7-F | SOT-363 | 3000/Tape & Reel |

Notes: 6. 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 Diagrams
 YM = Date Code Marking
 Y = Year ex: T = 2006
 M = Month ex: 9 = September

Date Code Key

| Year | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------|------|------|------|------|------|------|------|------|------|------|------|
| Code | N | 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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