

# DDC (LO-R1) U

## NPN PRE-BIASED SMALL SIGNAL DUAL SURFACE MOUNT TRANSISTOR

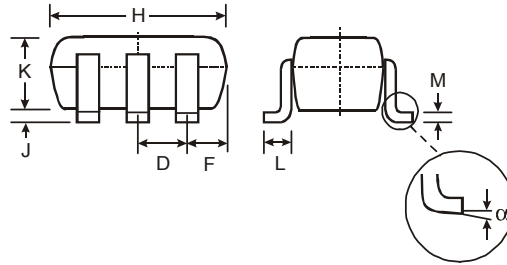
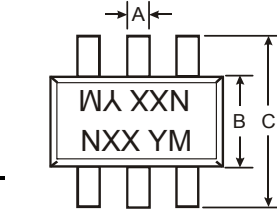
### Features

- 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)

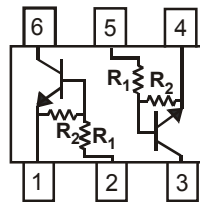
### Mechanical Data

- 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)

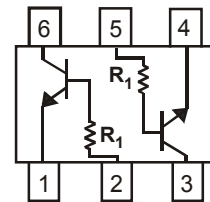
| P/N      | R1 (NOM) | R2 (NOM) | MARKING |
|----------|----------|----------|---------|
| DDC122LU | 0.22K    | 10K      | N81     |
| DDC142JU | 0.47K    | 10K      | N82     |
| DDC122TU | 0.22K    | OPEN     | N83     |
| DDC142TU | 0.47K    | OPEN     | N84     |



| 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 |
| $\alpha$             | 0°           | 8°   |
| All Dimensions in mm |              |      |



R<sub>1</sub>, R<sub>2</sub>



R<sub>1</sub> Only

SCHEMATIC DIAGRAM

### 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>        | -5 to +6 | V    |
| Input Voltage (1) to (2) and (4) to (5)     | V <sub>EBO</sub> (MAX) | 5        | V    |
| Output Current                              | I <sub>C</sub>         | 100      | mA   |
| Power Dissipation                           | P <sub>d</sub>         | 200      | mW   |
| Thermal Resistance, Junction to Ambient Air | R <sub>θJA</sub>       | 625      | °C/W |

- Notes:
1. 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](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

## R1, R2 Types

| Characteristic          |                      | Symbol              | Min        | Typ | Max        | Unit | Test Condition                                                                               |
|-------------------------|----------------------|---------------------|------------|-----|------------|------|----------------------------------------------------------------------------------------------|
| Input Voltage           | DDC122LU<br>DDC142JU | V <sub>I(off)</sub> | 0.3<br>0.3 | —   | —          | V    | V <sub>CC</sub> = 5V, I <sub>O</sub> = 100μA                                                 |
|                         | DDC122LU<br>DDC142JU | V <sub>I(on)</sub>  | —          | —   | 2.0<br>2.0 | V    | V <sub>O</sub> = 0.3V, I <sub>O</sub> = 20mA<br>V <sub>O</sub> = 0.3V, I <sub>O</sub> = 20mA |
| Output Voltage          |                      | V <sub>O(on)</sub>  | —          | —   | 0.3V       | V    | I <sub>O</sub> /I <sub>I</sub> = 5mA/0.25mA                                                  |
| Input Current           | DDC122LU<br>DDC142JU | I <sub>I</sub>      | —          | —   | 28<br>13   | mA   | V <sub>I</sub> = 5V                                                                          |
| Output Current          |                      | I <sub>O(off)</sub> | —          | —   | 0.5        | μA   | V <sub>CC</sub> = 50V, V <sub>I</sub> = 0V                                                   |
| DC Current Gain         | DDC122LU<br>DDC142JU | G <sub>I</sub>      | 56<br>56   | —   | —          | —    | V <sub>O</sub> = 5V, I <sub>O</sub> = 10mA                                                   |
| Gain-Bandwidth Product* |                      | f <sub>T</sub>      | —          | 200 | —          | MHz  | V <sub>CE</sub> = 10V, I <sub>E</sub> = 5mA, f = 100MHz                                      |

\* Transistor - For Reference Only

## Electrical Characteristics

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

## R1- Only

| Characteristic                       |                      | 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>    | 40         | —          | —          | V    | I <sub>C</sub> = 1mA                                     |
| Emitter-Base Breakdown Voltage       | DDC122TU<br>DDC142TU | BV <sub>EBO</sub>    | 5          | —          | —          | V    | I <sub>E</sub> = 50μA<br>I <sub>E</sub> = 50μA           |
| Collector Cutoff Current             |                      | I <sub>CBO</sub>     | —          | —          | 0.5        | μA   | V <sub>CB</sub> = 50V                                    |
| Emitter Cutoff Current               | DDC122TU<br>DDC142TU | I <sub>EBO</sub>     | —<br>—     | —          | 0.5<br>0.5 | μA   | V <sub>EB</sub> = 4V                                     |
| Collector-Emitter Saturation Voltage |                      | V <sub>CE(sat)</sub> | —          | —          | 0.3        | V    | I <sub>C</sub> = 5mA, I <sub>B</sub> = 0.25mA            |
| DC Current Transfer Ratio            | DDC122TU<br>DDC142TU | h <sub>FE</sub>      | 100<br>100 | 250<br>250 | 600<br>600 | —    | I <sub>C</sub> = 1mA, V <sub>CE</sub> = 5V               |
| Gain-Bandwidth Product*              |                      | f <sub>T</sub>       | —          | 200        | —          | MHz  | V <sub>CE</sub> = 10V, I <sub>E</sub> = -5mA, f = 100MHz |

\* Transistor - For Reference Only

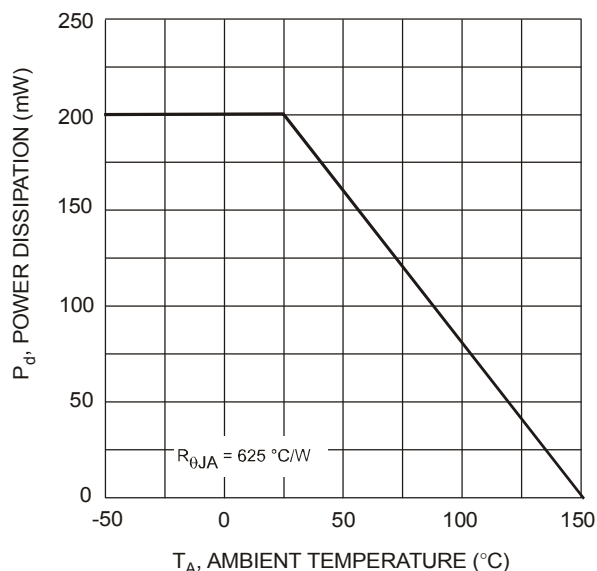


Fig. 1 Power Derating Curve

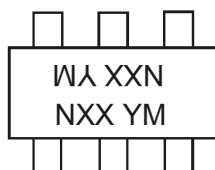
(150mW per element must not be exceeded).

## 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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