



# DDTC (LO-R1) U

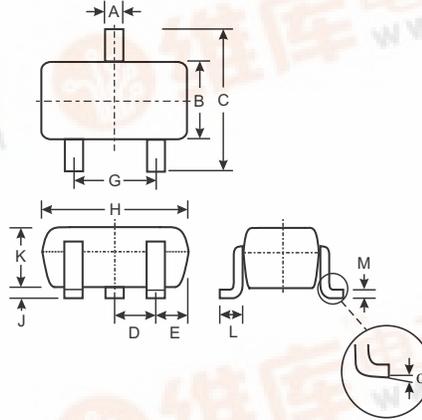
## NPN PRE-BIASED 100 mA SOT-323 SURFACE MOUNT TRANSISTOR

### Features

- Epitaxial Planar Die Construction
- Complementary PNP Types Available (DDTA)
- Built-In Biasing Resistors
- **Lead Free/RoHS Compliant (Note 2)**
- **"Green" Device (Note 3 & 4)**

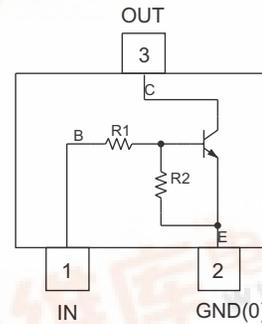
### Mechanical Data

- Case: SOT-323
- Case Material: Molded Plastic, "Green" Molding Compound, Note 4. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminals: Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe).
- Marking: Date Code and Type Code, See Page 2
- Ordering Information (See Page 2)
- Weight: 0.006 grams (approximate)



SOT-323		
Dim	Min	Max
A	0.25	0.40
B	1.15	1.35
C	2.00	2.20
D	0.65 Nominal	
E	0.30	0.40
G	1.20	1.40
H	1.80	2.20
J	0.0	0.10
K	0.90	1.00
L	0.25	0.40
M	0.10	0.18
$\alpha$	0°	8°
<b>All Dimensions in mm</b>		

P/N	R1 (NOM)	R2 (NOM)	Type Code
DDTC122LU	0.22K $\Omega$	10K $\Omega$	N81
DDTC142JU	0.47K $\Omega$	10K $\Omega$	N82
DDTC122TU	0.22K $\Omega$	OPEN	N83
DDTC142TU	0.47K $\Omega$	OPEN	N84



Schematic and Pin Configuration

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

Characteristic	Symbol	Value	Unit
Supply Voltage, (3) to (2)	V <sub>CC</sub>	50	V
Input Voltage, (1) to (2)	V <sub>IN</sub>	-5 to +6 -5 to +6	V
Input Voltage, (2) to (1)	V <sub>EBO</sub> (MAX)	5	V
Output Current	I <sub>C</sub>	100	mA
Power Dissipation (Note 1)	P <sub>d</sub>	200	mW
Thermal Resistance, Junction to Ambient Air (Note 1)	R <sub>θJA</sub>	625	°C/W
Operating and Storage and Temperature Range	T <sub>j</sub> , T <sub>STG</sub>	-55 to +150	°C

- Note:
1. Mounted on FR4 PC Board with recommended pad layout at <http://www.diodes.com/datasheets/ap02001.pdf>.
  2. No purposefully added lead.
  3. 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).
  4. Product manufactured with Date Code 0609 (week 9, 2006) and newer are built with Green Molding Compound. Product manufactured prior to Date Code 0609 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	DDTC122LU DDTC142JU	V <sub>I(off)</sub>	0.3 0.3	—	—	V	V <sub>CC</sub> = 5V, I <sub>O</sub> = 100μA
	DDTC122LU DDTC142JU	V <sub>I(on)</sub>	—	—	2.0 2.0	V	V <sub>O</sub> = 0.3V, I <sub>O</sub> = 20mA 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	DDTC122LU DDTC142JU	I <sub>I</sub>	—	—	28 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	DDTC122LU DDTC142JU	G <sub>I</sub>	56 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	DDTC122TU DDTC142TU	BV <sub>EBO</sub>	5	—	—	V	I <sub>E</sub> = 50μA I <sub>E</sub> = 50μA
Collector Cutoff Current	I <sub>CBO</sub>	—	—	0.5	μA	V <sub>CB</sub> = 50V	
Emitter Cutoff Current	DDTC122TU DDTC142TU	I <sub>EBO</sub>	—	—	0.5 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	DDTC122TU DDTC142TU	h <sub>FE</sub>	100 100	250 250	600 600	—	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

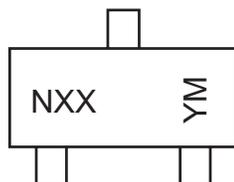
\* Transistor - For Reference Only

## Ordering Information (Note 4 & 5)

Device	Packaging	Shipping
DDTC122LU-7-F	SOT-323	3000/Tape & Reel
DDTC142JU-7-F	SOT-323	3000/Tape & Reel
DDTC122TU-7-F	SOT-323	3000/Tape & Reel
DDTC142TU-7-F	SOT-323	3000/Tape & Reel

- Notes: 4. Product manufactured with Date Code 0609 (week 9, 2006) and newer are built with Green Molding Compound. Product manufactured prior to Date Code 0609 are built with Non-Green Molding Compound and may contain Halogens or Sb2O3 Fire Retardants.  
5. For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

## Marking Information



NXX = Product Type Marking Code, See Table on Page 1  
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

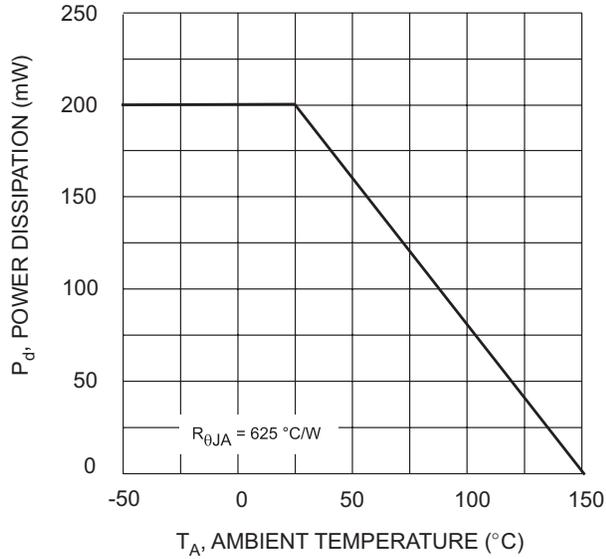


Fig. 1 Power Derating Curve

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