



# DDTC (LO-R1) U

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

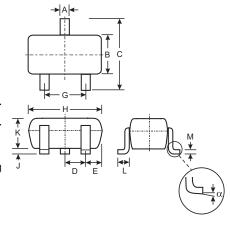
#### **Features**

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

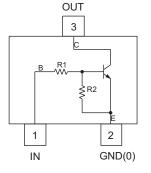
#### **Mechanical Data**

- 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)

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



	SOT-323										
Dim	Min	Max									
Α	0.25	0.40									
В	1.15	1.35									
С	2.00	2.20									
D	0.65 Nominal										
E	0.30	0.40									
G	1.20	1.40									
Н	1.80	2.20									
J	0.0	0.10									
K	0.90	1.00									
L	0.25	0.40									
М	0.10	0.18									
α	0°	8°									
All Din	ensions	in mm									



Schematic and Pin Configuration

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

Characteris	stic	Symbol	Value	Unit	
Supply Voltage, (3) to (2)		$V_{CC}$	50	V	
Input Voltage, (1) to (2)	DDTC122LU DDTC142JU	V <sub>IN</sub>	-5 to +6 -5 to +6	V	
Input Voltage, (2) to (1)	DDTC122TU DDTC142TU	V <sub>EBO (MAX)</sub>	5	V	
Output Current	All	Ic	100	mA	
Power Dissipation (Note 1)		P <sub>d</sub>	200	mW	
Thermal Resistance, Junction to Ar	nbient Air (Note 1)	$R_{ heta JA}$	625	°C/W	
Operating and Storage and Tempe	rature 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.
- 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	Characteristic					Unit	Test Condition
Input Voltage	DDTC122LU DDTC142JU	V <sub>I(off)</sub>	0.3 0.3	_	_	V	$V_{CC} = 5V$ , $I_{O} = 100\mu A$
	DDTC122LU DDTC142JU	V <sub>I(on)</sub>	_	_	2.0 2.0	٧	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	$I_0/I_1 = 5mA/0.25mA$
Input Current DDTC122LU DDTC142JU		II	_	_	28 13	mA	V <sub>I</sub> = 5V
Output Current		I <sub>O(off)</sub>	_	_	0.5	μΑ	$V_{CC} = 50V$ , $V_I = 0V$
DC Current Gain DDTC122LU DDTC142JU		G <sub>l</sub>	56 56	_	_	_	V <sub>O</sub> = 5V, I <sub>O</sub> = 10mA
Gain-Bandwidth Product*		f⊤	_	200	_	MHz	$V_{CE} = 10V$ , $I_E = 5mA$ , $f = 100MHz$

<sup>\*</sup> Transistor - For Reference Only

# **Electrical Characteristics** @ T<sub>A</sub> = 25°C unless otherwise specified

## R1-Only

Characteristic		Symbol	Min	Тур	Max	Unit	Test Condition
Collector-Base Breakdown Voltag	BV <sub>CBO</sub>	50	_	_	V	$I_C = 50\mu A$	
Collector-Emitter Breakdown Volta	BV <sub>CEO</sub>	40	_	_	V	$I_C = 1mA$	
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	5	_	_	٧	I <sub>E</sub> = 50μA I <sub>E</sub> = 50μA	
Collector Cutoff Current		I <sub>CBO</sub>	_	_	0.5	μΑ	V <sub>CB</sub> = 50V
Emitter Cutoff Current DDTC122TU DDTC142TU		I <sub>EBO</sub>	_	_	0.5 0.5	μА	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⊤	_	200	_	MHz	V <sub>CE</sub> = 10V, I <sub>E</sub> = -5mA, f = 100MHz	

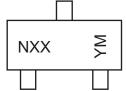
<sup>\*</sup> Transistor - For Reference Only

## 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.

# **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

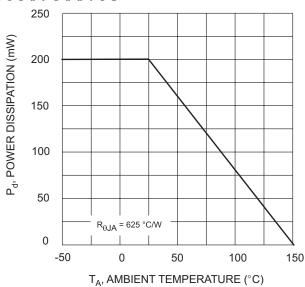
Date Code Key

Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Code	N	Р	R	S	Т	U	V	W	Х	Υ	Z

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	0	N	D

<sup>5.</sup> For Packaging Details, go to our website at http://www.diodes.com/datasheets/ap02007.pdf.





A, AMBIENT TEMPERATURE (°C)
Fig. 1 Power Derating Curve

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