DDTC (LO-R1) U

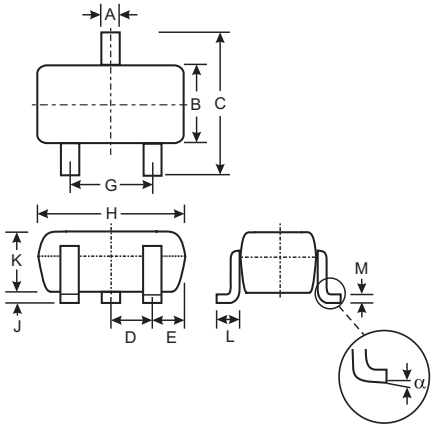
NPN PRE-BIASED 100 mA SOT-323 SURFACE MOUNT TRANSISTOR

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)**

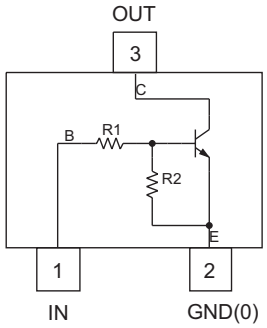
Mechanical Data

- 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
α	0°	8°
All Dimensions in mm		

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



Schematic and Pin Configuration

Maximum Ratings @ T_A = 25°C unless otherwise specified

Characteristic		Symbol	Value	Unit
Supply Voltage, (3) to (2)		V_{CC}	50	V
Input Voltage, (1) to (2)	DDTC122LU DDTC142JU	V_{IN}	-5 to +6 -5 to +6	V
Input Voltage, (2) to (1)	DDTC122TU DDTC142TU	$V_{EBO\ (MAX)}$	5	V
Output Current	All	I_C	100	mA
Power Dissipation (Note 1)		P_d	200	mW
Thermal Resistance, Junction to Ambient Air (Note 1)		$R_{\theta JA}$	625	°C/W
Operating and Storage and Temperature Range		T_j, T_{STG}	-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 @ $T_A = 25°C$ unless otherwise specified — R1, R2 Types

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage	DDTC122LU DDTC142JU	$V_{I(off)}$	0.3 0.3	—	—	V	$V_{CC} = 5V$, $I_O = 100\mu A$
	DDTC122LU DDTC142JU	$V_{I(on)}$	—	—	2.0 2.0	V	$V_O = 0.3V$, $I_O = 20mA$ $V_O = 0.3V$, $I_O = 20mA$
Output Voltage		$V_{O(on)}$	—	—	0.3V	V	$I_O/I_I = 5mA/0.25mA$
Input Current	DDTC122LU DDTC142JU	I_I	—	—	28 13	mA	$V_I = 5V$
Output Current		$I_{O(off)}$	—	—	0.5	μA	$V_{CC} = 50V$, $V_I = 0V$
DC Current Gain	DDTC122LU DDTC142JU	G_I	56 56	—	—	—	$V_O = 5V$, $I_O = 10mA$
Gain-Bandwidth Product*		f_T	—	200	—	MHz	$V_{CE} = 10V$, $I_E = 5mA$, $f = 100MHz$

* Transistor - For Reference Only

Electrical Characteristics @ $T_A = 25°C$ unless otherwise specified — R1-Only

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage		BV_{CBO}	50	—	—	V	$I_C = 50\mu A$
Collector-Emitter Breakdown Voltage		BV_{CEO}	40	—	—	V	$I_C = 1mA$
Emitter-Base Breakdown Voltage	DDTC122TU DDTC142TU	BV_{EBO}	5	—	—	V	$I_E = 50\mu A$ $I_E = 50\mu A$
Collector Cutoff Current		I_{CBO}	—	—	0.5	μA	$V_{CB} = 50V$
Emitter Cutoff Current	DDTC122TU DDTC142TU	I_{EBO}	— —	—	0.5 0.5	μA	$V_{EB} = 4V$
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	—	—	0.3	V	$I_C = 5mA$, $I_B = 0.25mA$
DC Current Transfer Ratio	DDTC122TU DDTC142TU	h_{FE}	100 100	250 250	600 600	—	$I_C = 1mA$, $V_{CE} = 5V$
Gain-Bandwidth Product*		f_T	—	200	—	MHz	$V_{CE} = 10V$, $I_E = -5mA$, $f = 100MHz$

* Transistor - For Reference Only

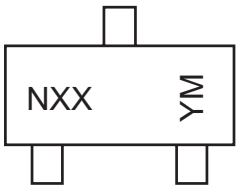
Ordering Information (Note 4 & 5)

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

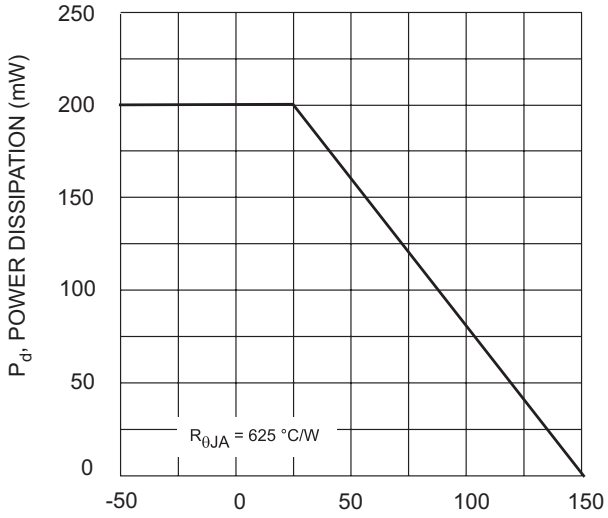


Fig. 1 Power Derating Curve