

# DDTC (R1 = R2 SERIES) UA

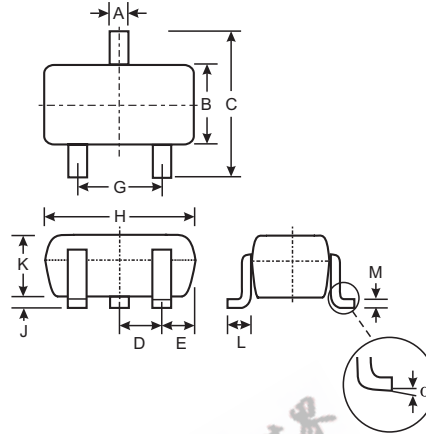
NPN PRE-BIASED SMALL SIGNAL SOT-323  
SURFACE MOUNT TRANSISTOR

## Features

- Epitaxial Planar Die Construction
- Complementary PNP Types Available (DDTA)
- Built-In Biasing Resistors, R1 = R2
- **Lead Free/RoHS Compliant (Note 2)**
- "Green" Device (Note 3 and 4)

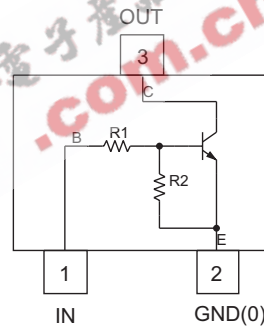
## Mechanical Data

- 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
- Terminal Connections: See Diagram
- Terminals: Solderable per MIL-STD-202, Method 208
- 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)
- Type Code: See Table Below
- Weight: 0.006 grams (approximate)

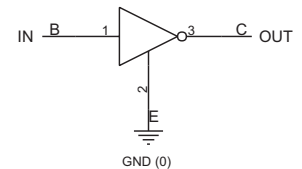


SOT-323		
Dim	Min	Max
A	0.25	0.40
B	1.15	1.35
C	2.00	2.20
D	0.65 Nominal	
E	0.30	0.40
G	1.20	1.40
H	1.80	2.20
J	0.0	0.10
K	0.90	1.00
L	0.25	0.40
M	0.10	0.18
$\alpha$	0°	8°
All Dimensions in mm		

P/N	R1, R2 (NOM)	Type Code
DDTC123EUA	2.2K $\Omega$	N04
DDTC143EUA	4.7K $\Omega$	N08
DDTC114EUA	10K $\Omega$	N13
DDTC124EUA	22K $\Omega$	N17
DDTC144EUA	47K $\Omega$	N20
DDTC115EUA	100K $\Omega$	N24



Schematic and Pin Configuration



Equivalent Inverter Circuit

## 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>	-10 to +12 -10 to +30 -10 to +40 -10 to +40 -10 to +40 -10 to +40	V
Output Current	I <sub>O</sub>	100 100 50 30 100 20	mA
Output Current All	I <sub>C</sub> (Max)	100	mA
Power Dissipation	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 Sb<sub>2</sub>O<sub>3</sub> Fire Retardants.

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

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage		V <sub>I(off)</sub>	0.5	1.1	—	V	V <sub>CC</sub> = 5V, I <sub>O</sub> = 100μA
		V <sub>I(on)</sub>	—	1.9	3		V <sub>O</sub> = 0.3V, I <sub>O</sub> = 20mA, DDTC123EUA V <sub>O</sub> = 0.3V, I <sub>O</sub> = 20mA, DDTC143EUA V <sub>O</sub> = 0.3V, I <sub>O</sub> = 10mA, DDTC114EUA V <sub>O</sub> = 0.3V, I <sub>O</sub> = 5mA, DDTC124EUA V <sub>O</sub> = 0.3V, I <sub>O</sub> = 2mA, DDTC144EUA V <sub>O</sub> = 0.3V, I <sub>O</sub> = 1mA, DDTC115EUA
Output Voltage		V <sub>O(on)</sub>	—	0.1	0.3	V	I <sub>O</sub> /I <sub>I</sub> = 10mA/0.5mA, DDTC123EUA I <sub>O</sub> /I <sub>I</sub> = 10mA/0.5mA, DDTC143EUA I <sub>O</sub> /I <sub>I</sub> = 10mA/0.5mA, DDTC114EUA I <sub>O</sub> /I <sub>I</sub> = 10mA/0.5mA, DDTC124EUA I <sub>O</sub> /I <sub>I</sub> = 10mA/0.5mA, DDTC144EUA I <sub>O</sub> /I <sub>I</sub> = 5mA/0.25mA, DDTC115EUA
Input Current	DDTC123EUA DDTC143EUA DDTC114EUA DDTC124EUA DDTC144EUA DDTC115EUA	I <sub>I</sub>	—	—	3.8 1.8 0.88 0.36 0.18 0.15	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	DDTC123EUA DDTC143EUA DDTC114EUA DDTC124EUA DDTC144EUA DDTC115EUA	G <sub>I</sub>	20 20 30 56 68 82	—	—	—	V <sub>O</sub> = 5V, I <sub>O</sub> = 20mA V <sub>O</sub> = 5V, I <sub>O</sub> = 10mA V <sub>O</sub> = 5V, I <sub>O</sub> = 5mA V <sub>O</sub> = 5V, I <sub>O</sub> = 5mA V <sub>O</sub> = 5V, I <sub>O</sub> = 5mA V <sub>O</sub> = 5V, I <sub>O</sub> = 5mA
Input Resistor (R <sub>1</sub> ) Tolerance		ΔR <sub>1</sub>	-30	—	+30	%	—
Resistance Ratio		R <sub>2</sub> /R <sub>1</sub>	0.8	1	1.2	—	—
Gain-Bandwidth Product*		f <sub>T</sub>	—	250	—	MHz	V <sub>CE</sub> = 10V, I <sub>E</sub> = 5mA, f = 100MHz

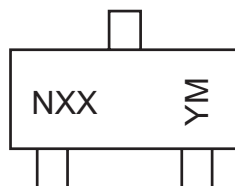
\* Transistor - For Reference Only

## Ordering Information (Note 4 & 5)

Device	Packaging	Shipping
DDTC123EUA-7-F	SOT-323	3000/Tape & Reel
DDTC143EUA-7-F	SOT-323	3000/Tape & Reel
DDTC114EUA-7-F	SOT-323	3000/Tape & Reel
DDTC124EUA-7-F	SOT-323	3000/Tape & Reel
DDTC144EUA-7-F	SOT-323	3000/Tape & Reel
DDTC115EUA-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 Sb<sub>2</sub>O<sub>3</sub> 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

**TYPICAL CURVES - DDTC143EUA**

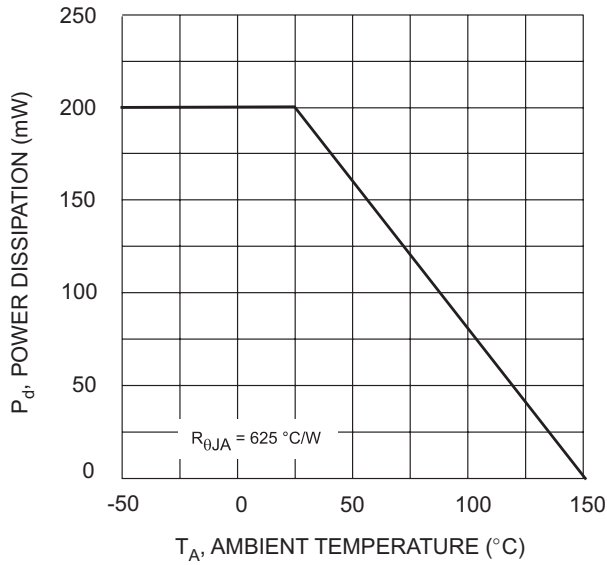


Fig. 1 Derating Curve

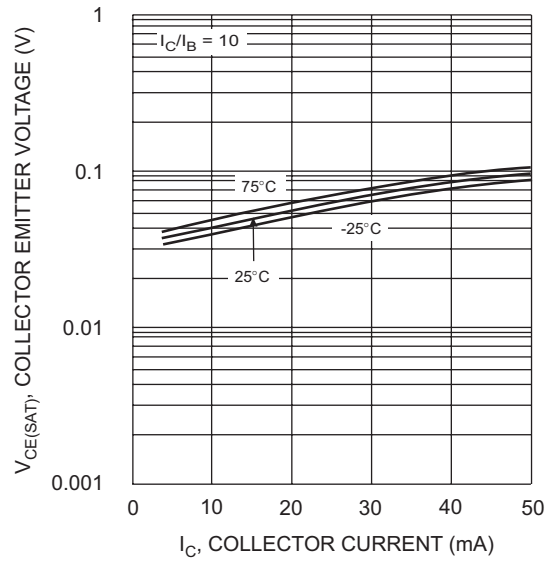


Fig. 2  $V_{CE(SAT)}$  vs.  $I_C$

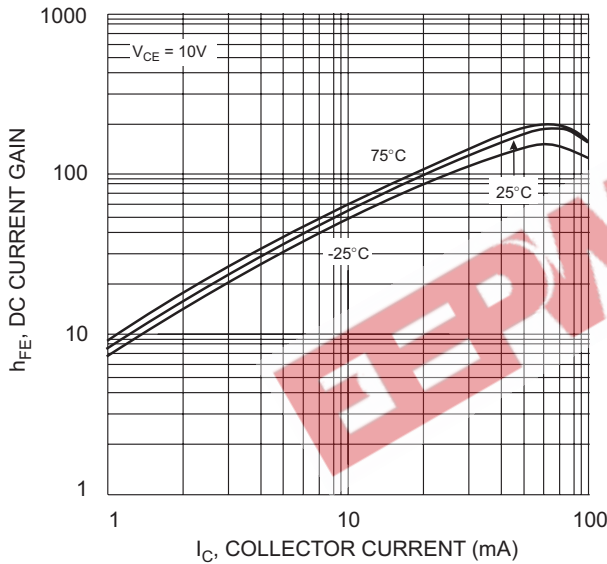


Fig. 3 DC CURRENT GAIN

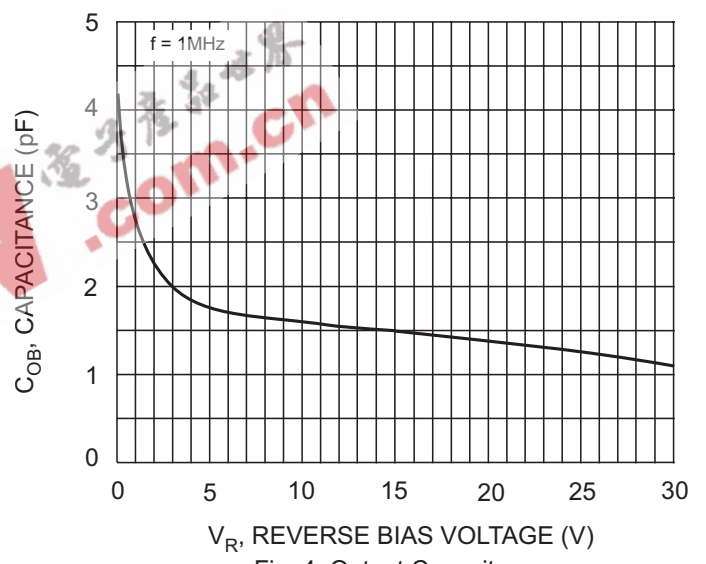


Fig. 4 Output Capacitance

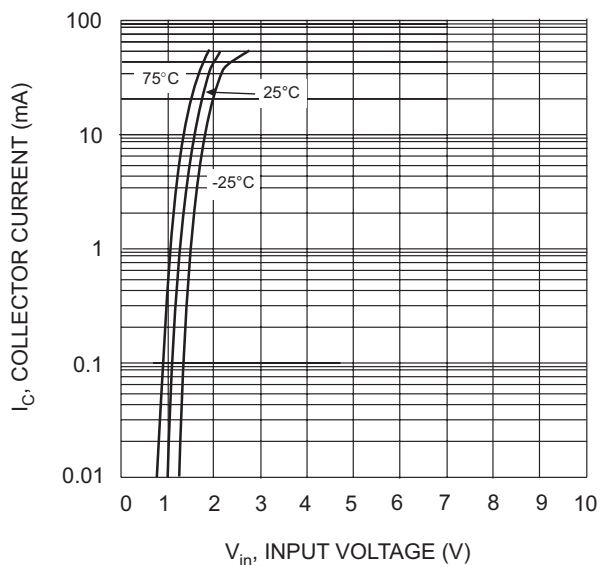


Fig. 5 Collector Current Vs. Input Voltage

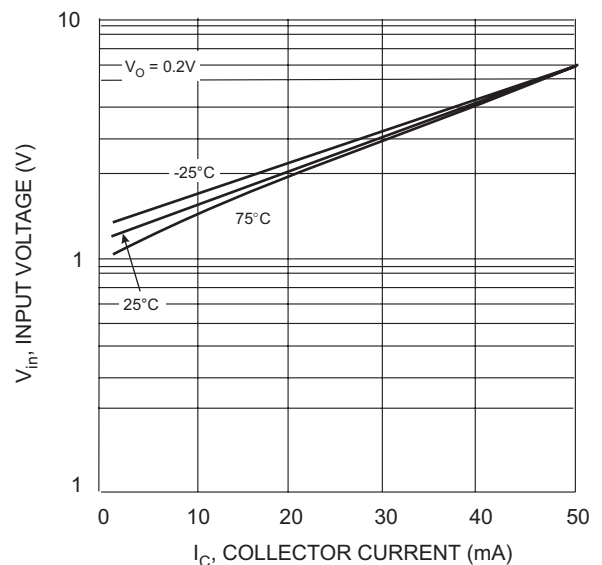


Fig. 6 Input Voltage vs. Collector Current



#### IMPORTANT NOTICE

Diodes Incorporated and its subsidiaries reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to any product herein. Diodes Incorporated does not assume any liability arising out of the application or use of any product described herein; neither does it convey any license under its patent rights, nor the rights of others. The user of products in such applications shall assume all risks of such use and will agree to hold Diodes Incorporated and all the companies whose products are represented on our website, harmless against all damages.

#### LIFE SUPPORT

Diodes Incorporated products are not authorized for use as critical components in life support devices or systems without the expressed written approval of the President of Diodes Incorporated.

EEPW 电子产品世界  
.com.cn