

# DDTC (R1 = R2 SERIES) UA

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

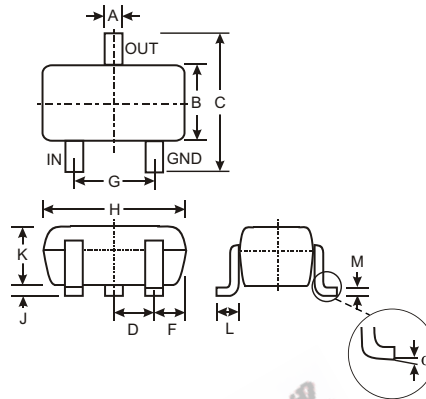
NEW PRODUCT

## Features

- Epitaxial Planar Die Construction
- Complementary PNP Types Available (DDTA)
- Built-In Biasing Resistors, R1 = R2

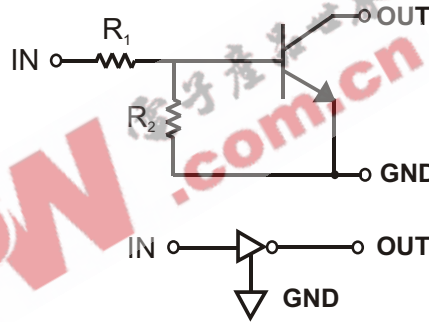
## Mechanical Data

- Case: SOT-323, Molded Plastic
- Case material - UL Flammability Rating 94V-0
- Moisture sensitivity: Level 1 per J-STD-020A
- Terminals: Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Marking: Date Code and Marking Code (See Diagrams & Page 2)
- Weight: 0.006 grams (approx.)
- Ordering Information (See Page 2)



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
	0	8
All Dimensions in mm		

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



SCHEMATIC DIAGRAM

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

Characteristic	Symbol	Value	Unit
Supply Voltage, (3) to (1)	V <sub>CC</sub>	50	V
Input Voltage, (2) to (1)	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	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>JA</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>.

**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> = 100 A
		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	A	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		DR <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

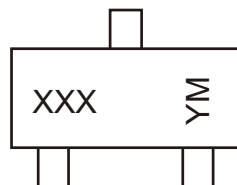
\* Transistor - For Reference Only

**Ordering Information** (Note 2)

Device	Packaging	Shipping
DDTC123EUA-7	SOT-323	3000/Tape & Reel
DDTC143EUA-7	SOT-323	3000/Tape & Reel
DDTC114EUA-7	SOT-323	3000/Tape & Reel
DDTC124EUA-7	SOT-323	3000/Tape & Reel
DDTC144EUA-7	SOT-323	3000/Tape & Reel
DDTC115EUA-7	SOT-323	3000/Tape & Reel

Notes: 2. For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

**Marking Information**



XXX = Product Type Marking Code  
See Sheet 1 Diagrams  
YM = Date Code Marking  
Y = Year ex: N = 2002  
M = Month ex: 9 = September

Date Code Key

Year	2002	2003	2004	2005	2006	2007	2008	2009
Code	N	P	R	S	T	U	V	W

Month	Jan	Feb	March	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

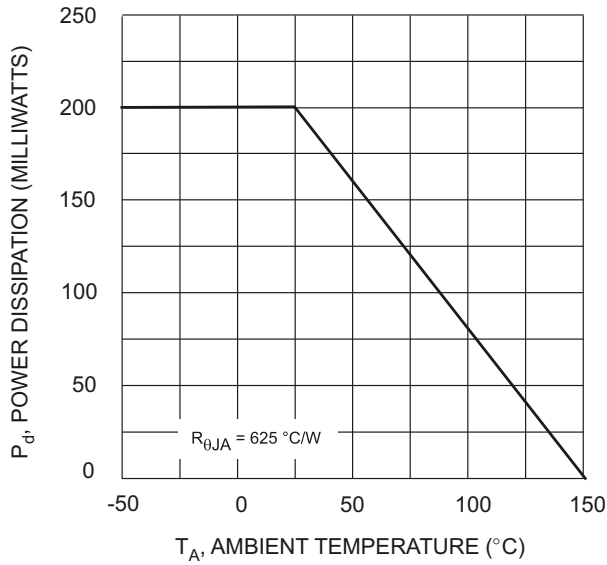


Fig. 1 Derating Curve

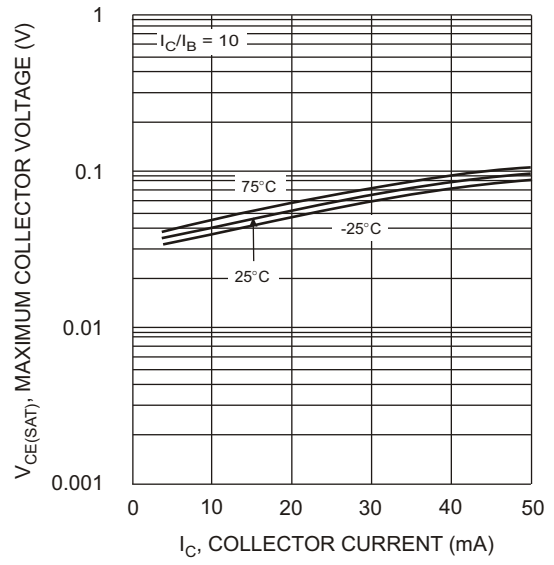


Fig. 2  $V_{CE(SAT)}$  vs.  $I_C$

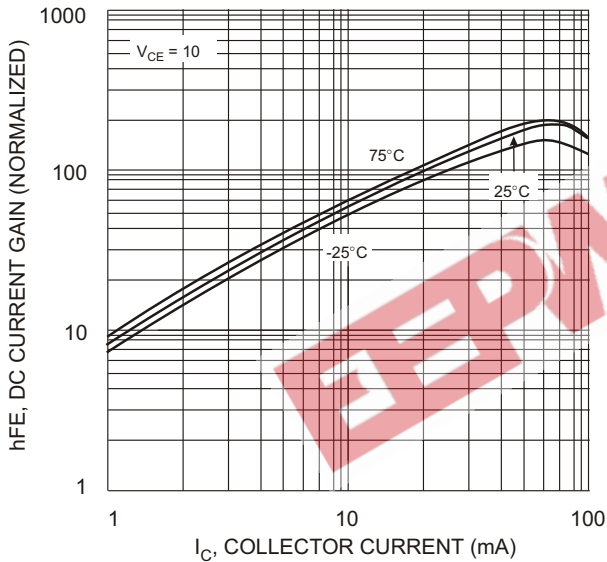


Fig. 3 DC CURRENT GAIN

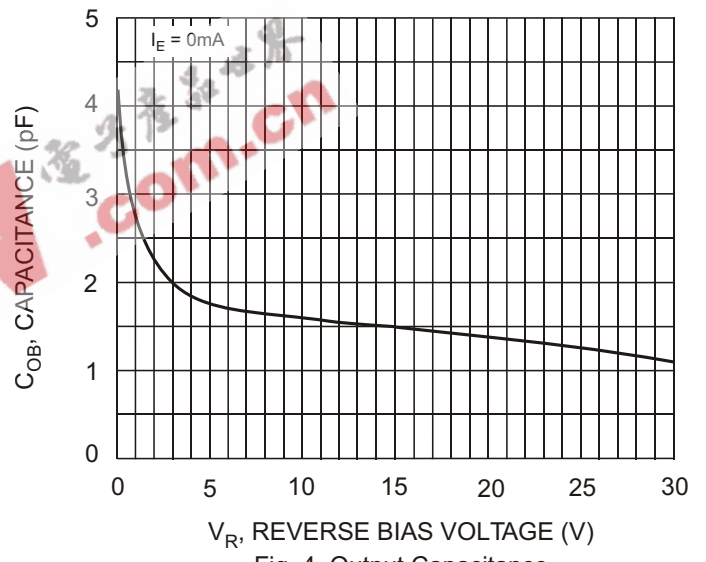


Fig. 4 Output Capacitance

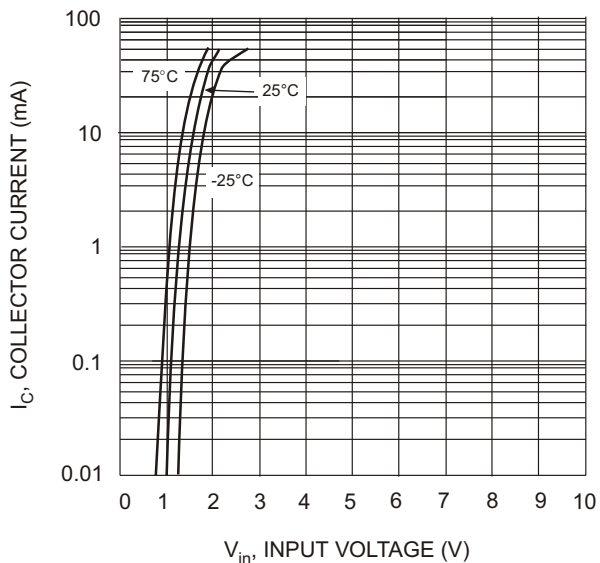


Fig. 5 Collector Current Vs. Input Voltage

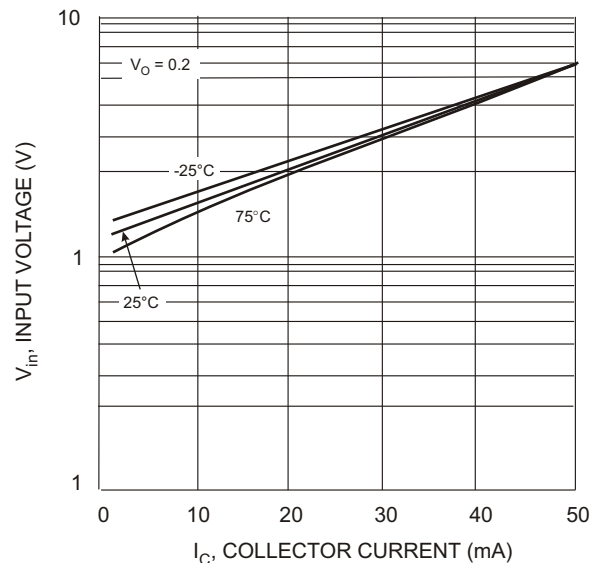


Fig. 6 Input Voltage vs. Collector Current