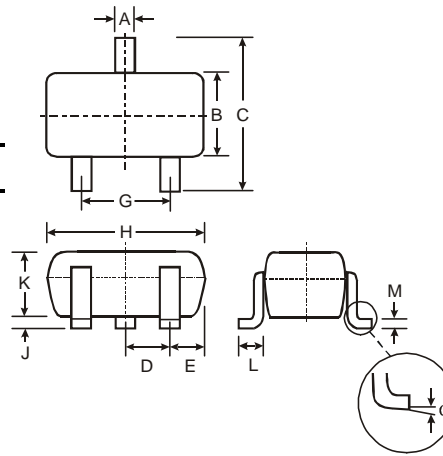


**Features**

- Epitaxial Planar Die Construction
- Complementary PNP Types Available (DDTA)
- Built-In Biasing Resistors, R1≠R2
- **Lead Free/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2 & 3)**

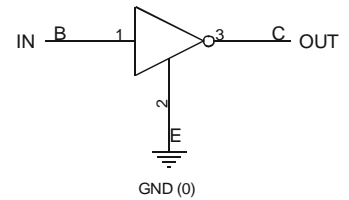
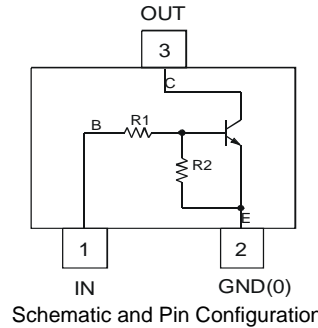
**Mechanical Data**

- Case: SOT-323
- Case Material: Molded Plastic, "Green" Molding Compound, Note 3. 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 Information: See Page 4
- Type Code: See Table Below
- Ordering Information: See Page 4
- 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
DDTC113ZUA	1K $\Omega$	10K $\Omega$	N02
DDTC123YUA	2.2K $\Omega$	10K $\Omega$	N05
DDTC123JUA	2.2K $\Omega$	47K $\Omega$	N06
DDTC143XUA	4.7K $\Omega$	10K $\Omega$	N09
DDTC143FUA	4.7K $\Omega$	22K $\Omega$	N10
DDTC143ZUA	4.7K $\Omega$	47K $\Omega$	N11
DDTC114YUA	10K $\Omega$	47K $\Omega$	N14
DDTC114WUA	10K $\Omega$	4.7K $\Omega$	N15
DDTC124XUA	22K $\Omega$	47K $\Omega$	N18
DDTC144VUA	47K $\Omega$	10K $\Omega$	N21
DDTC144WUA	47K $\Omega$	22K $\Omega$	N22



**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 +10 -5 to +12 -5 to +12 -7 to +20 -6 to +30 -5 to +30 -6 to +40 -10 to +30 -10 to +40 -15 to +40 -10 to +40	V
Output Current	I <sub>O</sub>	100 100 100 100 100 100 70 100 50 30 30	mA
Output Current	I <sub>C</sub> (Max)	100	mA

Equivalent Inverter Circuit

Notes: 1. No purposefully added lead.  
 2. 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).  
 3. Product manufactured with Date Code 0627 (week 27, 2006) and newer are built with Green Molding Compound. Product manufactured prior to Date Code 0627 are built with Non-Green Molding Compound and may contain Halogens or Sb2O3 Fire Retardants.

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

Characteristic	Symbol	Value	Unit
Output Current	I <sub>C</sub> (Max)	100	mA
Power Dissipation	P <sub>d</sub>	200	mW
Thermal Resistance, Junction to Ambient Air (Note 4)	R <sub>θJA</sub>	625	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

Notes: 4. 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>	0.3	—	—	V	V <sub>CC</sub> = 5V, I <sub>O</sub> = 100μA
		0.3				
		0.5				
		0.3				
		0.3				
		0.5				
		0.3				
		0.8				
		0.4				
		1.0				
		0.8				
Input Voltage	V <sub>I(on)</sub>	—	—	3.0	V	V <sub>O</sub> = 0.3V, I <sub>O</sub> = 20mA
				3.0		V <sub>O</sub> = 0.3V, I <sub>O</sub> = 20mA
				1.1		V <sub>O</sub> = 0.3V, I <sub>O</sub> = 5mA
				2.5		V <sub>O</sub> = 0.3V, I <sub>O</sub> = 20mA
				1.3		V <sub>O</sub> = 0.3V, I <sub>O</sub> = 3mA
				1.3		V <sub>O</sub> = 0.3V, I <sub>O</sub> = 5mA
				1.4		V <sub>O</sub> = 0.3V, I <sub>O</sub> = 1mA
				3.0		V <sub>O</sub> = 0.3V, I <sub>O</sub> = 2mA
				2.5		V <sub>O</sub> = 0.3V, I <sub>O</sub> = 2mA
				5.0		V <sub>O</sub> = 0.3V, I <sub>O</sub> = 2mA
				4.0		V <sub>O</sub> = 0.3V, I <sub>O</sub> = 2mA
Output Voltage	V <sub>O(on)</sub>	—	0.1	0.3	V	I <sub>O</sub> /I <sub>I</sub> = 5mA/0.25mA DDTC123JUA
						I <sub>O</sub> /I <sub>I</sub> = 5mA/0.25mA DDTC143ZUA
						I <sub>O</sub> /I <sub>I</sub> = 5mA/0.25mA DDTC114YUA
						I <sub>O</sub> /I <sub>I</sub> = 10mA/0.5mA All Others
Input Current	I <sub>I</sub>	—	—	7.2	mA	V <sub>I</sub> = 5V
				3.8		
				3.6		
				1.8		
				1.8		
				1.8		
				0.88		
				0.88		
				0.36		
				0.16		
				0.16		
Output Current	I <sub>O(off)</sub>	—	—	0.5	μA	V <sub>CC</sub> = 50V, V <sub>I</sub> = 0V
DC Current Gain	G <sub>I</sub>	33	—	—	—	V <sub>O</sub> = 5V, I <sub>O</sub> = 5mA
		33				V <sub>O</sub> = 5V, I <sub>O</sub> = 10mA
		80				V <sub>O</sub> = 5V, I <sub>O</sub> = 10mA
		30				V <sub>O</sub> = 5V, I <sub>O</sub> = 10mA
		68				V <sub>O</sub> = 5V, I <sub>O</sub> = 10mA
		80				V <sub>O</sub> = 5V, I <sub>O</sub> = 10mA
		68				V <sub>O</sub> = 5V, I <sub>O</sub> = 5mA
		24				V <sub>O</sub> = 5V, I <sub>O</sub> = 10mA
		68				V <sub>O</sub> = 5V, I <sub>O</sub> = 5mA
		33				V <sub>O</sub> = 5V, I <sub>O</sub> = 5mA
		56				V <sub>O</sub> = 5V, I <sub>O</sub> = 5mA
Input Resistor Tolerance	ΔR <sub>1</sub>	-30	—	+30	%	—
Resistance Ratio Tolerance	ΔR <sub>2</sub> /R <sub>1</sub>	-20	—	+20	%	—
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

**Typical Curves – DDTC123JUA**

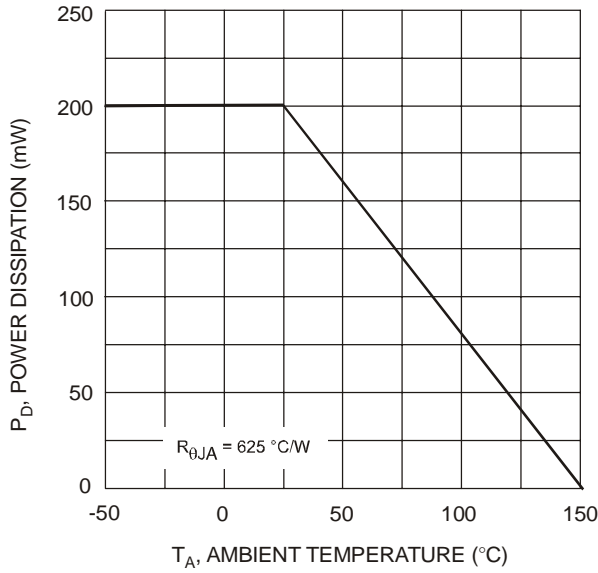


Fig. 1 Derating Curve

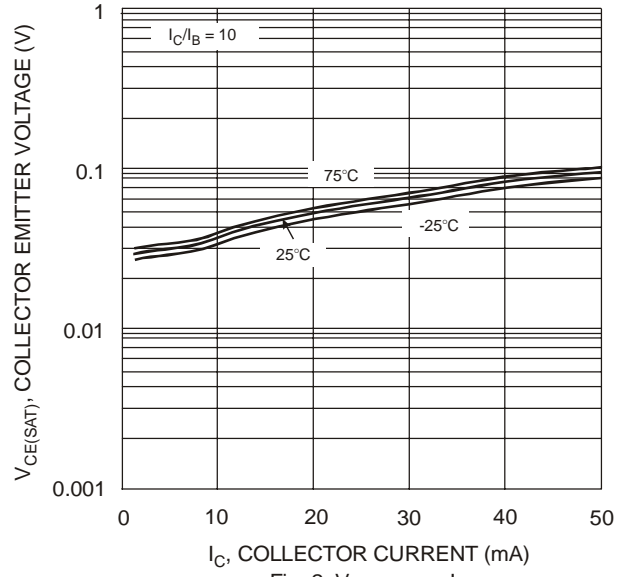


Fig. 2  $V_{CE(SAT)}$  vs.  $I_C$

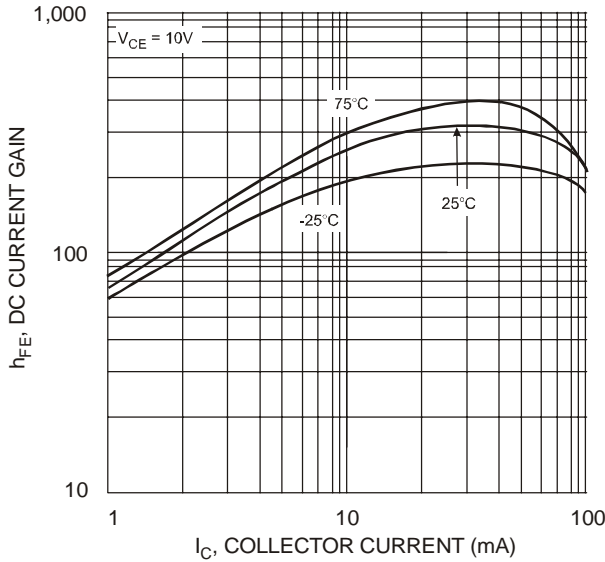


Fig. 3 DC Current Gain

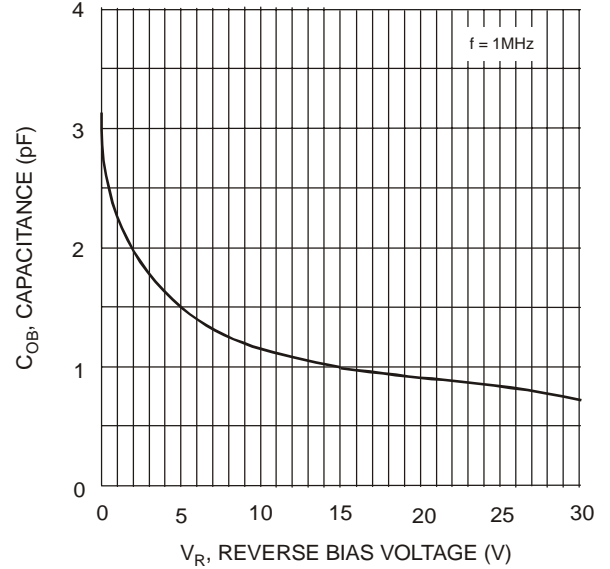


Fig. 4 Output Capacitance

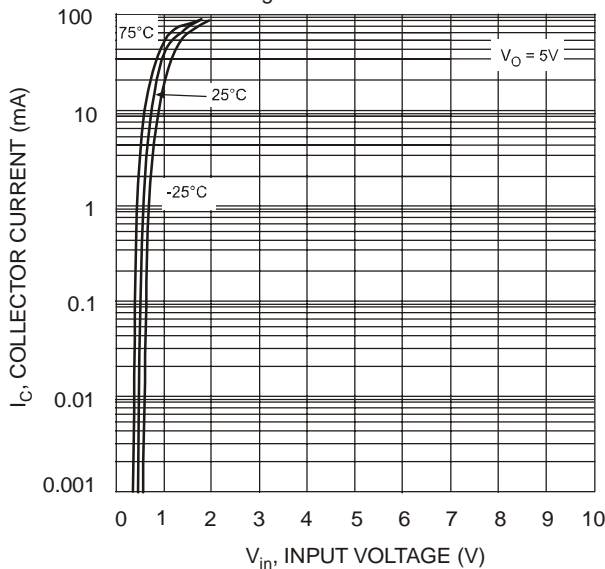


Fig. 5 Collector Current vs. Input Voltage

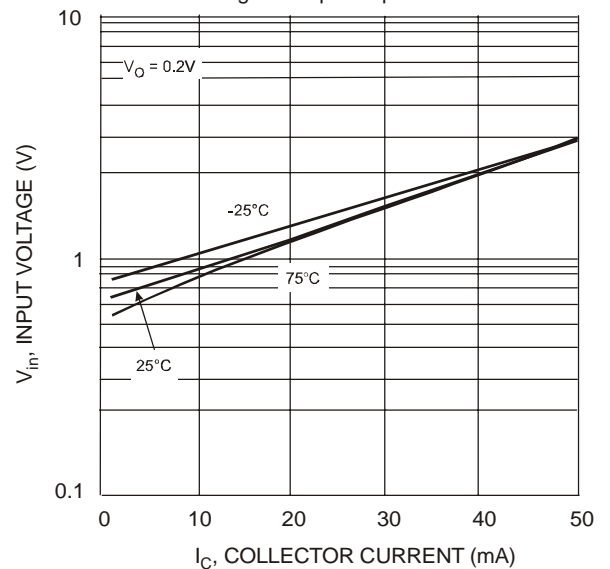


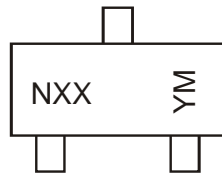
Fig. 6 Input Voltage vs. Collector Current

## Ordering Information (Note 3 & 5)

Device	Packaging	Shipping
DDTC113ZUA-7-F	SOT-323	3000/Tape & Reel
DDTC123YUA-7-F	SOT-323	3000/Tape & Reel
DDTC123JUA-7-F	SOT-323	3000/Tape & Reel
DDTC143XUA-7-F	SOT-323	3000/Tape & Reel
DDTC143FUA-7-F	SOT-323	3000/Tape & Reel
DDTC143ZUA-7-F	SOT-323	3000/Tape & Reel
DDTC114YUA-7-F	SOT-323	3000/Tape & Reel
DDTC114WUA-7-F	SOT-323	3000/Tape & Reel
DDTC124XUA-7-F	SOT-323	3000/Tape & Reel
DDTC144VUA-7-F	SOT-323	3000/Tape & Reel
DDTC144WUA-7-F	SOT-323	3000/Tape & Reel

Notes: 5. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

## Marking Information



NXX = Product Type Marking Code  
See Page 1 Diagrams  
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

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- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
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- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



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