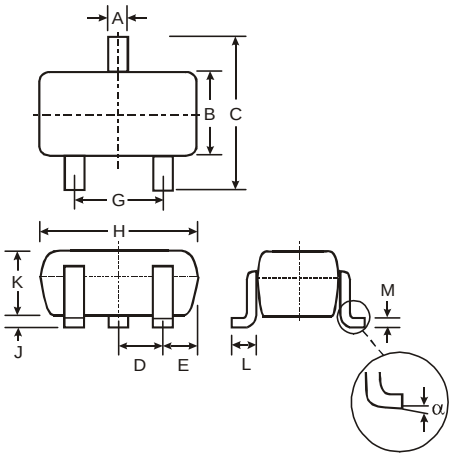
DDTC (R1≠R2 SERIES) UA

NPN PRE-BIASED SMALL SIGNAL SURFACE MOUNT TRANSISTOR

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)**

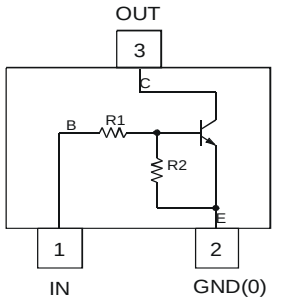


SOT-323		
Dim	**Min**	**Max**
A	0.25	0.40
B	1.15	1.35
C	2.00	2.20
D	0.65 Nominal	
E	0.30	0.40
G	1.20	1.40
H	1.80	2.20
J	0.0	0.10
K	0.90	1.00
L	0.25	0.40
M	0.10	0.18
α	0°	8°
All Dimensions in mm		

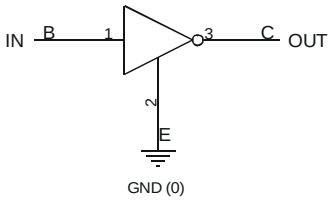
Mechanical Data

- 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)

P/N	R1 (NOM)	R2 (NOM)	Type Code
DDTC113ZUA	1KΩ	10KΩ	N02
DDTC123YUA	2.2KΩ	10KΩ	N05
DDTC123JUA	2.2KΩ	47KΩ	N06
DDTC143XUA	4.7KΩ	10KΩ	N09
DDTC143FUA	4.7KΩ	22KΩ	N10
DDTC143ZUA	4.7KΩ	47KΩ	N11
DDTC114YUA	10KΩ	47KΩ	N14
DDTC114WUA	10KΩ	4.7KΩ	N15
DDTC124XUA	22KΩ	47KΩ	N18
DDTC144VUA	47KΩ	10KΩ	N21
DDTC144WUA	47KΩ	22KΩ	N22



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)	DDTC113ZUA	V_{IN}	-5 to +10	V
	DDTC123YUA		-5 to +12	
	DDTC123JUA		-5 to +12	
	DDTC143XUA		-7 to +20	
	DDTC143FUA		-6 to +30	
	DDTC143ZUA		-5 to +30	
	DDTC114YUA		-6 to +40	
	DDTC114WUA		-10 to +30	
	DDTC124XUA		-10 to +40	
	DDTC144VUA		-15 to +40	
	DDTC144WUA		-10 to +40	Equivalent Inverter Circuit
Output Current	DDTC113ZUA	I_O	100	mA
	DDTC123YUA		100	
	DDTC123JUA		100	
	DDTC143XUA		100	
	DDTC143FUA		100	
	DDTC143ZUA		100	
	DDTC114YUA		70	
	DDTC114WUA		100	
	DDTC124XUA		50	
	DDTC144VUA		30	
	DDTC144WUA		30	
Output Current	All	I_C (Max)	100	mA

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.
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_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Output Current All	I_C (Max)	100	mA
Power Dissipation	P_d	200	mW
Thermal Resistance, Junction to Ambient Air (Note 4)	$R_{\theta JA}$	625	°C/W
Operating and Storage Temperature Range	T_j, T_{STG}	-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_A = 25°C unless otherwise specified

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage	DDTC113ZUA	$V_{I(off)}$	0.3	—	—	V	V_{CC} = 5V, I_O = 100μA
	DDTC123YUA		0.3				
	DDTC123JUA		0.5				
	DDTC143XUA		0.3				
	DDTC143FUA		0.3				
	DDTC143ZUA		0.5				
	DDTC114YUA		0.3				
	DDTC114WUA		0.8				
	DDTC124XUA		0.4				
	DDTC144VUA		1.0				
	DDTC144WUA		0.8				
Input Voltage	DDTC113ZUA	$V_{I(on)}$	—	—	3.0		V_O = 0.3V, I_O = 20mA
	DDTC123YUA				3.0		V_O = 0.3V, I_O = 20mA
	DDTC123JUA				1.1		V_O = 0.3V, I_O = 5mA
	DDTC143XUA				2.5		V_O = 0.3V, I_O = 20mA
	DDTC143FUA				1.3		V_O = 0.3V, I_O = 3mA
	DDTC143ZUA				1.3		V_O = 0.3V, I_O = 5mA
	DDTC114YUA				1.4		V_O = 0.3V, I_O = 1mA
	DDTC114WUA				3.0		V_O = 0.3V, I_O = 2mA
	DDTC124XUA				2.5		V_O = 0.3V, I_O = 2mA
	DDTC144VUA				5.0		V_O = 0.3V, I_O = 2mA
	DDTC144WUA				4.0		V_O = 0.3V, I_O = 2mA
Output Voltage		$V_{O(on)}$	—	0.1	0.3	V	I_O/I_I = 5mA/0.25mA DDTC123JUA
							I_O/I_I = 5mA/0.25mA DDTC143ZUA
							I_O/I_I = 5mA/0.25mA DDTC114YUA
							I_O/I_I = 10mA/0.5mA All Others
Input Current	DDTC113ZUA	I_I	—	—	7.2	mA	V_I = 5V
	DDTC123YUA				3.8		
	DDTC123JUA				3.6		
	DDTC143XUA				1.8		
	DDTC143FUA				1.8		
	DDTC143ZUA				1.8		
	DDTC114YUA				0.88		
	DDTC114WUA				0.88		
	DDTC124XUA				0.36		
	DDTC144VUA				0.16		
	DDTC144WUA				0.16		
Output Current		$I_{O(off)}$	—	—	0.5	μA	V_{CC} = 50V, V_I = 0V
DC Current Gain	DDTC113ZUA	G_I	33	—	—	—	V_O = 5V, I_O = 5mA
	DDTC123YUA		33				V_O = 5V, I_O = 10mA
	DDTC123JUA		80				V_O = 5V, I_O = 10mA
	DDTC143XUA		30				V_O = 5V, I_O = 10mA
	DDTC143FUA		68				V_O = 5V, I_O = 10mA
	DDTC143ZUA		80				V_O = 5V, I_O = 10mA
	DDTC114YUA		68				V_O = 5V, I_O = 5mA
	DDTC114WUA		24				V_O = 5V, I_O = 10mA
	DDTC124XUA		68				V_O = 5V, I_O = 5mA
	DDTC144VUA		33				V_O = 5V, I_O = 5mA
	DDTC144WUA		56				V_O = 5V, I_O = 5mA
Input Resistor Tolerance		ΔR_1	-30	—	+30	%	—
Resistance Ratio Tolerance		$\Delta R_2/R_1$	-20	—	+20	%	—
Gain-Bandwidth Product*		f_T	—	250	—	MHz	V_{CE} = 10V, I_E = 5mA, f = 100MHz

* Transistor - For Reference Only

Typical Curves – DDTC123JUA

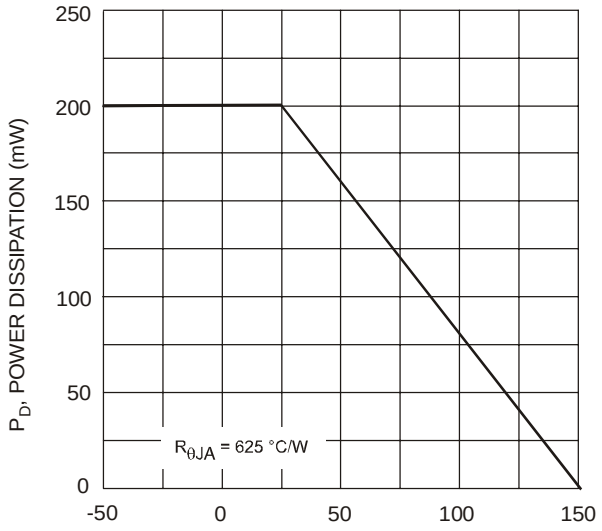


Fig. 1 Derating Curve

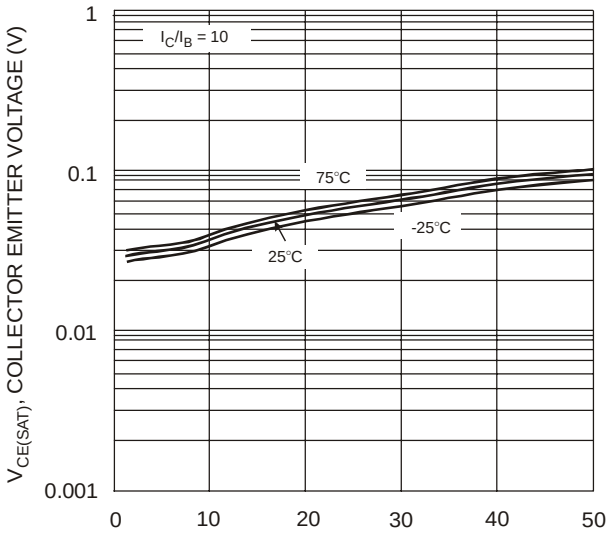


Fig. 2 $V_{CE(SAT)}$ vs. I_C

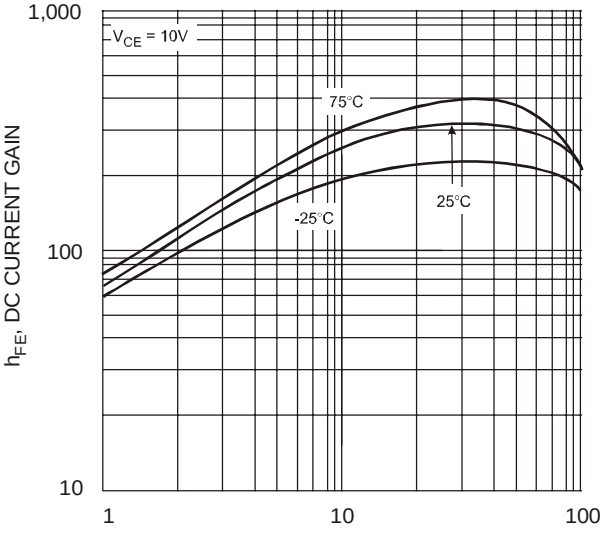


Fig. 3 DC Current Gain

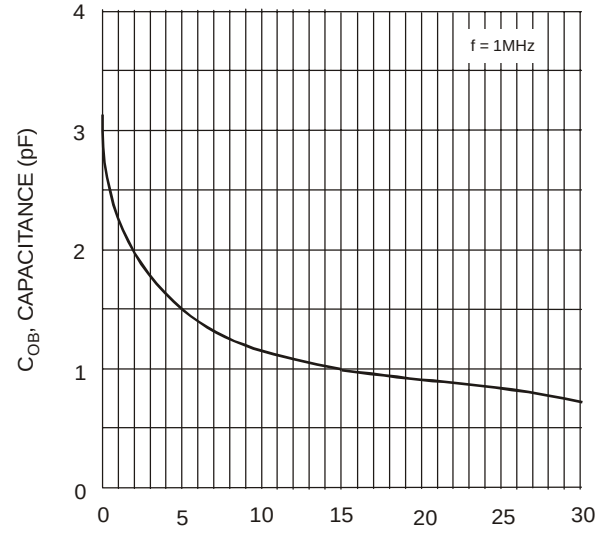


Fig. 4 Output Capacitance

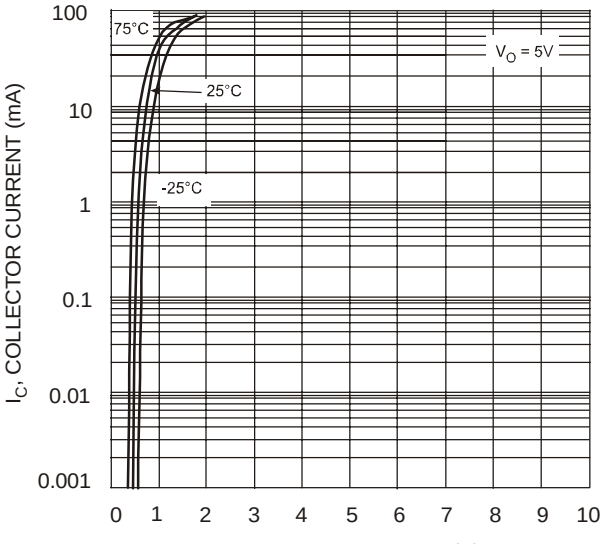


Fig. 5 Collector Current vs. Input Voltage

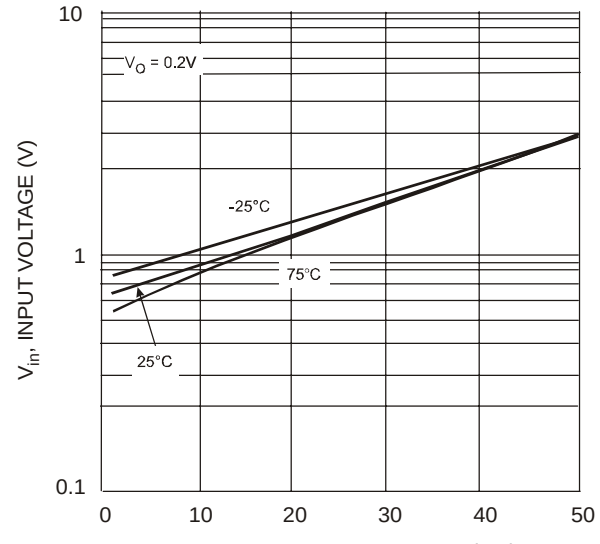


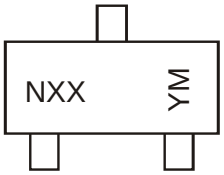
Fig. 6 Input Voltage vs. Collector Current

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

LifeElectronics
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