NEW PRODUCT

DDTC (R1≠R2 SERIES) UA

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

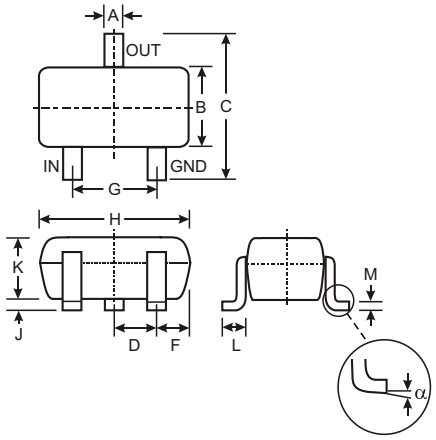
Features

- Epitaxial Planar Die Construction
- Complementary PNP Types Available (DDTA)
- Built-In Biasing Resistors, R1≠R2
- Also Available in Lead Free Version

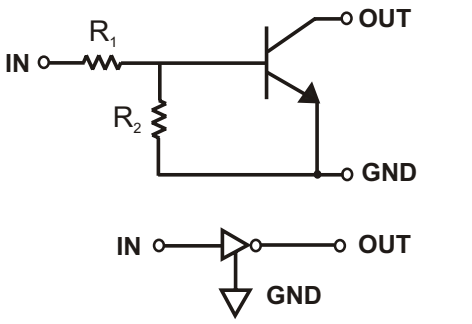
Mechanical Data

- 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
- Also Available in Lead Free Plating (Matte Tin Finish). Please see Ordering Information, Note 3, on Page 2
- Terminal Connections: See Diagram
- Marking: Date Code and Marking Code (See Diagrams & Page 2)
- Weight: 0.006 grams (approx.)
- Ordering Information (See Page 2)

P/N	R1 (NOM)	R2 (NOM)	MARKING
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



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		



SCHEMATIC DIAGRAM

Maximum Ratings @ T_A = 25°C unless otherwise specified

Characteristic		Symbol	Value	Unit
Supply Voltage, (3) to (1)		V_{CC}	50	V
Input Voltage, (2) to (1)	DDTC113ZUA DDTC123YUA DDTC123JUA DDTC143XUA DDTC143FUA DDTC143ZUA DDTC114YUA DDTC114WUA DDTC124XUA DDTC144VUA DDTC144WUA	V_{IN}	-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	DDTC113ZUA DDTC123YUA DDTC123JUA DDTC143XUA DDTC143FUA DDTC143ZUA DDTC114YUA DDTC114WUA DDTC124XUA DDTC144VUA DDTC144WUA	I_O	100 100 100 100 100 100 70 100 50 30 30	mA
Output Current	All	I_C (Max)	100	mA
Power Dissipation		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.

Electrical Characteristics @ $T_A = 25°C$ unless otherwise specified

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage	DDTC113ZUA DDTC123YUA DDTC123JUA DDTC143XUA DDTC143FUA DDTC143ZUA DDTC114YUA DDTC114WUA DDTC124XUA DDTC144VUA DDTC144WUA	$V_{I(off)}$	0.3 0.3 0.5 0.3 0.3 0.5 0.3 0.8 0.4 1.0 0.8	—	—	V	V_{CC} = 5V, I_O = 100μA
	DDTC113ZUA DDTC123YUA DDTC123JUA DDTC143XUA DDTC143FUA DDTC143ZUA DDTC114YUA DDTC114WUA DDTC124XUA DDTC144VUA DDTC144WUA	$V_{I(on)}$	—	—	3.0 3.0 1.1 2.5 1.3 1.3 1.4 3.0 2.5 5.0 4.0		V_O = 0.3V, I_O = 20mA V_O = 0.3V, I_O = 20mA V_O = 0.3V, I_O = 5mA V_O = 0.3V, I_O = 20mA V_O = 0.3V, I_O = 3mA V_O = 0.3V, I_O = 5mA V_O = 0.3V, I_O = 1mA V_O = 0.3V, I_O = 2mA V_O = 0.3V, I_O = 2mA V_O = 0.3V, I_O = 2mA V_O = 0.3V, I_O = 2mA
Output Voltage		$V_{O(on)}$	—	0.1	0.3	V	I_O/I_I = 5mA/0.25mA DDCT123JUA I_O/I_I = 5mA/0.25mA DDCT143ZUA I_O/I_I = 5mA/0.25mA DDCT114YUA I_O/I_I = 10mA/0.5mA All Others
Input Current	DDTC113ZUA DDTC123YUA DDTC123JUA DDTC143XUA DDTC143FUA DDTC143ZUA DDTC114YUA DDTC114WUA DDTC124XUA DDTC144VUA DDTC144WUA	I_I	—	—	7.2 3.8 3.6 1.8 1.8 1.8 0.88 0.88 0.36 0.16 0.16	mA	V_I = 5V
Output Current		$I_{O(off)}$	—	—	0.5	μA	V_{CC} = 50V, V_I = 0V
DC Current Gain	DDTC113ZUA DDTC123YUA DDTC123JUA DDTC143XUA DDTC143FUA DDTC143ZUA DDTC114YUA DDTC114WUA DDTC124XUA DDTC144VUA DDTC144WUA	G_I	33 33 80 30 68 80 68 24 68 33 56	—	—	—	V_O = 5V, I_O = 5mA V_O = 5V, I_O = 10mA V_O = 5V, I_O = 10mA V_O = 5V, I_O = 10mA V_O = 5V, I_O = 10mA V_O = 5V, I_O = 10mA V_O = 5V, I_O = 5mA V_O = 5V, I_O = 10mA V_O = 5V, I_O = 5mA V_O = 5V, I_O = 5mA 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

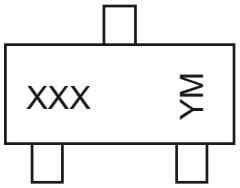
Ordering Information (Note 2)

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

Notes: 2. For Packaging Details, go to our website at http://www.diodes.com/datasheets/ap02007.pdf.
3. For Lead Free version (with Lead Free terminal finish) part number, please add "-F" suffix to part number above. Example: DDTC144WUA-7-F.

NEW PRODUCT

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 - DDTC123JUA

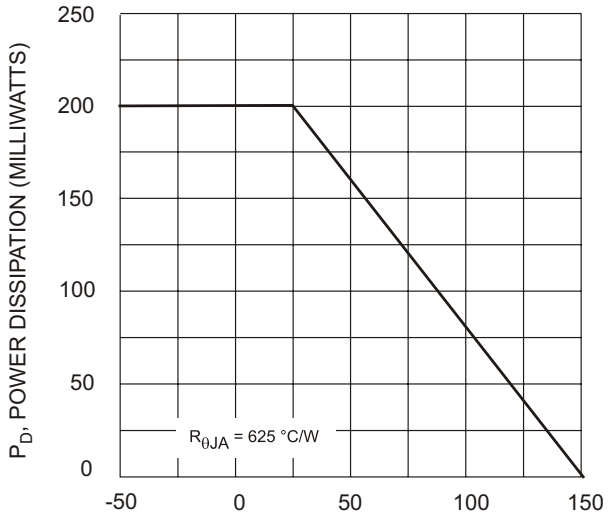


Fig. 1 Derating Curve

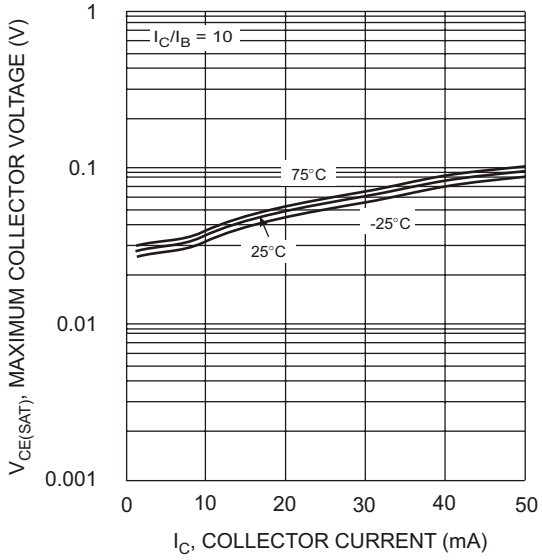


Fig. 2 $V_{CE(SAT)}$ vs. I_C

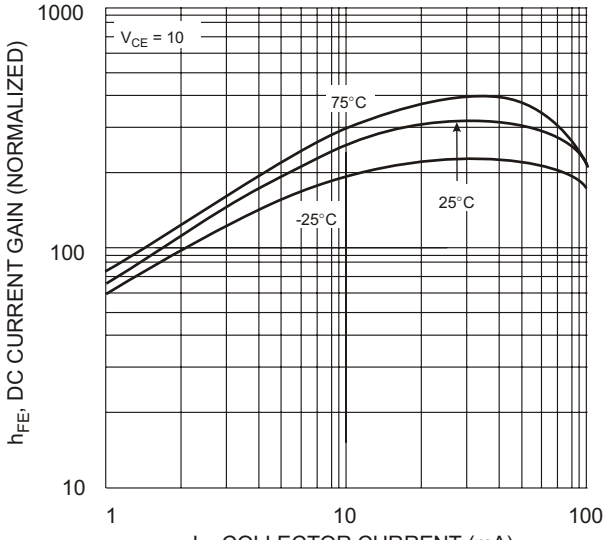


Fig. 3 DC Current Gain

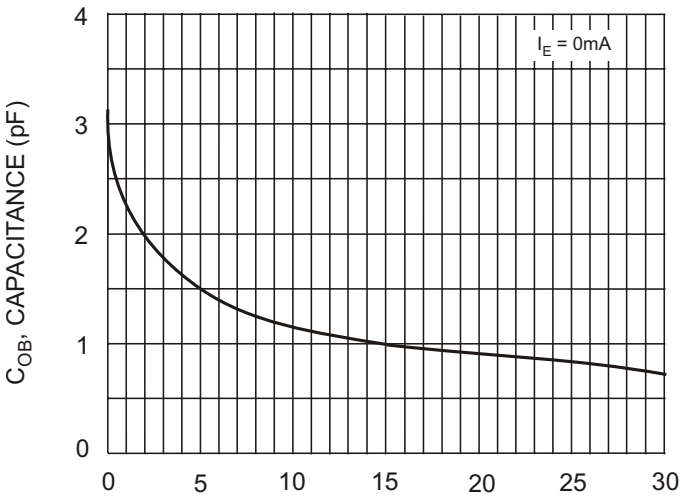


Fig. 4 Output Capacitance

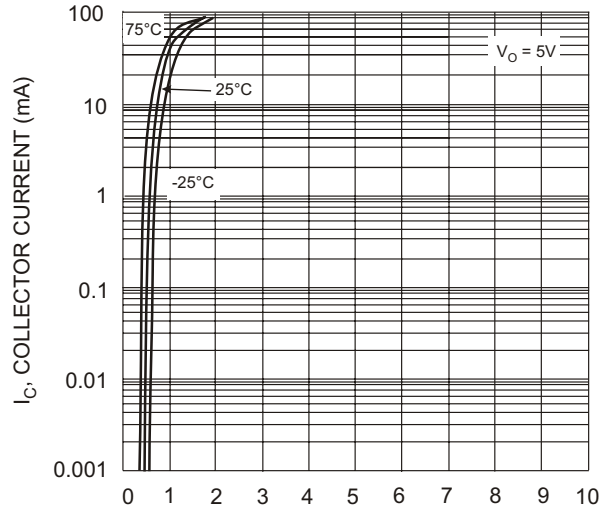


Fig. 5 Collector Current Vs. Input Voltage

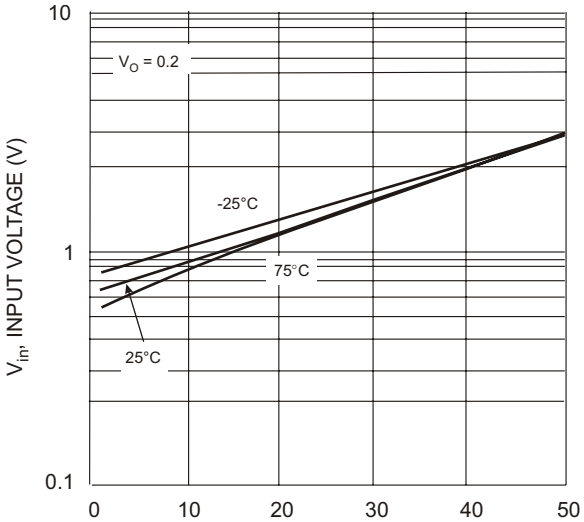


Fig. 6 Input Voltage vs. Collector Current