



**THE DATASHEET OF  
DDTC114WUA-7-F**



## Features

- Epitaxial Planar Die Construction
- Built-In Biasing Resistors
- Surface Mount Package Suited for Automated Assembly
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please contact us or your local Diodes representative.**  
<https://www.diodes.com/quality/product-definitions/>

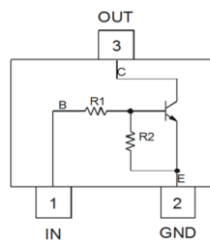
## Mechanical Data

- Package: SOT323
- Package Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 (Ⓒ3)
- Weight: 0.006 grams (Approximate)

Part Number	R1(NOM)	R2(NOM)
DDTC113ZUA	1kΩ	10kΩ
DDTC123YUA	2.2kΩ	10kΩ
DDTC123JUA	2.2kΩ	47kΩ
DDTC143XUA	4.7kΩ	10kΩ
DDTC143FUA	4.7kΩ	22kΩ
DDTC143ZUA	4.7kΩ	47kΩ
DDTC114YUA	10kΩ	47kΩ
DDTC114WUA	10kΩ	4.7kΩ
DDTC124XUA	22kΩ	47kΩ
DDTC144VUA	47kΩ	10kΩ
DDTC144WUA	47kΩ	22kΩ



Top View

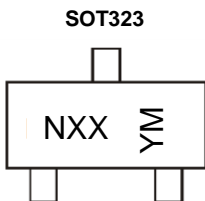


Device Schematic

## Ordering Information (Note 4)

Orderable Part Number	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
					Quantity	Carrier
DDTC113ZUA-7-F	SOT323	N02	7	8	3,000	Reel
DDTC123YUA-7-F	SOT323	N05	7	8	3,000	Reel
DDTC123JUA-7-F	SOT323	N06	7	8	3,000	Reel
DDTC143XUA-7-F	SOT323	N09	7	8	3,000	Reel
DDTC143FUA-7-F	SOT323	N10	7	8	3,000	Reel
DDTC143ZUA-7-F	SOT323	N11	7	8	3,000	Reel
DDTC114YUA-7-F	SOT323	N14	7	8	3,000	Reel
DDTC114WUA-7-F	SOT323	N15	7	8	3,000	Reel
DDTC124XUA-7-F	SOT323	N18	7	8	3,000	Reel
DDTC144VUA-7-F	SOT323	N21	7	8	3,000	Reel
DDTC144WUA-7-F	SOT323	N22	7	8	3,000	Reel

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
  2. See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
  3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
  4. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

**Marking Information**


NXX = Product Type Marking Code  
 YM = Date Code Marking  
 Y or  $\bar{Y}$  = Year (ex: K = 2023)  
 M = Month (ex: D = December)

**Date Code Key**

Year	2020	.....	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Code	H	.....	K	L	M	N	P	R	S	T	U	V

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

**Absolute Maximum Ratings NPN Section (@ $T_{amb} = +25^{\circ}\text{C}$ , unless otherwise specified.)**

Characteristic	Symbol	Value	Unit
Supply Voltage <Pin: (3) to (2)>	$V_{CC}$	50	V
Input Voltage <Pin: (1) to (2)>	$V_{IN}$	DDTC113ZUA	-5 to +10
		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		
Output Current	$I_{OUT}$	DDTC113ZUA	100
		DDTC123YUA	100
		DDTC123JUA	100
		DDTC143XUA	100
		DDTC143FUA	100
		DDTC143ZUA	100
		DDTC114YUA	70
		DDTC114WUA	100
		DDTC124XUA	50
		DDTC144VUA	30
DDTC144WUA	30		
Output Current	$I_C$ (max)	100	mA

**Thermal Characteristics (@ $T_{amb} = +25^{\circ}\text{C}$ , unless otherwise specified.)**

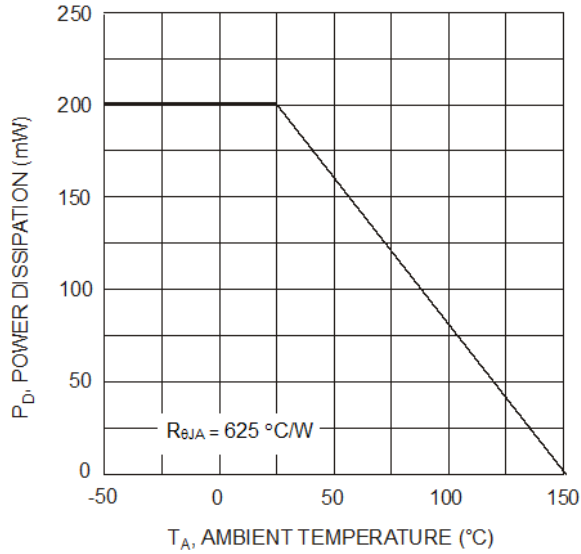
Characteristic	Symbol	Value	Unit
Power Dissipation (Notes 5, 6)	$P_D$	200	mW
Thermal Resistance, Junction to Ambient Air (Note 5)	$R_{\theta JA}$	625	$^{\circ}\text{C}/\text{W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^{\circ}\text{C}$

Notes: 5. Mounted on FR4 PC Board with minimum recommended pad layout.  
 6. 150mW per element must not be exceeded.

**Electrical Characteristics** (@T<sub>amb</sub> = +25°C, unless otherwise specified.)

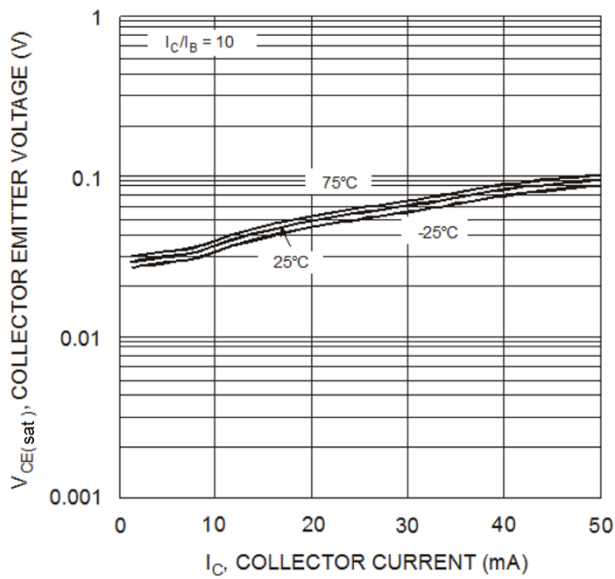
Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition	
Input Voltage	DDTC113ZUA	V <sub>IN(off)</sub>	0.3	—	—	V	V <sub>CC</sub> = 5V, I <sub>OUT</sub> = 100µA	
	DDTC123YUA		0.3					
	DDTC123JUA		0.5					
	DDTC143XUA		0.3					
	DDTC143FUA		0.3					
	DDTC143ZUA		0.5					
	DDTC114YUA		0.3					
	DDTC114WUA		0.8					
	DDTC124XUA		0.4					
	DDTC144VUA		1.0					
	DDTC144WUA		0.8					
	DDTC113ZUA		V <sub>IN(on)</sub>					—
	DDTC123YUA	3.0		V <sub>OUT</sub> = 0.3V, I <sub>OUT</sub> = 20mA				
	DDTC123JUA	1.1		V <sub>OUT</sub> = 0.3V, I <sub>OUT</sub> = 5mA				
	DDTC143XUA	2.5		V <sub>OUT</sub> = 0.3V, I <sub>OUT</sub> = 20mA				
	DDTC143FUA	1.3		V <sub>OUT</sub> = 0.3V, I <sub>OUT</sub> = 3mA				
	DDTC143ZUA	1.3		V <sub>OUT</sub> = 0.3V, I <sub>OUT</sub> = 5mA				
	DDTC114YUA	1.4		V <sub>OUT</sub> = 0.3V, I <sub>OUT</sub> = 1mA				
	DDTC114WUA	3.0		V <sub>OUT</sub> = 0.3V, I <sub>OUT</sub> = 2mA				
	DDTC124XUA	2.5		V <sub>OUT</sub> = 0.3V, I <sub>OUT</sub> = 2mA				
	DDTC144VUA	5.0		V <sub>OUT</sub> = 0.3V, I <sub>OUT</sub> = 2mA				
	DDTC144WUA	4.0		V <sub>OUT</sub> = 0.3V, I <sub>OUT</sub> = 2mA				
Output Voltage		V <sub>OUT(on)</sub>		—	0.1	0.3	V	
Input Current	DDTC113ZUA	I <sub>IN</sub>	—	—	7.2	mA	V <sub>IN</sub> = 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 <sub>OUT(off)</sub>
DC Current Gain	DDTC113ZUA	G <sub>I</sub>	—	—	—	—	V <sub>OUT</sub> = 5V, I <sub>OUT</sub> = 5mA	
	DDTC123YUA						33	V <sub>OUT</sub> = 5V, I <sub>OUT</sub> = 10mA
	DDTC123JUA						80	V <sub>OUT</sub> = 5V, I <sub>OUT</sub> = 10mA
	DDTC143XUA						30	V <sub>OUT</sub> = 5V, I <sub>OUT</sub> = 10mA
	DDTC143FUA						68	V <sub>OUT</sub> = 5V, I <sub>OUT</sub> = 10mA
	DDTC143ZUA						80	V <sub>OUT</sub> = 5V, I <sub>OUT</sub> = 10mA
	DDTC114YUA						68	V <sub>OUT</sub> = 5V, I <sub>OUT</sub> = 5mA
	DDTC114WUA						24	V <sub>OUT</sub> = 5V, I <sub>OUT</sub> = 10mA
	DDTC124XUA						68	V <sub>OUT</sub> = 5V, I <sub>OUT</sub> = 5mA
	DDTC144VUA						33	V <sub>OUT</sub> = 5V, I <sub>OUT</sub> = 5mA
	DDTC144WUA						56	V <sub>OUT</sub> = 5V, I <sub>OUT</sub> = 5mA
	Input Resistor (R <sub>1</sub> ) Tolerance							ΔR <sub>1</sub>
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	

**Typical Curves – Total Device**

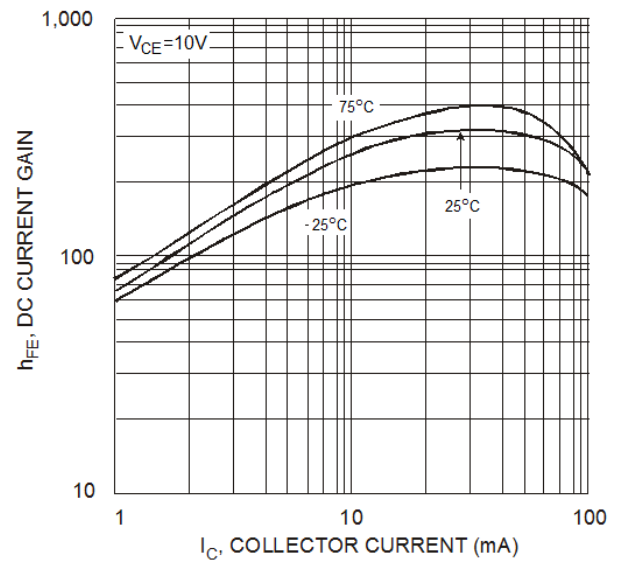


**Figure 1. Derating Curve**

**Typical Curves – DDTC123JUA (@T<sub>A</sub> = +25°C, unless otherwise specified.)**

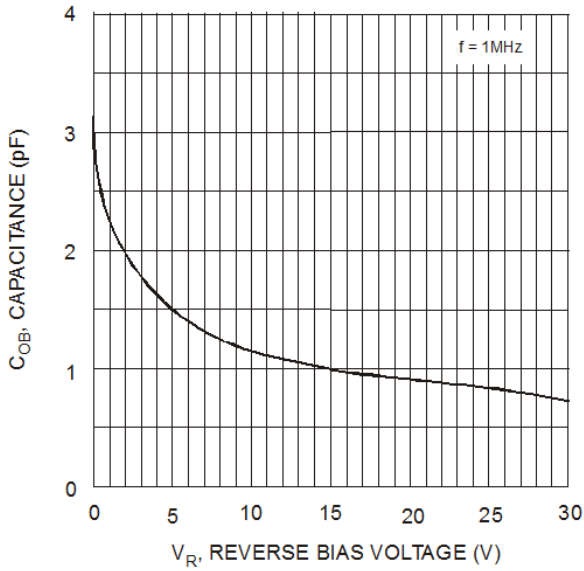


**Figure 2. V<sub>CE(sat)</sub> VS I<sub>C</sub>**

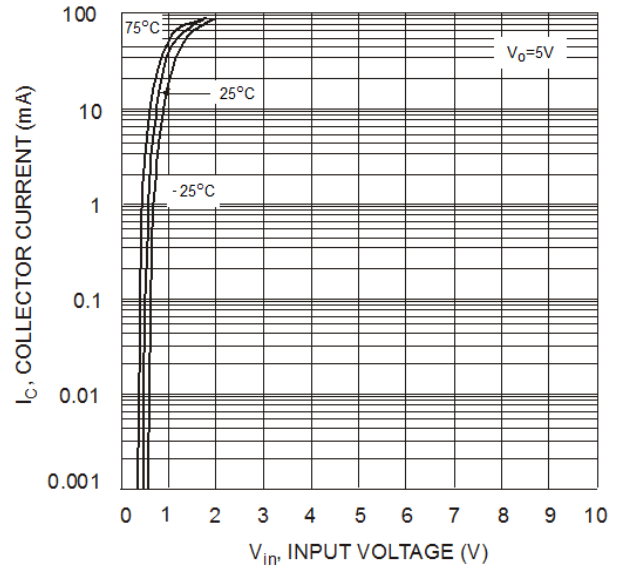


**Figure 3. DC Current Gain**

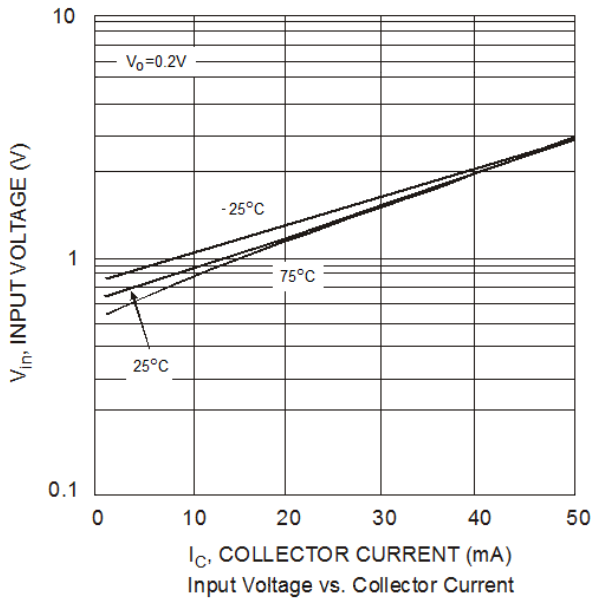
**Typical Curves – DDTC123JUA (continued)**



**Figure 4. Output Capacitance**



**Figure 5. Collector Current vs Input Voltage**

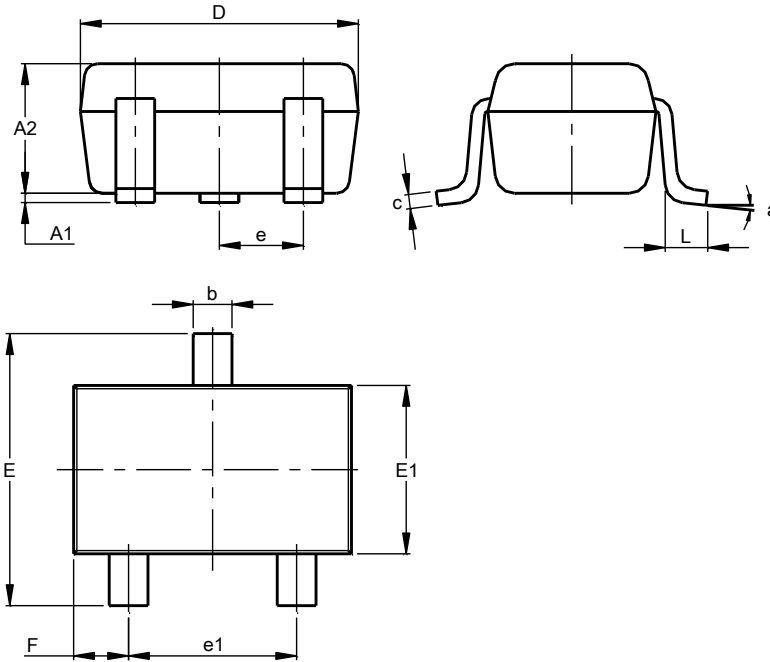


**Figure 6. Input Voltage vs Collector Current**

**Package Outline Dimensions**

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**SOT323**

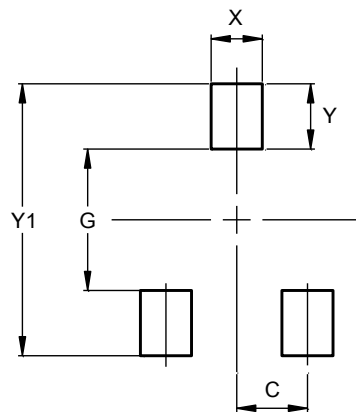


SOT323			
Dim	Min	Max	Typ
A1	0.00	0.10	0.05
A2	0.90	1.00	0.95
b	0.25	0.40	0.30
c	0.10	0.18	0.11
D	1.80	2.20	2.15
E	2.00	2.20	2.10
E1	1.15	1.35	1.30
e	0.650 BSC		
e1	1.20	1.40	1.30
F	0.375	0.475	0.425
L	0.25	0.40	0.30
a	0°	8°	--
All Dimensions in mm			

**Suggested Pad Layout**

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**SOT323**



Dimensions	Value (in mm)
C	0.650
G	1.300
X	0.470
Y	0.600
Y1	2.500

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