

DDTC (R1≠R2 SERIES)UA

NPN PRE-BIASED SMALL SIGNAL SURFACE MOUNT TRANSISTOR

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)
- Qualified to AEC-Q101 Standards for High Reliability

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

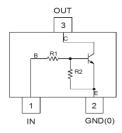
SOT323



Top View

Mechanical Data

- Case: SOT323
- Case 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)



Device Schematic

Ordering Information (Note 4)

Product	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
DDTC113ZUA-7-F	AEC-Q101	N02	7	8	3,000
DDTC123YUA-7-F	AEC-Q101	N05	7	8	3,000
DDTC123JUA-7-F	AEC-Q101	N06	7	8	3,000
DDTC143XUA-7-F	AEC-Q101	N09	7	8	3,000
DDTC143FUA-7-F	AEC-Q101	N10	7	8	3,000
DDTC143ZUA-7-F	AEC-Q101	N11	7	8	3,000
DDTC114YUA-7-F	AEC-Q101	N14	7	8	3,000
DDTC114WUA-7-F	AEC-Q101	N15	7	8	3,000
DDTC124XUA-7-F	AEC-Q101	N18	7	8	3,000
DDTC144VUA-7-F	AEC-Q101	N21	7	8	3,000
DDTC144WUA-7-F	AEC-Q101	N22	7	8	3,000

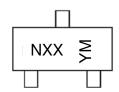
Notes:

- 1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
- 2. See http://www.diodes.com/quality/lead_free.html 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 http://www.diodes.com/products/packages.html.



Marking Information

SOT323



NXX = Product Type Marking Code YM = Date Code Marking Y = Year (ex: D = 2016)

M = Month (ex: 9 = September)

Date Code Key

Year	2016	2017	2018	2019	202	0 20	21	2022	2023	2024	2025	2026
Code	D	Е	F	G	Н		I	J	K	L	М	N
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	0	N	D

Absolute Maximum Ratings NPN Section (@T_A = +25°C, unless otherwise specified.)

Charac	teristic	Symbol	Value	Unit
Supply Voltage <pin: (2)="" (3)="" to=""></pin:>		V _{CC}	50	V
Input Voltage <pin: (1)="" (2)="" to=""></pin:>	DDTC113ZUA DDTC123YUA DDTC123JUA DDTC143XUA DDTC143FUA DDTC143ZUA DDTC114YUA DDTC114WUA DDTC124XUA DDTC144VUA 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 -10 to +40	V
Output Current	DDTC113ZUA DDTC123YUA DDTC123JUA DDTC143XUA DDTC143FUA DDTC143ZUA DDTC114YUA DDTC114WUA DDTC124XUA DDTC144VUA DDTC144VUA DDTC144WUA	lo	100 100 100 100 100 100 70 100 50 30	mA
Output Current	1	I _C (Max)	100	mA

Thermal Characteristics (@T_A = +25°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)	$R_{ heta JA}$	625	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

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

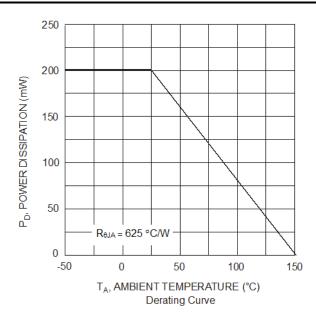


Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

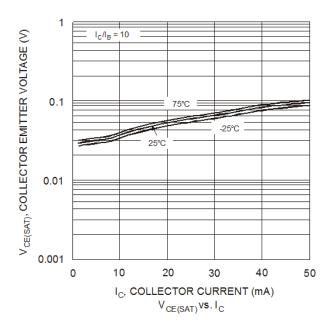
Characteristi	<u> </u>	Symbol	Min	Тур	Max	Unit	Test Condition		
Ondi doteristi	DDTC113ZUA	- Jboi	0.3	٩٤.	max	Oint	100t Condition		
	DDTC123YUA		0.3						
	DDTC123JUA		0.5						
	DDTC12330A		0.3						
			0.3						
	DDTC143FUA DDTC143ZUA	V	0.5				V 5V I 100A		
		$V_{I(oFF)}$		_	_		$V_{CC} = 5V, I_{O} = 100\mu A$		
	DDTC114YUA		0.3						
	DDTC104VUA		0.8						
	DDTC124XUA		0.4						
	DDTC144VUA		1.0						
	DDTC144WUA		8.0		0.0		V 00V 1 00 1		
Input Voltage	DDTC113ZUA				3.0	V	$V_0 = 0.3V, I_0 = 20mA$		
	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	$V_{I(ON)}$	_	_	1.3		$V_0 = 0.3V$, $I_0 = 5mA$		
	DDTC114YUA	VI(ON)			1.4		$V_O = 0.3V$, $I_O = 1mA$		
	DDTC114WUA				3.0				
							$V_0 = 0.3V, I_0 = 2mA$		
	DDTC124XUA				2.5		$V_O = 0.3V, I_O = 2mA$		
	DDTC144VUA				5.0		$V_O = 0.3V, I_O = 2mA$		
	DDTC144WUA				4.0		$V_O = 0.3V$, $I_O = 2mA$		
		V _{O(ON)}				V	$I_O/I_I = 5mA / 0.25mA DDTC123JUA$		
Output Voltage							I _O /I _I = 5mA / 0.25mA DDTC143ZUA		
output voitage			_	0.1	0.3		I _O /I _I = 5mA / 0.25mA DDTC114YUA		
							$I_0/I_1 = 10\text{mA} / 0.5\text{mA}$ All Others		
	DDTC113ZUA				7.2		10/1 = 10mA/ 0.3mA All Others		
	DDTC123YUA				3.8				
	DDTC123JUA				3.6				
	DDTC143XUA				1.8				
	DDTC143FUA				1.8				
Input Current	DDTC143ZUA	II	_		1.8	mA	$V_1 = 5V$		
input current	DDTC114YUA	"			0.88	1117 (V = 3 V		
	DDTC114WUA				0.88				
	DDTC124XUA				0.36				
	DDTC144VUA				0.16				
	DDTC144WUA				0.16				
Output Current	BBTOTTIVOX	I _{O(OFF)}		_	0.5	μA	$V_{CC} = 50V, V_{I} = 0V$		
Catpat Carrent	DDTC113ZUA	IO(OFF)	33		0.0	μ/ι	i		
	DDTC123YUA						$V_0 = 5V, I_0 = 5mA$		
		-	33				$V_0 = 5V, I_0 = 10mA$		
	DDTC123JUA		80				$V_O = 5V, I_O = 10mA$		
	DDTC143XUA		30				$V_0 = 5V, I_0 = 10mA$		
	DDTC143FUA		68				$V_O = 5V$, $I_O = 10mA$		
DC Current Gain	DDTC143ZUA	Gl	80	_		_	$V_O = 5V, I_O = 10mA$		
	DDTC114YUA	·	68				$V_{O} = 5V, I_{O} = 5mA$		
	DDTC114WUA		24				$V_0 = 5V$, $I_0 = 10mA$		
	DDTC124XUA		68				$V_0 = 5V, I_0 = 5mA$		
	DDTC144VUA	-	33						
	DDTC144WUA						$V_0 = 5V, I_0 = 5mA$		
		. =	56		00	0′	$V_O = 5V$, $I_O = 5mA$		
Input Resistor (R ₁) Tolerance		ΔR_1 $\Delta R_2/R_1$	-30	_	+30	%	_		
	Resistance Ratio Tolerance		-20	_	+20	%	_		
Gain-Bandwidth Product		f⊤	_	250	_	MHz	$V_{CE} = 10V$, $I_{E} = 5mA$, $f = 100MHz$		

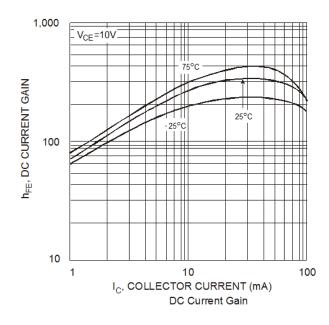


Typical Curves - Total Device



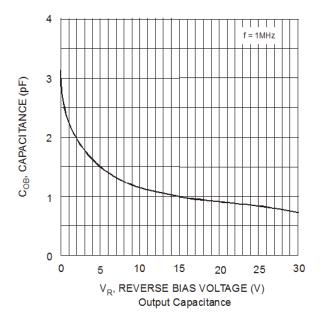
Typical Curves - DDTC123JUA (@T_A = +25°C, unless otherwise specified.)

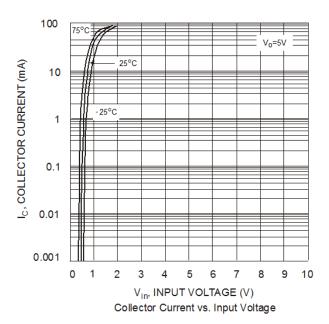


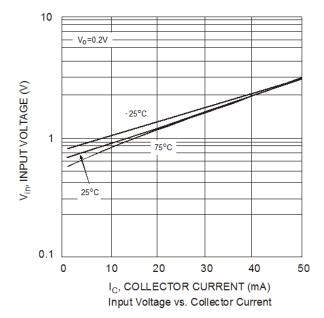




Typical Curves - DDTC123JUA (continued)





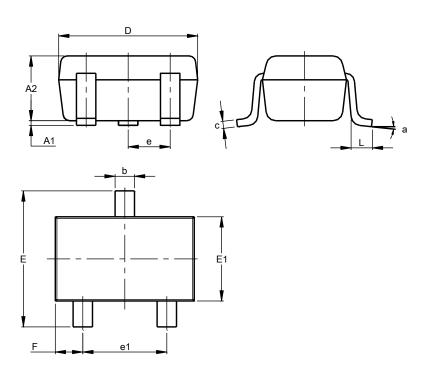




Package Outline Dimensions

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

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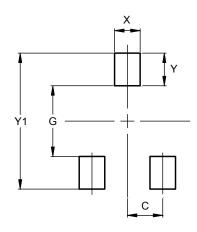


	80	T323					
Dim	Min	Max	Тур				
A1	0.00	0.10	0.05				
A2	0.90	1.00	0.95				
b	0.25	0.40	0.30				
C	0.10	0.18	0.11				
D	1.80	2.20	2.15				
Е	2.00	2.20	2.10				
E1	1.15	1.35	1.30				
е	C).650 E	SC				
e1	1.20	1.40	1.30				
F	0.375	0.475	0.425				
L	0.25	0.40	0.30				
а	0°	8°					
All Dimensions in mm							

Suggested Pad Layout

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

SOT323



Dimensions	Value (in mm)
С	0.650
G	1.300
X	0.470
Υ	0.600
Y1	2.500

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