

## Features

- Epitaxial Planar Die Construction
- Built-In Biasing Resistor, R1 Only
- 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-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](#) or your local Diodes representative. <https://www.diodes.com/quality/product-definitions/>**

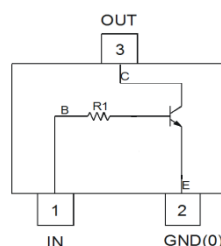
## Mechanical Data

- 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 (E3)
- Weight: 0.006 grams (Approximate)

Part Number	R1(NOM)
DDTC113TUA	1kΩ
DDTC123TUA	2.2kΩ
DDTC143TUA	4.7kΩ
DDTC114TUA	10kΩ
DDTC124TUA	22kΩ
DDTC144TUA	47kΩ
DDTC115TUA	100kΩ
DDTC125TUA	200kΩ



Top View



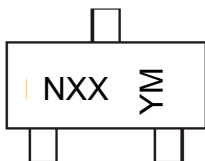
Device Schematic

## Ordering Information (Note 4)

Product	Status	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
DDTC113TUA-7-F	Active	Standard	N01	7	8	3,000
DDTC113TUA-13-F	Active	Standard	N01	13	8	10,000
DDTC123TUA-7-F	Active	Standard	N03	7	8	3,000
DDTC123TUA-13-F	Active	Standard	N03	13	8	10,000
DDTC143TUA-7-F	Active	Standard	N07	7	8	3,000
DDTC143TUA-13-F	Active	Standard	N07	13	8	10,000
DDTC114TUA-7-F	Active	Standard	N12	7	8	3,000
DDTC114TUA-13-F	Active	Standard	N12	13	8	10,000
DDTC124TUA-7-F	Active	Standard	N16	7	8	3,000
DDTC124TUA-13-F	Active	Standard	N16	13	8	10,000
DDTC144TUA-7-F	Active	Standard	N19	7	8	3,000
DDTC144TUA-13-F	Active	Standard	N19	13	8	10,000
DDTC115TUA-7-F	Active	Standard	N23	7	8	3,000
DDTC115TUA-13-F	Active	Standard	N23	13	8	10,000
DDTC125TUA-7-F	Obsolete	Standard	N25	7	8	3,000
DDTC125TUA-13-F	Obsolete	Standard	N25	13	8	10,000

- 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 = Year (ex: 1 = 2021)  
 M = Month (ex: 9 = September)

### Date Code Key

Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Code	I	J	K	L	M	N	O	P	R	S	T	U

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<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CB0</sub>	50	V
Collector-Emitter Voltage	V <sub>CEO</sub>	50	V
Emitter-Base Voltage	V <sub>EBO</sub>	5	V
Collector Current	I <sub>C</sub> (Max)	100	mA

## Thermal Characteristics (@ T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P <sub>D</sub>	200	mW
Thermal Resistance, Junction to Ambient Air (Note 5)	R <sub>θJA</sub>	625	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

Note: 5. Mounted on FR4 PC Board with minimum recommended pad layout.

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CB0</sub>	50	—	—	V	I <sub>C</sub> = 50μA
Collector-Emitter Breakdown Voltage	BV <sub>CEO</sub>	50	—	—	V	I <sub>C</sub> = 1mA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	5	—	—	V	I <sub>E</sub> = 50μA
Collector Cutoff Current	I <sub>CB0</sub>	—	—	0.5	μA	V <sub>CB</sub> = 50V
Emitter Cutoff Current	I <sub>EBO</sub>	—	—	0.5	μA	V <sub>EB</sub> = 4V
Collector-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	—	—	0.3	V	I <sub>C</sub> /I <sub>B</sub> = 10mA/1mA DDTC113TUA I <sub>C</sub> /I <sub>B</sub> = 5mA/0.5mA DDTC123TUA I <sub>C</sub> /I <sub>B</sub> = 2.5mA/0.25mA DDTC143TUA I <sub>C</sub> /I <sub>B</sub> = 1mA/0.1mA DDTC114TUA I <sub>C</sub> /I <sub>B</sub> = 5mA/0.5mA DDTC124TUA I <sub>C</sub> /I <sub>B</sub> = 2.5mA/0.25mA DDTC144TUA I <sub>C</sub> /I <sub>B</sub> = 1mA/0.1mA DDTC115TUA I <sub>C</sub> /I <sub>B</sub> = 0.5mA/0.05mA DDTC125TUA
DC Current Transfer Ratio	h <sub>FE</sub>	100	250	600	—	I <sub>C</sub> = 1mA, V <sub>CE</sub> = 5V
Input Resistor (R <sub>1</sub> ) Tolerance	ΔR <sub>1</sub>	-30	—	+30	%	—
Gain-Bandwidth Product (Note 6)	f <sub>T</sub>	—	250	—	MHZ	V <sub>CE</sub> = 10V, I <sub>E</sub> = -5mA, f = 100MHZ

Note 6. Transistor only.

**Typical Curves – DDTC114TUA** (@  $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

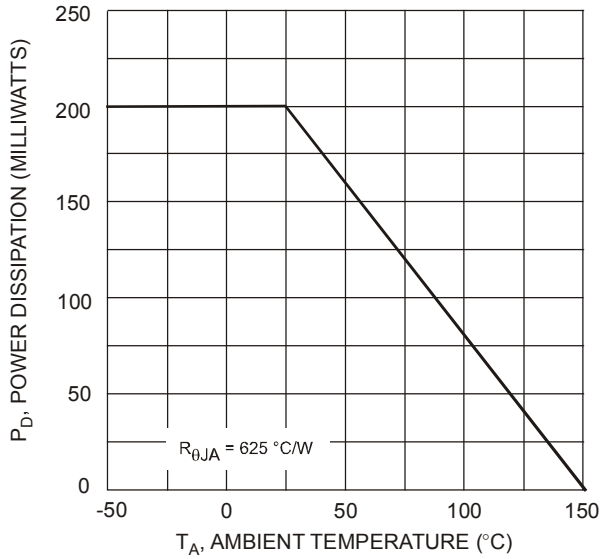


Fig. 1 Derating Curve

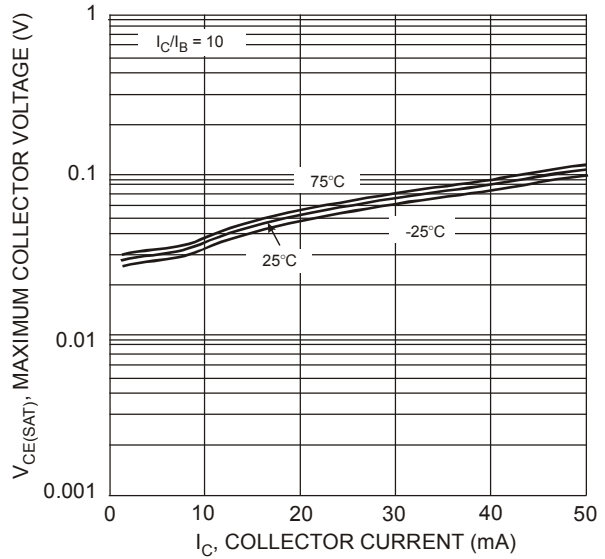


Fig. 2  $V_{CE(SAT)}$  vs.  $I_C$

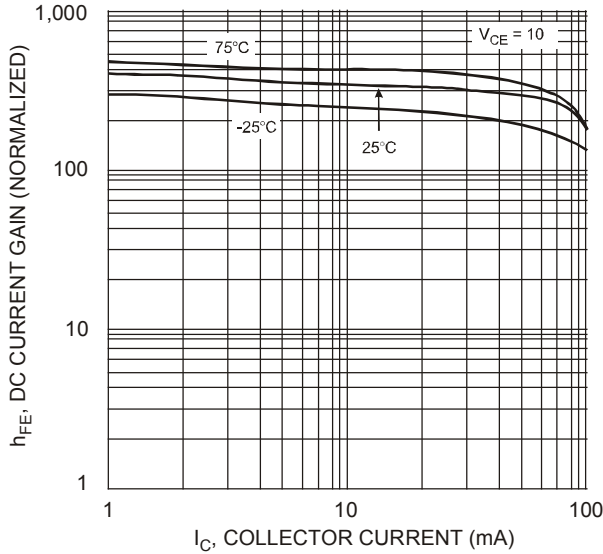


Fig. 3 DC Current Gain

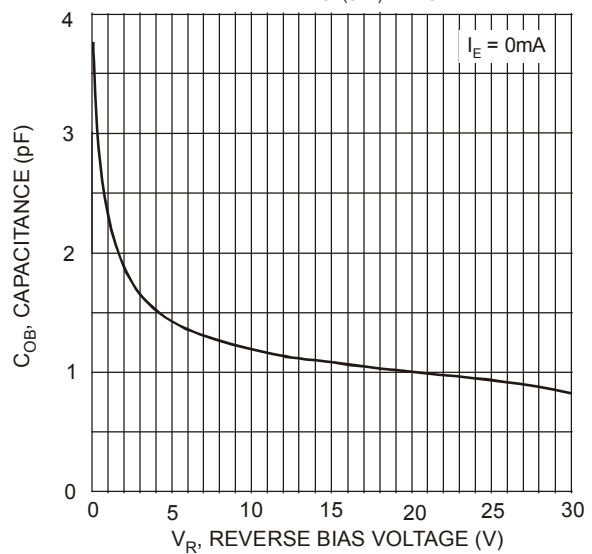


Fig. 4 Output Capacitance

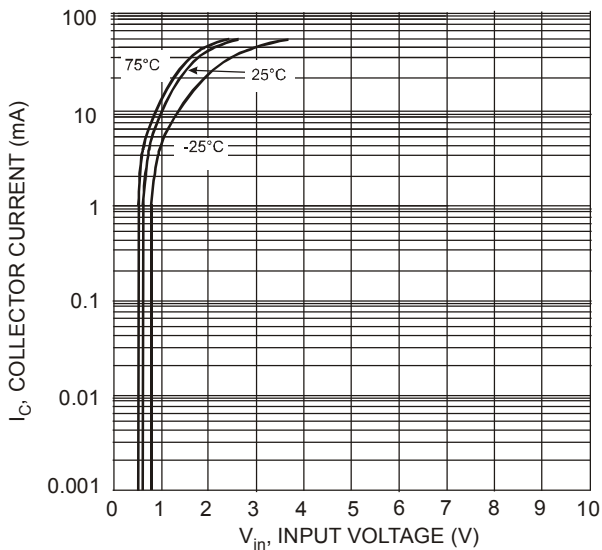


Fig. 5 Collector Current vs. Input Voltage

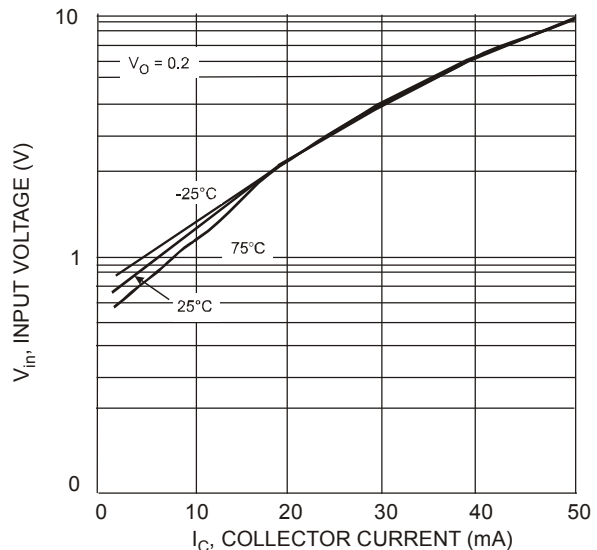
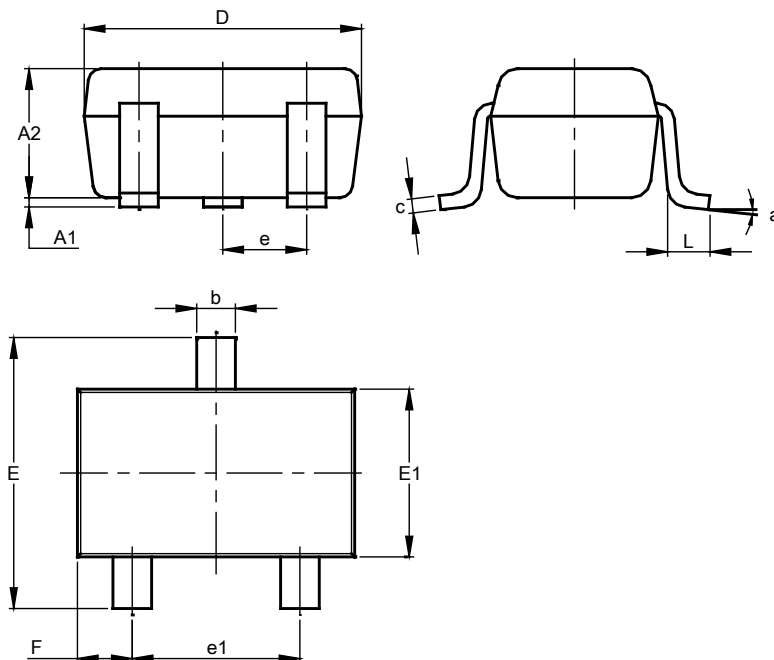


Fig. 6 Input Voltage vs. Collector Current

## Package Outline Dimensions

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

**SOT323**

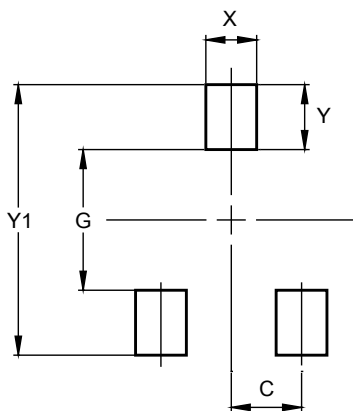


SOT323			
Dim	Min	Max	Typ
A1	0.00	0.10	0.05
A2	0.90	1.00	0.95
b	0.25	0.40	0.30
c	0.10	0.18	0.11
D	1.80	2.20	2.15
E	2.00	2.20	2.10
E1	1.15	1.35	1.30
e	0.650 BSC		
e1	1.20	1.40	1.30
F	0.375	0.475	0.425
L	0.25	0.40	0.30
a	0°	8°	--
All Dimensions in mm			

## 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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