

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-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](https://www.diodes.com/quality/product-definitions/) or your local Diodes representative. <https://www.diodes.com/quality/product-definitions/>**

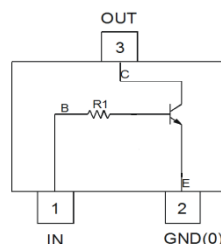
Mechanical Data

- 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 **Ⓢ**
- 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



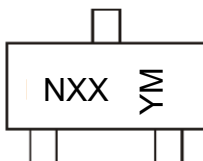
Device Schematic

Ordering Information (Note 4)

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

- 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: J = 2022)
 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	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 (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CB0}	50	V
Collector-Emitter Voltage	V_{CEO}	50	V
Emitter-Base Voltage	V_{EBO}	5	V
Collector Current	I_C (Max)	100	mA

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

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

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

Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CB0}	50	—	—	V	$I_C = 50\mu\text{A}$
Collector-Emitter Breakdown Voltage	BV_{CEO}	50	—	—	V	$I_C = 1\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	5	—	—	V	$I_E = 50\mu\text{A}$
Collector Cutoff Current	I_{CB0}	—	—	0.5	μA	$V_{CB} = 50\text{V}$
Emitter Cutoff Current	I_{EBO}	—	—	0.5	μA	$V_{EB} = 4\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	—	0.3	V	$I_C/I_B = 10\text{mA}/1\text{mA}$ DDTC113TUA $I_C/I_B = 5\text{mA}/0.5\text{mA}$ DDTC123TUA $I_C/I_B = 2.5\text{mA}/0.25\text{mA}$ DDTC143TUA $I_C/I_B = 1\text{mA}/0.1\text{mA}$ DDTC114TUA $I_C/I_B = 5\text{mA}/0.5\text{mA}$ DDTC124TUA $I_C/I_B = 2.5\text{mA}/0.25\text{mA}$ DDTC144TUA $I_C/I_B = 1\text{mA}/0.1\text{mA}$ DDTC115TUA $I_C/I_B = 0.5\text{mA}/0.05\text{mA}$ DDTC125TUA
DC Current Transfer Ratio	h_{FE}	100	250	600	—	$I_C = 1\text{mA}, V_{CE} = 5\text{V}$
Input Resistor (R_1) Tolerance	ΔR_1	-30	—	+30	%	—
Gain-Bandwidth Product (Note 6)	f_T	—	250	—	MHz	$V_{CE} = 10\text{V}, I_E = -5\text{mA}, f = 100\text{MHz}$

Note 6. Transistor only.

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

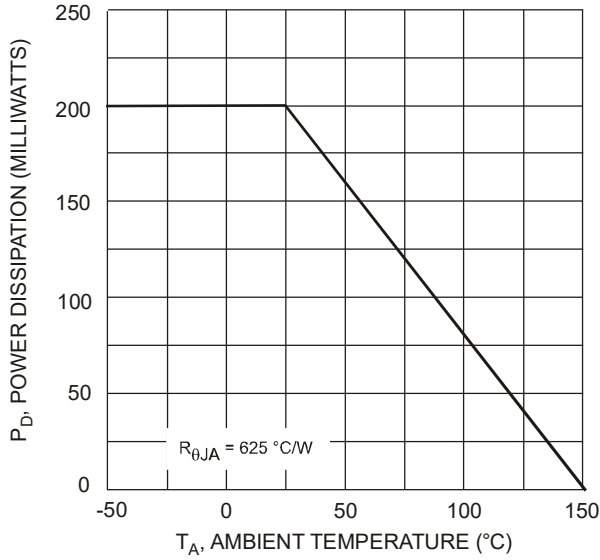


Fig. 1 Derating Curve

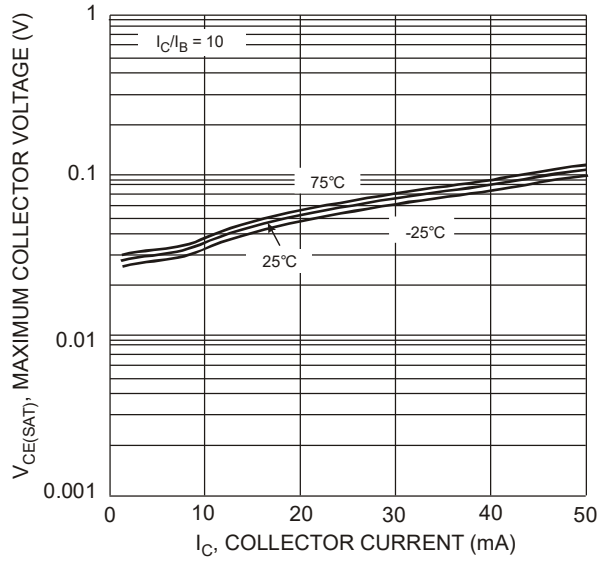


Fig. 2 $V_{CE(SAT)}$ vs. I_C

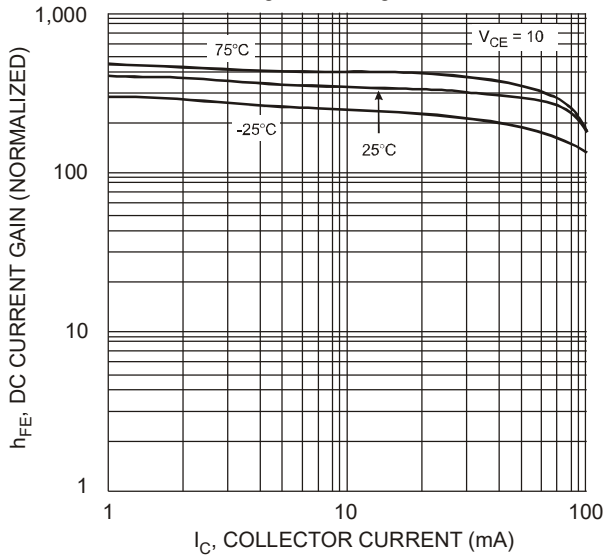


Fig. 3 DC Current Gain

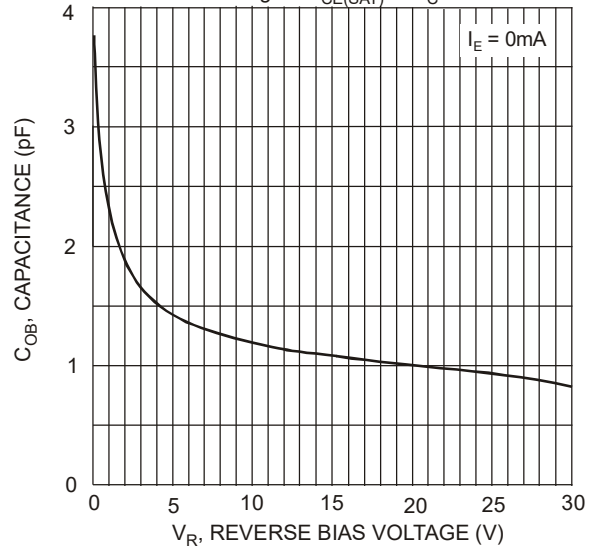


Fig. 4 Output Capacitance

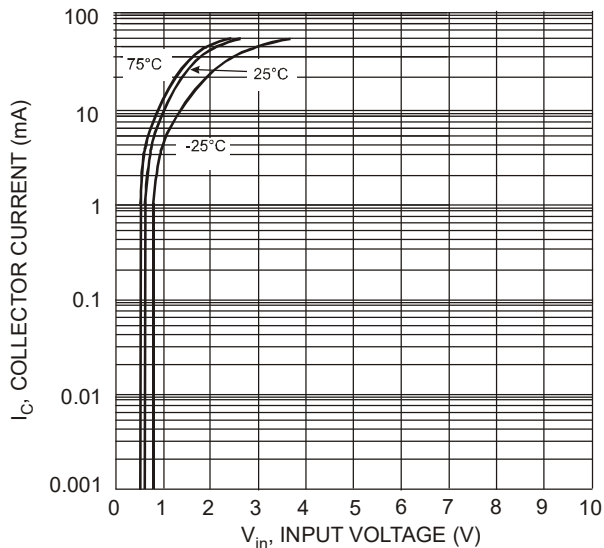


Fig. 5 Collector Current vs. Input Voltage

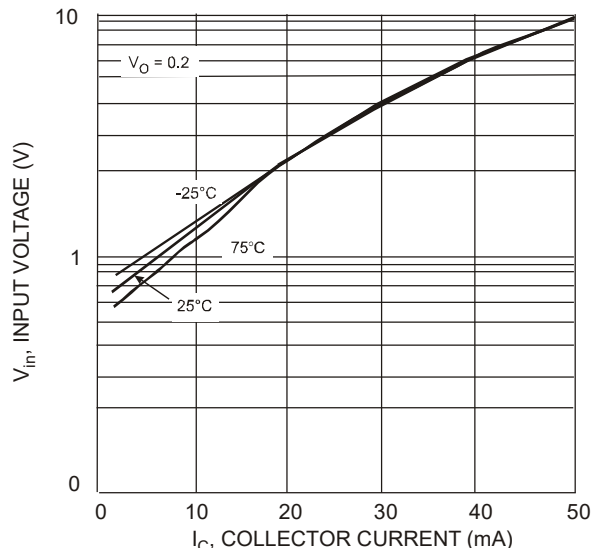
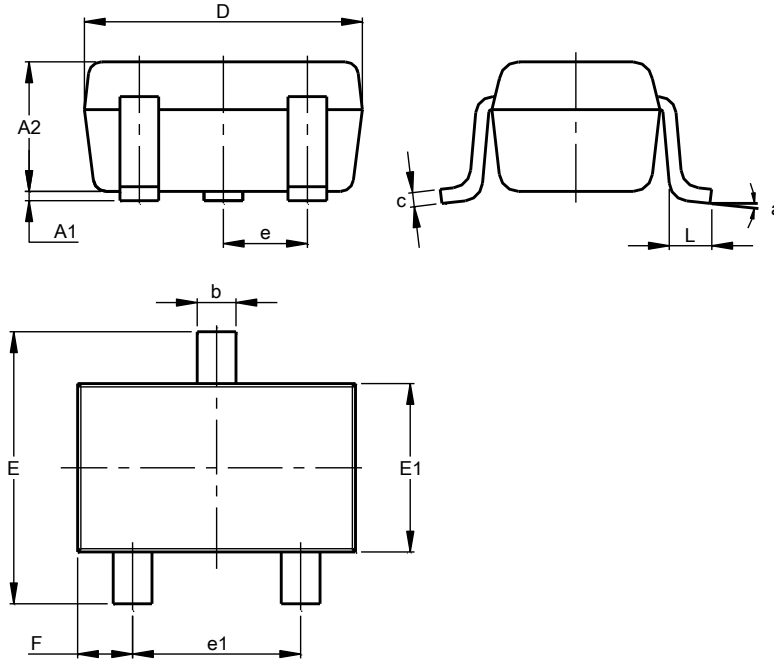


Fig. 6 Input Voltage vs. Collector Current

Package Outline Dimensions

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

SOT323

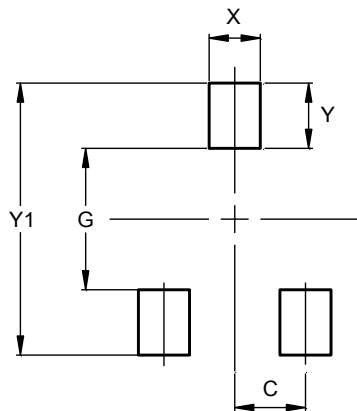


SOT323			
Dim	Min	Max	Typ
A1	0.00	0.10	0.05
A2	0.90	1.00	0.95
b	0.25	0.40	0.30
c	0.10	0.18	0.11
D	1.80	2.20	2.15
E	2.00	2.20	2.10
E1	1.15	1.35	1.30
e	0.650 BSC		
e1	1.20	1.40	1.30
F	0.375	0.475	0.425
L	0.25	0.40	0.30
a	0°	8°	--
All Dimensions in mm			

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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