

Features

- Epitaxial Planar Die Construction
- Complementary PNP Types Available (DDTA)
- Built-In Biasing Resistor, R1 Only
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The DDTC (R1-ONLY SERIES) E is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**

<https://www.diodes.com/quality/product-definitions/>

Mechanical Data

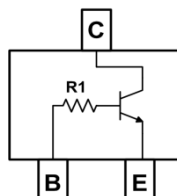
- Case: SOT523
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish. Solderable per MIL-STD-202, Method 208 
- Weight: 0.002 grams (Approximate)

Part Number	R1 (NOM)
DDTC113TE	1k Ω
DDTC123TE	2.2k Ω
DDTC143TE	4.7k Ω
DDTC114TE	10k Ω
DDTC124TE	22k Ω
DDTC144TE	47k Ω
DDTC115TE	100k Ω
DDTC125TE	200k Ω

SOT523



Top View



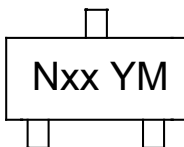
Device Schematic – Top View

Ordering Information (Note 4)

Part Number	Status	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity Per Reel
DDTC113TE-7-F	Active	Standard	N01	7	8	3,000
DDTC123TE-7-F	Active	Standard	N03	7	8	3,000
DDTC143TE-7-F	Active	Standard	N07	7	8	3,000
DDTC114TE-7-F	Active	Standard	N12	7	8	3,000
DDTC124TE-7-F	Active	Standard	N16	7	8	3,000
DDTC124TEQ-7-F	Active	Automotive	N16	7	8	3,000
DDTC144TE-7-F	Active	Standard	N19	7	8	3,000
DDTC115TE-7-F	Active	Standard	N23	7	8	3,000
DDTC125TE-7-F	Obsolete	Standard	N25	7	8	3,000

- 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
 (See Table in Features)
 YM = Date Code Marking
 Y or $\bar{Y}$ = Year (ex: 1 = 2021)
 M or $\bar{M}$ = Month (ex: 9 = September)

Date Code Key

Year	2002	...	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Code	O	...	I	J	K	L	M	N	O	P	R	S

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	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	150	mW
Thermal Resistance, Junction to Ambient Air (Note 5)	$R_{\theta JA}$	833	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	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_{CBO}	—	—	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	$I_C/I_B = 10\text{mA}/1\text{mA}$ DDTC113TE $I_C/I_B = 5\text{mA}/0.5\text{mA}$ DDTC123TE $I_C/I_B = 2.5\text{mA}/0.25\text{mA}$ DDTC143TE $I_C/I_B = 1\text{mA}/0.1\text{mA}$ DDTC114TE $I_C/I_B = 5\text{mA}/0.5\text{mA}$ DDTC124TE $I_C/I_B = 2.5\text{mA}/0.25\text{mA}$ DDTC144TE $I_C/I_B = 1\text{mA}/0.1\text{mA}$ DDTC115TE $I_C/I_B = 0.5\text{mA}/0.05\text{mA}$ DDTC125TE
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	$V_{CE} = 10\text{V}, I_E = -5\text{mA}, f = 100\text{MHz}$

Notes: 5. Mounted on FR-4 PC Board with minimum recommended pad layout.
 6. Transistor only.

Typical Curves – DDTC114TE

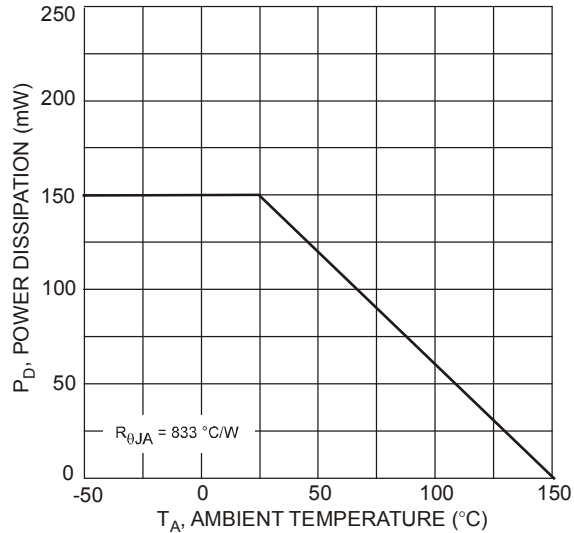


Fig. 1 Power Dissipation vs. Ambient Temperature

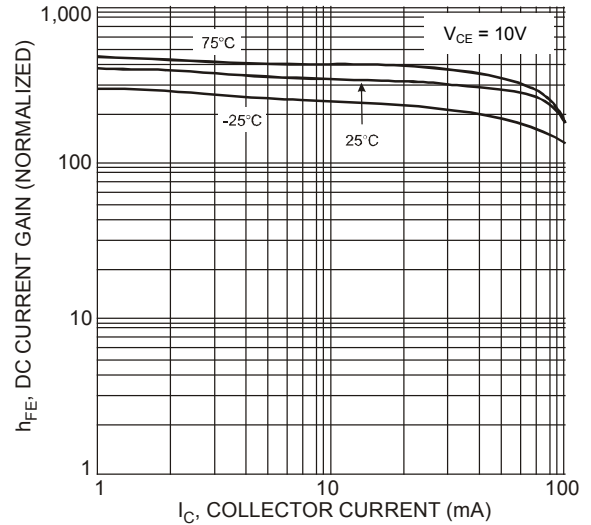


Fig. 2 Typical DC Current Gain vs. Collector Current

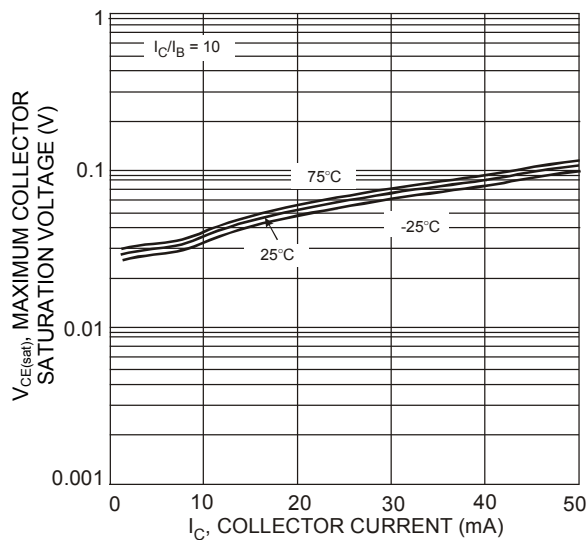


Fig. 3 Typical Collector Emitter Saturation Voltage vs. Collector Current

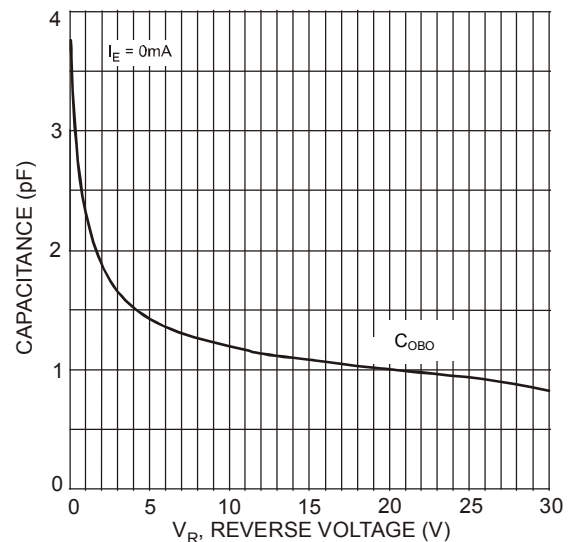


Fig. 4 Typical Capacitance Characteristics

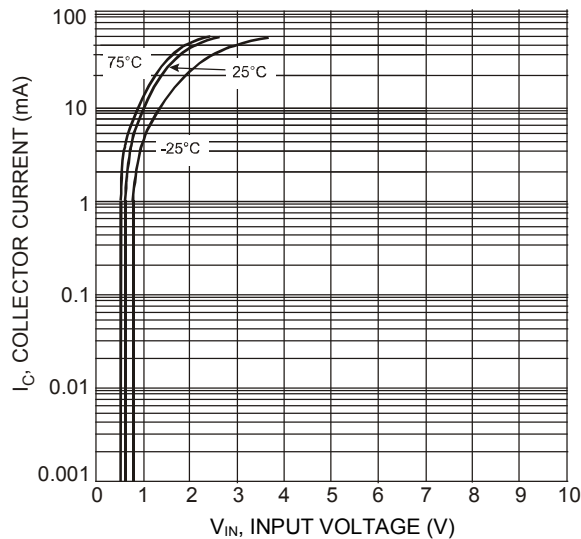


Fig. 5 Collector Current vs. Input Voltage

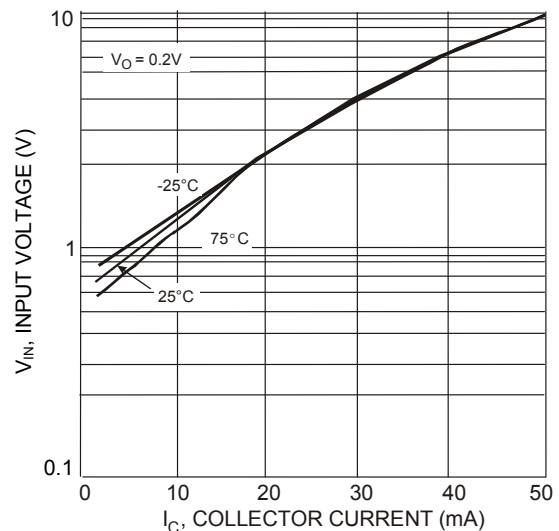
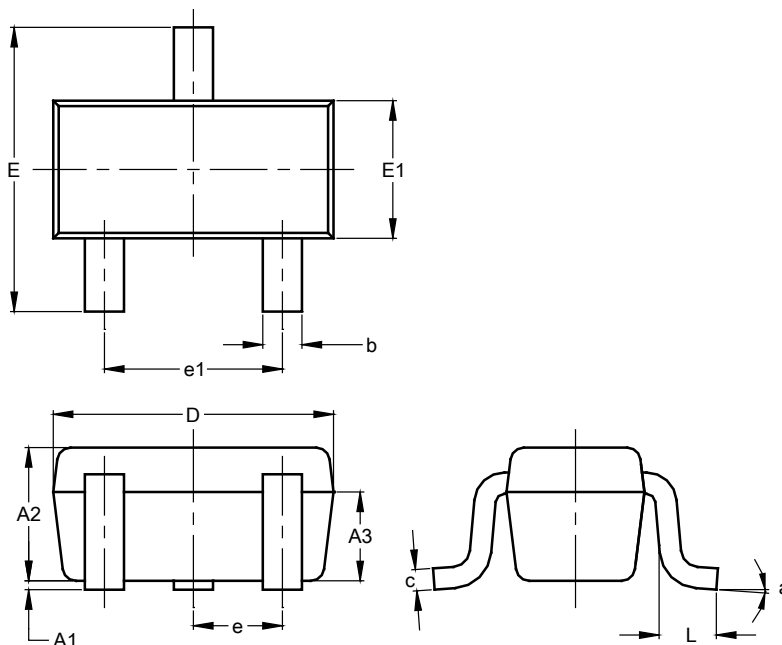


Fig. 6 Input Voltage vs. Collector Current

Package Outline Dimensions

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

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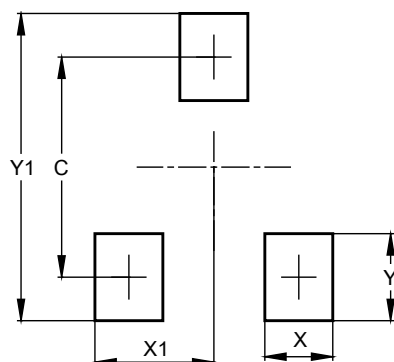


SOT523			
Dim	Min	Max	Typ
A1	0.00	0.10	0.05
A2	0.60	0.80	0.75
A3	0.45	0.65	0.50
b	0.15	0.30	0.22
c	0.10	0.20	0.12
D	1.50	1.70	1.60
E	1.45	1.75	1.60
E1	0.75	0.85	0.80
e	0.50 BSC		
e1	0.90	1.10	1.00
L	0.20	0.40	0.33
a	0°	—	8°
All Dimensions in mm			

Suggested Pad Layout

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

SOT523



Dimensions	Value (in mm)
C	1.29
X	0.40
X1	0.70
Y	0.51
Y1	1.80

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