

## Features

- Epitaxial Planar Die Construction
- Complementary NPN Types Available (DDTC)
- Built-In Biasing Resistors, R1 only
- **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](mailto:contact@diodes.com) or your local Diodes representative. <https://www.diodes.com/quality/product-definitions/>**

## Mechanical Data

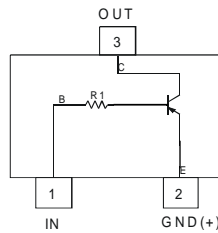
- Case: SOT523
- Case Material: Molded Plastic, "Green" Molding Compound  
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208③
- Weight: 0.002 grams (Approximate)

Part Number	R1 (NOM)
DDTA113TE	1kΩ
DDTA123TE	2.2 kΩ
DDTA143TE	4.7kΩ
DDTA114TE	10kΩ
DDTA124TE	22kΩ
DDTA144TE	47kΩ
DDTA115TE	100kΩ
DDTA125TE	200kΩ

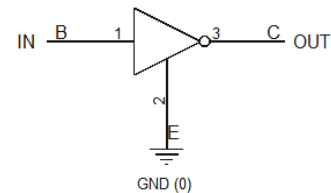
SOT523



Top View



Device Schematic



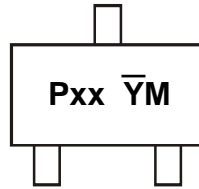
Equivalent Inverter Circuit

## Ordering Information (Note 4)

Part Number	Status	Compliance	Marking Code	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
DDTA113TE-7-F	Active	Standard	P01	7	8	3000
DDTA123TE-7-F	Active	Standard	P03	7	8	3000
DDTA143TE-7-F	Active	Standard	P07	7	8	3000
DDTA114TE-7-F	Active	Standard	P12	7	8	3000
DDTA124TE-7-F	Active	Standard	P16	7	8	3000
DDTA144TE-7-F	Active	Standard	P19	7	8	3000
DDTA115TE-7-F	Active	Standard	P23	7	8	3000
DDTA125TE-7-F	Obsolete	Standard	P25	7	8	3000

- 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**



Pxx = Product Type Marking Code (See Ordering Information)  
 YM = Date Code Marking  
 Y or  $\bar{Y}$  = Year (ex: I = 2021)  
 M = Month (ex: 9 = September)

Date Code Key

<b>Year</b>	2004	...	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
<b>Code</b>	R	...	I	J	K	L	M	N	O	P	R	S
<b>Month</b>	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>Code</b>	1	2	3	4	5	6	7	8	9	O	N	D

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

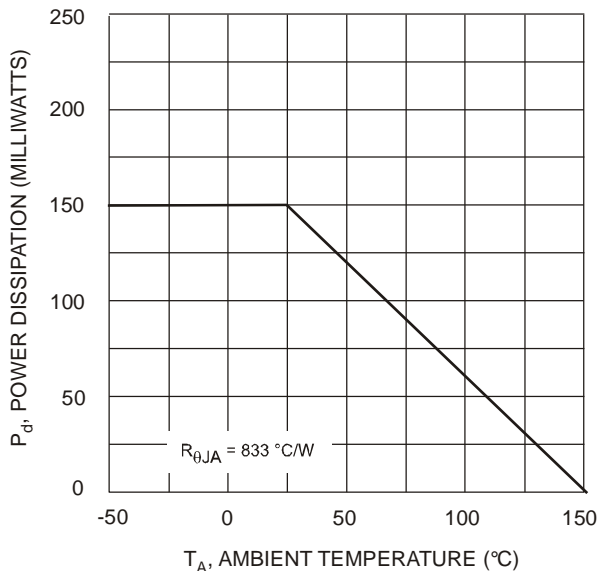
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CBO}$	-50	V
Collector-Emitter Voltage	$V_{CEO}$	-50	V
Emitter-Base Voltage	$V_{EBO}$	-5	V
Peak Pulse Collector Current (Single Pulse)	$I_{CM}$	-100	mA

**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	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

Note: 5. For a device surface mounted on 15mm x 15mm x 0.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; device measured when operating in steady state condition.

**Thermal Characteristics and Derating Information**



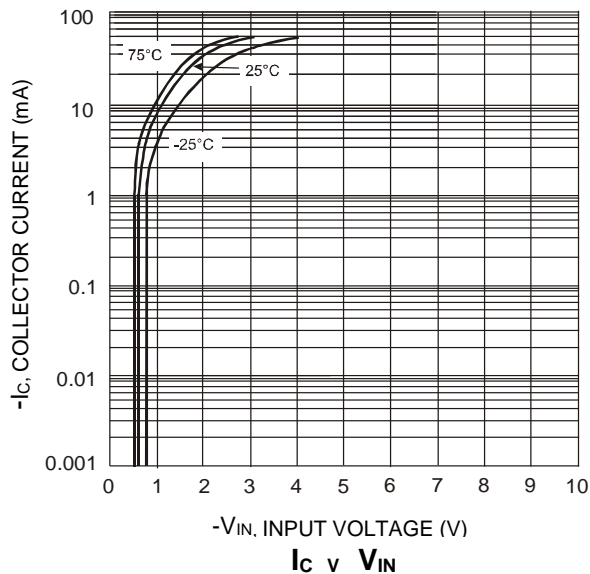
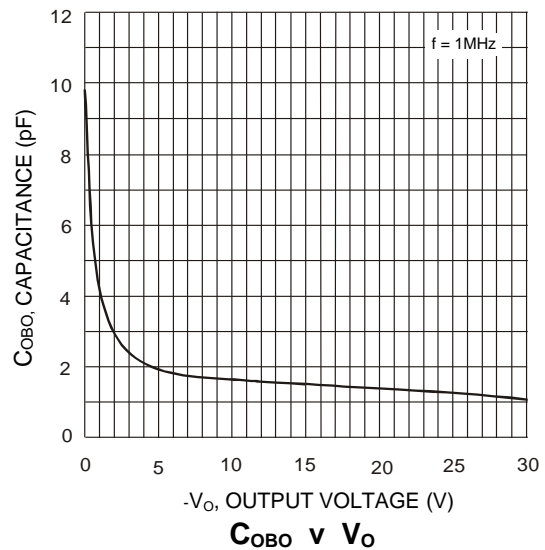
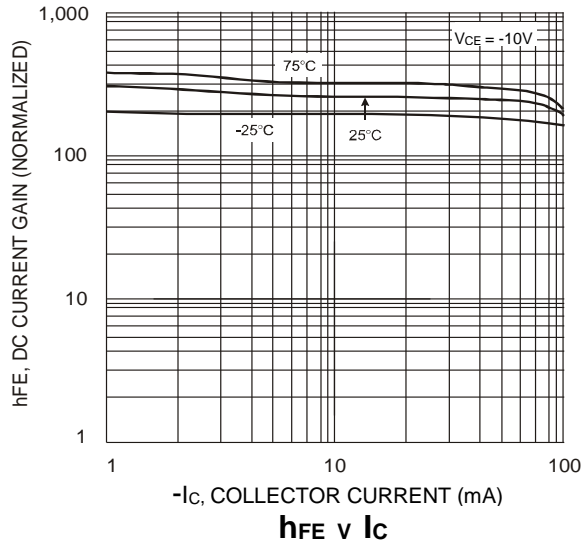
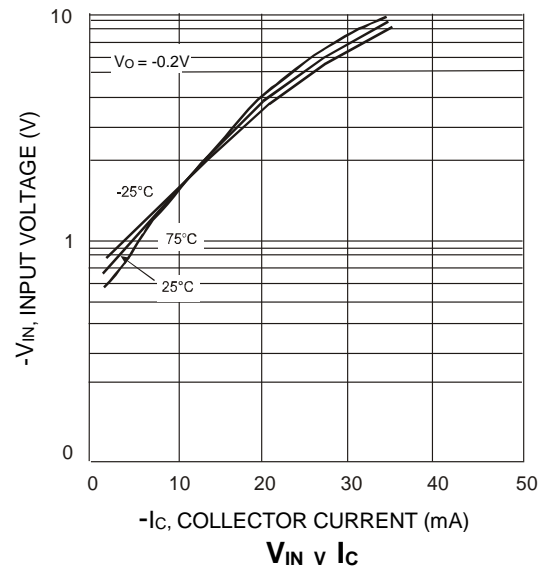
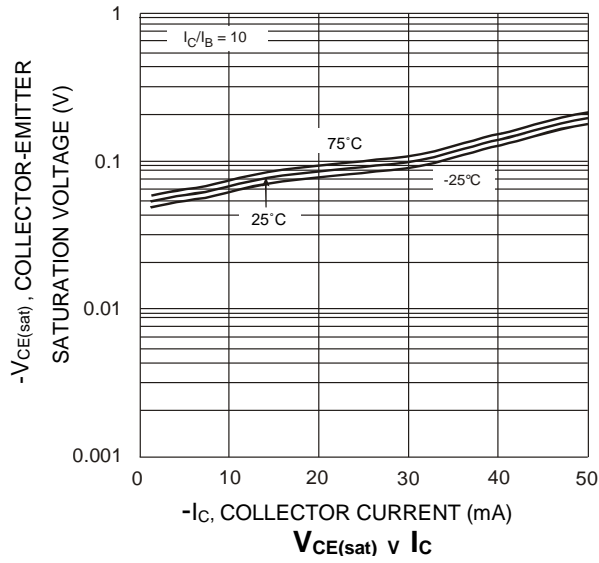
**Derating Curve**

**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 (Note 6)	$BV_{CEO}$	-50	—	—	V	$I_C = -1\text{mA}$
Emitter-Base Breakdown Voltage	$BV_{EBO}$	-5	—	—	V	$I_E = -50\mu\text{A}$
Collector Cut-Off Current	$I_{CBO}$	—	—	-0.5	$\mu\text{A}$	$V_{CB} = -50\text{V}$
Emitter Cutoff Current	$I_{EBO}$	—	—	-0.5	$\mu\text{A}$	$V_{EB} = -4\text{V}$
Collector-Emitter Saturation Voltage (Note 6)	$V_{CE(sat)}$	—	—	-0.3	V	$I_C/I_B = -10\text{mA}/-1\text{mA}$ DDTA113TE $I_C/I_B = -5\text{mA}/-0.5\text{mA}$ DDTA123TE $I_C/I_B = -2.5\text{mA}/-0.25\text{mA}$ DDTA143TE $I_C/I_B = -1\text{mA}/-0.1\text{mA}$ DDTA114TE $I_C/I_B = -5\text{mA}/-0.5\text{mA}$ DDTA124TE $I_C/I_B = -2.5\text{mA}/-0.25\text{mA}$ DDTA144TE $I_C/I_B = -1\text{mA}/-0.1\text{mA}$ DDTA115TE $I_C/I_B = -0.5\text{mA}/-0.05\text{mA}$ DDTA125TE
DC Current Gain (Note 6)	$h_{FE}$	100	250	600	—	$I_C = -1\text{mA}$ , $V_{CE} = -5\text{V}$
Transition Frequency (Note 6)	$f_T$	—	250	—	MHz	$V_{CE} = -10\text{V}$ , $I_E = 5\text{mA}$ , $f = 100\text{MHz}$

Note: 6. Measured under pulsed conditions. Pulse width  $\leq 300\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

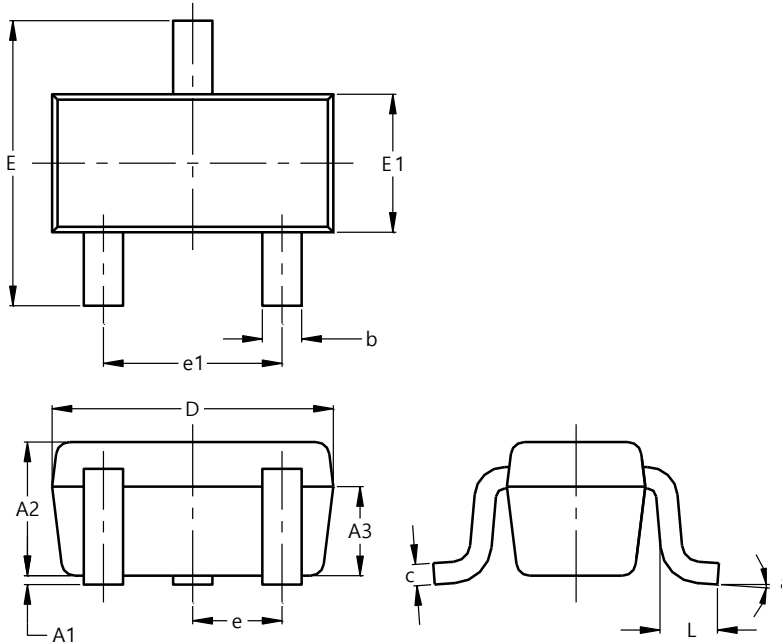
**Typical Electrical Characteristics** (@  $T_A = +25^\circ\text{C}$  unless otherwise specified.)



**Package Outline Dimensions**

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

**SOT523**

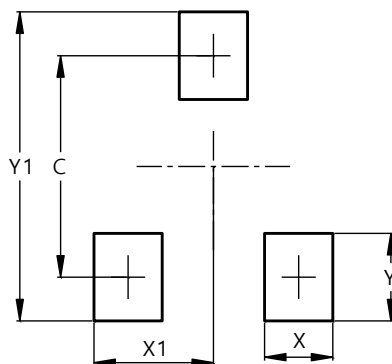


SOT523			
Dim	Min	Max	Typ
A1	0.00	0.10	0.05
A2	0.60	0.80	0.75
A3	0.45	0.65	0.50
b	0.15	0.30	0.22
c	0.10	0.20	0.12
D	1.50	1.70	1.60
E	1.45	1.75	1.60
E1	0.75	0.85	0.80
e	0.50 BSC		
e1	0.90	1.10	1.00
L	0.20	0.40	0.33
a	0°	--	8°
All Dimensions in mm			

**Suggested Pad Layout**

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

**SOT523**



Dimensions	Value
C	1.29
X	0.40
X1	0.70
Y	0.51
Y1	1.80

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