



## Features

- Epitaxial Planar Die Construction
- Complementary NPN Types Available (DDTC)
- Built-In Biasing Resistors, R1 = R2
- **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**

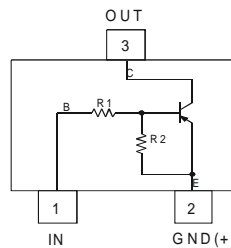
## Mechanical Data

- 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 208 Ⓜ
- Weight: 0.002 grams (Approximate)

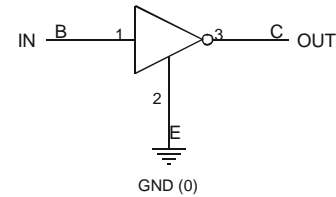
Part Number	R1, R2 (NOM)
DDTA123EE	2.2kΩ
DDTA143EE	4.7kΩ
DDTA114EE	10kΩ
DDTA124EE	22kΩ
DDTA144EE	47kΩ
DDTA115EE	100kΩ



Top View



Device Schematic



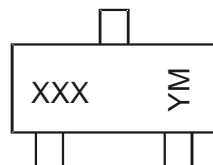
Equivalent Inverter Circuit

## Ordering Information (Note 4)

Product	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
DDTA123EE-7-F	AEC-Q101	P04	7	8	3,000
DDTA143EE-7-F	AEC-Q101	P08	7	8	3,000
DDTA114EE-7-F	AEC-Q101	P13	7	8	3,000
DDTA124EE-7-F	AEC-Q101	P17	7	8	3,000
DDTA144EE-7-F	AEC-Q101	P20	7	8	3,000
DDTA115EE-7-F	AEC-Q101	P24	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



XXX = Product Type Marking Code, See Table Above  
 YM = Date Code Marking  
 Y or Y = Year (ex: F = 2018)  
 M = Month (ex: 9 = September)

### Date Code Key

Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Code	F	G	H	I	J	K	L	M	N	O	P

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

**Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Supply Voltage <Pin: (3) to (2)>		V <sub>CC</sub>	50	V
Input Voltage <Pin: (1) to (2)>	DDTA123EE	V <sub>IN</sub>	+10 to -12	V
	DDTA143EE		+10 to -30	
	DDTA114EE		+10 to -40	
	DDTA124EE		+10 to -40	
	DDTA144EE		+10 to -40	
	DDTA115EE		+10 to -40	
Output Current	DDTA123EE	I <sub>O</sub>	-100	mA
	DDTA143EE		-100	
	DDTA114EE		-50	
	DDTA124EE		-30	
	DDTA144EE		-30	
	DDTA115EE		-20	
Output 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 & 6)	P <sub>D</sub>	150	mW
Thermal Resistance, Junction to Ambient Air (Note 5)	R <sub>θJA</sub>	833	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

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

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage		V <sub>I(OFF)</sub>	-0.5	-1.1	—	V	V <sub>CC</sub> = -5V, I <sub>O</sub> = -100μA
		V <sub>I(ON)</sub>	—	-1.9	-3		V <sub>O</sub> = -0.3V, I <sub>O</sub> = -20mA, DDTA123EE V <sub>O</sub> = -0.3V, I <sub>O</sub> = -20mA, DDTA143EE V <sub>O</sub> = -0.3V, I <sub>O</sub> = -10mA, DDTA114EE V <sub>O</sub> = -0.3V, I <sub>O</sub> = -5mA, DDTA124EE V <sub>O</sub> = -0.3V, I <sub>O</sub> = -2mA, DDTA144EE V <sub>O</sub> = -0.3V, I <sub>O</sub> = -1mA, DDTA115EE
Output Voltage		V <sub>O(ON)</sub>	—	-0.1	-0.3	V	I <sub>O</sub> /I <sub>I</sub> = -10mA/-0.5mA DDTA123EE I <sub>O</sub> /I <sub>I</sub> = -10mA/-0.5mA DDTA143EE I <sub>O</sub> /I <sub>I</sub> = -10mA/-0.5mA DDTA114EE I <sub>O</sub> /I <sub>I</sub> = -10mA/-0.5mA DDTA124EE I <sub>O</sub> /I <sub>I</sub> = -10mA/-0.5mA DDTA144EE I <sub>O</sub> /I <sub>I</sub> = -5mA/-0.25mA DDTA115EE
Input Current	DDTA123EE DDTA143EE DDTA114EE DDTA124EE DDTA144EE DDTA115EE	I <sub>I</sub>	—	—	-3.8 -1.8 -0.88 -0.36 -0.18 -0.15	mA	V <sub>I</sub> = -5V
Output Current		I <sub>O(OFF)</sub>	—	—	-0.5	μA	V <sub>CC</sub> = -50V, V <sub>I</sub> = 0V
DC Current Gain	DDTA123EE DDTA143EE DDTA114EE DDTA124EE DDTA144EE DDTA115EE	G <sub>I</sub>	-20 -20 -30 -56 -68 -82	—	—	—	V <sub>O</sub> = -5V, I <sub>O</sub> = -20mA V <sub>O</sub> = -5V, I <sub>O</sub> = -10mA V <sub>O</sub> = -5V, I <sub>O</sub> = -5mA V <sub>O</sub> = -5V, I <sub>O</sub> = -5mA V <sub>O</sub> = -5V, I <sub>O</sub> = -5mA
Input Resistor Tolerance		ΔR <sub>1</sub>	-30	—	+30	%	—
Resistance Ratio Tolerance		ΔR <sub>2</sub> /R <sub>1</sub>	0.8	1	1.2	%	—
Gain-Bandwidth Product (Note 7)		f <sub>T</sub>	—	250	—	MHz	V <sub>CE</sub> = -10V, I <sub>E</sub> = 5mA, f = 100MHz

Notes:  
 5. Mounted on FR-4 PC Board with minimum recommended pad layout.  
 6. 150mW per element must not be exceeded.  
 7. Transistor only.

**Typical Electrical Characteristics – DDTA143EE**

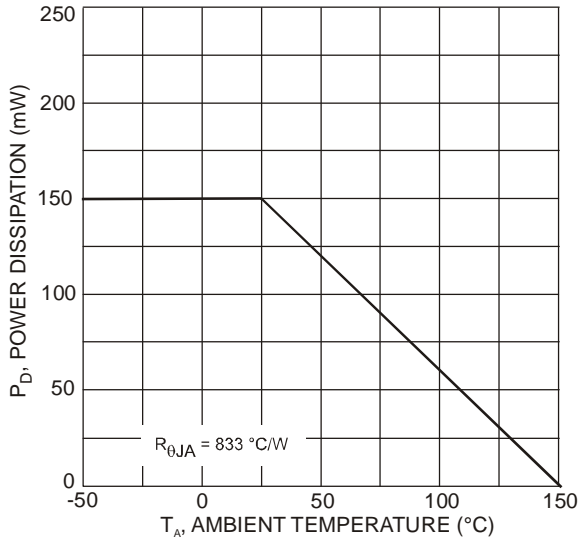


Figure 1 Power Dissipation vs. Ambient Temperature

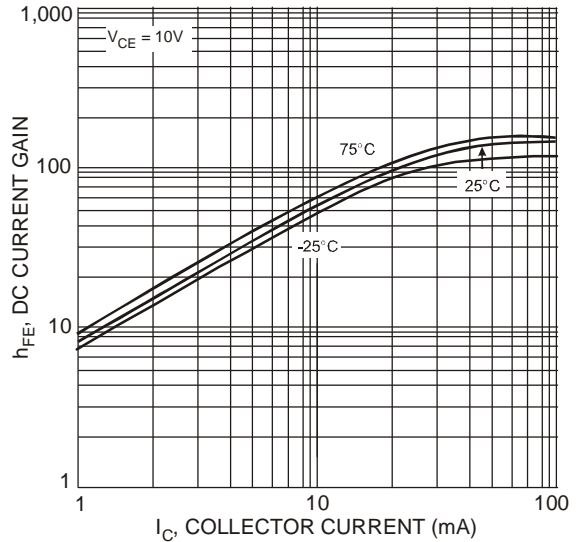


Figure 2 Typical DC Current Gain vs. Collector Current

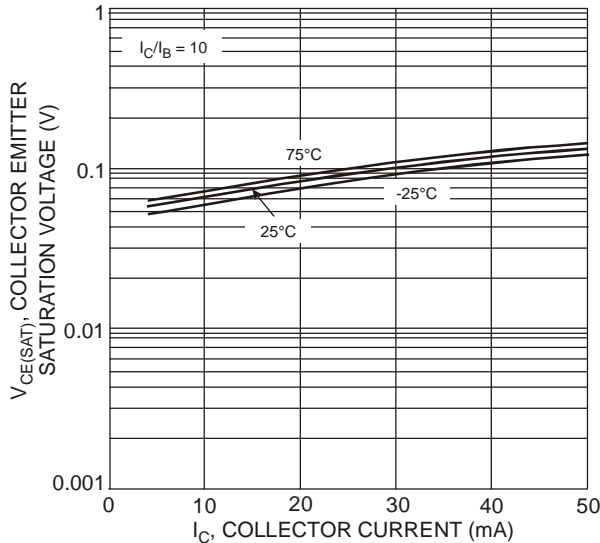


Figure 3 Typical Collector Emitter Saturation Voltage vs. Collector Current

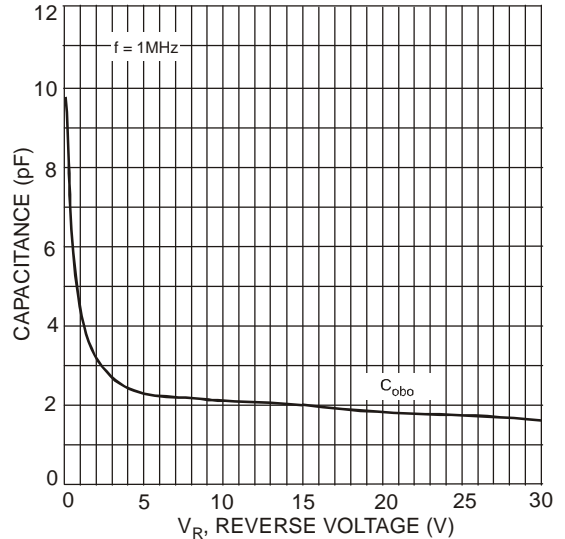


Figure 4 Typical Capacitance Characteristics

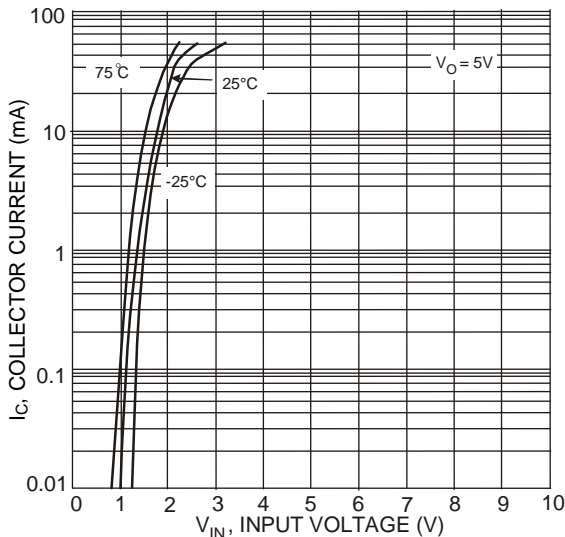


Figure 5 Collector Current vs. Input Voltage

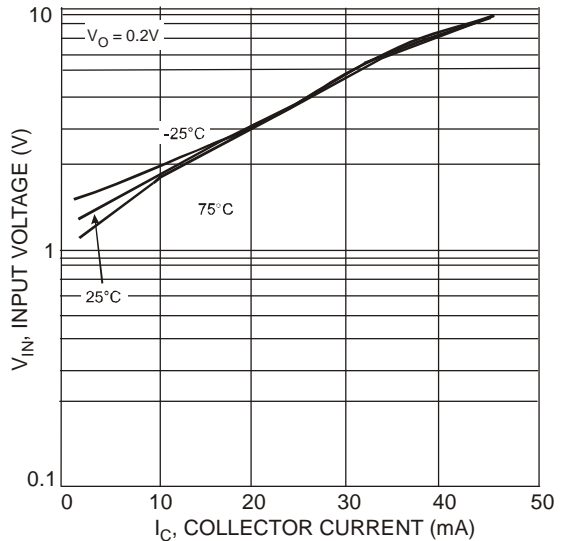
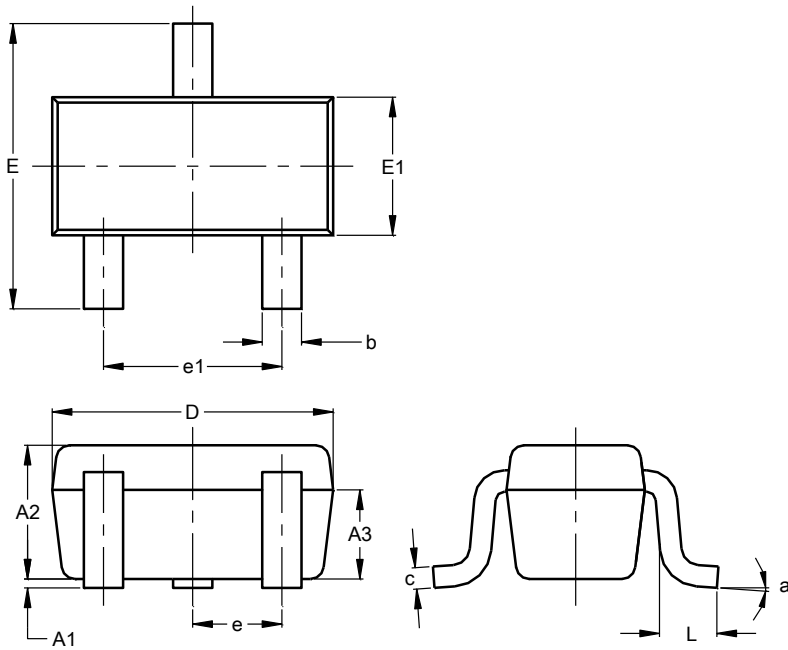


Figure 6 Input Voltage vs. Collector Current

**Package Outline Dimensions**

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

**SOT523**

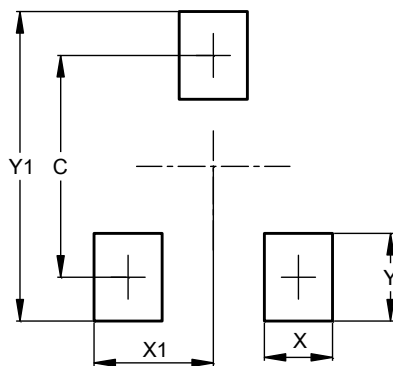


SOT523			
Dim	Min	Max	Typ
A1	0.00	0.10	0.05
A2	0.60	0.80	0.75
A3	0.45	0.65	0.50
b	0.15	0.30	0.22
c	0.10	0.20	0.12
D	1.50	1.70	1.60
E	1.45	1.75	1.60
E1	0.75	0.85	0.80
e	0.50 BSC		
e1	0.90	1.10	1.00
L	0.20	0.40	0.33
a	0°	--	8°
All Dimensions in mm			

**Suggested Pad Layout**

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

**SOT523**



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

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