



**THE DATASHEET OF
DDTA123EE-7**



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**

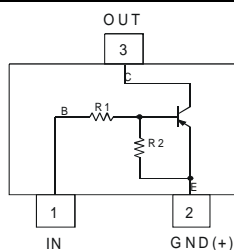
Mechanical Data

- 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)

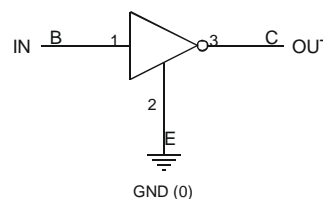
Part Number	R1, R2 (NOM)
DDTA123EE	2.2kΩ
DDTA143EE	4.7kΩ
DDTA114EE	10kΩ
DDTA124EE	22kΩ
DDTA144EE	47kΩ
DDTA115EE	100kΩ



Top View



Device Schematic



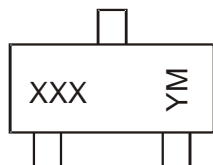
Equivalent Inverter Circuit

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_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Supply Voltage <Pin: (3) to (2)>		V _{CC}	50	V
Input Voltage <Pin: (1) to (2)>	DDTA123EE	V _{IN}	+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 _O	-100	mA
	DDTA143EE		-100	
	DDTA114EE		-50	
	DDTA124EE		-30	
	DDTA144EE		-30	
	DDTA115EE		-20	
Output Current	I _C (Max)	-100	mA	

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5 & 6)	P _D	150	mW
Thermal Resistance, Junction to Ambient Air (Note 5)	R _{θJA}	833	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

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

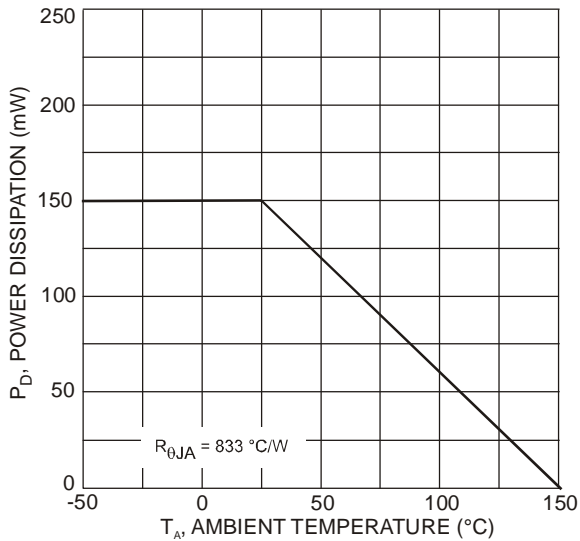


Figure 1 Power Dissipation vs. Ambient Temperature

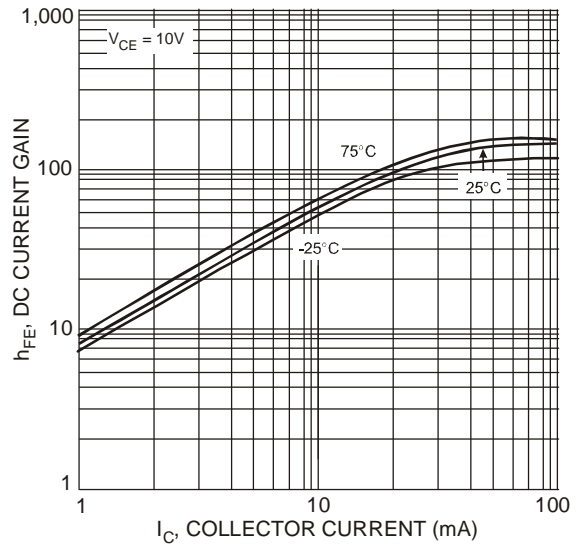


Figure 2 Typical DC Current Gain vs. Collector Current

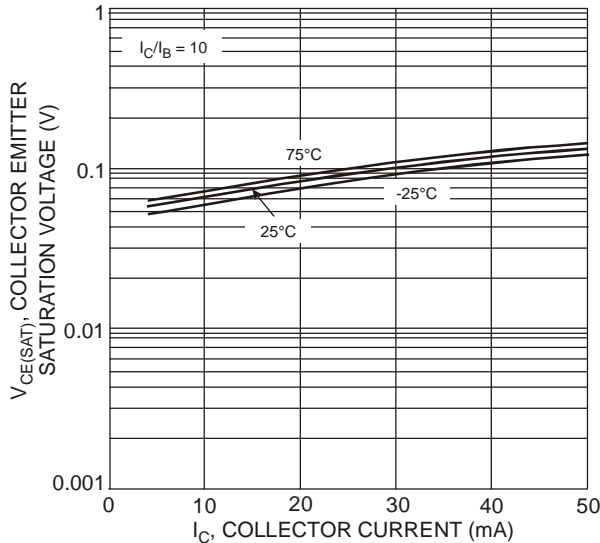


Figure 3 Typical Collector Emitter Saturation Voltage vs. Collector Current

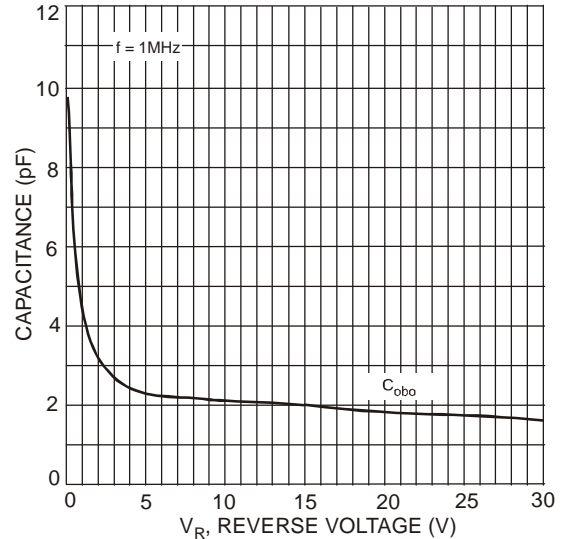


Figure 4 Typical Capacitance Characteristics

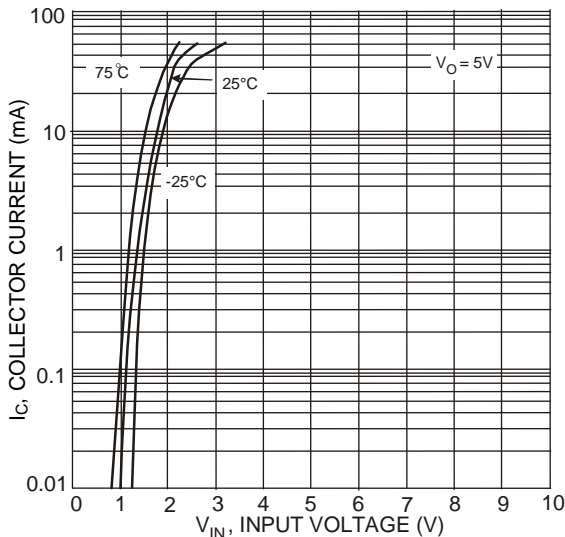


Figure 5 Collector Current vs. Input Voltage

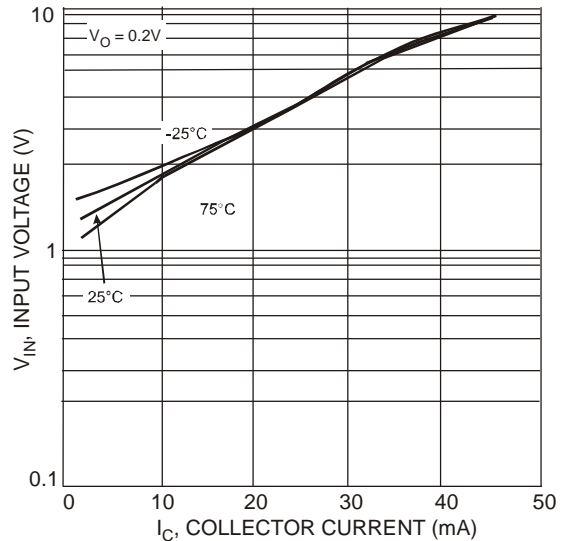
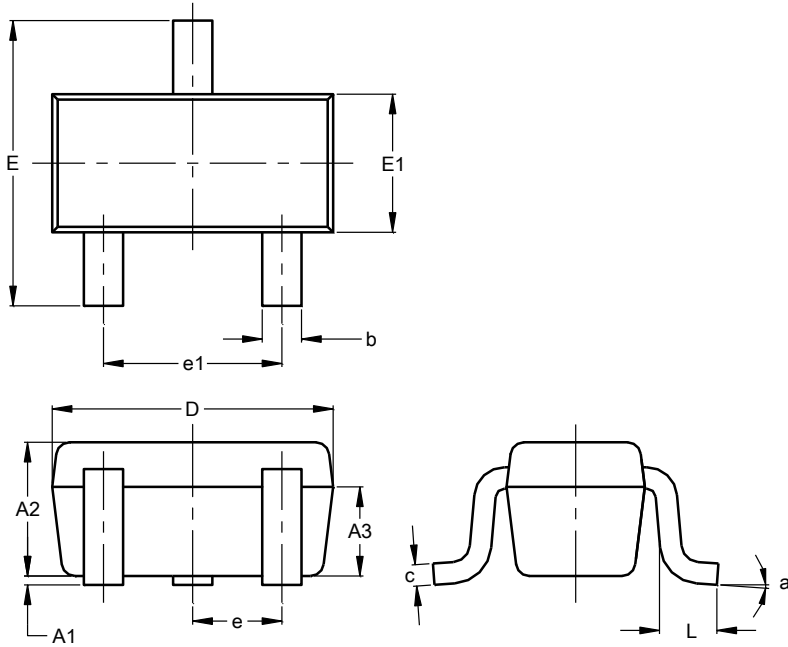


Figure 6 Input Voltage vs. Collector Current

Package Outline Dimensions

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

SOT523

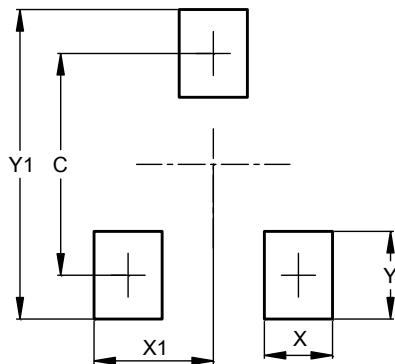


SOT523			
Dim	Min	Max	Typ
A1	0.00	0.10	0.05
A2	0.60	0.80	0.75
A3	0.45	0.65	0.50
b	0.15	0.30	0.22
c	0.10	0.20	0.12
D	1.50	1.70	1.60
E	1.45	1.75	1.60
E1	0.75	0.85	0.80
e	0.50 BSC		
e1	0.90	1.10	1.00
L	0.20	0.40	0.33
a	0°	--	8°
All Dimensions in mm			

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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