

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**

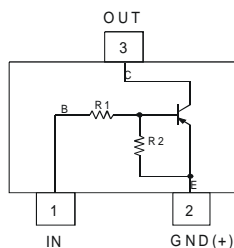
Mechanical Data

- 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)

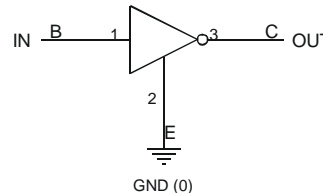
Part Number	R1, R2 (NOM)
DDTA123EE	2.2k Ω
DDTA143EE	4.7k Ω
DDTA114EE	10k Ω
DDTA124EE	22k Ω
DDTA144EE	47k Ω
DDTA115EE	100k Ω



Top View



Device Schematic



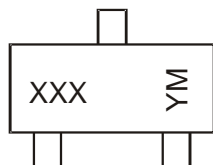
Equivalent Inverter Circuit

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

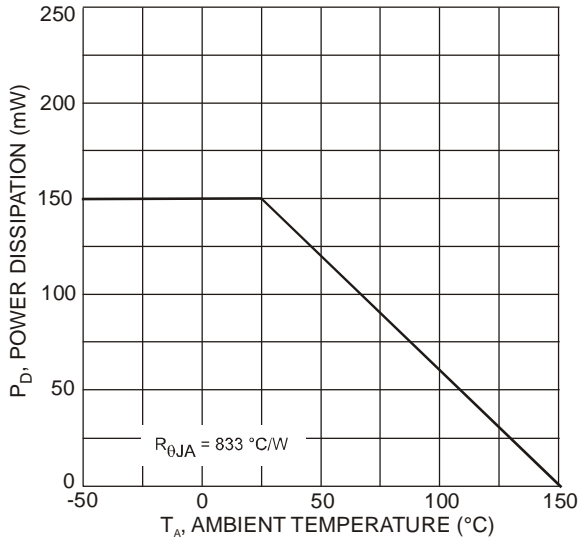


Figure 1 Power Dissipation vs. Ambient Temperature

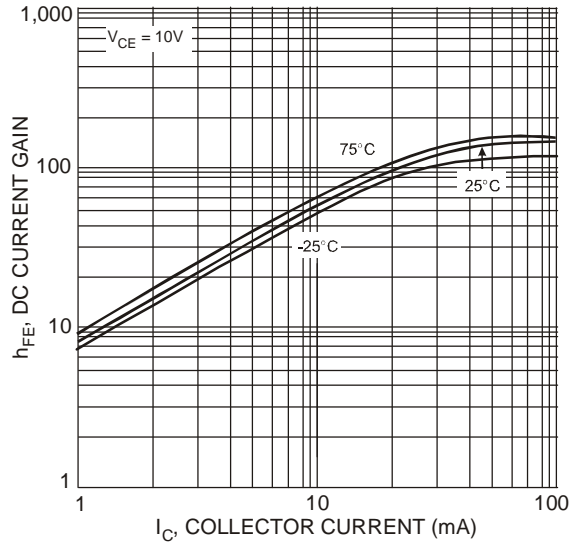


Figure 2 Typical DC Current Gain vs. Collector Current

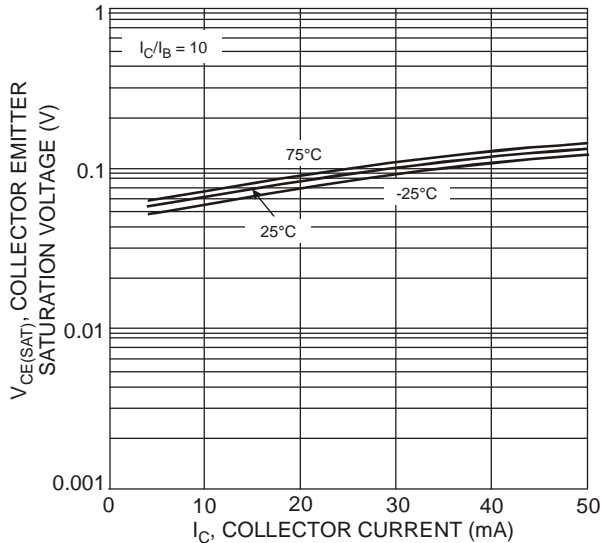


Figure 3 Typical Collector Emitter Saturation Voltage vs. Collector Current

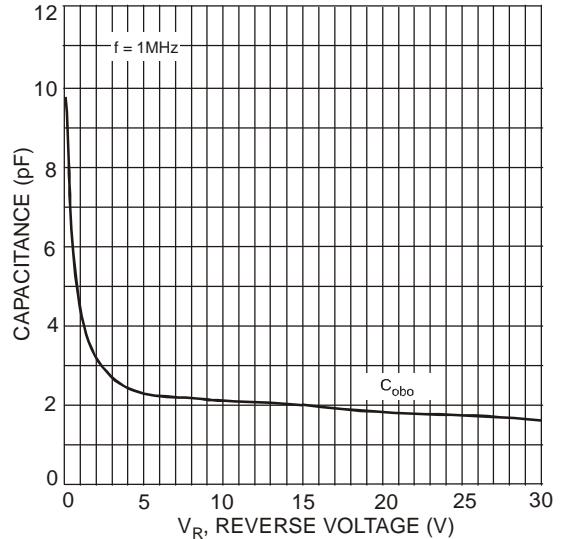


Figure 4 Typical Capacitance Characteristics

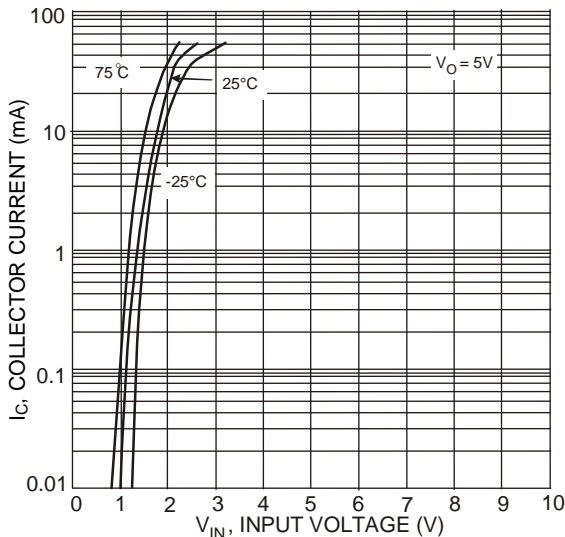


Figure 5 Collector Current vs. Input Voltage

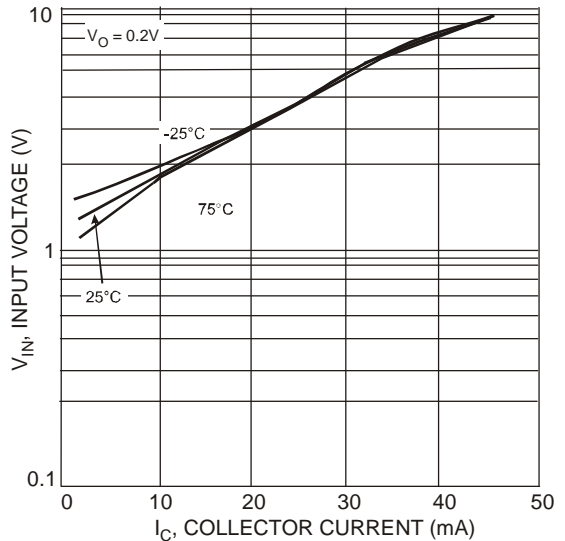
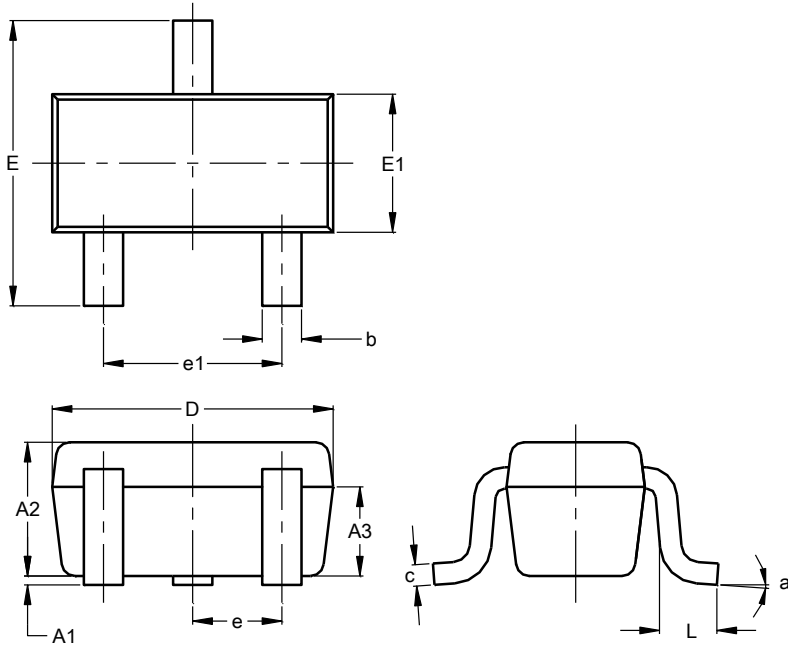


Figure 6 Input Voltage vs. Collector Current

Package Outline Dimensions

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

SOT523

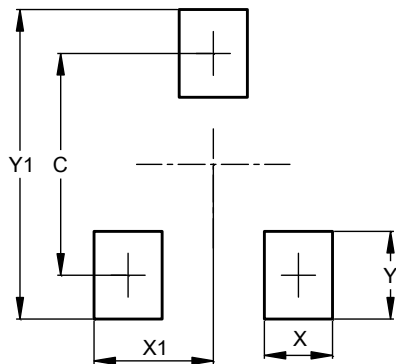


SOT523			
Dim	Min	Max	Typ
A1	0.00	0.10	0.05
A2	0.60	0.80	0.75
A3	0.45	0.65	0.50
b	0.15	0.30	0.22
c	0.10	0.20	0.12
D	1.50	1.70	1.60
E	1.45	1.75	1.60
E1	0.75	0.85	0.80
e	0.50 BSC		
e1	0.90	1.10	1.00
L	0.20	0.40	0.33
a	0°	--	8°
All Dimensions in mm			

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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