



**THE DATASHEET OF  
DDTA123YE-7-F**



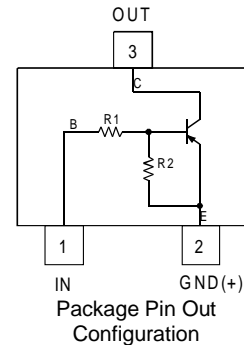
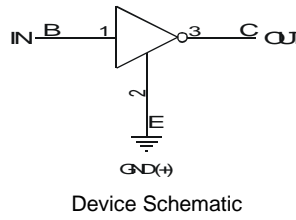
**Features**

- 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 (E3)
- Weight: 0.002 grams (Approximate)

Part Number	R1 (NOM)	R2 (NOM)
DDTA113ZE	1kΩ	10kΩ
DDTA123YE	2.2kΩ	10kΩ
DDTA123JE	2.2kΩ	47kΩ
DDTA143XE	4.7kΩ	10kΩ
DDTA143FE	4.7kΩ	22kΩ
DDTA143ZE	4.7kΩ	47kΩ
DDTA114YE	10kΩ	47kΩ
DDTA114WE	10kΩ	4.7kΩ
DDTA124XE	22kΩ	47kΩ
DDTA144VE	47kΩ	10kΩ
DDTA144WE	47kΩ	22kΩ

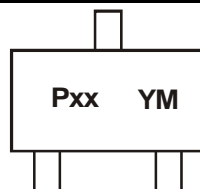


**Ordering Information** (Note 4)

Part Number	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
DDTA113ZE-7-F	AEC-Q101	P02	7	8	3,000
DDTA123YE-7-F	AEC-Q101	P05	7	8	3,000
DDTA123JE-7-F	AEC-Q101	P06	7	8	3,000
DDTA143XE-7-F	AEC-Q101	P09	7	8	3,000
DDTA143FE-7-F	AEC-Q101	P10	7	8	3,000
DDTA143ZE-7-F	AEC-Q101	P11	7	8	3,000
DDTA114YE-7-F	AEC-Q101	P14	7	8	3,000
DDTA114WE-7-F	AEC-Q101	P15	7	8	3,000
DDTA124XE-7-F	AEC-Q101	P18	7	8	3,000
DDTA144VE-7-F	AEC-Q101	P21	7	8	3,000
DDTA144WE-7-F	AEC-Q101	P22	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 [http://www.diodes.com/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html) 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 <http://www.diodes.com/products/packages.html>.

**Marking Information**



Pxx = Product Type Marking Code (See Ordering Information)  
 YM = Date Code Marking  
 Y or Ȳ = 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

### Absolute Maximum Ratings (@T<sub>A</sub> = 25°C unless otherwise specified)

Characteristic	Symbol	Value	Unit	
Supply Voltage, (2) to (3)	V <sub>CC</sub>	-50	V	
Input Voltage, (1) to (2)	V <sub>IN</sub>	DDTA113ZE	+5 to -10	
		DDTA123YE	+5 to -12	
		DDTA123JE	+5 to -12	
		DDTA143XE	+7 to -20	
		DDTA143FE	+6 to -30	
		DDTA143ZE	+5 to -30	
		DDTA114YE	+6 to -40	
		DDTA114WE	+10 to -30	
		DDTA124XE	+10 to -40	
		DDTA144VE	+15 to -40	
		DDTA144WE	+10 to -40	
Output Current	I <sub>O</sub>	DDTA113ZE	-100	
		DDTA123YE	-100	
		DDTA123JE	-100	
		DDTA143XE	-100	
		DDTA143FE	-100	
		DDTA143ZE	-100	
		DDTA114YE	-70	
		DDTA114WE	-100	
		DDTA124XE	-50	
		DDTA144VE	-30	
DDTA144WE	-30			
Output Current	All	I <sub>C(MAX)</sub>	-100	mA

### Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	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

Note: 5. Mounted on FR4 PC Board with minimum recommended pad layout.

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

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage	DDTA113ZE DDTA123YE DDTA123JE DDTA143XE DDTA143FE DDTA143ZE DDTA114YE DDTA114WE DDTA124XE DDTA144VE DDTA144WE	V <sub>I(OFF)</sub>	-0.3 -0.3 -0.5 -0.3 -0.3 -0.5 -0.3 -0.8 -0.4 -1.0 -0.8	—	—	V	V <sub>CC</sub> = -5V, I <sub>O</sub> = -100μA
	DDTA113ZE DDTA123YE DDTA123JE DDTA143XE DDTA143FE DDTA143ZE DDTA114YE DDTA114WE DDTA124XE DDTA144VE DDTA144WE	V <sub>I(ON)</sub>	—	—	-3.0 -3.0 -1.1 -2.5 -1.3 -1.3 -1.4 -3.0 -2.5 -5.0 -4.0	V	V <sub>O</sub> = -0.3V, I <sub>O</sub> = -20mA V <sub>O</sub> = -0.3V, I <sub>O</sub> = -20mA V <sub>O</sub> = -0.3V, I <sub>O</sub> = -5mA V <sub>O</sub> = -0.3V, I <sub>O</sub> = -20mA V <sub>O</sub> = -0.3V, I <sub>O</sub> = -3mA V <sub>O</sub> = -0.3V, I <sub>O</sub> = -5mA V <sub>O</sub> = -0.3V, I <sub>O</sub> = -1mA V <sub>O</sub> = -0.3V, I <sub>O</sub> = -2mA V <sub>O</sub> = -0.3V, I <sub>O</sub> = -2mA V <sub>O</sub> = -0.3V, I <sub>O</sub> = -2mA V <sub>O</sub> = -0.3V, I <sub>O</sub> = -2mA
Output Voltage		V <sub>O(ON)</sub>	—	-0.1	-0.3	V	I <sub>O</sub> /I <sub>I</sub> = -5mA/-0.25mA DDTA123E I <sub>O</sub> /I <sub>I</sub> = -5mA/-0.25mA DDTA143E I <sub>O</sub> /I <sub>I</sub> = -5mA/-0.25mA DDTA114E I <sub>O</sub> /I <sub>I</sub> = -10mA/-0.5mA All Others
Input Current	DDTA113ZE DDTA123YE DDTA123JE DDTA143XE DDTA143FE DDTA143ZE DDTA114YE DDTA114WE DDTA124XE DDTA144VE DDTA144WE	I <sub>I</sub>	—	—	-7.2 -3.8 -3.6 -1.8 -1.8 -1.8 -0.88 -0.88 -0.36 -0.16 -0.16	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	DDTA113ZE DDTA123YE DDTA123JE DDTA143XE DDTA143FE DDTA143ZE DDTA114YE DDTA114WE DDTA124XE DDTA144VE DDTA144WE	G <sub>I</sub>	33 33 80 30 68 80 68 24 68 33 56	—	—	—	V <sub>O</sub> = -5V, I <sub>O</sub> = -10mA
Input Resistor Tolerance		ΔR <sub>1</sub>	-30	—	+30	%	—
Resistance Ratio Tolerance		ΔR <sub>2</sub> /R <sub>1</sub>	-20	—	+20	%	—
Gain-Bandwidth Product (Note 6)		f <sub>T</sub>	—	250	—	MHz	V <sub>CE</sub> = -10V, I <sub>E</sub> = 5mA, f = 100MHz

Note: 6. Transistor – For Reference Only

**Typical Curves – DDTA123JE**

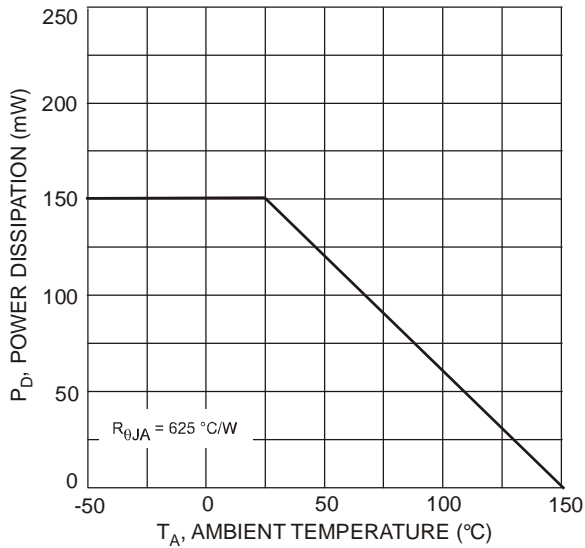


Fig. 1 Power Dissipation vs. Ambient Temperature

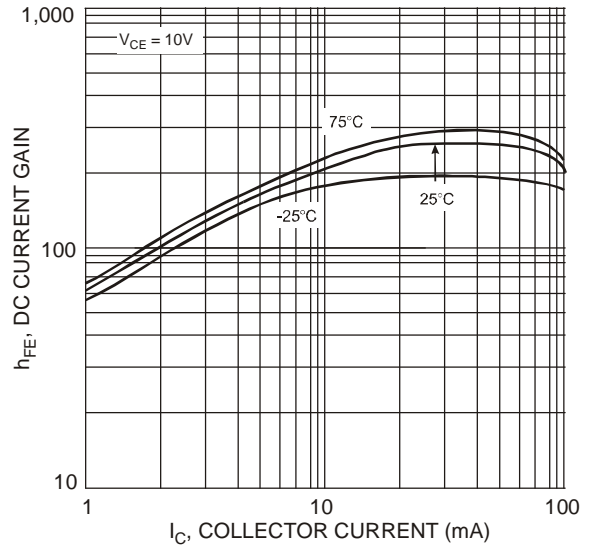


Fig. 2 Typical DC Current Gain vs. Collector Current

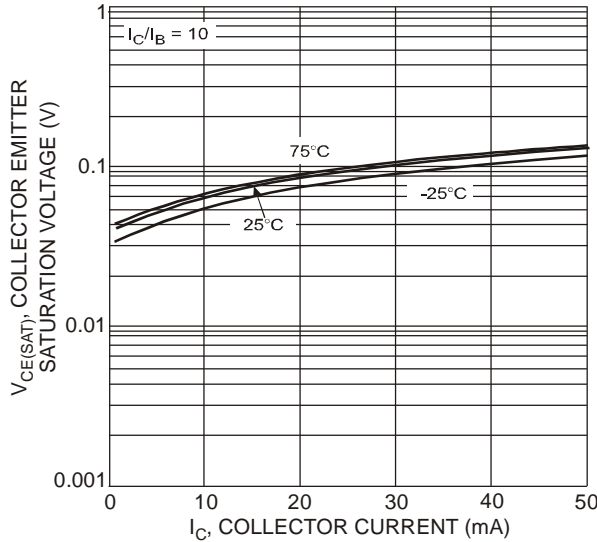


Fig. 3 Collector Emitter Saturation Voltage vs. Collector Current

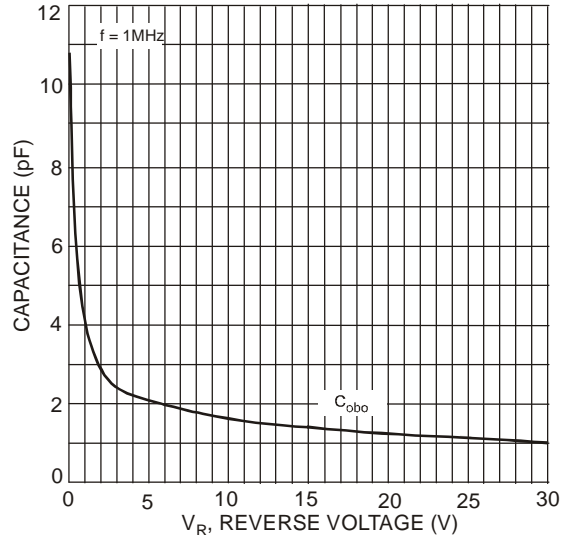


Fig. 4 Typical Capacitance Characteristics

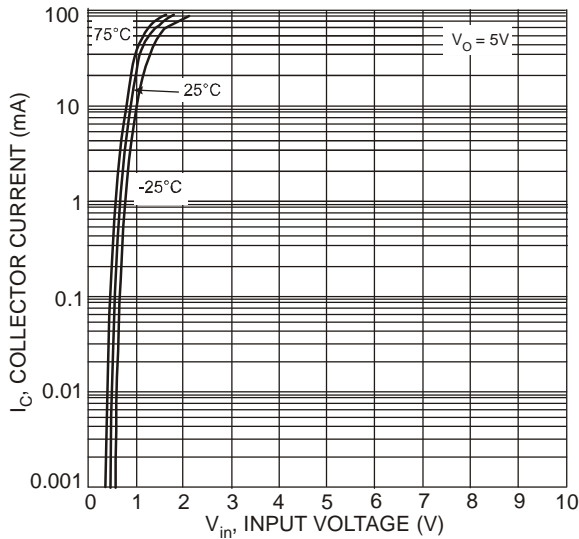


Fig. 5 Collector Current vs. Input Voltage

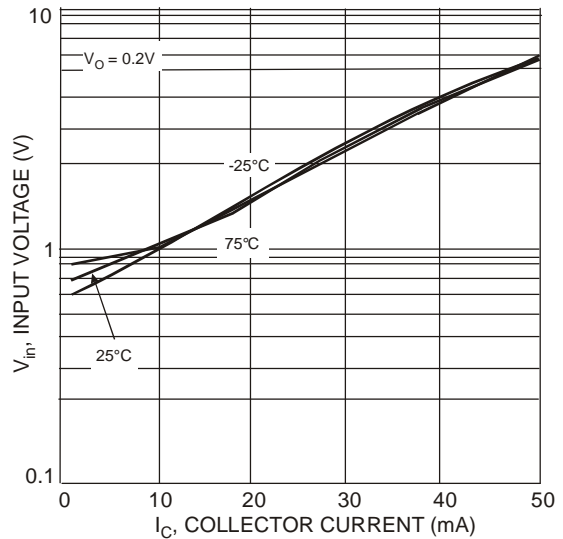
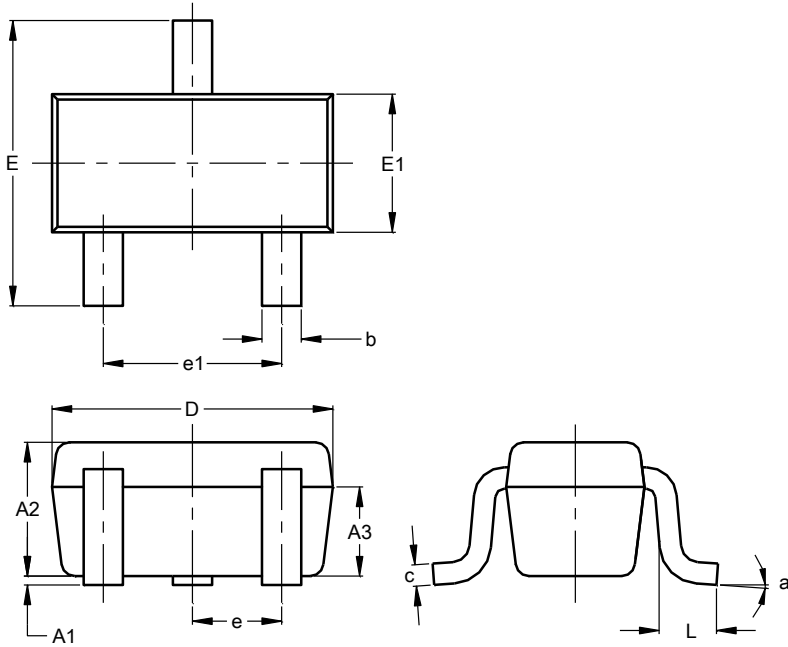


Fig. 6 Input Voltage vs. Collector Current

**Package Outline Dimensions**

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

**SOT523**

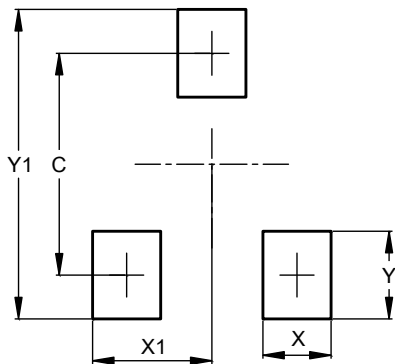


SOT523			
Dim	Min	Max	Typ
A1	0.00	0.10	0.05
A2	0.60	0.80	0.75
A3	0.45	0.65	0.50
b	0.15	0.30	0.22
c	0.10	0.20	0.12
D	1.50	1.70	1.60
E	1.45	1.75	1.60
E1	0.75	0.85	0.80
e	0.50 BSC		
e1	0.90	1.10	1.00
L	0.20	0.40	0.33
a	0°	--	8°
All Dimensions in mm			

**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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