

**PNP PRE-BIASED SMALL SIGNAL SURFACE MOUNT TRANSISTOR**

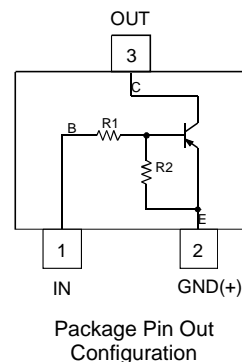
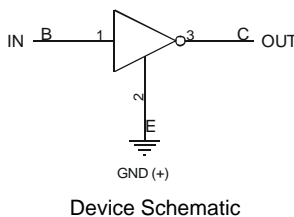
**Features**

- Epitaxial Planar Die Construction
- Complementary NPN Types Available (DDTC)
- Built-In Biasing Resistors, R1≠R2
- “Lead Free”, RoHS Compliant (Note 1)
- Halogen and Antimony Free "Green" Device (Note 2)
- Qualified to AEC-Q101 Standards for High Reliability

**Mechanical Data**

- Case: SOT523
- Case Material: Molded Plastic, “Green” Molding Compound, Note 3. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish annealed over Alloy 42 leadframe (Lead Free Plating) Solderable per MIL-STD-202, Method 208
- Weight: 0.002 grams (approximate)

Part Number	R1 (NOM)	R2 (NOM)	Marking
DDTA113ZE	1KΩ	10KΩ	P02
DDTA123YE	2.2KΩ	10KΩ	P05
DDTA123JE	2.2KΩ	47KΩ	P06
DDTA143XE	4.7KΩ	10KΩ	P09
DDTA143FE	4.7KΩ	22KΩ	P10
DDTA143ZE	4.7KΩ	47KΩ	P11
DDTA114YE	10KΩ	47KΩ	P14
DDTA114WE	10KΩ	4.7KΩ	P15
DDTA124XE	22KΩ	47KΩ	P18
DDTA144VE	47KΩ	10KΩ	P21
DDTA144WE	47KΩ	22KΩ	P22

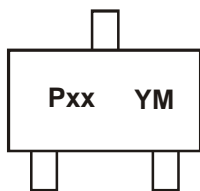


**Ordering Information** (Note 3)

Part Number	Case	Packaging
DDTA113ZE-7-F	SOT523	3000/Tape & Reel
DDTA123YE-7-F	SOT523	3000/Tape & Reel
DDTA123JE-7-F	SOT523	3000/Tape & Reel
DDTA143XE-7-F	SOT523	3000/Tape & Reel
DDTA143FE-7-F	SOT523	3000/Tape & Reel
DDTA143ZE-7-F	SOT523	3000/Tape & Reel
DDTA114YE-7-F	SOT523	3000/Tape & Reel
DDTA114WE-7-F	SOT523	3000/Tape & Reel
DDTA124XE-7-F	SOT523	3000/Tape & Reel
DDTA144VE-7-F	SOT523	3000/Tape & Reel
DDTA144WE-7-F	SOT523	3000/Tape & Reel

- Notes:
1. No purposefully added lead.
  2. Diodes Inc.'s "Green" policy can be found on our website at <http://www.diodes.com>.
  3. For packaging details, go to our website at <http://www.diodes.com>.

**Marking Information**



Pxx = Product Type Marking Code (See Features Table)  
 YM = Date Code Marking  
 Y = Year (ex: T = 2006)  
 M = Month (ex: 9 = September)

Date Code Key

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Code	S	T	U	V	W	X	Y	Z	A	B	C

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, (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	P <sub>D</sub>	150	mW
Thermal Resistance, Junction to Ambient Air (Note 4)	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** @<sub>T<sub>A</sub></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 <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*		f <sub>T</sub>	—	250	—	MHz	V <sub>CE</sub> = -10V, I <sub>E</sub> = 5mA, f = 100MHz

\* Transistor – For Reference Only

Notes: 4. Mounted on FR4 PC Board with recommended pad layout at <http://www.diodes.com>.

**Typical Curves – DDTA123JE**

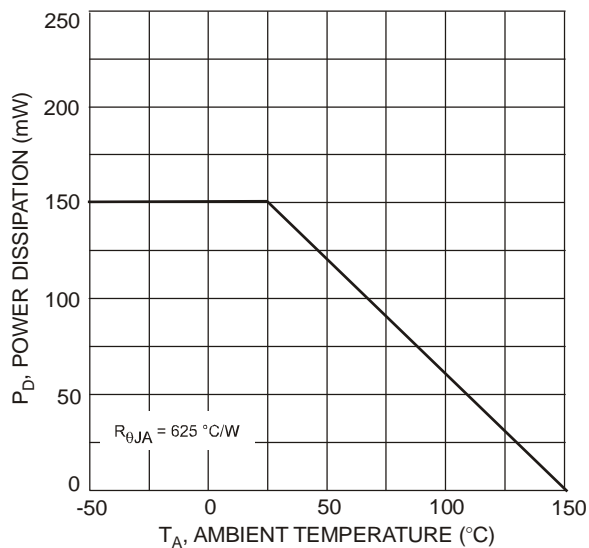


Fig. 1 Power Dissipation vs. Ambient Temperature

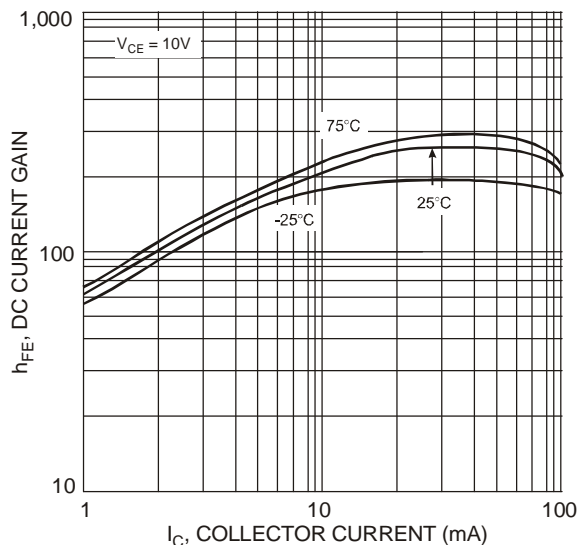


Fig. 2 Typical DC Current Gain vs. Collector Current

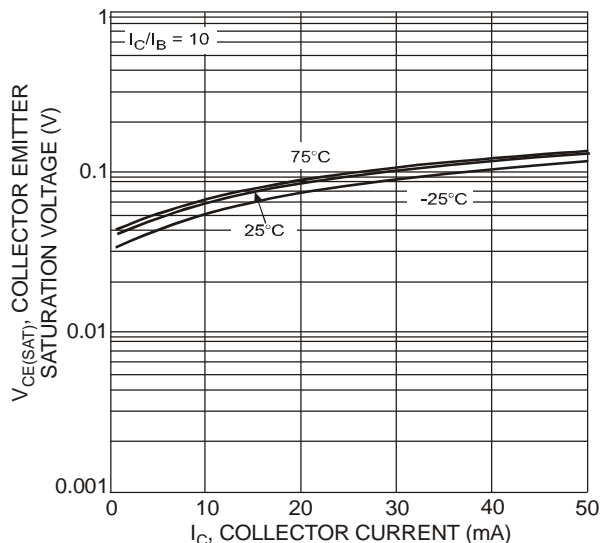


Fig. 3 Collector Emitter Saturation Voltage vs. Collector Current

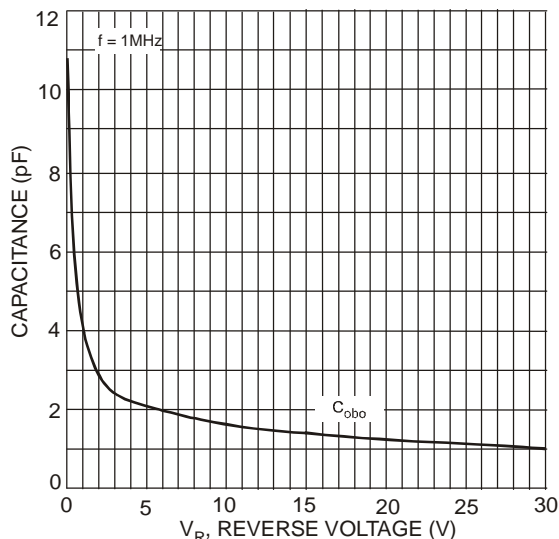


Fig. 4 Typical Capacitance Characteristics

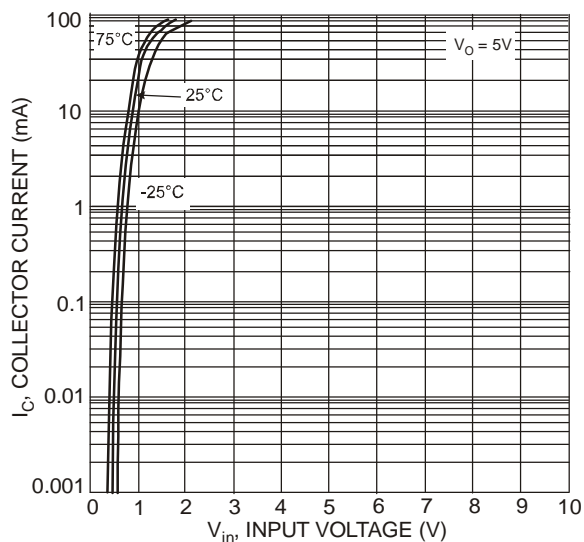


Fig. 5 Collector Current vs. Input Voltage

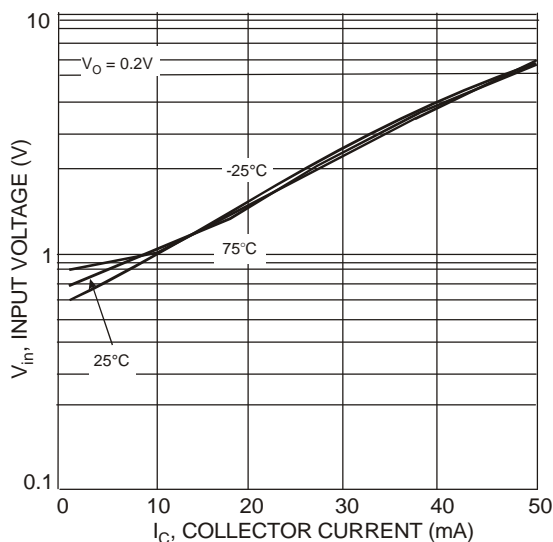
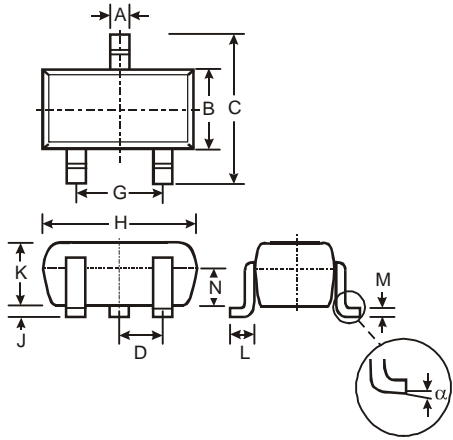


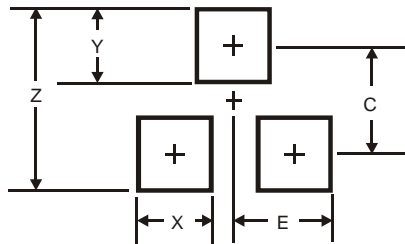
Fig. 6 Input Voltage vs. Collector Current

**Package Outline Dimensions**



SOT523			
Dim	Min	Max	Typ
A	0.15	0.30	0.22
B	0.75	0.85	0.80
C	1.45	1.75	1.60
D	—	—	0.50
G	0.90	1.10	1.00
H	1.50	1.70	1.60
J	0.00	0.10	0.05
K	0.60	0.80	0.75
L	0.10	0.30	0.22
M	0.10	0.20	0.12
N	0.45	0.65	0.50
α	0°	8°	—
All Dimensions in mm			

**Suggested Pad Layout**



Dimensions	Value (in mm)
Z	1.8
X	0.4
Y	0.51
C	1.3
E	0.7

**IMPORTANT NOTICE**

DIODES INCORPORATED MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARDS TO THIS DOCUMENT, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION).

Diodes Incorporated and its subsidiaries reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to this document and any product described herein. Diodes Incorporated does not assume any liability arising out of the application or use of this document or any product described herein; neither does Diodes Incorporated convey any license under its patent or trademark rights, nor the rights of others. Any Customer or user of this document or products described herein in such applications shall assume all risks of such use and will agree to hold Diodes Incorporated and all the companies whose products are represented on Diodes Incorporated website, harmless against all damages.

Diodes Incorporated does not warrant or accept any liability whatsoever in respect of any products purchased through unauthorized sales channel. Should Customers purchase or use Diodes Incorporated products for any unintended or unauthorized application, Customers shall indemnify and hold Diodes Incorporated and its representatives harmless against all claims, damages, expenses, and attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized application.

Products described herein may be covered by one or more United States, international or foreign patents pending. Product names and markings noted herein may also be covered by one or more United States, international or foreign trademarks.

**LIFE SUPPORT**

Diodes Incorporated products are specifically not authorized for use as critical components in life support devices or systems without the express written approval of the Chief Executive Officer of Diodes Incorporated. As used herein:

A. Life support devices or systems are devices or systems which:

1. are intended to implant into the body, or
2. support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in significant injury to the user.

B. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or to affect its safety or effectiveness.

Customers represent that they have all necessary expertise in the safety and regulatory ramifications of their life support devices or systems, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of Diodes Incorporated products in such safety-critical, life support devices or systems, notwithstanding any devices- or systems-related information or support that may be provided by Diodes Incorporated. Further, Customers must fully indemnify Diodes Incorporated and its representatives against any damages arising out of the use of Diodes Incorporated products in such safety-critical, life support devices or systems.

Copyright © 2011, Diodes Incorporated

**[www.diodes.com](http://www.diodes.com)**