

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

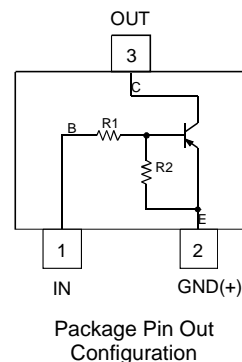
**Features**

- 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

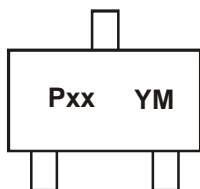


**Ordering Information** (Note 3)

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** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage	DDTA113ZE DDTA123YE DDTA123JE DDTA143XE DDTA143FE DDTA143ZE DDTA114YE DDTA114WE DDTA124XE DDTA144VE DDTA144WE	$V_{I(OFF)}$	-0.3 -0.3 -0.5 -0.3 -0.3 -0.5 -0.3 -0.8 -0.4 -1.0 -0.8	—	—	V	$V_{CC} = -5V, I_O = -100\mu A$
	DDTA113ZE DDTA123YE DDTA123JE DDTA143XE DDTA143FE DDTA143ZE DDTA114YE DDTA114WE DDTA124XE DDTA144VE DDTA144WE	$V_{I(ON)}$	—	—	-3.0 -3.0 -1.1 -2.5 -1.3 -1.3 -1.4 -3.0 -2.5 -5.0 -4.0	V	$V_O = -0.3V, I_O = -20mA$ $V_O = -0.3V, I_O = -20mA$ $V_O = -0.3V, I_O = -5mA$ $V_O = -0.3V, I_O = -20mA$ $V_O = -0.3V, I_O = -3mA$ $V_O = -0.3V, I_O = -5mA$ $V_O = -0.3V, I_O = -1mA$ $V_O = -0.3V, I_O = -2mA$ $V_O = -0.3V, I_O = -2mA$ $V_O = -0.3V, I_O = -2mA$ $V_O = -0.3V, I_O = -2mA$
Output Voltage		$V_{O(ON)}$	—	-0.1	-0.3	V	$I_O/I_I = -5mA/-0.25mA$ DDTA123E $I_O/I_I = -5mA/-0.25mA$ DDTA143E $I_O/I_I = -5mA/-0.25mA$ DDTA114E $I_O/I_I = -10mA/-0.5mA$ All Others
Input Current	DDTA113ZE DDTA123YE DDTA123JE DDTA143XE DDTA143FE DDTA143ZE DDTA114YE DDTA114WE DDTA124XE DDTA144VE DDTA144WE	$I_I$	—	—	-7.2 -3.8 -3.6 -1.8 -1.8 -0.88 -0.88 -0.36 -0.16 -0.16	mA	$V_I = -5V$
Output Current		$I_{O(OFF)}$	—	—	-0.5	$\mu A$	$V_{CC} = -50V, V_I = 0V$
DC Current Gain	DDTA113ZE DDTA123YE DDTA123JE DDTA143XE DDTA143FE DDTA143ZE DDTA114YE DDTA114WE DDTA124XE DDTA144VE DDTA144WE	$G_I$	33 33 80 30 68 80 68 24 68 33 56	—	—	—	$V_O = -5V, I_O = -10mA$
Input Resistor Tolerance		$\Delta R_1$	-30	—	+30	%	—
Resistance Ratio Tolerance		$\Delta R_2/R_1$	-20	—	+20	%	—
Gain-Bandwidth Product*		$f_T$	—	250	—	MHz	$V_{CE} = -10V, I_E = 5mA, f = 100MHz$

\* Transistor – For Reference Only

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

**Typical Curves – DDTA123JE**

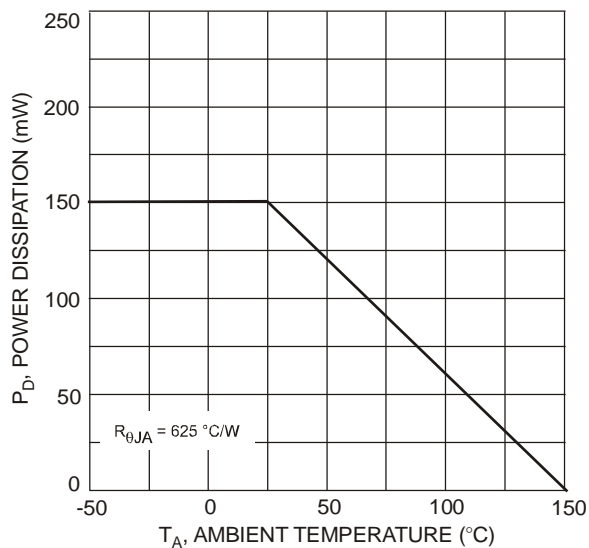


Fig. 1 Power Dissipation vs. Ambient Temperature

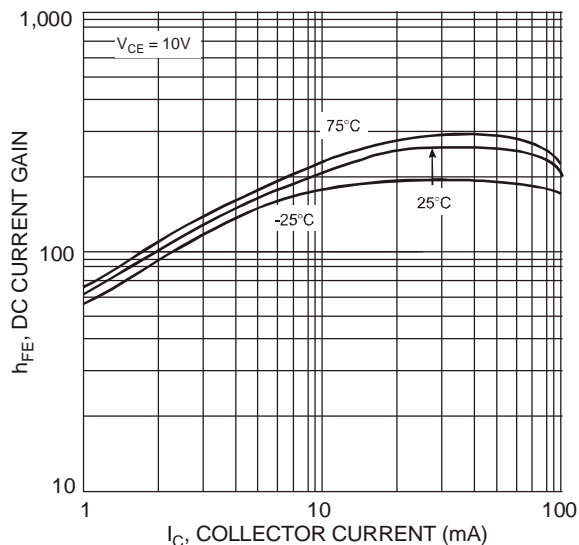


Fig. 2 Typical DC Current Gain vs. Collector Current

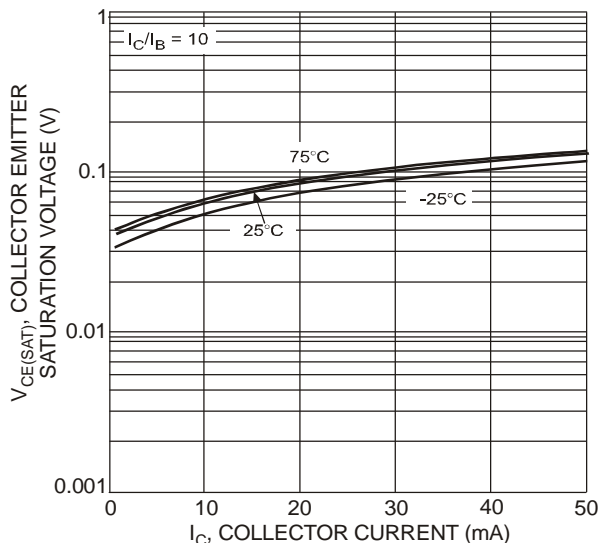


Fig. 3 Collector Emitter Saturation Voltage vs. Collector Current

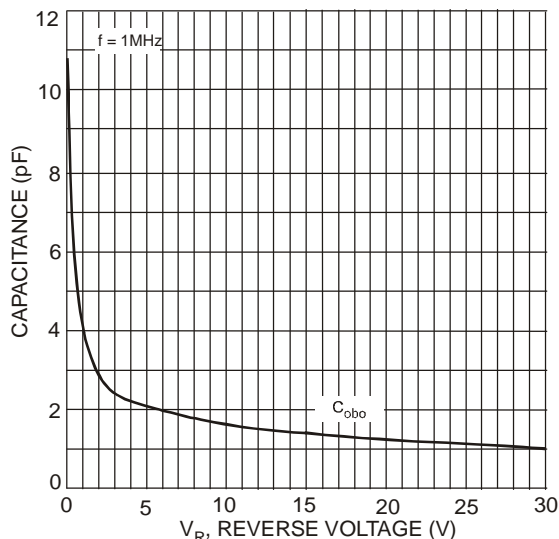


Fig. 4 Typical Capacitance Characteristics

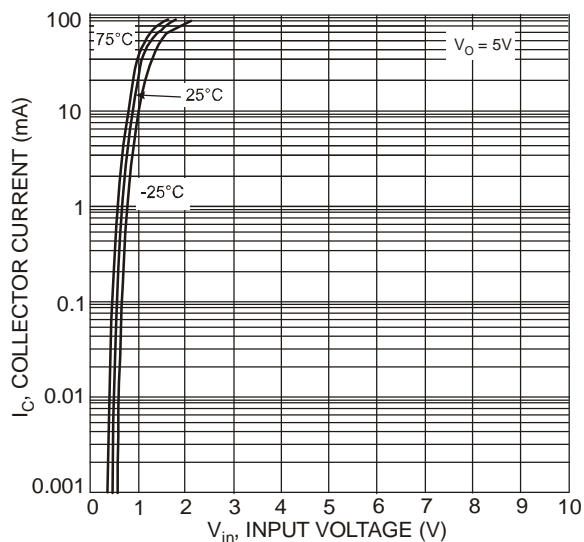


Fig. 5 Collector Current vs. Input Voltage

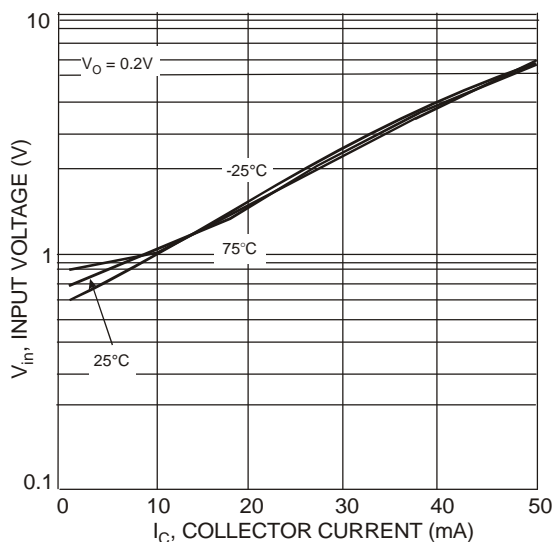
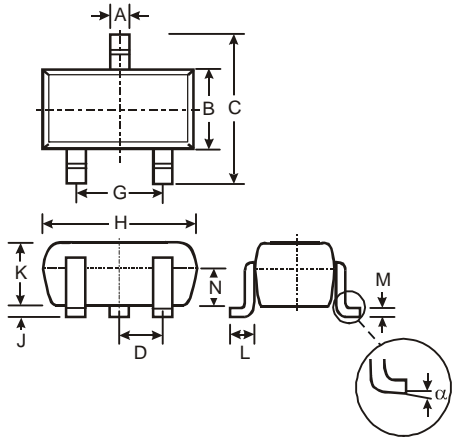


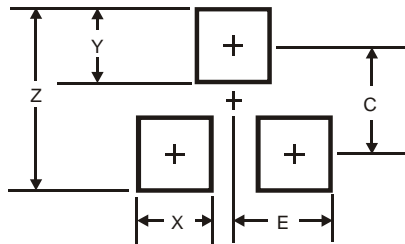
Fig. 6 Input Voltage vs. Collector Current

**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

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