

# DDTA (R1 = R2 SERIES) E

## PNP PRE-BIASED SMALL SIGNAL SURFACE MOUNT TRANSISTOR

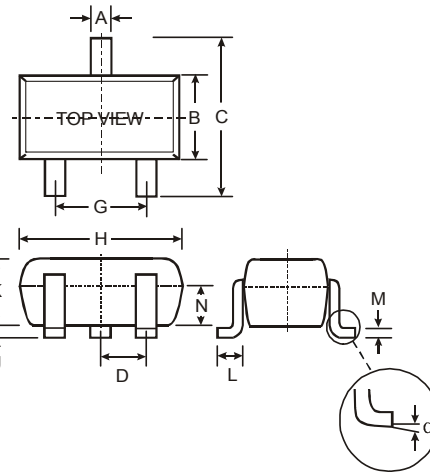
NEW PRODUCT

### Features

- Epitaxial Planar Die Construction
- Complementary NPN Types Available (DDTC)
- Built-In Biasing Resistors, R1 = R2
- **Lead Free/RoHS Compliant (Note 2)**
- **"Green" Device (Note 3 and 4)**

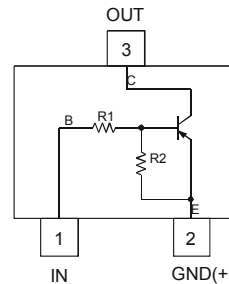
### Mechanical Data

- Case: SOT-523
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminals: Finish - Solderable per MIL-STD-202, Method 208
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe).
- Terminal Connections: See Diagram
- Marking & Date Code Information: See Table Below & Page 4
- Ordering Information: See Page 4
- Weight: 0.002 grams (approximate)

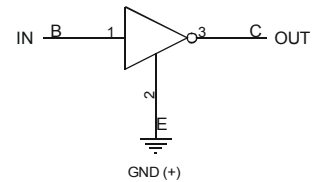


SOT-523			
Dim	Min	Max	Typ
A	0.15	0.30	0.22
B	0.75	0.85	0.80
C	1.45	1.75	1.60
D	—	—	0.50
G	0.90	1.10	1.00
H	1.50	1.70	1.60
J	0.00	0.10	0.05
K	0.60	0.80	0.75
L	0.10	0.30	0.22
M	0.10	0.20	0.12
N	0.45	0.65	0.50
$\alpha$	0°	8°	—
All Dimensions in mm			

P/N	R1, R2 (NOM)	Marking
DDTA123EE	2.2K $\Omega$	P04
DDTA143EE	4.7K $\Omega$	P08
DDTA114EE	10K $\Omega$	P13
DDTA124EE	22K $\Omega$	P17
DDTA144EE	47K $\Omega$	P20
DDTA115EE	100K $\Omega$	P24



Schematic and Pin Configuration



Equivalent Inverter Circuit

### Maximum Ratings @<sub>T<sub>A</sub></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>	+10 to -12 +10 to -30 +10 to -40 +10 to -40 +10 to -40 +10 to -40	V
Output Current	I <sub>O</sub>	-100 -100 -50 -30 -30 -20	mA
Power Dissipation	P <sub>d</sub>	150	mW
Thermal Resistance, Junction to Ambient Air (Note 1)	R <sub>θJA</sub>	833	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

- Notes:
1. Mounted on FR4 PC Board with recommended pad layout at <http://www.diodes.com/datasheets/ap02001.pdf>.
  2. No purposefully added lead.
  3. Diodes Inc.'s "Green" policy can be found on our website at [http://www.diodes.com/products/lead\\_free/index.php](http://www.diodes.com/products/lead_free/index.php).
  4. Product manufactured with Date Code UO (week 40, 2007) and newer are built with Green Molding Compound. Product manufactured prior to Date Code UO are built with Non-Green Molding Compound and may contain Halogens or Sb2O3 Fire Retardants.

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

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage		V <sub>I(off)</sub>	-0.5	-1.1	—	V	V <sub>CC</sub> = 5V, I <sub>O</sub> = 100μA
		V <sub>I(on)</sub>	—	-1.9	-3		V <sub>O</sub> = 0.3V, I <sub>O</sub> = 20mA, DDTA123EE V <sub>O</sub> = 0.3V, I <sub>O</sub> = 20mA, DDTA143EE V <sub>O</sub> = 0.3V, I <sub>O</sub> = 10mA, DDTA114EE V <sub>O</sub> = 0.3V, I <sub>O</sub> = 5mA, DDTA124EE V <sub>O</sub> = 0.3V, I <sub>O</sub> = 2mA, DDTA144EE V <sub>O</sub> = 0.3V, I <sub>O</sub> = 1mA, DDTA115EE
Output Voltage		V <sub>O(on)</sub>	—	-0.1	-0.3	V	I <sub>O</sub> /I <sub>I</sub> = 10mA/0.5mA, DDTA123EE I <sub>O</sub> /I <sub>I</sub> = 10mA/0.5mA, DDTA143EE I <sub>O</sub> /I <sub>I</sub> = 10mA/0.5mA, DDTA114EE I <sub>O</sub> /I <sub>I</sub> = 10mA/0.5mA, DDTA124EE I <sub>O</sub> /I <sub>I</sub> = 10mA/0.5mA, DDTA144EE I <sub>O</sub> /I <sub>I</sub> = 5mA/0.25mA, DDTA115EE
Input Current	DDTA123EE DDTA143EE DDTA114EE DDTA124EE DDTA144EE DDTA115EE	I <sub>I</sub>	—	—	-3.8 -1.8 -0.88 -0.36 -0.18 -0.15	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	DDTA123EE DDTA143EE DDTA114EE DDTA124EE DDTA144EE DDTA115EE	G <sub>I</sub>	-20 -20 -30 -56 -68 -82	—	—	—	V <sub>O</sub> = -5V, I <sub>O</sub> = -20mA V <sub>O</sub> = -5V, I <sub>O</sub> = -10mA V <sub>O</sub> = -5V, I <sub>O</sub> = -5mA V <sub>O</sub> = -5V, I <sub>O</sub> = -5mA V <sub>O</sub> = -5V, I <sub>O</sub> = -5mA V <sub>O</sub> = -5V, I <sub>O</sub> = -5mA
Input Resistor (R <sub>1</sub> ) Tolerance		ΔR <sub>1</sub>	-30	—	+30	%	—
Resistance Ratio		R <sub>2</sub> /R <sub>1</sub>	0.8	1	1.2	—	—
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

**TYPICAL CURVES – DDTA143E**

NEW PRODUCT

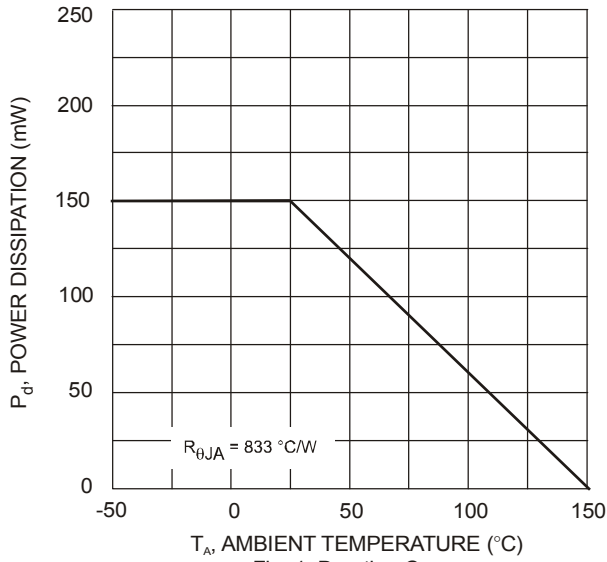


Fig. 1 Derating Curve

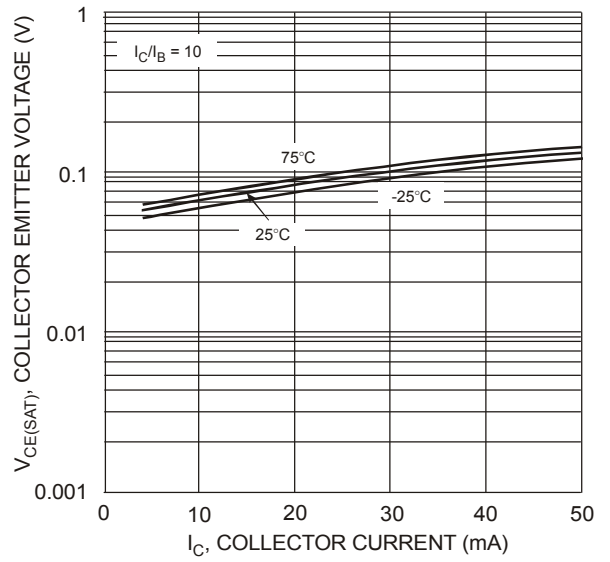


Fig. 2  $V_{CE(SAT)}$  vs.  $I_C$

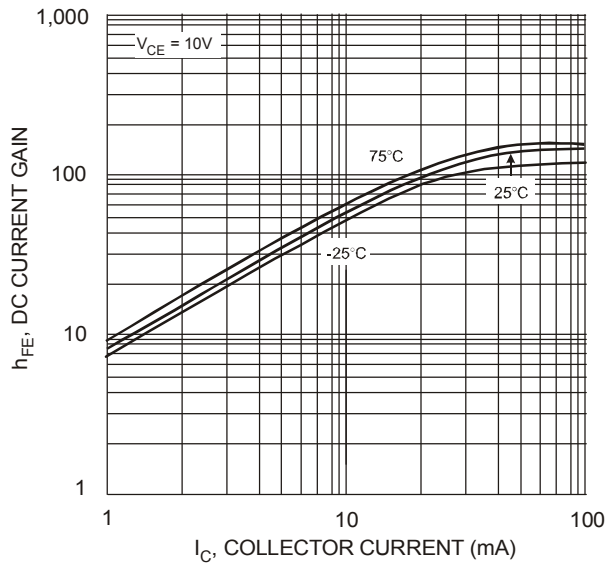


Fig. 3 DC Current Gain

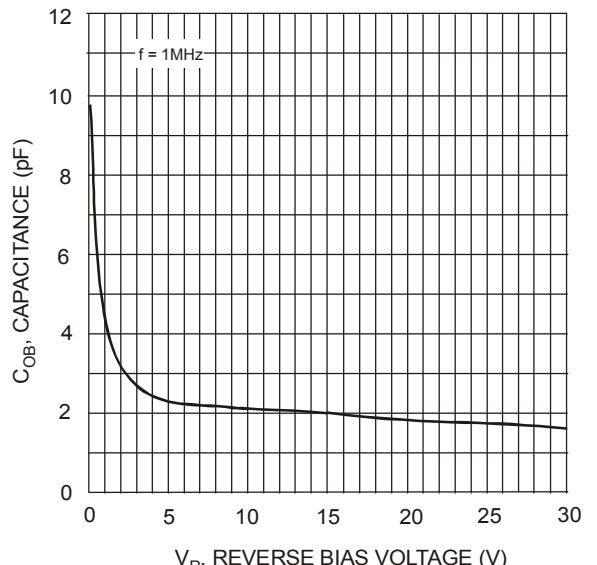


Fig. 4 Output Capacitance

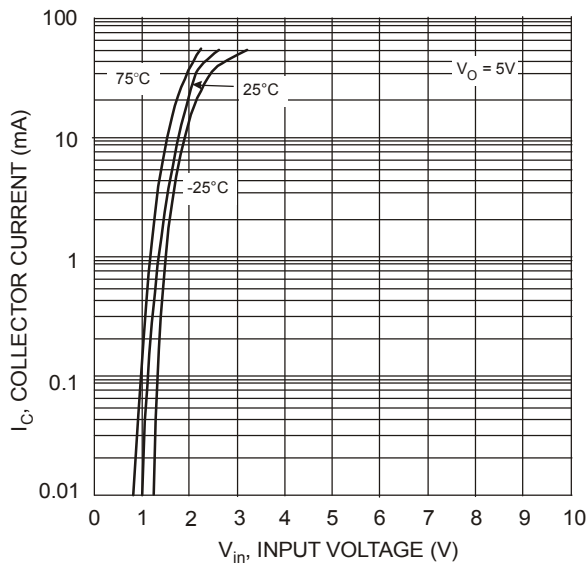


Fig. 5 Collector Current vs. Input Voltage

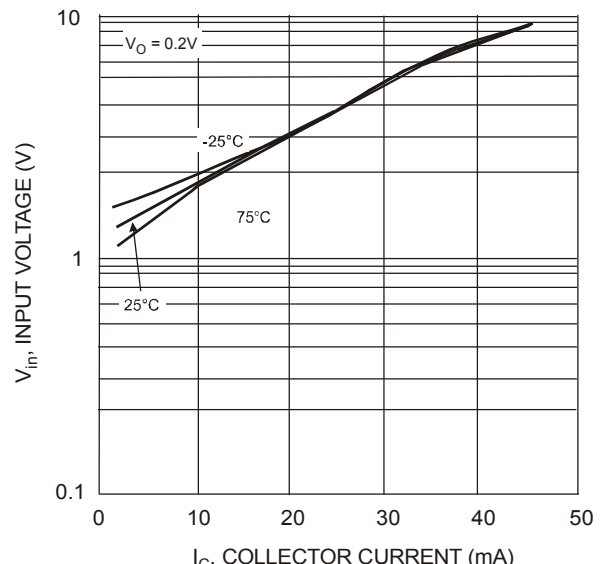


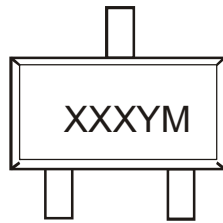
Fig. 6 Input Voltage vs. Collector Current

## Ordering Information (Note 5)

Device	Packaging	Shipping
DDTA123EE-7-F	SOT-523	3000/Tape & Reel
DDTA143EE-7-F	SOT-523	3000/Tape & Reel
DDTA114EE-7-F	SOT-523	3000/Tape & Reel
DDTA124EE-7-F	SOT-523	3000/Tape & Reel
DDTA144EE-7-F	SOT-523	3000/Tape & Reel
DDTA115EE-7-F	SOT-523	3000/Tape & Reel

Notes: 5. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

## Marking Information



XXX = Product Type Marking Code (See Page 1, e.g. P04 = DDTA123EE)  
 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
Code	S	T	U	V	W	X	Y	Z

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

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