

# DDTA (R1 = R2 SERIES) CA

PNP PRE-BIASED SMALL SIGNAL SOT-23  
SURFACE MOUNT TRANSISTOR

NEW PRODUCT

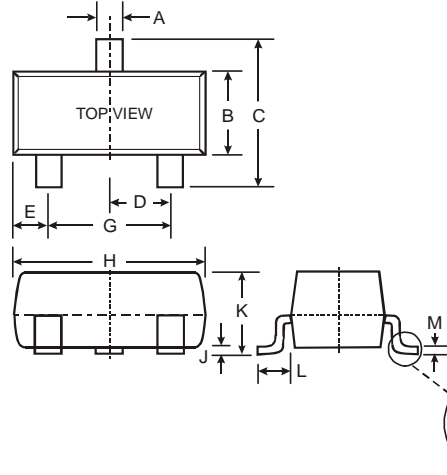
## Features

- Epitaxial Planar Die Construction
- Complementary NPN Types Available (DDTC)
- Built-In Biasing Resistors, R1 = R2
- **Lead, Halogen and Antimony Free, RoHS Compliant "Green" Device (Notes 1 and 2)**

## Mechanical Data

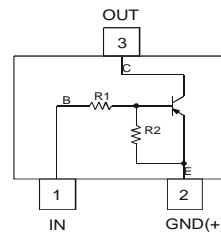
- Case: SOT-23
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminal Connections: See Diagram
- Terminals: Solderable per MIL-STD-202, Method 208
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe).
- Marking: Date Code and Type Code: See Table Below & Page 4
- Ordering Information: See Page 4
- Weight: 0.008 grams (approximate)

P/N	R1, R2 (NOM)	Type Code
DDTA123ECA	2.2K $\Omega$	P04
DDTA143ECA	4.7K $\Omega$	P08
DDTA114ECA	10K $\Omega$	P13
DDTA124ECA	22K $\Omega$	P17
DDTA144ECA	47K $\Omega$	P20
DDTA115ECA	100K $\Omega$	P24

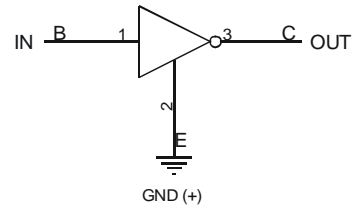


SOT-23		
Dim	Min	Max
A	0.37	0.51
B	1.20	1.40
C	2.30	2.50
D	0.89	1.03
E	0.45	0.60
G	1.78	2.05
H	2.80	3.00
J	0.013	0.10
K	0.903	1.10
L	0.45	0.61
M	0.085	0.180
$\alpha$	0°	8°

All Dimensions in mm



Schematic and Pin Configuration



Equivalent Inverter Circuit

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

Characteristic	Symbol	Value	Unit
Supply Voltage, (3) to (2)	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
Output Current	I <sub>C</sub> (Max)	-100	mA

- Notes:
1. No purposefully added lead. Halogen and Antimony Free.
  2. Product manufactured with Data Code V9 (week 33, 2008) and newer are built with Green Molding Compound. Product manufactured prior to Date Code V9 are built with Non-Green Molding Compound and may contain Halogens or Sb<sub>2</sub>O<sub>3</sub> Fire Retardants.

## Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation	$P_d$	200	mW
Thermal Resistance, Junction to Ambient Air (Note 3)	$R_{\theta JA}$	625	$^{\circ}\text{C/W}$
Operating and Storage and Temperature Range	$T_i, T_{STG}$	-55 to +150	$^{\circ}\text{C}$

Notes: 3. Mounted on FR4 PC Board with recommended pad layout as shown on Diodes Inc., suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>

## Electrical Characteristics @ $T_A = 25^{\circ}\text{C}$ unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage	$V_{I(off)}$	-0.5	-1.1	—	V	$V_{CC} = 5V, I_O = 100\mu\text{A}$
	$V_{I(on)}$	—	-1.9	-3		$V_O = 0.3V, I_O = 20\text{mA}$ , DDTA123ECA $V_O = 0.3V, I_O = 20\text{mA}$ , DDTA143ECA $V_O = 0.3V, I_O = 10\text{mA}$ , DDTA114ECA $V_O = 0.3V, I_O = 5\text{mA}$ , DDTA124ECA $V_O = 0.3V, I_O = 2\text{mA}$ , DDTA144ECA $V_O = 0.3V, I_O = 1\text{mA}$ , DDTA115ECA
Output Voltage	$V_{O(on)}$	—	-0.1	-0.3	V	$I_O/I_I = 10\text{mA}/0.5\text{mA}$ , DDTA123ECA $I_O/I_I = 10\text{mA}/0.5\text{mA}$ , DDTA143ECA $I_O/I_I = 10\text{mA}/0.5\text{mA}$ , DDTA114ECA $I_O/I_I = 10\text{mA}/0.5\text{mA}$ , DDTA124ECA $I_O/I_I = 10\text{mA}/0.5\text{mA}$ , DDTA144ECA $I_O/I_I = 5\text{mA}/0.25\text{mA}$ , DDTA115ECA
Input Current	$I_I$	—	—	-3.8 -1.8 -.88 -.36 -.18 -.15	mA	$V_I = -5V$
Output Current	$I_{O(off)}$	—	—	0.5	$\mu\text{A}$	$V_{CC} = -50V, V_I = 0V$
DC Current Gain	$G_I$	-20 -20 -30 -56 -68 -82	—	—	—	$V_O = -5V, I_O = -20\text{mA}$ $V_O = -5V, I_O = -10\text{mA}$ $V_O = -5V, I_O = -5\text{mA}$ $V_O = -5V, I_O = -5\text{mA}$ $V_O = -5V, I_O = -5\text{mA}$ $V_O = -5V, I_O = -5\text{mA}$
Input Resistor ( $R_1$ ) Tolerance	$\Delta R_1$	-30	—	+30	%	—
Resistance Ratio	$R_2/R_1$	0.8	1	1.2	—	—
Gain-Bandwidth Product*	$f_T$	—	250	—	MHz	$V_{CE} = -10V, I_E = 5\text{mA}$ , $f = 100\text{MHz}$

\* Transistor - For Reference Only

**Typical Curves – DDTA143ECA**

NEW PRODUCT

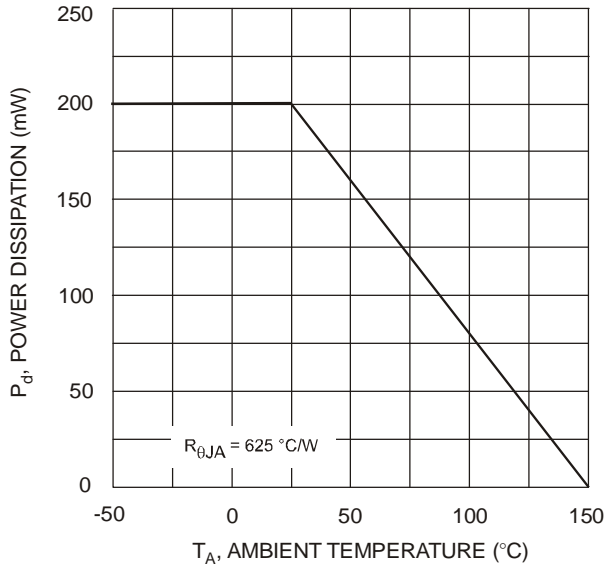


Fig. 1 Derating Curve

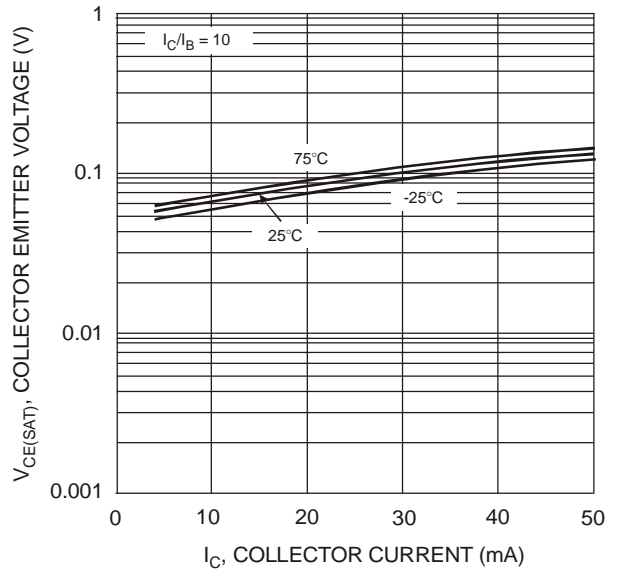


Fig. 2  $V_{CE(SAT)}$  vs.  $I_C$

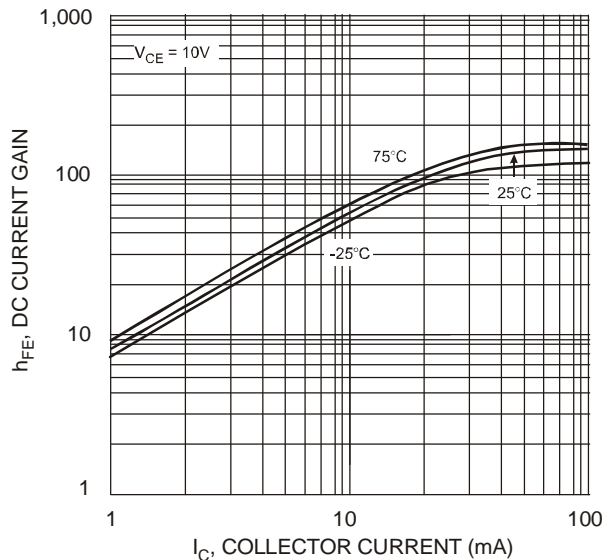


Fig. 3 DC Current Gain

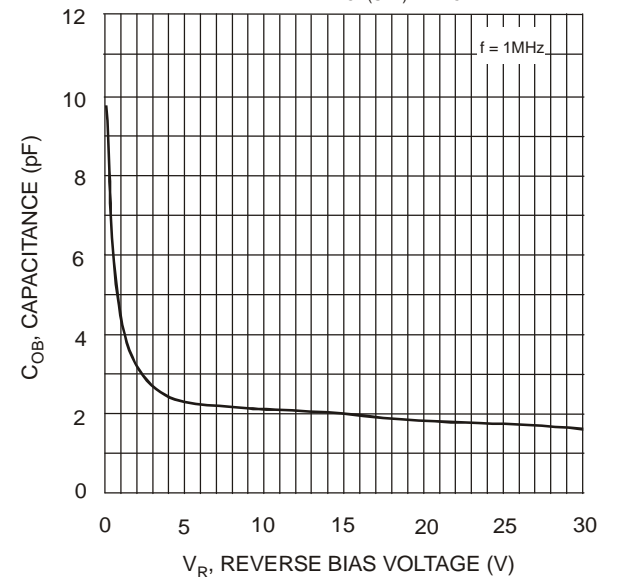


Fig. 4 Output Capacitance

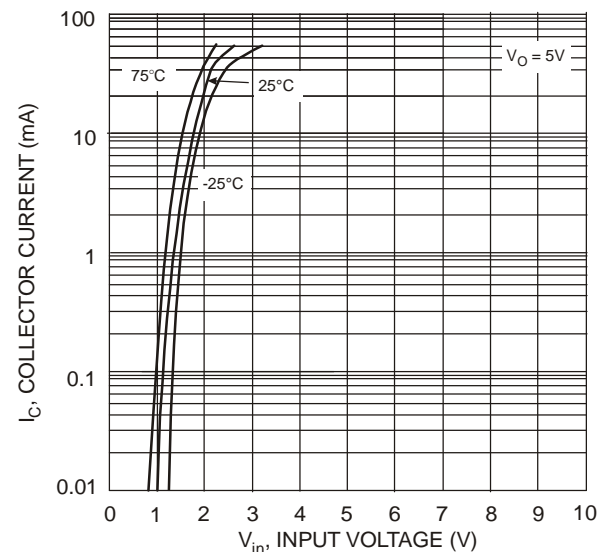


Fig. 5 Collector Current vs. Input Voltage

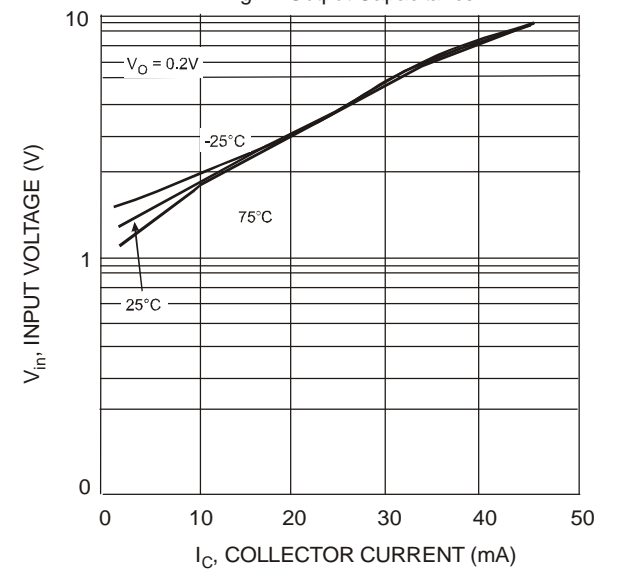


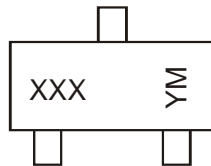
Fig. 6 Input Voltage vs. Collector Current

## Ordering Information (Note 4)

Device	Packaging	Shipping
DDTA123ECA-7-F	SOT-23	3000/Tape & Reel
DDTA143ECA-7-F	SOT-23	3000/Tape & Reel
DDTA114ECA-7-F	SOT-23	3000/Tape & Reel
DDTA124ECA-7-F	SOT-23	3000/Tape & Reel
DDTA144ECA-7-F	SOT-23	3000/Tape & Reel
DDTA115ECA-7-F	SOT-23	3000/Tape & Reel

Notes: 4. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

## Marking Information



XXX = Product Type Marking Code, See Table on Page 1  
 YM = Date Code Marking  
 Y = Year ex: T = 2006  
 M = Month ex: 9 = September

### Date Code Key

Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Code	N	P	R	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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