

**PNP PRE-BIASED SMALL SIGNAL SOT23 SURFACE MOUNT TRANSISTOR**
**Features**

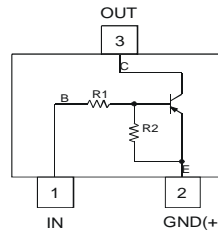
- Epitaxial Planar Die Construction
- Complementary NPN Types Available (DDTC)
- Built-In Biasing Resistors, R1 = R2
- **"Lead Free", RoHS Compliant (Note 1)**
- **Halogen and Antimony Free "Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

**Mechanical Data**

- Case: SOT23
- Case material: Molded Plastic. "Green" Molding Compound.
- Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish
- Weight: 0.008 grams (approximate)

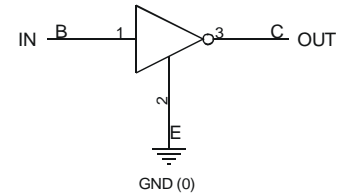
Part Number	R1, R2 (NOM)
DDTA123ECA	2.2KΩ
DDTA143ECA	4.7KΩ
DDTA114ECA	10KΩ
DDTA124ECA	22KΩ
DDTA144ECA	47KΩ
DDTA115ECA	100KΩ

SOT23



Top View

Device Schematic

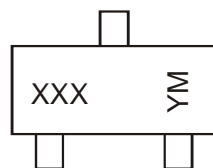


Equivalent Inverter Circuit

**Ordering Information** (Note 3 & 4)

Product	Grade	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
DDTA123ECA-7-F	Commercial	P04	7	8	3,000
DDTA143ECA-7-F	Commercial	P08	7	8	3,000
DDTA114ECA-7-F	Commercial	P13	7	8	3,000
DDTA114ECAQ-7-F	Automotive	P13	7	8	3,000
DDTA114ECAQ-13-F	Automotive	P13	13	8	10,000
DDTA124ECA-7-F	Commercial	P17	7	8	3,000
DDTA144ECA-7-F	Commercial	P20	7	8	3,000
DDTA115ECA-7-F	Commercial	P24	7	8	3,000

- 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>.
  4. Products with Q-suffix are automotive grade. Automotive products are electrical and thermal the same as the commercial, except where specified.

**Marking Information**


XXX = Product Type Marking Code, See Ordering Information  
 YM = Date Code Marking  
 Y = Year (ex: X = 2010)  
 M = Month (ex: 9 = September)

## Date Code Key

Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Code	N	P	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E

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

Characteristic		Symbol	Value	Unit
Supply Voltage <Pin: (3) to (2)>		$V_{CC}$	50	V
Input Voltage <Pin: (1) to (2)>	DDTA123ECA	$V_{IN}$	+10 to -12	V
	DDTA143ECA		+10 to -30	
	DDTA114ECA		+10 to -40	
	DDTA124ECA		+10 to -40	
	DDTA144ECA		+10 to -40	
	DDTA115ECA		+10 to -40	
Output Current	DDTA123ECA	$I_O$	-100	mA
	DDTA143ECA		-100	
	DDTA114ECA		-50	
	DDTA124ECA		-30	
	DDTA144ECA		-30	
	DDTA115ECA		-20	
Output Current		$I_C$ (Max)	-100	mA

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

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5 & 6)	$P_D$	200	mW
Thermal Resistance, Junction to Ambient Air (Note 5)	$R_{\theta JA}$	625	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

Notes: 5. Mounted on FR4 PC Board with minimum recommended pad layout  
6. 150mW per element must not be exceeded.

**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, DDTA123ECA V <sub>O</sub> = -0.3V, I <sub>O</sub> = -20mA, DDTA143ECA V <sub>O</sub> = -0.3V, I <sub>O</sub> = -10mA, DDTA114ECA V <sub>O</sub> = -0.3V, I <sub>O</sub> = -5mA, DDTA124ECA V <sub>O</sub> = -0.3V, I <sub>O</sub> = -2mA, DDTA144ECA V <sub>O</sub> = -0.3V, I <sub>O</sub> = -1mA, DDTA115ECA
Output Voltage		V <sub>O(on)</sub>	—	-0.1	-0.3	V	I <sub>O</sub> /I <sub>I</sub> = -10mA/-0.5mA DDTA123ECA I <sub>O</sub> /I <sub>I</sub> = -10mA/-0.5mA DDTA143ECA I <sub>O</sub> /I <sub>I</sub> = -10mA/-0.5mA DDTA114ECA I <sub>O</sub> /I <sub>I</sub> = -10mA/-0.5mA DDTA124ECA I <sub>O</sub> /I <sub>I</sub> = -10mA/-0.5mA DDTA144ECA I <sub>O</sub> /I <sub>I</sub> = -5mA/-0.25mA DDTA115ECA
Input Current	DDTA123ECA DDTA143ECA DDTA114ECA DDTA124ECA DDTA144ECA DDTA115ECA	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	DDTA123ECA DDTA143ECA DDTA114ECA DDTA124ECA DDTA144ECA DDTA115ECA	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 Tolerance		ΔR <sub>1</sub>	-30	—	+30	%	—
Resistance Ratio Tolerance		ΔR <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

**Typical Characteristics – DDTA143ECA**

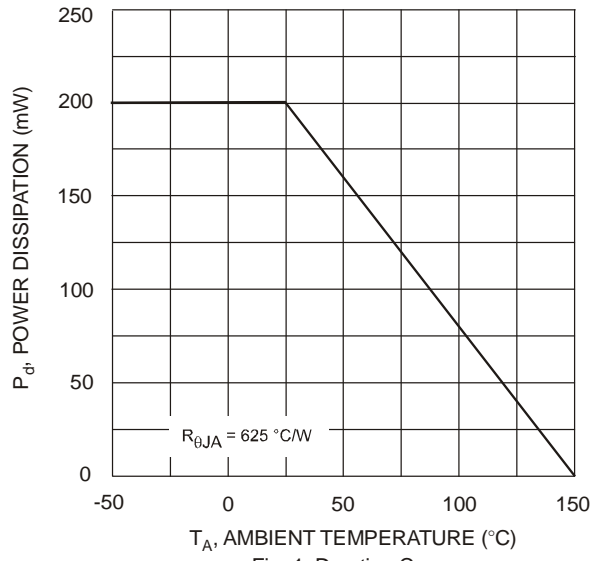


Fig. 1 Derating Curve

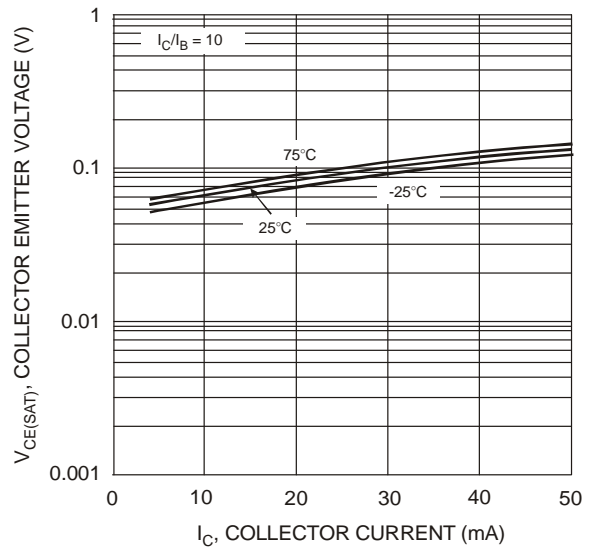


Fig. 2  $V_{CE(SAT)}$  vs.  $I_C$

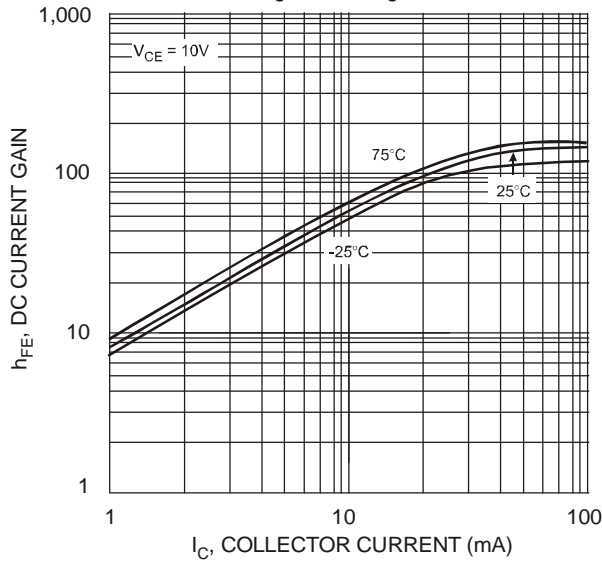


Fig. 3 DC Current Gain

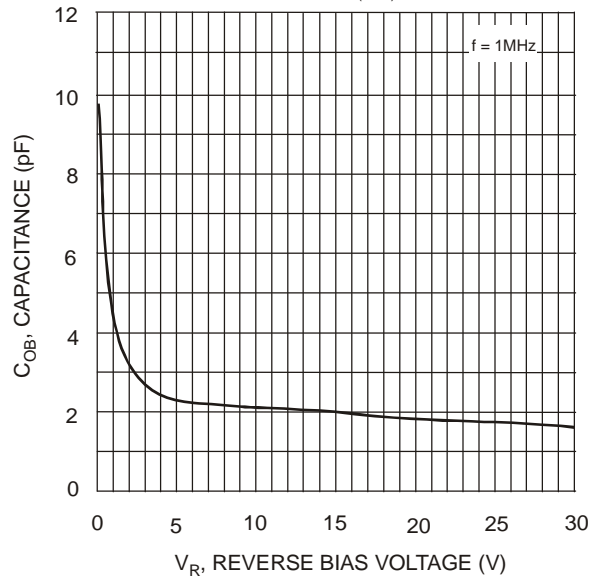


Fig. 4 Output Capacitance

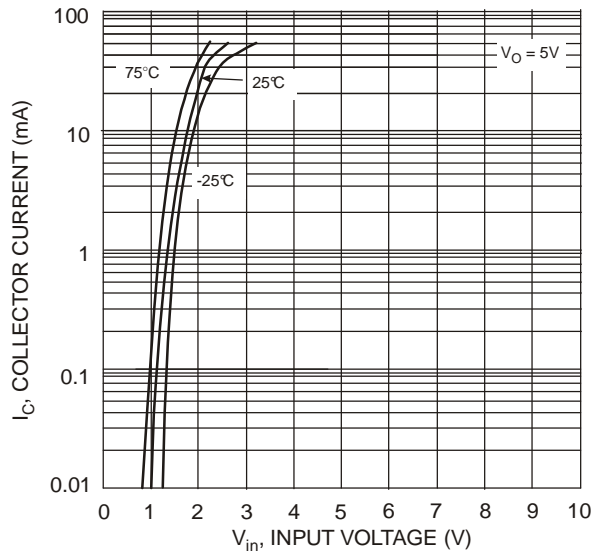


Fig. 5 Collector Current vs. Input Voltage

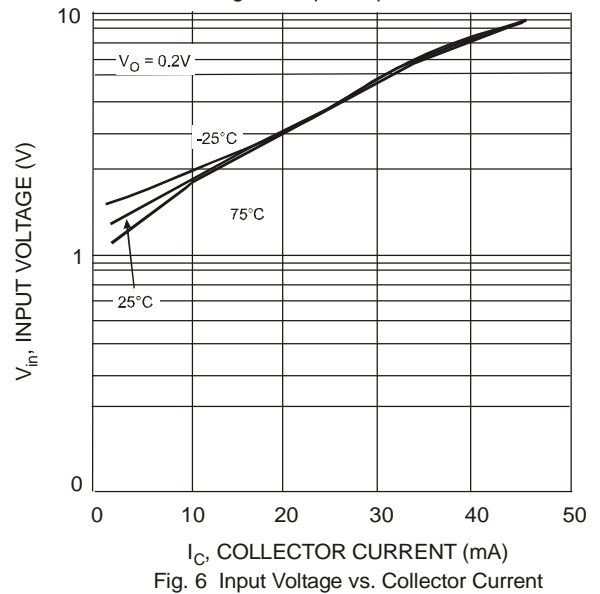
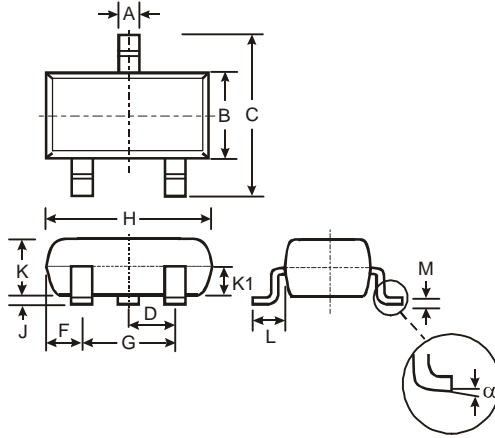


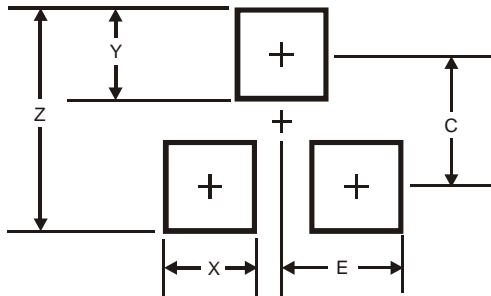
Fig. 6 Input Voltage vs. Collector Current

**Package Outline Dimensions**



SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.903	1.10	1.00
K1	-	-	0.400
L	0.45	0.61	0.55
M	0.085	0.18	0.11
α	0°	8°	-
All Dimensions in mm			

**Suggested Pad Layout**



Dimensions	Value (in mm)
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35

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