DDTA (R1 = R2 SERIES) CA

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**

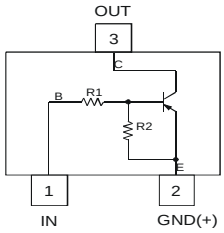
Mechanical Data

- 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)

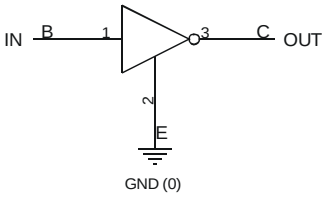
Part Number	R1, R2 (NOM)
DDTA123ECA	2.2KΩ
DDTA143ECA	4.7KΩ
DDTA114ECA	10KΩ
DDTA124ECA	22KΩ
DDTA144ECA	47KΩ
DDTA115ECA	100KΩ

SOT23

Top View



Device Schematic



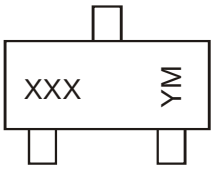
Equivalent Inverter Circuit

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

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Maximum Ratings @T_A = 25°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 DDTA143ECA DDTA114ECA DDTA124ECA DDTA144ECA DDTA115ECA	V_{IN}	+10 to –12 +10 to –30 +10 to –40 +10 to –40 +10 to –40 +10 to –40	V
Output Current	DDTA123ECA DDTA143ECA DDTA114ECA DDTA124ECA DDTA144ECA DDTA115ECA	I_O	-100 -100 -50 -30 -30 -20	mA
Output Current		I_C (Max)	-100	mA

Thermal Characteristics @T_A = 25°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	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

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

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Electrical Characteristics @T_A = 25°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 = -100μA
		$V_{I(on)}$	—	-1.9	-3		V_O = -0.3V, I_O = -20mA, DDTA123ECA V_O = -0.3V, I_O = -20mA, DDTA143ECA V_O = -0.3V, I_O = -10mA, DDTA114ECA V_O = -0.3V, I_O = -5mA, DDTA124ECA V_O = -0.3V, I_O = -2mA, DDTA144ECA V_O = -0.3V, I_O = -1mA, DDTA115ECA
Output Voltage		$V_{O(on)}$	—	-0.1	-0.3	V	I_O/I_I = -10mA/-0.5mA DDTA123ECA I_O/I_I = -10mA/-0.5mA DDTA143ECA I_O/I_I = -10mA/-0.5mA DDTA114ECA I_O/I_I = -10mA/-0.5mA DDTA124ECA I_O/I_I = -10mA/-0.5mA DDTA144ECA I_O/I_I = -5mA/-0.25mA DDTA115ECA
Input Current	DDTA123ECA DDTA143ECA DDTA114ECA DDTA124ECA DDTA144ECA DDTA115ECA	I_I	—	—	-3.8 -1.8 -0.88 -0.36 -0.18 -0.15	mA	V_I = -5V
Output Current		$I_{O(off)}$	—	—	-0.5	μA	V_{CC} = -50V, V_I = 0V
DC Current Gain	DDTA123ECA DDTA143ECA DDTA114ECA DDTA124ECA DDTA144ECA DDTA115ECA	G_I	20 20 30 56 68 82	—	—	—	V_O = -5V, I_O = -20mA V_O = -5V, I_O = -10mA V_O = -5V, I_O = -5mA V_O = -5V, I_O = -5mA V_O = -5V, I_O = -5mA V_O = -5V, I_O = -5mA
Input Resistor Tolerance		ΔR_1	-30	—	+30	%	—
Resistance Ratio Tolerance		$\Delta R_2/R_1$	0.8	1	1.2	%	—
Gain-Bandwidth Product		f_T	—	250	—	MHz	V_{CE} = -10V, I_E = -5mA, f = 100MHz

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Typical Characteristics – DDTA143ECA

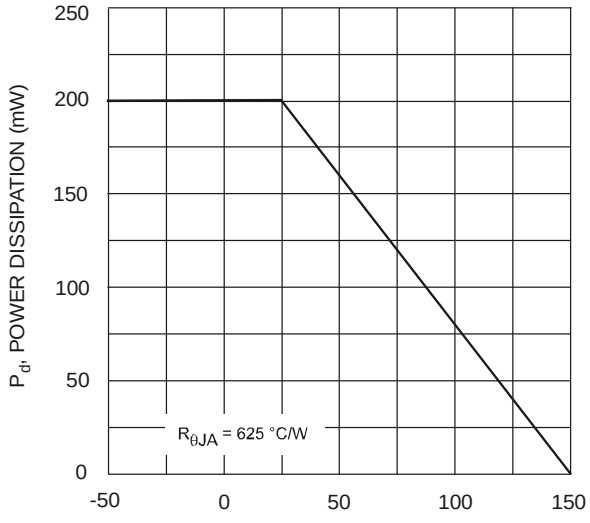

Fig. 1 Derating Curve

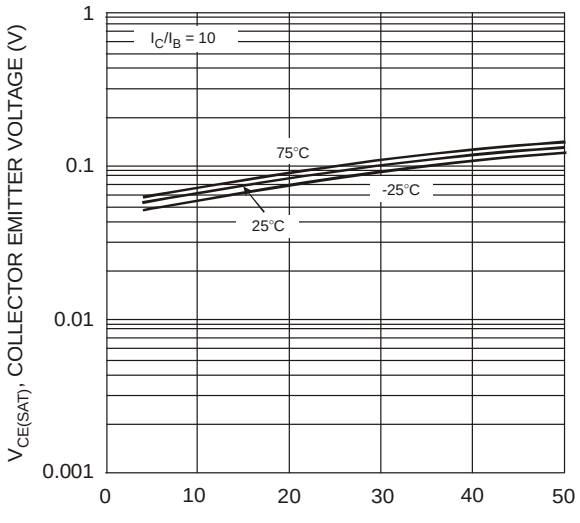

Fig. 2 $V_{CE(SAT)}$ vs. I_C

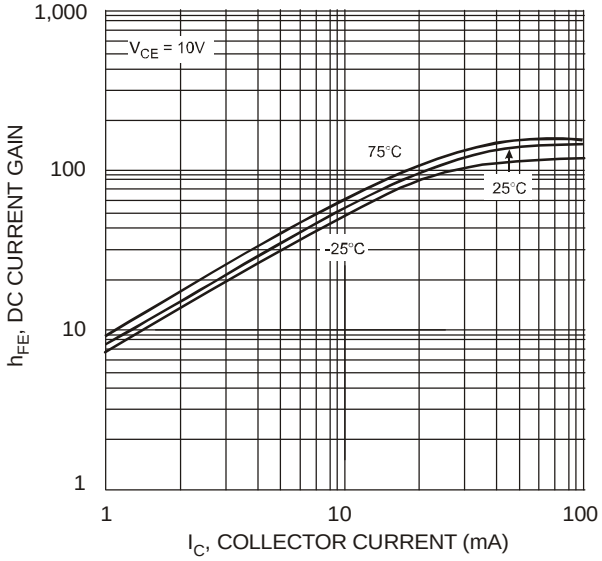

Fig. 3 DC Current Gain

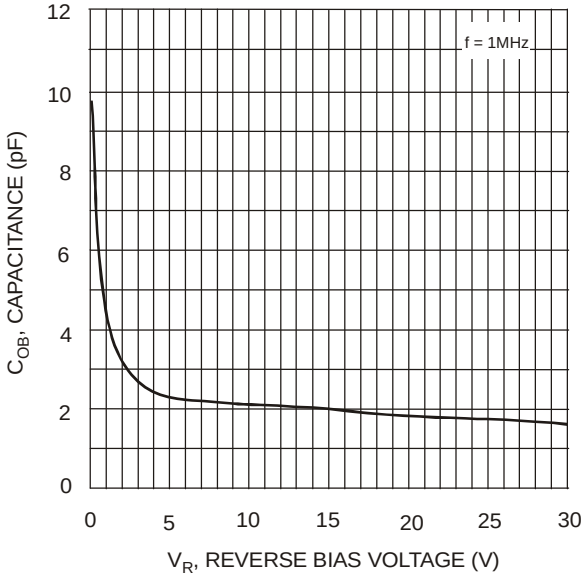

Fig. 4 Output Capacitance

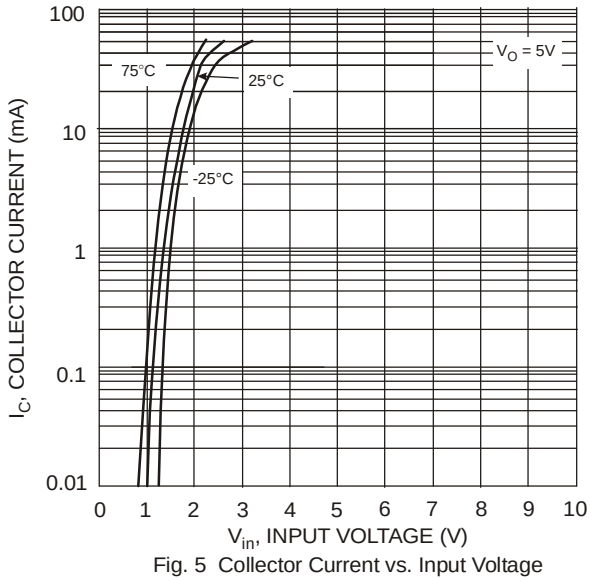

Fig. 5 Collector Current vs. Input Voltage

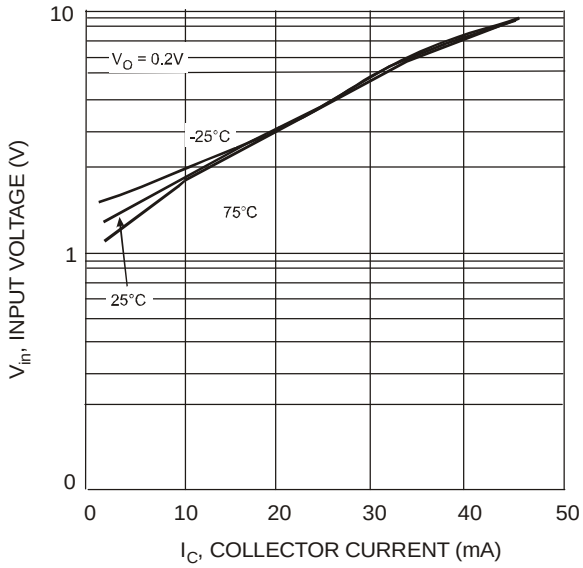

Fig. 6 Input Voltage vs. Collector Current

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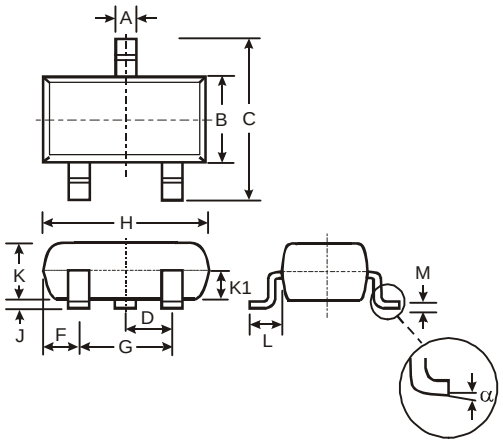
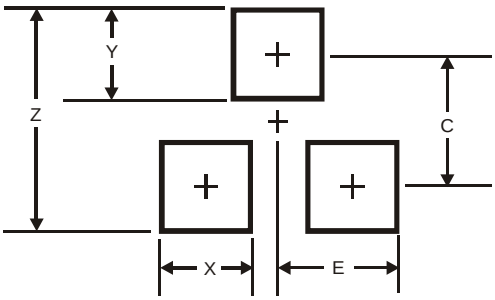
Package Outline Dimensions



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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