DDTA (R1 = R2 SERIES) CA

PNP PRE-BIASED SMALL SIGNAL SURFACE MOUNT TRANSISTOR

Features

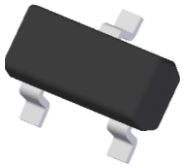
- Epitaxial Planar Die Construction
- Complementary NPN Types Available (DDTC)
- Built-In Biasing Resistors, R1 = R2
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 4)**

Mechanical Data

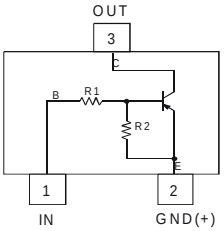
- Case: SOT23
- Case Material: Molded Plastic, "Green" Molding Compound UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.008 grams (Approximate)

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

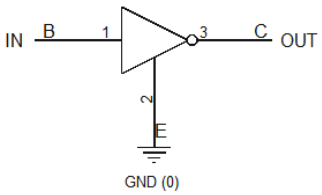
SOT23



Top View



Device Schematic



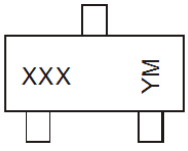
Equivalent Inverter Circuit

Ordering Information (Notes 4, 5 & 6)

Part Number	Status	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity Per Reel
DDTA123ECA-7-F	Active	AEC-Q101	P04	7	8	3,000
DDTA143ECA-7-F	Active	AEC-Q101	P08	7	8	3,000
DDTA114ECA-7-F	Active	AEC-Q101	P13	7	8	3,000
DDTA114ECAQ-7-F	NRND (Use ADTA114ECAQ)	Automotive	P13	7	8	3,000
DDTA114ECAQ-13-F	NRND (Use ADTA114ECAQ)	Automotive	P13	13	8	10,000
DDTA124ECA-7-F	Active	AEC-Q101	P17	7	8	3,000
DDTA144ECA-7-F	Active	AEC-Q101	P20	7	8	3,000
DDTA144ECAQ-13-F	NRND (Use ADTA144ECAQ)	Automotive	P20	13	8	10,000
DDTA115ECA-7-F	Active	AEC-Q101	P24	7	8	3,000

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
2. See https://www.diodes.com/quality/lead-free/ for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to https://www.diodes.com/quality/.
5. For packaging details, go to our website at https://www.diodes.com/design/support/packaging/diodes-packaging/.
6. NRND = Not Recommended for New Design.

Marking Information



XXX = Product Type Marking Code, See Ordering Information
YM = Date Code Marking
Y = Year (ex: F = 2018)
M = Month (ex: 9 = September)

Date Code Key

Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Code	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U

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

Absolute 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 7)	P_D	200	mW
Thermal Resistance, Junction to Ambient Air (Note 7)	$R_{\theta JA}$	625	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Notes: 7. Mounted on FR-4 PC Board with minimum recommended pad layout.

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 (Note 8)		f_T	—	250	—	MHz	V_{CE} = -10V, I_E = -5mA, f = 100MHz

Note: 8. Transistor - For Reference Only

Typical Characteristics – DDTA143ECA (@T_A = +25°C, unless otherwise specified.)

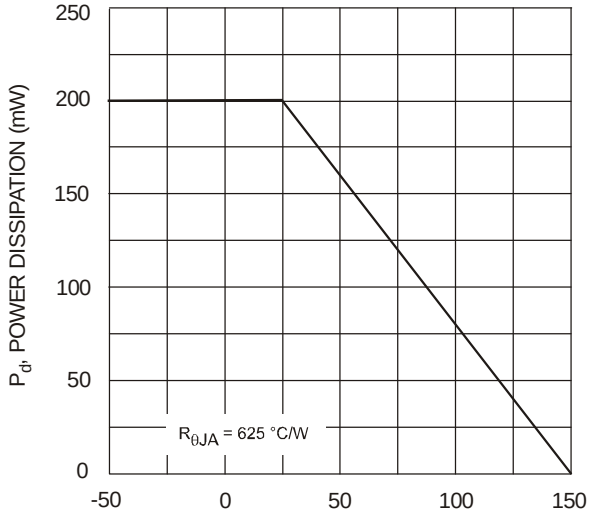


Fig. 1 Derating Curve

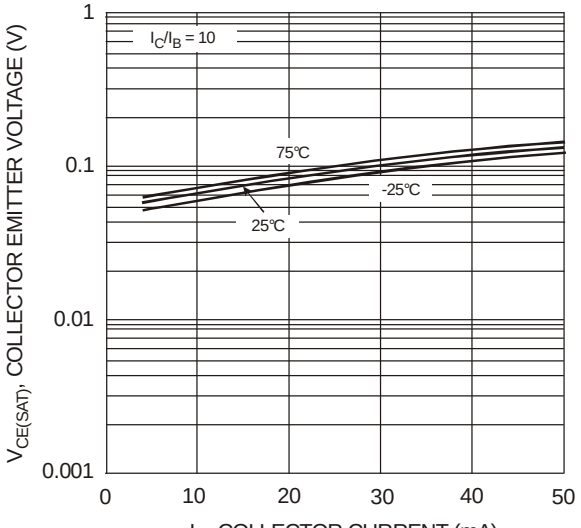


Fig. 2 $V_{CE(SAT)}$ vs. I_C

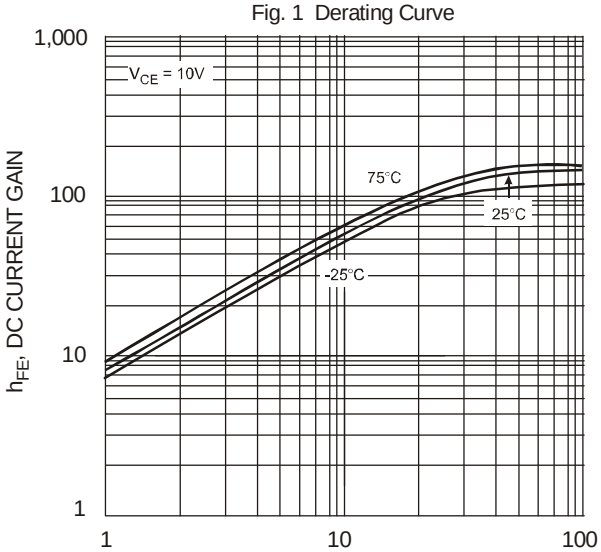


Fig. 3 DC Current Gain

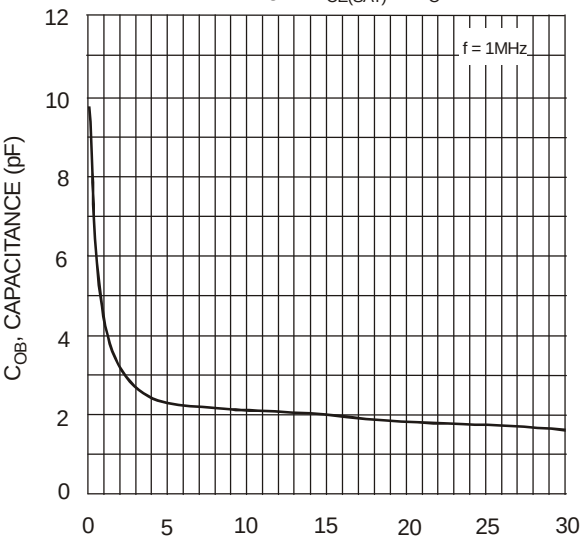


Fig. 4 Output Capacitance

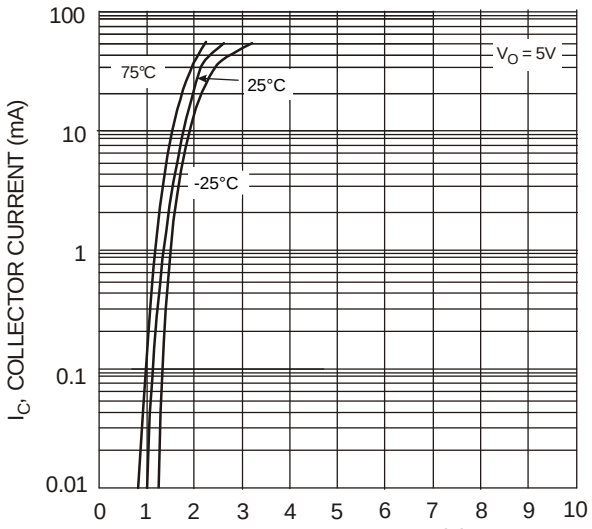


Fig. 5 Collector Current vs. Input Voltage

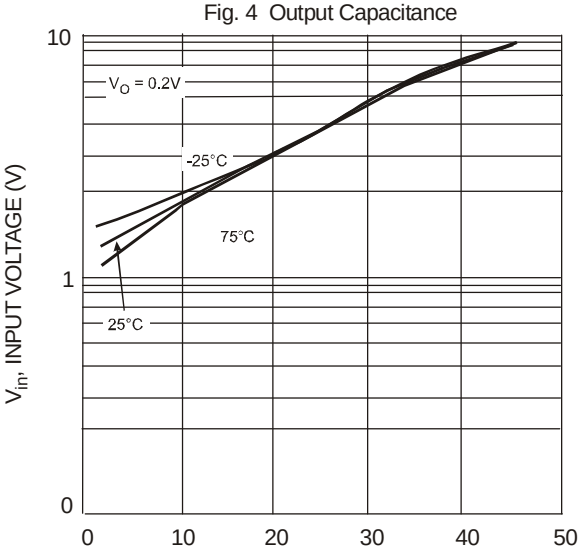
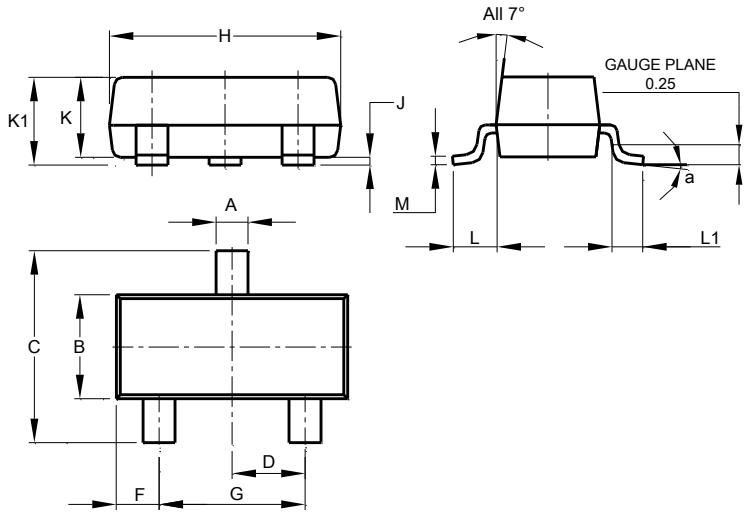


Fig. 6 Input Voltage vs. Collector Current

Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.

SOT23

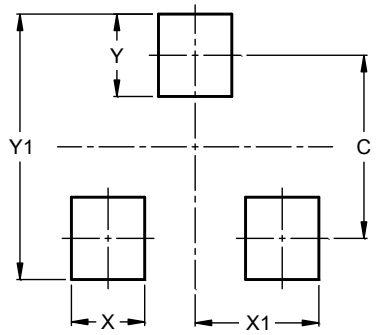


SOT23			
Dim	**Min**	**Max**	**Typ**
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.

SOT23



Dimensions	Value (in mm)
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9

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