



### DDTC(R1-ONLY SERIES) CA

NPN PRE-BIASED SMALL SIGNAL SURFACE MOUNT TRANSISTOR

#### Features

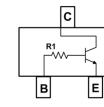
- **Epitaxial Planar Die Construction**
- Complementary PNP Types Available (DDTA)
- Built-In Biasing Resistors, R1 only
- Totally Lead-Free & Fully RoHS compliant (Notes 1 & 2)
- Halogen and Antimony Free "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability
- PPAP Capable (Note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

Part Number	R1 (NOM)
DDTC113TCA	1ΚΩ
DDTC123TCA	2.2ΚΩ
DDTC143TCA	4.7ΚΩ
DDTC114TCA	10ΚΩ
DDTC124TCA	22ΚΩ
DDTC144TCA	47ΚΩ
DDTC115TCA	100ΚΩ
DDTC125TCA	200ΚΩ



Top View

- **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 (@3)
- Weight: 0.008 grams (approximate)



Device Schematic - Top View

### Ordering Information (Notes 4 & 5)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
DDTC113TCA-7-F	AEC-Q101	N01	7	8	3,000
DDTC123TCA-7-F	AEC-Q101	N03	7	8	3,000
DDTC143TCA-7-F	AEC-Q101	N07	7	8	3,000
DDTC143TCAQ-7-F	Automotive	N07	7	8	3,000
DDTC143TCAQ-13-F	Automotive	N07	13	8	10,000
DDTC114TCA-7-F	AEC-Q101	N12	7	8	3,000
DDTC124TCA-7-F	AEC-Q101	N16	7	8	3,000
DDTC144TCA-7-F	AEC-Q101	N19	7	8	3,000
DDTC115TCA-7-F	AEC-Q101	N23	7	8	3,000
DDTC125TCA-7-F	AEC-Q101	N25	7	8	3,000

Notes: 1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.

2. See http://www.diodes.com/quality/lead\_free.html 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 http://www.diodes.com/quality/product\_compliance\_definitions/.

5. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

#### Marking Information

Date Code Key			Nxx	Ţ × ₹	YM = Y = Y	= Product T Date Code Year (ex: X = Month (ex: 9	Marking 2010)	<b>.</b> .	See Table	above)		
Year	2006	2007	20	08	2009	2010	2011	2012	20	13	2014	2015
Code	Т	U	١	/	W	Х	Y	Z		Ą	В	С
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	0	N	D
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### Absolute Maximum Ratings (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	50	V
Collector-Emitter Voltage	V <sub>CEO</sub>	50	V
Emitter-Base Voltage	V <sub>EBO</sub>	5	V
Collector Current	I <sub>C</sub> (Max)	100	mA

# Thermal Characteristics (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 6)	PD	200	mW
Thermal Resistance, Junction to Ambient Air (Note 6)	R <sub>0JA</sub>	625	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

## Electrical Characteristics (@T<sub>A</sub> = +25°C, unless otherwise specified.)

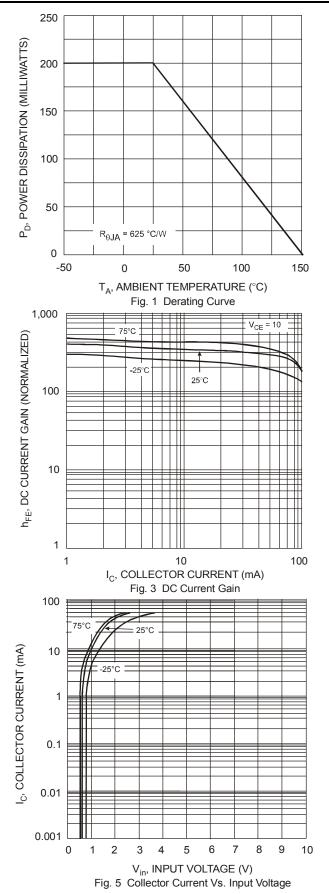
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	<b>BV</b> CBO	50	_		V	I <sub>C</sub> = 50μA
Collector-Emitter Breakdown Voltage	BV <sub>CEO</sub>	50	_	_	V	I <sub>C</sub> = 1mA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	5	_	_	V	I <sub>E</sub> = 50μA
Collector Cutoff Current	I <sub>CBO</sub>	_		0.5	μA	$V_{CB} = 50V$
Emitter Cutoff Current	I <sub>EBO</sub>	_	_	0.5	μA	$V_{EB} = 4V$
Collector-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	_		0.3	V	$\begin{split} &  _{C/IB} = 10 \text{mA}/1\text{mA} & \text{DDTC113TCA} \\ &  _{C/IB} = 5\text{mA}/0.5\text{mA} & \text{DDTC123TCA} \\ &  _{C/IB} = 2.5\text{mA}/2.5\text{mA} & \text{DDTC143TCA} \\ &  _{C/IB} = 1\text{mA}/.1\text{mA} & \text{DDTC114TCA} \\ &  _{C/IB} = 5\text{mA}/0.5\text{mA} & \text{DDTC124TCA} \\ &  _{C/IB} = 2.5\text{mA}/2.5\text{mA} & \text{DDTC144TCA} \\ &  _{C/IB} = 1\text{mA}/0.1\text{mA} & \text{DDTC115TCA} \\ &  _{C/IB} = .5\text{mA}/0.5\text{mA} & \text{DDTC125TCA} \\ \end{split}$
DC Current Transfer Ratio	h <sub>FE</sub>	100 120	250 -	600 630		$I_{C} = 1 \text{mA}, V_{CE} = 5 \text{V}$ $I_{C} = 5 \text{mA}, V_{CE} = 5 \text{V}$ DDTC143TCAQ
Input Resistor (R1) Tolerance	$\Delta R_1$	-30		+30	%	
Gain-Bandwidth Product (Note 7)	f⊤		250		MHz	V <sub>CE</sub> = 10V, I <sub>E</sub> = -5mA, f = 100MHz

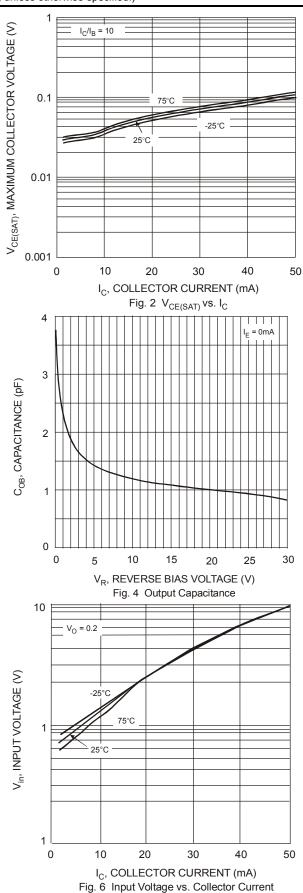
Notes: 6. Mounted on FR4 PC Board with minimum recommended pad layout 7. Transistor - For Reference Only



## DDTC(R1-ONLY SERIES) CA

## Typical Characteristics – DDTC144TCA (@T<sub>A</sub> = +25°C, unless otherwise specified.)



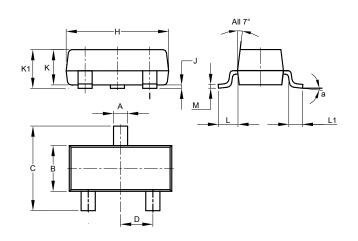


DDTC(R1-ONLY SERIES) CA Document number: DS30331 Rev. 9 - 2



## **Package Outline Dimensions**

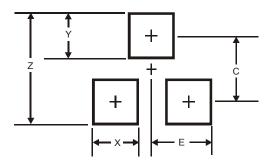
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



SOT23						
Dim	Min	Max	Тур			
Α	0.37	0.51	0.40			
в	1.20	1.40	1.30			
С	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			
н	2.80	3.00	2.90			
J	0.013	0.10	0.05			
κ	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			
М	0.085	0.150	0.110			
а	8°					
All	All Dimensions in mm					

## **Suggested Pad Layout**

Please see AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for the latest version.



Dimensions	Value (in mm)
Z	2.9
Х	0.8
Y	0.9
С	2.0
E	1.35



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