



# DDTC (R1-ONLY SERIES) CA

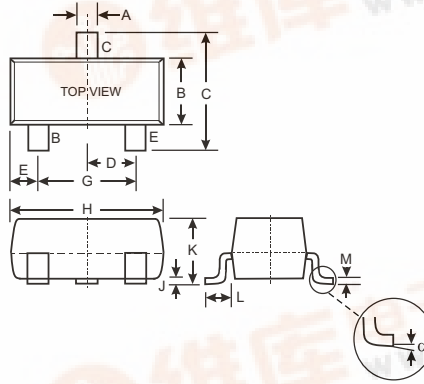
**NPN PRE-BIASED SMALL SIGNAL SOT-23 SURFACE MOUNT TRANSISTOR**

## Features

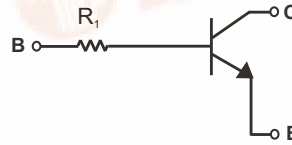
- Epitaxial Planar Die Construction
- Complementary PNP Types Available (DDTA)
- Built-In Biasing Resistor, R1 only
- Lead Free/RoHS Compliant (Note 2)**

## 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 Marking Code (See Table Below & Page 2)
- Ordering Information (See Page 2)
- Weight: 0.008 grams (approximate)



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
	0	8
All Dimensions in mm		



SCHMATIC DIAGRAM

P/N	R1 (NOM)	MARKING
DDTC113TCA	1K	N01
DDTC123TCA	2.2K	N03
DDTC143TCA	4.7K	N07
DDTC114TCA	10K	N12
DDTC124TCA	22K	N16
DDTC144TCA	47K	N19
DDTC115TCA	100K	N23
DDTC125TCA	200K	N25

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CB0</sub>	50	V
Collector-Emitter Voltage	V <sub>CE0</sub>	50	V
Emitter-Base Voltage	V <sub>EB0</sub>	5	V
Collector Current	I <sub>C (Max)</sub>	100	mA
Power Dissipation	P <sub>d</sub>	200	mW
Thermal Resistance, Junction to Ambient Air (Note 1)	R <sub>JA</sub>	625	C/W
Operating and Storage and Temperature Range	T <sub>j</sub> , T <sub>STG</sub>	-55 to +150	C

- Note: 1. Mounted on FR4 PC Board with recommended pad layout at <http://www.diodes.com/datasheets/ap02001.pdf>.  
 2. No purposefully added lead.

NEW PRODUCT



## Electrical Characteristics @ T<sub>A</sub> = 25 C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	50			V	I <sub>C</sub> = 50 A
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> = 50 A
Collector Cutoff Current	I <sub>CBO</sub>			0.5	A	V <sub>CB</sub> = 50V
Emitter Cutoff Current	I <sub>EBO</sub>			0.5	A	V <sub>EB</sub> = 4V
Collector-Emitter Saturation Voltage	V <sub>CE(sat)</sub>			0.3	V	I <sub>C</sub> /I <sub>B</sub> = 10mA/1mA DDTC113TCA I <sub>C</sub> /I <sub>B</sub> = 5mA/0.5mA DDTC123TCA I <sub>C</sub> /I <sub>B</sub> = 2.5mA/.25mA DDTC143TCA I <sub>C</sub> /I <sub>B</sub> = 1mA/.1mA DDTC114TCA I <sub>C</sub> /I <sub>B</sub> = 5mA/0.5mA DDTC124TCA I <sub>C</sub> /I <sub>B</sub> = 2.5mA/.25mA DDTC144TCA I <sub>C</sub> /I <sub>B</sub> = 1mA/0.1mA DDTC115TCA I <sub>C</sub> /I <sub>B</sub> = .5mA/.05mA DDTC125TCA
DC Current Transfer Ratio	h <sub>FE</sub>	100	250	600		I <sub>C</sub> = 1mA, V <sub>CE</sub> = 5V
Input Resistor (R <sub>1</sub> ) Tolerance	R <sub>1</sub>	-30		+30	%	
Gain-Bandwidth Product*	f <sub>T</sub>		250		MHz	V <sub>CE</sub> = 10V, I <sub>E</sub> = -5mA, f = 100MHz

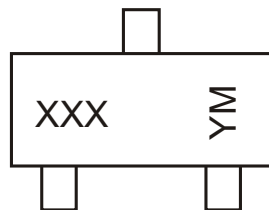
\* Transistor - For Reference Only

## Ordering Information (Note 3)

Device	Packaging	Shipping
DDTC113TCA-7-F	SOT-23	3000/Tape & Reel
DDTC123TCA-7-F	SOT-23	3000/Tape & Reel
DDTC143TCA-7-F	SOT-23	3000/Tape & Reel
DDTC114TCA-7-F	SOT-23	3000/Tape & Reel
DDTC124TCA-7-F	SOT-23	3000/Tape & Reel
DDTC144TCA-7-F	SOT-23	3000/Tape & Reel
DDTC115TCA-7-F	SOT-23	3000/Tape & Reel
DDTC125TCA-7-F	SOT-23	3000/Tape & Reel

Notes: 3. 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: N = 2002  
 M = Month ex: 9 = September

Date Code Key

Year	2002	2003	2004	2005	2006	2007	2008	2009
Code	N	P	R	S	T	U	V	W

Month	Jan	Feb	March	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

**TYPICAL CURVES - DDT114TCA**

NEW PRODUCT

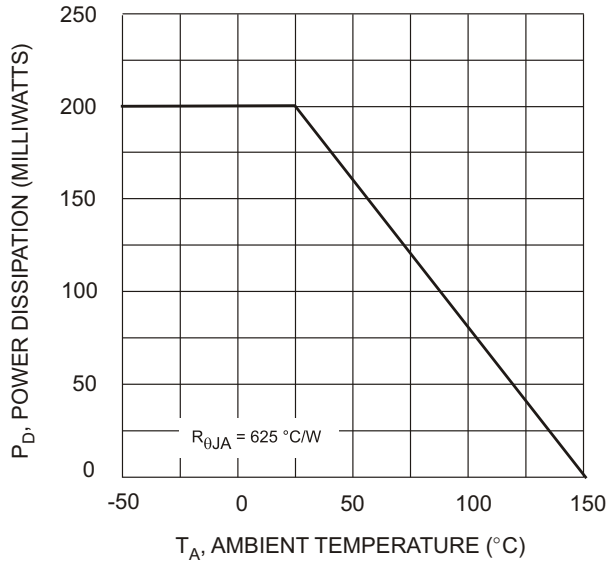


Fig. 1 Derating Curve

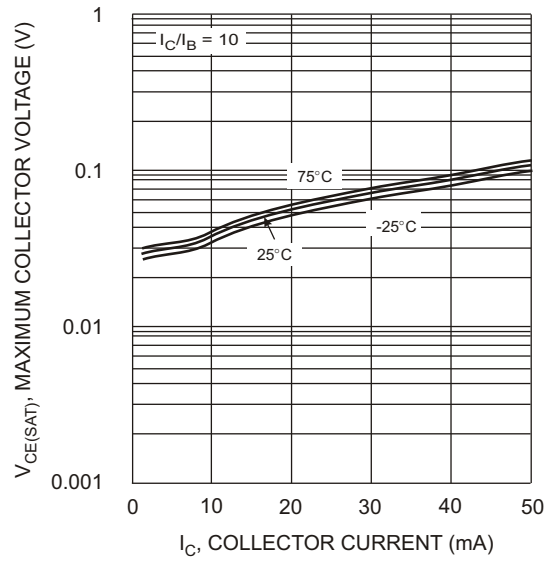


Fig. 2  $V_{CE(SAT)}$  vs.  $I_C$

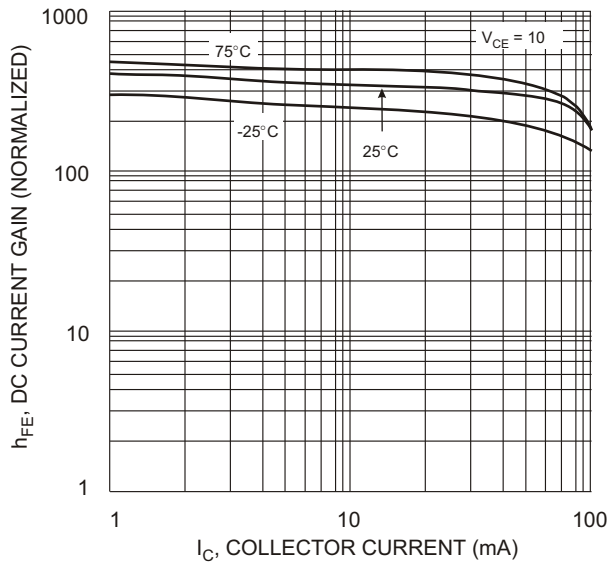


Fig. 3 DC Current Gain

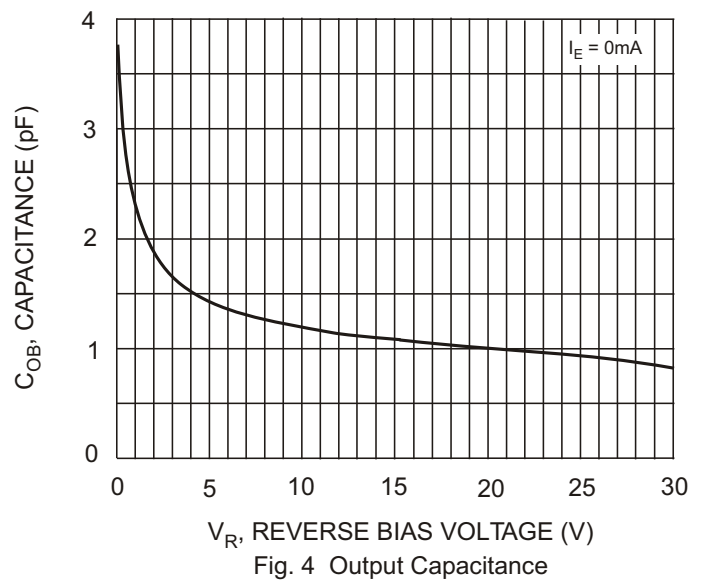


Fig. 4 Output Capacitance

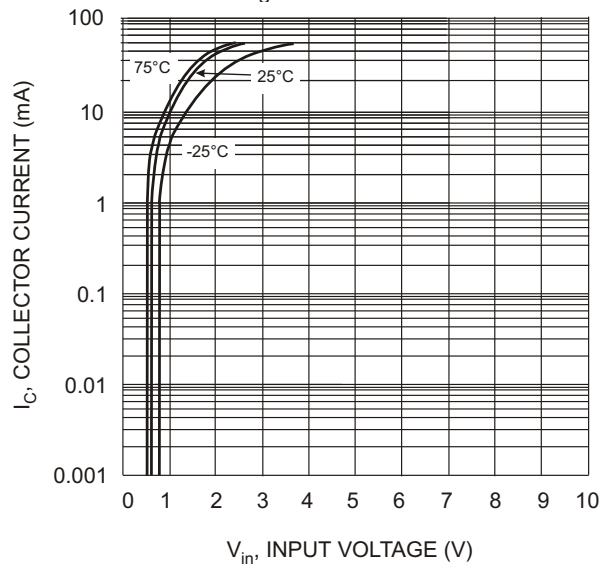


Fig. 5 Collector Current Vs. Input Voltage

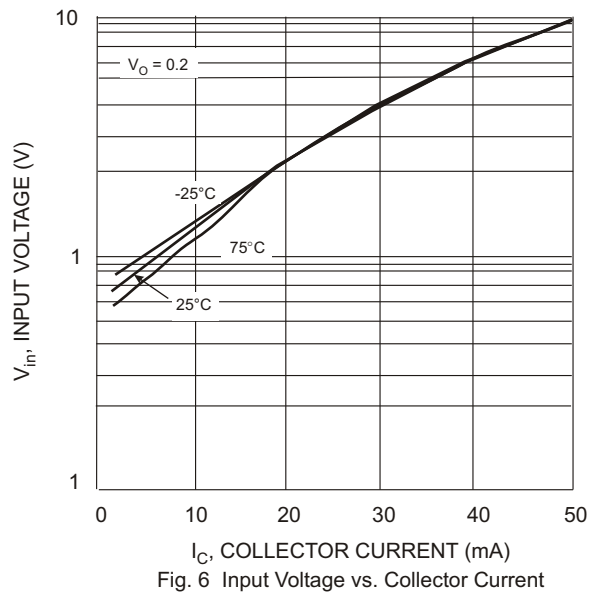


Fig. 6 Input Voltage vs. Collector Current



#### **IMPORTANT NOTICE**

Diodes, Inc. and its subsidiaries reserve the right to make changes without further notice to any product herein to make corrections, modifications, enhancements, improvements, or other changes. Diodes, Inc. does not assume any liability arising out of the application or use of any product described herein; neither does it convey any license under its patent rights, nor the rights of others. The user of products in such applications shall assume all risks of such use and will agree to hold Diodes Incorporated and all the companies whose products are represented on our website, harmless against all damages.

#### **LIFE SUPPORT**

The products located on our website at [www.diodes.com](http://www.diodes.com) are not recommended for use in life support systems where a failure or malfunction of the component may directly threaten life or cause injury without the expressed written approval of Diodes Incorporated.