

NPN PRE-BIASED SMALL SIGNAL SOT23 SURFACE MOUNT TRANSISTOR
Product Summary

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

Features and Benefits

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

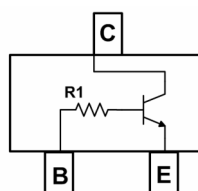
Mechanical Data

- 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)

SOT23



Top View

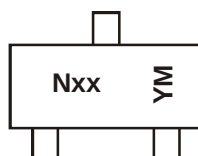


Device Schematic – Top View

Ordering Information (Note 3 & 4)

Product	Grade	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
DDTC113TCA-7-F	Commercial	N01	7	8	3,000
DDTC123TCA-7-F	Commercial	N03	7	8	3,000
DDTC143TCA-7-F	Commercial	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	Commercial	N12	7	8	3,000
DDTC124TCA-7-F	Commercial	N16	7	8	3,000
DDTC144TCA-7-F	Commercial	N19	7	8	3,000
DDTC115TCA-7-F	Commercial	N23	7	8	3,000
DDTC125TCA-7-F	Commercial	N25	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


NXX = Product Type Marking Code (See Table above)
 YM = Date Code Marking
 Y = Year (ex: X = 2010)
 M = Month (ex: 9 = September)

Date Code Key

Date Code Key

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Code	T	U	V	W	X	Y	Z	A	B	C

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°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CBO}	50	V
Collector-Emitter Voltage	V _{CEO}	50	V
Emitter-Base Voltage	V _{EBO}	5	V
Collector Current	I _C (Max)	100	mA

Thermal Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Power Dissipation (Notes 5 & 6)	P _D	200	mW
Thermal Resistance, Junction to Ambient Air (Note 5)	R _{θJA}	625	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

Electrical Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CBO}	50	—	—	V	I _C = 50μA
Collector-Emitter Breakdown Voltage	BV _{CEO}	50	—	—	V	I _C = 1mA
Emitter-Base Breakdown Voltage	BV _{EBO}	5	—	—	V	I _E = 50μA
Collector Cutoff Current	I _{CBO}	—	—	0.5	μA	V _{CB} = 50V
Emitter Cutoff Current	I _{EBO}	—	—	0.5	μA	V _{EB} = 4V
Collector-Emitter Saturation Voltage	V _{CE(sat)}	—	—	0.3	V	I _C /I _B = 10mA/1mA DDTC113TCA I _C /I _B = 5mA/0.5mA DDTC123TCA I _C /I _B = 2.5mA/.25mA DDTC143TCA I _C /I _B = 1mA/.1mA DDTC114TCA I _C /I _B = 5mA/0.5mA DDTC124TCA I _C /I _B = 2.5mA/.25mA DDTC144TCA I _C /I _B = 1mA/0.1mA DDTC115TCA I _C /I _B = .5mA/.05mA DDTC125TCA
DC Current Transfer Ratio	h _{FE}	100 120	250 -	600 630	—	I _C = 1mA, V _{CE} = 5V I _C = 5mA, V _{CE} = 5V DDTC143TCAQ
Input Resistor (R ₁) Tolerance	ΔR ₁	-30	—	+30	%	—
Gain-Bandwidth Product*	f _T	—	250	—	MHz	V _{CE} = 10V, I _E = -5mA, f = 100MHz

* Transistor - For Reference Only

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

Typical Characteristics – DDTC144TCA

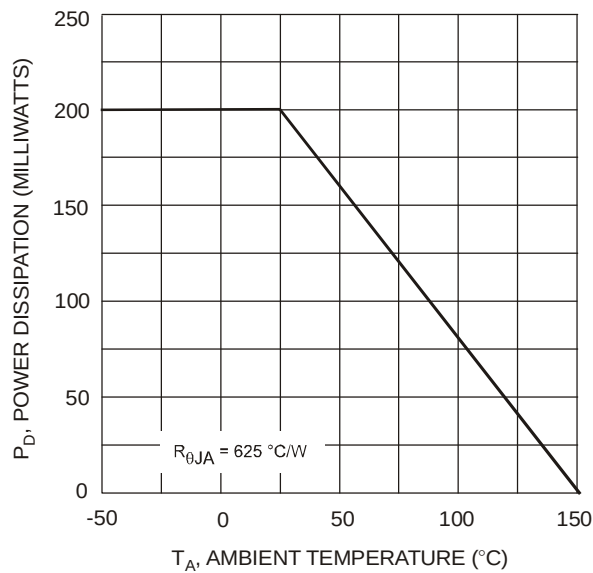


Fig. 1 Derating Curve

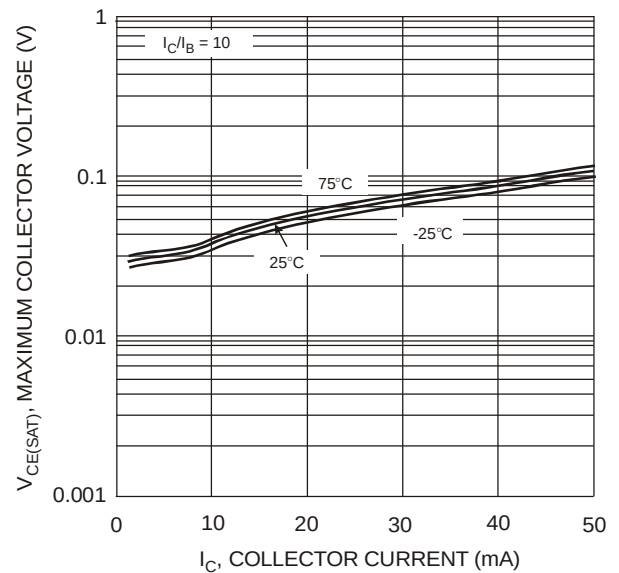


Fig. 2 $V_{CE(SAT)}$ vs. I_C

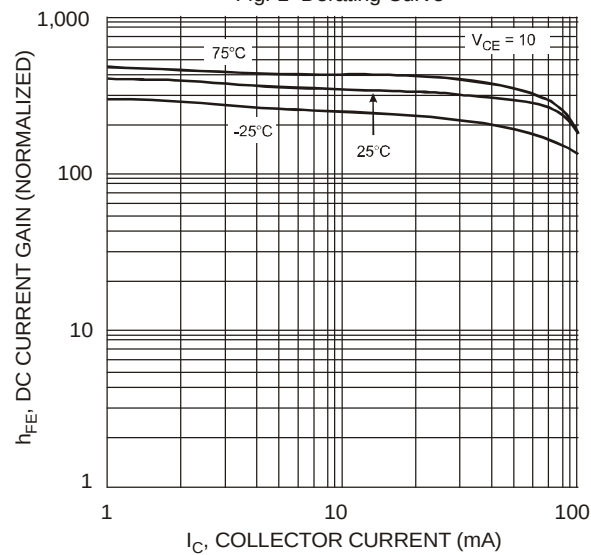


Fig. 3 DC Current Gain

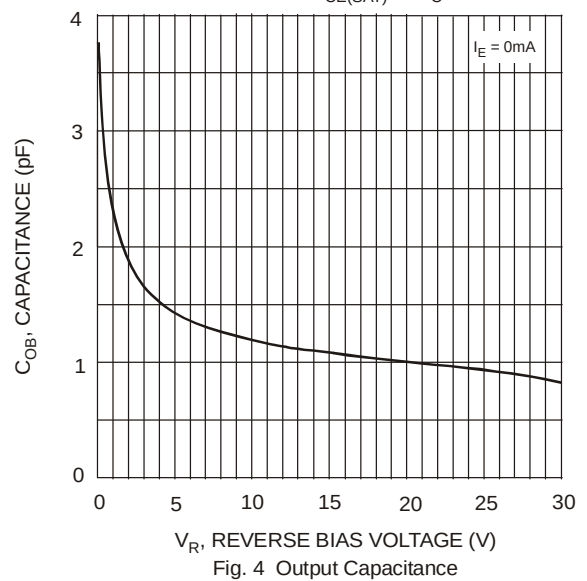


Fig. 4 Output Capacitance

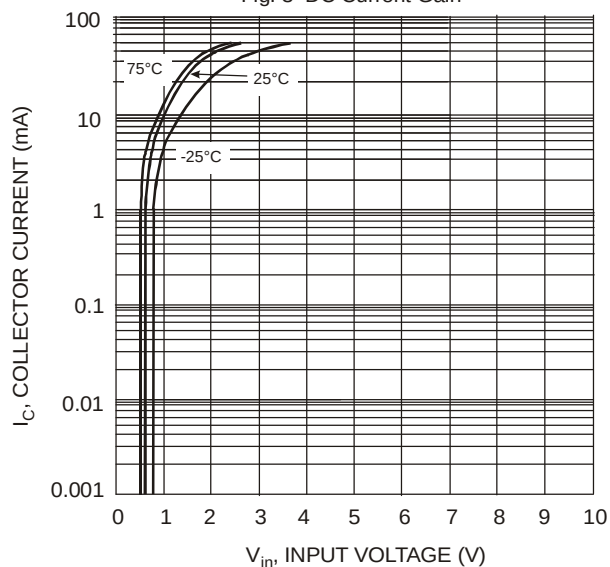


Fig. 5 Collector Current Vs. Input Voltage

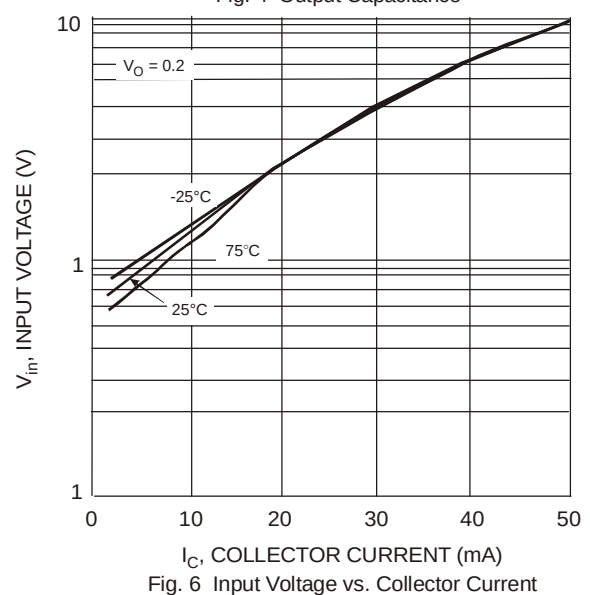
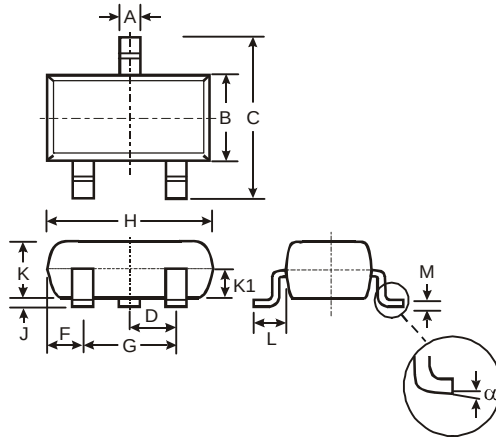


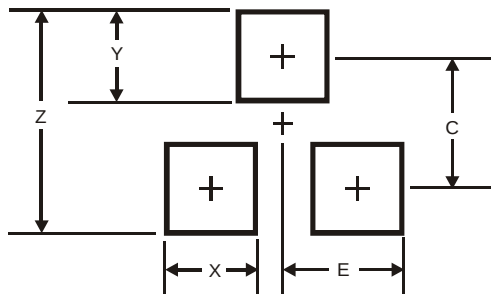
Fig. 6 Input Voltage vs. Collector Current

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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