

DDTC113TCA-7 Datasheet



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DiGi Electronics Part Number	DDTC113TCA-7-DG
Manufacturer	Diodes Incorporated
Manufacturer Product Number	DDTC113TCA-7
Description	TRANS PREBIAS NPN 50V SOT23-3
Detailed Description	Pre-Biased Bipolar Transistor (BJT) NPN - Pre-Biased 50 V 100 mA 250 MHz 200 mW Surface Mount SOT-23-3



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DiGi is a global authorized distributor of electronic components.

Purchase and inquiry

Manufacturer Product Number:

DDTC113TCA-7

Series:

-

Transistor Type:

NPN - Pre-Biased

Voltage - Collector Emitter Breakdown (Max):

50 V

DC Current Gain (hFE) (Min) @ Ic, Vce:

100 @ 1mA, 5V

Current - Collector Cutoff (Max):

500nA (ICBO)

Power - Max:

200 mW

Package / Case:

TO-236-3, SC-59, SOT-23-3

Base Product Number:

DDTC113

Manufacturer:

Diodes Incorporated

Product Status:

Discontinued at Digi-Key

Current - Collector (Ic) (Max):

100 mA

Resistor - Base (R1):

1 kOhms

Vce Saturation (Max) @ Ib, Ic:

300mV @ 1mA, 10mA

Frequency - Transition:

250 MHz

Mounting Type:

Surface Mount

Supplier Device Package:

SOT-23-3

Environmental & Export classification

RoHS Status:

RoHS non-compliant

REACH Status:

REACH Unaffected

HTSUS:

8541.21.0075

Moisture Sensitivity Level (MSL):

1 (Unlimited)

ECCN:

EAR99

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)**
- **The DDTC143TCAQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**

<https://www.diodes.com/quality/product-definitions/>

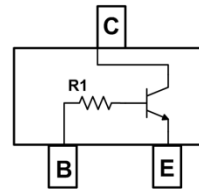
Mechanical Data

- 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)

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



Top View



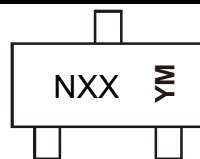
Device Schematic – Top View

Ordering Information (Note 4)

Product	Status	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
DDTC113TCA-7-F	Active	Standard	N01	7	8	3,000
DDTC123TCA-7-F	Active	Standard	N03	7	8	3,000
DDTC143TCA-7-F	Active	Standard	N07	7	8	3,000
DDTC143TCAQ-7-F	Active	Automotive	N07	7	8	3,000
DDTC143TCAQ-13-F	Active	Automotive	N07	13	8	10,000
DDTC114TCA-7-F	Active	Standard	N12	7	8	3,000
DDTC124TCA-7-F	Active	Standard	N16	7	8	3,000
DDTC144TCA-7-F	Active	Standard	N19	7	8	3,000
DDTC115TCA-7-F	Active	Standard	N23	7	8	3,000
DDTC125TCA-7-F	Obsolete	Standard	N25	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. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



NXX = Product Type Marking Code (See Table above)
 YM = Date Code Marking
 Y = Year (ex: 1 = 2021)
 M = Month (ex: 9 = September)

Date Code Key

Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Code	I	J	K	L	M	N	O	P	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



DDTC (R1-ONLY SERIES) CA

Absolute Maximum Ratings (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CB0}	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 (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P_D	200	mW
Thermal Resistance, Junction to Ambient Air (Note 5)	$R_{\theta JA}$	625	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CB0}	50	—	—	V	$I_C = 50\mu\text{A}$
Collector-Emitter Breakdown Voltage	BV_{CEO}	50	—	—	V	$I_C = 1\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	5	—	—	V	$I_E = 50\mu\text{A}$
Collector Cutoff Current	I_{CB0}	—	—	0.5	μA	$V_{CB} = 50\text{V}$
Emitter Cutoff Current	I_{EBO}	—	—	0.5	μA	$V_{EB} = 4\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	—	0.3	V	$I_C/I_B = 10\text{mA}/1\text{mA}$ DDTC113TCA $I_C/I_B = 5\text{mA}/0.5\text{mA}$ DDTC123TCA $I_C/I_B = 2.5\text{mA}/.25\text{mA}$ DDTC143TCA $I_C/I_B = 1\text{mA}/.1\text{mA}$ DDTC114TCA $I_C/I_B = 5\text{mA}/0.5\text{mA}$ DDTC124TCA $I_C/I_B = 2.5\text{mA}/.25\text{mA}$ DDTC144TCA $I_C/I_B = 1\text{mA}/0.1\text{mA}$ DDTC115TCA $I_C/I_B = .5\text{mA}/.05\text{mA}$ DDTC125TCA
DC Current Transfer Ratio	h_{FE}	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 (R_1) Tolerance	ΔR_1	-30	—	+30	%	—
Gain-Bandwidth Product (Note 6)	f_T	—	250	—	MHz	$V_{CE} = 10\text{V}, I_E = -5\text{mA}, f = 100\text{MHz}$

Notes: 5. Mounted on FR4 PC Board with minimum recommended pad layout
6. Transistor - For Reference Only



Typical Characteristics – DDTC144TCA (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

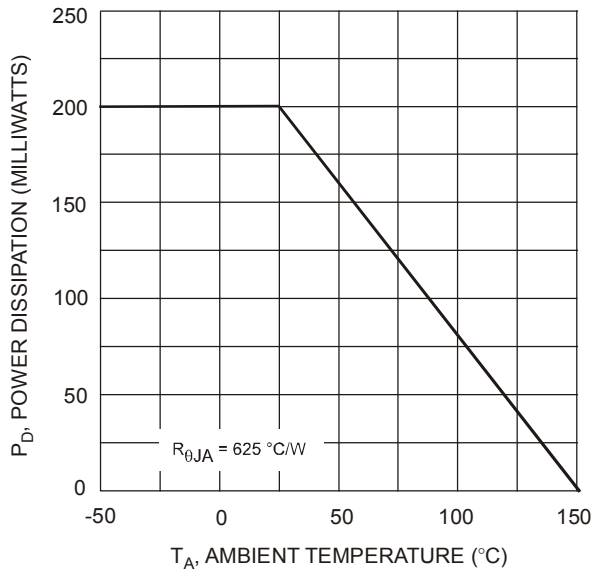


Fig. 1 Derating Curve

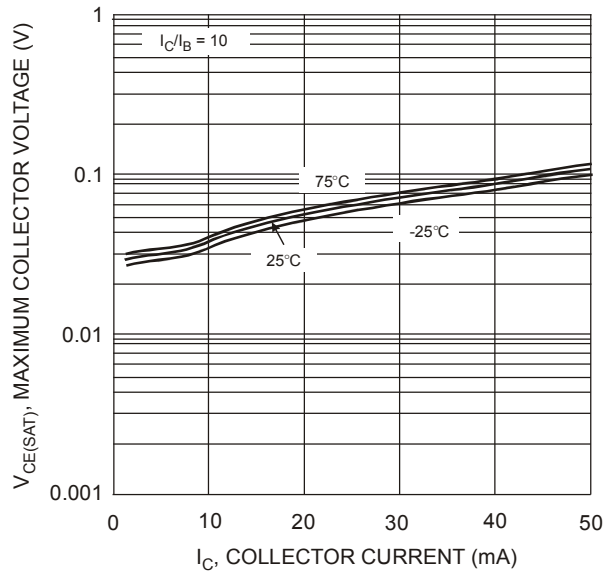


Fig. 2 $V_{CE(SAT)}$ vs. I_C

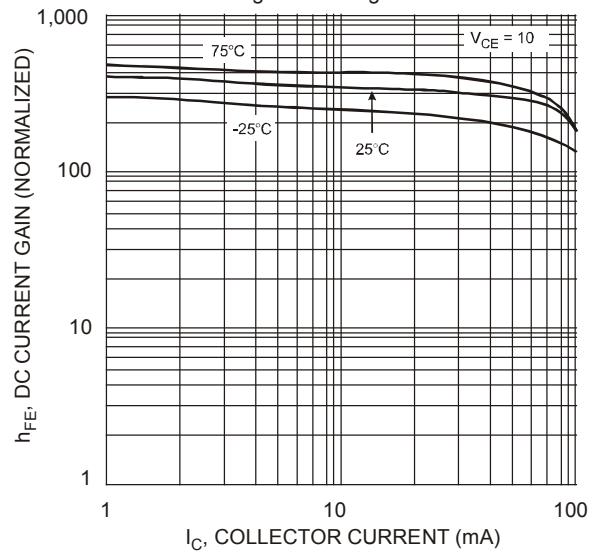


Fig. 3 DC Current Gain

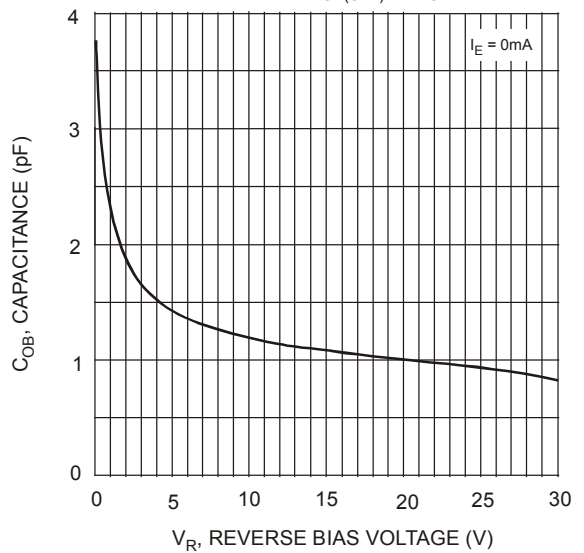


Fig. 4 Output Capacitance

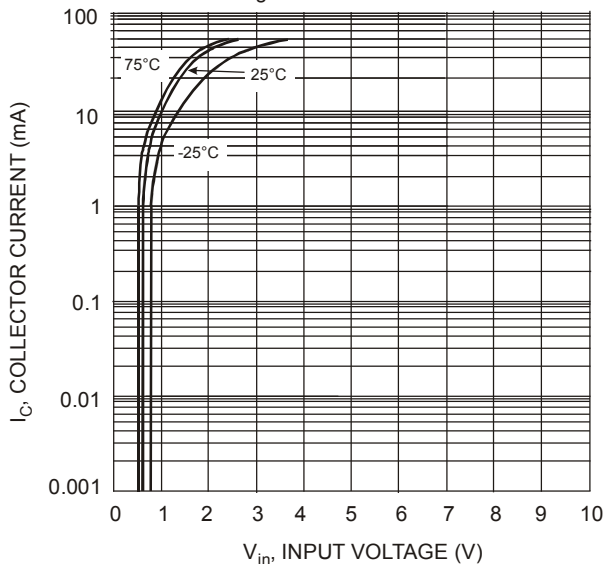


Fig. 5 Collector Current Vs. Input Voltage

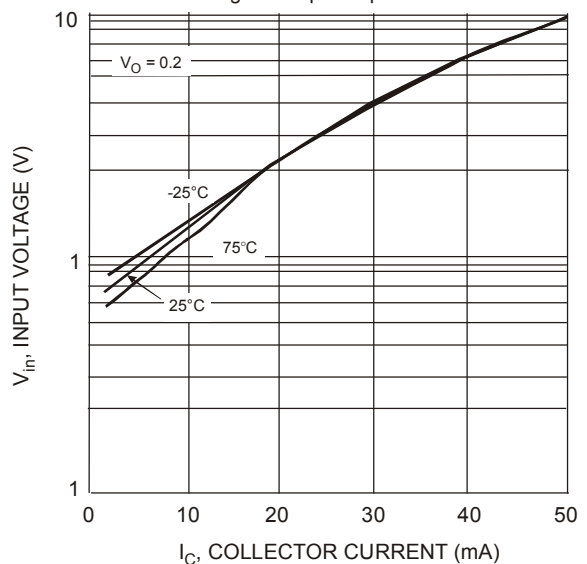
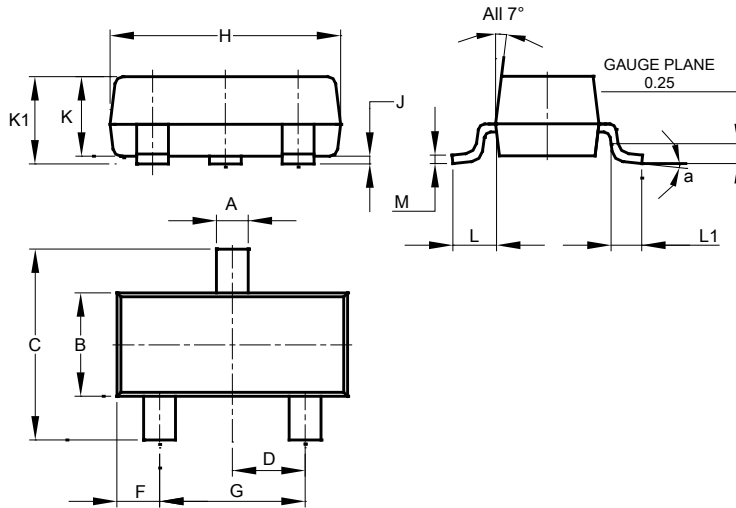


Fig. 6 Input Voltage vs. Collector Current

Package Outline Dimensions

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

SOT23

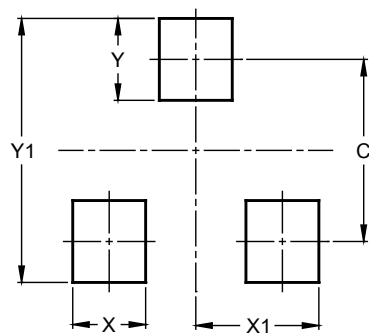


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

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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