



**THE DATASHEET OF
DDTD122TC-7-F**



Features

- Epitaxial Planar Die Construction
- Complementary PNP Types Available (DDTB)
- Built-In Biasing Resistors
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](https://www.diodes.com) or your local Diodes representative. <https://www.diodes.com/quality/product-definitions/>**

Mechanical Data

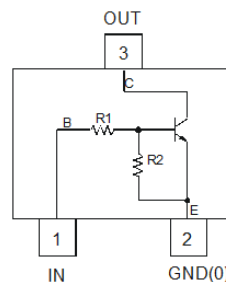
- Case: SOT23
- Case Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads; Solderable per MIL-STD-202, Method 208 @3
- Weight: 0.008 grams (Approximate)

P/N	R1 (NOM)	R2 (NOM)
DDTD122LC	0.22kΩ	10kΩ
DDTD142JC	0.47kΩ	10kΩ
DDTD122TC	0.22kΩ	OPEN
DDTD142TC	0.47kΩ	OPEN

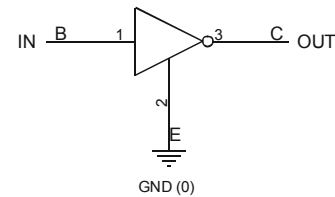
SOT23



Top View



Device Schematic



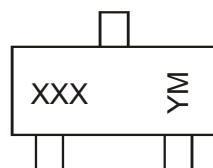
Equivalent Inverter Circuit

Ordering Information (Note 4)

Product	Status	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
DDTD122LC -7-F	Obsolete	Standard	N75	7	8	3,000
DDTD142JC -7-F	Active	Standard	N76	7	8	3,000
DDTD122TC -7-F	Obsolete	Standard	N77	7	8	3,000
DDTD142TC -7-F	Obsolete	Standard	N78	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



XXX = Product Type Marking Code, See Table Above
 YM = Date Code Marking
 Y = Year ex: I = 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

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

Characteristic		Symbol	Value	Unit
Supply Voltage <Pin: (3) to (2)>		V_{CC}	50	V
Input Voltage <Pin: (1) to (2)>	DDTD122LC	V_{IN}	-5 to +6	V
	DDTD142JC		-5 to +6	
Input Voltage <Pin: (2) to (1)>	DDTD122TC	$V_{EBO (MAX)}$	5	V
	DDTD142TC		5	
Output Current		I_C	500	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	$^\circ\text{C}$

Note: 5. Mounted on FR4 PC board with recommended pad layout.

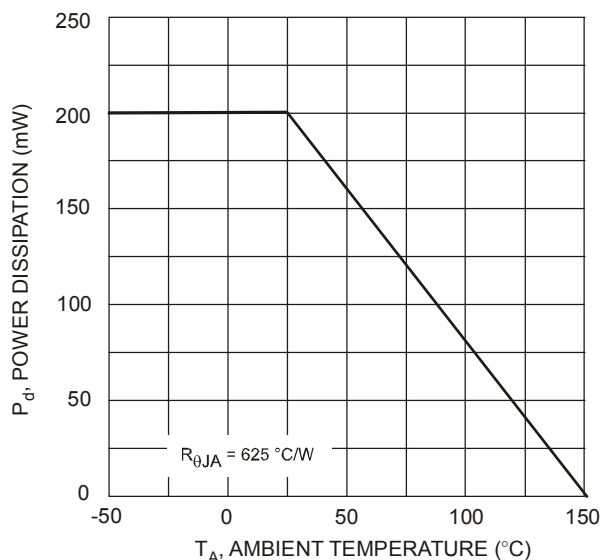


Fig. 1 Power Derating Curve

Electrical Characteristics - R1, R2 Types (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage	DDTD122LC DDTD142JC	$V_{I(off)}$	0.3 0.3	—	—	V	$V_{CC} = 5V, I_O = 100\mu\text{A}$
	DDTD122LC DDTD142JC	$V_{I(on)}$	—	—	2.0 2.0	V	$V_O = 0.3V, I_O = 20\text{mA}$ $V_O = 0.3V, I_O = 20\text{mA}$
Output Voltage		$V_{O(on)}$	—	—	0.3V	V	$I_O/I_I = 50\text{mA}/2.5\text{mA}$
Input Current	DDTD122LC DDTD142JC	I_I	—	—	28 13	mA	$V_I = 5V$
Output Current		$I_{O(off)}$	—	—	0.5	μA	$V_{CC} = 50V, V_I = 0V$
DC Current Gain	DDTD122LC DDTD142JC	G_I	56 56	—	—	—	$V_O = 5V, I_O = 50\text{mA}$
Gain-Bandwidth Product (Note 6)		f_T	—	200	—	MHz	$V_{CE} = 10V, I_E = 5\text{mA}, f = 100\text{MHz}$

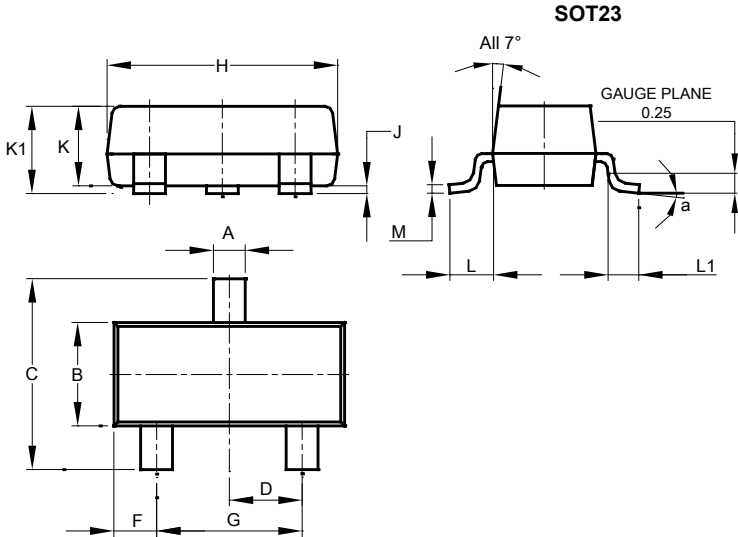
Electrical Characteristics - R1- Only, R2- Only Types (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage		BV_{CBO}	50	—	—	V	$I_C = 50\mu\text{A}$
Collector-Emitter Breakdown Voltage		BV_{CEO}	40	—	—	V	$I_C = 1\text{mA}$
Emitter-Base Breakdown Voltage	DDTD122TC DDTD142TC	BV_{EBO}	5	—	—	V	$I_E = 50\mu\text{A}$ $I_E = 50\mu\text{A}$
Collector Cut-Off Current		I_{CBO}	—	—	0.5	μA	$V_{CB} = 50V$
Emitter Cut-Off Current	DDTD122TC DDTD142TC	I_{EBO}	— —	—	0.5 0.5	μA	$V_{EB} = 4V$
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	—	—	0.3	V	$I_C = 50\text{mA}, I_B = 2.5\text{mA}$
DC Current Transfer Ratio	DDTD122TC DDTD142TC	h_{FE}	100 100	250 250	600 600	—	$I_C = 5\text{mA}, V_{CE} = 5V$
Gain-Bandwidth Product (Note 6)		f_T	—	200	—	MHz	$V_{CE} = 10V, I_E = -5\text{mA}, f = 100\text{MHz}$

Note: 6. Transistor – For Reference Only

Package Outline Dimensions

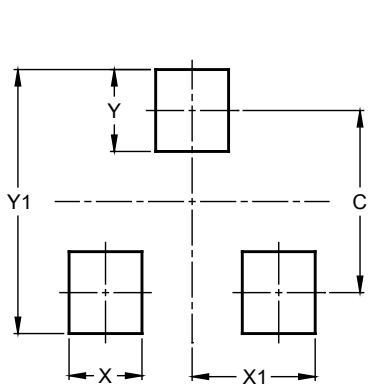
Please see <http://www.diodes.com/package-outlines.html> for the latest version.



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.



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

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