DDTD (LO-R1) C

NPN PRE-BIASED 500 mA SOT-23 SURFACE MOUNT TRANSISTOR

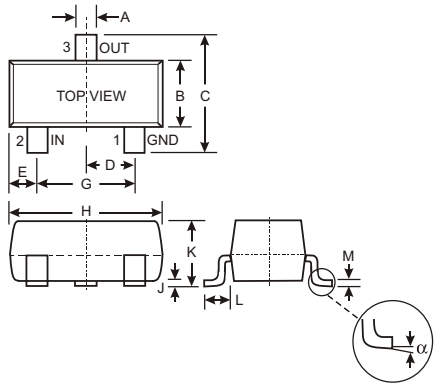
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Features

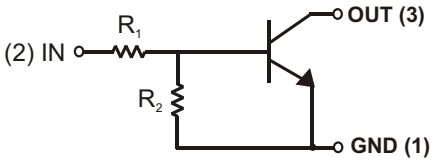
- Epitaxial Planar Die Construction
- Complementary PNP Types Available (DDTB)
- Built-In Biasing Resistors
- Lead Free Product

Mechanical Data

- Case: SOT-23, Molded Plastic
- Case material - UL Flammability Rating 94V-0
- Moisture sensitivity: Level 1 per J-STD-020A
- Terminals: Finish - Matte Tin (Note 1) Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Marking: Date Code and Marking Code (See Diagrams & Page 2)
- Weight: 0.008 grams (approx.)
- Ordering Information (See Page 2)



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
α	0°	8°
All Dimensions in mm		



P/N	R1 (NOM)	R2 (NOM)	MARKING
DDTD122LC	0.22KΩ	10KΩ	N75
DDTD142JC	0.47KΩ	10KΩ	N76
DDTD122TC	0.22KΩ	OPEN	N77
DDTD142TC	0.47KΩ	OPEN	N78

Maximum Ratings @ T_A = 25°C unless otherwise specified

Characteristic		Symbol	Value	Unit
Supply Voltage, (3) to (1)		V_{CC}	50	V
Input Voltage, (2) to (1)	DDTD122LC DDTD142JC	V_{IN}	-5 to +6 -5 to +6	V
Input Voltage, (1) to (2)	DDTD122TC DDTD142TC	$V_{EBO\ (MAX)}$	5	V
Output Current	All	I_C	500	mA
Power Dissipation (Note 2)		P_d	200	mW
Thermal Resistance, Junction to Ambient Air (Note 2)		$R_{\theta JA}$	625	°C/W
Operating and Storage and Temperature Range		T_j, T_{STG}	-55 to +150	°C

Note: 1. If lead-bearing terminal plating is required, please contact your Diodes Inc. sales representative for availability and minimum order details.
2. Mounted on FR4 PC Board with recommended pad layout at http://www.diodes.com/datasheets/ap02001.pdf.

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Electrical Characteristics @ T_A = 25°C unless otherwise specified — R1, R2 Types

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 = 100μA
	DDTD122LC DDTD142JC	$V_{I(on)}$	—	—	2.0 2.0	V	V_O = 0.3V, I_O = 20mA V_O = 0.3V, I_O = 20mA
Output Voltage		$V_{O(on)}$	—	—	0.3V	V	I_O/I_I = 50mA/2.5mA
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 = 50mA
Gain-Bandwidth Product*		f_T	—	200	—	MHz	V_{CE} = 10V, I_E = 5mA, f = 100MHz

* Transistor - For Reference Only

Electrical Characteristics @ T_A = 25°C unless otherwise specified — R1-Only, R2-Only Types

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}	40	—	—	V	I_C = 1mA
Emitter-Base Breakdown Voltage	DDTD122TC DDTD142TC	BV_{EBO}	5	—	—	V	I_E = 50μA I_E = 50μA
Collector Cutoff Current		I_{CBO}	—	—	0.5	μA	V_{CB} = 50V
Emitter Cutoff 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 = 50mA, I_B = 2.5mA
DC Current Transfer Ratio	DDTD122TC DDTD142TC	h_{FE}	100 100	250 250	600 600	—	I_C = 5mA, V_{CE} = 5V
Gain-Bandwidth Product*		f_T	—	200	—	MHz	V_{CE} = 10V, I_E = -5mA, f = 100MHz

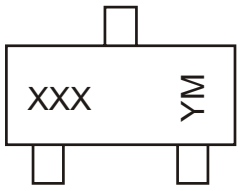
* Transistor - For Reference Only

Ordering Information (Note 3)

Device	Packaging	Shipping
DDTD122LC-7	SOT-23	3000/Tape & Reel
DDTD142JC-7	SOT-23	3000/Tape & Reel
DDTD122TC-7	SOT-23	3000/Tape & Reel
DDTD142TC-7	SOT-23	3000/Tape & Reel

Notes: 1. If lead-bearing terminal plating is required, please contact your Diodes Inc. sales representative for availability and minimum order details.
3. For Packaging Details, go to our website at http://www.diodes.com/datasheets/ap02007.pdf.

Marking Information



XXX = Product Type Marking Code
See Sheet 1 Diagrams
YM = Date Code Marking
Y = Year ex: P = 2003
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

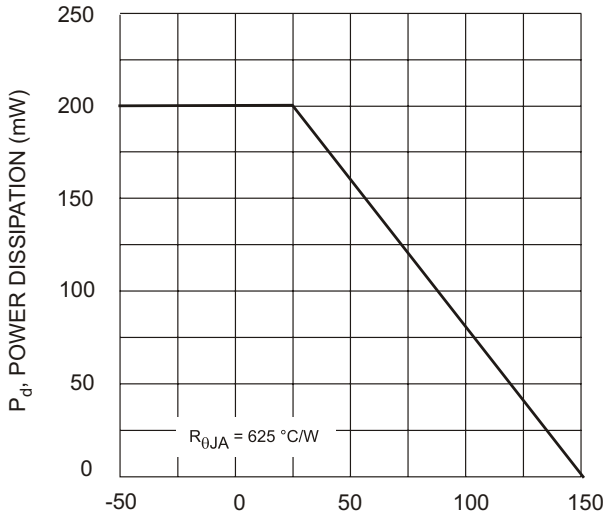


Fig. 1 Power Derating Curve