



DDTD (xxxx) U

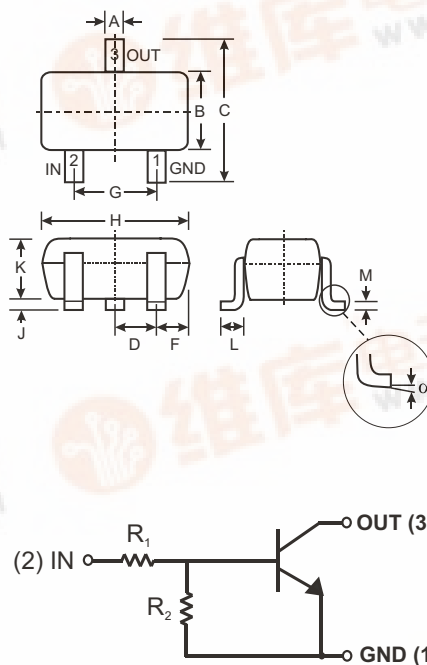
NPN PRE-BIASED 500 mA SOT-323 SURFACE MOUNT TRANSISTOR

Features

- Epitaxial Planar Die Construction
- Complementary PNP Types Available (DDTB)
- Built-In Biasing Resistors, R1, R2
- Also Available in Lead Free Version

Mechanical Data

- Case: SOT-323, Molded Plastic
- Case material - UL Flammability Rating 94V-0
- Moisture sensitivity: Level 1 per J-STD-020A
- Terminals: Solderable per MIL-STD-202, Method 208
- Also Available in Lead Free Plating (Matte Tin Finish). Please see Ordering Information, Note 3, on Page 3
- Terminal Connections: See Diagram
- Marking: Date Code and Marking Code (See Diagrams & Page 3)
- Weight: 0.006 grams (approx.)
- Ordering Information (See Page 3)



SOT-323		
Dim	Min	Max
A	0.25	0.40
B	1.15	1.35
C	2.00	2.20
D	0.65 Nominal	
E	0.30	0.40
G	1.20	1.40
H	1.80	2.20
J	0.0	0.10
K	0.90	1.00
L	0.25	0.40
M	0.10	0.18
α	0°	8°

All Dimensions in mm

P/N	R1 (NOM)	R2 (NOM)	MARKING
DDTD113EU	1K	1K	N60
DDTD123EU	2.2K	2.2K	N61
DDTD143EU	4.7K	4.7K	N62
DDTD114EU	10K	10K	N63
DDTD122JU	0.22K	4.7K	N64
DDTD113ZU	1K	10K	N65
DDTD123YU	2.2K	10K	N66
DDTD133HU	3.3K	10K	N67
DDTD123TU	2.2K	OPEN	N69
DDTD143TU	4.7K	OPEN	N70
DDTD114TU	10K	OPEN	N71
DDTD114GU	0	10K	N72

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)	V _{IN}	-10 to +10 -10 to +12 -10 to +30 -10 to +40 -5 to +5 -5 to +10 -5 to +12 -6 to +20	V
Input Voltage, (1) to (2)	V _{EBO} (MAX)	5	V
Output Current	I _C	500	mA
Power Dissipation	P _d	200	mW
Thermal Resistance, Junction to Ambient Air (Note 1)	R _{θJA}	625	°C/W
Operating and Storage and Temperature Range	T _j , T _{STG}	-55 to +150	°C

Note: 1. Mounted on FR4 PC Board with recommended pad layout at <http://www.diodes.com/datasheets/ap02001.pdf>.



Electrical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

R1, R2 Types

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage	DDTD113EU DDTD123EU DDTD143EU DDTD114EU DDTD122JU DDTD113ZU DDTD123YU DDTD133HU	$V_{I(off)}$	0.5 0.5 0.5 0.5 0.5 0.3 0.3 0.3	—	—	V	$V_{CC} = 5V, I_O = 100\mu A$
	DDTD113EU DDTD123EU DDTD143EU DDTD114EU DDTD122JU DDTD113ZU DDTD123YU DDTD133HU	$V_{I(on)}$	—	—	3.0 3.0 3.0 3.0 3.0 2.0 2.0 2.0	V	$V_O = 0.3V, I_O = 20mA$ $V_O = 0.3V, I_O = 20mA$ $V_O = 0.3V, I_O = 20mA$ $V_O = 0.3V, I_O = 10mA$ $V_O = 0.3V, I_O = 30mA$ $V_O = 0.3V, I_O = 20mA$ $V_O = 0.3V, I_O = 20mA$ $V_O = 0.3V, I_O = 20mA$
Output Voltage		$V_{O(on)}$	—	—	0.3V	V	$I_O/I_I = 50mA/2.5mA$
Input Current	DDTD113EU DDTD123EU DDTD143EU DDTD114EU DDTD122JU DDTD113ZU DDTD123YU DDTD133HU	I_I	—	—	7.2 3.8 1.8 0.88 28 7.2 3.6 2.4	mA	$V_I = 5V$
	DDTD113EU DDTD123EU DDTD143EU DDTD114EU DDTD122JU DDTD113ZU DDTD123YU DDTD133HU	$I_{O(off)}$	—	—	0.5	μA	$V_{CC} = 50V, V_I = 0V$
DC Current Gain	DDTD113EU DDTD123EU DDTD143EU DDTD114EU DDTD122JU DDTD113ZU DDTD123YU DDTD133HU	G_I	33 39 47 56 47 56 56 56	—	—	—	$V_O = 5V, I_O = 50mA$
	DDTD113EU DDTD123EU DDTD143EU DDTD114EU DDTD122JU DDTD113ZU DDTD123YU DDTD133HU	f_T	—	200	—	MHz	$V_{CE} = 10V, I_E = 5mA, f = 100MHz$

* Transistor - For Reference Only

Electrical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

R1-Only, R2-Only Types

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage		BV_{CBO}	50	—	—	V	$I_C = 50\mu A$
Collector-Emitter Breakdown Voltage		BV_{CEO}	40	—	—	V	$I_C = 1mA$
Emitter-Base Breakdown Voltage	DDTD123TU DDTD143TU DDTD114TU DDTD114GU	BV_{EBO}	5	—	—	V	$I_E = 50\mu A$ $I_E = 50\mu A$ $I_E = 50\mu A$ $I_E = 720\mu A$
	DDTD123TU DDTD143TU DDTD114TU DDTD114GU	I_{CBO}	—	—	0.5	μA	$V_{CB} = 50V$
Emitter Cutoff Current	DDTD123TU DDTD143TU DDTD114TU DDTD114GU	I_{EBO}	— — — 300	—	0.5 0.5 0.5 580	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	DDTD123TU DDTD143TU DDTD114TU DDTD114GU	h_{FE}	100 100 100 56	250 250 250 —	600 600 600 —	—	$I_C = 5mA, V_{CE} = 5V$
Gain-Bandwidth Product*		f_T	—	200	—	MHz	$V_{CE} = 10V, I_E = -5mA, f = 100MHz$

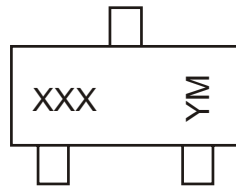
* Transistor - For Reference Only

Ordering Information (Note 2)

Device	Packaging	Shipping
DDTD113EU-7	SOT-323	3000/Tape & Reel
DDTD123EU-7	SOT-323	3000/Tape & Reel
DDTD143EU-7	SOT-323	3000/Tape & Reel
DDTD114EU-7	SOT-323	3000/Tape & Reel
DDTD122JU-7	SOT-323	3000/Tape & Reel
DDTD113ZU-7	SOT-323	3000/Tape & Reel
DDTD123YU-7	SOT-323	3000/Tape & Reel
DDTD133HU-7	SOT-323	3000/Tape & Reel
DDTD123TU-7	SOT-323	3000/Tape & Reel
DDTD143TU-7	SOT-323	3000/Tape & Reel
DDTD114TU-7	SOT-323	3000/Tape & Reel
DDTD114GU-7	SOT-323	3000/Tape & Reel

- Notes:
- For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.
 - For Lead Free version (with Lead Free terminal finish) part number, please add "-F" suffix to part number above.
Example: DDTD114GU-7-F.

Marking Information



XXX = Product Type Marking Code
 See Sheet 1 Diagrams
 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