DDTD (xxxx) U

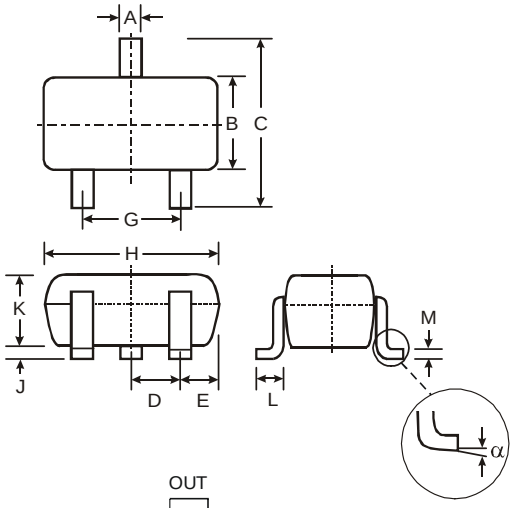
NPN PRE-BIASED 500 mA SURFACE MOUNT TRANSISTOR

Features

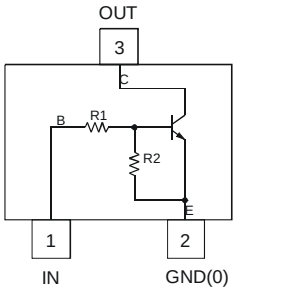
- Epitaxial Planar Die Construction
- Complementary PNP Types Available (DDTB)
- Built-In Biasing Resistors, R1, R2
- **Lead Free/RoHS Compliant Version (Note 2)**
- **"Green" Device, Note 3 and 4**

Mechanical Data

- Case: SOT-323
- Case Material: Molded Plastic, "Green" Molding Compound, Note 4. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminals: Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe).
- Marking Information: See Table Below & Page 3
- Ordering Information: See Page 3
- Weight: 0.006 grams (approximate)



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		



Schematic and Pin Configuration

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 (2)		V_{CC}	50	V
Input Voltage, (1) to (2)	DDTD113EU	V_{IN}	-10 to +10	V
	DDTD123EU		-10 to +12	
	DDTD143EU		-10 to +30	
	DDTD114EU		-10 to +40	
	DDTD122JU		-5 to +5	
	DDTD113ZU		-5 to +10	
	DDTD123YU		-5 to +12	
	DDTD133HU		-6 to +20	
Input Voltage, (2) to (1)	DDTD123TU DDTD143TU DDTD114TU DDTD114GU	$V_{EBO\ (MAX)}$	5	V
Output Current	All	I_C	500	mA
Power Dissipation		P_d	200	mW
Thermal Resistance, Junction to Ambient Air	(Note 1)	$R_{\theta JA}$	625	°C/W
Operating and Storage Temperature Range		T_j, T_{STG}	-55 to +150	°C

Notes:
1. Mounted on FR4 PC Board with recommended pad layout at http://www.diodes.com/datasheets/ap02001.pdf.
2. No purposefully added lead.
3. Diodes Inc.'s "Green" policy can be found on our website at http://www.diodes.com/products/lead_free/index.php.
4. Product manufactured with Date Code 0627 (week 27, 2006) and newer are built with Green Molding Compound. Product manufactured prior to Date Code 0627 are built with Non-Green Molding Compound and may contain Halogens or Sb2O3 Fire Retardants.

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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	DDTD113EU	$V_{I(off)}$	0.5	—	—	V	V_{CC} = 5V, I_O = 100μA
	DDTD123EU		0.5				
	DDTD143EU		0.5				
	DDTD114EU		0.5				
	DDTD122JU		0.5				
	DDTD113ZU		0.3				
	DDTD123YU		0.3				
	DDTD133HU		0.3				
	DDTD113EU	$V_{I(on)}$	—	—	3.0	V	V_O = 0.3V, I_O = 20mA
	DDTD123EU				3.0		V_O = 0.3V, I_O = 20mA
	DDTD143EU				3.0		V_O = 0.3V, I_O = 20mA
	DDTD114EU				3.0		V_O = 0.3V, I_O = 10mA
	DDTD122JU				3.0		V_O = 0.3V, I_O = 30mA
	DDTD113ZU				2.0		V_O = 0.3V, I_O = 20mA
	DDTD123YU				2.0		V_O = 0.3V, I_O = 20mA
	DDTD133HU				2.0		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	I_I	—	—	7.2	mA	V_I = 5V
	DDTD123EU				3.8		
	DDTD143EU				1.8		
	DDTD114EU				0.88		
	DDTD122JU				28		
	DDTD113ZU				7.2		
	DDTD123YU				3.6		
	DDTD133HU				2.4		
Output Current		$I_{O(off)}$	—	—	0.5	μA	V_{CC} = 50V, V_I = 0V
DC Current Gain	DDTD113EU	G_I	33	—	—	—	V_O = 5V, I_O = 50mA
	DDTD123EU		39				
	DDTD143EU		47				
	DDTD114EU		56				
	DDTD122JU		47				
	DDTD113ZU		56				
	DDTD123YU		56				
	DDTD133HU		56				
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	DDTD123TU	BV_{EBO}	5	—	—	V	I_E = 50μA
	DDTD143TU						I_E = 50μA
	DDTD114TU						I_E = 50μA
	DDTD114GU						I_E = 720μA
Collector Cutoff Current		I_{CBO}	—	—	0.5	μA	V_{CB} = 50V
Emitter Cutoff Current	DDTD123TU	I_{EBO}	—	—	0.5	μA	V_{EB} = 4V
	DDTD143TU		—		0.5		
	DDTD114TU		—		0.5		
	DDTD114GU		300		580		
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	—	—	0.3	V	I_C = 50mA, I_B = 2.5mA
DC Current Transfer Ratio	DDTD123TU	h_{FE}	100	250	600	—	I_C = 5mA, V_{CE} = 5V
	DDTD143TU		100	250	600		
	DDTD114TU		100	250	600		
	DDTD114GU		56	—	—		
Gain-Bandwidth Product*		f_T	—	200	—	MHz	V_{CE} = 10V, I_E = -5mA, f = 100MHz

* Transistor - For Reference Only

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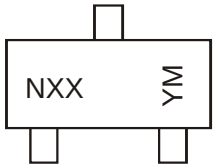
Ordering Information (Note 4 & 5)

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

Notes: 5. For packaging details, go to our website at http://www.diodes.com/datasheets/ap02007.pdf.

Marking Information



NXX = Product Type Marking Code
YM = Date Code Marking
Y = Year ex: T = 2006
M = Month ex: 9 = September

Date Code Key

Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Code	N	P	R	S	T	U	V	W	X	Y	Z

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

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- *Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.*

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- *Комплексную поставку.*
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- *Сертификаты соответствия на поставляемую продукцию (по желанию клиента).*
- *Тестирование поставляемой продукции.*
- *Поставку компонентов, требующих военную и космическую приемку.*
- *Входной контроль качества.*
- *Наличие сертификата ISO.*

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- *Оценку стоимости проекта по компонентам.*
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