NPN PRE-BIASED TRANSISTOR IN SOT323

Features

- Epitaxial Planar Die Construction
- Built-In Biasing Resistors
- Surface-Mount Package Suited for Automated Assembly
- **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-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please contact us or your local Diodes representative. https://www.diodes.com/quality/product-definitions/**

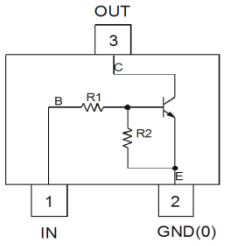
Mechanical Data

- Package: SOT323
- Package 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 (e3)
- Weight: 0.006 grams (Approximate)

Part Number	R1 (NOM)	R2 (NOM)
DDTD113EU	1kΩ	10kΩ
DDTD123EU	2.2kΩ	2.2kΩ
DDTD143EU	4.7kΩ	4.7kΩ
DDTD114EU	10kΩ	10kΩ
DDTD122JU	0.22kΩ	4.7kΩ
DDTD113ZU	1kΩ	10kΩ
DDTD123YU	2.2kΩ	10kΩ
DDTD133HU	3.3kΩ	10kΩ
DDTD123TU	2.2kΩ	Open
DDTD143TU	4.7kΩ	Open
DDTD114TU	10kΩ	Open
DDTD114GU	0	10kΩ

SOT323

Top View



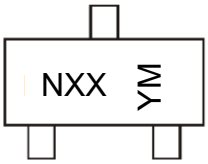
Device Schematic

Ordering Information (Note 4)

Orderable Part Number	Status	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
						Qty.	Carrier
DDTD113EU-7-F	Obsolete	SOT323	N60	7	8	3,000	Reel
DDTD123EU-7-F	Obsolete	SOT323	N61	7	8	3,000	Reel
DDTD143EU-7-F	Obsolete	SOT323	N62	7	8	3,000	Reel
DDTD114EU-7-F	Obsolete	SOT323	N63	7	8	3,000	Reel
DDTD122JU-7-F	Obsolete	SOT323	N64	7	8	3,000	Reel
DDTD113ZU-7-F	Active	SOT323	N65	7	8	3,000	Reel
DDTD123YU-7-F	Obsolete	SOT323	N66	7	8	3,000	Reel
DDTD133HU-7-F	Obsolete	SOT323	N67	7	8	3,000	Reel
DDTD123TU-7-F	Obsolete	SOT323	N69	7	8	3,000	Reel
DDTD143TU-7-F	Obsolete	SOT323	N70	7	8	3,000	Reel
DDTD114TU-7-F	Obsolete	SOT323	N71	7	8	3,000	Reel
DDTD114GU-7-F	Obsolete	SOT323	N72	7	8	3,000	Reel

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
YM = Date Code Marking
Y = Year (ex: N = 2026)
M = Month (ex: 1 = January)

Date Code Key

Year	2016	-	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Code	D	-	N	P	R	S	T	U	V	W	X	Y

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°C, unless otherwise specified.)

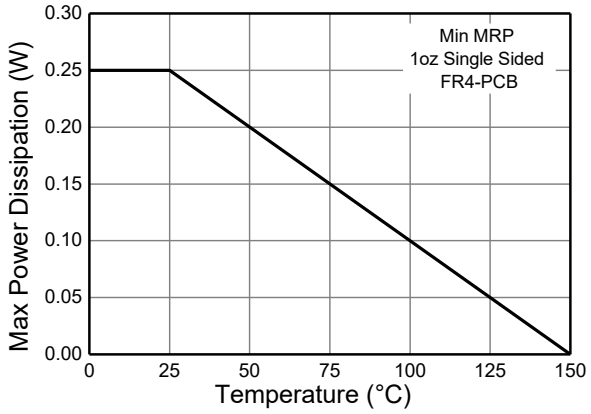
Characteristic		Symbol	Value	Unit
Supply Voltage, (3) to (2)		V_{CC}	50	V
Input Voltage, (1) to (2)	DDTD113EU DDTD123EU DDTD143EU DDTD114EU DDTD122JU DDTD113ZU DDTD123YU DDTD133HU	V_{IN}	-10 to +10 -10 to +12 -10 to +30 -10 to +40 -5 to +5 -5 to +10 -5 to +12 -6 to +20	V
Input Voltage, (2) to (1)	DDTD123TU DDTD143TU DDTD114TU DDTD114GU	$V_{EBO\ (MAX)}$	5	V
Output Current	All	I_C	500	mA

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

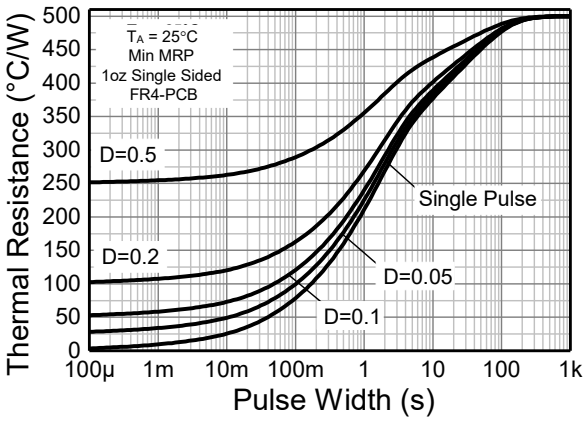
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P_D	250	mW
Thermal Resistance, Junction to Ambient Air (Note 5)	$R_{\theta JA}$	500	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

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

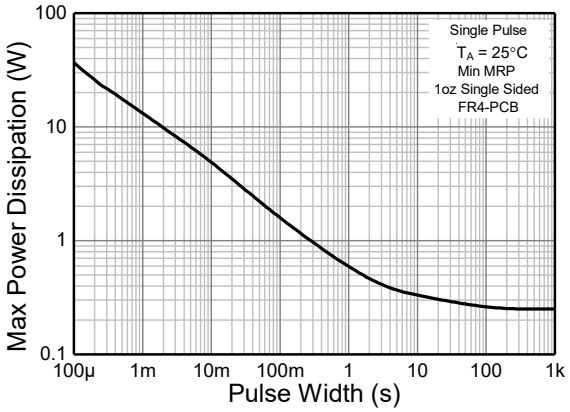
Thermal Characteristics and Derating Information



Derating Curve



Transient Thermal Impedance



Pulse Power Dissipation

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 = 0
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 (Note 6)		f_T	—	200	—	MHz	V_{CE} = 10V, I_E = 5mA, f = 100MHz

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

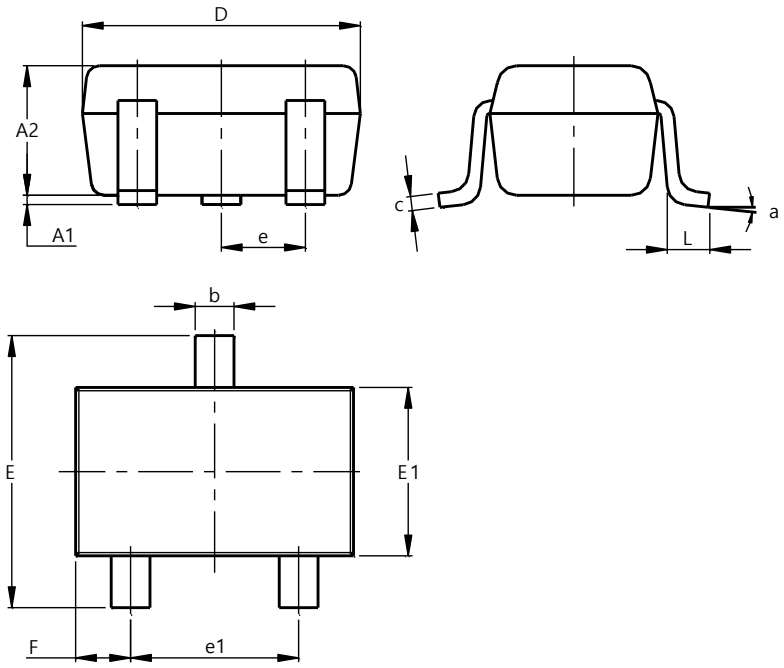
Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage		BV_{CBO}	50	—	—	V	I_C = 50µA
Collector-Emitter Breakdown Voltage		BV_{CEO}	40	—	—	V	I_C = 1mA
Emitter-Base Breakdown Voltage	DDTD123TU	BV_{EBO}	5	—	—	V	I_E = 50µA
	DDTD143TU						I_E = 50µA
	DDTD114TU						I_E = 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 (Note 6)		f_T	—	200	—	MHz	V_{CE} = 10V, I_E = 5mA, f = 100MHz

Note: 6. Transistor - for reference only.

Package Outline Dimensions

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

SOT323

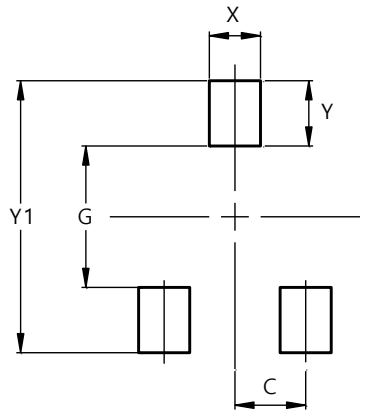


SOT323			
Dim	**Min**	**Max**	**Typ**
A1	0.00	0.10	0.05
A2	0.90	1.00	0.95
b	0.25	0.40	0.30
c	0.10	0.18	0.11
D	1.80	2.20	2.15
E	2.00	2.20	2.10
E1	1.15	1.35	1.30
e	0.650 BSC		
e1	1.20	1.40	1.30
F	0.375	0.475	0.425
L	0.25	0.40	0.30
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

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

SOT323



Dimensions	Value (in mm)
C	0.650
G	1.300
X	0.470
Y	0.600
Y1	2.500

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