DDTD113ZU-7-F Datasheet

https://www.DiGi-Electronics.com

DiGi Electronics Part Number	DDTD113ZU-7-F-DG
Manufacturer	Diodes Incorporated
Manufacturer Product Number	DDTD113ZU-7-F
Description	TRANS PREBIAS NPN 50V SOT323
Detailed Description	Pre-Biased Bipolar Transistor (BJT) NPN - Pre-Biased 50 V 500 mA 200 MHz 200 mW Surface Mount SOT-323

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Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
DDTD113ZU-7-F	Diodes Incorporated
Series:	Product Status:
-	Active
Transistor Type:	Current - Collector (Ic) (Max):
NPN - Pre-Biased	500 mA
Voltage - Collector Emitter Breakdown (Max):	Resistor - Base (R1):
50 V	1 kOhms
Resistor - Emitter Base (R2):	DC Current Gain (hFE) (Min) @ Ic, Vce:
10 kOhms	56 @ 50mA, 5V
Vce Saturation (Max) @ Ib, Ic:	Current - Collector Cutoff (Max):
300mV @ 2.5mA, 50mA	500nA
Frequency - Transition:	Power - Max:
200 MHz	200 mW
Mounting Type:	Package / Case:
Surface Mount	SC-70, SOT-323
Supplier Device Package:	Base Product Number:
SOT-323	DDTD113

Environmental & Export classification

RoHS Status:	Moisture Sensitivity Level (MSL):
ROHS3 Compliant	1 (Unlimited)
REACH Status:	ECCN:
REACH Unaffected	EAR99
HTSUS:	
8541.21.0075	

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-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please contact us or your local Diodes representative.** **https://www.diodes.com/quality/product-definitions/**

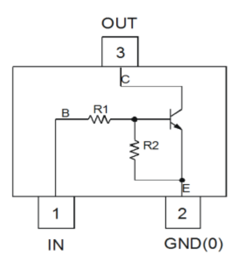
Mechanical Data

- Case: SOT323
- 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 (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



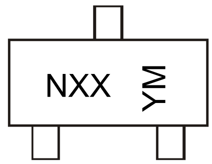
Device Schematic

Ordering Information (Note 4)

Product	Status	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
DDTD113EU-7-F	Obsolete	Standard	N60	7	8	3,000
DDTD123EU-7-F	Obsolete	Standard	N61	7	8	3,000
DDTD143EU-7-F	Obsolete	Standard	N62	7	8	3,000
DDTD114EU-7-F	Obsolete	Standard	N63	7	8	3,000
DDTD122JU-7-F	Obsolete	Standard	N64	7	8	3,000
DDTD113ZU-7-F	Active	Standard	N65	7	8	3,000
DDTD123YU-7-F	Obsolete	Standard	N66	7	8	3,000
DDTD133HU-7-F	Obsolete	Standard	N67	7	8	3,000
DDTD123TU-7-F	Active	Standard	N69	7	8	3,000
DDTD143TU-7-F	Obsolete	Standard	N70	7	8	3,000
DDTD114TU-7-F	Obsolete	Standard	N71	7	8	3,000
DDTD114GU-7-F	Obsolete	Standard	N72	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



NXX = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: I = 2021)
M = Month (ex: 9 = September)

Date Code Key

Year	2016	……	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Code	D	……	I	J	K	L	M	N	O	P	R	S

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	200	mW
Thermal Resistance, Junction to Ambient Air (Note 5)	$R_{\theta JA}$	625	°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.

Electrical Characteristics (@ T_A = +25°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 = 100μA
	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
Output Current		$I_{O(off)}$	—	—	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
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 DDTD143TU DDTD114TU DDTD114GU	BV_{EBO}	5	—	—	V	I_E = 50μA I_E = 50μA I_E = 50μA I_E = 720μA
Collector Cutoff Current		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 (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.

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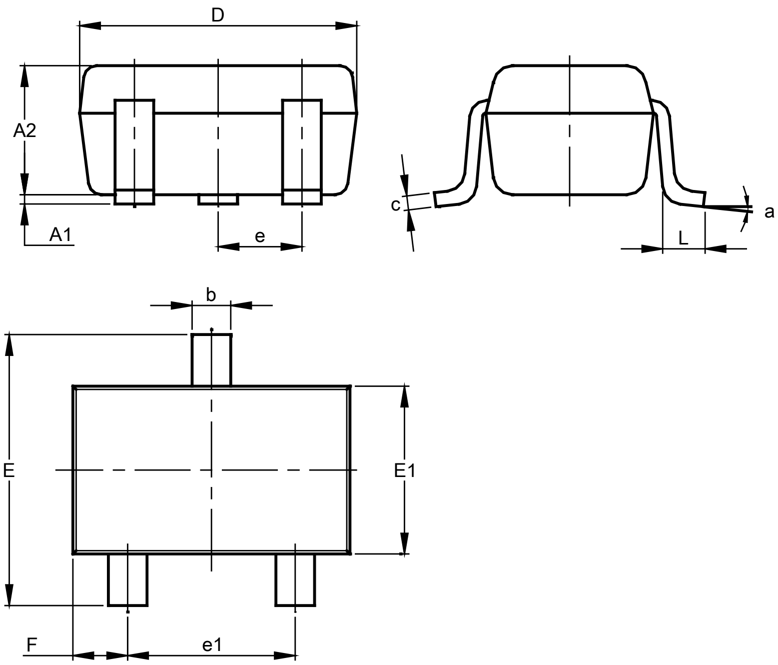
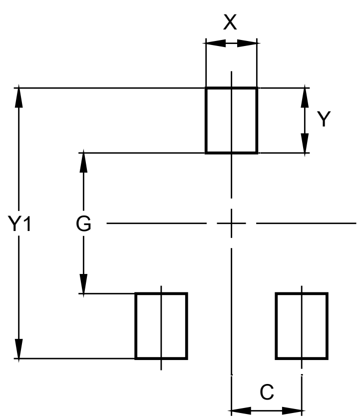


SOT323			
Dim	**Min**	**Max**	**Typ**
A1	0.00	0.10	0.05
A2	0.90	1.00	0.95
b	0.25	0.40	0.30
c	0.10	0.18	0.11
D	1.80	2.20	2.15
E	2.00	2.20	2.10
E1	1.15	1.35	1.30
e	0.650 BSC		
e1	1.20	1.40	1.30
F	0.375	0.475	0.425
L	0.25	0.40	0.30
a	0°	8°	--
All Dimensions in mm			

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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