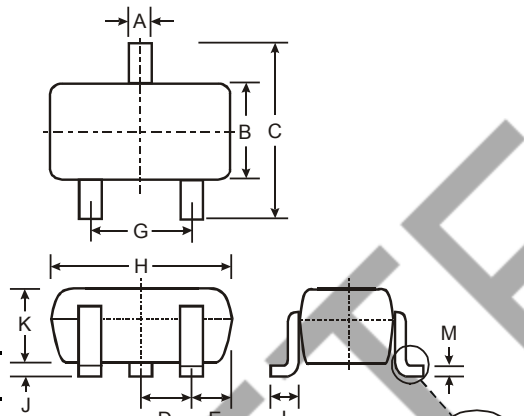


NPN PRE-BIASED 100 MA SURFACE MOUNT TRANSISTOR

OBSOLETE – PART DISCONTINUED

Features

- Epitaxial Planar Die Construction
- Complementary PNP Types Available (DDTA)
- Built-In Biasing Resistors
- **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](https://www.diodes.com/quality/product-definitions/) or your local Diodes representative.**
<https://www.diodes.com/quality/product-definitions/>

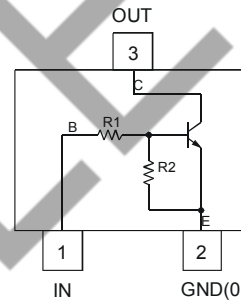


SOT-323		
Dim	Min	Max
A	0.25	0.40
B	1.15	1.35
C	2.00	2.20
D	0.65 Nominal	
E	0.30	0.40
G	1.20	1.40
H	1.80	2.20
J	0.0	0.10
K	0.90	1.00
L	0.25	0.40
M	0.10	0.18
α	0°	8°

All Dimensions in mm

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)



Schematic and Pin Configuration

P/N	R1 (NOM)	R2 (NOM)	Type Code
DDTC122LU	0.22K Ω	10K Ω	N81
DDTC142JU	0.47K Ω	10K Ω	N82
DDTC122TU	0.22K Ω	OPEN	N83
DDTC142TU	0.47K Ω	OPEN	N84

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) DDTC122LU	V _{IN}	-5 to +6	V
		-5 to +6	
Input Voltage, (2) to (1) DDTC142JU	V _{EBO (MAX)}	5	V
Output Current	I _C	100	mA
Power Dissipation	P _d	200	mW
	(Note 5)		
Thermal Resistance, Junction to Ambient Air	R _{θJA}	625	°C/W
	(Note 5)		
Operating and Storage Temperature Range	T _j , T _{STG}	-55 to +150	°C

- 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. 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.
 5. Mounted on FR4 PC Board with recommended pad layout at <http://www.diodes.com/package-outlines.html>.

Electrical Characteristics @_{T_A} = 25°C unless otherwise specified **R1, R2 Types**

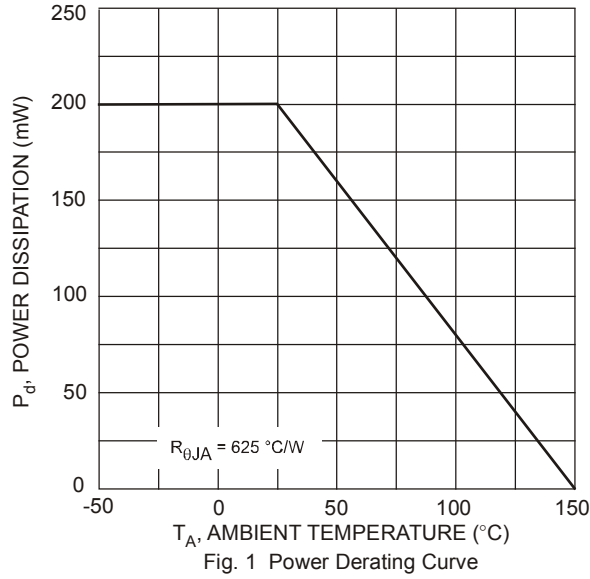
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition	
Input Voltage	DDTC122LU DDTC142JU	$V_{I(off)}$	0.3 0.3	—	—	V	$V_{CC} = 5V, I_O = 100\mu A$
	DDTC122LU DDTC142JU	$V_{I(on)}$	—	—	2.0 2.0	V	$V_O = 0.3V, I_O = 20mA$ $V_O = 0.3V, I_O = 20mA$
Output Voltage		$V_{O(on)}$	—	—	0.3V	V	$I_O/I_I = 5mA/0.25mA$
Input Current	DDTC122LU DDTC142JU	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	DDTC122LU DDTC142JU	G_I	56 56	—	—	—	$V_O = 5V, I_O = 10mA$
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 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	DDTC122TU DDTC142TU	BV_{EBO}	5	—	—	V	$I_E = 50\mu A$ $I_E = 50\mu A$
Collector Cutoff Current		I_{CBO}	—	—	0.5	μA	$V_{CB} = 50V$
Emitter Cutoff Current	DDTC122TU DDTC142TU	I_{EBO}	—	—	0.5 0.5	μA	$V_{EB} = 4V$
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	—	—	0.3	V	$I_C = 5mA, I_B = 0.25mA$
DC Current Transfer Ratio	DDTC122TU DDTC142TU	h_{FE}	100 100	250 250	600 600	—	$I_C = 1mA, V_{CE} = 5V$
Gain-Bandwidth Product*		f_T	—	200	—	MHz	$V_{CE} = 10V, I_E = -5mA, f = 100MHz$

* Transistor - For Reference Only

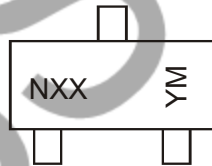


Ordering Information (Notes 4 & 6)

Device	Packaging	Shipping
DDTC122LU-7-F	SOT-323	3000/Tape & Reel
DDTC142JU-7-F	SOT-323	3000/Tape & Reel
DDTC122TU-7-F	SOT-323	3000/Tape & Reel
DDTC142TU-7-F	SOT-323	3000/Tape & Reel

- Notes:
- 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.
 - Mounted on FR4 PC Board with recommended pad layout at <http://www.diodes.com/package-outlines.html>.
 - For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



NXX = Product Type Marking Code, See Table on Page 1
 1 = Date Code Marking
 Y = Year ex: I = 2021
 M = Month ex: 9 = September

Date Code Key

Year	2010	...	2021	2022	2023	2024	2025	2026	2027	2028	2029
Code	X	...	I	J	K	L	M	N	O	P	R

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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