

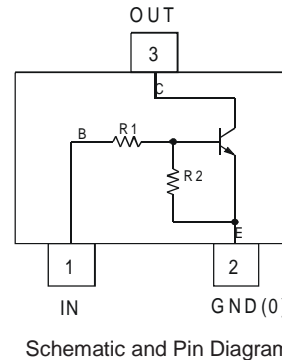
**Features**

- 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)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Part Number	R1 (NOM)	R2 (NOM)	Marking
DDTC122LE	0.22kΩ	10kΩ	N81
DDTC142JE	0.47kΩ	10kΩ	N82
DDTC122TE	0.22kΩ	OPEN	N83
DDTC142TE	0.47kΩ	OPEN	N84

**Mechanical Data**

- Case: SOT523
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish. Solderable per MIL-STD-202, Method 208③
- Weight: 0.002 grams (Approximate)

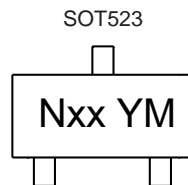


**Ordering Information** (Note 4)

Part Number	Compliance	Reel Size (inches)	Tape Width (mm)	Quantity Per Reel
DDTC122LE-7-F	AEC-Q101	7	8	3,000
DDTC142JE-7-F	AEC-Q101	7	8	3,000
DDTC122TE-7-F	AEC-Q101	7	8	3,000
DDTC142TE-7-F	AEC-Q101	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  
(See Table in Features)  
YM = Date Code Marking  
Y or  $\bar{Y}$  = Year (ex: F = 2018)  
M or  $\bar{M}$  = Month (ex: 9 = September)

Date Code Key

Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Code	F	G	H	I	J	K	L	M	N	O

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<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Supply Voltage, (3) to (2)		V <sub>CC</sub>	50	V
Input Voltage, (1) to (2)	DDTC122LE DDTC142JE	V <sub>IN</sub>	-5 to +6 -5 to +6	V
Input Voltage, (2) to (1)	DDTC122TE DDTC142TE	V <sub>EBO (MAX)</sub>	5	V
Output Current	All	I <sub>C</sub>	100	mA

**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Power Dissipation		P <sub>D</sub>	150	mW
Thermal Resistance, Junction to Ambient Air (Note 5)		R <sub>θJA</sub>	625	°C/W
Operating and Storage Temperature Range		T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

Note 5: Mounted on FR-4 PC Board with minimum recommended pad layout.

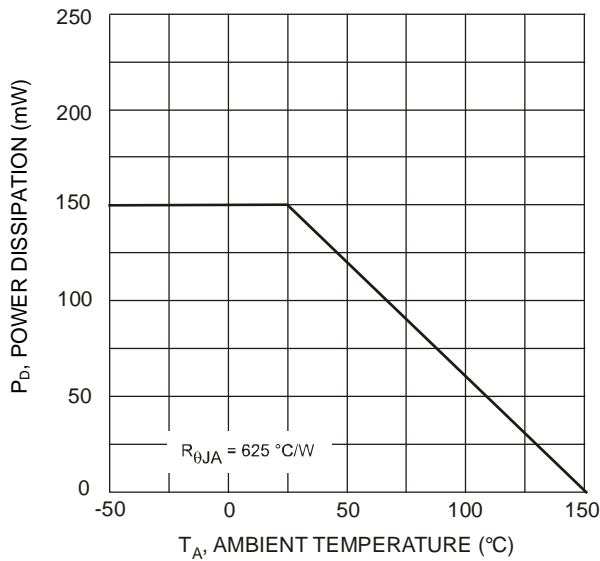


Fig. 1 Power Derating Curve

**Electrical Characteristics R1, R2 Types** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage	DDTC122LE DDTC142JE	V <sub>I(OFF)</sub>	0.3 0.3	—	—	V	V <sub>CC</sub> = 5V, I <sub>O</sub> = 100μA
	DDTC122LE DDTC142JE	V <sub>I(ON)</sub>	—	—	2.0 2.0	V	V <sub>O</sub> = 0.3V, I <sub>O</sub> = 20mA V <sub>O</sub> = 0.3V, I <sub>O</sub> = 20mA
Output Voltage		V <sub>O(ON)</sub>	—	—	0.3	V	I <sub>O</sub> /I <sub>I</sub> = 5mA/0.25mA
Input Current	DDTC122LE DDTC142JE	I <sub>I</sub>	—	—	28 13	mA	V <sub>I</sub> = 5V
Output Current		I <sub>O(OFF)</sub>	—	—	0.5	μA	V <sub>CC</sub> = 50V, V <sub>I</sub> = 0V
DC Current Gain	DDTC122LE DDTC142JE	G <sub>I</sub>	56 56	—	—	—	V <sub>O</sub> = 5V, I <sub>O</sub> = 10mA
Gain-Bandwidth Product (Note 6)		f <sub>T</sub>	—	200	—	MHz	V <sub>CE</sub> = 10V, I <sub>E</sub> = 5mA, f = 100MHz

**Electrical Characteristics R1- Only Type** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

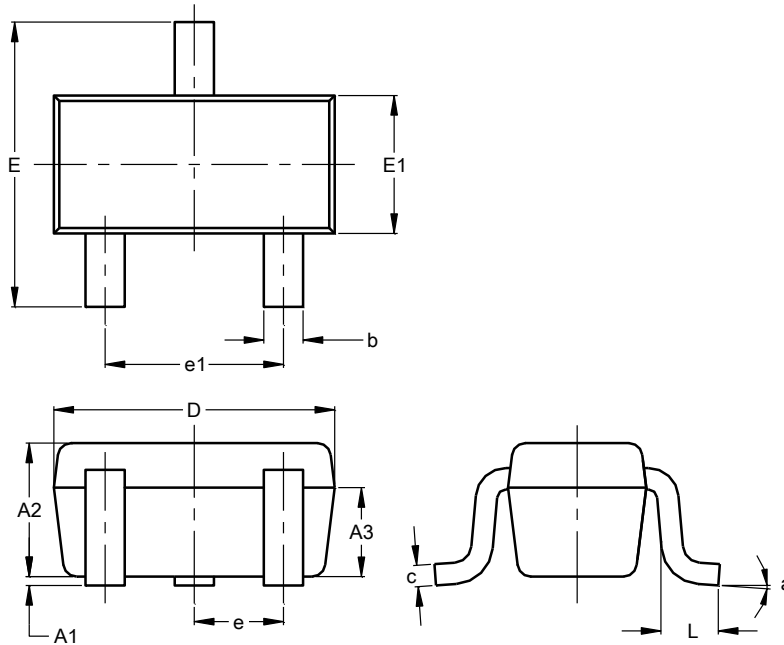
Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage		BV <sub>CB0</sub>	50	—	—	V	I <sub>C</sub> = 50μA
Collector-Emitter Breakdown Voltage		BV <sub>CEO</sub>	40	—	—	V	I <sub>C</sub> = 1mA
Emitter-Base Breakdown Voltage	DDTC122TE DDTC142TE	BV <sub>EBO</sub>	5	—	—	V	I <sub>E</sub> = 50μA I <sub>E</sub> = 50μA
Collector Cutoff Current		I <sub>CB0</sub>	—	—	0.5	μA	V <sub>CB</sub> = 50V
Emitter Cutoff Current	DDTC122TE DDTC142TE	I <sub>EBO</sub>	—	—	0.5 0.5	μA	V <sub>EB</sub> = 4V
Collector-Emitter Saturation Voltage		V <sub>CE(SAT)</sub>	—	—	0.3	V	I <sub>C</sub> = 5mA, I <sub>B</sub> = 0.25mA
DC Current Transfer Ratio	DDTC122TE DDTC142TE	h <sub>FE</sub>	100 100	250 250	600 600	—	I <sub>C</sub> = 1mA, V <sub>CE</sub> = 5V
Gain-Bandwidth Product (Note 6)		f <sub>T</sub>	—	200	—	MHz	V <sub>CE</sub> = 10V, I <sub>E</sub> = -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.

**SOT523**

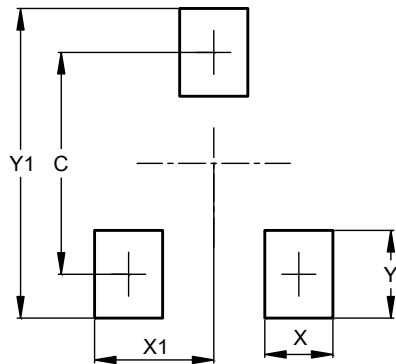


SOT523			
Dim	Min	Max	Typ
A1	0.00	0.10	0.05
A2	0.60	0.80	0.75
A3	0.45	0.65	0.50
b	0.15	0.30	0.22
c	0.10	0.20	0.12
D	1.50	1.70	1.60
E	1.45	1.75	1.60
E1	0.75	0.85	0.80
e	0.50 BSC		
e1	0.90	1.10	1.00
L	0.20	0.40	0.33
a	0°	--	8°
All Dimensions in mm			

**Suggested Pad Layout**

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

**SOT523**



Dimensions	Value (in mm)
C	1.29
X	0.40
X1	0.70
Y	0.51
Y1	1.80

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