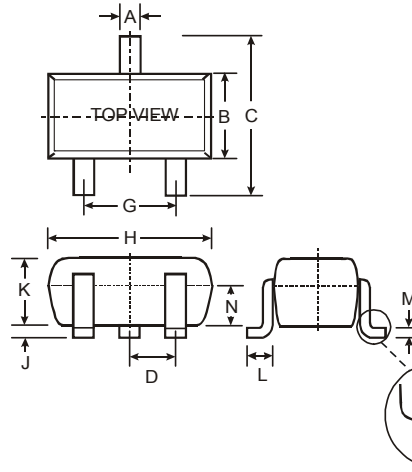


**Features**

- Epitaxial Planar Die Construction
- Complementary NPN Types Available (DDTC)
- Built-In Biasing Resistors
- **Lead Free/RoHS Compliant (Note 2)**
- **"Green" Device (Note 3 and 4)**

**Mechanical Data**

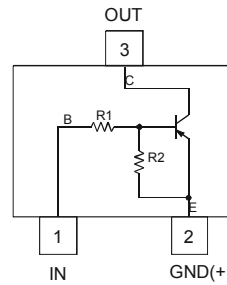
- Case: SOT-523
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminals: Finish – Matte Tin Solderable per MIL-STD 202, Method 208
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe)
- Terminal Connections: See Diagram
- Marking Information: See Table Below & Page 3
- Ordering Information: See Page 3
- Weight: 0.002 grams (approximate)



SOT-523			
Dim	Min	Max	Typ
A	0.15	0.30	0.22
B	0.75	0.85	0.80
C	1.45	1.75	1.60
D	—	—	0.50
G	0.90	1.10	1.00
H	1.50	1.70	1.60
J	0.00	0.10	0.05
K	0.60	0.80	0.75
L	0.10	0.30	0.22
M	0.10	0.20	0.12
N	0.45	0.65	0.50
$\alpha$	0°	8°	—

All Dimensions in mm

P/N	R1 (NOM)	R2 (NOM)	Type Code
DDTA122LE	0.22K $\Omega$	10K $\Omega$	P81
DDTA142JE	0.47K $\Omega$	10K $\Omega$	P82
DDTA122TE	0.22K $\Omega$	OPEN	P83
DDTA142TE	0.47K $\Omega$	OPEN	P84



Schematic and Pin Diagram

**Maximum Ratings** @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Supply Voltage, (2) to (3)	V <sub>CC</sub>	-50	V
Input Voltage, (1) to (2)	V <sub>IN</sub>	+5 to -6	V
Input Voltage, (2) to (1)	V <sub>EBO (MAX)</sub>	-5	V
Output Current	I <sub>C</sub>	-100	mA
Power Dissipation	P <sub>d</sub>	150	mW
Thermal Resistance, Junction to Ambient Air	R <sub>θJA</sub>	625	°C/W
Operating and Storage Temperature Range	T <sub>j</sub> , T <sub>STG</sub>	-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](http://www.diodes.com/products/lead_free/index.php).
  4. Product manufactured with Date Code UO (week 40, 2007) and newer are built with Green Molding Compound. Product manufactured prior to Date Code UO are built with Non-Green Molding Compound and may contain Halogens or Sb2O3 Fire Retardants.

## Electrical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified **R1, R2 Types**

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage	DDTA122LE DDTA142JE	$V_{I(off)}$	-0.3 -0.3	—	—	V	$V_{CC} = -5V, I_O = -100\mu A$
	DDTA122LE DDTA142JE	$V_{I(on)}$	—	—	-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	DDTA122LE DDTA142JE	$I_I$	—	—	-28 -13	mA	$V_I = -5V$
Output Current		$I_{O(off)}$	—	—	-0.5	$\mu A$	$V_{CC} = -50V, V_I = 0V$
DC Current Gain	DDTA122LE DDTA142JE	$G_I$	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 @ $T_A = 25^\circ\text{C}$ 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	DDTA122TE DDTA142TE	$BV_{EBO}$	-5	—	—	V	$I_E = -50\mu A$ $I_E = -50\mu A$
Collector Cutoff Current		$I_{CBO}$	—	—	-0.5	$\mu A$	$V_{CB} = -50V$
Emitter Cutoff Current	DDTA122TE DDTA142TE	$I_{EBO}$	— —	—	-0.5 -0.5	$\mu A$	$V_{EB} = -4V$
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	—	—	-0.3	V	$I_C = -5mA, I_B = -0.25mA$
DC Current Transfer Ratio	DDTA122TE DDTA142TE	$h_{FE}$	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

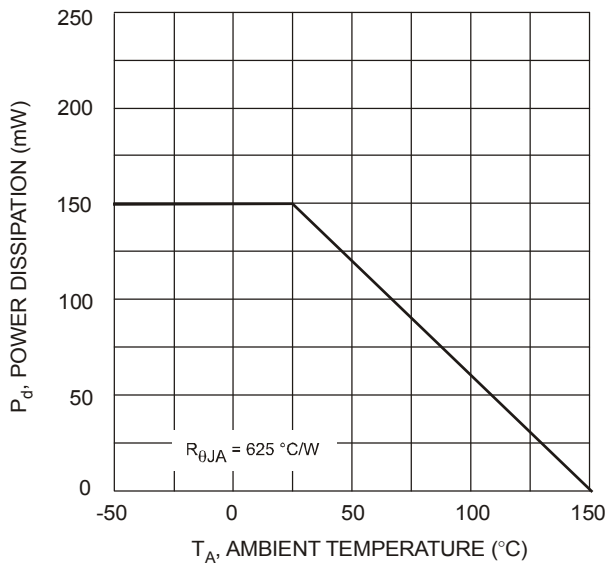


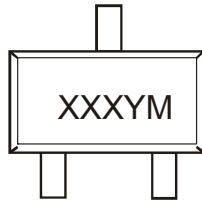
Fig. 1 Power Derating Curve

## Ordering Information (Note 5)

Device	Packaging	Shipping
DDTA122LE-7-F	SOT-523	3000/Tape & Reel
DDTA142JE-7-F	SOT-523	3000/Tape & Reel
DDTA122TE-7-F	SOT-523	3000/Tape & Reel
DDTA142TE-7-F	SOT-523	3000/Tape & Reel

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

## Marking Information



XXX = Product Type Marking Code (See Page 1)  
 YM = Date Code Marking  
 Y = Year ex: T = 2006  
 M = Month ex: 9 = September

### Date Code Key

Year	2006	2007	2008	2009	2010	2011	2012
Code	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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