

## Features

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

## Mechanical Data

- Case: SOT23
- 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
- Weight: 0.008 grams (Approximate)

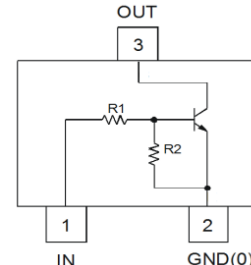
P/N	R1 (NOM)	R2 (NOM)
DDTD113EC	1kΩ	1kΩ
DDTD123EC	2.2kΩ	2.2kΩ
DDTD143EC	4.7kΩ	4.7kΩ
DDTD114EC	10kΩ	10kΩ
DDTD122JC	0.22kΩ	4.7kΩ
DDTD113ZC	1kΩ	10kΩ

P/N	R1 (NOM)	R2 (NOM)
DDTD123YC	2.2kΩ	10kΩ
DDTD133HC	3.3kΩ	10kΩ
DDTD123TC	2.2kΩ	OPEN
DDTD143TC	4.7kΩ	OPEN
DDTD114TC	10kΩ	OPEN
DDTD114GC	0	10kΩ

SOT23



Top View



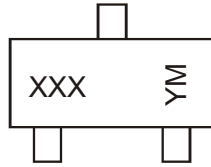
Device Schematic

## Ordering Information (Note 4)

Product	Status	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
DDTD113EC-7-F	Active	Standard	N60	7	8	3,000
DDTD123EC-7-F	Active	Standard	N61	7	8	3,000
DDTD143EC-7-F	Obsolete	Standard	N62	7	8	3,000
DDTD114EC-7-F	Active	Standard	N63	7	8	3,000
DDTD122JC-7-F	Obsolete	Standard	N64	7	8	3,000
DDTD113ZC-7-F	Active	Standard	N65	7	8	3,000
DDTD123YC-7-F	Active	Standard	N66	7	8	3,000
DDTD133HC-7-F	Obsolete	Standard	N67	7	8	3,000
DDTD123TC-7-F	Active	Standard	N69	7	8	3,000
DDTD143TC-7-F	Obsolete	Standard	N70	7	8	3,000
DDTD114TC-7-F	Obsolete	Standard	N71	7	8	3,000
DDTD114GC-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



XXX = Product Type Marking Code, See Table Above  
 YM = Date Code Marking  
 Y = Year ex: 1 = 2021  
 M = Month ex: 9 = September

Date Code Key

Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Code	I	J	K	L	M	N	O	P	R	S	T	U

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 <Pin: (3) to (2)>	V <sub>CC</sub>	50	V
Input Voltage <Pin: (1) to (2)>	V <sub>IN</sub>	-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 <Pin: (2) to (1)>	V <sub>EBO (MAX)</sub>	5	V
Output Current	I <sub>C</sub>	500	mA

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

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P <sub>D</sub>	200	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 FR4 PC board with recommended pad layout.

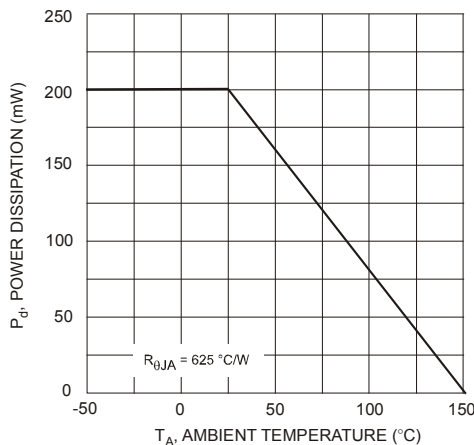


Fig. 1 Power Derating Curve

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage	DDTD113EC	0.5				V <sub>CC</sub> = 5V, I <sub>O</sub> = 100μA
	DDTD123EC	0.5				
	DDTD143EC	0.5				
	DDTD114EC	0.5				
	DDTD122JC	0.5	—	—	V	
	DDTD113ZC	0.3				
	DDTD123YC	0.3				
	DDTD133HC	0.3				
	DDTD113EC				3.0	V <sub>O</sub> = 0.3V, I <sub>O</sub> = 20mA V <sub>O</sub> = 0.3V, I <sub>O</sub> = 20mA V <sub>O</sub> = 0.3V, I <sub>O</sub> = 20mA V <sub>O</sub> = 0.3V, I <sub>O</sub> = 10mA V <sub>O</sub> = 0.3V, I <sub>O</sub> = 30mA V <sub>O</sub> = 0.3V, I <sub>O</sub> = 20mA V <sub>O</sub> = 0.3V, I <sub>O</sub> = 20mA V <sub>O</sub> = 0.3V, I <sub>O</sub> = 20mA
	DDTD123EC				3.0	
	DDTD143EC				3.0	
	DDTD114EC				3.0	
	DDTD122JC				3.0	
	DDTD113ZC				2.0	
DDTD123YC				2.0		
DDTD133HC				2.0		
Output Voltage	V <sub>O(on)</sub>	—	—	0.3V	V	I <sub>O</sub> /I <sub>I</sub> = 50mA/2.5mA
Input Current	DDTD113EC			7.2	mA	V <sub>I</sub> = 5V
	DDTD123EC			3.8		
	DDTD143EC			1.8		
	DDTD114EC			0.88		
	DDTD122JC			28		
	DDTD113ZC			7.2		
	DDTD123YC			3.6		
	DDTD133HC			2.4		
Output Current	I <sub>O(off)</sub>	—	—	0.5	μA	V <sub>CC</sub> = 50V, V <sub>I</sub> = 0V
DC Current Gain	DDTD113EC	33				V <sub>O</sub> = 5V, I <sub>O</sub> = 50mA
	DDTD123EC	39				
	DDTD143EC	47				
	DDTD114EC	56				
	DDTD122JC	47	—	—		
	DDTD113ZC	56				
	DDTD123YC	56				
	DDTD133HC	56				
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, R2- Only Types** (@ T<sub>A</sub> = +25°C, unless otherwise specified.)

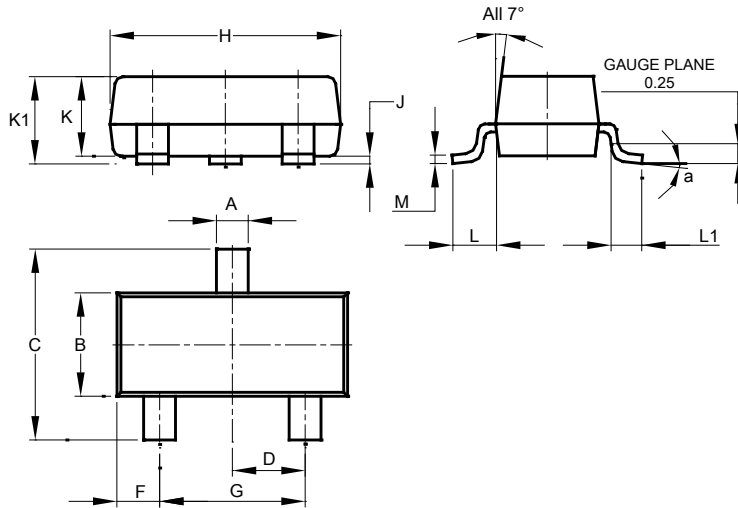
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	50	—	—	V	I <sub>C</sub> = 50μA
Collector-Emitter Breakdown Voltage	BV <sub>CEO</sub>	40	—	—	V	I <sub>C</sub> = 1mA
Emitter-Base Breakdown Voltage	DDTD123TC	5	—	—	V	I <sub>E</sub> = 50μA
	DDTD143TC					I <sub>E</sub> = 50μA
	DDTD114TC					I <sub>E</sub> = 50μA
	DDTD114GC					I <sub>E</sub> = 720μA
Collector Cut-Off Current	I <sub>CBO</sub>	—	—	0.5	μA	V <sub>CB</sub> = 50V
Emitter Cut-Off Current	DDTD123TC	—	—	0.5	μA	V <sub>EB</sub> = 4V
	DDTD143TC	—	—	0.5		
	DDTD114TC	—	—	0.5		
	DDTD114GC	300	—	580		
Collector-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	—	—	0.3	V	I <sub>C</sub> = 50mA, I <sub>B</sub> = 2.5mA
DC Current Transfer Ratio	DDTD123TC	100	250	600	—	I <sub>C</sub> = 5mA, V <sub>CE</sub> = 5V
	DDTD143TC	100	250	600		
	DDTD114TC	100	250	600		
	DDTD114GC	56	—	—		
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.

SOT23

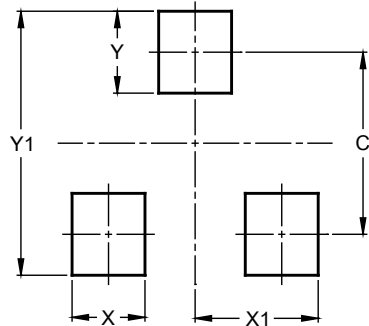


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

**Suggested Pad Layout**

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

SOT23



Dimensions	Value (in mm)
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9

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