



#### NPN PRE-BIASED SMALL SIGNAL SURFACE MOUNT TRANSISTOR

#### **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)
- Qualified to AEC-Q101 Standards for High Reliability
- PPAP Capable (Note 4)

R1(NOM) 4.7kΩ

#### **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 @3
- Weight: 0.006 grams (Approximate)





OUT 3 2 GND(0) IN

**Device Schematic** 

#### Ordering Information (Notes 4 & 5)

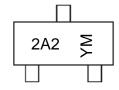
Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
ADTC143TUAQ-7	Automotive	2A2	7	8	3,000
ADTC143TUAQ-13	Automotive	2A2	13	8	10,000

Notes:

- 1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
- 2. See http://www.diodes.com/quality/lead\_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green"
- 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. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to http://www.diodes.com/product\_compliance\_definitions.html.
- 5. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

### **Marking Information**

**SOT323** 



2A2 = Product Type Marking Code YM = Date Code Marking Y = Year (ex: D = 2016)

M = Month (ex: 9 = September)

Date Code Kev

Year	2016	2017	2018	2019	202	20 20	)21 2	2022	2023	2024	2025	2026
Code	D	Е	F	G	Н		1	J	K	L	М	N
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	0	N	D



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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	50	V
Collector-Emitter Voltage	V <sub>CEO</sub>	50	V
Emitter-Base Voltage	$V_{EBO}$	5	V
Collector Current	I <sub>C</sub> (Max)	100	mA

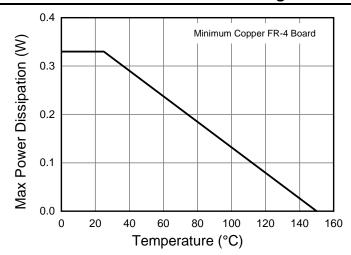
# Thermal Characteristics (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit	
Power Dissipation (Note 6)	$P_{D}$	330	mW	
Thermal Resistance, Junction to Ambient Air (Note 6)	$R_{ hetaJA}$	375	°C/W	
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C	

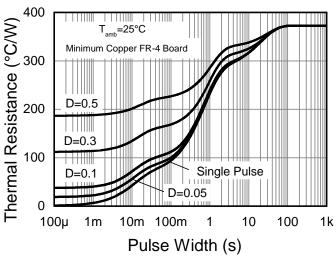
Note: 6. Mounted on FR-4 PC Board with minimum recommended pad layout.



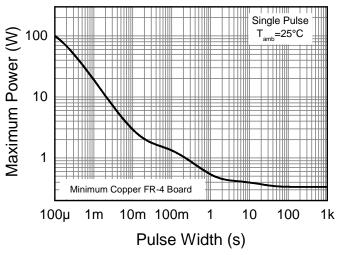
# Thermal Characteristics and Derating Information



### **Derating Curve**



**Transient Thermal Impedance** 



**Pulse Power Dissipation** 



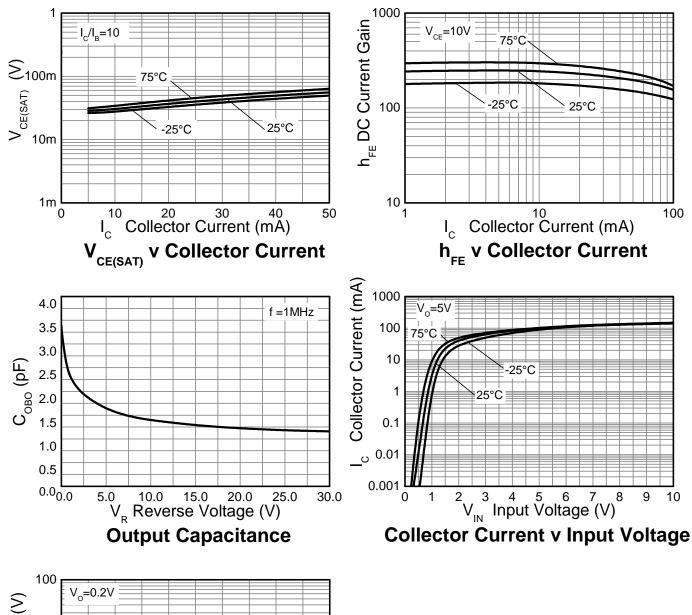
### Electrical Characteristics (@T<sub>A</sub> = +25°C, unless otherwise specified.)

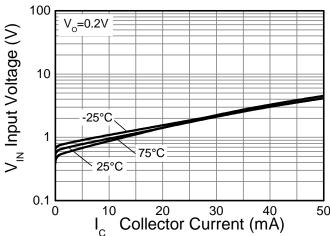
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	50		_	V	$I_C = 50\mu A$
Collector-Emitter Breakdown Voltage	BV <sub>CEO</sub>	50		_	V	$I_C = 1mA$
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	5	_	_	V	$I_E = 50\mu A$
Collector Cutoff Current	I <sub>CBO</sub>	_	_	0.5	μΑ	$V_{CB} = 50V$
Emitter Cutoff Current	I <sub>EBO</sub>	_		0.5	μΑ	$V_{EB} = 4V$
Collector-Emitter Saturation Voltage	V <sub>CE(SAT)</sub>	_	_	0.3	V	$I_{C}/I_{B} = 2.5 \text{mA}/0.25 \text{mA}$
DC Current Transfer Ratio	h <sub>FE</sub>	100	250	600	_	$I_C = 1mA$ , $V_{CE} = 5V$
Input Resistor (R <sub>1</sub> ) Tolerance	$\Delta R_1$	-30		+30	%	_
Gain-Bandwidth Product (Note 7)	f <sub>T</sub>		250	_	MHz	$V_{CE} = 10V$ , $I_E = 5mA$ , $f = 100MHz$

Note: 7. Transistor - For Reference Only.



### Typical Electrical Characteristics (@TA = +25°C, unless otherwise specified.)





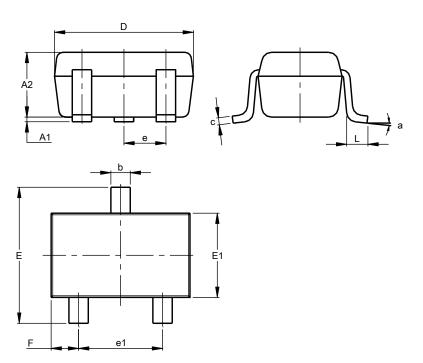
**Input Voltage v Collector Current** 



### **Package Outline Dimensions**

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

#### **SOT323**

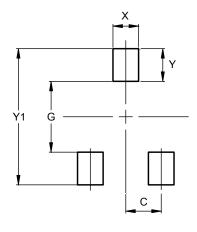


SOT323						
Dim	Min	Max	Тур			
A1	0.00	0.10	0.05			
A2	0.90	1.00	0.95			
b	0.25	0.40	0.30			
С	0.10	0.18	0.11			
D	1.80	2.20	2.15			
Е	2.00	2.20	2.10			
E1	1.15	1.35	1.30			
е	0.650 BSC					
e1	1.20	1.40	1.30			
F	0.375	0.475	0.425			
L	0.25	0.40	0.30			
а	0°	8°				
All Dimensions in mm						

## **Suggested Pad Layout**

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

#### SOT323



Dimensions	Value (in mm)		
С	0.650		
G	1.300		
X	0.470		
Y	0.600		
Y1	2 500		



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