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## Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: [info@chipsmall.com](mailto:info@chipsmall.com) Web: [www.chipsmall.com](http://www.chipsmall.com)

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



## Features and Benefits

- $BV_{CEO} > -12V$
- Maximum Continuous Current  $I_C = -5A$
- Peak Pulse Current  $I_C = -20A$
- High Gain Holds Up  $h_{FE} > 200$  @  $I_C = -2A$
- Very Low Equivalent On-Resistance;  $R_{CE(sat)} = 85m\Omega$  at  $-2A$
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

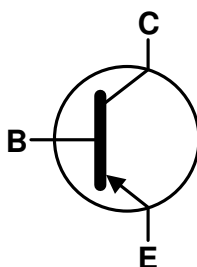
## Mechanical Data

- Case: SOT223
- 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: 0.112 grams (Approximate)

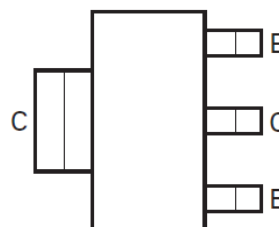
SOT223



Top View



Device Symbol



Top View  
Pin Out

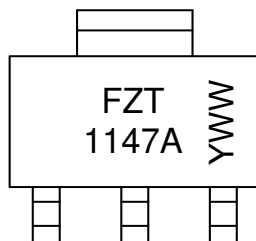
## Ordering Information (Note 4)

Part Number	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FZT1147ATA	AEC-Q101	FZT1147A	7	12	1,000

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
  2. See [http://www.diodes.com/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html) 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 <http://www.diodes.com/products/packages.html>.

## Marking Information

SOT223



FZT 1147A = Product Type Marking Code  
 YWW = Date Code Marking  
 Y or  $\bar{Y}$  = Last Digit of Year (ex: 6 = 2016)  
 WW or  $\bar{W}W$  = Week Code (01 to 53)

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	-15	V
Collector-Emitter Voltage	V <sub>CEO</sub>	-12	V
Emitter-Base Voltage	V <sub>EBO</sub>	-7	V
Continuous Collector Current	I <sub>C</sub>	-5	A
Base Current	I <sub>B</sub>	-500	mA
Peak Pulse Current	I <sub>CM</sub>	-20	A

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

Characteristic	Symbol	Value	Unit
Power Dissipation	P <sub>D</sub>	3.0	W
		2.0	
		1.6	
		1.2	
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>	41.7	°C/W
		62.5	
		78.1	
		104	
Thermal Resistance Junction to Lead	R <sub>θJL</sub>	10.9	
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

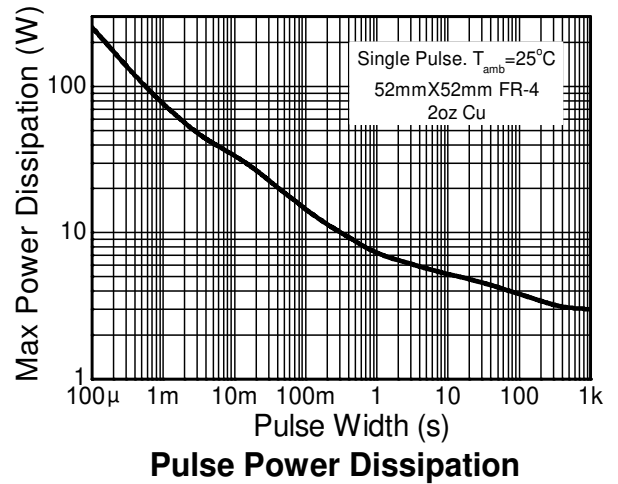
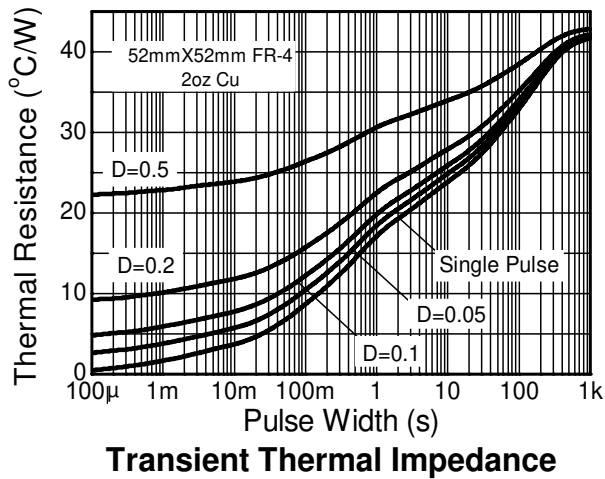
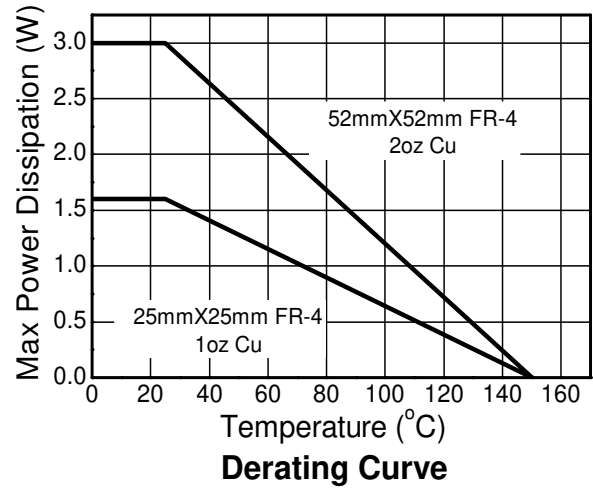
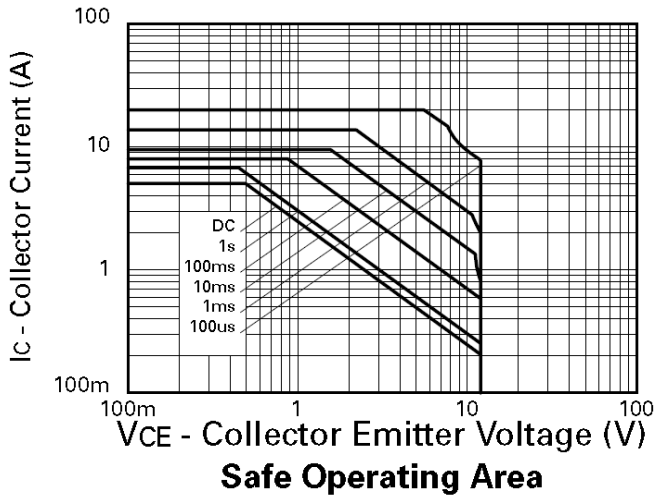
**ESD Ratings** (Note 10)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- Notes:
- For a device mounted with the collector lead on 52mm x 52mm 2oz copper that is on a single-sided 1.6mm FR-4 PCB; device is measured under still air conditions whilst operating in a steady-state.
  - Same as note (5), except the device is mounted on 25mm x 25mm 2oz copper.
  - Same as note (5), except the device is mounted on 25mm x 25mm 1oz copper.
  - Same as note (5), except the device is mounted on minimum recommended pad layout.
  - Thermal resistance from junction to solder-point (at the end of the collector lead).
  - Refer to JEDEC specification JESD22-A114 and JESD22-A115.



## Thermal Characteristics and Derating Information

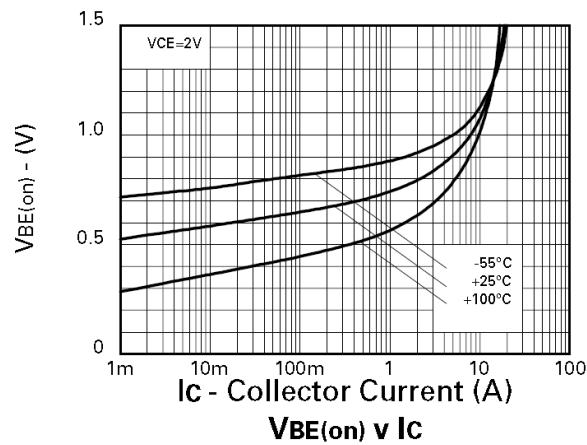
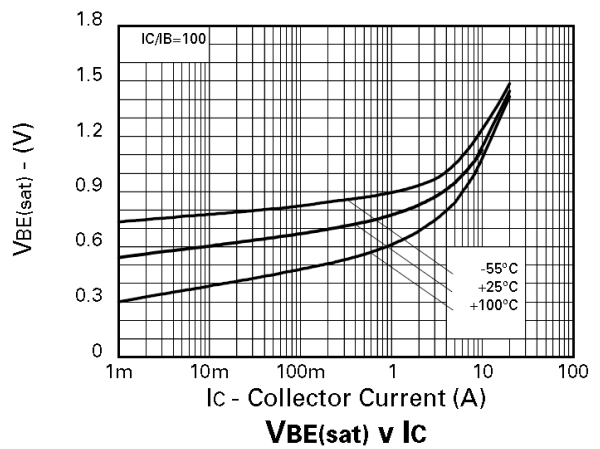
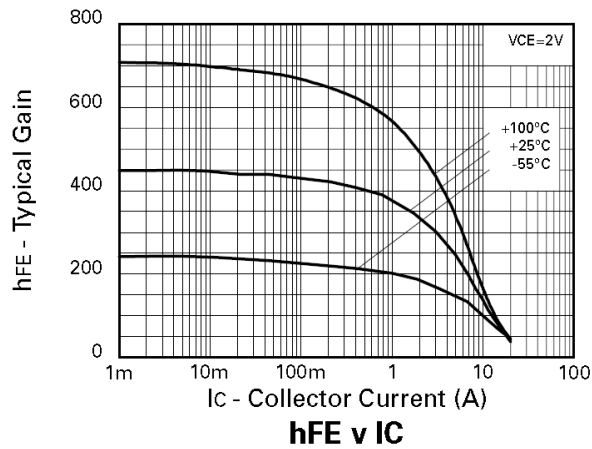
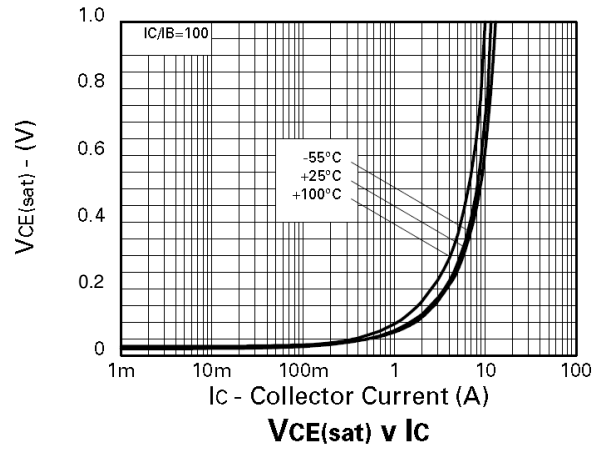
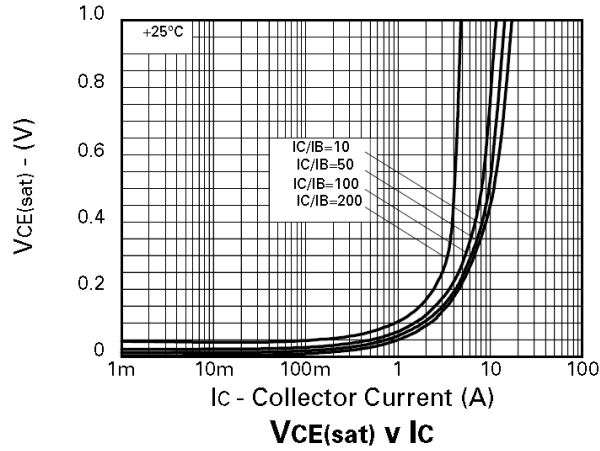


**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ.	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	-15	-35	-	V	I <sub>C</sub> = -100μA
Collector-Emitter Breakdown Voltage	BV <sub>CES</sub>	-12	-25	-	V	I <sub>C</sub> = -100μA
Collector-Emitter Breakdown Voltage (Note 11)	BV <sub>CEO</sub>	-12	-25	-	V	I <sub>C</sub> = -10mA
Collector-Emitter Breakdown Voltage	BV <sub>CEV</sub>	-12	-25	-	V	I <sub>C</sub> = -100μA, V <sub>EB</sub> = -1V
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	-7	-8.5	-	V	I <sub>E</sub> = -100μA
Collector Cut Off Current	I <sub>CBO</sub>	-	-0.3	-100	nA	V <sub>CB</sub> = -12V
Collector Cut Off Current	I <sub>CES</sub>	-	-0.3	-100	nA	V <sub>CES</sub> = -10V
Emitter Cut Off Current	I <sub>EBO</sub>	-	-0.3	-100	nA	V <sub>EB</sub> = -6V
DC Current Transfer Static Ratio (Note 11)	h <sub>FE</sub>	270	450	-	-	I <sub>C</sub> = -10mA, V <sub>CE</sub> = -2V
		250	400	850		I <sub>C</sub> = -0.5A, V <sub>CE</sub> = -2V
		200	340	-		I <sub>C</sub> = -2A, V <sub>CE</sub> = -2V
		150	245	-		I <sub>C</sub> = -5A, V <sub>CE</sub> = -2V
		90	145	-		I <sub>C</sub> = -10A, V <sub>CE</sub> = -2V
		-	50	-		I <sub>C</sub> = -20A, V <sub>CE</sub> = -2V
Collector-Emitter Saturation Voltage (Note 11)	V <sub>CE(sat)</sub>	-	-25	-50	mV	I <sub>C</sub> = -0.1A, I <sub>B</sub> = -1mA
		-	-70	-110		I <sub>C</sub> = -0.5A, I <sub>B</sub> = -2.5mA
		-	-90	-130		I <sub>C</sub> = -1A, I <sub>B</sub> = -6mA
		-	-115	-170		I <sub>C</sub> = -2A, I <sub>B</sub> = -20mA
		-	-250	-400		I <sub>C</sub> = -5A, I <sub>B</sub> = -50mA
Base-Emitter Saturation Voltage (Note 11)	V <sub>BE(sat)</sub>	-	-950	-1,050	mV	I <sub>C</sub> = -5A, I <sub>B</sub> = -50mA
Base-Emitter Turn-on Voltage (Note 11)	V <sub>BE(on)</sub>	-	-905	-1,000	mV	I <sub>C</sub> = -5A, V <sub>CE</sub> = -2V
Transitional Frequency	f <sub>T</sub>	-	115	-	MHz	I <sub>C</sub> = -50mA, V <sub>CE</sub> = -10V, f = 50MHz
Output Capacitance	C <sub>obo</sub>	-	80	-	pF	V <sub>CB</sub> = -10V, f = 1MHz
Switching Time	t <sub>ON</sub>	-	150	-	ns	V <sub>CC</sub> = -10V, I <sub>C</sub> = -4A, -I <sub>B1</sub> = I <sub>B2</sub> = 40mA
	t <sub>OFF</sub>	-	220	-	ns	

Note: 11. Measured under pulsed conditions. Pulse width = 300μs. Duty cycle ≤ 2%.

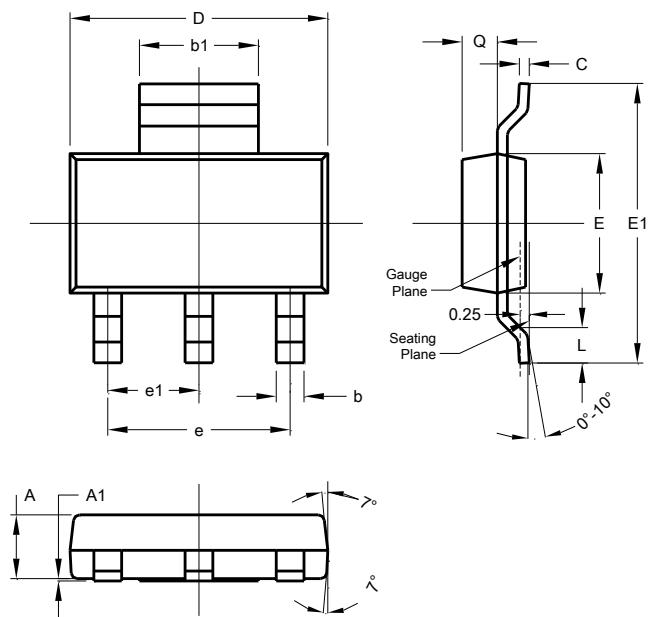
**Typical Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)



## Package Outline Dimensions

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

### SOT223

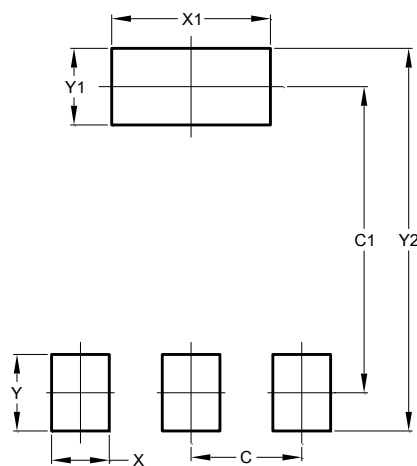


SOT223			
Dim	Min	Max	Typ
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b	0.60	0.80	0.70
b1	2.90	3.10	3.00
C	0.20	0.30	0.25
D	6.45	6.55	6.50
E	3.45	3.55	3.50
E1	6.90	7.10	7.00
e	-	-	4.60
e1	-	-	2.30
L	0.85	1.05	0.95
Q	0.84	0.94	0.89
All Dimensions in mm			

## Suggested Pad Layout

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

### SOT223



Dimensions	Value (in mm)
C	2.30
C1	6.40
X	1.20
X1	3.30
Y	1.60
Y1	1.60
Y2	8.00

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