



FZT1047A

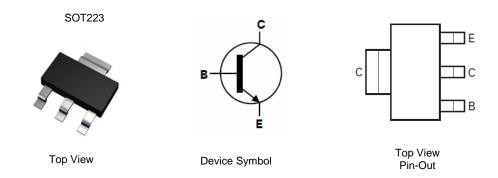
#### 10V NPN MEDIUM POWER HIGH GAIN TRANSISTOR IN SOT223

#### **Features**

- BV<sub>CEO</sub> > 10V
- I<sub>C</sub> = 5A High Continuous Collector Current
- I<sub>CM</sub> = 20A Peak Pulse Current
- Low Saturation Voltage V<sub>CE(sat)</sub> <45mV @ 500mA</li>
- $R_{SAT} = 44m\Omega$  @ 5A for a Low Equivalent On-Resistance
- h<sub>FE</sub> Specified up to 20A for a High Gain Hold-Up
- 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 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)



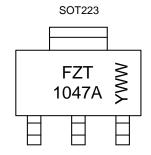
#### **Ordering Information** (Note 4)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FZT1047ATA	FZT1047A	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 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**



FZT 1047A = Product Type Marking Code YWW = Date Code Marking Y or  $\overline{Y}$  = Last Digit of Year (ex: 5= 2015) WW or  $\overline{W}W$  = Week Code (01~53)



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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	35	V
Collector-Emitter Voltage	V <sub>CEO</sub>	10	V
Emitter-Base Voltage	V <sub>EBO</sub>	7	V
Continuous Collector Current	Ic	5	Α
Peak Pulse Current	Ісм	20	Α
Base Current	I <sub>B</sub>	500	mA

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

Characteristic	Symbol	Value	Unit		
	(Note 5)		3.0		
Rower Dissipation	(Note 6)	D-	2.0	W	
Power Dissipation	(Note 7)	P <sub>D</sub>	1.6		
	(Note 8)		1.2		
	(Note 5)		41.7		
Thermal Resistance, Junction to Ambient	(Note 6)	5	62.5		
Thermal Resistance, Junction to Ambient	(Note 7)	$R_{ hetaJA}$	78.1	°C/W	
	(Note 8)		104	1	
Thermal Resistance Junction to Lead (Note 9)		$R_{ hetaJL}$	10.9		
Operating and Storage Temperature Range	$T_{J,}T_{STG}$	-55 to +150	°C		

## ESD Ratings (Note 10)

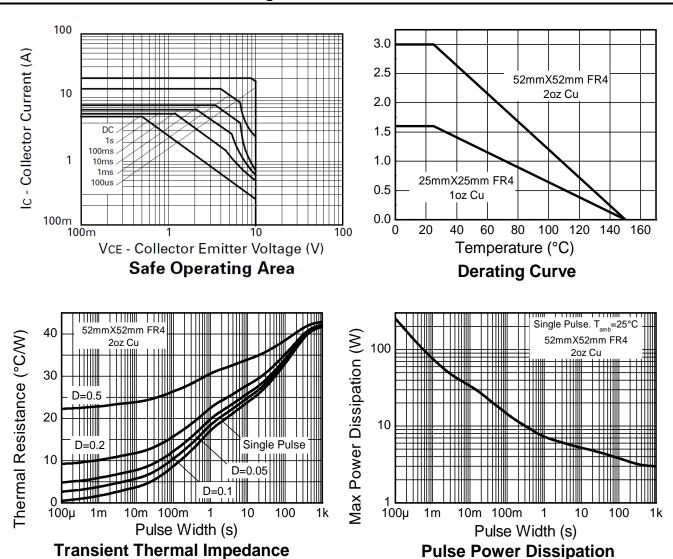
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	8,000	V	3B
Electrostatic Discharge - Machine Model	ESD MM	400	V	С

Notes:

- 5. For a device mounted with the collector lead on 52mm x 52mm 2oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
- 6. Same as note (5), except the device is mounted on 25mm x 25mm 2oz copper.
- 7. Same as note (5), except the device is mounted on 25mm x 25mm 1oz copper.
- 8. Same as note (5), except the device is mounted on minimum recommended pad layout.
- 9. Thermal resistance from junction to solder-point (at the end of the collector lead).
- 10. 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.)

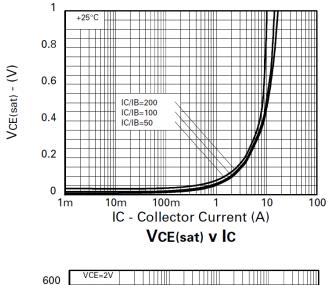
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	35	65	_	V	$I_C = 100\mu A$
Collector-Emitter Breakdown Voltage	BV <sub>CES</sub>	35	55	_	V	$I_C = 100\mu A$
Collector-Emitter Breakdown Voltage	BV <sub>CEV</sub>	35	60	_	V	$I_C = 100\mu A, V_{EB} = 1V$
Collector-Emitter Breakdown Voltage (Note 11)	BV <sub>CEO</sub>	10	16	_	V	I <sub>C</sub> = 10mA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	7	8.7		V	$I_E = 100\mu A$
Collector Cut-Off Current	I <sub>CBO</sub>	_	0.3	10	nA	V <sub>CB</sub> = 20V
Collector Cut-Off Current	I <sub>CES</sub>	_	0.3	10	nA	V <sub>CB</sub> = 20V
Emitter Cut-Off Current	I <sub>EBO</sub>	_	0.3	10	nA	V <sub>EB</sub> = 4V
		_	25	40		I <sub>C</sub> = 500mA, I <sub>B</sub> = 10mA
Collector-Emitter Saturation Voltage (Note 11)	.,	_	50	70	mV	$I_C = 1A, I_B = 10mA$
Collector-Emilier Saturation voltage (Note 11)	V <sub>CE(sat)</sub>	_	140	200	mv	I <sub>C</sub> = 3A, I <sub>B</sub> = 15mA
		_	220	350		$I_C = 5A$ , $I_B = 25mA$
Base-Emitter Saturation Voltage (Note 11)	V <sub>BE(sat)</sub>	_	925	1,000	mV	I <sub>C</sub> = 5A, I <sub>B</sub> = 25mA
Base-Emitter Turn-On Voltage (Note 11)	V <sub>BE(on)</sub>	1	890	975	mV	$I_C = 5A$ , $V_{CE} = 2V$
	h <sub>FE</sub>	280	430		_	$I_C = 10$ mA, $V_{CE} = 2$ V
		290	440			$I_C = 0.5A, V_{CE} = 2V$
DC Current Gain (Note 11)		300	450	1,200		$I_C = 1A$ , $V_{CE} = 2V$
		200	330			$I_C = 5A$ , $V_{CE} = 2V$
		60	110			$I_C = 20A, V_{CE} = 2V$
Output Capacitance	C <sub>obo</sub>		85	110	pF	V <sub>CB</sub> = 10V, f = 1MHz
Current Gain-Bandwidth Product	f⊤		150		MHz	V <sub>CE</sub> = 10V, I <sub>C</sub> = 50mA, f = 50MHz
Switching Times	t <sub>on</sub>		130		no	I <sub>C</sub> = 4A, V <sub>CC</sub> = 10V,
Switching Times	t <sub>off</sub>		230		ns	$I_{B1} = -I_{B2} = 40 \text{mA}$

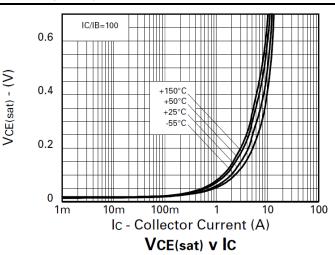
Note:

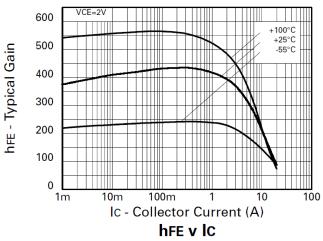
11. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2.

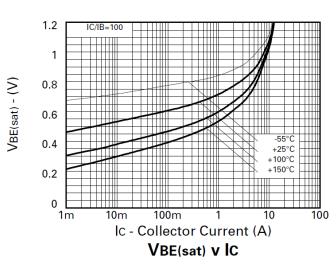


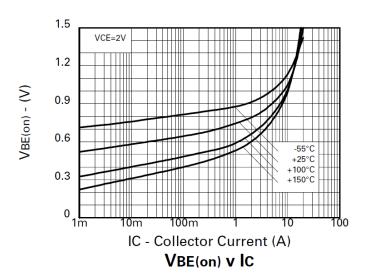
## Typical Electrical Characteristics (@TA = +25°C, unless otherwise specified.)







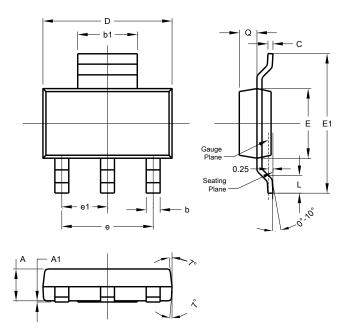






## **Package Outline Dimensions**

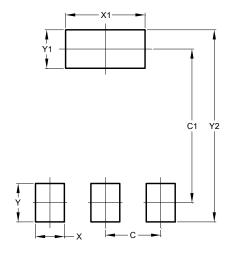
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



SOT223				
Dim	Min	Max	Тур	
Α	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	
С	0.20	0.30	0.25	
D	6.45	6.55	6.50	
Е	3.45	3.55	3.50	
E1	6.90	7.10	7.00	
е	-	-	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 AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for the latest version.



Dimensions	Value (in mm)		
С	2.30		
C1	6.40		
Х	1.20		
X1	3.30		
Υ	1.60		
Y1	1.60		
Y2	8.00		



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