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Diodes Incorporated
FZT869TA

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A Product Line of
Diodes Incorporated

Green

FZT869

25V NPN HIGH CURRENT TRANSISTOR IN SOT223

Features

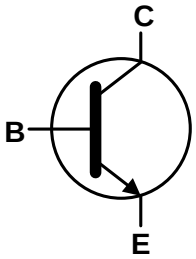
- BV_{CEO} > 25V
- I_C = 7A High Continuous Collector Current
- I_{CM} = 20A Peak Pulse Current
- Very Low Saturation Voltage $V_{CE(sat)}$ < 110mV @ 1A
- $R_{CE(sat)}$ = 36mΩ at 5A for a Low Equivalent On-Resistance
- h_{FE} Specified Up to 20A for a High Gain Hold Up
- P_{tot} = 3W
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

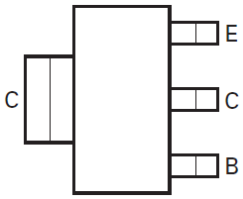
- Case: SOT223
- Case Material: Molded Plastic. "Green" Molding Compound. UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads. Solderable per MIL-STD-202, Method 208 (e3)
- Weight: 0.112 grams (Approximate)

SOT223

Top View



Device Symbol



Top View
Pin-Out

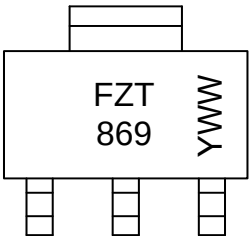
Ordering Information (Note 4)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FZT869TA	AEC-Q101	FZT869	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

SOT223



FZT 869 = 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)

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Absolute Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	60	V
Collector-Emitter Voltage	V_{CEO}	25	V
Emitter-Base Voltage	V_{EBO}	6	V
Continuous Collector Current	I_C	7	A
Peak Pulse Current	I_{CM}	20	A

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Power Dissipation Linear Derating Factor	(Note 5)	P_D	3 24	W mW/°C
	(Note 6)		1.6 12.8	
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	42	°C/W
	(Note 6)	$R_{\theta JA}$	78	
Thermal Resistance Junction to Lead	(Note 7)	$R_{\theta JL}$	8.8	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

ESD Ratings (Note 8)

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:
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 steady-state.
6. Same as note (5), except the device is mounted on 25mm x 25mm 1oz copper.
7. Thermal resistance from junction to solder-point (at the end of the collector lead).
8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

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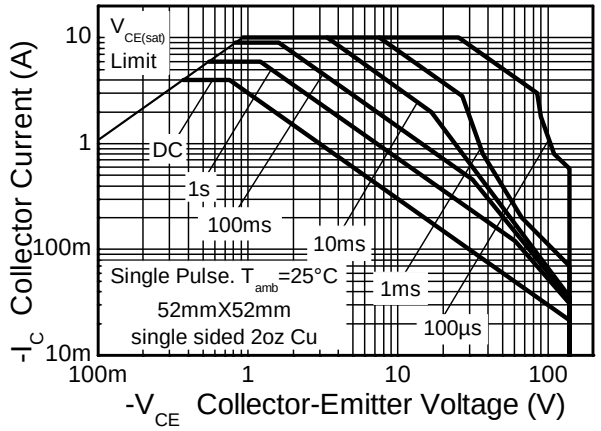
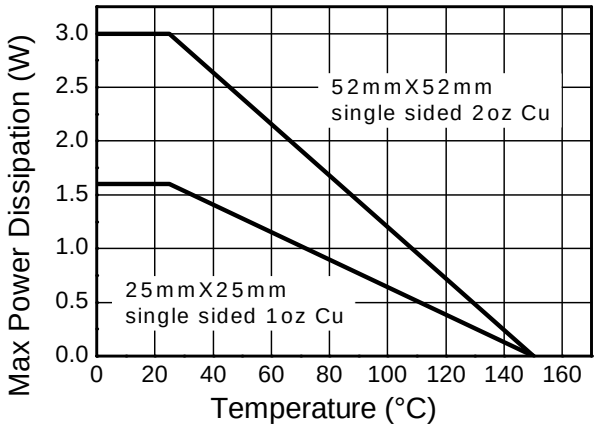
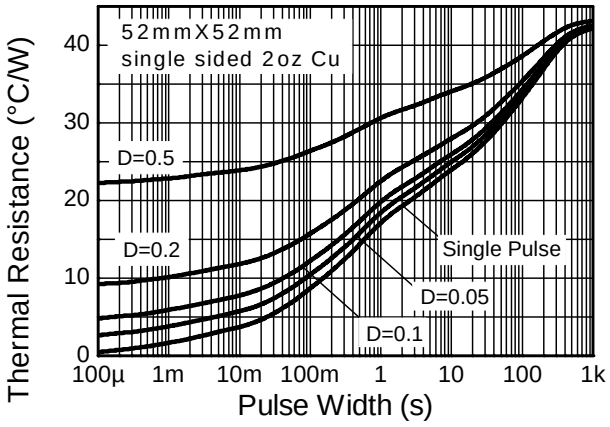
Thermal Characteristics and Derating Information



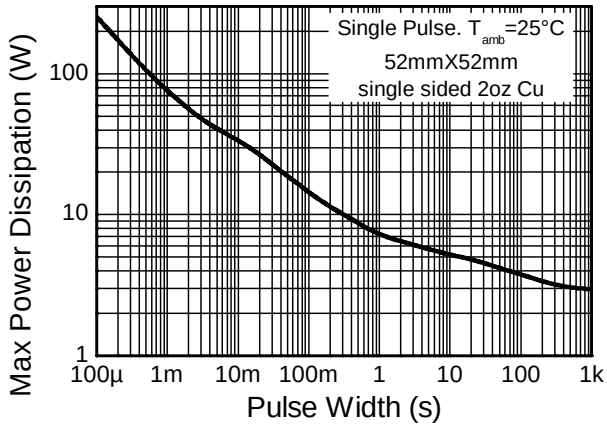
Safe Operating Area



Derating Curve



Transient Thermal Impedance



Pulse Power Dissipation

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Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	60	120	–	V	I_C = 100µA
Collector-Emitter Breakdown Voltage	BV_{CER}	60	120	–	V	I_C = 1µA, R_B ≤ 1kΩ
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	25	35	–	V	I_C = 10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	6	8	–	V	I_E = 100µA
Collector Cut-off Current	I_{CBO}	– –	– –	50 1	nA µA	V_{CB} = 50V V_{CB} = 50V, T_A = +100°C
Collector Cut-off Current	I_{CER}	– –	– –	50 1	nA µA	V_{CB} = 50V, R_B ≤ 1kΩ V_{CB} = 50V, T_A = +100°C
Emitter Cut-off Current	I_{EBO}	–	–	10	nA	V_{EB} = 6V
DC Current Gain (Note 9)	h_{FE}	300	450	–	–	I_C = 10mA, V_{CE} = 1V
		300	450	–		I_C = 1A, V_{CE} = 1V
		200	300	–		I_C = 7A, V_{CE} = 1V
		40	100	–		I_C = 20A, V_{CE} = 2V
Collector-Emitter Saturation Voltage (Note 9)	$V_{CE(sat)}$	–	35	50	mV	I_C = 0.5mA, I_B = 10mA
		–	67	110		I_C = 1A, I_B = 10mA
		–	168	215		I_C = 2A, I_B = 10mA
		–	–	350		I_C = 6.5A, I_B = 150mA
Base-Emitter Saturation Voltage (Note 9)	$V_{BE(sat)}$	–	–	1.2	V	I_C = 6.5A, I_B = 300mA
Base-Emitter Turn-On Voltage (Note 9)	$V_{BE(on)}$	–	–	1.13	mV	I_C = 6.5A, V_{CE} = 1V
Current Gain-Bandwidth Product (Note 9)	f_T	–	100	–	MHz	I_C = 100mA, V_{CE} = 10V, f = 50MHz
Output Capacitance (Note 9)	C_{obo}	–	70	–	pF	V_{CB} = 10V, f = 1MHz
Switching Times	t_{on}	–	60	–	ns	I_C = 1A, V_{CC} = 10V, I_{B1} = -I_{B2} = 100mA
	t_{off}	–	680	–		

Note: 9. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2%.

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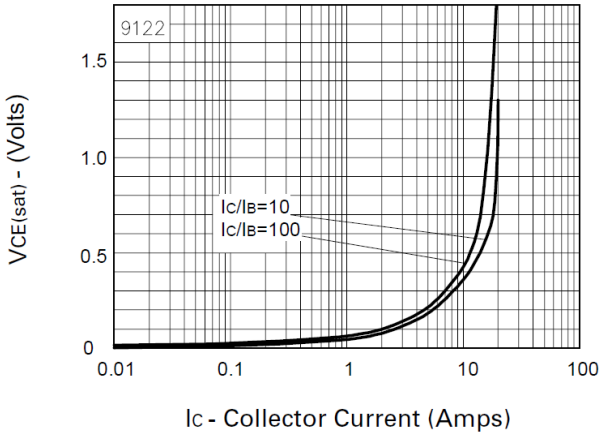
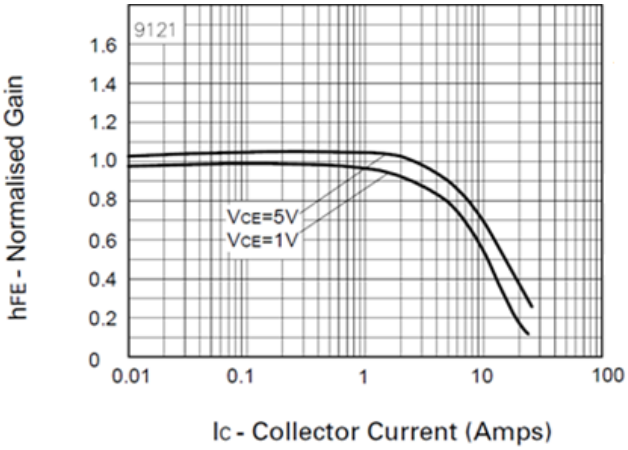
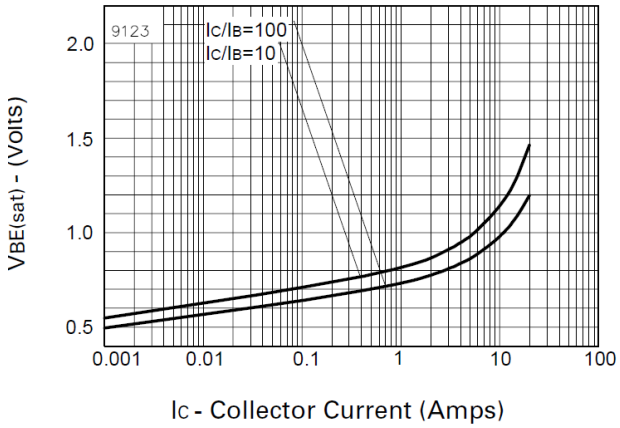
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



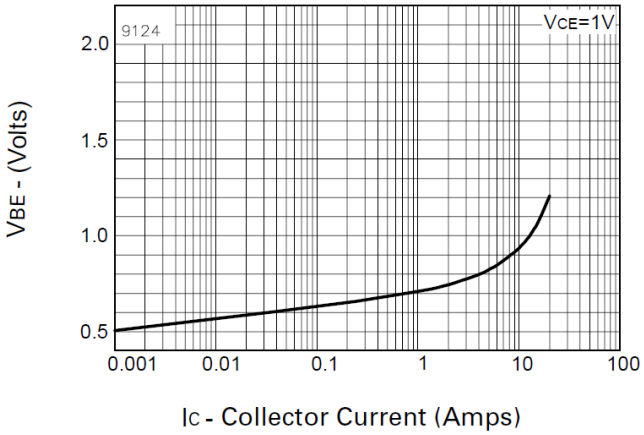
VCE(sat) v IC



hFE v IC



VBE(sat) v IC



VBE(on) v IC

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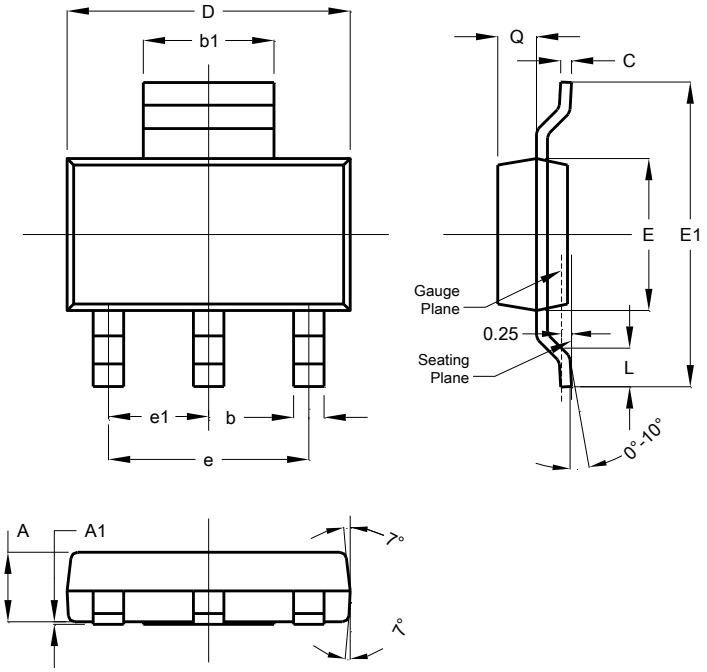
Package Outline Dimensions

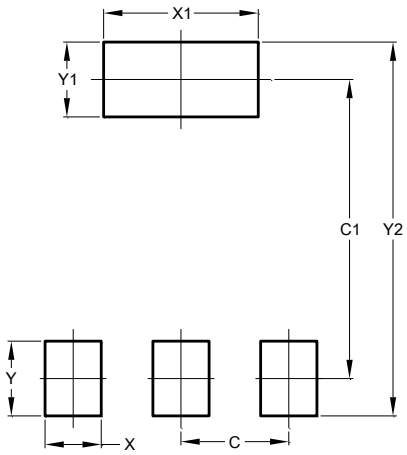
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



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 AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for the latest version.



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

Note: For high voltage applications, the appropriate industry sector guidelines should be considered with regards to creepage and clearance distances between device terminals and PCB tracking.

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FZT869

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