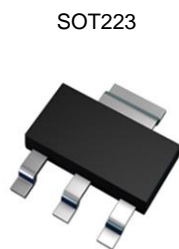


12V PNP HIGH CURRENT LOW SATURATION POWER TRANSISTOR IN SOT223
Features

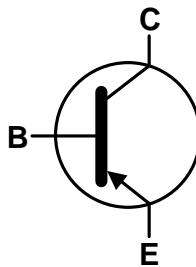
- $BV_{CEO} > -12V$
- $I_C = -6A$ High Continuous Collector Current
- $I_{CM} = -20A$ Peak Pulse Current
- Low Saturation Voltage $V_{CE(sat)} < -170mV @ -2A$
- h_{FE} Specified up to $-10A$ for a High Gain Hold Up
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

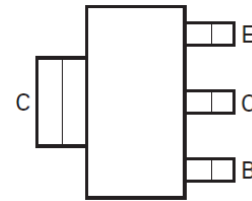
- Case: SOT223
- Case Material: Molded Plastic. "Green" Molding Compound. UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 ③
- Weight: 0.112 grams (Approximate)



Top View



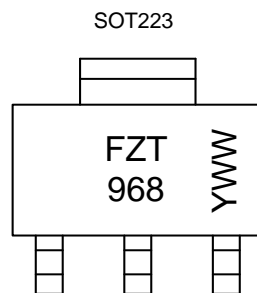
Device Symbol


 Top View
Pin-Out

Ordering Information (Note 4)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FZT968TA	AEC-Q101	FZT968	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 968 = Product Type Marking Code
 YWW = Date Code Marking
 Y or \bar{Y} = Last Digit of Year (ex: 5= 2015)
 WW or $\bar{W}W$ = Week Code (01~53)

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CBO}	-15	V
Collector-Emitter Voltage	V _{CEO}	-12	V
Emitter-Base Voltage	V _{EBO}	-6	V
Continuous Collector Current	I _C	-6	A
Peak Pulse Current	I _{CM}	-20	A

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

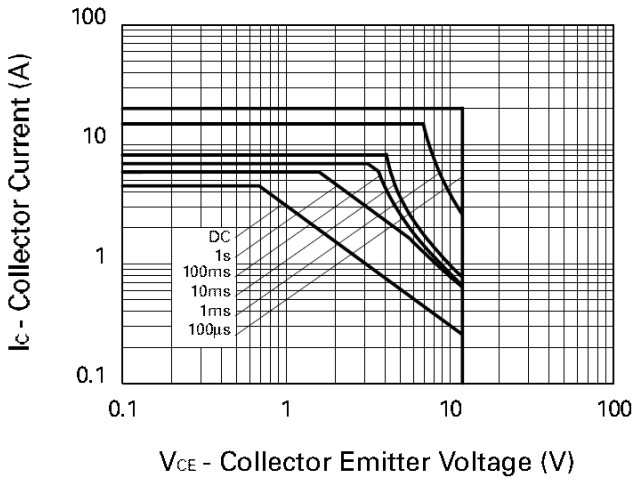
Characteristic	Symbol	Value	Unit
Power Dissipation Linear derating factor	P _D	3.0	W mW /°C
		24	
		1.6 12.8	
Thermal Resistance, Junction to Ambient	R _{θJA}	42	°C/W
	R _{θJA}	78	
Thermal Resistance Junction to Lead	R _{θJL}	8.8	
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

ESD Ratings (Note 9)

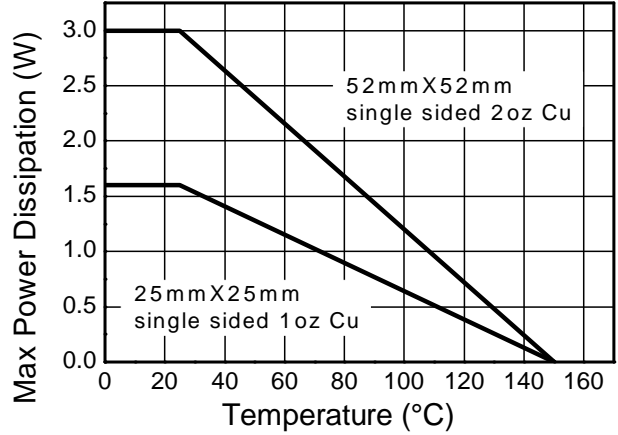
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

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

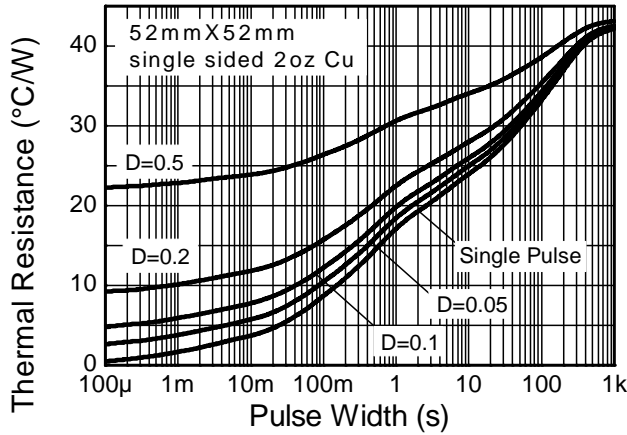
Thermal Characteristics and Derating Information



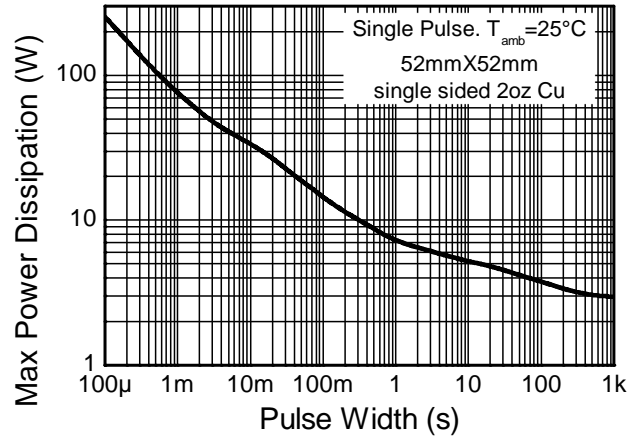
Safe Operating Area



Derating Curve



Transient Thermal Impedance



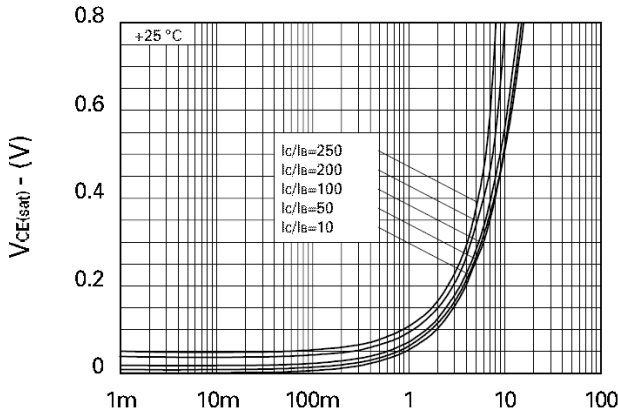
Pulse Power Dissipation

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CBO}	-15	-28	—	V	I _C = -100μA
Collector-Emitter Breakdown Voltage (Note 10)	BV _{CEO}	-12	-20	—	V	I _C = -10mA
Emitter-Base Breakdown Voltage	BV _{EBO}	-6	-8	—	V	I _E = -100μA
Collector Cutoff Current	I _{CBO}	—	<1	-10	nA	V _{CB} = -12V
Emitter Cutoff Current	I _{EBO}	—	<1	-10	nA	V _{CB} = -12V, T _A = +100°C
DC Current Transfer Static Ratio (Note 10)	h _{FE}	300	450	—	—	I _C = -10mA, V _{CE} = -1V
		300	450	1,000		I _C = -500mA, V _{CE} = -1V
		200	300	—		I _C = -5A, V _{CE} = -1V
		150	240	—		I _C = -10A, V _{CE} = -1V
		—	50	—		I _C = -20A, V _{CE} = -1V
Collector-Emitter Saturation Voltage (Note 10)	V _{CE(sat)}	—	-65	-130	mV	I _C = -500mA, I _B = -5mA
		—	-132	-170		I _C = -2A, I _B = -50mA
		—	-360	-450		I _C = -6A, I _B = -250mA
Base-Emitter Saturation Voltage (Note 10)	V _{BE(sat)}	—	-1.05	-1.2	V	I _C = -6A, I _B = -250mA
Base-Emitter Turn-on Voltage (Note 10)	V _{BE(on)}	—	-0.87	-1.05	V	I _C = -6A, V _{CE} = -1V
Transitional Frequency (Note 10)	f _T	—	80	—	MHz	I _C = -100mA, V _{CE} = -10V, f = 50MHz
Output capacitance	C _{obo}	—	161	—	pF	V _{CB} = -20V, f = 1MHz
Switching Time	t _{ON}	—	120	—	ns	V _{CC} = -10V, I _C = -4A, I _{B1} = -I _{B2} = -400mA
	t _{OFF}	—	116	—		

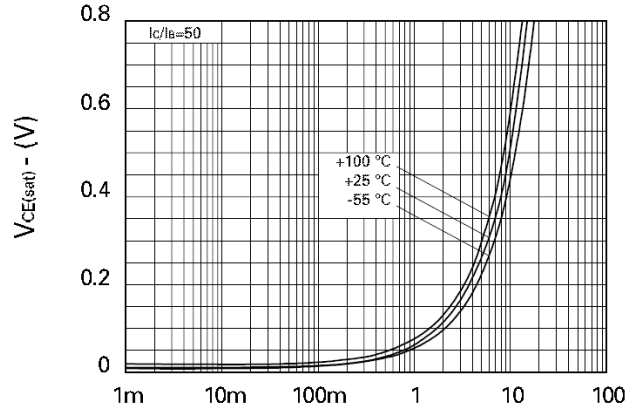
Note: 10. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

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



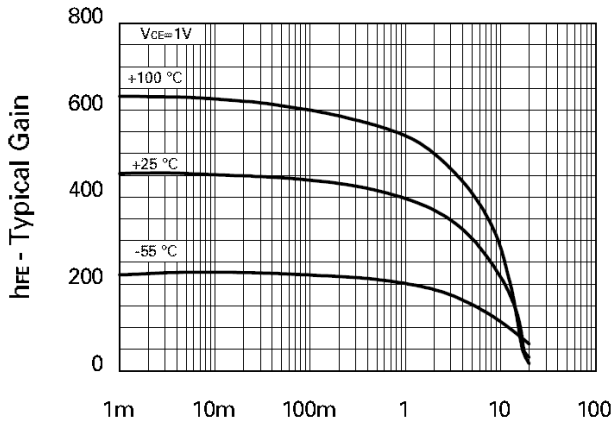
I_C - Collector Current (A)

$V_{CE(sat)}$ v I_C



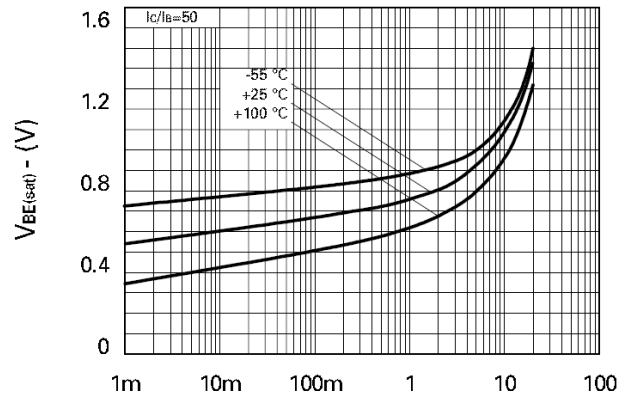
I_C - Collector Current (A)

$V_{CE(sat)}$ v I_C



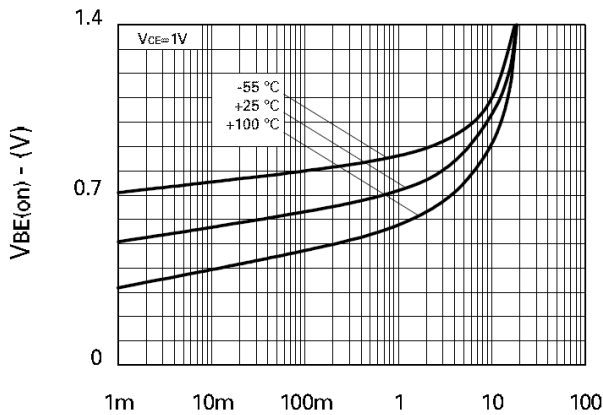
I_C - Collector Current (A)

h_{FE} v I_C



I_C - Collector Current (A)

$V_{BE(sat)}$ v I_C

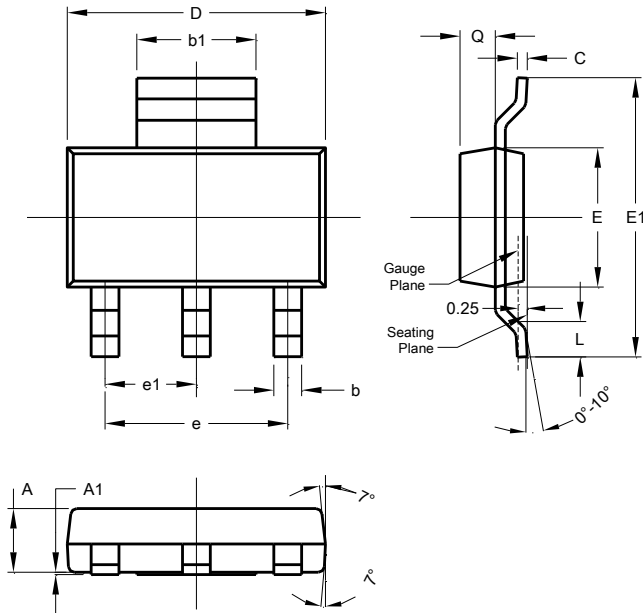


I_C - Collector Current (A)

$V_{BE(on)}$ v I_C

Package Outline Dimensions

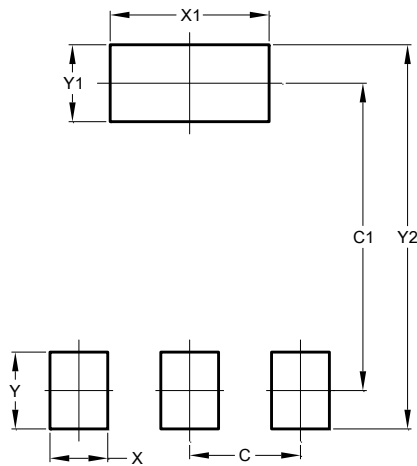
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



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

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SOT223 PNP SILICON PLANAR HIGH CURRENT (HIGH PERFORMANCE) POWER TRANSISTOR

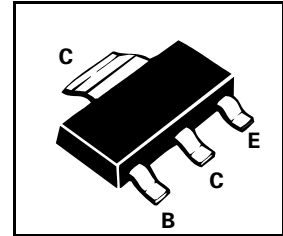
FZT968

ISSUE 3 – OCTOBER 1995

FEATURES

- * Extremely low equivalent on-resistance; $R_{CE(sat)} = 44m\Omega$ at 5A
- * 6 Amps continuous current (Up to 20 Amps peak)
- * High gain and very low saturation voltage

PARTMARKING DETAIL – FZT968



ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	VALUE	UNIT
Collector-Base Voltage	V_{CBO}	-15	V
Collector-Emitter Voltage	V_{CEO}	-12	V
Emitter-Base Voltage	V_{EBO}	-6	V
Peak Pulse Current	I_{CM}	-20	A
Continuous Collector Current	I_C	-6	A
Power Dissipation at $T_{amb}=25^\circ C$	P_{tot}	3	W
Operating and Storage Temperature Range	$T_j; T_{stg}$	-55 to +150	$^\circ C$

ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^\circ C$ unless otherwise stated)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.		
Breakdown Voltages	$V_{(BR)CBO}$	-15	-28		V	$I_C = -100\mu A$		
	$V_{(BR)CEO}$	-12	-20		V	$I_C = -10mA^*$		
	$V_{(BR)EBO}$	-6	-8		V	$I_E = -100\mu A$		
Collector Cut-Off Current	I_{CBO}			-10 -1.0	nA μA	$V_{CB} = -12V$ $V_{CB} = -12V, T_{amb} = 100^\circ C$		
Emitter Cut-Off Current	I_{EBO}			-10	nA	$V_{EB} = -6V$		
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		-65 -132 -360	-130 -170 -450	mV mV mV	$I_C = -500mA, I_B = -5mA^*$ $I_C = -2A, I_B = -50mA^*$ $I_C = -6A, I_B = -250mA^*$		
		Base-Emitter Saturation Voltage	$V_{BE(sat)}$		-1050	-1200	mV	$I_C = -6A, I_B = -250mA^*$
		Base-Emitter Turn-On Voltage	$V_{BE(on)}$		-870	-1050	mV	$I_C = -6A, V_{CE} = -1V^*$
Static Forward Current Transfer Ratio	h_{FE}	300	450	1000		$I_C = -10mA, V_{CE} = -1V^*$ $I_C = -500mA, V_{CE} = -1V^*$ $I_C = -5A, V_{CE} = -1V^*$ $I_C = -10A, V_{CE} = -1V^*$ $I_C = -20A, V_{CE} = -1V^*$		
		300	450					
		200	300					
		150	240					
		150	50					
Transition Frequency	f_T		80		MHz	$I_C = -100mA, V_{CE} = -10V$ $f = 50MHz$		
Output Capacitance	C_{obo}		161		pF	$V_{CB} = -20V, f = 1MHz$		
Switching Times	t_{on} t_{off}		120		ns	$I_C = -4A, I_B = -400mA$ $I_B = 400mA, V_{CE} = -10V$		
			116		ns			

*Measured under pulsed conditions. Pulse width=300 μs . Duty cycle $\leq 2\%$
Spice parameter data is available upon request for this device

TYPICAL CHARACTERISTICS

