A Product Line of
Diodes Incorporated

ZXTP03200BG
200V PNP Low V_{CE}(sat) transistor in SOT223

Summary

BV_{CEO} > -200V

BV_{ECO} > -2V

$I_{C(cont)}$ = 2A

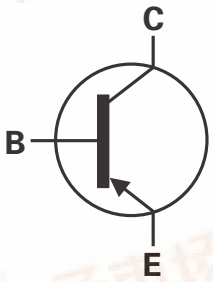
$V_{CE(sat)}$ < -160mV @ -1A

$R_{CE(sat)}$ = 135mΩ

P_D = 3W

Description

Packaged in the SOT223 outline this new 5th generation low saturation 200V PNP transistor offers extremely low on state losses making it ideal for use in DC-DC circuits and various driving and power management functions

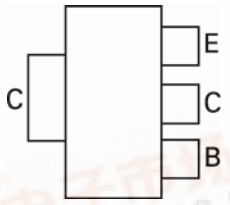


Features

- 2 Amps continuous current
- Up to 5 Amps peak current
- Very low saturation voltage
- Enhanced switching performance

Applications

- DC-DC conversion



Pin out - top view

Ordering Information

Device	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTP03200BGTA	7	12	1000

Device Marking

ZXTP03200BG

Absolute Maximum Ratings

Parameter	Symbol	Limit	Unit
Collector-Base Voltage	V_{CBO}	-220	V
Collector-Emitter Voltage	V_{CEO}	-200	V
Emitter-Base Voltage	V_{EBO}	-7	V
Continuous Collector Current (a)	I_C	-2	A
Base Current	I_B	-1	A
Peak Pulse Current	I_{CM}	-5	A
Power Dissipation at T_A=25°C (a) Linear Derating Factor	P_D	1.25 10	W mW/°C
Power Dissipation at T_A=25°C (b) Linear Derating Factor	P_D	1.65 13.2	W mW/°C
Power Dissipation at T_A=25°C (c) Linear Derating Factor	P_D	3 24	W mW/°C
Power Dissipation at T_A=25°C (d) Linear Derating Factor	P_D	5.8 46.5	W mW/°C
Power Dissipation at T_C=25°C (e) Linear Derating Factor	P_D	11.9 95.2	W mW/°C
Operating and Storage Temperature Range	T_j, T_{stg}	-55 to 150	°C

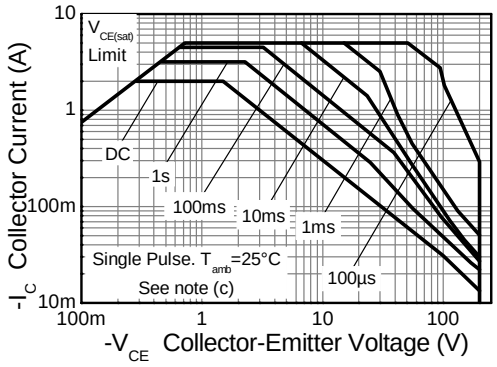
Thermal Resistance

Parameter	Symbol	Value	Unit
Junction to Ambient (a)	$R_{\theta JA}$	100	°C/W
Junction to Ambient (b)	$R_{\theta JA}$	76	°C/W
Junction to Ambient (c)	$R_{\theta JA}$	41.6	°C/W
Junction to Ambient (d)	$R_{\theta JA}$	21.5	°C/W
Junction to Lead (e)	$R_{\theta JL}$	10.5	°C/W

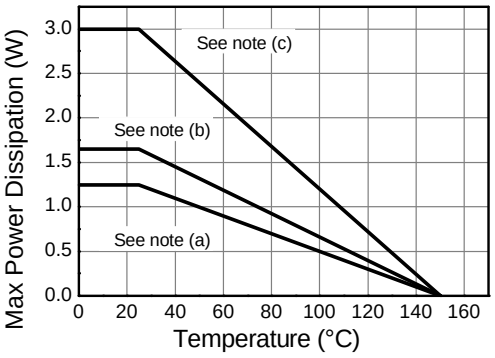
NOTES:

(a) For a device surface mounted on 15mm x 15mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.
(b) Mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.
(c) Mounted on 50mm x 50mm x 1.6mm FR4 PCB with high coverage of single sided 2oz copper, in still air conditions.
(d) As (c) above measured at t<5 seconds.
(e) Junction to Lead from Collector Tab.Typical

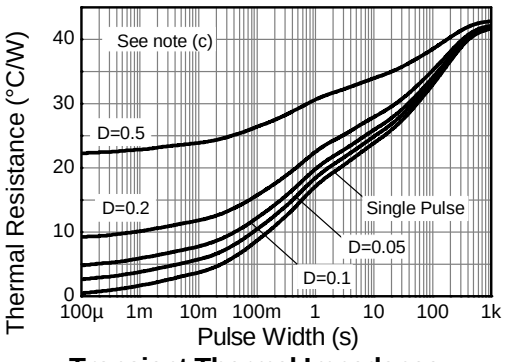
Thermal Characteristics



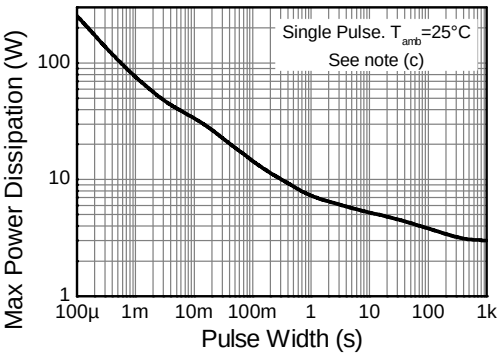
Safe Operating Area



Derating Curve



Transient Thermal Impedance



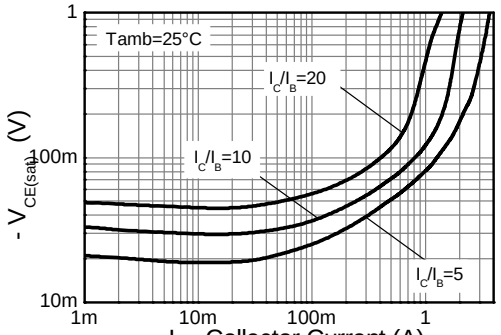
Pulse Power Dissipation

Electrical Characteristics (at T_{amb} = 25°C unless otherwise stated)

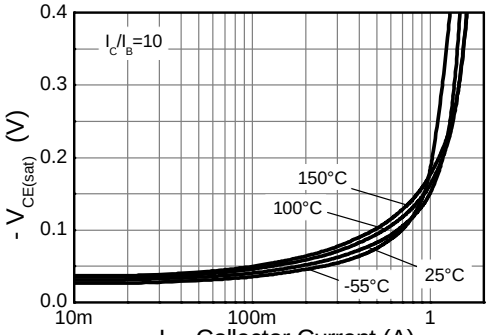
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-Base Breakdown Voltage	BV_{CBO}	-220	-245		V	I_C = -100μA
Collector-Emitter Breakdown Voltage	BV_{CER}	-220	-245		V	I_C = -1μA, $R_{BE} \leq$ 1kΩ
Collector-Emitter Breakdown voltage	BV_{CEO}	-200	-225		V	I_C = -10mA (*)
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	-8.4		V	I_E = -100μA
Collector-Base Cut-off Current	I_{CBO}		<1 	-50 -0.5	nA μA	V_{CB}= -200V V_{CB}= -200V,T_{amb}=100˚C
Emitter Cut-off Current	I_{EBO}		<1	-10	nA	V_{EB}= -6V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		-37 -130 -135 -180	-50 -155 -160 -275	mV mV mV mV	I_C = -0.1A, I_B = -10mA (*) I_C = -0.5A, I_B = -25mA (*) I_C = -1A, I_B = -100mA (*) I_C = -2A, I_B = -400mA (*)
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		-955	-1100	mV	I_C = -2A, I_B = -400mA (*)
Base-Emitter Turn-On Voltage	$V_{BE(on)}$		-860	-1000	mV	I_C = -2A, V_{CE} = -5V (*)
Static Forward Current Transfer Ratio	h_{FE}	100 100 20	195 170 50 5	300		I_C = -10mA, V_{CE} = -5V (*) I_C = -1A, V_{CE} = -5V (*) I_C = -2A, V_{CE} = -5V (*) I_C = -5A, V_{CE} = -5V (*)
Transition Frequency	f_T		105		MHz	I_C = -100mA, V_{CE}= -10V f = 50MHz
Output Capacitance	C_{obo}		31		pF	V_{CB} = -10V,f = 1MHz (*)
Delay Time	t_d		21		ns	I_C = -1A, V_{CC} = -50V, I_{B1} = -I_{B2} = -100mA
Rise Time	t_r		18		ns	
Storage Time	t_s		680		ns	
Fall Time	t_f		75		ns	

NOTES:
(*) Measured under pulsed conditions. Pulse width ≤ 300μs; duty cycle ≤ 2%.

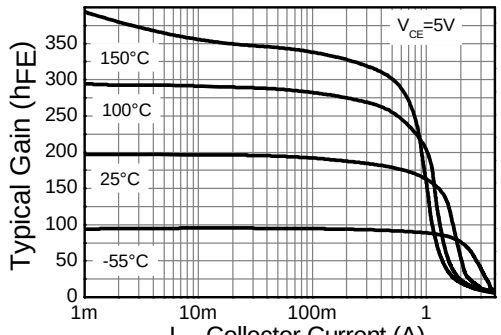
Typical Characteristics



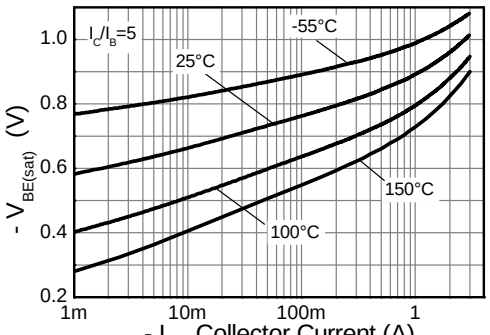
$V_{CE(sat)}$ v I_C



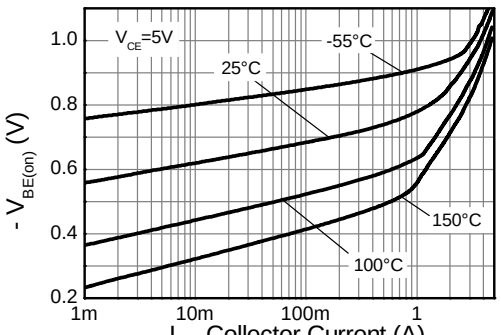
$V_{CE(sat)}$ v I_C



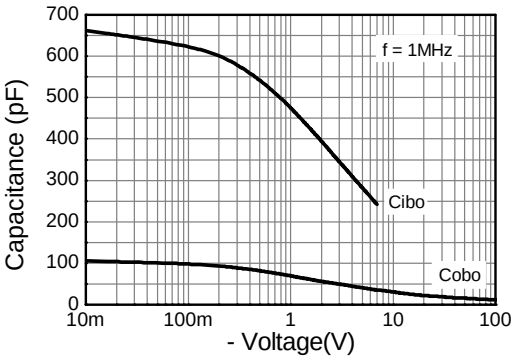
h_{FE} v I_C



$V_{BE(sat)}$ v I_C



$V_{BE(on)}$ v I_C



Capacitance v Voltage

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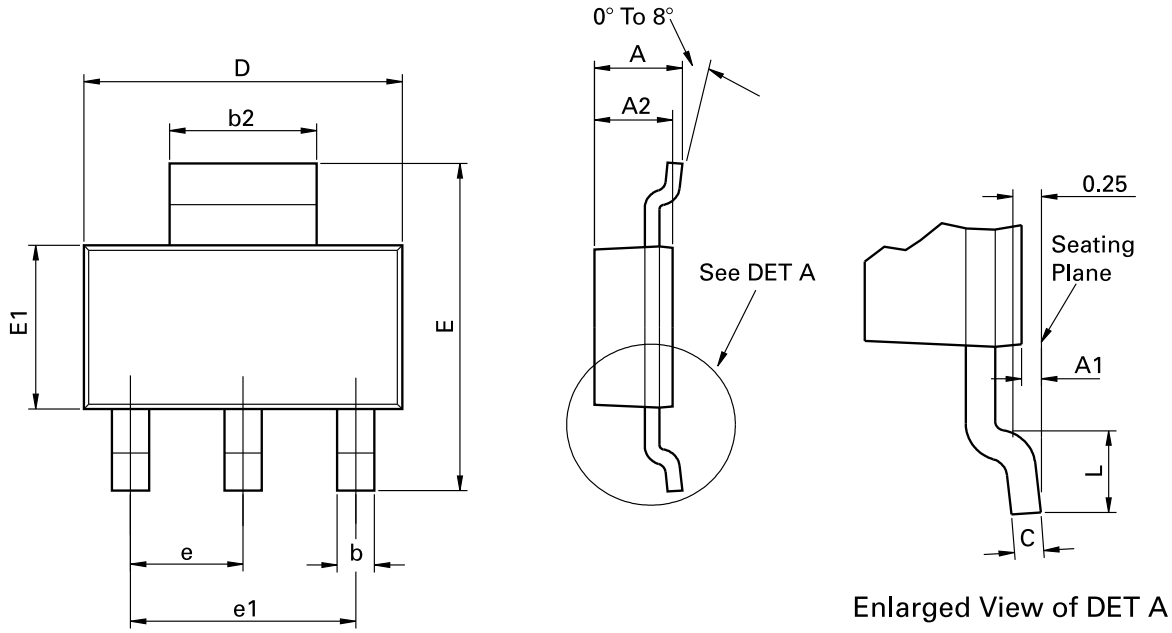
Package Information – SOT223



Conforms to JEDEC TO-261 AA Issue B

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min	Max	Min	Max		Min	Max	Min	Max
A	-	1.80	-	0.071	e	2.30 BSC		0.0905 BSC	
A1	0.02	0.10	0.0008	0.004	e1	4.60 BSC		0.181 BSC	
b	0.66	0.84	0.026	0.033	E	6.70	7.30	0.264	0.287
b2	2.90	3.10	0.114	0.122	E1	3.30	3.70	0.130	0.146
C	0.23	0.33	0.009	0.013	L	0.90	-	0.355	-
D	6.30	6.70	0.248	0.264	-	-	-	-	-

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or

   2. support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in significant injury to the user.

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Product status key:

"Preview"	Future device intended for production at some point. Samples may be available
"Active"	Product status recommended for new designs
"Last time buy (LTB)"	Device will be discontinued and last time buy period and delivery is in effect
"Not recommended for new designs"	Device is still in production to support existing designs and production
"Obsolete"	Production has been discontinued

Datasheet status key:

"Draft version"	This term denotes a very early datasheet version and contains highly provisional information, which may change in any manner without notice.
"Provisional version"	This term denotes a pre-release datasheet. It provides a clear indication of anticipated performance. However, changes to the test conditions and specifications may occur, at any time and without notice.
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