

ZXTP25020DG

20V PNP high gain transistor in SOT223

Summary

$BV_{CEO} > -20V$

$BV_{ECO} > -4V$

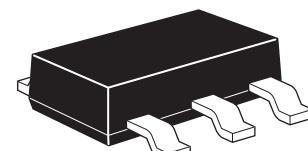
$I_{C(\text{cont})} = 6A$

$V_{CE(\text{sat})} < -65mV @ -1A$

$R_{CE(\text{sat})} = 42m\Omega$

$P_D = 3.0W$

Complementary part number ZXTN25020DG

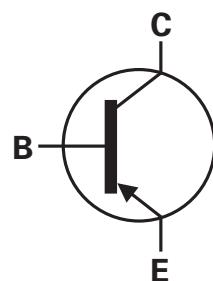


Description

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

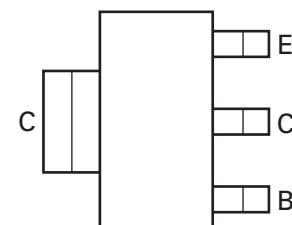
Features

- High peak current
- Low saturation voltage
- High gain
- High power dissipation



Applications

- Load switch
- Motor drive
- Disconnect switch
- Regulator circuit



Ordering information

Device	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTP25020DGTA	7	12	1000

Pinout - top view

Device marking

- ZXTP25
020D

Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Collector-Base voltage	BV_{CBO}	-25	V
Collector-Emitter voltage	BV_{CEO}	-20	V
Emitter-Collector voltage (reverse blocking)	BV_{ECO}	-4	V
Emitter-Base voltage	BV_{EBO}	-7	V
Continuous Collector current ^(c)	I_C	-6	A
Base current	I_B	-1	A
Peak pulse current	I_{CM}	-10	A
Power dissipation at $T_A = 25^\circ\text{C}$ ^(a)	P_D	1.2	W
Linear derating factor		9.6	$\text{mW}/^\circ\text{C}$
Power dissipation at $T_A = 25^\circ\text{C}$ ^(b)	P_D	1.6	W
Linear derating factor		12.8	$\text{mW}/^\circ\text{C}$
Power dissipation at $T_A = 25^\circ\text{C}$ ^(c)	P_D	3	W
Linear derating factor		24	$\text{mW}/^\circ\text{C}$
Power dissipation at $T_A = 25^\circ\text{C}$ ^(d)	P_D	5.3	W
Linear derating factor		42	$\text{mW}/^\circ\text{C}$
Power dissipation at $T_C = 25^\circ\text{C}$ ^(e)	P_D	7.8	W
Linear derating factor		63	$\text{mW}/^\circ\text{C}$
Operating and storage temperature range	T_j, T_{stg}	-55 to 150	$^\circ\text{C}$

Thermal resistance

Parameter	Symbol	Limit	Unit
Junction to ambient ^(a)	$R_{\Theta JA}$	104	$^\circ\text{C}/\text{W}$
Junction to ambient ^(b)	$R_{\Theta JA}$	78	$^\circ\text{C}/\text{W}$
Junction to ambient ^(c)	$R_{\Theta JA}$	42	$^\circ\text{C}/\text{W}$
Junction to ambient ^(d)	$R_{\Theta JA}$	23.5	$^\circ\text{C}/\text{W}$
Junction to case ^(e)	$R_{\Theta JC}$	16	$^\circ\text{C}/\text{W}$

NOTES:

(a) For a device surface mounted on 15mm x 15mm x 0.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

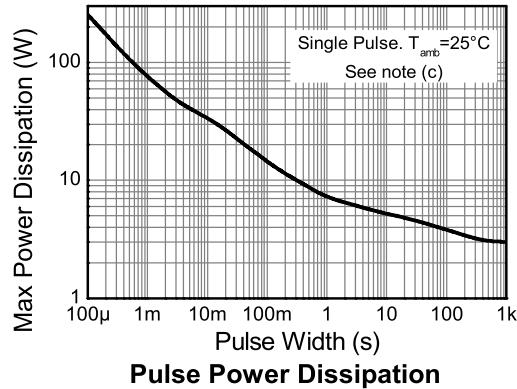
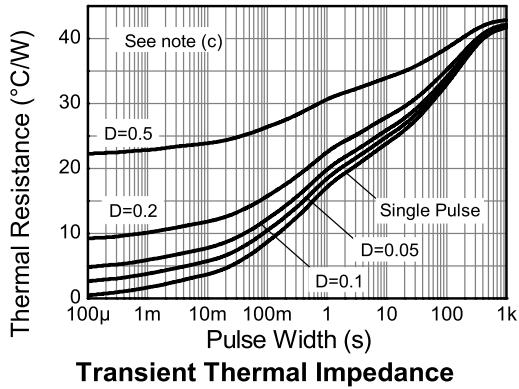
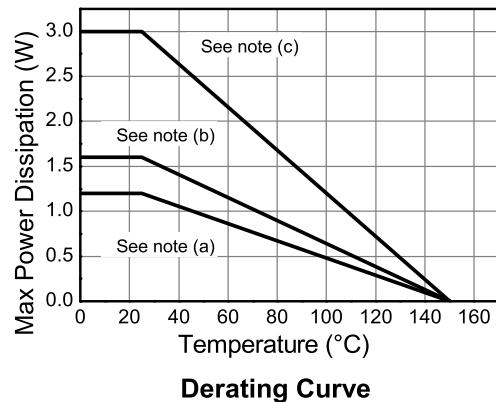
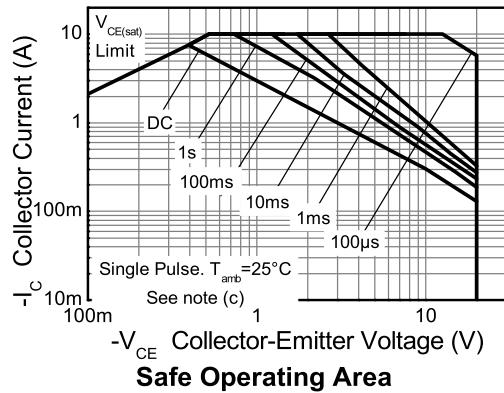
(b) Mounted on 25mm x 25mm x 0.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

(c) Mounted on 50mm x 50mm x 0.6mm 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 case (collector tab). Typical.

Thermal characteristics



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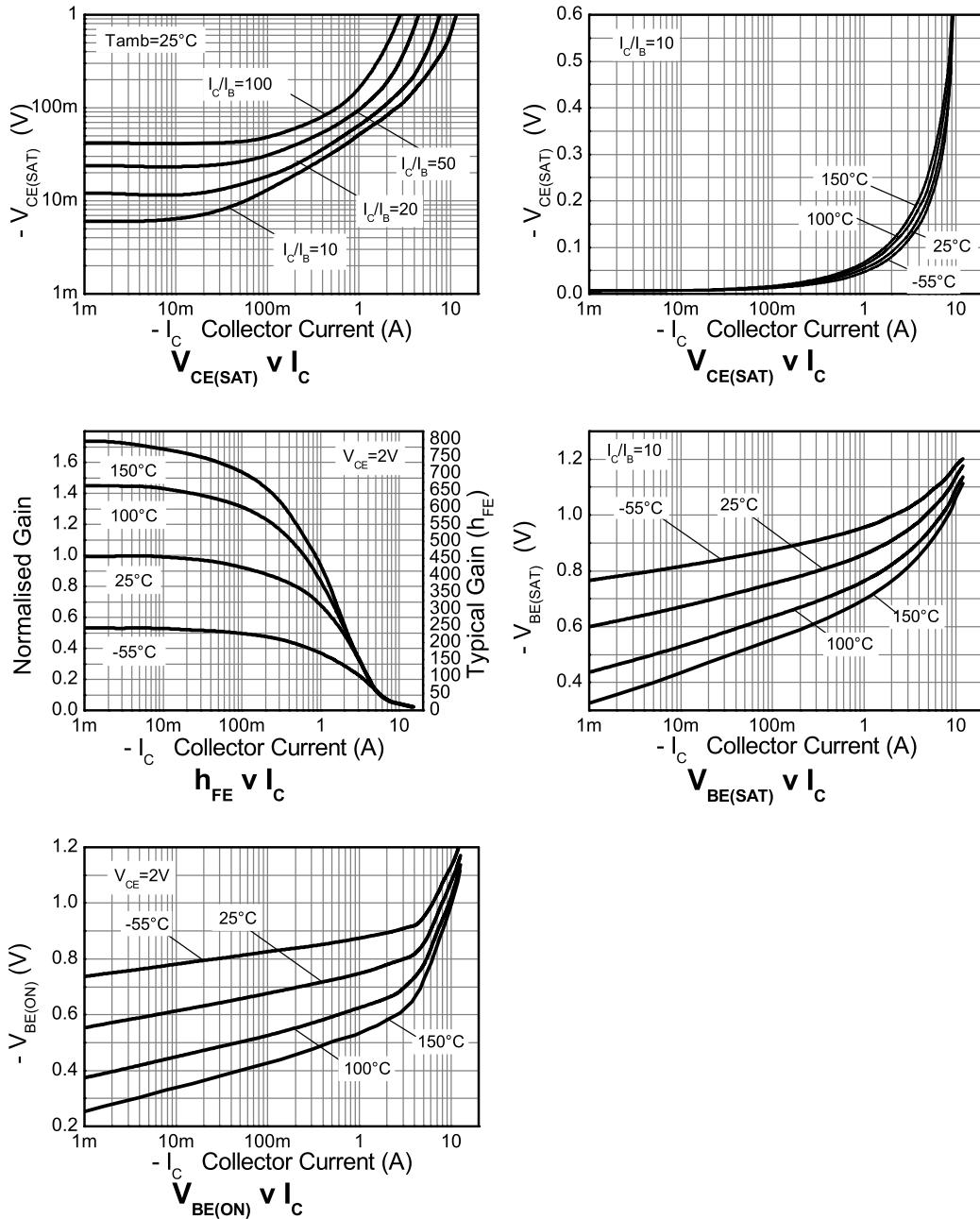
Electrical characteristics (at $T_{amb} = 25^\circ C$ unless otherwise stated)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-Base breakdown voltage	BV_{CBO}	-25	-55		V	$I_C = -100\mu A$
Collector-Emitter breakdown voltage	BV_{CEO}	-20	-45		V	$I_C = -10mA$ (*)
Emitter-Collector breakdown voltage (reverse blocking)	BV_{ECX}	-4	-8.5		V	$I_E = -100\mu A, R_{BC} < 1k\Omega$ or $0.25V > V_{BC} > -0.25V$
Emitter-Collector breakdown voltage (reverse blocking)	BV_{ECO}	-4	-8.5		V	$I_E = -100\mu A$
Emitter-Base breakdown voltage	BV_{EBO}	-7	-8.3		V	$I_E = -100\mu A$
Collector-Base cut-off current	I_{CBO}		<1	50 0.5	nA μA	$V_{CB} = -25V$ $V_{CB} = -25V, T_{amb} = 100^\circ C$
Emitter cut-off current	I_{EBO}		<1	100	nA	$V_{EB} = -5.6V$
Collector-Emitter saturation voltage	$V_{CE(sat)}$		-50 -150 -190 -250	-65 -215 -245 -355	mV mV mV mV	$I_C = -1A, I_B = -100mA$ (*) $I_C = -1A, I_B = -10mA$ (*) $I_C = -2A, I_B = -40mA$ (*) $I_C = -6A, I_B = -600mA$ (*)
Base-Emitter saturation voltage	$V_{BE(sat)}$		-1050	-1150	mV	$I_C = -6A, I_B = -600mA$ (*)
Base-Emitter turn-on voltage	$V_{BE(on)}$		-910	-1000	mV	$I_C = -6A, V_{CE} = -2V$ (*)
Static forward current transfer ratio	h_{FE}	300 200 25	450 310 50 20	900		$I_C = -10mA, V_{CE} = -2V$ (*) $I_C = -1A, V_{CE} = -2V$ (*) $I_C = -6A, V_{CE} = -2V$ (*) $I_C = -10A, V_{CE} = -2V$ (*)
Transition frequency	f_T		290		MHz	$I_C = -50mA, V_{CE} = -10V$ $f = 50MHz$
Input capacitance	C_{ibo}		157	400	pF	$V_{EB} = -0.5V, f = 1MHz$ (*)
Output capacitance	C_{obo}		21	30	pF	$V_{CB} = -10V, f = 1MHz$ (*)
Delay time	t_d		14.2		ns	$I_C = -1A, V_{CC} = -10V$, $I_{B1} = -I_{B2} = -50mA$
Rise time	t_r		16.3		ns	
Storage time	t_s		186		ns	
Fall time	t_f		32.7		ns	

NOTES:

(*) Measured under pulsed conditions. Pulse width $\leq 300\mu s$; duty cycle $\leq 2\%$.

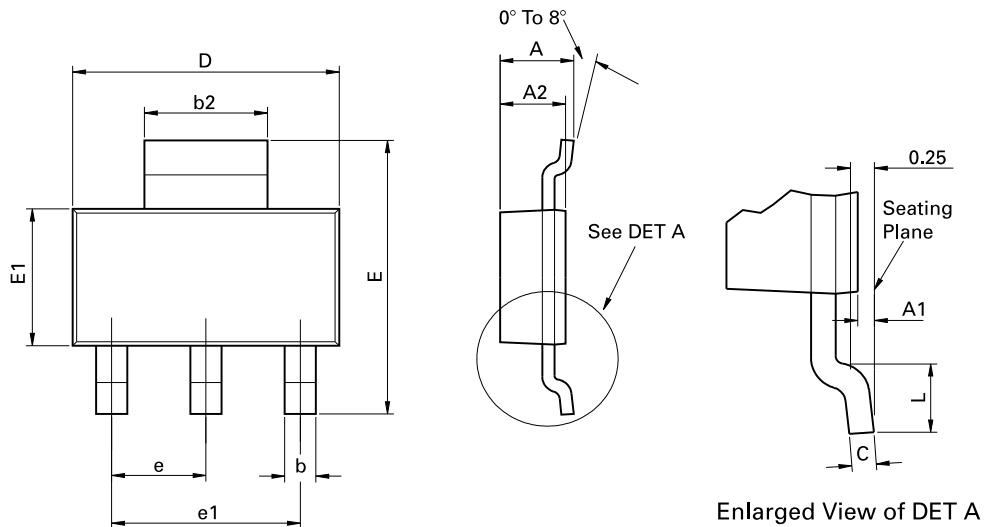
Typical characteristics



ZXTP25020DG

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Package outline - 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	D	6.30	6.70	0.248	0.264
A1	0.02	0.10	0.0008	0.004	e	2.30 BSC		0.0905 BSC	
A2	1.55	1.65	0.0610	0.0649	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	-

Note: Controlling dimensions are in millimeters. Approximate dimensions are provided in inches

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