

ZXTP19020DG

20V PNP high gain transistor in SOT223

Summary

$BV_{CEO} > -20V$

$BV_{ECO} > -4V$

$I_{C(cont)} = 8A$

$V_{CE(sat)} < -47mV @ -1A$

$R_{CE(sat)} = 28m\Omega$

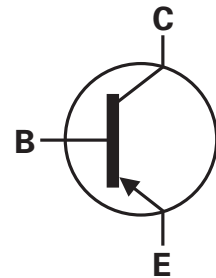
$P_D = 3.0W$

Complementary part number ZXTN19020DG



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

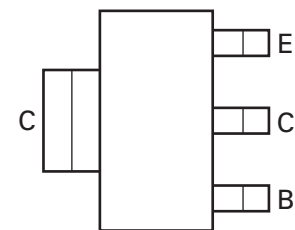
- Higher power dissipation SOT223 package
- High gain
- High peak current
- Low saturation voltages
- 4V reverse blocking voltage

Applications

- Power disconnect switch
- High side drivers
- Motor drive

Ordering information

Device	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTP19020DGTA	7	12	1000



Pinout - top view

Device marking

ZXTP19020D

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Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Collector-Base voltage	V_{CBO}	-25	V
Collector-Emitter voltage	V_{CEO}	-20	V
Emitter-Collector voltage (reverse blocking)	V_{ECO}	-4	V
Emitter-Base voltage	V_{EBO}	-7	V
Continuous Collector current ^(c)	I_C	-8	A
Base current	I_B	-1	A
Peak pulse current	I_{CM}	-15	A
Power dissipation at $T_A = 25^\circ\text{C}^{(a)}$	P_D	1.2	W
Linear derating factor		9.6	mW/°C
Power dissipation at $T_A = 25^\circ\text{C}^{(b)}$	P_D	1.6	W
Linear derating factor		12.8	mW/°C
Power dissipation at $T_A = 25^\circ\text{C}^{(c)}$	P_D	3.0	W
Linear derating factor		24	mW/°C
Power dissipation at $T_A = 25^\circ\text{C}^{(d)}$	P_D	5.3	W
Linear derating factor		42	mW/°C
Power dissipation at $T_C = 25^\circ\text{C}^{(e)}$	P_D	10.2	W
Linear derating factor		81	mW/°C
Operating and storage temperature range	T_j, T_{stg}	-55 to 150	°C

Thermal resistance

Parameter	Symbol	Limit	Unit
Junction to ambient ^(a)	$R_{\theta JA}$	104	°C/W
Junction to ambient ^(b)	$R_{\theta JA}$	78	°C/W
Junction to ambient ^(c)	$R_{\theta JA}$	42	°C/W
Junction to ambient ^(d)	$R_{\theta JA}$	23.5	°C/W
Junction to case ^(e)	$R_{\theta JC}$	12.3	°C/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.

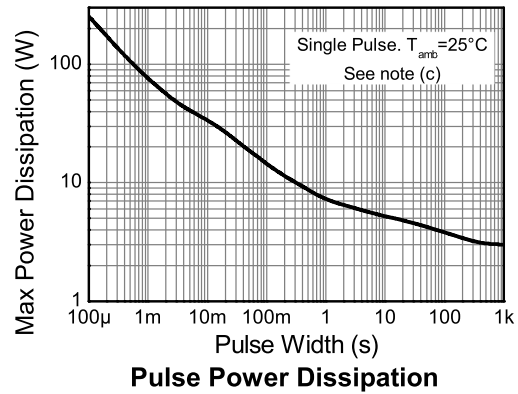
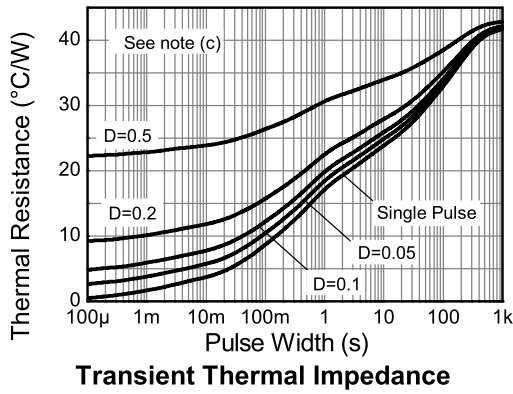
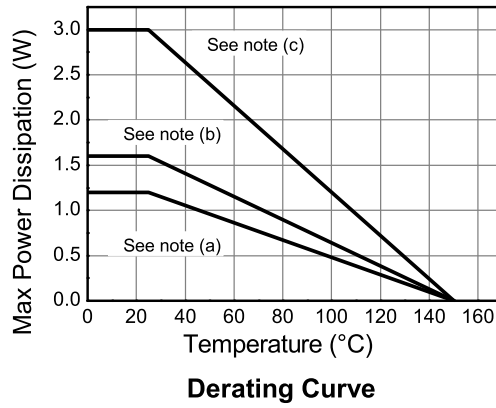
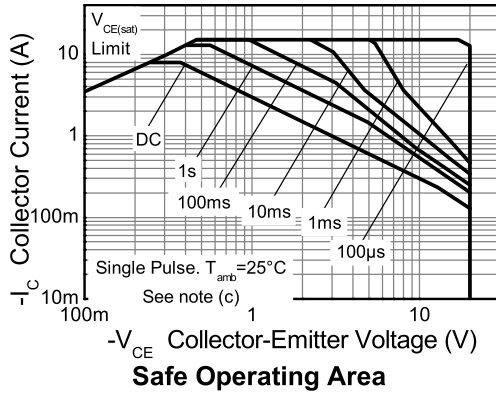
(c) Mounted on 50mm x 50mm x 0.6mm FR4 PCB with high coverage of single sided 2oz copper, in still air conditions.

(d) As (c) above measured at $t < 5$ seconds.

(e) Junction to case (collector tab). Typical

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Thermal characteristics



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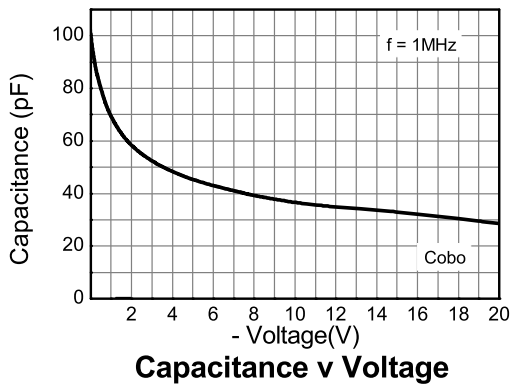
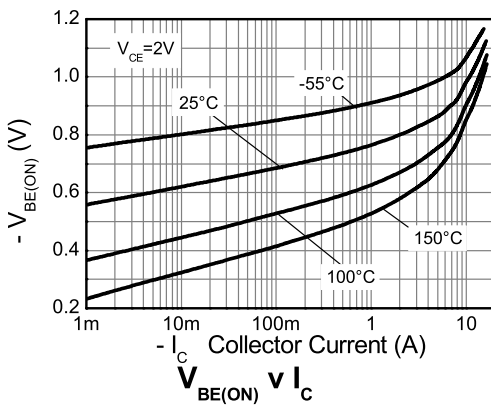
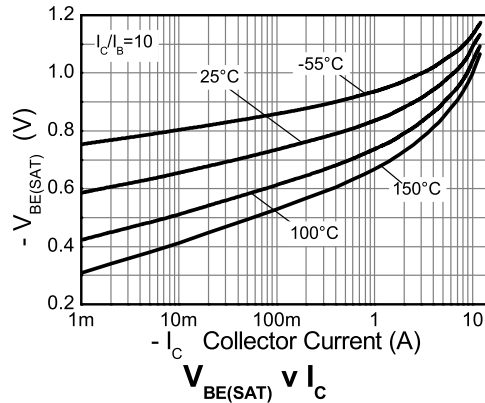
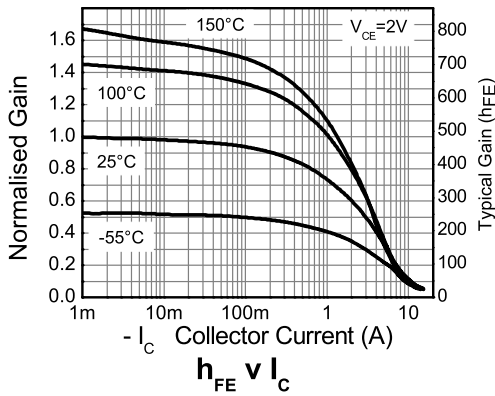
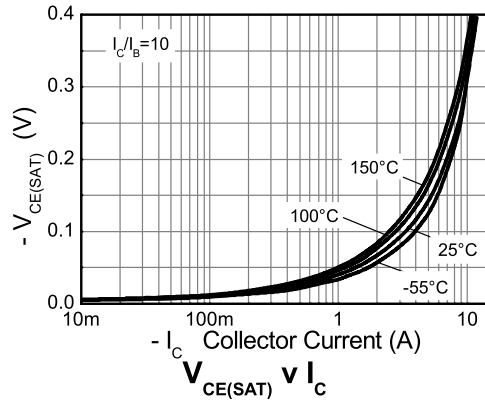
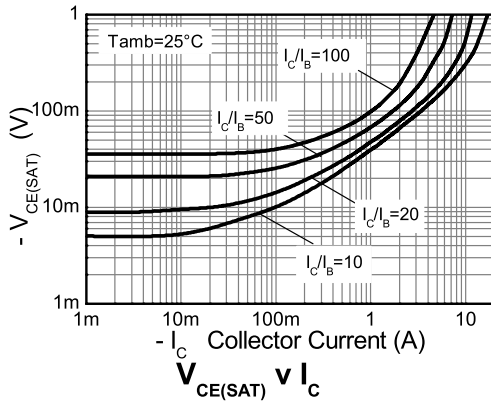
Electrical characteristics (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-Base breakdown voltage	BV_{CBO}	-25	-55		V	$I_C = -100\mu\text{A}$
Collector-Emitter breakdown voltage	BV_{CEO}	-20	-50		V	$I_C = -10\text{mA}^{(*)}$
Emitter-Collector breakdown voltage (reverse blocking)	BV_{ECX}	-4	-8.6		V	$I_E = -100\mu\text{A}$, $R_{BC} < 1\text{k}\Omega$ or $0.25\text{V} > V_{BC} > -0.25\text{V}$
Emitter-Collector breakdown voltage (reverse blocking)	BV_{ECO}	-4	-8.6		V	$I_E = -100\mu\text{A}$
Emitter-Base breakdown voltage	BV_{EBO}	-7	-8.2		V	$I_E = -100\mu\text{A}$
Collector-Base cut-off current	I_{CBO}		<1	50 0.5	nA μA	$V_{CB} = -25\text{V}$ $V_{CB} = -25\text{V}$, $T_{amb} = 100^{\circ}\text{C}$
Emitter cut-off current	I_{EBO}		<1	-50	nA	$V_{EB} = -5.6\text{V}$
Collector-Emitter saturation voltage	$V_{CE(sat)}$		-40 -97 -115 -220	-47 -130 -145 -275	mV mV mV mV	$I_C = -1\text{A}$, $I_B = -100\text{mA}^{(*)}$ $I_C = -1\text{A}$, $I_B = -10\text{mA}^{(*)}$ $I_C = -2\text{A}$, $I_B = -40\text{mA}^{(*)}$ $I_C = -8\text{A}$, $I_B = -800\text{mA}^{(*)}$
Base-Emitter saturation voltage	$V_{BE(sat)}$		-1050	-1150	mV	$I_C = -8\text{A}$, $I_B = -800\text{mA}^{(*)}$
Base-Emitter turn-on voltage	$V_{BE(on)}$		-930	-1000	mV	$I_C = -8\text{A}$, $V_{CE} = -2\text{V}^{(*)}$
Static forward current transfer ratio	h_{FE}	300 200 45	450 290 70 25	900		$I_C = -100\text{mA}$, $V_{CE} = -2\text{V}^{(*)}$ $I_C = -2\text{A}$, $V_{CE} = -2\text{V}^{(*)}$ $I_C = -8\text{A}$, $V_{CE} = -2\text{V}^{(*)}$ $I_C = -15\text{A}$, $V_{CE} = -2\text{V}^{(*)}$
Transition frequency	f_T		176		MHz	$I_C = -50\text{mA}$, $V_{CE} = -10\text{V}$ $f = 50\text{MHz}$
Input capacitance	C_{ibo}			400	pF	$V_{EB} = -0.5\text{V}$, $f = 1\text{MHz}^{(*)}$
Output capacitance	C_{obo}		36	45	pF	$V_{CB} = -10\text{V}$, $f = 1\text{MHz}^{(*)}$
Delay time	t_d		23		ns	$I_C = -1\text{A}$, $V_{CC} = -10\text{V}$, $I_{B1} = -I_{B2} = -50\text{mA}$
Rise time	t_r		18.4		ns	
Storage time	t_s		266		ns	
Fall time	t_f		49.6		ns	

NOTES:

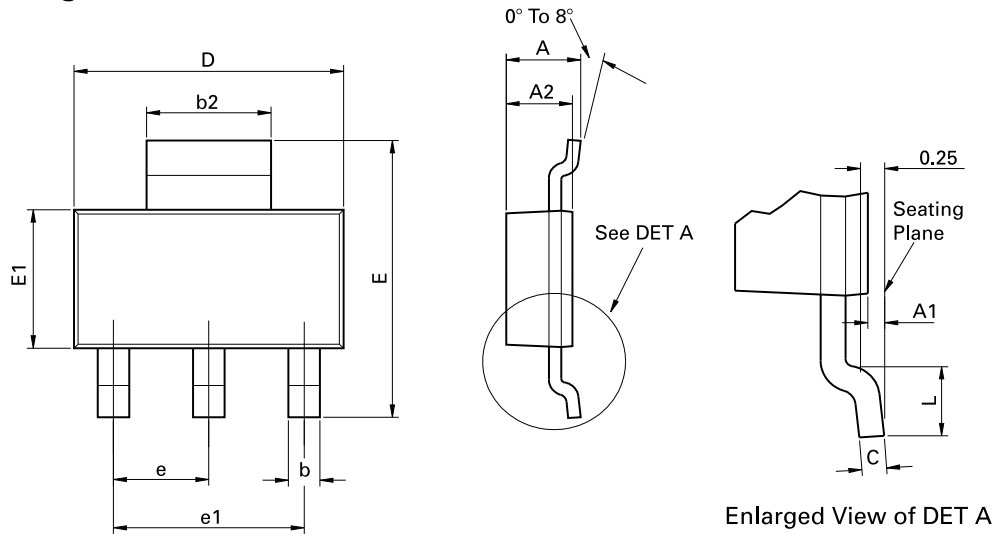
(*) Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.

Typical characteristics



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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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Europe	Americas	Asia Pacific	Corporate Headquarters
Zetex GmbH Kustermann-park Balanstraße 59 D-81541 München Germany Telephone: (49) 89 45 49 49 0 Fax: (49) 89 45 49 49 49 europe.sales@zetex.com	Zetex Inc 700 Veterans Memorial Highway Hauppauge, NY 11788 USA Telephone: (1) 631 360 2222 Fax: (1) 631 360 8222 usa.sales@zetex.com	Zetex (Asia Ltd) 3701-04 Metroplaza Tower 1 Hing Fong Road, Kwai Fong Hong Kong Telephone: (852) 26100 611 Fax: (852) 24250 494 asia.sales@zetex.com	Zetex Semiconductors plc Zetex Technology Park, Chadderton Oldham, OL9 9LL United Kingdom Telephone: (44) 161 622 4444 Fax: (44) 161 622 4446 hq@zetex.com

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Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)

Факс: 8 (812) 320-02-42

Электронная почта: org@eplast1.ru

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.