

ZXTP25020DG 20V PNP high gain transistor in SOT223

Summary

 $BV_{CEO} > -20V$ $BV_{ECO} > -4V$ $I_{C(cont)} = 6A$ $V_{CE(sat)} < -65mV @ -1A$ $R_{CE(sat)} = 42m\Omega$ $P_{D} = 3.0W$

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

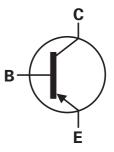
- Load switch
- Motor drive
- Disconnect switch
- Regulator circuit

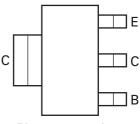
Ordering information

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

Device marking

ZXTP25
020D





Pinout - top view

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)	۱ _C	-6	А
Base current	ا _B	-1	А
Peak pulse current	I _{CM}	-10	А
Power dissipation at $T_A = 25^{\circ}C^{(a)}$	PD	1.2	W
Linear derating factor		9.6	mW/°C
Power dissipation at $T_A = 25^{\circ}C^{(b)}$	PD	1.6	W
Linear derating factor		12.8	mW/°C
Power dissipation at $T_A = 25^{\circ}C^{(C)}$	PD	3	W
Linear derating factor		24	mW/°C
Power dissipation at $T_A = 25^{\circ}C^{(d)}$	PD	5.3	W
Linear derating factor		42	mW/°C
Power dissipation at $T_{C} = 25^{\circ}C^{(e)}$	PD	7.8	W
Linear derating factor		63	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 _{0JA}	104	°C/W
Junction to ambient ^(b)	R _{0JA}	78	°C/W
Junction to ambient ^(c)	R _{0JA}	42	°C/W
Junction to ambient ^(d)	$R_{\Theta JA}$	23.5	°C/W
Junction to case ^(e)	R _{OJC}	16	°C/W

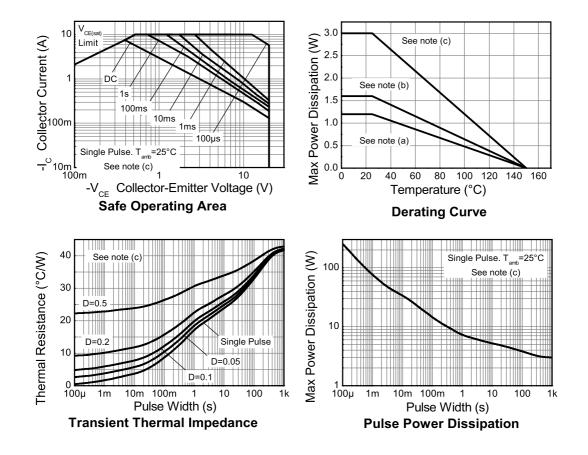
NOTES:

(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.

Thermal characteristics



Parameter	Symbol	Min.	Тур.	Max.	Unit	Conditions
Collector-Base breakdown voltage	BV _{CBO}	-25	-55		V	I _C = -100μA
Collector-Emitter breakdown voltage	BV _{CEO}	-20	-45		V	I _C = -10mA ^(*)
Emitter-Collector breakdown voltage (reverse blocking)	BV _{ECX}	-4	-8.5		V	$I_E = -100$ μA, $R_{BC} < 1$ kΩ or 0.25V > V _{BC} > -0.25V
Emitter-Collector breakdown voltage (reverse blocking)	BV _{ECO}	-4	-8.5		V	I _E = -100μA
Emitter-Base breakdown voltage	BV _{EBO}	-7	-8.3		V	I _E = -100μA
Collector-Base cut-off	I _{CBO}		<1	50	nA	V _{CB} = -25V
current				0.5	μA	V _{CB} = -25V, T _{amb} =100°C
Emitter cut-off current	I _{EBO}		<1	100	nA	V _{EB} = -5.6V
Collector-Emitter	V _{CE(sat)}		-50	-65	mV	$I_{\rm C} = -1A$, $I_{\rm B} = -100 {\rm mA}^{(*)}$
saturation voltage			-150	-215	mV	$I_{\rm C} = -1A$, $I_{\rm B} = -10 {\rm mA}^{(*)}$
			-190	-245	mV	$I_{C} = -2A, I_{B} = -40mA^{(*)}$
			-250	-355	mV	$I_{C} = -6A, I_{B} = -600 \text{mA}^{(*)}$
Base-Emitter saturation voltage	V _{BE(sat)}		-1050	-1150	mV	$I_{C} = -6A, I_{B} = -600 \text{mA}^{(*)}$
Base-Emitter turn-on voltage	V _{BE(on)}		-910	-1000	mV	$I_{C} = -6A, V_{CE} = -2V^{(*)}$
Static forward current	h _{FE}	300	450	900		$I_{C} = -10 \text{mA}, V_{CE} = -2V^{(*)}$
transfer ratio		200	310			$I_{C} = -1A, V_{CE} = -2V^{(*)}$
		25	50			$I_{C} = -6A, V_{CE} = -2V^{(*)}$
			20			$I_{C} = -10A, V_{CE} = -2V^{(*)}$
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	
Rise time	t _r		16.3		ns	$I_{C} = -1A, V_{CC} = -10V,$
Storage time	t _s		186		ns	I _{B1} = -I _{B2} = -50mA
Fall time	t _f		32.7		ns	

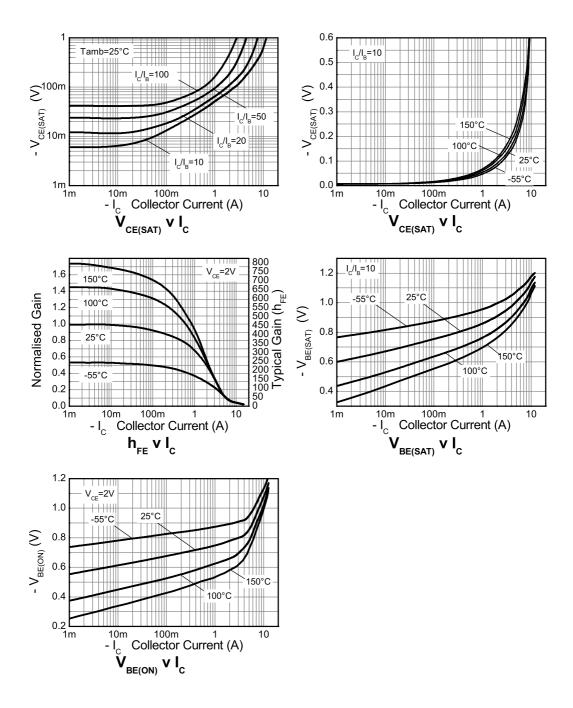
Electrical characteristics (at T_{amb} = 25°C unless otherwise stated)

NOTES:

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

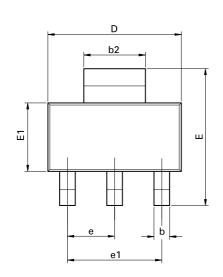


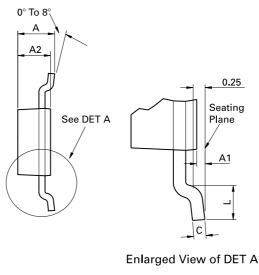
Typical characteristics



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Package outline - SOT223





Conforms to JEDEC TO-261 AA Issue B

Dim.	Millin	neters	Inc	hes	Dim.	Millimeters		Inches	
Dini.	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
Α	-	1.80	-	0.071	D	6.30	6.70	0.248	0.264
A1	0.02	0.10	0.0008	0.004	е	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
С	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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