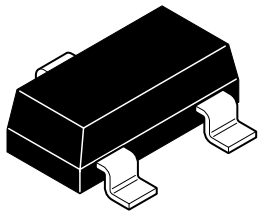
ZXTP25020BFH
20V, SOT23, PNP medium power transistor

Summary



BV_{CEX} > -40V

BV_{CEO} > -20V

BV_{ECO} > -7V

$I_{C(cont)}$ = -4A

$R_{CE(sat)}$ = 32 mΩ

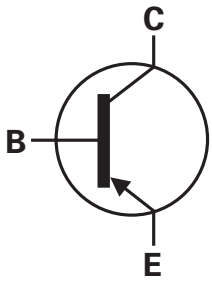
$V_{CE(sat)}$ < -60mV @ 1A

P_D = 1.25W

Complementary part number ZXTN25020BFH

Description

Advanced process capability and package design have been used to maximize the power handling and performance of this small outline transistor. The compact size and ratings of this device make it ideally suited to applications where space is at a premium.

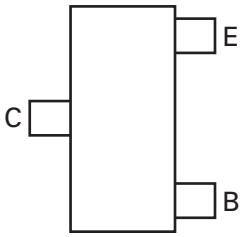


Features

- High power dissipation SOT23 package
- High peak current
- Low saturation voltage
- 40V forward blocking voltage
- 7V reverse blocking voltage

Applications

- MOSFET and IGBT gate driving
- DC - DC converters
- Motor drive
- High side driver
- Battery charging



Pinout - top view

Ordering information

Device	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTP25020BFHTA	7	8	3,000

Device marking

1A9

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Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Collector-base voltage	V_{CBO}	-40	V
Collector-emitter voltage (forward blocking)	V_{CEX}	-40	V
Collector-emitter voltage	V_{CEO}	-20	V
Emitter-collector voltage (reverse blocking)	V_{ECO}	-7	V
Emitter-base voltage	V_{EBO}	-7	V
Continuous collector current[b]	I_C	-4	A
Peak pulse current	I_{CM}	-10	A
Power dissipation at T_{amb} =25°C[a]	P_D	0.73	W
Linear derating factor		5.84	mW/°C
Power dissipation at T_{amb} =25°C[b]	P_D	1.05	W
Linear derating factor		8.4	mW/°C
Power dissipation at T_{amb} =25°C[d]	P_D	1.25	W
Linear derating factor		9.6	mW/°C
Power dissipation at T_{amb} =25°C[d]	P_D	1.81	W
Linear derating factor		14.5	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]	$R_{\Theta JA}$	171	°C/W
Junction to ambient[b]	$R_{\Theta JA}$	119	°C/W
Junction to ambient[c]	$R_{\Theta JA}$	100	°C/W
Junction to ambient[d]	$R_{\Theta JA}$	69	°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.

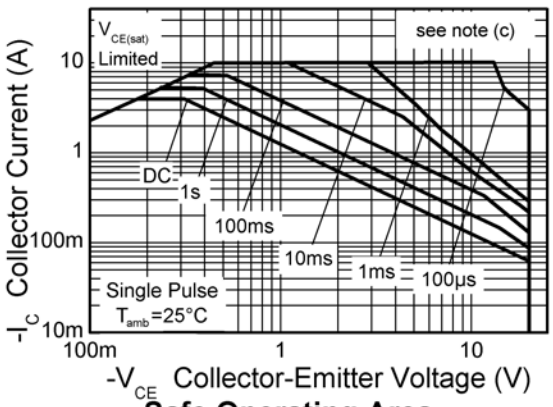
(b) Mounted on 25mm x 25mm x 1.6mm FR4 PCB with a high coverage of single sided 2 oz copper in still air conditions.

(c) Mounted on 50mm x 50mm x 1.6mm FR4 PCB with a high coverage of single sided 2 oz copper in still air conditions.

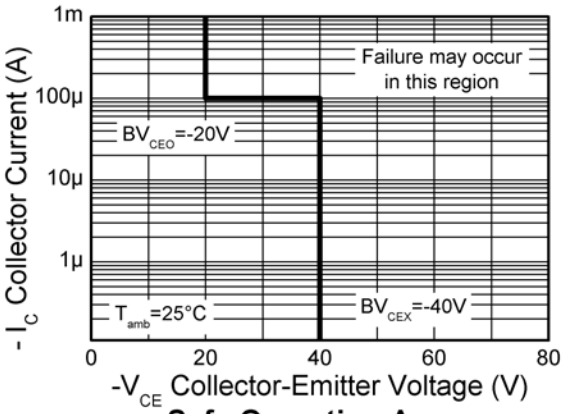
(d) As (c) above measured at t<5secs.

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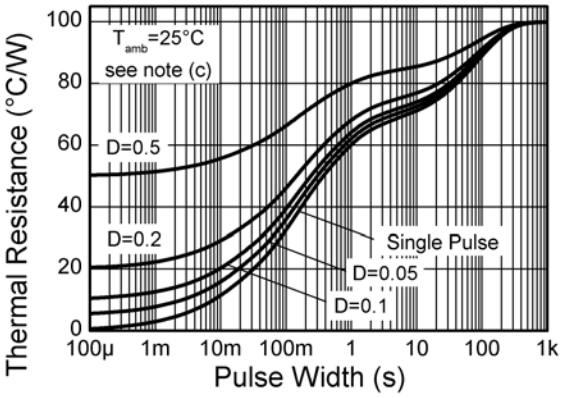
Characteristics



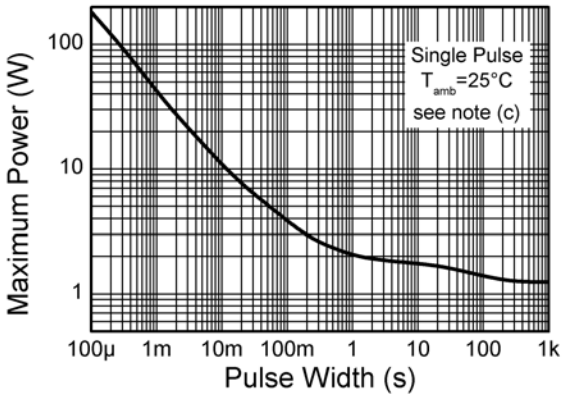
Safe Operating Area



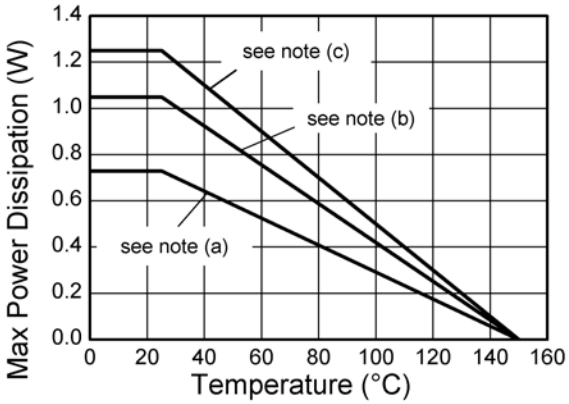
Safe Operating Area



Transient Thermal Impedance



Pulse Power Dissipation



Derating Curve

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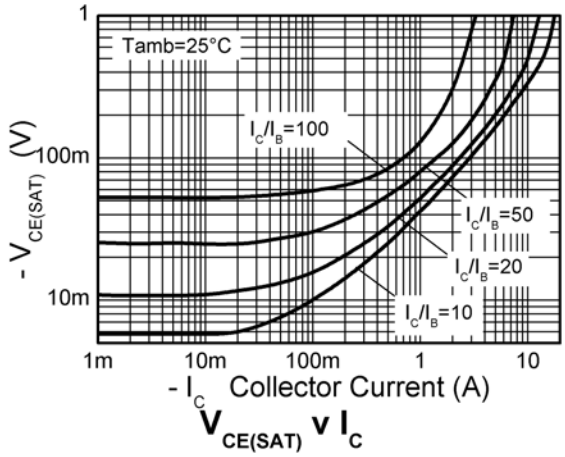
Electrical characteristics (at T_{amb} = 25°C unless otherwise stated)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	-40	-60		V	I_C = -100μA
Collector-emitter breakdown voltage (forward blocking)	BV_{CEX}	-40	-60		V	I_E = -100μA (*) R_{BE} < 1kΩ or 1V < V_{BE} < -0.25V
Collector-emitter breakdown voltage (base open)	BV_{CEO}	-20	-35		V	I_C = -10mA(*)
Emitter-base breakdown voltage	BV_{EBO}	-7	-8.2		V	I_E = -100μA
Emitter-collector breakdown voltage (reverse blocking)	BV_{ECX}	-6	-8		V	I_E = -100μA (*) R_{BC} < 10kΩ or 0.25 < V_{BC} < -0.25V
Emitter-collector breakdown voltage (base open)	BV_{ECO}	-7	-8.6		V	I_E = -100μA(*)
Collector-base cut-off current	I_{CBO}		<-1	-50	nA	V_{CB} = -32V
				-20	μA	V_{CB} = -32V, T_{amb}= 100°C
Collector-emitter cut-off current	I_{CEX}		-	100	nA	V_{CE} = -32V; R_{BE} < 1kΩ or 1V < V_{BE} < -0.25V
Emitter-base cut-off current	I_{EBO}		<-1	-50	nA	V_{EB} = -5.6V
Collector-emitter saturation voltage	$V_{CE(sat)}$		-44	-60	mV	I_C = -1A, I_B = -100mA(*)
			-80	-110	mV	I_C = -1A, I_B = -20mA(*)
			-125	-190	mV	I_C = -2A, I_B = -40mA(*)
			-160	-210	mV	I_C = -4A, I_B = -200mA(*)
			-160	-210	mV	I_C = -5A, I_B = -500mA(*)
Base-emitter saturation voltage	$V_{BE(sat)}$		-930	-1000	mV	I_C = -4A, I_B = -200mA(*)
Base-emitter turn-on voltage	$V_{BE(on)}$		-820	-900	mV	I_C = -4A, V_{CE} = -2V(*)
Static forward current transfer ratio	h_{FE}	100	200	300		I_C = -10mA, V_{CE} = -2V(*)
		80	160			I_C = -1A, V_{CE} = -2V(*)
		50	100			I_C = -4A, V_{CE} = -2V(*)
			45			I_C = -10A, V_{CE} = -2V(*)
Transition frequency	f_T		250		MHz	I_C = -50mA, V_{CE} = -10V f = 100MHz
Output capacitance	C_{OBO}		32.5	40	pF	V_{CB} = -10V, f = 1MHz(*)
Delay time	t_d		53		ns	V_{CC} = -15V, I_C = -750mA, I_{B1} = I_{B2}= -15mA
Rise time	t_r		63		ns	
Storage time	t_s		128		ns	
Fall time	t_f		50		ns	

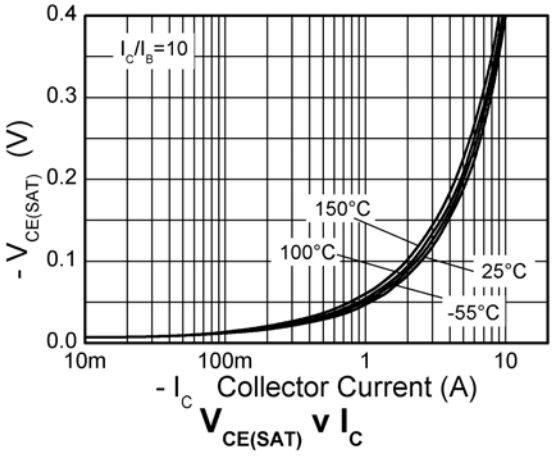
NOTES:
(*) Measured under pulsed conditions. Pulse width ≤ 300μs; duty cycle ≤ 2%.

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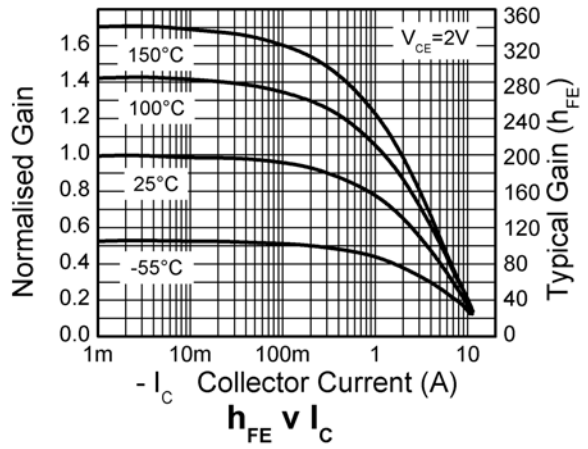
Typical characteristics



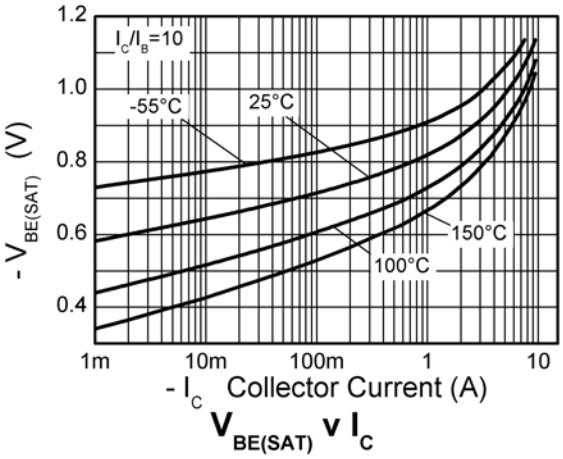
$V_{CE(SAT)}$ v I_C



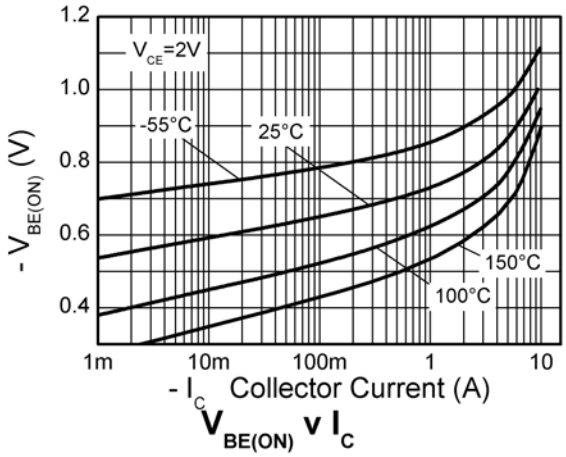
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C



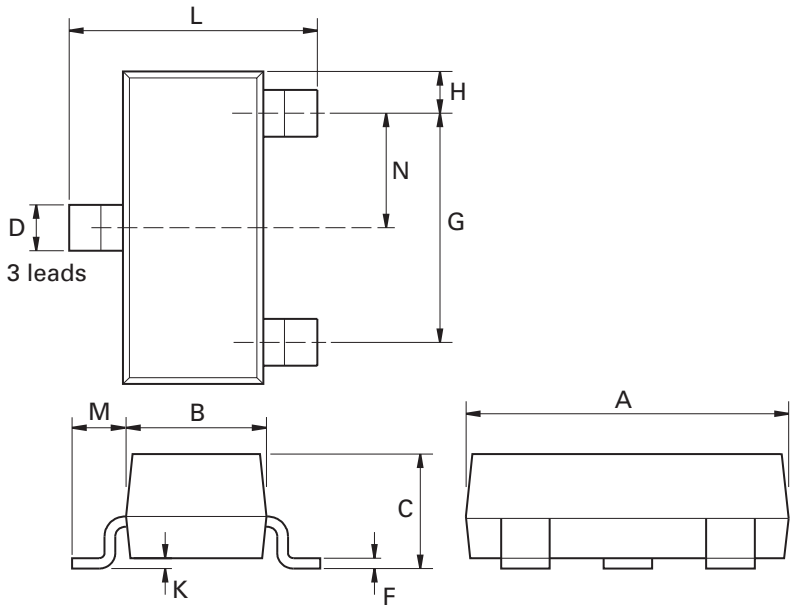
$V_{BE(SAT)}$ v I_C



$V_{BE(ON)}$ v I_C

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Package outline - SOT23



Dim.	Millimeters		Inches		Dim.	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Max.	Max.
A	2.67	3.05	0.105	0.120	H	0.33	0.51	0.013	0.020
B	1.20	1.40	0.047	0.055	K	0.01	0.10	0.0004	0.004
C	-	1.10	-	0.043	L	2.10	2.50	0.083	0.0985
D	0.37	0.53	0.015	0.021	M	0.45	0.64	0.018	0.025
F	0.085	0.15	0.0034	0.0059	N	0.95 NOM		0.0375 NOM	
G	1.90 NOM		0.075 NOM		-	-	-	-	-

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

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