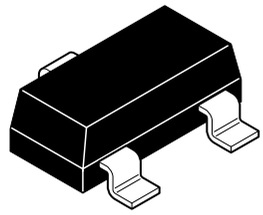
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ZXTN25060BFH
60V, SOT23, NPN medium power transistor

Summary



BV_{CEX} > 150V

BV_{CEO} > 60V

BV_{ECO} > 6V

$I_{C(cont)}$ = 3.5A

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

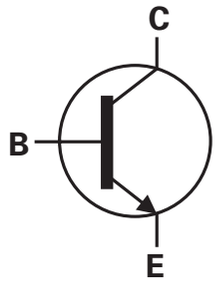
$R_{CE(sat)}$ = 43 mΩ

P_D = 1.25W

Complementary part number ZXTP25060BFH

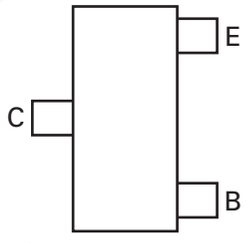
Description

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
- 150V forward blocking voltage



Pinout - top view

Applications

- Lamp, relay and solenoid drivers
- General switching in automotive and industrial applications
- Motor drive and control

Ordering information

Device	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTN25060BFHTA	7	8	3,000

Device marking

019

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Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Collector-base voltage	V_{CBO}	150	V
Collector-emitter voltage (forward blocking)	V_{CEX}	150	V
Collector-emitter voltage	V_{CEO}	60	V
Emitter-collector voltage (reverse blocking)	V_{ECO}	6	V
Emitter-base voltage	V_{EBO}	7	V
Continuous collector current (b)	I_C	3.5	A
Peak pulse current	I_{CM}	10	A
Power dissipation at T_A =25°C (a) Linear derating factor	P_D	0.73 5.84	W mW/°C
Power dissipation at T_A =25°C (b) Linear derating factor	P_D	1.05 8.4	W mW/°C
Power dissipation at T_A =25°C (c) Linear derating factor	P_D	1.25 9.6	W mW/°C
Power dissipation at T_A =25°C (d) Linear derating factor	P_D	1.81 14.5	W 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.

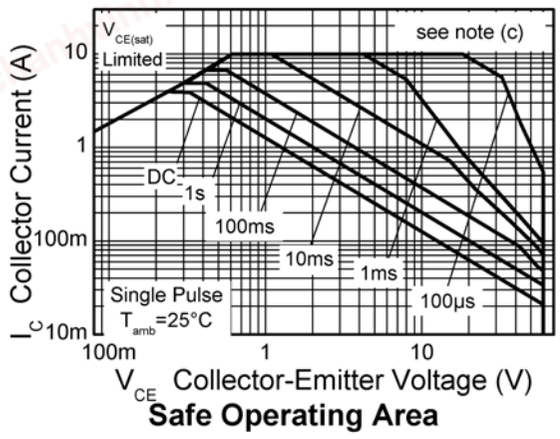
(c) Mounted on 50mm x 50mm x 1.6mm FR4 PCB with a high coverage of single sided 2 oz copper in still air conditions.

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

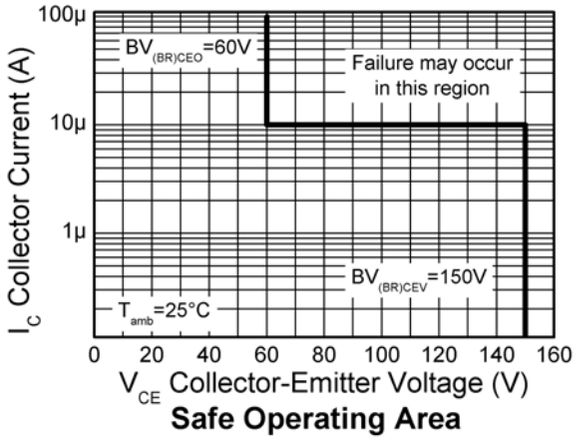
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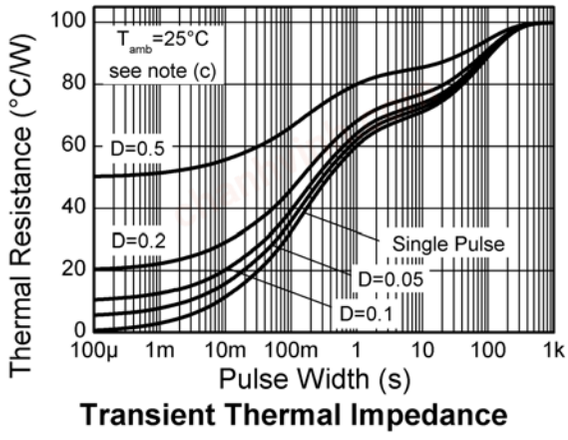
Characteristics



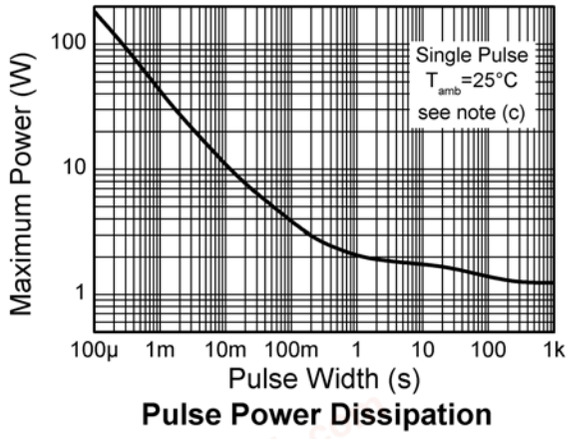
Safe Operating Area



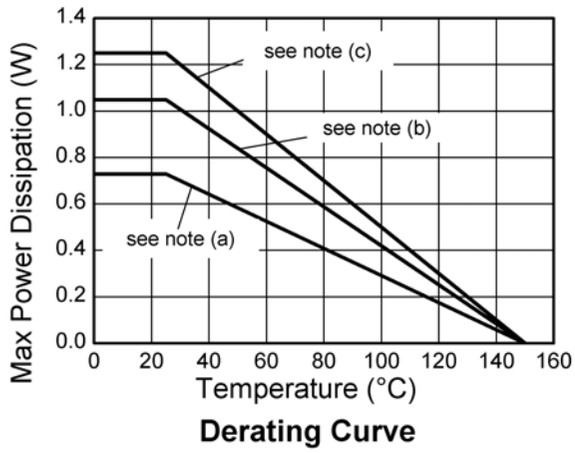
Safe Operating Area



Transient Thermal Impedance



Pulse Power Dissipation



Derating Curve

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ELECTRICAL CHARACTERISTICS (at T_{amb} = 25°C unless otherwise stated)

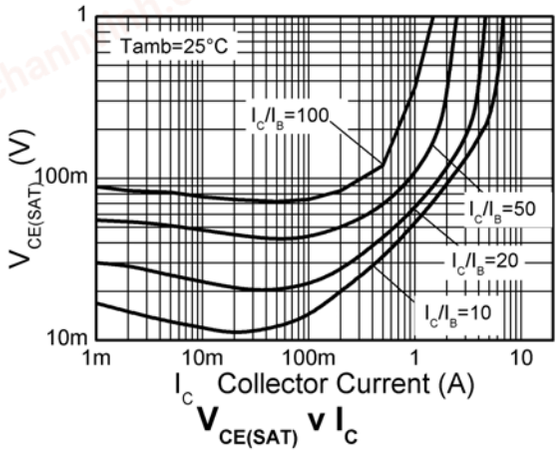
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	150	190		V	I_C = 100μA
Collector-emitter breakdown voltage (forward blocking)	BV_{CEX}	150	190			I_C = 100μA, $R_{BE} \leq 1k\Omega$ or -1V < V_{BE} < 0.25V
Collector-emitter breakdown voltage (base open)	BV_{CEO}	60	80		V	I_C = 10mA (*)
Emitter-collector breakdown voltage (reverse blocking)	BV_{ECX}	6	8		V	I_E = 100μA, $R_{BC} \leq 1k\Omega$ or 0.25V > V_{BC} > -0.25V
Emitter-collector breakdown voltage (base open)	BV_{ECO}	6	7		V	I_E = 100μA,
Emitter-base breakdown voltage	BV_{EBO}	7	8		V	I_E = 100μA
Collector cut-off current	I_{CBO}		<1 	50 20	nA μA	V_{CB} = 120V V_{CB} = 120V, T_{amb}= 100°C
Collector-emitter cut-off current	I_{CEX}		-	100	nA	V_{CE} = 120V; $R_{BE} \leq 1k\Omega$ or -1V < V_{BE} < 0.25V
Emitter cut-off current	I_{EBO}		<1	50	nA	V_{EB} = 5.6V
Collector-emitter saturation voltage	$V_{CE(sat)}$		33 73 50 150	40 95 65 175	mV mV mV mV	I_C = 0,5A, I_B = 50mA (*) I_C = 0,5A, I_B = 10mA (*) I_C = 1A, I_B = 100mA (*) I_C = 3.5A, I_B = 350mA (*)
Base-emitter saturation voltage	$V_{BE(sat)}$		960	1050	mV	I_C = 3.5A, I_B = 350mA (*)
Base-emitter turn-on voltage	$V_{BE(on)}$		865	950	mV	I_C = 3.5A, V_{CE} = 2V (*)
Static forward current transfer ratio	h_{FE}	100 90 25	200 180 40	300		I_C = 10mA, V_{CE} = 2V (*) I_C = 1A, V_{CE} = 2V (*) I_C = 3.5A, V_{CE} = 2V (*)
Transition frequency	f_T		185		MHz	I_C = 100mA, V_{CE} = 5V f = 100MHz
Output capacitance	C_{OBO}		11.5	20	pF	V_{CB} = 10V, f = 1MHz (*)
Turn-on time	$t_{(on)}$		34		ns	V_{CC} = 10V. I_C = 500mA, I_{B1} = I_{B2}= 50mA.
Turn-off time	$t_{(off)}$		566		ns	

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

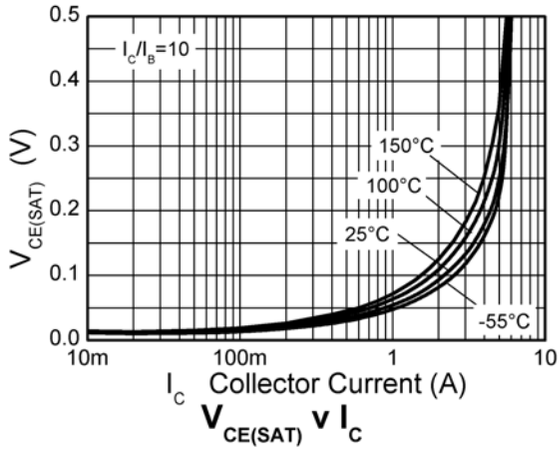
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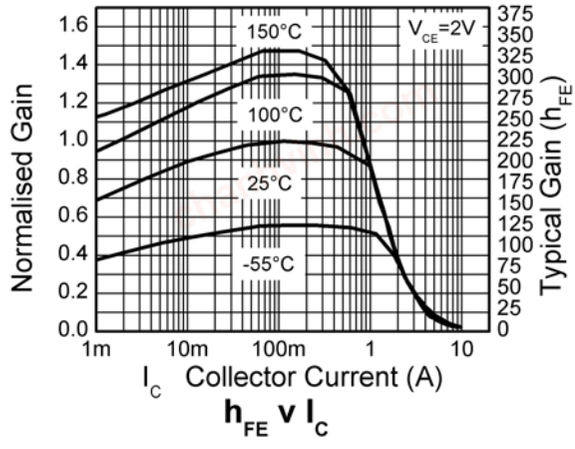
Typical characteristics



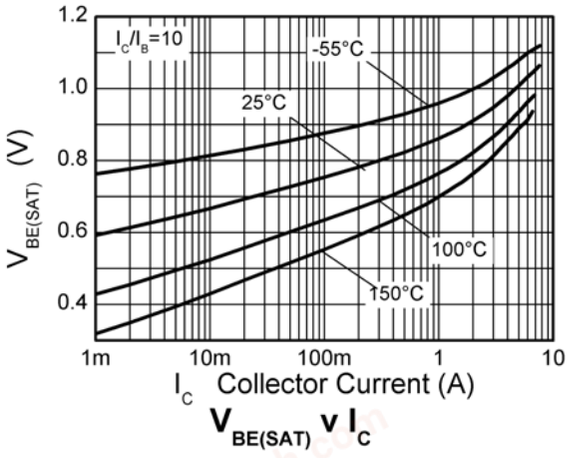
$V_{CE(SAT)}$ v I_C



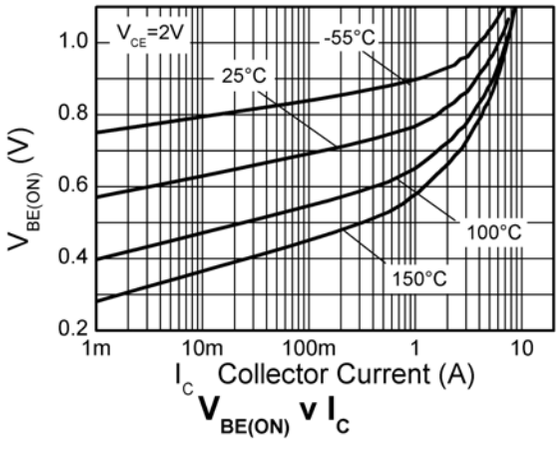
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C



$V_{BE(SAT)}$ v I_C

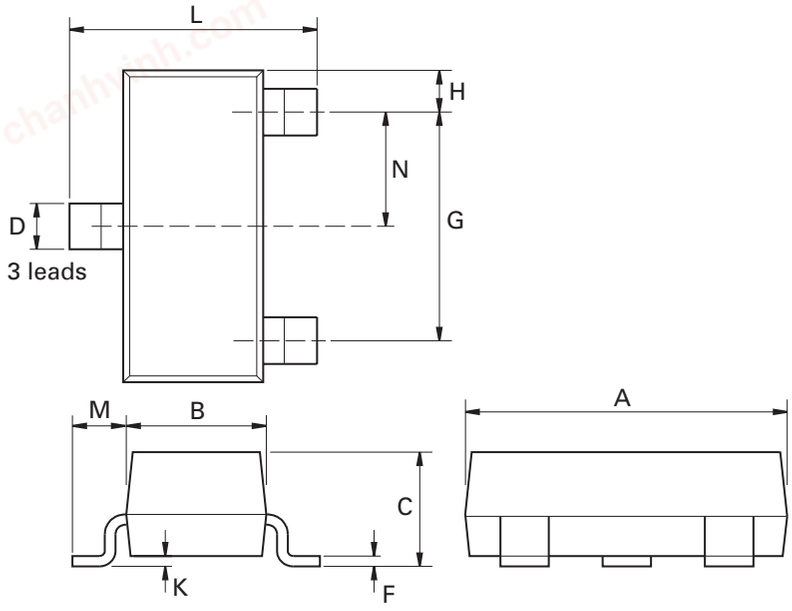


$V_{BE(ON)}$ v I_C

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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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