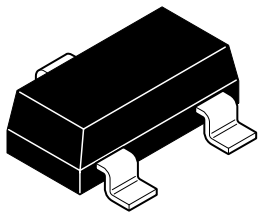
ZXTN25100BFH
100V, SOT23, medium power transistor

Summary



BV_{CEX} > 170V

BV_{CEO} > 100V

BV_{ECO} > 6V

$I_{C(cont)}$ = 3A

$V_{CE(sat)}$ < 80mV @ 1A

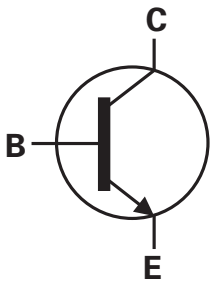
$R_{CE(sat)}$ = 67mΩ

P_D = 1.25W

Complementary part number ZXTP25100BFH

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.

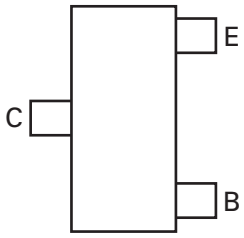


Features

- High power dissipation SOT23 package
- Low saturation voltage
- 170V forward blocking voltage

Applications

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



Pinout - top view

Ordering information

Device	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTN25100BFHTA	7	8	3,000

Device marking

021

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Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Collector-base voltage	V_{CBO}	170	V
Collector-emitter voltage (forward blocking)	V_{CEX}	170	V
Collector-emitter voltage	V_{CEO}	100	V
Emitter-collector voltage (reverse blocking)	V_{ECO}	6	V
Emitter-base voltage	V_{EBO}	7	V
Continuous collector current[b]	I_C	3	A
Peak pulse current	I_{CM}	9	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[c]	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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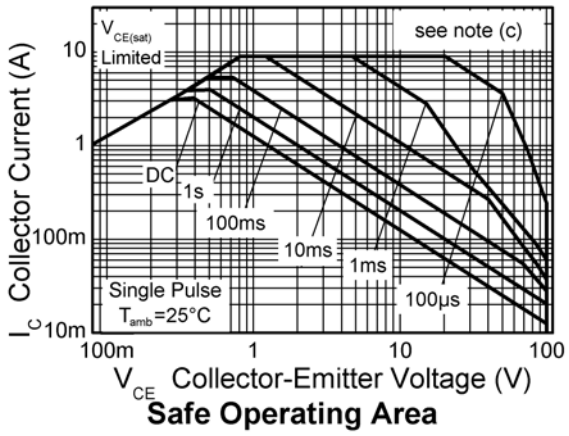
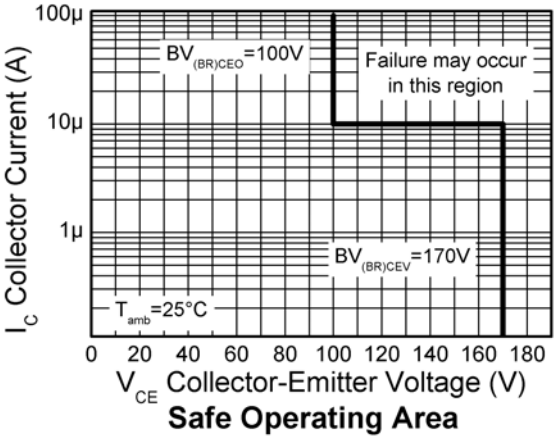
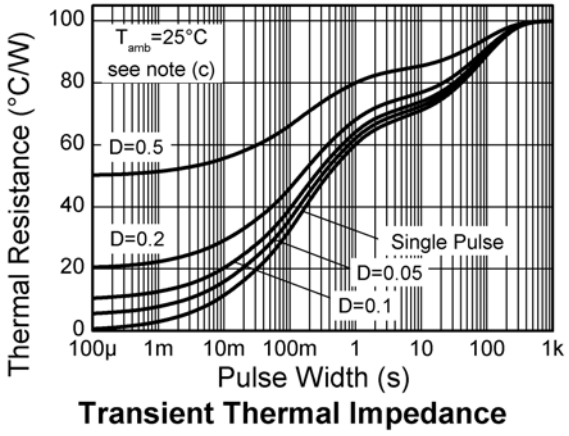
Characteristics



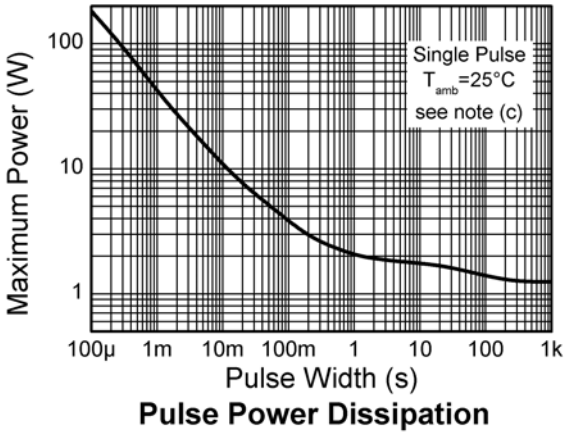
Safe Operating Area



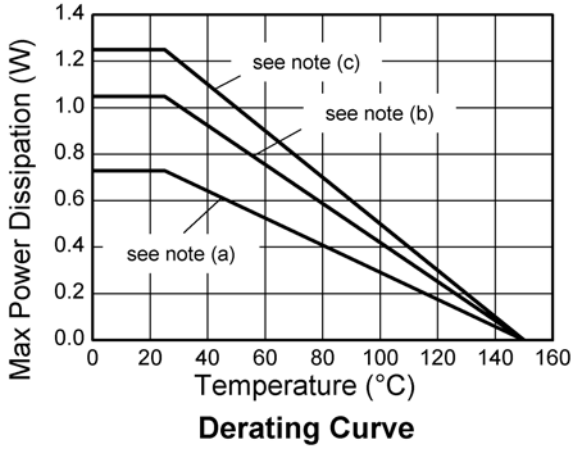
Safe Operating Area



Transient Thermal Impedance



Pulse Power Dissipation



Derating Curve

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ELECTRICAL CHARACTERISTICS (at Tamb = 25°C unless otherwise stated)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	170	220		V	I_C = 100μA
Collector-emitter breakdown voltage (forward blocking)	BV_{CEX}	170	210			I_C = 100μA, R_{BE} < 1kΩ or -1V < V_{BE} < 0.25V
Collector-emitter breakdown voltage (base open)	BV_{CEO}	100	120		V	I_C = 10mA (*)
Emitter-collector breakdown voltage (reverse blocking)	BV_{ECX}	6	7		V	I_E = 100μA, R_{BC} < 1kΩ or 0.25V > V_{BC} > -0.25V
Emitter-collector breakdown voltage (base open)	BV_{ECO}	6	8.4		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} = 136V V_{CB} = 136V, T_{amb}= 100°C
Collector emitter cut-off current	I_{CEX}		-	100	nA	V_{CE} = 136V; R_{BE} < 1kΩ or -1V < V_{BE} < 0.25V
Emitter cut-off current	I_{EBO}		<1	50	nA	V_{EB} = 5.6V
Collector-emitter saturation voltage	$V_{CE(sat)}$		40 100 70 200	55 135 80 250	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 = 3A, I_B = 300mA(*)
Base-emitter saturation voltage	$V_{BE(sat)}$		940	1050	mV	I_C = 3A, I_B = 300mA(*)
Base-emitter turn-on voltage	$V_{BE(on)}$		890	1000	mV	I_C = 3A, V_{CE} = 2V(*)
Static forward current transfer ratio	h_{FE}	100 50	200 85 20	300		I_C = 10mA, V_{CE} = 2V(*) I_C = 1A, V_{CE} = 2V(*) I_C = 3A, V_{CE} = 2V(*)
Transition frequency	f_T		160		MHz	I_C = 100mA, V_{CE} = 5V f = 100MHz
Output capacitance	C_{OBO}		9.4	20	pF	V_{CB} = 10V, f = 1MHz(*)
Delay time	$t_{(d)}$		16		ns	V_{CC} = 10V. I_C = 500mA, I_{B1} = I_{B2}= 50mA.
Rise time	$t_{(r)}$		55		ns	
Storage time	$t_{(s)}$		677		ns	
Fall time	$t_{(f)}$		95		ns	

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

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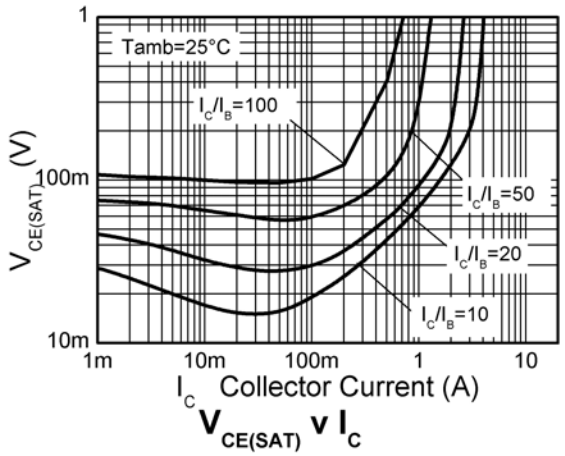
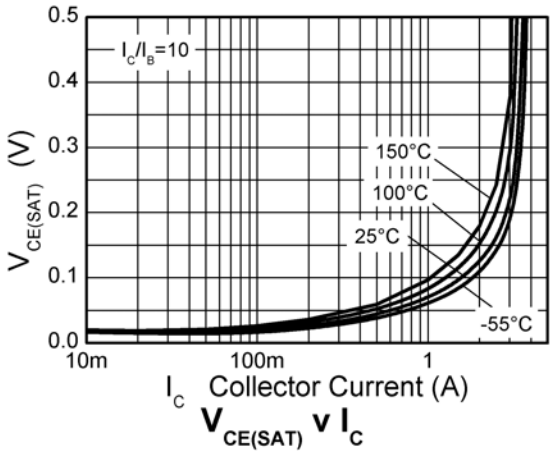
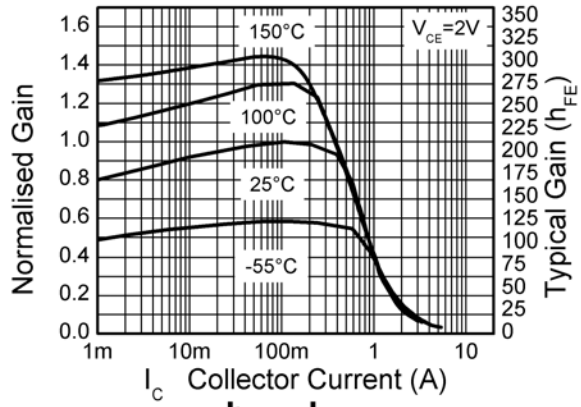
Typical characteristics



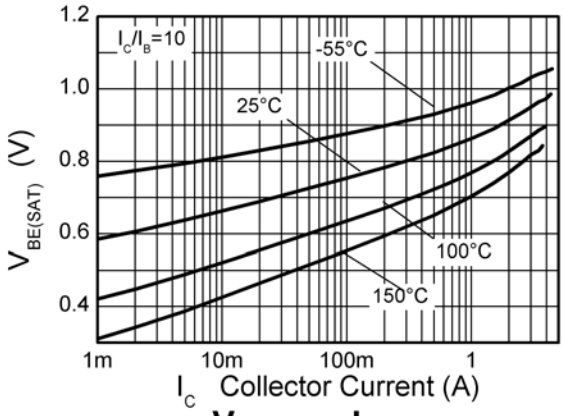
$V_{CE(SAT)}$ v I_C



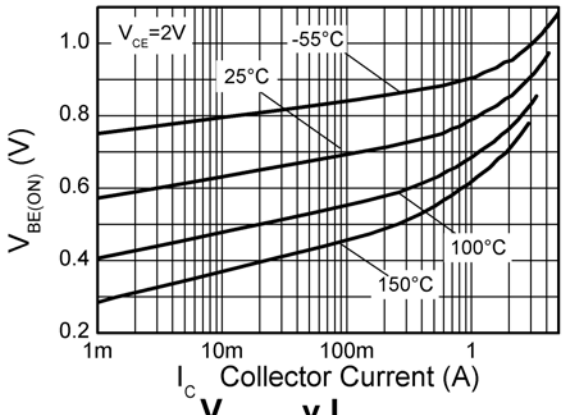
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C



$V_{BE(SAT)}$ v I_C



$V_{BE(ON)}$ v I_C

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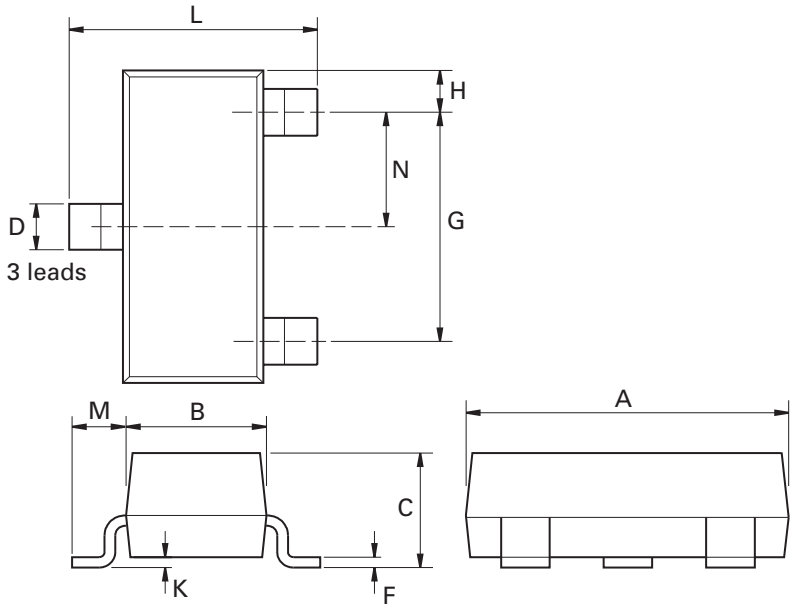
Package outline - SOT23



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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