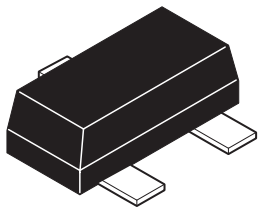
ZXTN08400BFF
400V, SOT23F, NPN medium power high voltage transistor

Summary



BV_{CEX} > 450V

BV_{CEO} > 400V

BV_{ECO} > 6V

$I_{C(cont)}$ = 0.5A

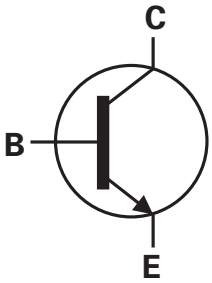
$V_{CE(sat)}$ < 175mV @ 500mA

P_D = 1.5W

Complementary part number ZXTP08400BFF

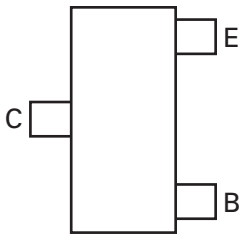
Description

This NPN transistor has been designed for applications requiring high voltage blocking. The SOT23F package is pin compatible with the industry standard SOT23 foot print but offers lower profile and higher dissipation for applications where power density is of utmost importance.



Features

- High voltage
- Low saturation voltage
- Low profile small outline package



Pinout - top view

Applications

- Modems
- Telecoms line switching

Ordering information

Device	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTN08400BFFTA	7	8	3000

Device marking

1D5

Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Collector-base voltage	V_{CBO}	450	V
Collector-emitter voltage (forward blocking)	V_{CEX}	450	V
Collector-emitter voltage	V_{CEO}	400	V
Emitter-collector voltage (reverse blocking)	V_{ECO}	6	V
Emitter-base voltage	V_{EBO}	7	V
Continuous collector current[c]	I_C	0.5	A
Peak pulse current	I_{CM}	1	A
Base current	I_B	0.2	A
Power dissipation at T_{amb} =25°C[a]	P_D	0.84	W
Linear derating factor		6.72	mW/°C
Power dissipation at T_{amb} =25°C[b]	P_D	1.34	W
Linear derating factor		10.72	mW/°C
Power dissipation at T_{amb} =25°C[c]	P_D	1.5	W
Linear derating factor		12.0	mW/°C
Power dissipation at T_{amb} =25°C[d]	P_D	2.0	W
Linear derating factor		16.0	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]	$R_{\Theta JA}$	149	°C/W
Junction to ambient[b]	$R_{\Theta JA}$	93	°C/W
Junction to ambient[c]	$R_{\Theta JA}$	83	°C/W
Junction to ambient[d]	$R_{\Theta JA}$	60	°C/W

NOTES:

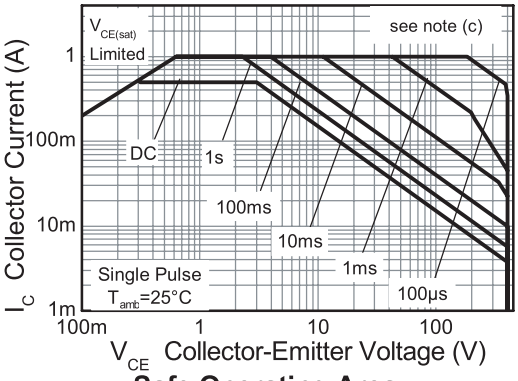
(a) For a device surface mounted on 15mm x 15mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

(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.

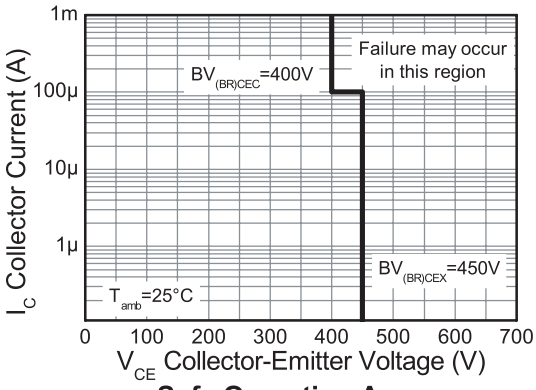
(c) Mounted on 50mm x 50mm x 1.6mm FR4 PCB with a high coverage of single sided 2 oz copper in still air conditions.

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

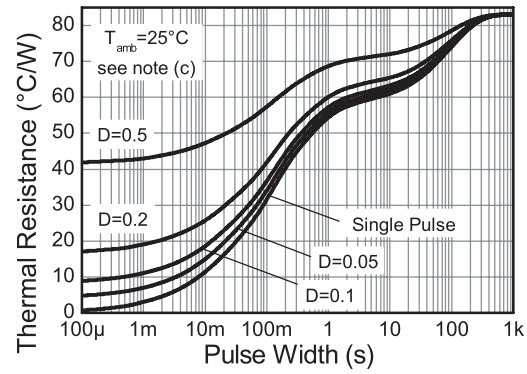
Typical characteristics



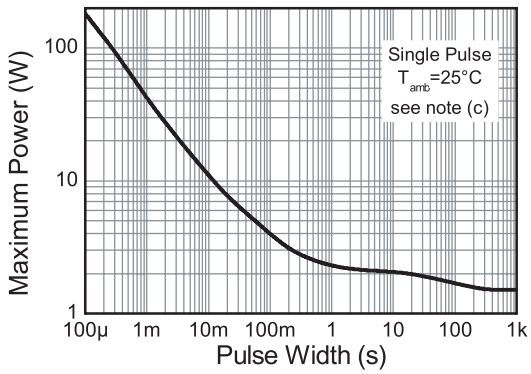
Safe Operating Area



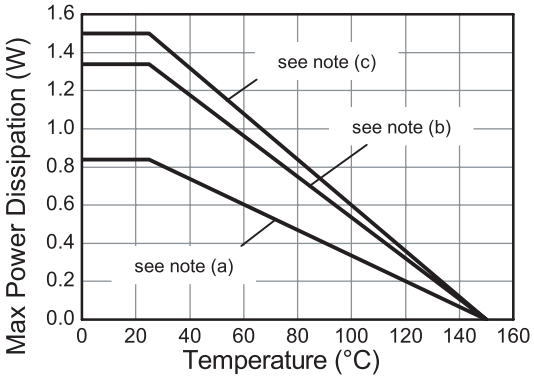
Safe Operating Area



Transient Thermal Impedance



Pulse Power Dissipation



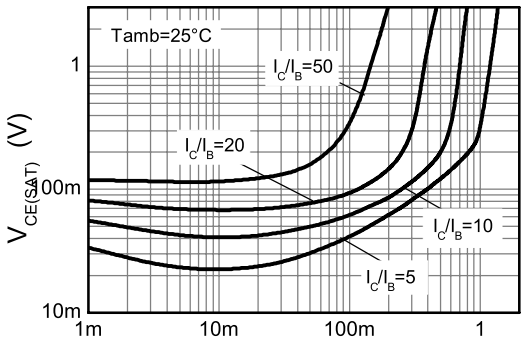
Derating Curve

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

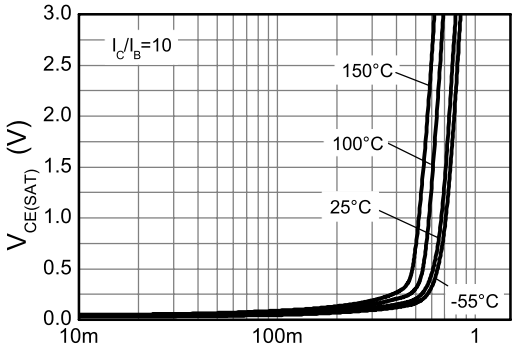
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	450	550		V	I_C = 100μA
Collector-emitter breakdown voltage (forward blocking)	BV_{CEX}	450	550		V	I_C = 100μA, R_{BE} < 1kΩ or -1V < V_{BE} < 0.25V
Collector-emitter breakdown voltage (base open)	BV_{CEO}	400	500		V	I_C = 10mA(*)
Emitter-collector breakdown voltage (reverse blocking)	BV_{ECX}	6	8.0		V	I_E = 100μA, R_{BC} < 1kΩ or 0.25V > V_{BC} > -0.25V
Emitter-collector breakdown voltage (base open)	BV_{ECO}	6	8.5		V	I_E = 100μA,
Emitter-base breakdown voltage	BV_{EBO}	7	8.1		V	I_E = 100μA
Collector-base cut-off current	I_{CBO}		<1	50 20	nA μA	V_{CB} = 360V V_{CB} = 360V, T_{amb}= 100°C
Collector-emitter cut-off current	I_{CEX}		<1	100	nA	V_{CE} = 360V, 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	$V_{CE(sat)}$		70 50 120 125	85 70 170 175	mV mV mV mV	I_C = 20mA, I_B = 1mA (*) I_C = 50mA, I_B = 5mA(*) I_C = 300mA, I_B = 30mA(*) I_C = 500mA, I_B = 100mA(*)
Base-emitter saturation voltage	$V_{BE(sat)}$		865	950	mV	I_C = 500mA, I_B = 100mA(*)
Base-emitter turn-on voltage	$V_{BE(on)}$		800	900	mV	I_C = 500mA, V_{CE} = 10V(*)
Static forward current transfer ratio	h_{FE}	90 100 10	165 180 20	300		I_C = 1mA, V_{CE} = 5V(*) I_C = 50mA, V_{CE} = 5V(*) I_C = 500mA, V_{CE} = 10V(*)
Transition frequency	f_T		40		MHz	I_C = 10mA, V_{CE} = 20V f = 20MHz
Output capacitance	C_{OBO}		8	10	pF	V_{CB} = 20V, f = 1MHz(*)
Delay time	t_d		100		ns	V_{CC} = 100V. I_C = 100mA, I_{B1} = 10mA, I_{B2}= 20mA.
Rise time	t_r		52		ns	
Storage time	t_s		3122		ns	
Fall time	t_f		240		ns	

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

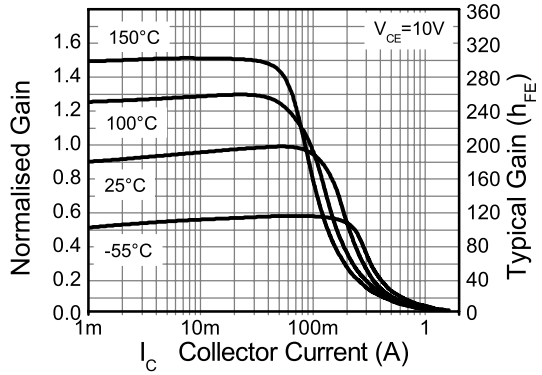
Typical characteristics



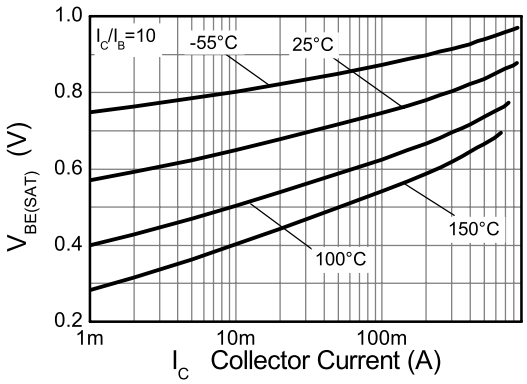
$V_{CE(SAT)}$ v I_C



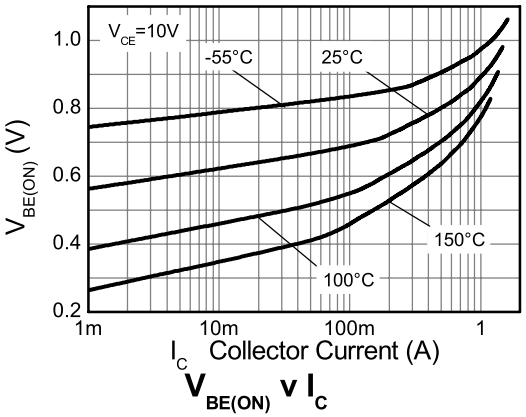
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C

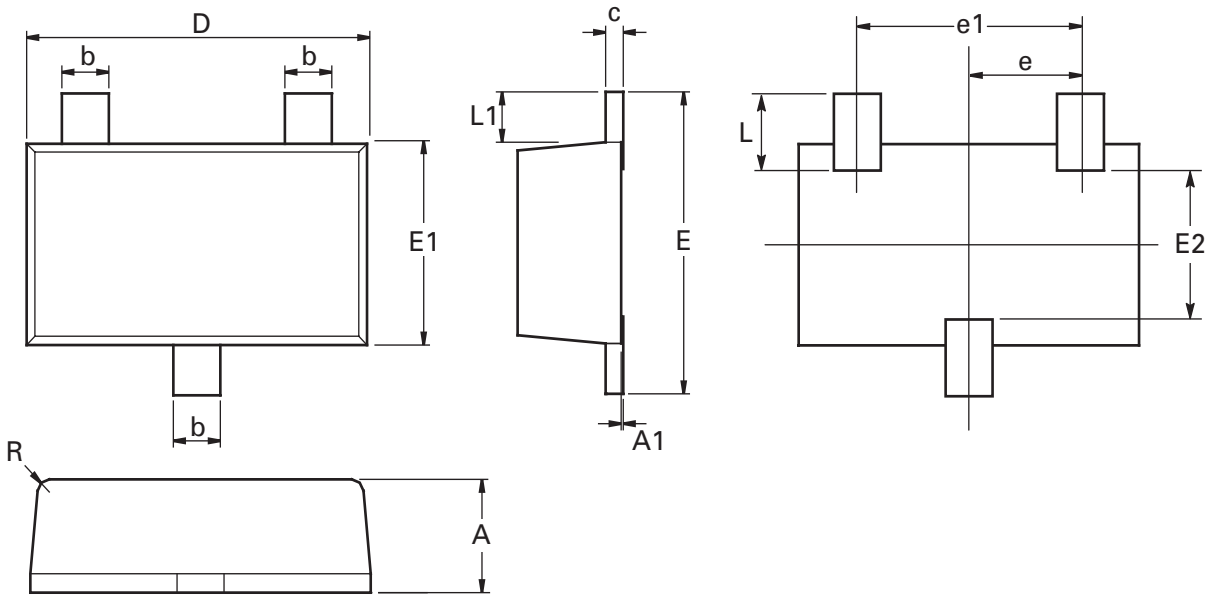


$V_{BE(SAT)}$ v I_C



$V_{BE(ON)}$ v I_C

Package outline - SOT23F



Dim.	Millimeters		Inches		Dim.	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Max.	Max.
A	0.80	1.00	0.0315	0.0394	E	2.30	2.50	0.0906	0.0984
A1	0.00	0.10	0.00	0.0043	E1	1.50	1.70	0.0590	0.0669
b	0.35	0.45	0.0153	0.0161	E2	1.10	1.26	0.0433	0.0496
c	0.10	0.20	0.0043	0.0079	L	0.48	0.68	0.0189	0.0268
D	2.80	3.00	0.1102	0.1181	L1	0.30	0.50	0.0153	0.0161
e	0.95 ref		0.0374 ref		R	0.05	0.15	0.0019	0.0059
e1	1.80	2.00	0.0709	0.0787	O	0°	12°	0°	12°

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

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