

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

Applications

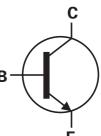
- Modems
- Telecoms line switching

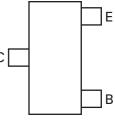
Ordering information

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

Device marking

1D5





Pinout - top view

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	Α
Peak pulse current	I _{CM}	1	Α
Base current	I _B	0.2	Α
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

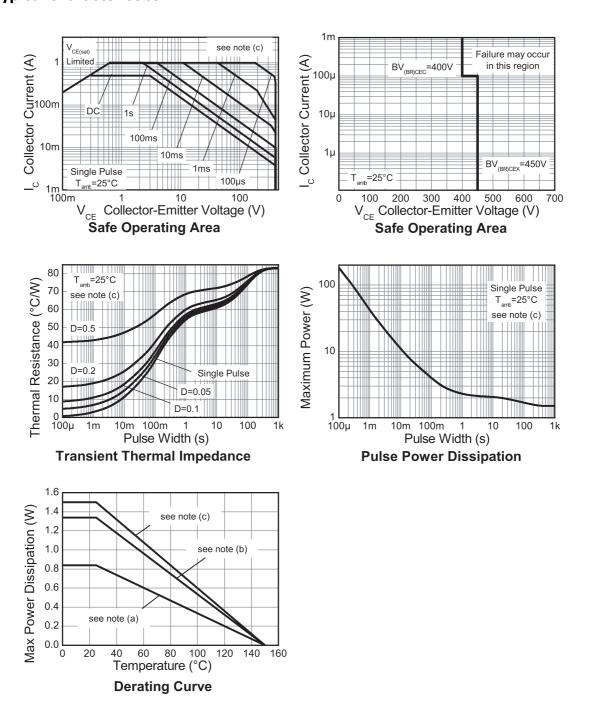
Parameter	Symbol	Limit	Unit
Junction to ambient ^(a)	$R_{\Theta JA}$	149	°C/W
Junction to ambient ^(b)	$R_{\Theta JA}$	93	°C/W
Junction to ambient ^(c)	$R_{\Theta JA}$	83	°C/W
Junction to ambient ^(d)	$R_{\Theta JA}$	60	°C/W

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



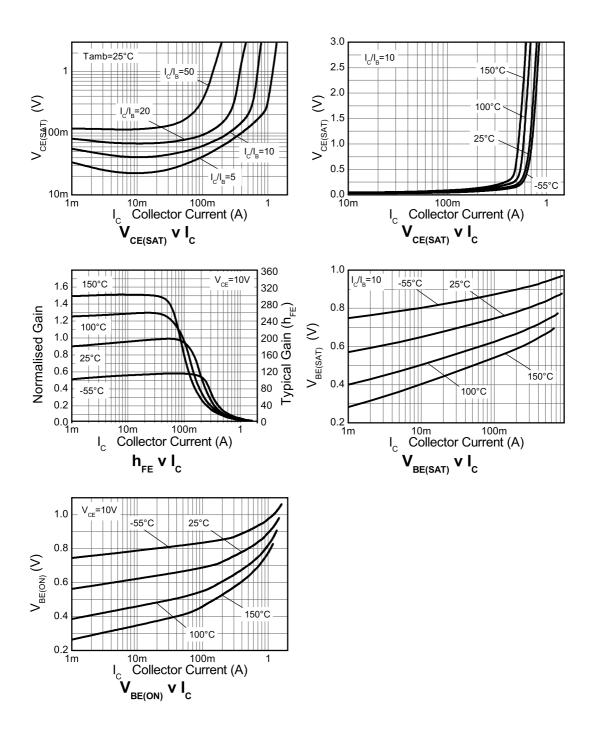
Electrical characteristics (at T_{amb} = 25°C unless otherwise stated)

Parameter	Symbol	Min.	Тур.	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	$I_C = 100 \mu A, R_{BE} < 1 k\Omega \text{ or}$ -1V < $V_{BE} < 0.25 V$
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	$I_E = 100 \mu A$, $R_{BC} < 1 k \Omega$ or $0.25 V > V_{BC} > -0.25 V$
Emitter-collector breakdown voltage (base open)	BV _{ECO}	6	8.5		V	$I_E = 100 \mu A$,
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, T _{amb} = 100°C
Collector-emitter cut-off current	I _{CEX}		<1	100	nA	$V_{CE} = 360V, R_{BE} < 1k\Omega \text{ or} -1V < V_{BE} < 0.25V$
Emitter-base cut-off current	I _{EBO}		<1	50	nA	V _{EB} = 5.6V
Collector-emitter saturation voltage	V _{CE(sat)}		70	85	mV	I _C = 20mA, I _B = 1mA ^(*)
			50	70	mV	$I_C = 50 \text{mA}, I_B = 5 \text{mA}^{(*)}$
			120	170	mV	$I_C = 300 \text{mA}, I_B = 30 \text{mA}^{(*)}$
			125	175	mV	$I_C = 500 \text{mA}, I_B = 100 \text{mA}^{(*)}$
Base-emitter saturation voltage	V _{BE(sat)}		865	950	mV	$I_C = 500 \text{mA}, I_B = 100 \text{mA}^{(*)}$
Base-emitter turn-on voltage	V _{BE(on)}		800	900	mV	I _C = 500mA, V _{CE} = 10V ^(*)
Static forward current transfer	h _{FE}	90	165			$I_C = 1mA, V_{CE} = 5V^{(*)}$
ratio		100	180	300		$I_C = 50 \text{mA}, V_{CE} = 5 V^{(*)}$
		10	20			$I_C = 500 \text{mA}, V_{CE} = 10 V^{(*)}$
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.
Rise time	t _r		52		ns	$I_C = 100 \text{mA},$
Storage time	t _s		3122		ns	I _{B1} = 10mA, I _{B2} = 20mA.
Fall time	t _f		240		ns	

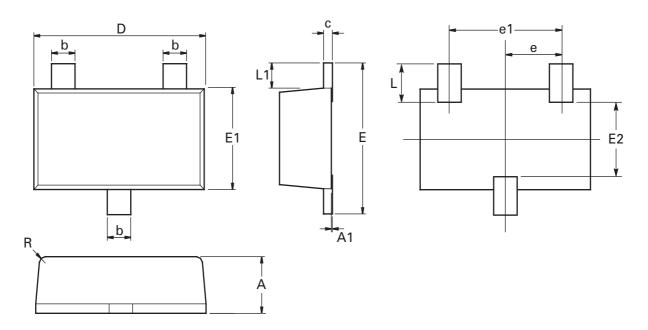
NOTES:

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

Typical characteristics



Package outline - SOT23F



Dim.	Millimeters		Inches		Dim.	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Max.	Max.
Α	0.80	1.00	0.0315	0.0394	Е	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
С	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
е	0.95 ref		0.0374 ref		R	0.05	0.15	0.0019	0.0059
e1	1.80	2.00	0.0709	0.0787	0	0°	12°	0°	12°

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

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