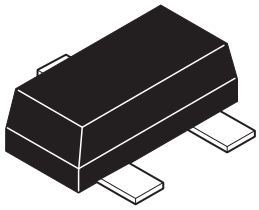
ZXTN19060CFF
60V, SOT23F, NPN high gain power transistor

Summary



BV_{CEX} > 160V

BV_{CEO} > 60V

BV_{ECO} > 6V

$I_{C(cont)}$ = 5.5A

$V_{CE(sat)}$ < 45mV @ 1A

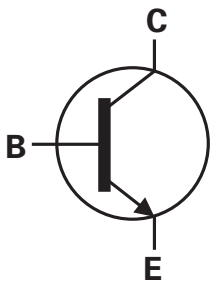
$R_{CE(sat)}$ = 26mΩ

P_D = 1.5W

Complementary part number ZXTP19060CFF

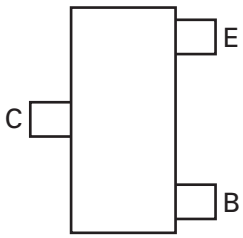
Description

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



Features

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



Pinout - top view

Applications

- Motor drive
- Siren driver

Ordering information

Device	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTN19060CFFTA	7	8	3000

Device marking

1E4

Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Collector-base voltage	V_{CBO}	160	V
Collector-emitter voltage (forward blocking)	V_{CEX}	160	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 (c)	I_C	5.5	A
Base current	I_B	1	A
Peak pulse current	I_{CM}	12	A
Power dissipation @ T_{amb} =25°C (a)	P_D	0.84	W
Linear derating factor		6.72	mW/°C
Power dissipation @ T_{amb} =25°C (b)	P_D	1.34	W
Linear derating factor		10.72	mW/°C
Power dissipation @ T_{amb} =25°C (c)	P_D	1.50	W
Linear derating factor		12.0	mW/°C
Power dissipation @ 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)	$R_{\Theta JA}$	149.3	°C/W
Junction to ambient(b)	$R_{\Theta JA}$	93.4	°C/W
Junction to ambient(c)	$R_{\Theta JA}$	83.3	°C/W
Junction to ambient(d)	$R_{\Theta JA}$	60	°C/W

NOTES:

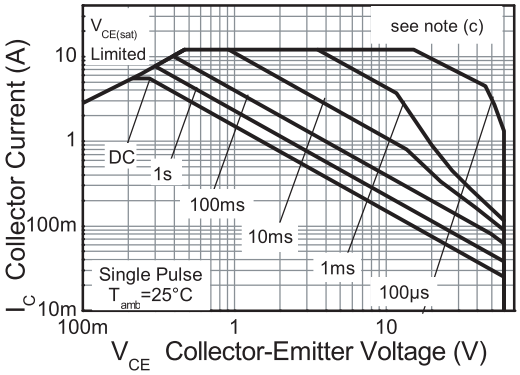
(a) For a device surface mounted on 15mm x 15mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

(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.

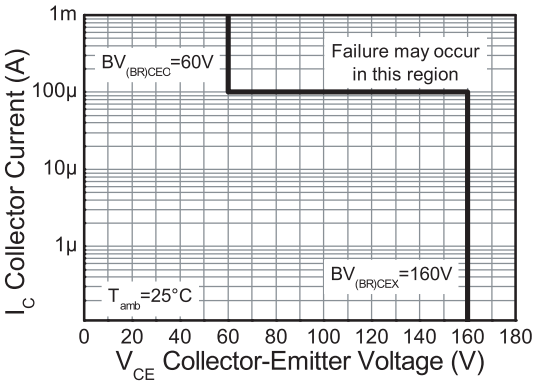
(c) Mounted on 50mm x 50mm x 1.6mm FR4 PCB with a high coverage of single sided 2 oz copper in still air conditions.

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

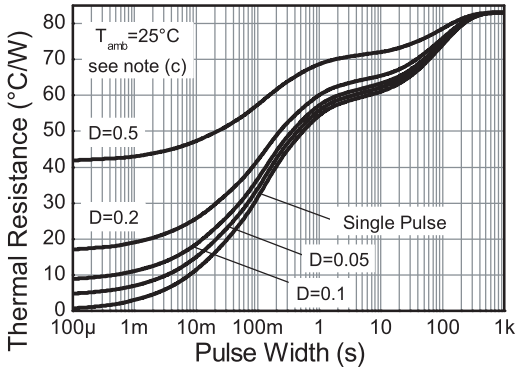
Characteristics



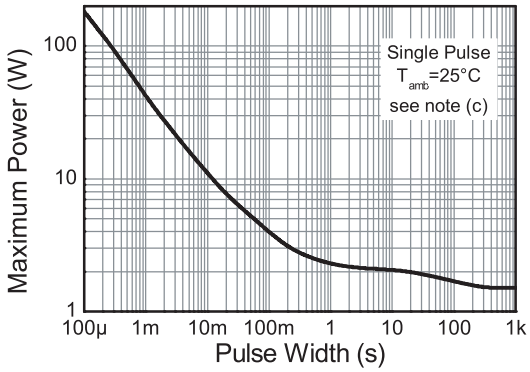
Safe Operating Area



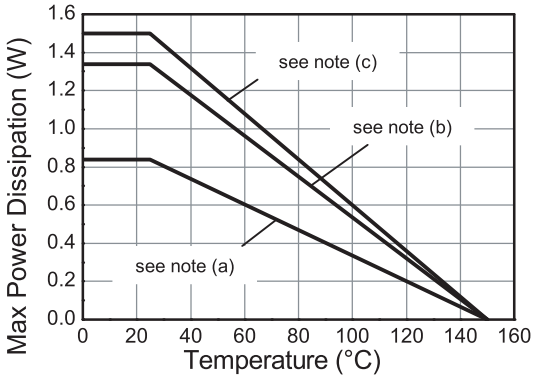
Safe Operating Area



Transient Thermal Impedance



Pulse Power Dissipation



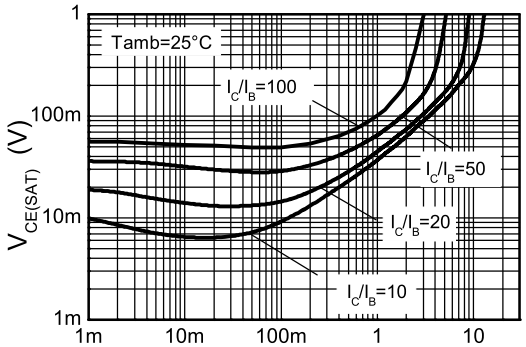
Derating Curve

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

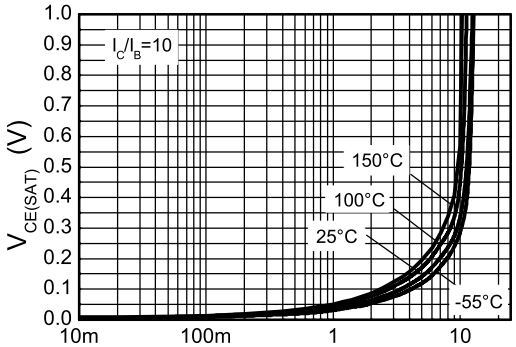
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	160	200		V	IC = 100μA
Collector-emitter breakdown voltage (forward blocking)	BV_{CEX}	160	200		V	I_C = 100μA, $R_{BE} \leq$ 1kΩ or -1V < V_{BE} < 0.25V
Collector-emitter breakdown voltage (base open)	BV_{CEO}	60	75		V	I_C = 10mA (*)
Emitter-base breakdown voltage	BV_{EBO}	7	8.3		V	I_E = 100μA
Emitter-collector breakdown voltage (reverse blocking)	BV_{ECX}	6	7		V	I_E = 100mA, $R_{BC} \leq$1kΩ or 0.25V > V_{BC} > -0.25V
Emitter-collector breakdown voltage (base open)	BV_{ECO}	6	7		V	I_E = 100μA,
Collector-base cut-off current	I_{CBO}		<1	50	nA	V_{CB} = 160V
				0.5	μA	V_{CB} = 160V, T_{amb}= 100°C
Collector-emitter cut-off current	I_{CEX}		<1	100	nA	V_{CE} = 120V, $R_{BE} \leq$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	$V_{CE(sat)}$		36	45	mV	I_C = 1A, I_B = 100mA(*)
			105	150	mV	I_C = 1A, I_B = 10mA(*)
			105	135	mV	I_C = 2A, I_B = 40mA(*)
			145	175	mV	I_C = 5.5A, I_B = 550mA(*)
Base-emitter saturation voltage	$V_{BE(sat)}$		1000	1100	mV	I_C = 5.5A, I_B = 550mA(*)
Base-emitter turn-on voltage	$V_{BE(on)}$		880	1000	mV	I_C = 5.5A, V_{CE} = 2V(*)
Static forward current transfer ratio	h_{FE}	200	350	500		I_C = 0.1A, V_{CE} = 2V(*)
		160	280			I_C = 2A, V_{CE} = 2V(*)
		30	50			I_C = 6A, V_{CE} = 2V(*)
Transition frequency	f_T		130		MHz	I_C = 50mA, V_{CE} = 10V f = 50MHz
Input capacitance	C_{ibo}		310		pF	V_{EB} = 0.5V, f = 1MHz(*)
Output capacitance	C_{obo}		19.3	25	pF	V_{CB} = 10V, f = 1MHz(*)
Delay time	t_d		27.3		ns	V_{CC} = 10V. I_C = 500mA, I_{B1} = I_{B2}= 50mA.
Rise time	t_r		13.2		ns	
Storage time	t_s		682		ns	
Fall time	t_f		90.9		ns	

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

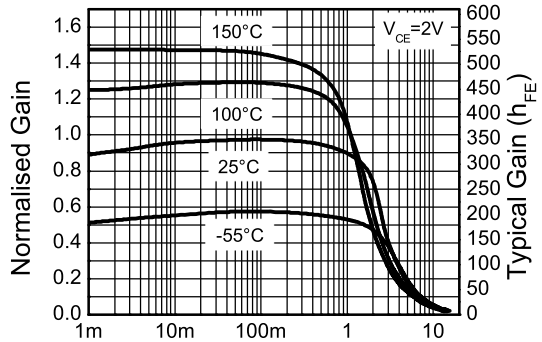
Typical characteristics



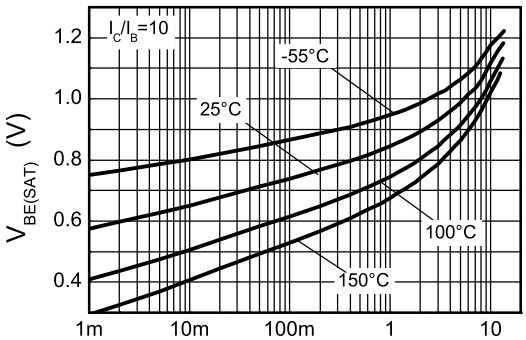
$V_{CE(SAT)}$ v I_C



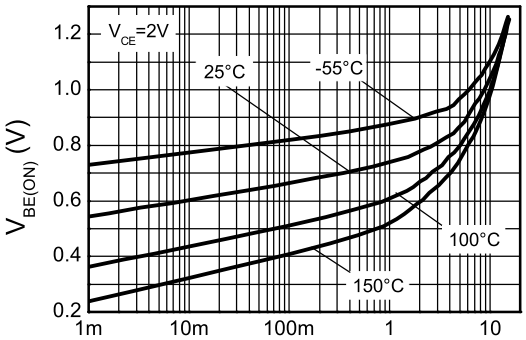
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C

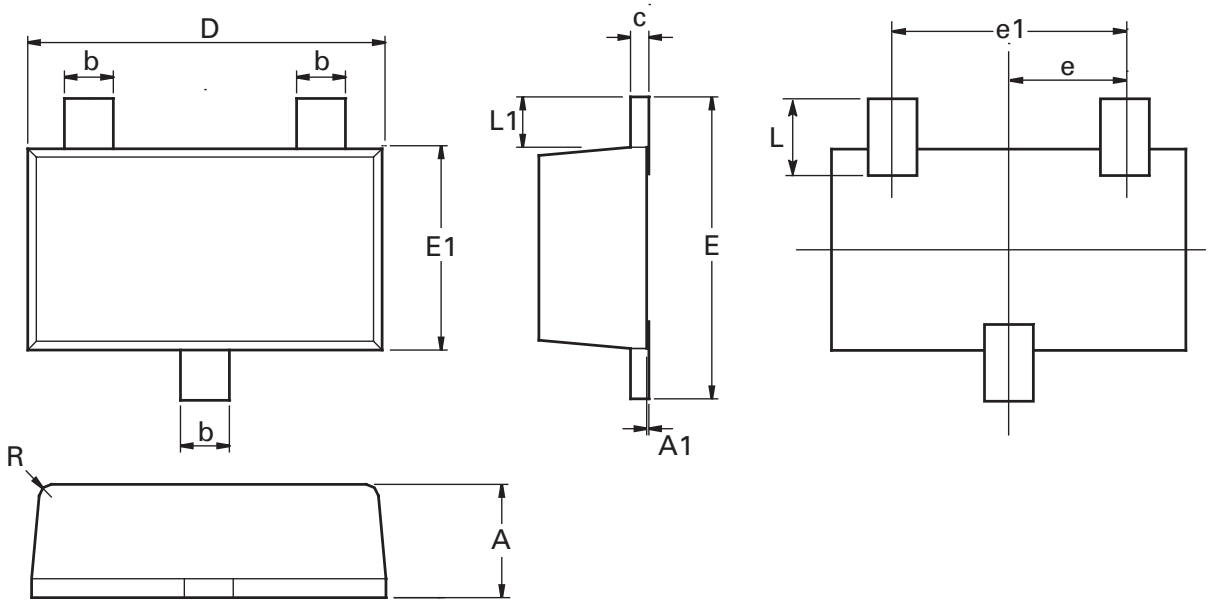


$V_{BE(SAT)}$ v I_C



$V_{BE(ON)}$ 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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