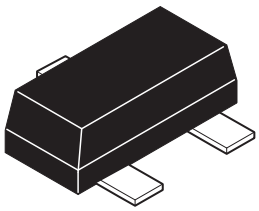
ZXTP07012EFF
12V, SOT23F, PNP medium power transistor

Summary;



BV_{CEO} > -12V

$I_{C(cont)}$ = -4A

$V_{CE(sat)}$ < -75mV @ 1A

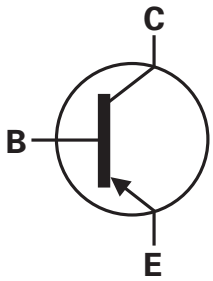
$R_{CE(sat)}$ = 50mΩ

P_D = 1.5W

Complementary part number ZXTN07012EFF

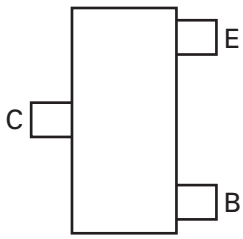
Description

This low voltage PNP transistor has been designed for applications requiring high gain and very 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

- Low profile SOT23F package
- Low saturation voltage
- High gain
- High power dissipation



Pinout - top view

Applications

- Load switches
- Battery charging
- Motor drive

Ordering information

Device	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTP07012EFFTA	7	8	3000

Device marking

1D1

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Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Collector-base voltage	V_{CBO}	-12	V
Collector-emitter voltage	V_{CEO}	-12	V
Emitter-base voltage	V_{EBO}	-7	V
Continuous collector current[c]	I_C	-4	A
Peak pulse current	I_{CM}	-8	A
Base current	I_B	-1	A
Power dissipation at T_{amb} =25°C[a]		0.84	W
Linear derating factor	P_D	6.72	mW/°C
Power dissipation at T_{amb} =25°C[b]		1.34	W
Linear derating factor	P_D	10.72	mW/°C
Power dissipation at T_{amb} =25°C[c]		1.50	W
Linear derating factor	P_D	12.0	mW/°C
Power dissipation at T_{amb} =25°C[d]		2.0	W
Linear derating factor	P_D	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.

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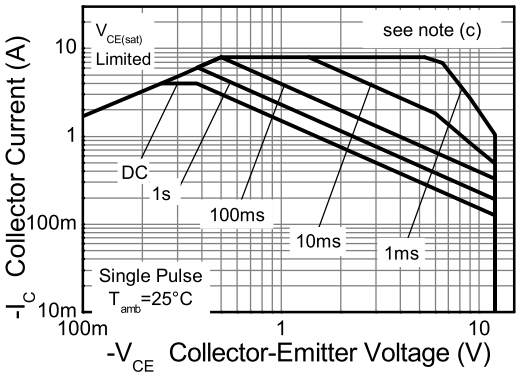
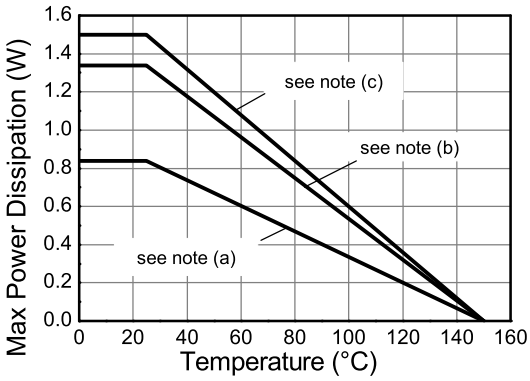
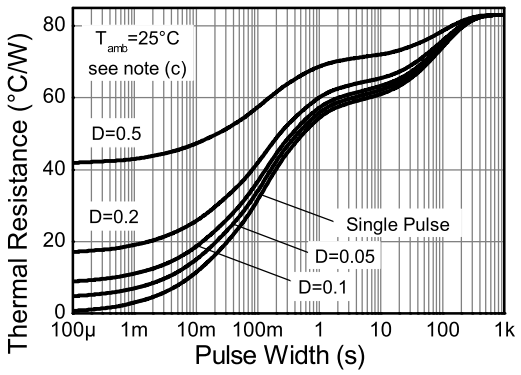
Characteristics



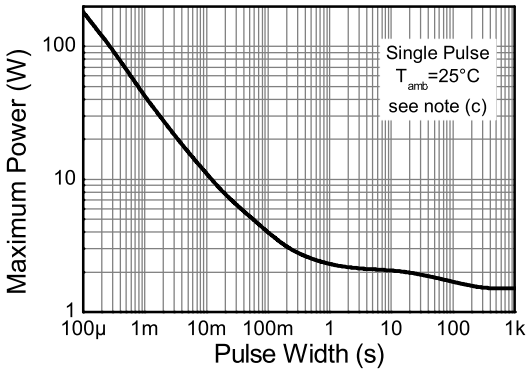
Safe Operating Area



Derating Curve



Transient Thermal Impedance



Pulse Power Dissipation

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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}	-12	-23		V	I_C = -100μA
Collector-emitter breakdown voltage (base open)	BV_{CEO}	-12	-16		V	I_C = -10mA (*) *
Emitter-base breakdown voltage	BV_{EBO}	-7	-8.4		V	I_E = -100μA
Collector-base cut-off current	I_{CBO}		<-1	-50	nA	V_{CB} = -10V
				-20	μA	V_{CB} = -10V, T_{amb}= 100°C
Emitter-base cut-off current	I_{EBO}		<-1	-50	nA	V_{EB} = -5.6V
Collector-emitter saturation voltage	$V_{CE(sat)}$		-80	-100	mV	I_C = -0.5A, I_B = -2.5mA(*)
			-60	-75	mV	I_C = -1A, I_B = -100mA(*)
			-130	-165	mV	I_C = -1A, I_B = -5mA(*)
			-250	-350	mV	I_C = -2A, I_B = -10mA(*)
			-260	-340	mV	I_C = -4A, I_B = -80mA(*)
Base-emitter saturation voltage	$V_{BE(sat)}$		-945	-1050	mV	I_C = -4A, I_B = -80mA(*)
Base-emitter turn-on voltage	$V_{BE(on)}$		-850	-950	mV	I_C = -4A, V_{CE} = -2V(*)
Static forward current transfer ratio	h_{FE}	500	750	1500		I_C = -10mA, V_{CE} = -2V(*)
		400	570			I_C = -1A, V_{CE} = -2V(*)
		230	320			I_C = -4A, V_{CE} = -2V(*)
		150	210			I_C = -6A, V_{CE} = -2V(*)
Transition frequency	f_T	100	250		MHz	I_C = -50mA, V_{CE} = -5V f = 50MHz
Input capacitance	C_{ibo}		223		pF	V_{CB} = -0.5V, f = 1MHz(*)
Output capacitance	C_{obo}		49	60	pF	V_{CB} = -8V, f = 1MHz(*)
Delay time	t_d		12.8		ns	V_{CC} = -10V. I_C = -500mA, I_{B1} = I_{B2}= -50mA.
Rise time	t_r		15.6		ns	
Storage time	t_s		240		ns	
Fall time	t_f		92.8		ns	

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

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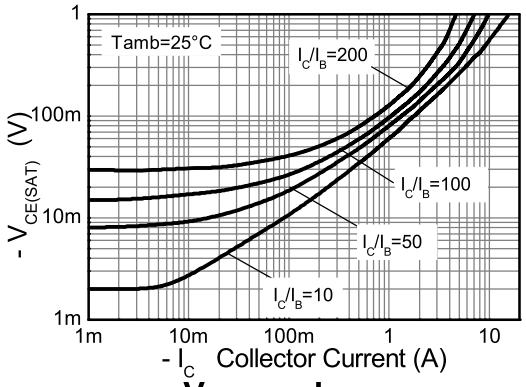
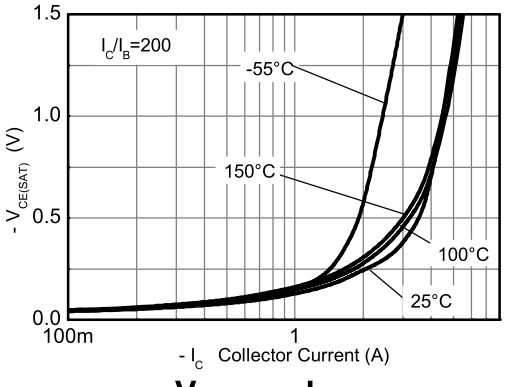
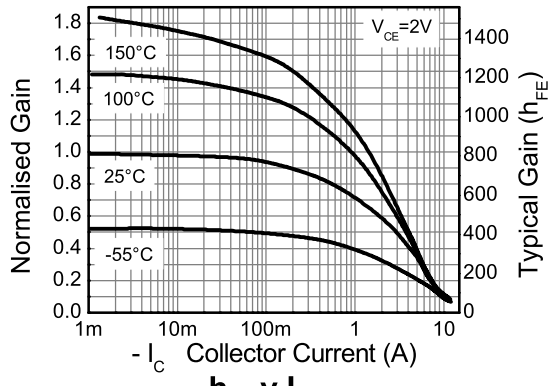
Typical characteristics



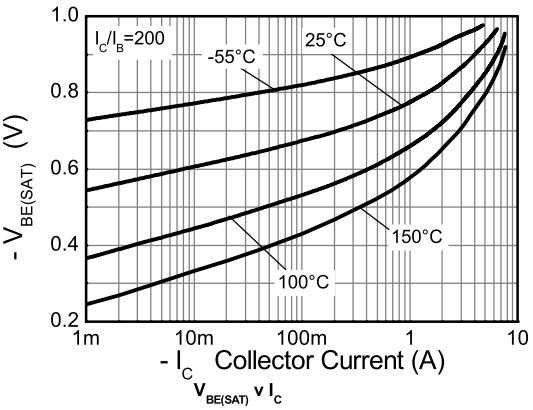
$V_{CE(SAT)}$ v I_C



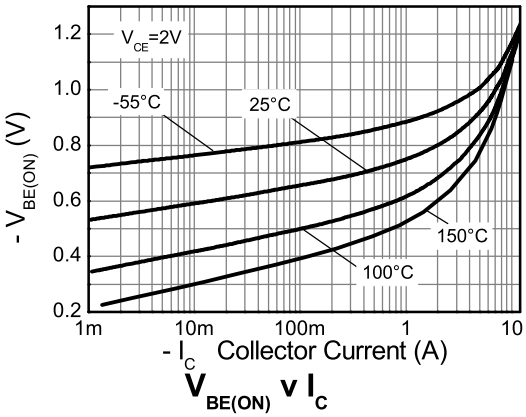
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C



$V_{BE(SAT)}$ v I_C



$V_{BE(ON)}$ v I_C

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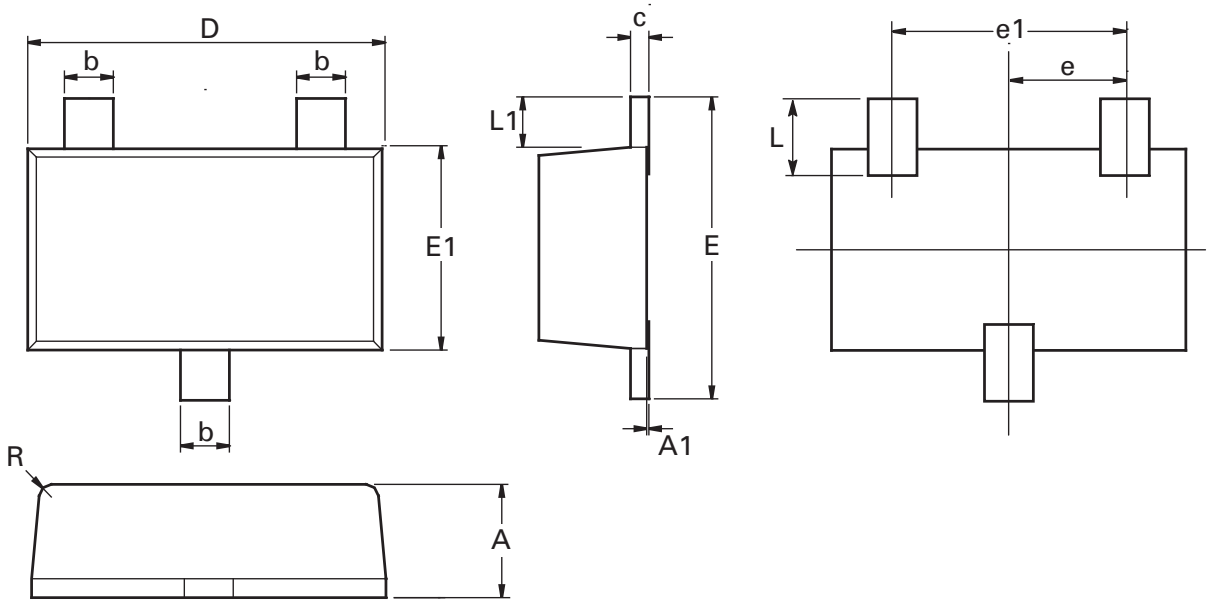
Package outline - SOT23F



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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