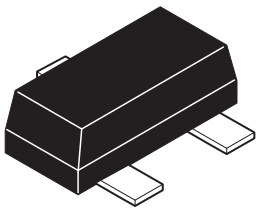
ZXTP25020CFF
20V, SOT23F, PNP medium power transistor

Summary



BV_{CEO} > -20V

BV_{ECO} > -7V

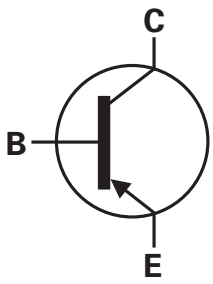
$I_{C(cont)}$ = -4.5A

$R_{CE(sat)}$ = 41mΩ

$V_{CE(sat)}$ < -65mV @ 1A

P_D = 1.5W

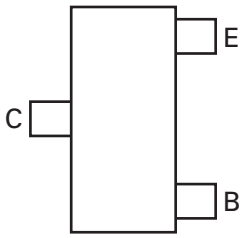
Description



Advanced process capability and packaging maximise the power handling and performance of this small outline transistor. The reverse blocking capability of the transistor can often result in the elimination of a series connected Schottky diode commonly required with either bipolar transistors or MOSFETs when used in battery charging applications.

Features

- 20V PNP
- Very low saturation voltage
- 7V reverse blocking capability
- High pulse current
- Low profile SOT23F package



Pinout - top view

Applications

- Mobile phone charging circuits
- Disconnect switch in portable products
- High side driving
- Motor control
- DC-DC convertors
- MOSFET and IGBT gate driving

Ordering information

Device	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTP25020CFFTA	7	8	3000

Device marking

1F4

Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Collector-base voltage	V_{CBO}	-25	V
Collector-emitter voltage	V_{CEO}	-20	V
Emitter-collector voltage (reverse blocking)	V_{ECO}	-7	V
Emitter-base voltage	V_{EBO}	-7	V
Continuous collector current[c]	I_C	-4.5	A
Peak pulse current	I_{CM}	-10	A
Base current	I_B	-1	A
Power dissipation at T_{amb} =25°C[a]	P_D	0.79	W
Linear derating factor		6.3	mW/°C
Power dissipation at T_{amb} =25°C[b]	P_D	1.13	W
Linear derating factor		9	mW/°C
Power dissipation at T_{amb} =25°C[c]	P_D	1.50	W
Linear derating factor		12.0	mW/°C
Power dissipation at T_{amb} =25°C[d]	P_D	1.96	W
Linear derating factor		15.7	mW/°C
Operating and storage temperature range	T_j, T_{stg}	-55 to 150	°C

Thermal resistance

Parameter	Symbol	Value	Unit
Junction to ambient[a]	$R_{\Theta JA}$	158.7	°C/W
Junction to ambient[b]	$R_{\Theta JA}$	110.4	°C/W
Junction to ambient[c]	$R_{\Theta JA}$	83.3	°C/W
Junction to ambient[d]	$R_{\Theta JA}$	63.7	°C/W

NOTES:

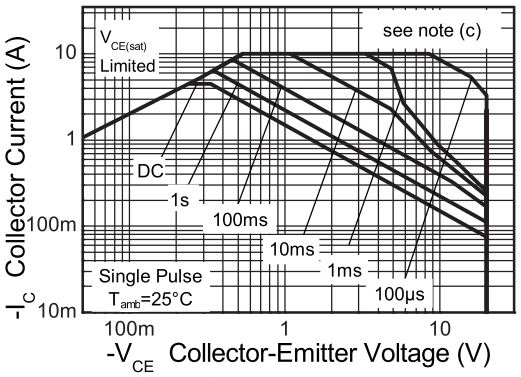
(a) For a device surface mounted on 15mm x 15mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

(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.

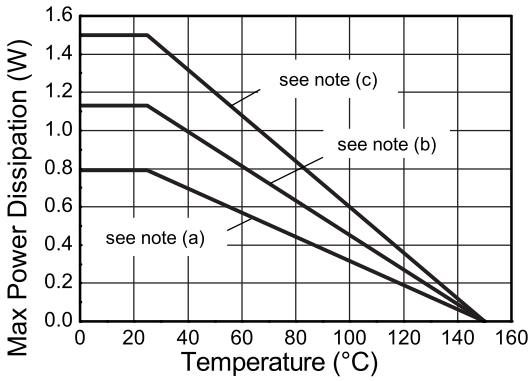
(c) Mounted on 50mm x 50mm x 1.6mm FR4 PCB with a high coverage of single sided 2 oz copper in still air conditions.

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

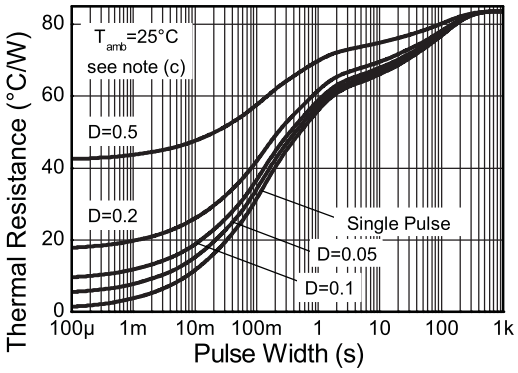
Characteristics



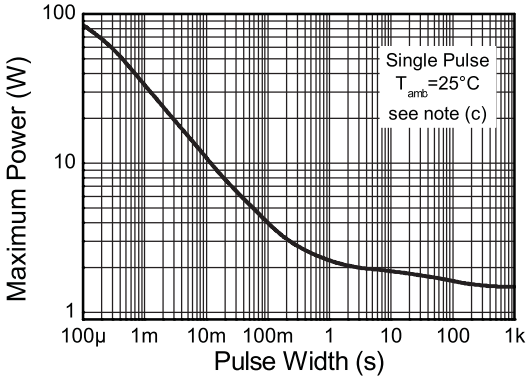
Safe Operating Area



Derating Curve



Transient Thermal Impedance



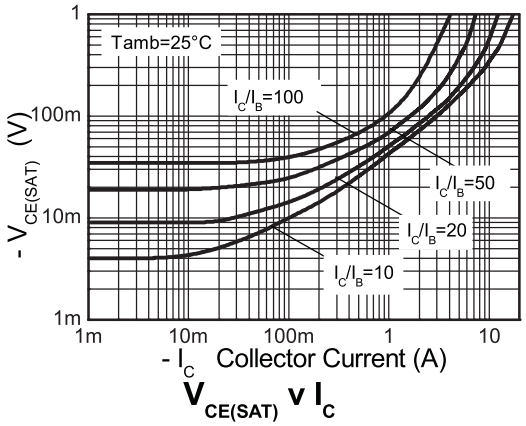
Pulse Power Dissipation

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

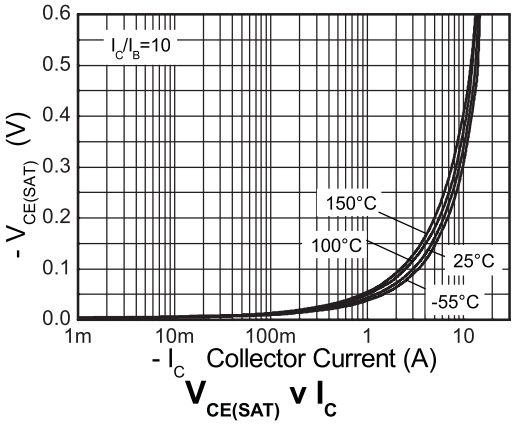
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	-25	-50		V	I_C = -100μA
Collector-emitter breakdown voltage (base open)	BV_{CEO}	-20	-35		V	I_C = -10mA (*)
Emitter-base breakdown voltage	BV_{EBO}	-7	-8.2		V	I_E = -100μA
Emitter-collector breakdown voltage (reverse blocking)	BV_{ECX}	-7	-8.0		V	I_E = -100μA(*) R_{BC} < 10kΩ or -0.25 < V_{BC} <0.25V
Emitter-collector breakdown voltage (base open)	BV_{ECO}	-7	-8.8		V	I_E = -100uA(*)
Collector-base cut-off current	I_{CBO}		<-1	-50	nA	V_{CB} = -20V
				-20	μA	V_{CB} = -20V, T_{amb}= 100°C
Emitter-base cut-off current	I_{EBO}		<-1	-50	nA	V_{EB} = -5.6V
Collector-emitter saturation voltage	$V_{CE(sat)}$		-50	-65	mV	I_C = -1A, I_B = -100mA(*)
			-80	-110	mV	I_C = -1A, I_B = -20mA(*)
			-135	-185	mV	I_C = -2A, I_B = -40mA(*)
			-210	-260	mV	I_C = -4.5A, I_B = -225mA(*)
Base-emitter saturation voltage	$V_{BE(sat)}$		-950	-1050	mV	I_C = -4.5A, I_B = -225mA(*)
Base-emitter turn-on voltage	$V_{BE(on)}$		-840	-950	mV	I_C = -4.5A, V_{CE} = -2V(*)
Static forward current transfer ratio	h_{FE}	200	350	500		I_C = -10mA, V_{CE} = -2V(*)
		150	250			I_C = -1A, V_{CE} = -2V(*)
		85	140			I_C = -4A, V_{CE} = -2V(*)
			40			I_C = -10A, V_{CE} = -2V(*)
Transition frequency	f_T		285		MHz	I_C = -50mA, V_{CE} = -10V f = 100MHz
Output capacitance	C_{obo}		32.4	40	pF	V_{CB} = -10V, f = 1MHz (*)
Delay time	t_d		38.4		ns	V_{CC} = -15V. I_C = -750mA, I_{B1} = I_{B2}= -15mA.
Rise time	t_r		49.2		ns	
Storage time	t_s		168		ns	
Fall time	t_f		55		ns	

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

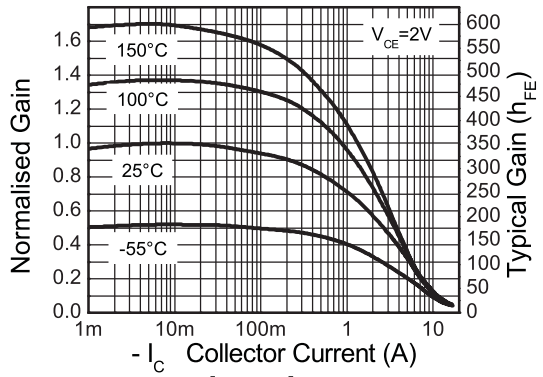
Typical characteristics



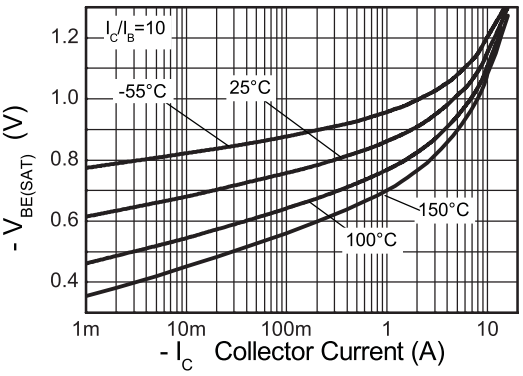
$V_{CE(SAT)}$ v I_C



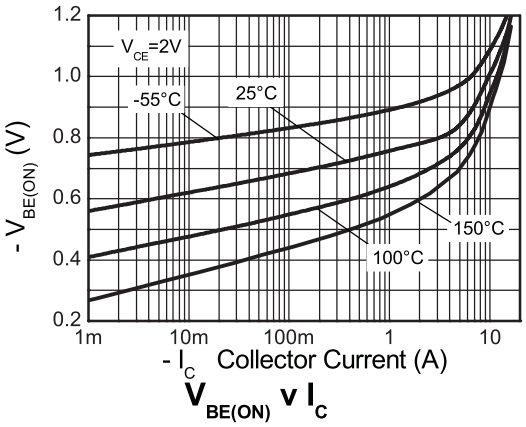
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C



$V_{BE(SAT)}$ v I_C



$V_{BE(ON)}$ v I_C

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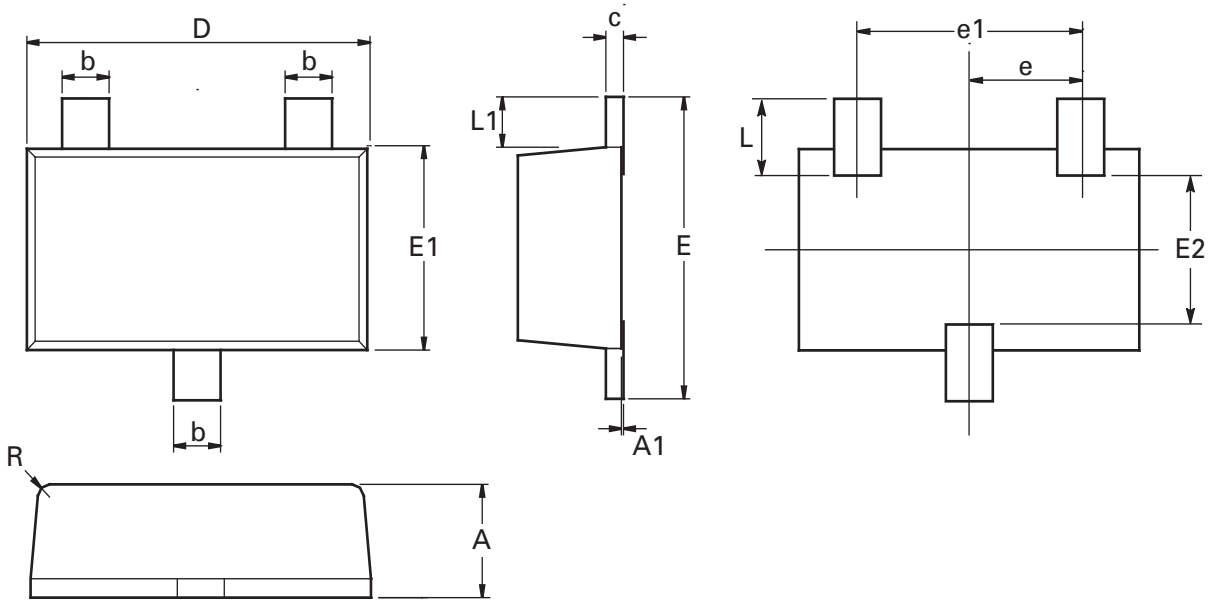
Package outline - SOT23F



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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