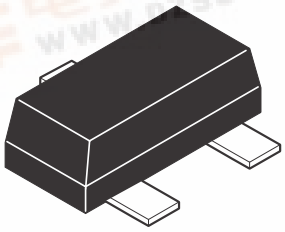
ZXTP19020DFF
20V, SOT23F, PNP medium power transistor

Summary



BV_{CEO} > -20V

BV_{ECO} > -4V

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

$V_{CE(sat)}$ < 44mV @ 1A

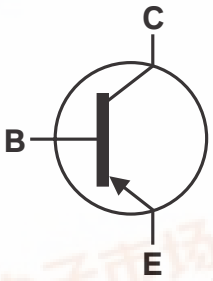
$R_{CE(sat)}$ = 26mΩ

P_D = 1.5W

Complementary part number: ZXTN19020DFF

Description

Advanced process capability and package design have been used to maximize the power handling and performance of this small outline transistor. The compact size and ratings of this device make it ideally suited to applications where space is at a premium



Features

- High power dissipation SOT23 package
- 15A peak current
- Guaranteed gain at a collector current of 10A
- Very low saturation voltage

Applications

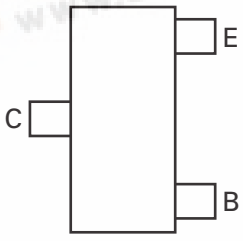
- MOSFET and IGBT gate driving
- Power switches
- Motor control

Ordering information

Device	Reel size (inches)	Tape width	Quantity per reel
ZXTP19020DFFTA	7	8	3000

Device marking

1D8



Pinout - top view

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}	-4	V
Emitter-base voltage	V_{EBO}	-7	V
Continuous collector current(c)	I_C	-5.5	A
Peak pulse current	I_{CM}	-15	A
Base current	I_B	-1	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	mW/°C
Power dissipation at T_{amb} = 25°C(d)	P_D	2	W
linear derating factor		16	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)	$R_{\Theta JA}$	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
Junction to case(e)	$R_{\Theta JC}$	38	°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.

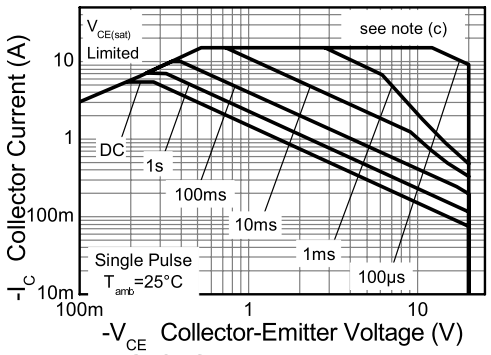
(b) Mounted on 25mm x 25mm x 1.6mm FR4 PCB with a high coverage of single sided 2 oz copper in still air conditions.

(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.

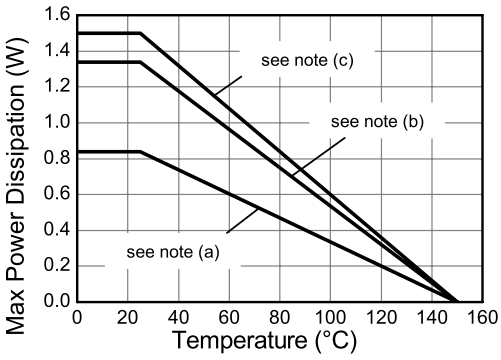
(d) As (c) above measured at t<5secs

(e) Junction to case from collector tab

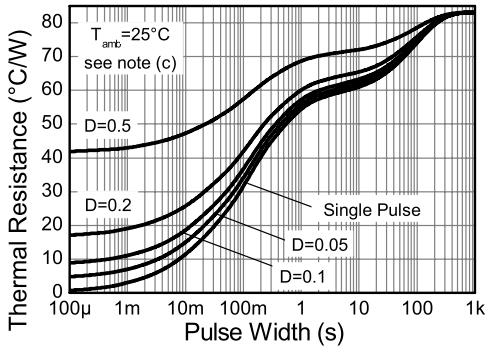
Characteristics



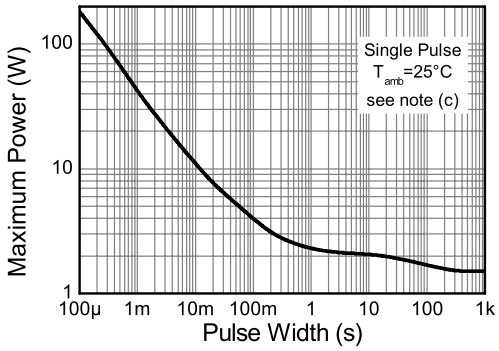
Safe Operating Area



Derating Curve



Transient Thermal Impedance



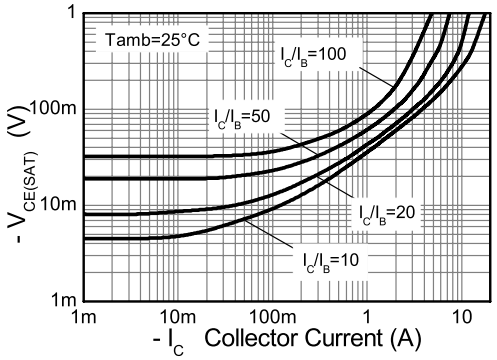
Pulse Power Dissipation

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

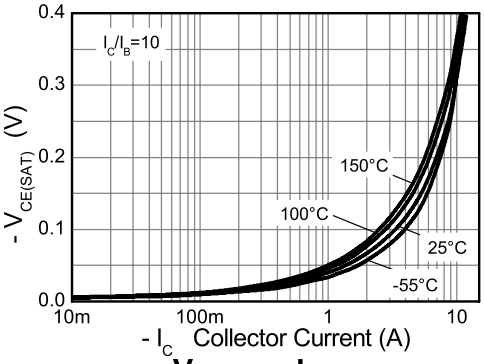
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	-25	-55		V	I_C = -100μA
Collector-emitter breakdown voltage (base open)	BV_{CEO}	-20	-50		V	I_C = -10mA (*)
Emitter-collector breakdown voltage (reverse blocking)	BV_{ECX}	-4	-8.6		V	I_E = -100μA, R_{BC} < 1kΩ or 0.25V > V_{BC} > -0.25V
Emitter-collector breakdown voltage (base open)	BV_{ECO}	-4	-8.6		V	I_E = -100μA
Emitter-base breakdown voltage	BV_{EBO}	-7	-8.2		V	I_E = -100μA
Collector-base cut-off current	I_{CBO}		<-1	-50 -0.5	nA μA	V_{CB} = -25V V_{CB} = -25V, T_{amb}= 100°C
Emitter-base cut-off current	I_{EBO}		<-1	-50	nA	V_{EB} = -5.6V
Collector-emitter saturation voltage	$V_{CE(sat)}$		-37 -90 -105 -160 -145	-44 -125 -140 -210 -175	mV mV mV mV mV	I_C = -1A, I_B = -100mA(*) I_C = -1A, I_B = -10mA(*) I_C = -2A, I_B = -40mA(*) I_C = -5A, I_B = -250mA(*) I_C = -5.5A, I_B = -550mA(*)
Base-emitter saturation voltage	$V_{BE(sat)}$		-975	-1050	mV	I_C = -5.5A, I_B = -550mA(*)
Base-emitter turn-on voltage	$V_{BE(on)}$		-830	-900	mV	I_C = -5.5A, V_{CE} = -2V(*)
Static forward current transfer ratio	h_{FE}	300 200 85 25	450 310 130 50 20	900		I_C = -100mA, V_{CE} = -2V(*) I_C = -2A, V_{CE} = -2V(*) I_C = -5.5A, V_{CE} = -2V(*) I_C = -10A, V_{CE} = -2V(*) I_C = -15A, V_{CE} = -2V(*)
Transition frequency	f_T		176		MHz	I_C = -50mA, V_{CE} = -10V f = 50MHz
Input capacitance	C_{ibo}			400	pF	V_{EB} = -0.5V, f = 1MHz(*)
Output capacitance	C_{obo}		36	45	pF	V_{CB} = -10V, f = 1MHz(*)
Delay time	t_d		23		ns	I_C = -1A, V_{CC} = -10V I_{B1} = -I_{B2}= -50mA.
Rise time	t_r		18.4		ns	
Storage time	t_s		266		ns	
Fall time	t_f		49.6		ns	

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

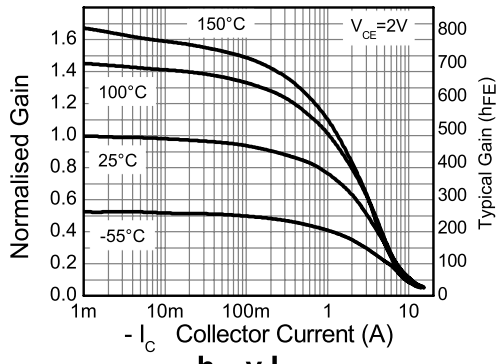
Typical characteristics



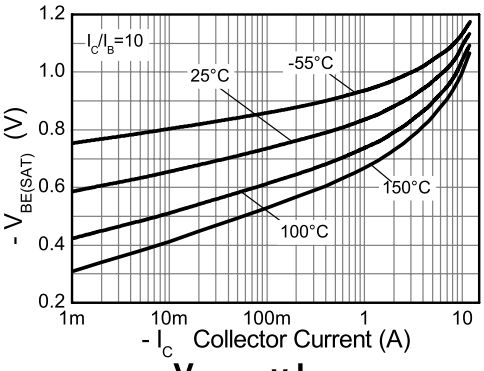
$V_{CE(SAT)}$ v I_C



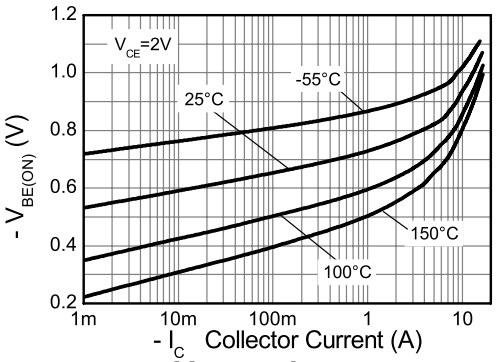
$V_{CE(SAT)}$ v I_C



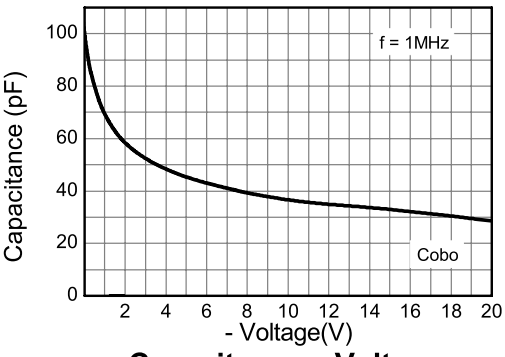
h_{FE} v I_C



$V_{BE(SAT)}$ v I_C

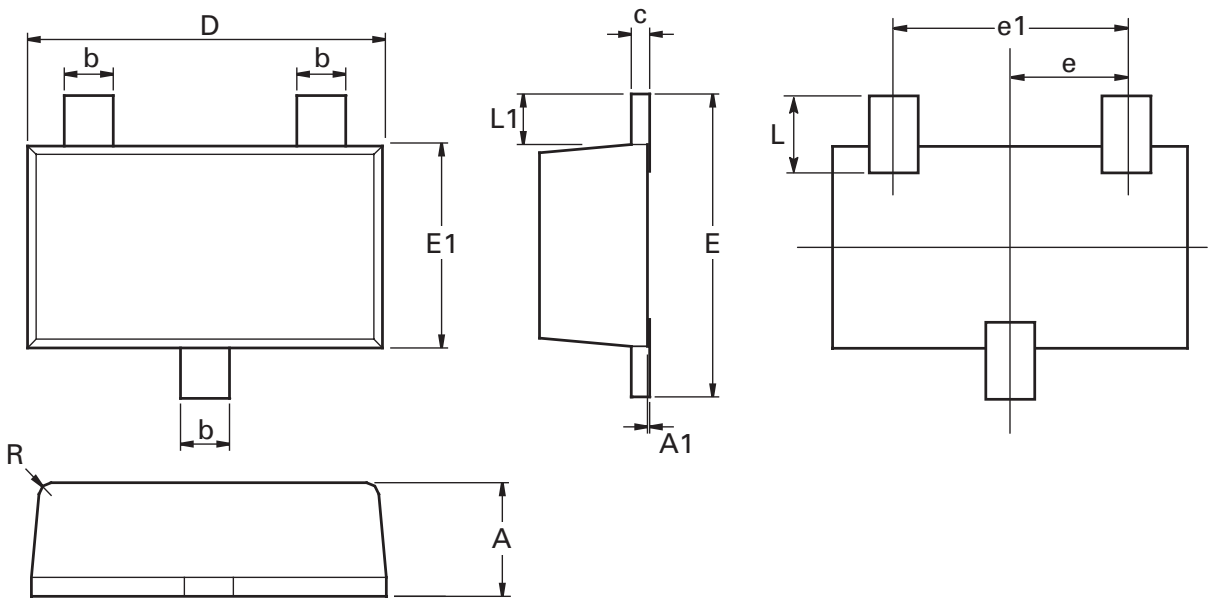


$V_{BE(ON)}$ v I_C



Capacitance v Voltage

SOT23F Package outline



Dim.	Millimeters		Inches		Dim.	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	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	L	0.48	0.68	0.0189	0.0268
c	0.10	0.20	0.0043	0.0079	L1	0.30	0.50	0.0153	0.0161
D	2.80	3.00	0.1102	0.1181	R	0.05	0.15	0.0019	0.0059
e	0.95 ref		0.0374 ref		O	0°	12°	0°	12°
e1	1.80	2.00	0.0709	0.0787	-	-	-	-	-

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

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