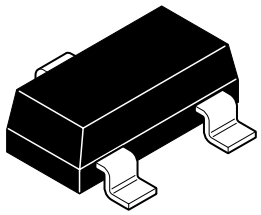
ZXTN25020DFL
20V, SOT23, NPN low power transistor

Summary



BV_{CEX} > 100V

BV_{CEO} > 20V

BV_{ECO} > 5V

$I_{C(cont)}$ = 2A

I_{CM} = 8A

$V_{CE(sat)}$ < 70mV @ 1A

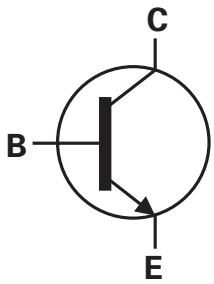
$R_{CE(sat)}$ = 55mΩ

P_D = 350mW

Complementary part number ZXTP25020DFL

Description

Advanced process capability has been used to achieve high current gain hold up making this device ideal for applications requiring high pulse currents.

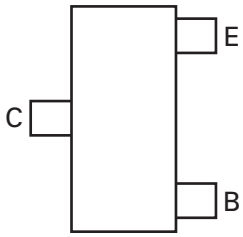


Features

- High peak current
- Low saturation voltage
- 100V forward blocking voltage

Applications

- MOSFET and IGBT gate driving
- DC-DC conversion
- LED driving
- Interface between low voltage IC's and loads



Pinout - top view

Ordering information

Device	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTN25020DFLTA	7	8	3,000

Device marking

1A1

Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Collector-base voltage	V_{CBO}	100	V
Collector-emitter voltage (forward blocking)	V_{CEX}	100	V
Collector-emitter voltage	V_{CEO}	20	V
Emitter-collector voltage (reverse blocking)	V_{ECO}	5	V
Emitter-base voltage	V_{EBO}	7	V
Continuous collector current[(a)]	I_C	2	A
Base current	I_B	500	mA
Peak pulse current	I_{CM}	8	A
Power dissipation at T_{amb} =25°C[(a)]	P_D	350	mW
Linear derating factor		2.8	mW/°C
Operating and storage temperature range	T_j, T_{stg}	-55 to 150	°C

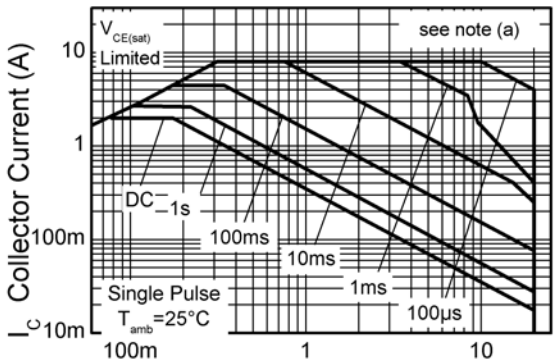
Thermal resistance

Parameter	Symbol	Limit	Unit
Junction to ambient[(a)]	$R_{\Theta JA}$	357	°C/W

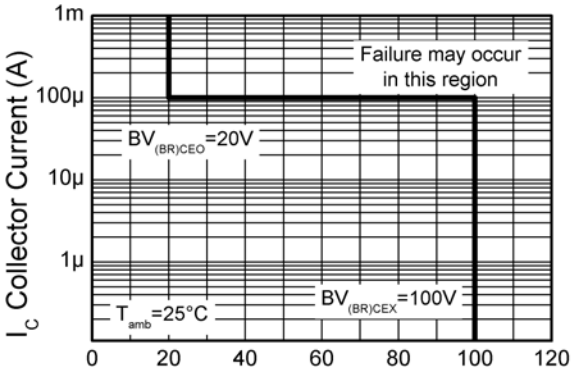
NOTES:

(a) For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

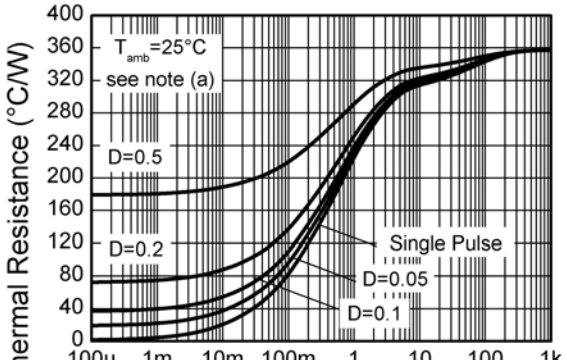
Characteristics



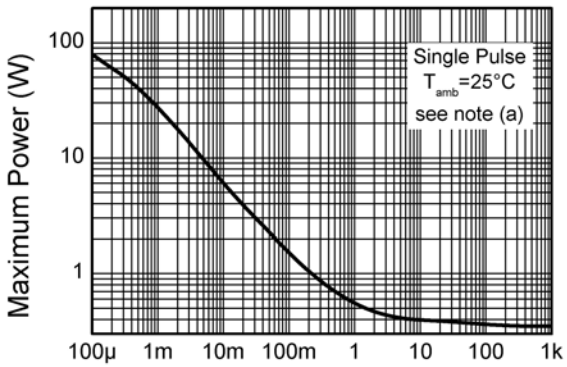
Safe Operating Area



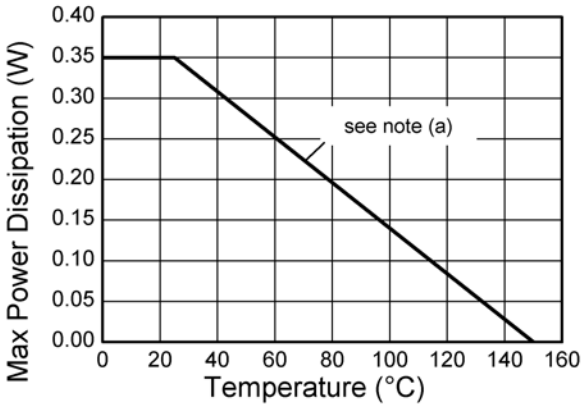
Safe Operating Area



Transient Thermal Impedance



Pulse Power Dissipation



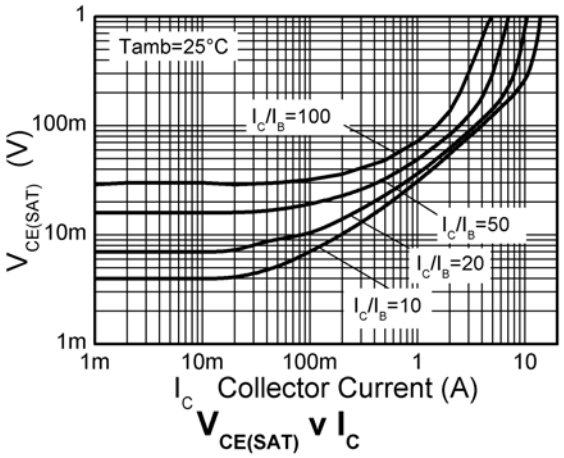
Derating Curve

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

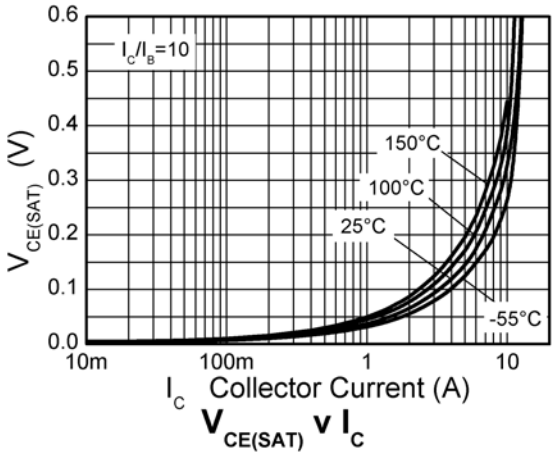
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	100	125		V	I_C = 100μA
Collector-emitter breakdown voltage (forward blocking)	BV_{CEX}	100	120		V	I_C = 100 A; R_{BE} < 1kΩ or -1V < V_{BE} < 0.25V
Collector-emitter breakdown voltage (base open)	BV_{CEO}	20	35		V	I_C = 10mA (*)
Emitter-collector breakdown voltage (reverse blocking)	BV_{ECX}	6	8		V	I_E = 100μA, R_{BC} < 1kΩ or 0.25V > V_{BC} > -0.25V
Emitter-collector breakdown voltage (base open)	BV_{ECO}	5	6		V	I_E = 100μA,
Emitter-base breakdown voltage	BV_{EBO}	7	8.3		V	I_E = 100μA
Collector cut-off current	I_{CBO}		<1	50 20	nA μA	V_{CB} = 80V V_{CB} = 80V, T_{amb}= 100°C
Collector-emitter cut-off current	I_{CEX}		-	100	nA	V_{CE} = 80V; R_{BE} < 1kΩ or -1V < V_{BE} < 0.25V
Emitter cut-off current	I_{EBO}		<1	50	nA	V_{EB} = 5.6V
Collector-emitter saturation voltage	$V_{CE(SAT)}$		60 85 140 180 245	70 100 160 225 270	mV mV mV mV mV	I_C = 1A, I_B = 100mA(*) I_C = 1A, I_B = 20mA(*) I_C = 2A, I_B = 40mA(*) I_C = 2A, I_B = 20mA(*) I_C = 4,5A, I_B = 450mA(*)
Base-emitter saturation voltage	$V_{BE(SAT)}$		895	1000	mV	I_C = 2A, I_B = 40mA(*)
Base-emitter turn-on voltage	$V_{BE(ON)}$		825	900	mV	I_C = 2A, V_{CE} = 2V(*)
Static forward current transfer ratio	h_{FE}	300 220 80	450 350 120	900		I_C = 10mA, V_{CE} = 2V(*) I_C = 2A, V_{CE} = 2V(*) I_C = 4.5A, V_{CE} = 2V(*)
Transition frequency	f_T		215		MHz	I_C = 50mA, V_{CE} = 10V f = 100MHz
Output capacitance	C_{OBO}		16.5	25	pF	V_{CB} = 10V, f = 1MHz(*)
Delay time	$t_{(d)}$		67.7		ns	V_{CC} = 10V. I_C = 1A, I_{B1} = I_{B2}= 10mA.
Rise time	$t_{(r)}$		72.2		ns	
Storage time	$t_{(s)}$		361		ns	
Fall time	$t_{(f)}$		63.9		ns	

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

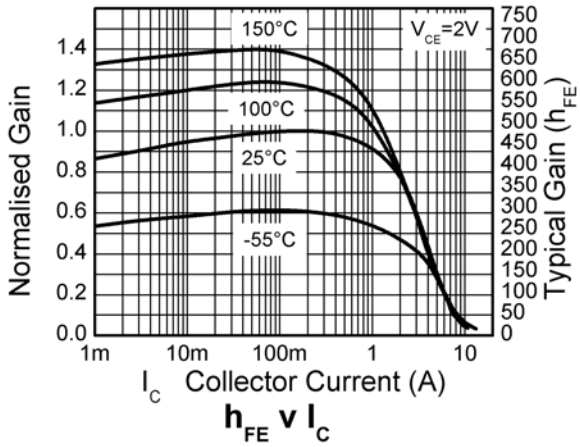
Typical characteristics



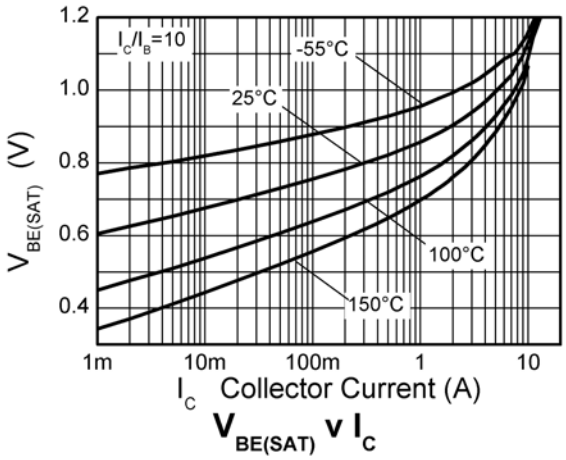
$V_{CE(SAT)}$ v I_C



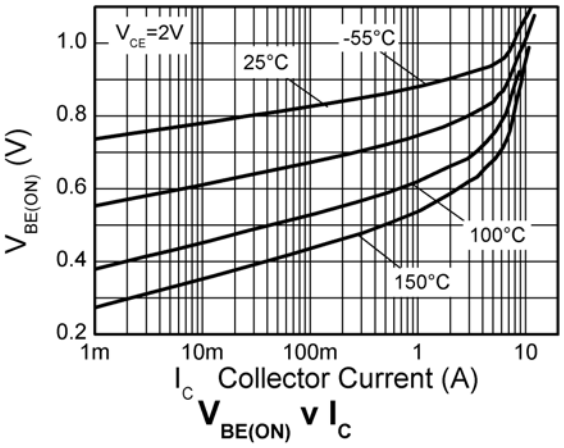
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C

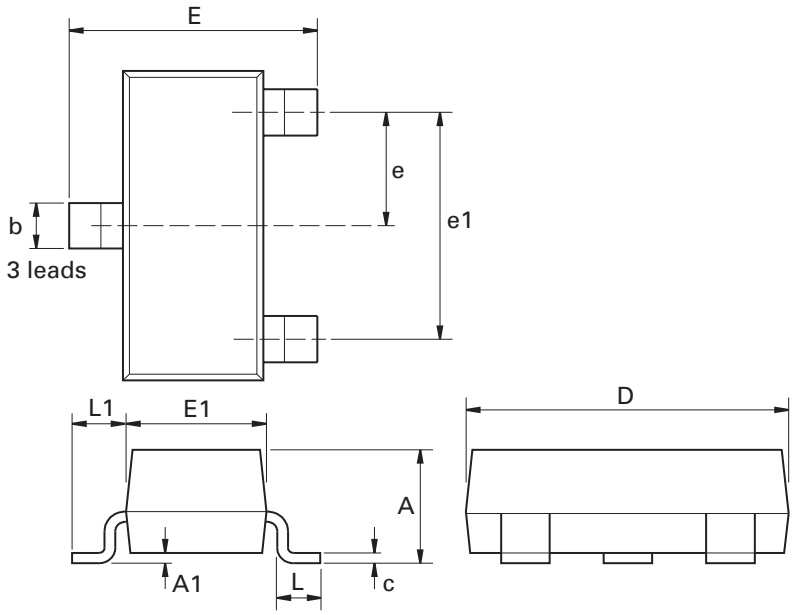


$V_{BE(SAT)}$ v I_C



$V_{BE(ON)}$ v I_C

Package outline - SOT23



Dim.	Millimeters		Inches		Dim.	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Max.	Max.
A	2.67	3.05	0.105	0.120	H	0.33	0.51	0.013	0.020
B	1.20	1.40	0.047	0.055	K	0.01	0.10	0.0004	0.004
C	-	1.10	-	0.043	L	2.10	2.50	0.083	0.0985
D	0.37	0.53	0.015	0.021	M	0.45	0.64	0.018	0.025
F	0.085	0.15	0.0034	0.0059	N	0.95 NOM		0.0375 NOM	
G	1.90 NOM		0.075 NOM		-	-	-	-	-

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

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ESD (Electrostatic discharge)

Semiconductor devices are susceptible to damage by ESD. Suitable precautions should be taken when handling and transporting devices. The possible damage to devices depends on the circumstances of the handling and transporting, and the nature of the device. The extent of damage can vary from immediate functional or parametric malfunction to degradation of function or performance in use over time. Devices suspected of being affected should be replaced.

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Zetex Semiconductors is committed to environmental excellence in all aspects of its operations which includes meeting or exceeding regulatory requirements with respect to the use of hazardous substances. Numerous successful programs have been implemented to reduce the use of hazardous substances and/or emissions.

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Product status key:	
"Preview"	Future device intended for production at some point. Samples may be available
"Active"	Product status recommended for new designs
"Last time buy (LTB)"	Device will be discontinued and last time buy period and delivery is in effect
"Not recommended for new designs"	Device is still in production to support existing designs and production
"Obsolete"	Production has been discontinued

Datasheet status key:	
"Draft version"	This term denotes a very early datasheet version and contains highly provisional information, which may change in any manner without notice.
"Provisional version"	This term denotes a pre-release datasheet. It provides a clear indication of anticipated performance. However, changes to the test conditions and specifications may occur, at any time and without notice.
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