

ZXTN25020DFL

20V, SOT23, NPN low power transistor

Summary

$BV_{CEX} > 100V$

$BV_{CEO} > 20V$

$BV_{ECO} > 5V$

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

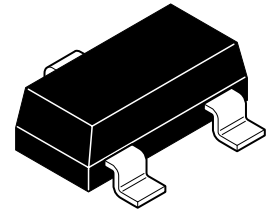
$I_{CM} = 8A$

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

$R_{CE(sat)} = 55m\Omega$

$P_D = 350mW$

Complementary part number ZXTP25020DFL



Description

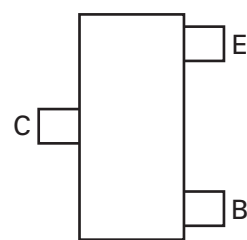
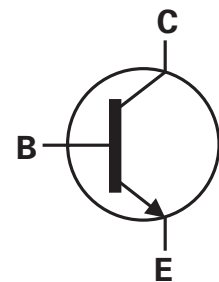
Advanced process capability has been used to achieve high current gain hold up making this device ideal for applications requiring high pulse currents.

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

ZXTN25020DFL

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 $T_{amb} = 25^\circ\text{C}$ ^(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

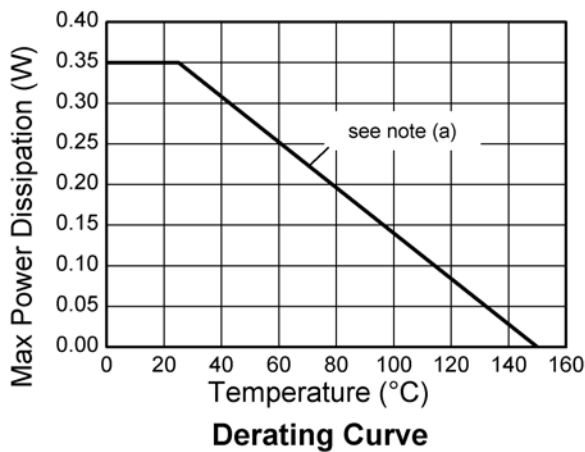
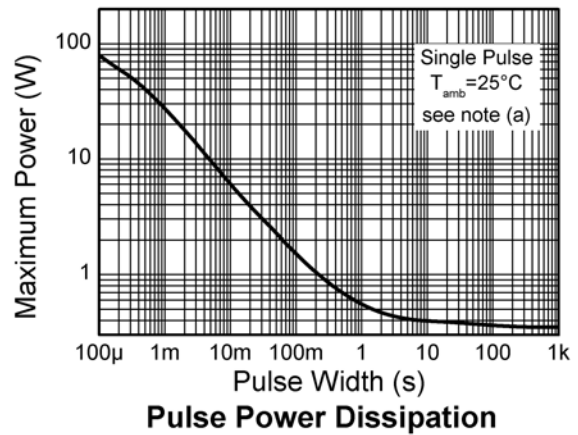
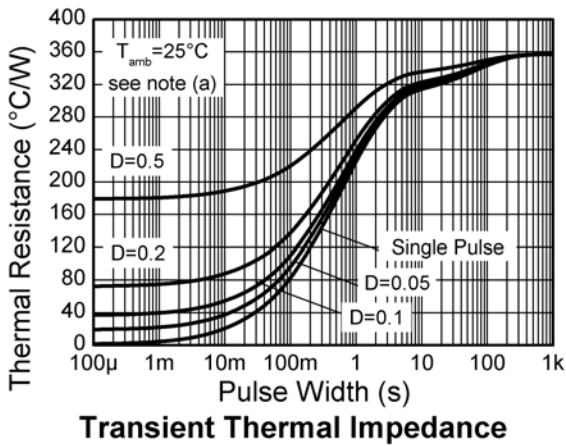
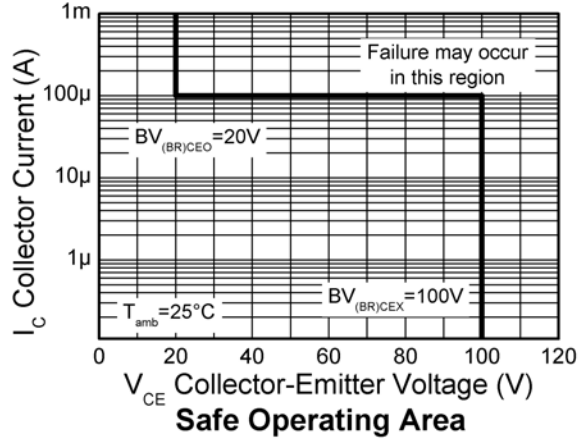
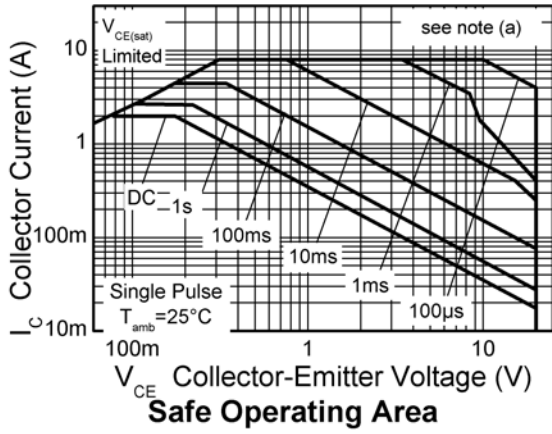
Parameter	Symbol	Limit	Unit
Junction to ambient ^(a)	$R_{\theta JA}$	357	°C/W

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.

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Characteristics



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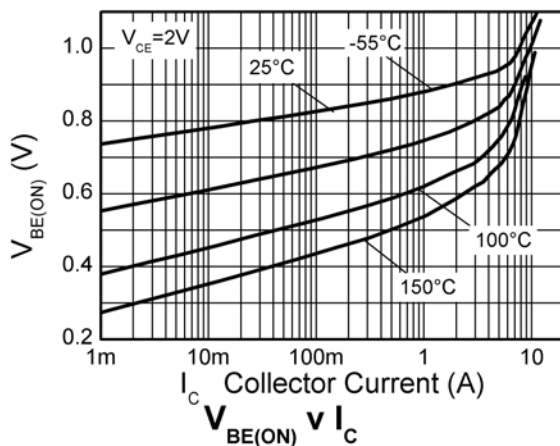
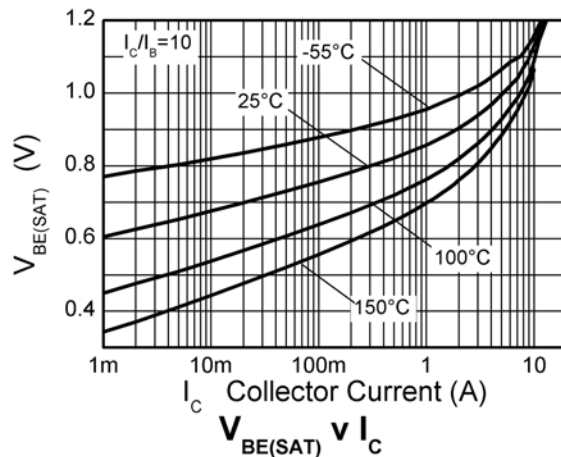
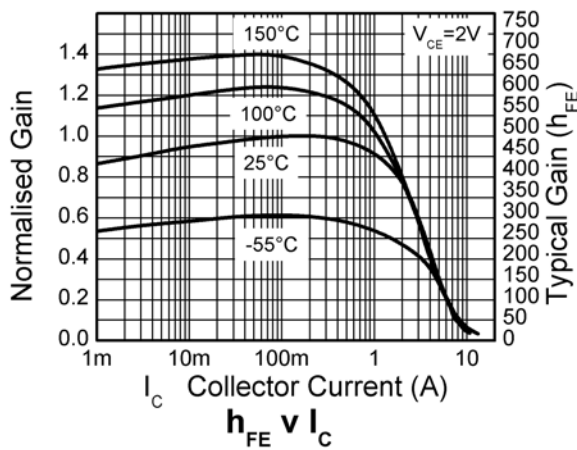
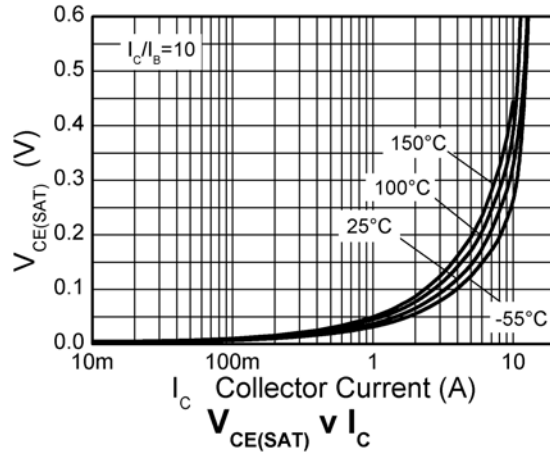
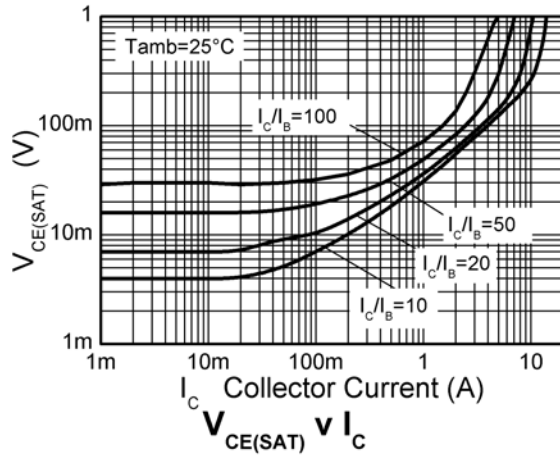
Electrical characteristics (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated)

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

NOTES:

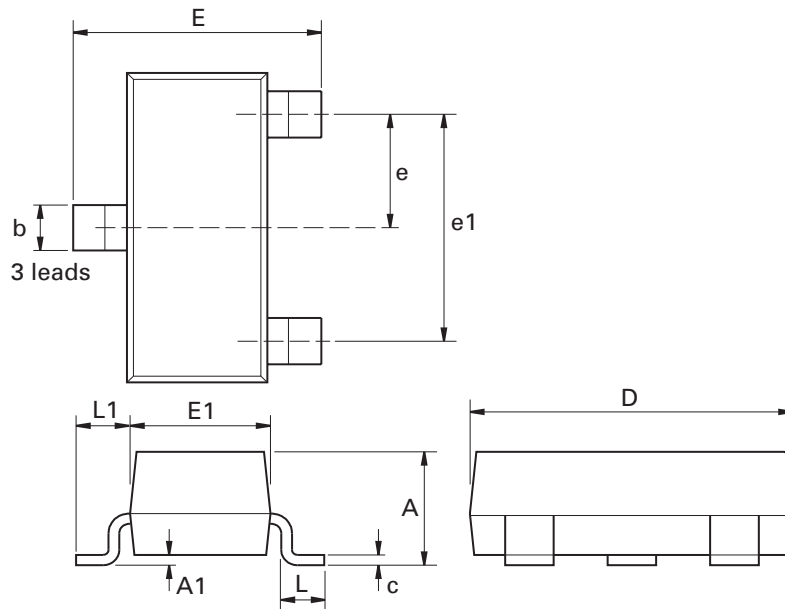
(*) Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.

Typical characteristics



ZXTN25020DFL

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.

Green compliance

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.

All Zetex components are compliant with the RoHS directive, and through this it is supporting its customers in their compliance with WEEE and ELV directives.

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.
"Issue"	This term denotes an issued datasheet containing finalized specifications. However, changes to specifications may occur, at any time and without notice.

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