

# ZXTP25020DFL

## 20V, SOT23, PNP low power transistor

### Summary

$BV_{CEO} > -20V$

$BV_{ECO} > -4V$

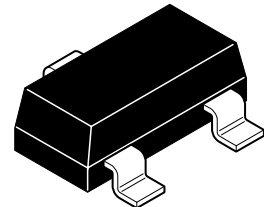
$I_{C(cont)} = 1.5A$

$V_{CE(sat)} < 85\text{ mV @ } 1A$

$R_{CE(sat)} = 54m\Omega$

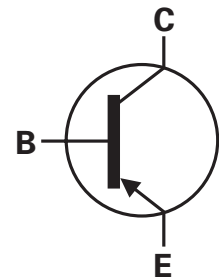
$P_D = 350mW$

Complementary part number ZXTN25020DFL



### Description

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

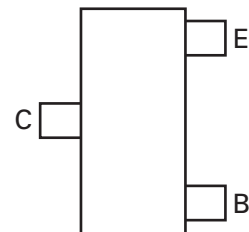


### Features

- High peak current
- Low saturation voltage

### Applications

- DC-DC converters
- MOSFET and IGBT gate driving



Pinout - top view

### Ordering information

Device	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTP25020DFLTA	7	8	3000

### Device marking

1F2

# ZXTP25020DFL

## Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Collector-base voltage	$V_{CBO}$	-25	V
Collector-emitter voltage (forward blocking)	$V_{CEO}$	-20	V
Emitter-collector voltage (reverse blocking)	$V_{ECO}$	-4	V
Emitter-base voltage	$V_{EBO}$	-7	V
Continuous collector current	$I_C$	-1.5	A
Base current	$I_B$	-500	mA
Peak pulse current	$I_{CM}$	-6	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

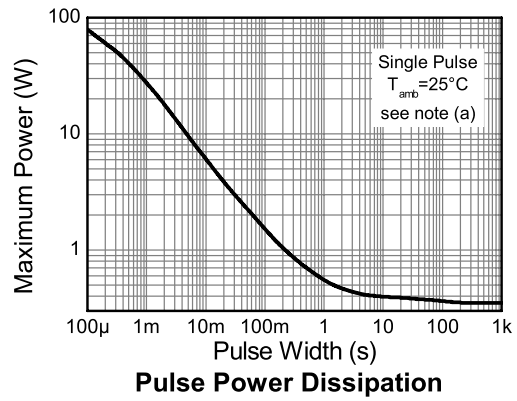
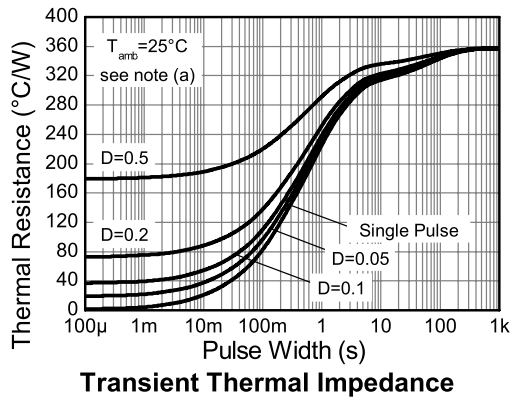
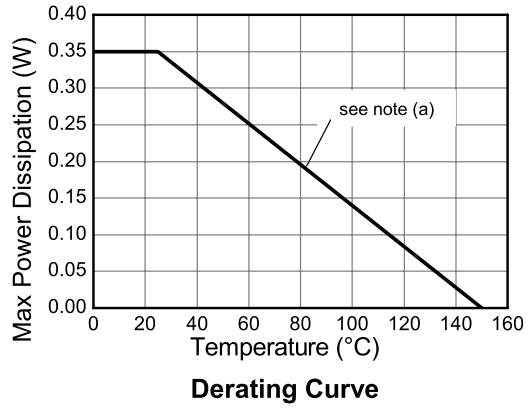
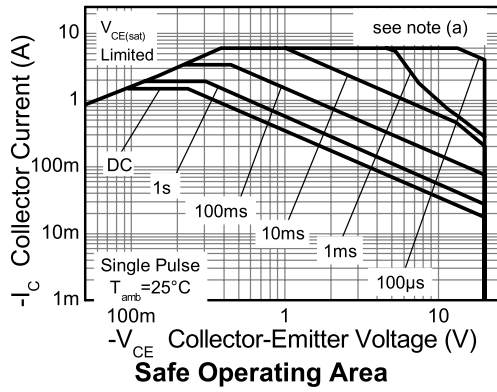
Parameter	Symbol	Limit	Unit
Junction to ambient <sup>(a)</sup>	$R_{\theta JA}$	357	°C/W

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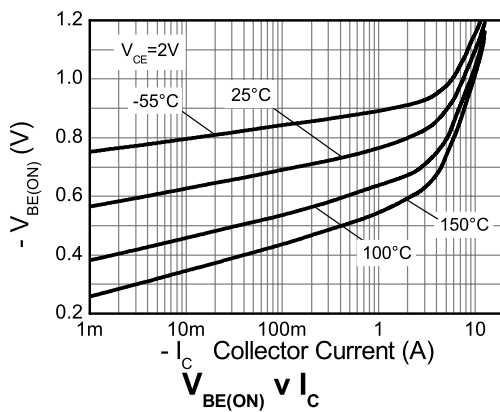
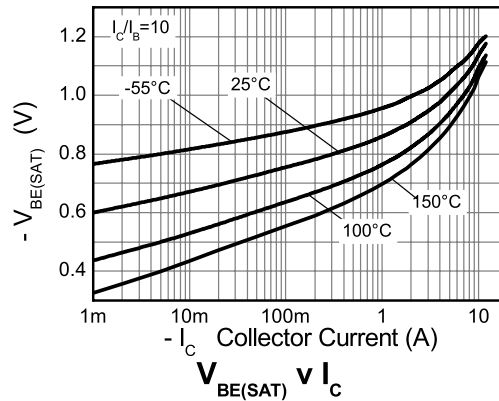
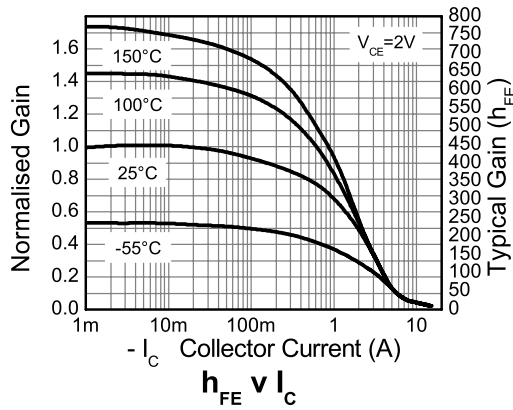
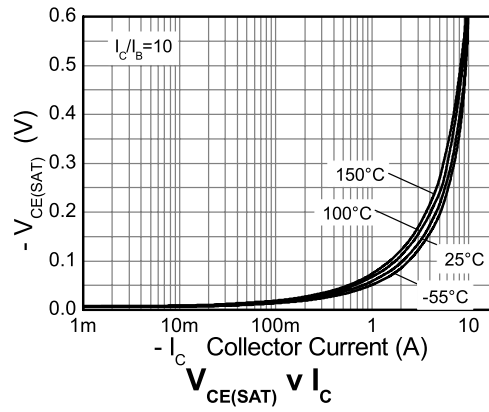
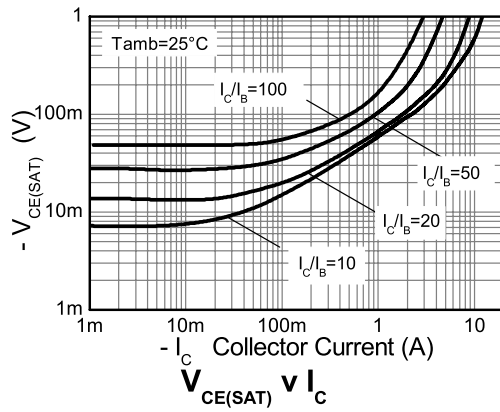
## Electrical characteristics (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	$BV_{CBO}$	-25	-55		V	$I_C = -100\mu\text{A}$
Collector-emitter breakdown voltage (base open)	$BV_{CEO}$	-20	-45		V	$I_C = -10\text{mA}^{(*)}$
Emitter-base breakdown voltage	$BV_{EBO}$	-7	-8.3		V	$I_E = -100\mu\text{A}$
Emitter-collector breakdown voltage (reverse blocking)	$BV_{ECO}$	-4	-8.5		V	$I_E = -100\mu\text{A}^{(*)}$
Collector cut-off current	$I_{CBO}$		<-1	-50 -20	nA $\mu\text{A}$	$V_{CB} = -20\text{V}$ $V_{CB} = -20\text{V}, T_{amb} = 100^{\circ}\text{C}$
Emitter cut-off current	$I_{EBO}$		<-1	-50	nA	$V_{EB} = -5.6\text{V}$
Collector-emitter saturation voltage	$V_{CE(sat)}$		-65 -160 150 -210 -215	-85 -225 -195 -275 260	mV mV mV mV mV	$I_C = -1\text{A}, I_B = -100\text{mA}^{(*)}$ $I_C = -1\text{A}, I_B = -10\text{mA}^{(*)}$ $I_C = -1.5\text{A}, I_B = -30\text{mA}^{(*)}$ $I_C = -2\text{A}, I_B = -40\text{mA}^{(*)}$ $I_C = -4\text{A}, I_B = -400\text{mA}^{(*)}$
Base-emitter saturation voltage	$V_{BE(sat)}$		-845	-950	mV	$I_C = -1.5\text{A}, I_B = -30\text{mA}^{(*)}$
Base-emitter turn-on voltage	$V_{BE(on)}$		-785	-900	mV	$I_C = -1.5\text{A}, V_{CE} = -2\text{V}^{(*)}$
Static forward current transfer ratio	$h_{FE}$	300 160 60	450 250 90 15	900		$I_C = -10\text{mA}, V_{CE} = -2\text{V}^{(*)}$ $I_C = -1.5\text{A}, V_{CE} = -2\text{V}^{(*)}$ $I_C = -4\text{A}, V_{CE} = -2\text{V}^{(*)}$ $I_C = -10\text{A}, V_{CE} = -2\text{V}^{(*)}$
Transition frequency	$f_T$		290		MHz	$I_C = -50\text{mA}, V_{CE} = -10\text{V}$ $f = 50\text{MHz}$
Output capacitance	$C_{obo}$		21	30	pF	$V_{CB} = -10\text{V}, f = 1\text{MHz}^{(*)}$
Delay time	$t_{(d)}$		14.2			$V_{CC} = -10\text{V}, I_C = -1\text{A}, I_{B1} = I_{B2} = -50\text{mA}.$
Rise time	$t_{(r)}$		16.3			
Storage time	$t_{(s)}$		186			
Fall time	$t_{(f)}$		32.7			

### NOTES:

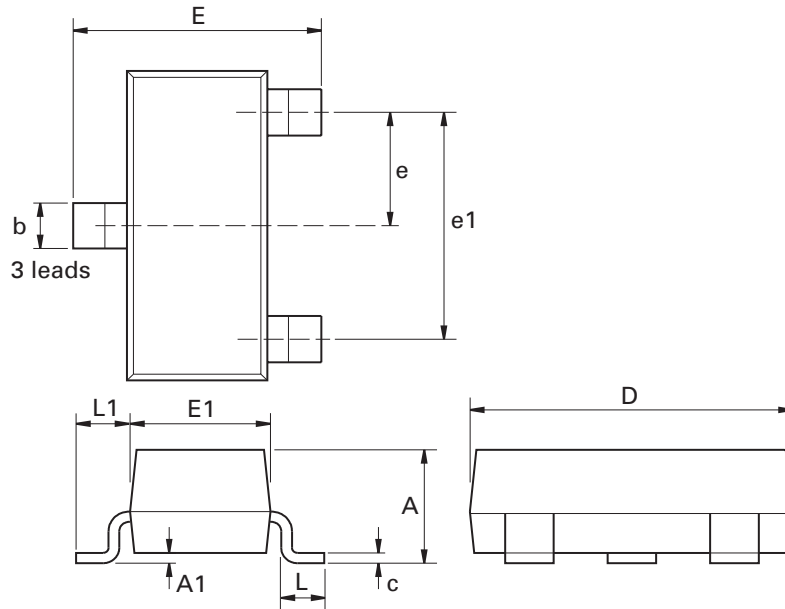
(\*) Measured under pulsed conditions. Pulse width  $\leq 300\mu\text{s}$ ; duty cycle  $\leq 2\%$ .

## Typical characteristics



# ZXTP25020DFL

## Package outline - SOT23



Dim.	Millimeters		Inches		Dim.	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Max.	Max.
A	-	1.12	-	0.044	e1	1.90 NOM		0.075 NOM	
A1	0.01	0.10	0.0004	0.004	E	2.10	2.64	0.083	0.104
b	0.30	0.50	0.012	0.020	E1	1.20	1.40	0.047	0.055
C	0.085	0.120	0.003	0.008	L	0.25	0.62	0.018	0.024
D	2.80	3.04	0.110	0.120	L1	0.45	0.62	0.018	0.024
e	0.95 NOM		0.0375 NOM		-	-	-	-	-

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

# ZXTP25020DFL

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# ZXTP25020DFL

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"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

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