

# ZXTP25020DFL

## 20V, SOT23, PNP low power transistor

### Summary

$BV_{CEO} > -20V$

$BV_{ECO} > -4V$

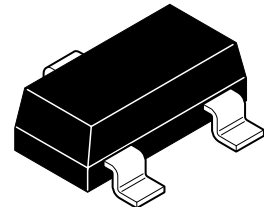
$I_{C(cont)} = 1.5A$

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

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

$P_D = 350mW$

Complementary part number ZXTN25020DFL



### Description

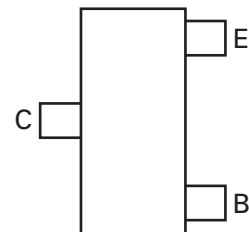
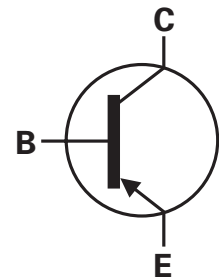
Advanced process capability has been used to achieve high current gain hold up making this device ideal for applications requiring high pulse currents.

### 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

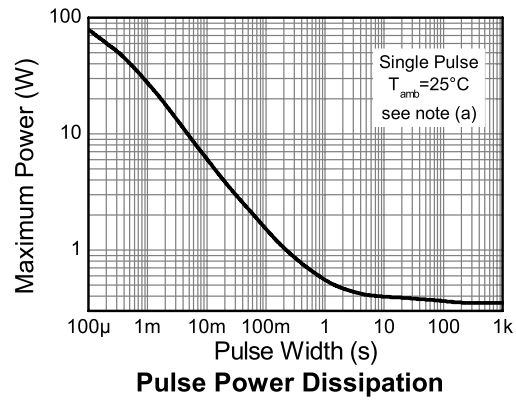
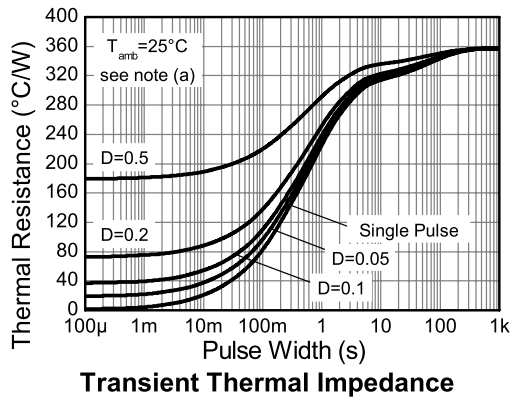
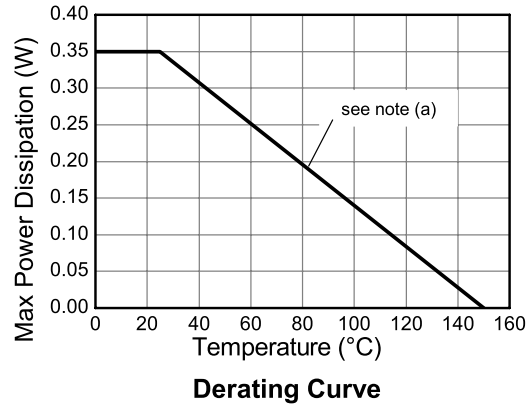
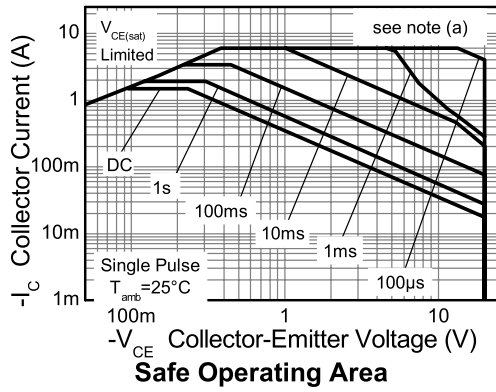
Parameter	Symbol	Limit	Unit
Junction to ambient <sup>(a)</sup>	$R_{\theta JA}$	357	°C/W

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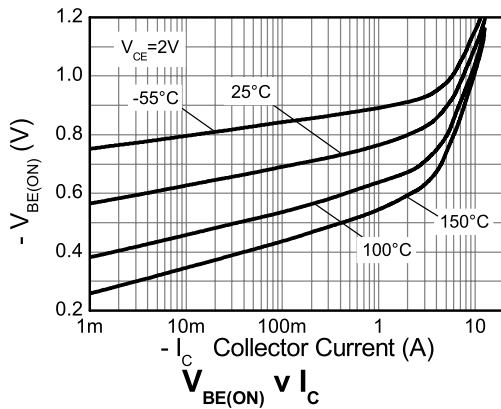
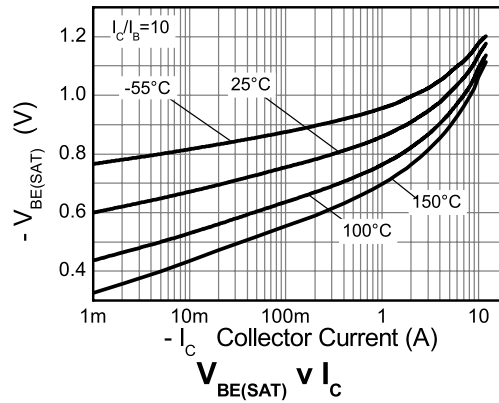
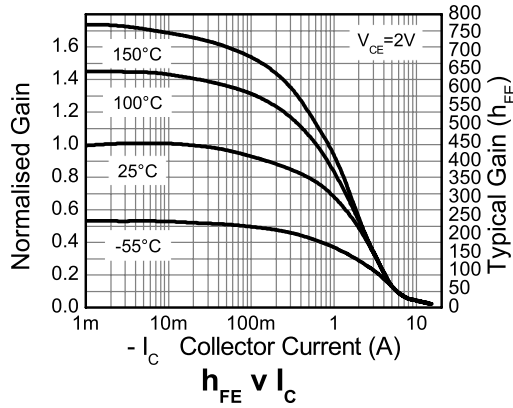
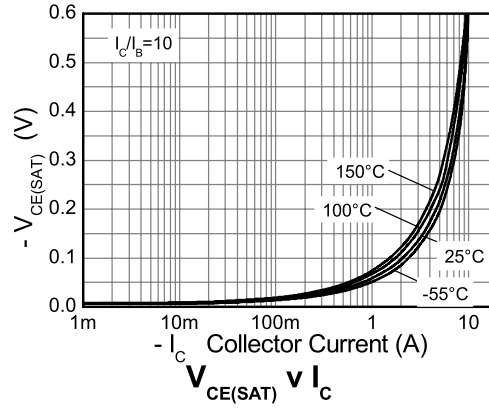
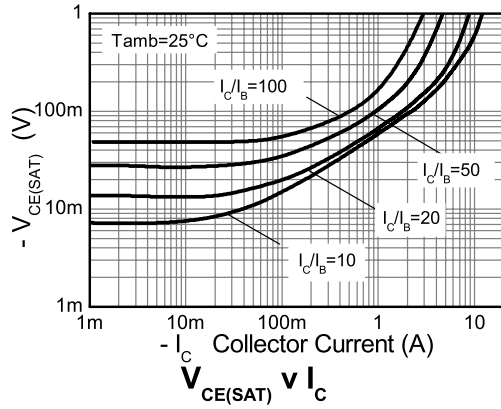
## Electrical characteristics (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated)

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:

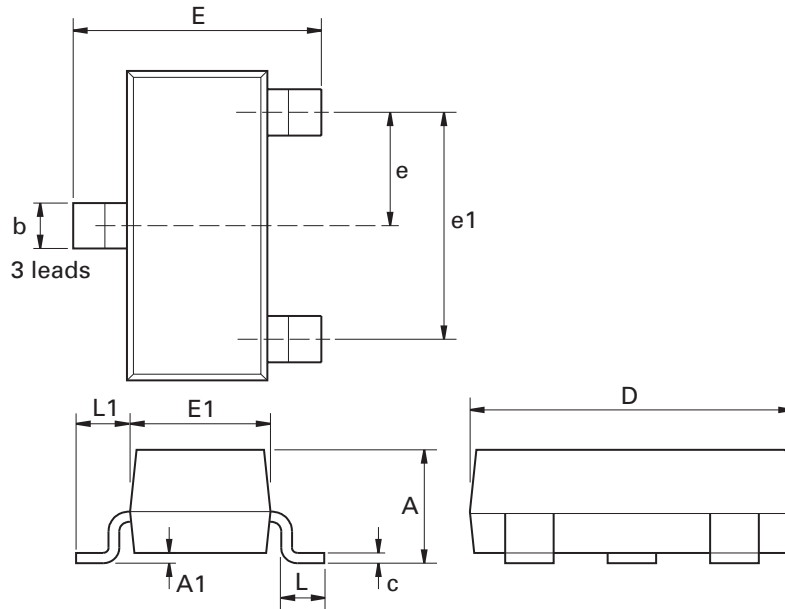
(\*) Measured under pulsed conditions. Pulse width  $\leq 300\mu\text{s}$ ; duty cycle  $\leq 2\%$ .

## 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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"Obsolete"	Production has been discontinued

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