

**SuperSOT4™  
20V NPN SILICON LOW SATURATION TRANSISTOR****SUMMARY** $V_{CE0}=20V; R_{SAT} = 40m\Omega; I_c= 2.5A$ **DESCRIPTION**

This new 4th generation ultra low saturation transistor utilises the Zetex matrix structure combined with advanced assembly techniques to give extremely low on state losses. This makes it ideal for high efficiency, low voltage switching applications.

**FEATURES**

- Extremely Low Equivalent On Resistance
- Extremely Low Saturation Voltage
- $h_{FE}$  characterised up to 5A
- $I_c=2.5A$  Continuous Collector Current
- SOT23 package

**APPLICATIONS**

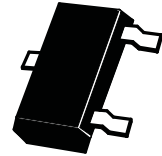
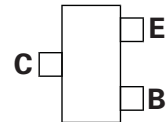
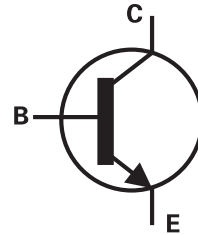
- DC - DC Converters
- Power Management Functions
- Power switches
- Motor control

**ORDERING INFORMATION**

DEVICE	REEL SIZE (inches)	TAPE WIDTH (mm)	QUANTITY PER REEL
ZXT11N20DFTA	7	8mm embossed	3000 units
ZXT11N20DFTC	13	8mm embossed	10000 units

**DEVICE MARKING**

2N0

**SOT23**

Top View

# ZXT11N20DF

## ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	LIMIT	UNIT
Collector-Base Voltage	$V_{CBO}$	40	V
Collector-Emitter Voltage	$V_{CEO}$	20	V
Emitter-Base Voltage	$V_{EBO}$	7.5	V
Peak Pulse Current	$I_{CM}$	5	A
Continuous Collector Current	$I_C$	2.5	A
Base Current	$I_B$	500	mA
Power Dissipation at $T_A=25^\circ\text{C}$ (a) Linear Derating Factor	$P_D$	625 5	mW mW/ $^\circ\text{C}$
Power Dissipation at $T_A=25^\circ\text{C}$ (b) Linear Derating Factor	$P_D$	806 6.4	mW mW/ $^\circ\text{C}$
Operating and Storage Temperature Range	$T_j:T_{stg}$	-55 to +150	$^\circ\text{C}$

## THERMAL RESISTANCE

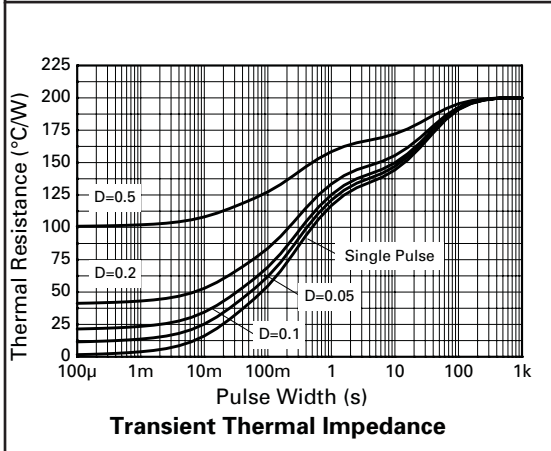
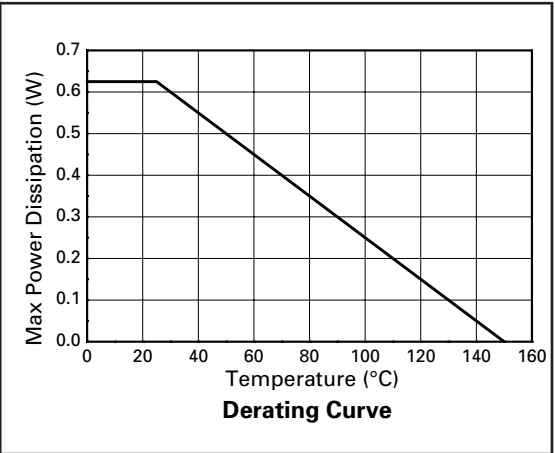
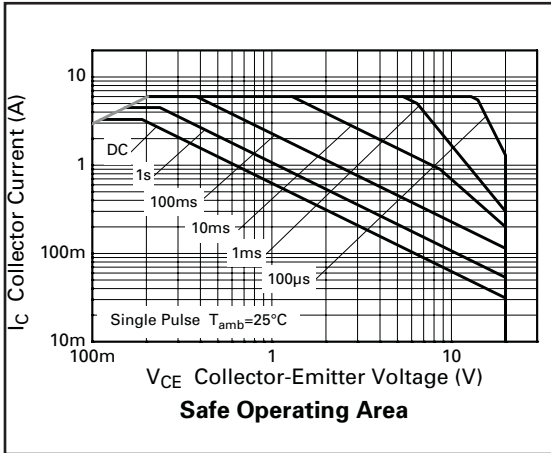
PARAMETER	SYMBOL	VALUE	UNIT
Junction to Ambient (a)	$R_{\theta JA}$	200	$^\circ\text{C}/\text{W}$
Junction to Ambient (b)	$R_{\theta JA}$	155	$^\circ\text{C}/\text{W}$

### NOTES

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

(b) For a device surface mounted on FR4 PCB measured at  $t \leq 5$  secs.

## TYPICAL CHARACTERISTICS



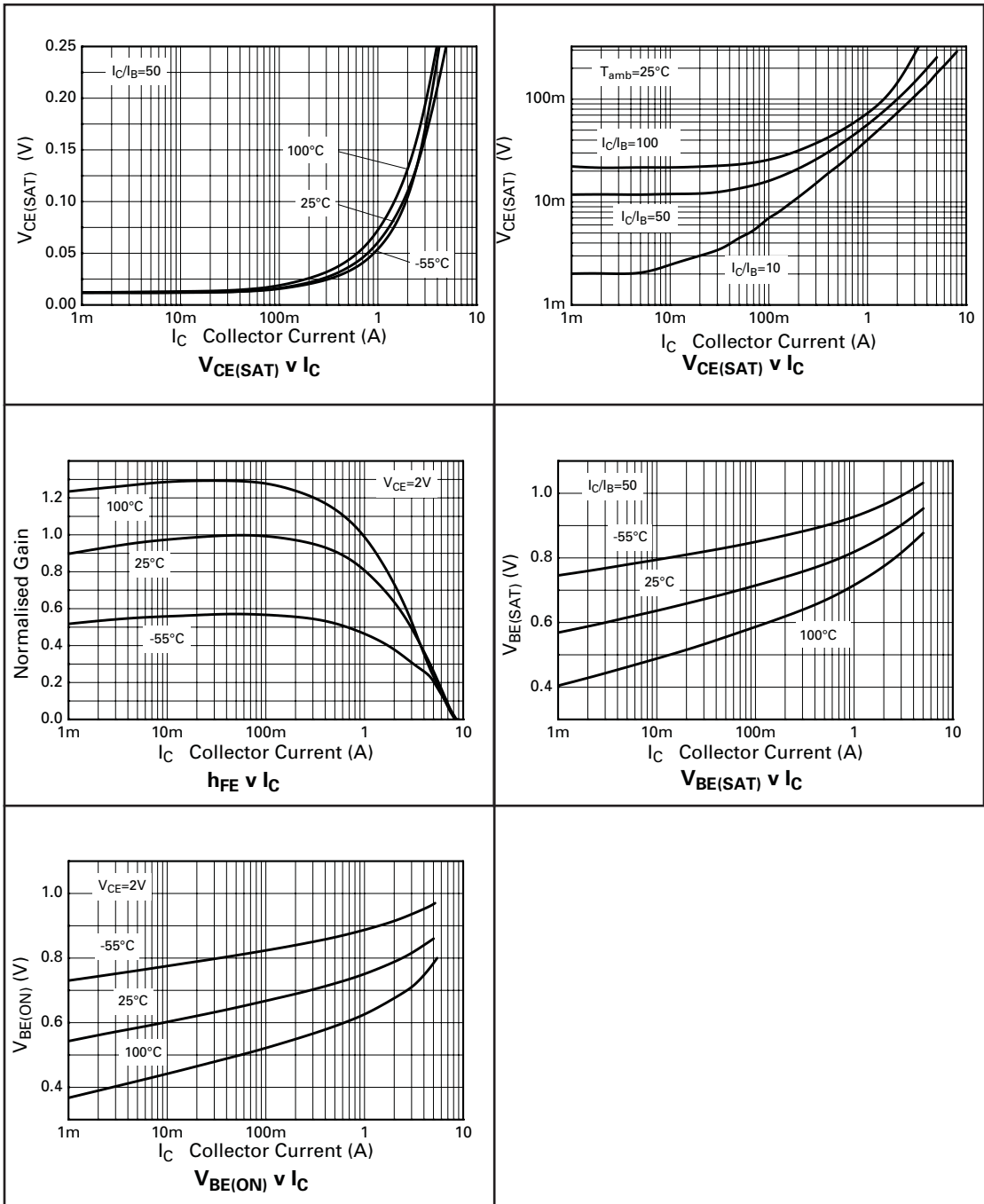
# ZXT11N20DF

## ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated).

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	40			V	$I_C=100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	20			V	$I_C=10\text{mA}^*$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	7.5			V	$I_E=100\mu\text{A}$
Collector Cut-Off Current	$I_{CBO}$			100	nA	$V_{CB}=32\text{V}$
Emitter Cut-Off Current	$I_{EBO}$			100	nA	$V_{EB}=6\text{V}$
Collector Emitter Cut-Off Current	$I_{CES}$			100	nA	$V_{CES}=32\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		7 65 40 90	12 100 60 130	mV mV mV mV	$I_C=0.1\text{A}, I_B=10\text{mA}^*$ $I_C=1\text{A}, I_B=10\text{mA}^*$ $I_C=1\text{A}, I_B=100\text{mA}^*$ $I_C=2.5\text{A}, I_B=250\text{mA}^*$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		0.9	1.0	V	$I_C=2.5\text{A}, I_B=250\text{mA}^*$
Base-Emitter Turn-On Voltage	$V_{BE(on)}$		0.85	1.0	V	$I_C=2.5\text{A}, V_{CE}=2\text{V}^*$
Static Forward Current Transfer Ratio	$h_{FE}$	200 300 250 150 100		900		$I_C=10\text{mA}, V_{CE}=2\text{V}^*$ $I_C=100\text{mA}, V_{CE}=2\text{V}^*$ $I_C=1\text{A}, V_{CE}=2\text{V}^*$ $I_C=3\text{A}, V_{CE}=2\text{V}^*$ $I_C=5\text{A}, V_{CE}=2\text{V}^*$
Transition Frequency	$f_T$		160		MHz	$I_C=50\text{mA}, V_{CE}=10\text{V}$ $f=50\text{MHz}$
Output Capacitance	$C_{obo}$		20		pF	$V_{CB}=10\text{V}, f=1\text{MHz}$
Turn-On Time	$t_{(on)}$		122		ns	$V_{CC}=10\text{V}, I_C=2\text{A}$ $I_{B1}=I_{B2}=20\text{mA}$
Turn-Off Time	$t_{(off)}$		295		ns	

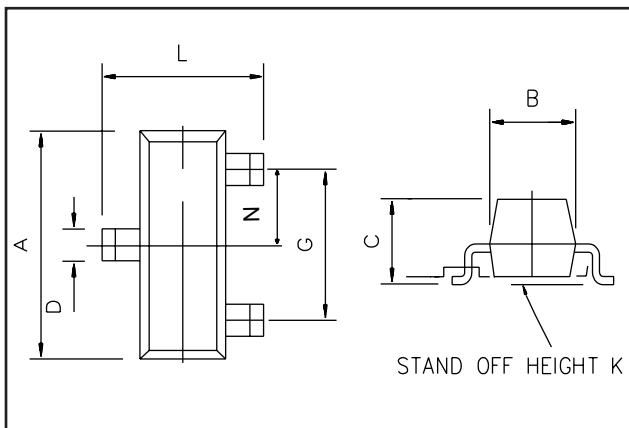
\*Measured under pulsed conditions. Pulse width=300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$

## TYPICAL CHARACTERISTICS



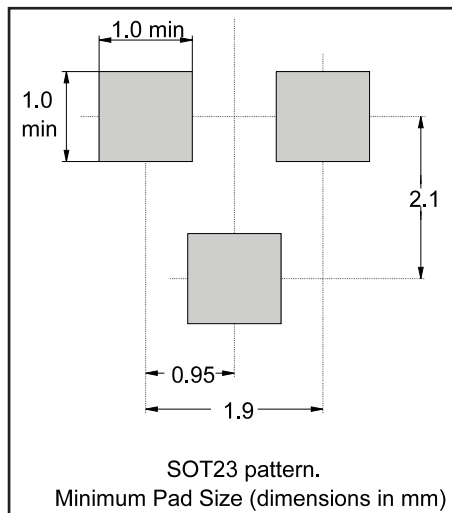
# ZXT11N20DF

## PACKAGE DIMENSIONS



DIM	Millimetres		Inches	
	Min	Max	Min	Max
A	2.67	3.05	0.105	0.120
B	1.20	1.40	0.047	0.055
C	-	1.10	-	0.043
D	0.37	0.53	0.0145	0.021
F	0.085	0.15	0.0033	0.0059
G	NOM 1.9		NOM 0.075	
K	0.01	0.10	0.0004	0.004
L	2.10	2.50	0.0825	0.0985
N	NOM 0.95		NOM 0.037	

## PAD LAYOUT DETAILS



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