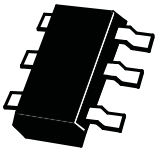
SuperSOT4™
20V NPN SILICON LOW SATURATION SWITCHING TRANSISTOR

SUMMARY

V_{CEO}=20V; R_{SAT} = 38mΩ; I_C= 4.5A



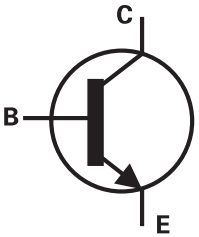
SOT23-6

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 15A
- I_C=4.5A Continuous Collector Current
- SOT23-6 package

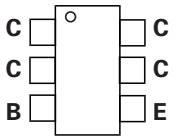


APPLICATIONS

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

ORDERING INFORMATION

DEVICE	REEL SIZE (inches)	TAPE WIDTH (mm)	QUANTITY PER REEL
ZXT13N20DE6TA	7	8mm embossed	3000 units
ZXT13N20DE6TC	13	8mm embossed	10000 units



Top View

DEVICE MARKING

N20D

ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	LIMIT	UNIT
Collector-Base Voltage	V_{CBO}	50	V
Collector-Emitter Voltage	V_{CEO}	20	V
Emitter-Base Voltage	V_{EBO}	7.5	V
Peak Pulse Current	I_{CM}	15	A
Continuous Collector Current	I_C	4.5	A
Base Current	I_B	500	mA
Power Dissipation at TA=25°C (a) Linear Derating Factor	P_D	1.1 8.8	W mW/°C
Power Dissipation at TA=25°C (b) Linear Derating Factor	P_D	1.7 13.6	W mW/°C
Operating and Storage Temperature Range	T_j:T_{stg}	-55 to +150	°C

THERMAL RESISTANCE

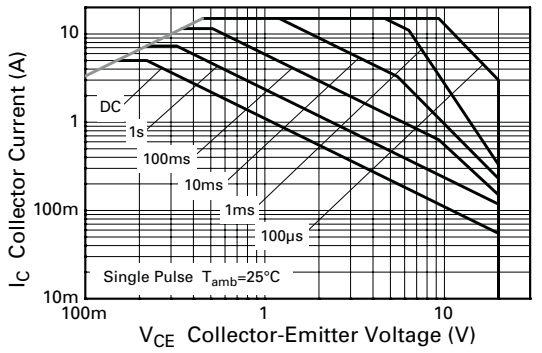
PARAMETER	SYMBOL	VALUE	UNIT
Junction to Ambient (a)	$R_{\theta JA}$	113	°C/W
Junction to Ambient (b)	$R_{\theta JA}$	73	°C/W

NOTES

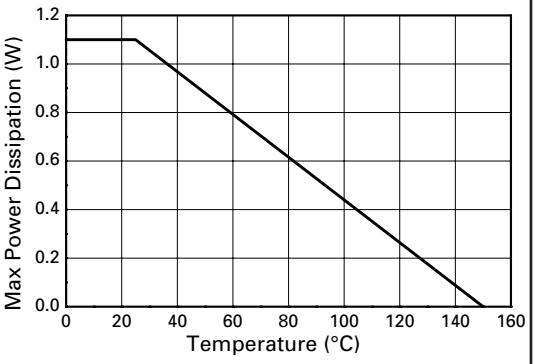
(a) For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions

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

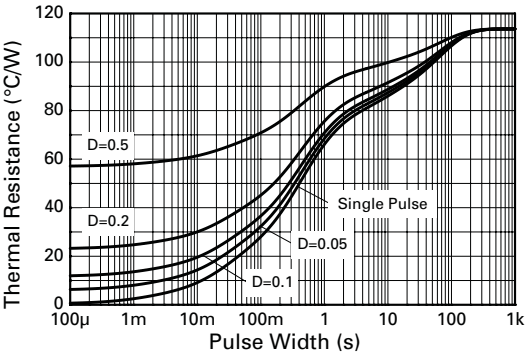
TYPICAL CHARACTERISTICS



Safe Operating Area



Derating Curve



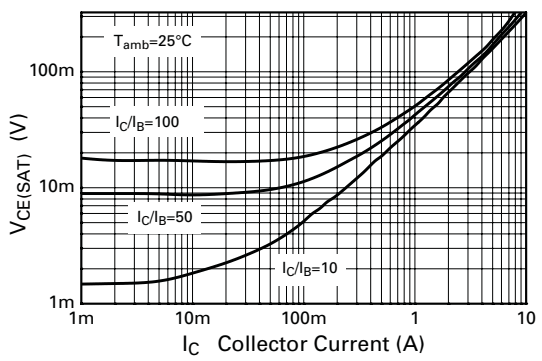
Transient Thermal Impedance

ELECTRICAL CHARACTERISTICS (at T_{amb} = 25°C unless otherwise stated).

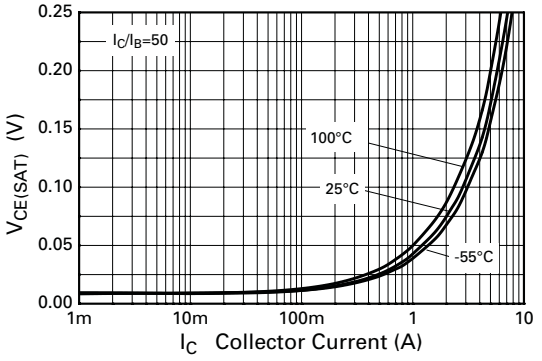
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	50	100		V	I_C=100μA
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	20	33		V	I_C=10mA*
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	7.5	8.5		V	I_E=100μA
Collector Cut-Off Current	I_{CBO}			100	nA	V_{CB}=40V
Emitter Cut-Off Current	I_{EBO}			100	nA	V_{EB}=6V
Collector Emitter Cut-Off Current	I_{CES}			100	nA	V_{CES}=40V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		5.0 55 170	8 75 230	mV mV mV	I_C=0.1A, I_B=10mA* I_C=1A, I_B=10mA* I_C=4.5A, I_B=45mA*
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		0.9	1.0	V	I_C=4.5A, I_B=45mA*
Base-Emitter Turn-On Voltage	$V_{BE(on)}$		0.85	0.90	V	I_C=4.5A, V_{CE}=2V*
Static Forward Current Transfer Ratio	h_{FE}	250 300 200 15	400 450 300 45	900		I_C=10mA, V_{CE}=2V* I_C=1A, V_{CE}=2V* I_C=5A, V_{CE}=2V* I_C=15A, V_{CE}=2V*
Transition Frequency	f_T		96		MHz	I_C=50mA, V_{CE}=10V f=50MHz
Output Capacitance	C_{obo}		50		pF	V_{CB}=10V, f=1MHz
Turn-On Time	$t_{(on)}$		115		ns	V_{CC}=10V, I_C=2A I_{B1}=I_{B2}=40mA
Turn-Off Time	$t_{(off)}$		485		ns	

*Measured under pulsed conditions. Pulse width=300μs. Duty cycle ≤ 2%

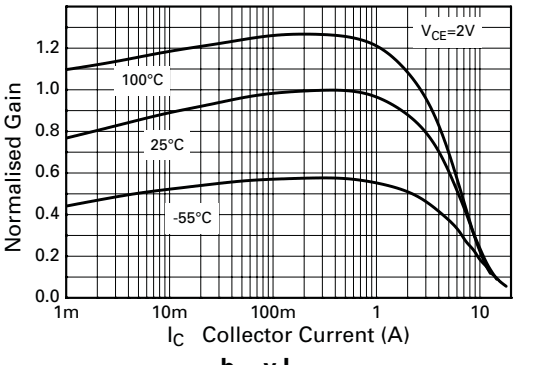
TYPICAL CHARACTERISTICS



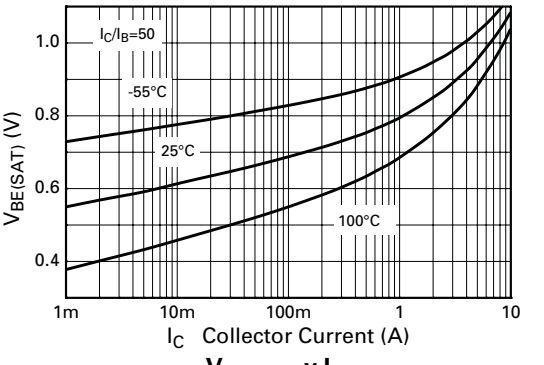
$V_{CE(SAT)}$ v I_C



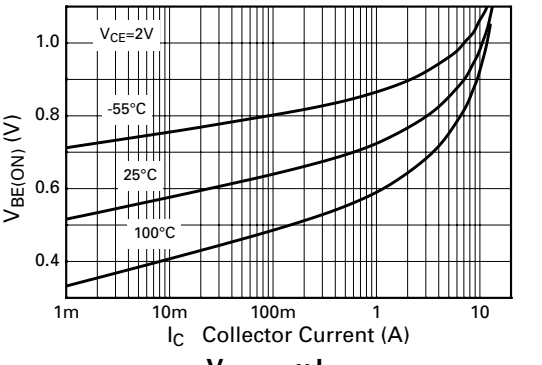
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C

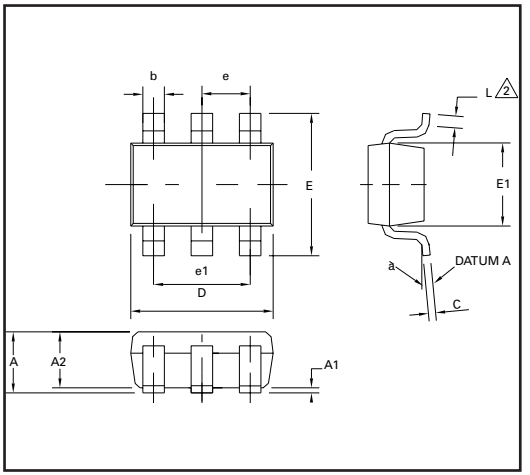


$V_{BE(SAT)}$ v I_C

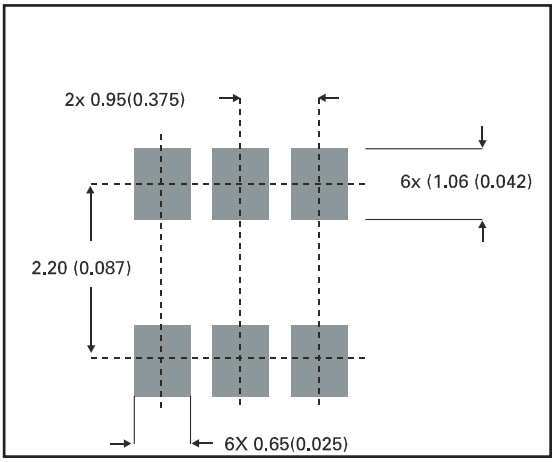


$V_{BE(ON)}$ v I_C

PACKAGE DIMENSIONS



PAD LAYOUT DETAILS



DIM	Millimetres		Inches	
	Min	Max	Min	Max
A	0.90	1.45	0.35	0.057
A1	0.00	0.15	0	0.006
A2	0.90	1.30	0.035	0.051
b	0.35	0.50	0.014	0.019
C	0.09	0.20	0.0035	0.008
D	2.80	3.00	0.110	0.118
E	2.60	3.00	0.102	0.118
E1	1.50	1.75	0.059	0.069
L	0.10	0.60	0.004	0.002
e	0.95 REF		0.037 REF	
e1	1.90 REF		0.074 REF	
L	0°	10°	0°	10°

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