SuperSOT4™
DUAL 20V NPN SILICON LOW SATURATION SWITCHING TRANSISTOR

SUMMARY

V_{CEO}=20V; R_{SAT} = 40mΩ; I_C= 3.5A

DESCRIPTION

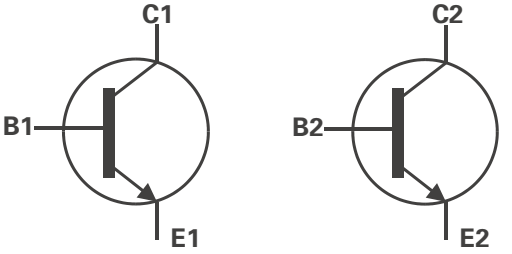
This new 4th generation ultra low saturation transistor utilises the Zetex matrix structure combined with advanced assembly techniques to give extremely low on state losses. This makes it ideal for high efficiency, low voltage switching applications.



MSOP8

FEATURES

- Extremely Low Equivalent On Resistance
- Extremely Low Saturation Voltage
- h_{FE} characterised up to 10A
- I_C=3.5A Continuous Collector Current
- MSOP8 package

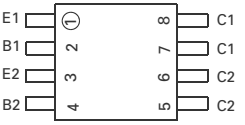


APPLICATIONS

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

ORDERING INFORMATION

DEVICE	REEL SIZE (inches)	TAPE WIDTH (mm)	QUANTITY PER REEL
ZXT12N20DXTA	7	12mm embossed	1000 units
ZXT12N20DXTC	13	12mm embossed	4000 units



Top View

DEVICE MARKING

T12N20DX

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	3.5	A
Base Current	I_B	500	mA
Power Dissipation at TA=25°C (a)(d) Linear Derating Factor	P_D	0.87 6.9	W mW/°C
Power Dissipation at TA=25°C (a)(e) Linear Derating Factor	P_D	1.04 8.3	W mW/°C
Power Dissipation at TA=25°C (b)(d) Linear Derating Factor	P_D	1.25 10	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)(d)	$R_{\theta JA}$	143	°C/W
Junction to Ambient (b)(d)	$R_{\theta JA}$	100	°C/W
Junction to Ambient (a)(e)	$R_{\theta JA}$	120	°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

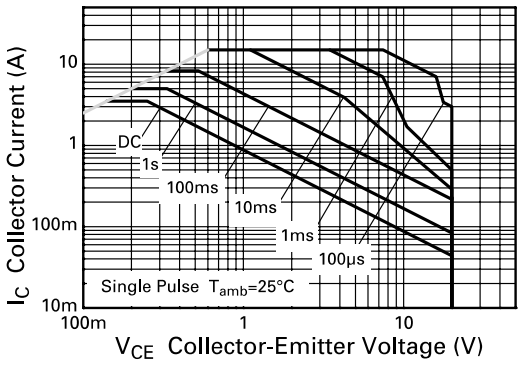
(b) For a device surface mounted on FR4 PCB measured at t≤5 secs.

(c) Repetitive rating - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance graph.

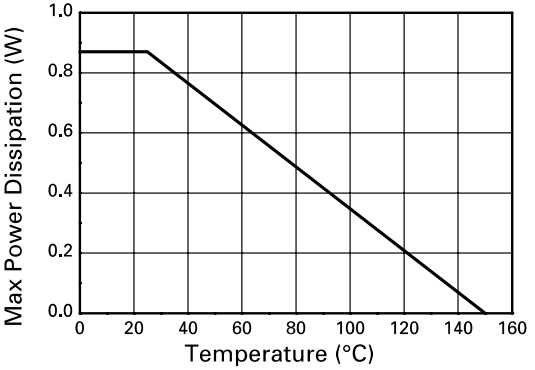
(d) For device with one active die.

(e) For device with two active die running at equal power.

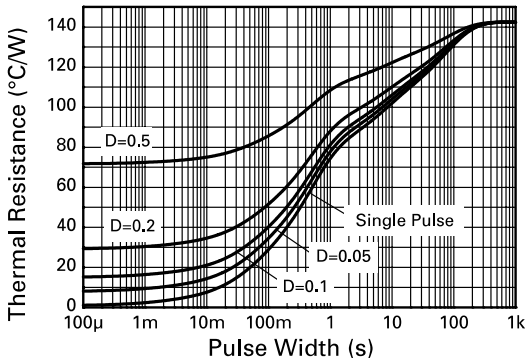
CHARACTERISTICS



Safe Operating Area



Derating Curve



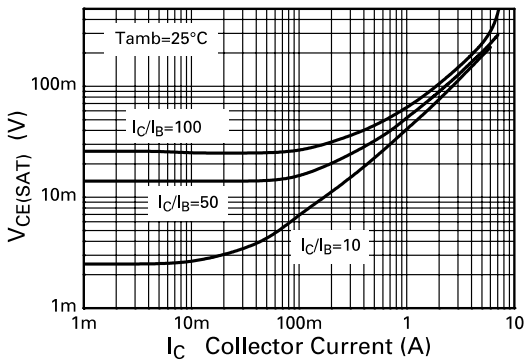
Transient Thermal Impedance

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

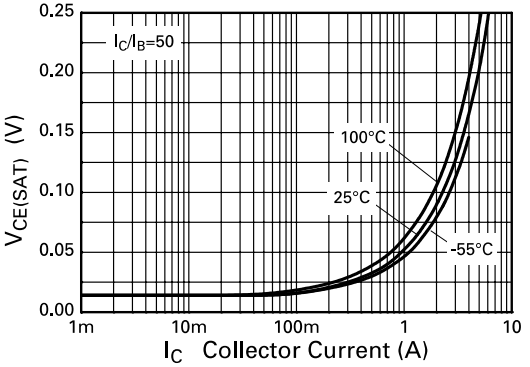
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	50	100		V	I_C=100μA
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	20	30		V	I_C=10mA*
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	7.5	8.5		V	I_E=100μA
Collector Cut-Off Current	I_{CBO}			100	nA	V_{CB}=40V
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	$V_{CE(sat)}$		7.0 65 120 160	10 100 160 200	mV mV mV mV	I_C=0.1A, I_B=10mA* I_C=1A, I_B=10mA* I_C=3A, I_B=150mA* I_C=3.5A, I_B=50mA*
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		0.9	1.0	V	I_C=3.5A, I_B=50mA*
Base-Emitter Turn-On Voltage	$V_{BE(on)}$		0.85	0.9	V	I_C=3.5A, V_{CE}=2V*
Static Forward Current Transfer Ratio	h_{FE}	250 300 200 40	400 450 320 70	900		I_C=10mA, V_{CE}=2V* I_C=1A, V_{CE}=2V* I_C=3.5A, V_{CE}=2V* I_C=10A, V_{CE}=2V*
Transition Frequency	f_T		112		MHz	I_C=50mA, V_{CE}=10V f=50MHz
Output Capacitance	C_{obo}		43		pF	V_{CB}=10V, f=1MHz
Turn-On Time	$t_{(on)}$		65		ns	V_{CC}=10V, I_C=2A I_{B1}=I_{B2}=40mA
Turn-Off Time	$t_{(off)}$		400		ns	

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

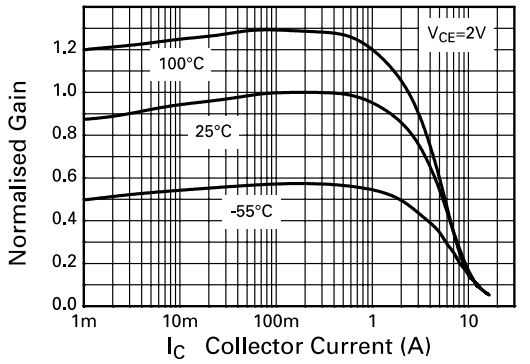
TYPICAL CHARACTERISTICS



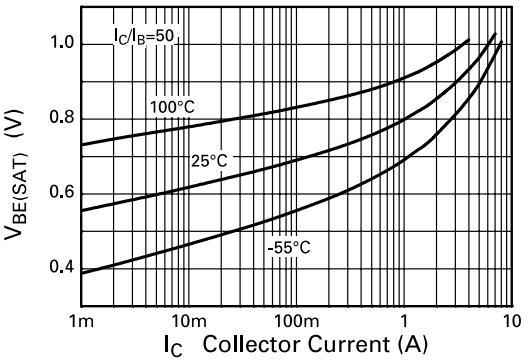
$V_{CE(SAT)}$ v I_C



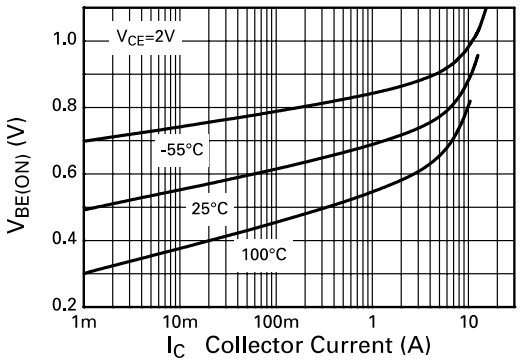
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C

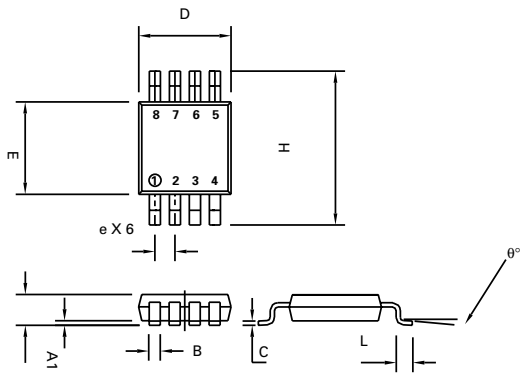


$V_{BE(SAT)}$ v I_C



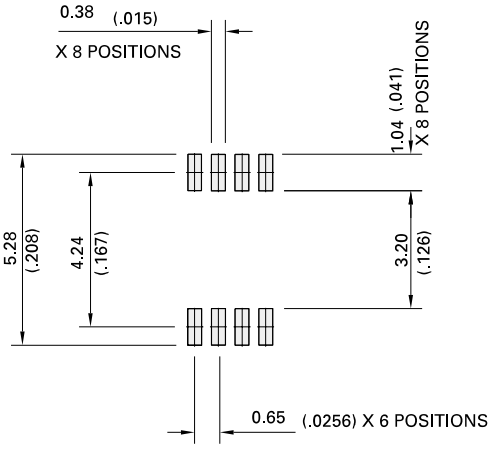
$V_{BE(ON)}$ v I_C

PACKAGE DIMENSIONS



Conforms to JEDEC MO-187 Iss A

PAD LAYOUT DETAILS



DIM	Millimetres		Inches	
	MIN	MAX	MIN	MAX
A		1.10		0.043
A1	0.05	0.15	0.002	0.006
B	0.25	0.40	0.010	0.016
C	0.13	0.23	0.005	0.009
D	2.90	3.10	0.114	0.122
e	0.65	BSC	0.0256	BSC
E	2.90	3.10	0.114	0.122
H	4.90	BSC	0.193	BSC
L	0.40	0.70	0.016	0.028
q°	0°	6°	0°	6°

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