ZXTCM322

MPPS™ Miniature Package Power Solutions
50V NPN LOW SATURATION TRANSISTOR

SUMMARY
V_{CEO}= 50V; R_{SAT} = 68mΩ; I_C= 4A

DESCRIPTION
Packaged in the innovative 2mm x 2mm MLP (Micro Leaded Package) outline, this new 4th generation low saturation transistor offers extremely low on state losses making it ideal for use in DC-DC circuits and various driving and power management functions.

Additionally users will also gain several other **key benefits**:

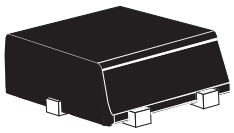
Performance capability equivalent to much larger packages

Improved circuit efficiency & power levels

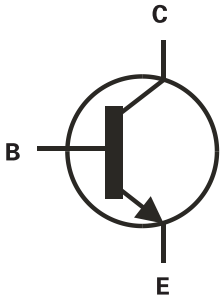
Lower package height (nom 0.9mm)

PCB area and device placement savings

Reduced component count



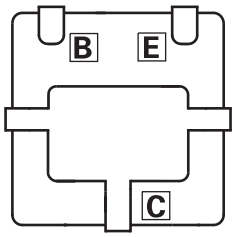
2mm x 2mm MLP
(single die)



FEATURES
- Low Equivalent On Resistance
- Extremely Low Saturation Voltage **(100mV max @1A)**
- h_{FE} specified up to 6A
- I_C= 4A Continuous Collector Current
- 2mm x 2mm MLP

APPLICATIONS
- DC - DC Converters
- Charging Circuits
- Power switches
- Motor control

PINOUT



2mm x 2mm Single MLP
underside view

ORDERING INFORMATION

DEVICE	REEL	TAPE WIDTH	QUANTITY PER REEL
ZXTCM322TA	7''	8mm	3000
ZXTCM322TC	13''	8mm	10000

DEVICE MARKING
SC

ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	LIMIT	UNIT
Collector-Base Voltage	V_{CBO}	100	V
Collector-Emitter Voltage	V_{CEO}	50	V
Emitter-Base Voltage	V_{EBO}	7.5	V
Peak Pulse Current (c)	I_{CM}	6	A
Continuous Collector Current (a)	I_C	4	A
Base Current	I_B	1000	mA
Power Dissipation at TA=25°C (a) Linear Derating Factor	P_D	1.5 12	W mW/°C
Power Dissipation at TA=25°C (b) Linear Derating Factor	P_D	2.45 19.6	W mW/°C
Power Dissipation at TA=25°C (d) Linear Derating Factor	P_D	1 8	W mW/°C
Power Dissipation at TA=25°C (e) Linear Derating Factor	P_D	3 24	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)	$R_{\theta JA}$	83	°C/W
Junction to Ambient (b)	$R_{\theta JA}$	51	°C/W
Junction to Ambient (d)	$R_{\theta JA}$	125	°C/W
Junction to Ambient (e)	$R_{\theta JA}$	42	°C/W

NOTES

(a) For a single device surface mounted on 10sq cm1oz copper on FR4 PCB in still air conditions **with all exposed pads attached**.

(b) For a single device surface mounted on 10sq cm1oz copper on FR4 PCB in still air conditions measured at t≤5 secs **with all exposed pads attached.**

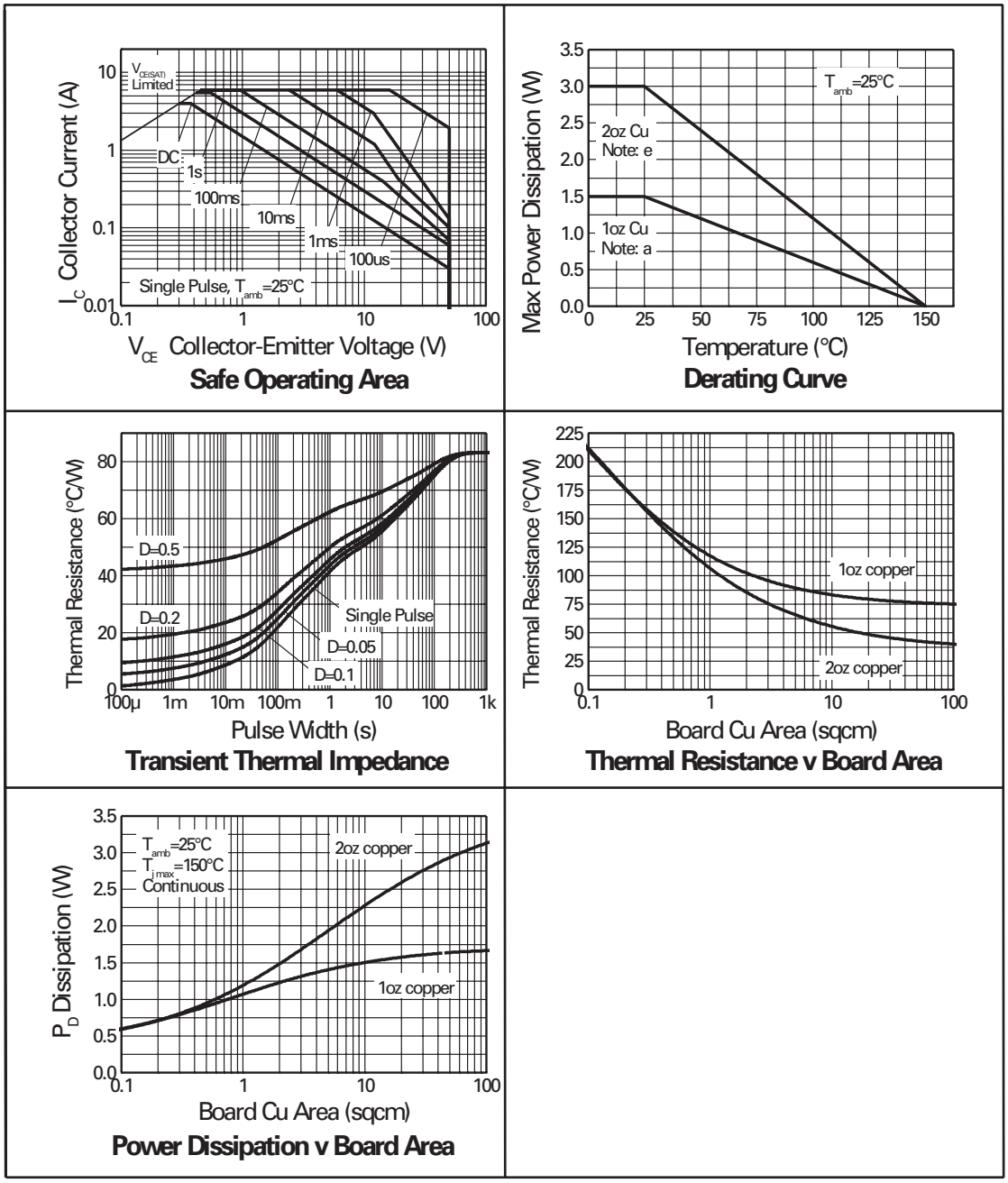
(c) Repetitive rating - pulse width limited by max junction temperature. refer to Transient Thermal Impedance graph.

(d) For a single device surface mounted on 10sq cm1oz copper on FR4 PCB in still air conditions **with minimal lead connections only**.

(e) For a single device surface mounted on 65sq cm2oz copper on FR4 PCB in still air conditions **with all exposed pads attached**.

(f) The minimum copper dimensions requires for mounting are no smaller than the exposed metal pads on the base of the device, as shown in the package dimensions data. The thermal resistance for a device mounted on 1.5mm thick FR4 board using minimum copper of 1oz weight and 1mm wide wide tracks is Rth=300°C giving a power rating of Ptot=420mW.

TYPICAL CHARACTERISTICS



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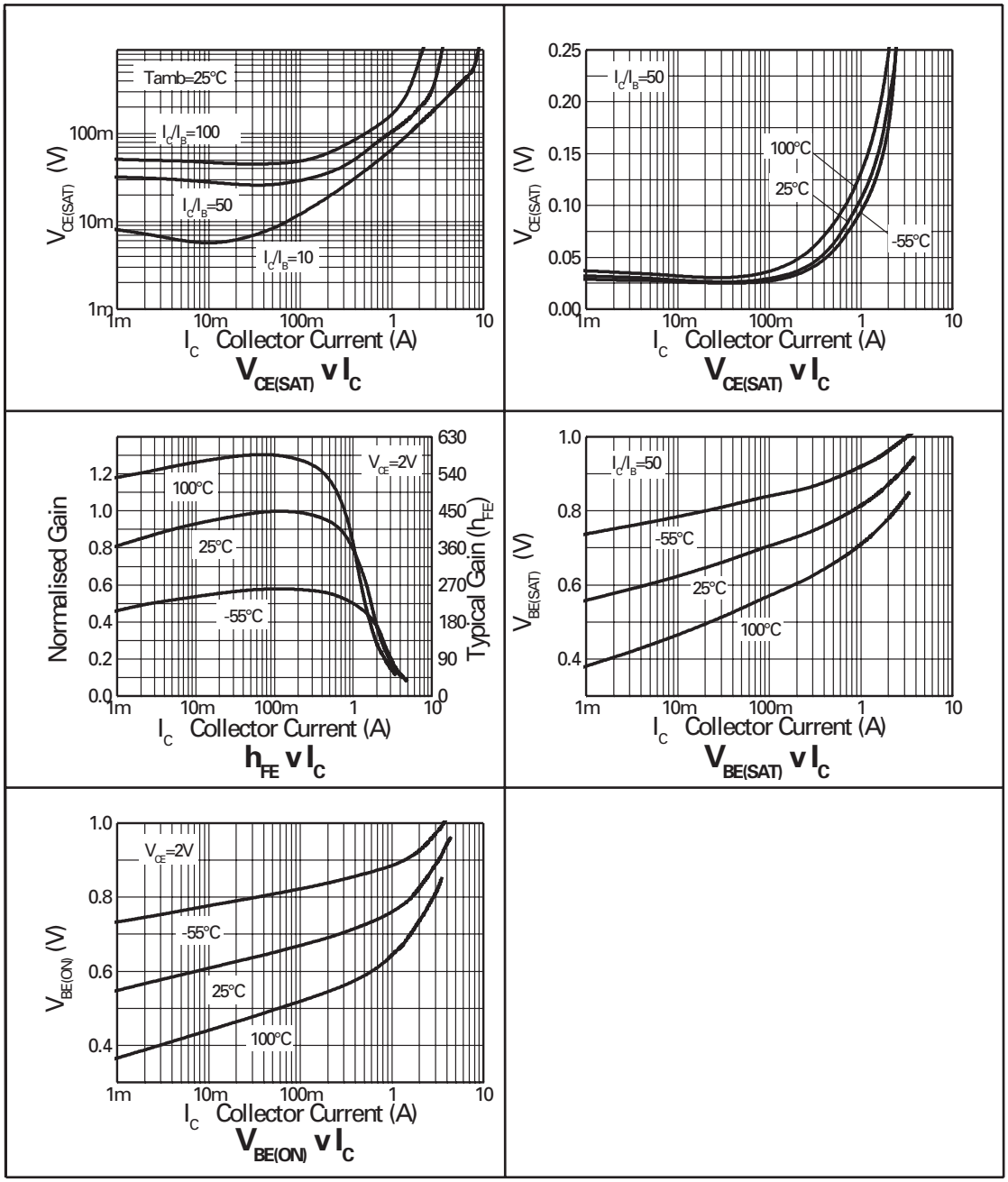
ELECTRICAL CHARACTERISTICS (at T_{amb} = 25°C unless otherwise stated).

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	100	190		V	I_C=100μA
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	50	65		V	I_C=10mA*
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	7.5	8.2		V	I_E=100μA
Collector Cut-Off Current	I_{CBO}			25	nA	V_{CB}=80V
Emitter Cut-Off Current	I_{EBO}			25	nA	V_{EB}=6V
Collector Emitter Cut-Off Current	I_{CES}			25	nA	V_{CES}=40V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		10 70 145 115 225 270	20 100 200 220 300 320	mV mV mV mV mV mV	I_C=0.1A, I_B=10mA* I_C=1A, I_B=50mA* I_C=1A, I_B=10mA* I_C=2A, I_B=50mA* I_C=3A, I_B=100mA* I_C=4A, I_B=200mA*
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		1.00	1.05	V	I_C=4A, I_B=200mA*
Base-Emitter Turn-On Voltage	$V_{BE(on)}$		0.94	1.00	V	I_C=4A, V_{CE}=2V*
Static Forward Current Transfer Ratio	h_{FE}	200 300 200 100	400 450 400 225 40			I_C=10mA, V_{CE}=2V* I_C=0.2A, V_{CE}=2V* I_C=1A, V_{CE}=2V* I_C=2A, V_{CE}=2V* I_C=6A, V_{CE}=2V*
Transition Frequency	f_T	100	165		MHz	I_C=50mA, V_{CE}=10V f=100MHz
Output Capacitance	C_{obo}		12	20	pF	V_{CB}=10V, f=1MHz
Turn-On Time	$t_{(on)}$		170		ns	V_{CC}=10V, I_C=1A I_{B1}=I_{B2}=10mA
Turn-Off Time	$t_{(off)}$		750		ns	

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

TYPICAL CHARACTERISTICS



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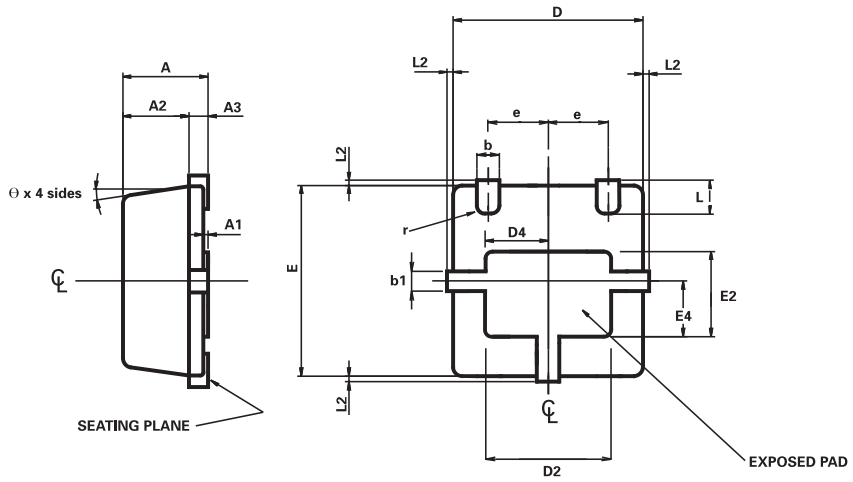
MLP322 PACKAGE OUTLINE (2mm x 2mm Micro Leaded Package)



CONTROLLING DIMENSIONS IN MILLIMETRES
APPROX. CONVERTED DIMENSIONS IN INCHES

PACKAGE DIMENSIONS

DIM	MILLIMETRES		INCHES		DIM	MILLIMETRES		INCHES	
	MIN.	MAX.	MIN.	MAX.		MIN.	MAX.	MIN.	MAX.
A	0.80	1.00	0.0315	0.0393	e	0.65 REF		0.0255 REF	
A1	0.00	0.05	0.00	0.002	E	2.00 BSC		0.0787 BSC	
A2	0.65	0.75	0.0255	0.0295	E2	0.79	0.99	0.031	0.039
A3	0.15	0.25	0.0059	0.0098	E4	0.48	0.68	0.0188	0.0267
b	0.18	0.28	0.0070	0.0110	L	0.20	0.45	0.0078	0.0177
b1	0.17	0.30	0.0066	0.0118	L2	0.125 MAX.		0.005 REF	
D	2.00 BSC		0.0787 BSC		r	0.075 BSC		0.0029 BSC	
D2	1.22	1.42	0.0480	0.0559	θ	0°	12°	0°	12°
D4	0.56	0.76	0.0220	0.0299					

Europe

Zetex plc
Fields New Road
Chadderton
Oldham, OL9 8NP
United Kingdom
Telephone (44) 161 622 4422
Fax: (44) 161 622 4420
uksales@zetex.com

Zetex GmbH
Streitfeldstraße 19
D-81673 München

Germany
Telefon: (49) 89 45 49 49 0
Fax: (49) 89 45 49 49 49
europe.sales@zetex.com

Americas

Zetex Inc
700 Veterans Memorial Hwy
Hauppauge, NY11788

USA
Telephone: (631) 360 2222
Fax: (631) 360 8222
usa.sales@zetex.com

Asia Pacific

Zetex (Asia) Ltd
3701-04 Metroplaza, Tower 1
Hing Fong Road
Kwai Fong
Hong Kong
Telephone: (852) 26100 611
Fax: (852) 24250 494
asia.sales@zetex.com

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