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ZXT1M322

MPPS™ Miniature Package Power Solutions
12V PNP LOW SATURATION SWITCHING TRANSISTOR

SUMMARY
V_{CEO}= -12V; R_{SAT} = 60mΩ; 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.

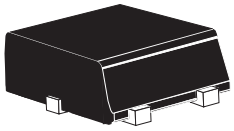
Additionally users will also gain several other **key benefits**:

Performance capability equivalent to much larger packages

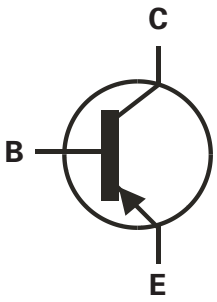
Improved circuit efficiency & power levels

PCB area and device placement savings

Lower package height (nom 0.9mm)



2mm x 2mm MLP
(single die)



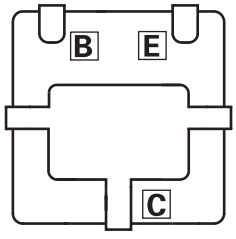
FEATURES

- Low Equivalent On Resistance
- Extremely Low Saturation Voltage **(-140mV@ -1A)**
- h_{FE} specified up to -10A
- I_C= -4A Continuous Collector Current
- 2mm x 2mm MLP

APPLICATIONS

- DC - DC Converters (FET Driving)
- Charging Circuits
- Power switches
- Motor control

PINOUT



2mm x 2mm Single MLP
underside view

ORDERING INFORMATION

DEVICE	REEL	TAPE WIDTH	QUANTITY PER REEL
ZXT1M322TA	7''	8mm	3000
ZXT1M322TC	13''	8mm	10000

DEVICE MARKING
S1

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ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	LIMIT	UNIT
Collector-Base Voltage	V_{CBO}	-20	V
Collector-Emitter Voltage	V_{CEO}	-12	V
Emitter-Base Voltage	V_{EBO}	-7.5	V
Peak Pulse Current	I_{CM}	-12	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**.

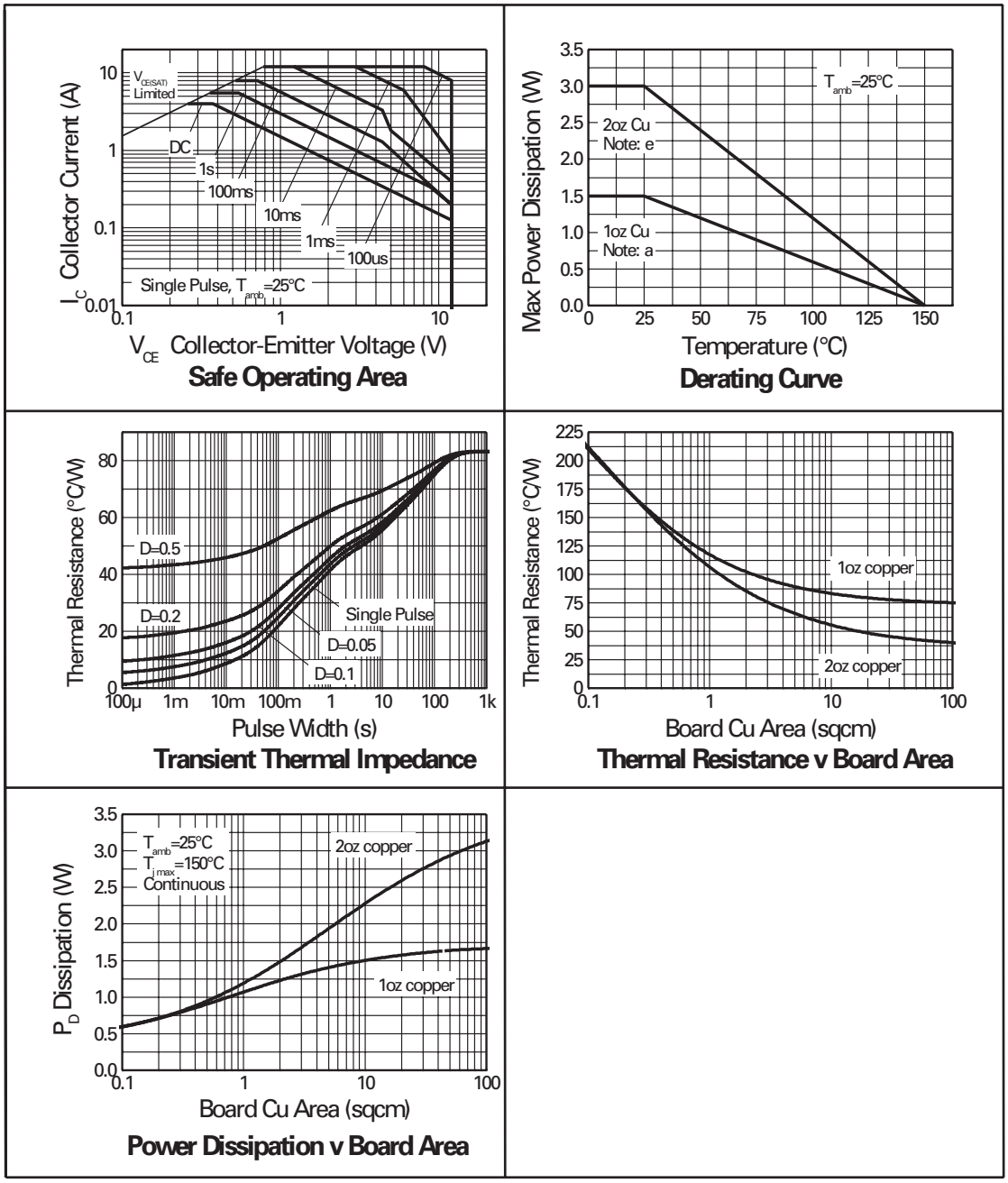
(c) Repetitive rating - pulse width limited by max junction temperature. refer to Transient Thermal Impedance graph.

(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 required 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 is Rth=300°C/W giving a power rating of Ptot=420mW.

CHARACTERISTICS



ZXT1M322

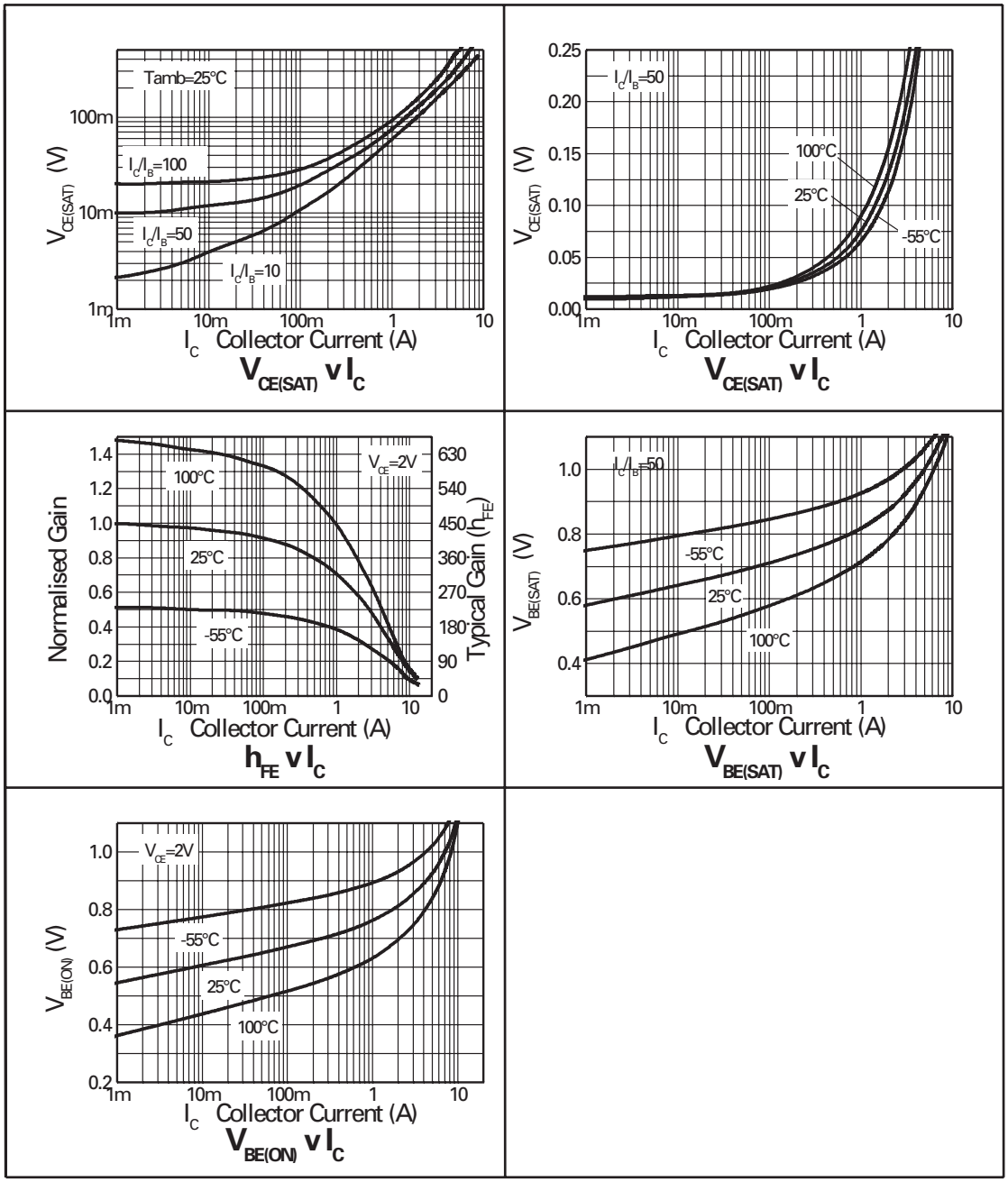
ELECTRICAL CHARACTERISTICS (at T_{amb} = 25°C unless otherwise stated).

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-20	-35		V	I_C=-100μA
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	-12	-25		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}			-25	nA	V_{CB}=-16V
Emitter Cut-Off Current	I_{EBO}			-25	nA	V_{EB}=-6V
Collector Emitter Cut-Off Current	I_{CES}			-25	nA	V_{CES}=-10V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		-10 -100 -100 -195 -240	-17 -140 -150 -300 -300	mV mV mV mV mV	I_C=-0.1A, I_B=-10mA* I_C=-1A, I_B=-10mA* I_C=-1.5A, I_B=-50mA* I_C=-3A, I_B=-50mA* I_C=-4A, I_B=-150mA*
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		-0.97	-1.05	V	I_C=-4A, I_B=-150mA*
Base-Emitter Turn-On Voltage	$V_{BE(on)}$		-0.87	-0.95	V	I_C=-4A, V_{CE}=-2V*
Static Forward Current Transfer Ratio	h_{FE}	300 300 180 60 45	475 450 275 100 70			I_C=-10mA, V_{CE}=-2V* I_C=-0.1A, V_{CE}=-2V* I_C=-2.5A, V_{CE}=-2V* I_C=-8A, V_{CE}=-2V* I_C=-10A, V_{CE}=-2V*
Transition Frequency	f_T	100	110		MHz	I_C=-50mA, V_{CE}=-10V f=100MHz
Output Capacitance	C_{obo}		21	30	pF	V_{CB}=-10V, f=1MHz
Turn-On Time	$t_{(on)}$		70		ns	V_{CC}=-6V, I_C=-2A I_{B1}=I_{B2}=-50mA
Turn-Off Time	$t_{(off)}$		130		ns	

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

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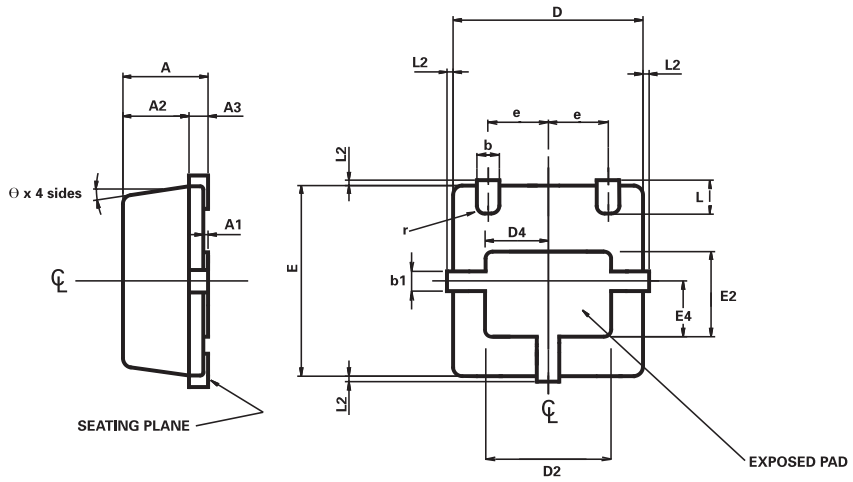
CHARACTERISTICS



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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					

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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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