ZXT2M322

MPPS™ Miniature Package Power Solutions
20V PNP LOW SATURATION SWITCHING TRANSISTOR

SUMMARY
V_{CEO}= 20V; R_{SAT} = 64mΩ; I_C= -3.5A

DESCRIPTION
Packaged in the innovative 2mm x 2mm MLP (Micro Leaded Package) outline, this new 4th generation low saturation transistors 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**:

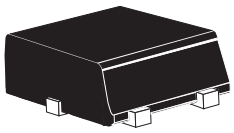
Performance capability equivalent to much larger packages

Improved circuit efficiency & power levels

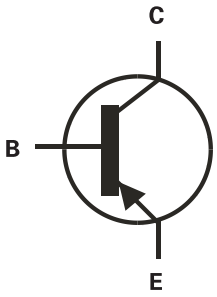
Lower package height (nom 0.9mm)

PCB area and device placement savings

Reduced component count



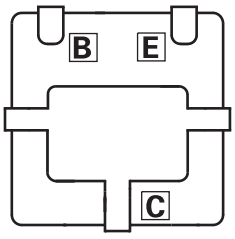
2mm x 2mm MLP
(single die)



FEATURES
- Low Equivalent On Resistance
- Extremely Low Saturation Voltage **(-220mV @-1A)**
- h_{FE} characterised up to -6A
- I_C= -3.5A Continuous Collector Current
- 2mm x 2mm MLP

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

PINOUT



2mm x 2mm Single MLP
underside view

ORDERING INFORMATION

DEVICE	REEL	TAPE WIDTH	QUANTITY PER REEL
ZXT2M322TA	7''	8mm	3000
ZXT2M322TC	13''	8mm	10000

DEVICE MARKING
S2

ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	LIMIT	UNIT
Collector-Base Voltage	V_{CBO}	-25	V
Collector-Emitter Voltage	V_{CEO}	-20	V
Emitter-Base Voltage	V_{EBO}	-7.5	V
Peak Pulse Current (c)	I_{CM}	-6	A
Continuous Collector Current (a)	I_C	-3.5	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.**

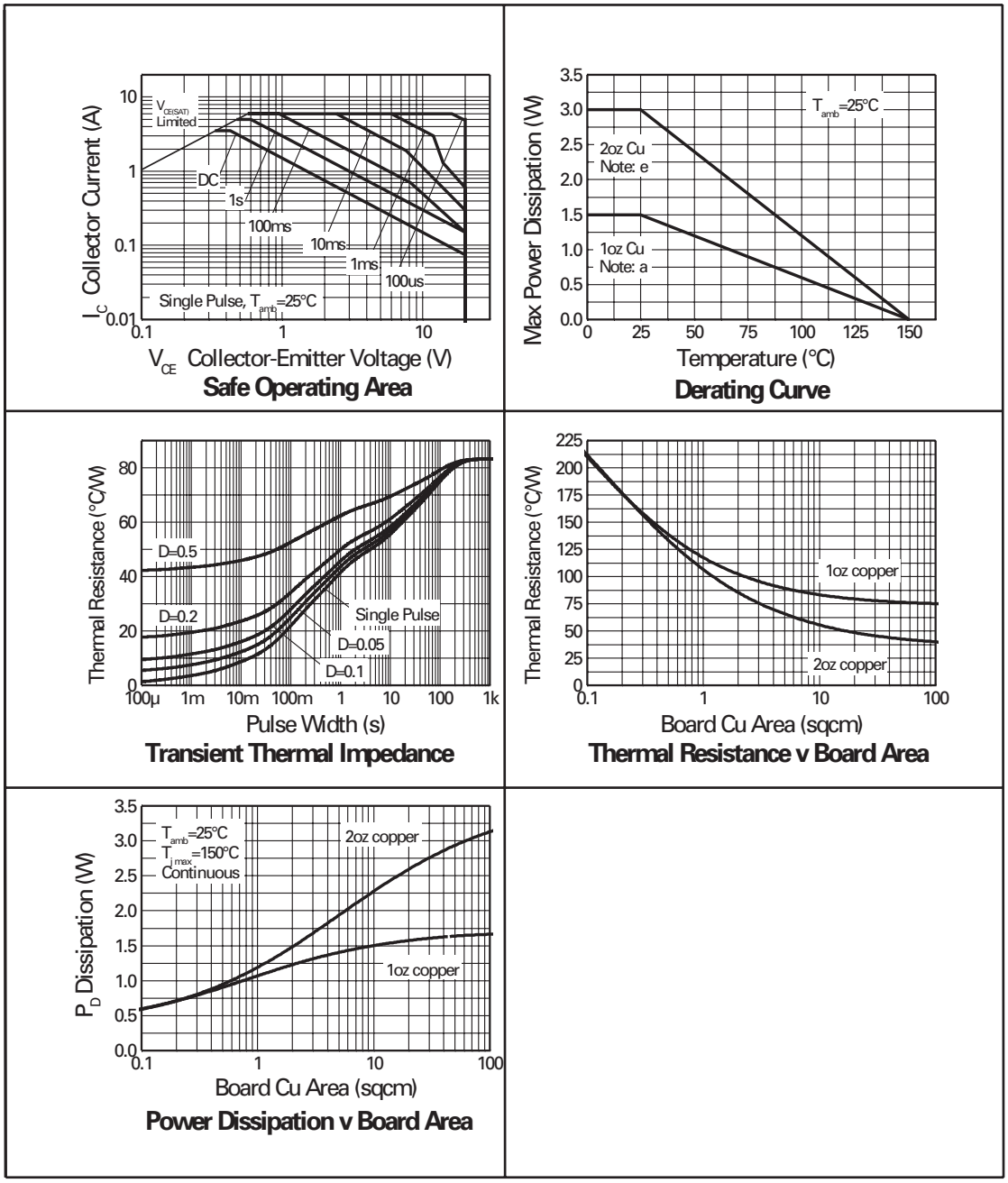
(c) Repetitive rating - pulse width limited by max junction temperature. refer to Transient Thermal Impedance graph.

(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



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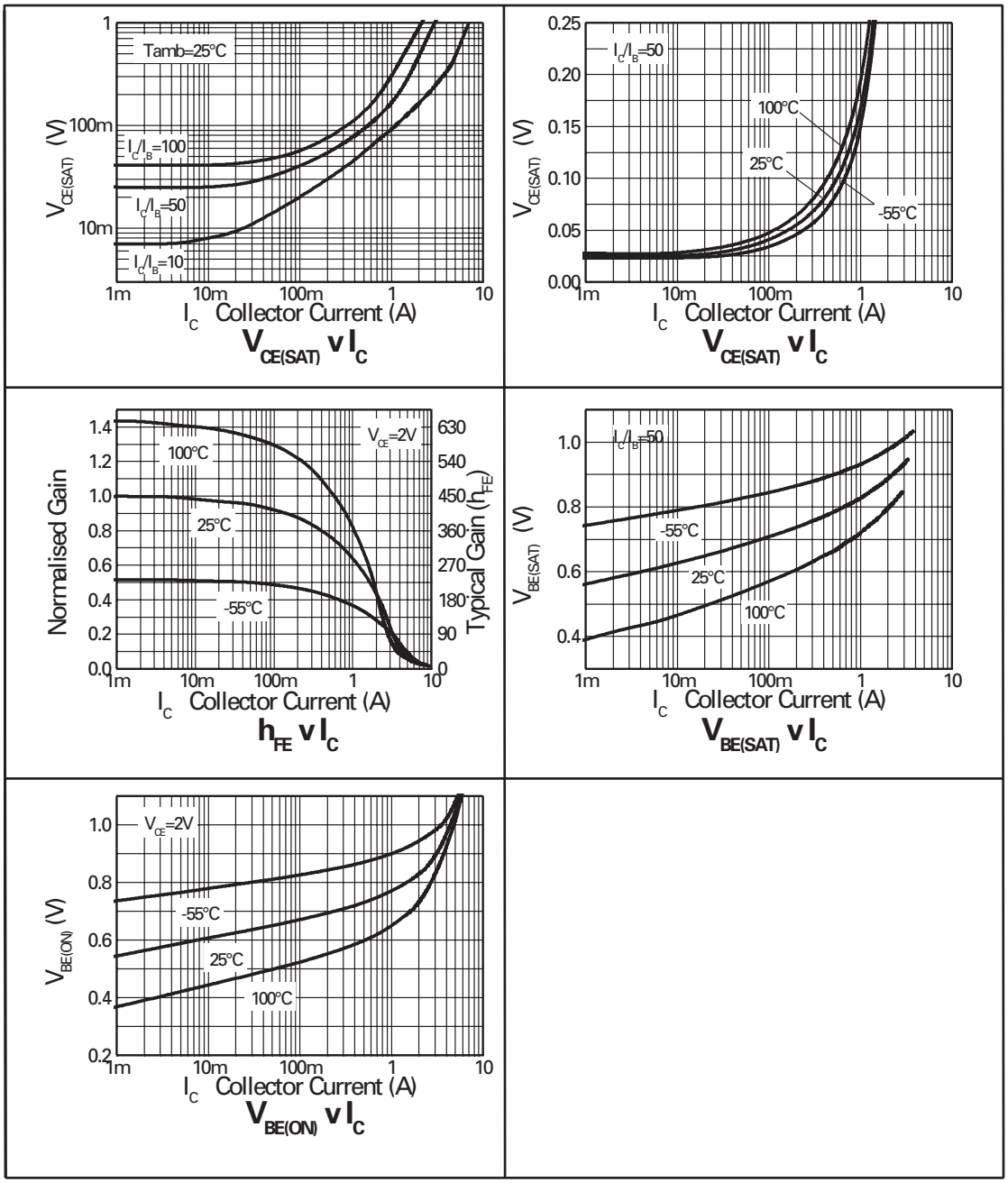
ELECTRICAL CHARACTERISTICS (at T_{amb} = 25°C unless otherwise stated).

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-25	-35		V	I_C=-100μA
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	-20	-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}=-20V
Emitter Cut-Off Current	I_{EBO}			-25	nA	V_{EB}=-6V
Collector Emitter Cut-Off Current	I_{CES}			-25	nA	V_{CES}=-16V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		-19 -170 -190 -240 -225	-30 -220 -250 -350 -300	mV mV mV mV mV	I_C=-0.1A, I_B=-10mA* I_C=-1A, I_B=-20mA* I_C=-1.5A, I_B=-50mA* I_C=-2.5A, I_B=-150mA* I_C=-3.5A, I_B=-350mA*
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		-1.10	-1.075	V	I_C=-3.5A, I_B=-350mA*
Base-Emitter Turn-On Voltage	$V_{BE(on)}$		-0.87	-0.95	V	I_C=-3.5A, V_{CE}=-2V*
Static Forward Current Transfer Ratio	h_{FE}	300 300 150 15	475 450 230 30			I_C=-10mA, V_{CE}=-2V* I_C=-0.1A, V_{CE}=-2V* I_C=-2A, V_{CE}=-2V* I_C=-6A, V_{CE}=-2V*
Transition Frequency	f_T	150	180		MHz	I_C=-50mA, V_{CE}=-10V f=100MHz
Output Capacitance	C_{obo}		21	30	pF	V_{CB}=-10V, f=1MHz
Turn-On Time	$t_{(on)}$		40		ns	V_{CC}=-10V, I_C=-1A I_{B1}=I_{B2}=10mA
Turn-Off Time	$t_{(off)}$		670		ns	

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

CHARACTERISTICS



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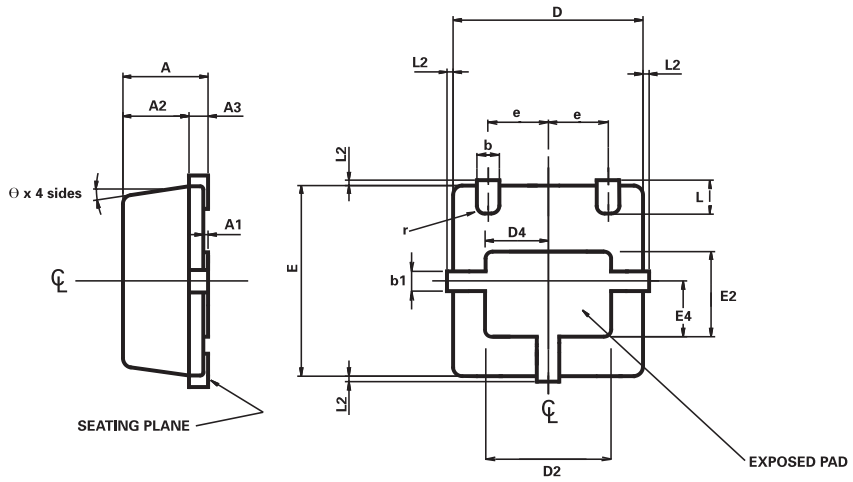
MLP322 PACKAGE OUTLINE (2mm x 2mm Micro Leaded Package)



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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