ZXTD2M832

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

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

DESCRIPTION
Packaged in the innovative 3mm x 2mm MLP (Micro Leaded Package) outline, these new 4th generation low saturation dual transistors offer extremely low on state losses making them ideal for use in DC-DC circuits and various driving and power management functions.

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

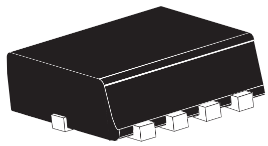
Performance capability equivalent to much larger packages

Improved circuit efficiency & power levels

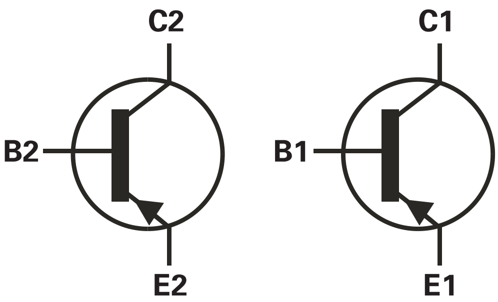
PCB area and device placement savings

Lower package height (nom 0.9mm)

Reduced component count



3mm x 2mm (Dual die) MLP



FEATURES
- Low Equivalent On Resistance
- Extremely Low Saturation Voltage **(-220mV @ -1A)**
- h_{FE} characterised up to -6A
- I_C = -3.5A Continuous Collector Current
- 3mm x 2mm MLP

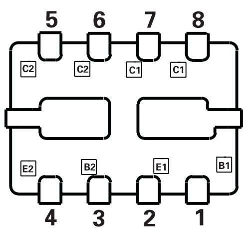
APPLICATIONS
- DC - DC Converters (FET Drivers)
- Charging circuits
- Power switches
- Motor control
- LED Backlighting circuits

ORDERING INFORMATION

DEVICE	REEL	TAPE WIDTH	QUANTITY PER REEL
ZXTD2M832TA	7′′	8mm	3000
ZXTD2M832TC	13′′	8mm	10000

DEVICE MARKING
D22

PINOUT



3mm x 2mm MLP
underside view

ISSUE 1 - JUNE 2002

ZETEX

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	I_{CM}	-6	A
Continuous Collector Current (a)(f)	I_C	-3.5	A
Base Current	I_B	-1000	mA
Power Dissipation at TA=25°C (a)(f) Linear Derating Factor	P_D	1.5 12	W mW/°C
Power Dissipation at TA=25°C (b)(f) Linear Derating Factor	P_D	2.45 19.6	W mW/°C
Power Dissipation at TA=25°C (c)(f) Linear Derating Factor	P_D	1 8	W mW/°C
Power Dissipation at TA=25°C (d)(f) Linear Derating Factor	P_D	1.13 9	W mW/°C
Power Dissipation at TA=25°C (d)(g) Linear Derating Factor	P_D	1.7 13.6	W mW/°C
Power Dissipation at TA=25°C (e)(g) 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)(f)	$R_{\theta JA}$	83.3	°C/W
Junction to Ambient (b)(f)	$R_{\theta JA}$	51	°C/W
Junction to Ambient (c)(f)	$R_{\theta JA}$	125	°C/W
Junction to Ambient (d)(f)	$R_{\theta JA}$	111	°C/W
Junction to Ambient (d)(g)	$R_{\theta JA}$	73.5	°C/W
Junction to Ambient (e)(g)	$R_{\theta JA}$	41.7	°C/W

Notes

(a) For a dual device surface mounted on 8 sq cm single sided 2oz copper on FR4 PCB, in still air conditions **with all exposed pads attached**. The copper area is split down the centre line into two separate areas with one half connected to each half of the dual device.

(b) Measured at t<5 secs for a dual device surface mounted on 8 sq cm single sided 2oz copper on FR4 PCB, in still air conditions **with all exposed pads attached.** The copper area is split down the centre line into two separate areas with one half connected to each half of the dual device.

(c) For a dual device surface mounted on 8 sq cm single sided 2oz copper on FR4 PCB, in still air conditions **with minimal lead connections only.**

(d) For a dual device surface mounted on 10 sq cm single sided 1oz copper on FR4 PCB, in still air conditions **with all exposed pads attached attached**. The copper area is split down the centre line into two separate areas with one half connected to each half of the dual device.

(e) For a dual device surface mounted on 85 sq cm single sided 2oz copper on FR4 PCB, in still air conditions **with all exposed pads attached attached**. The copper area is split down the centre line into two separate areas with one half connected to each half of the dual device.

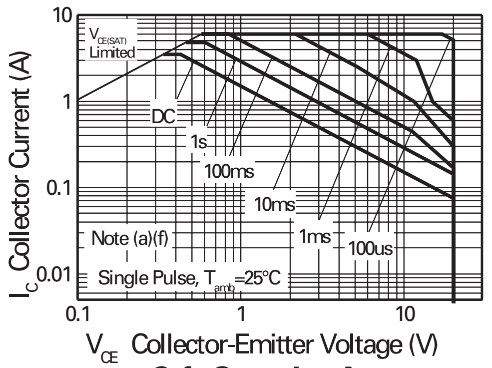
(f) For a dual device with one active die.

(g) For dual device with 2 active die running at equal power.

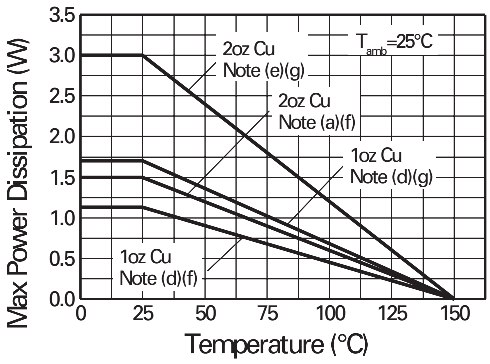
(h) Repetitive rating - pulse width limited by max junction temperature. Refer to Transient Thermal Impedance graph.

(i) 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 dual device mounted on 1.5mm thick FR4 board using minimum copper 1 oz weight, 1mm wide tracks and one half of the device active is Rth = 250°C/W giving a power rating of Ptot = 500mW.

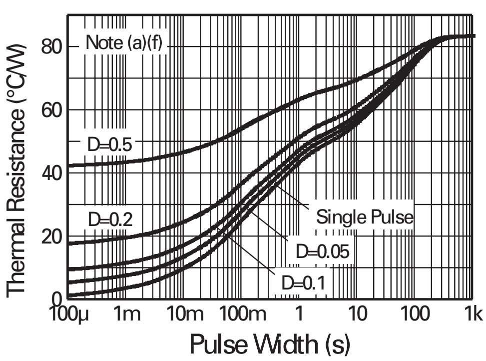
TYPICAL CHARACTERISTICS



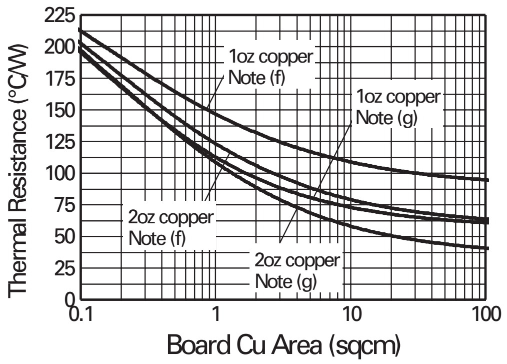
Safe Operating Area



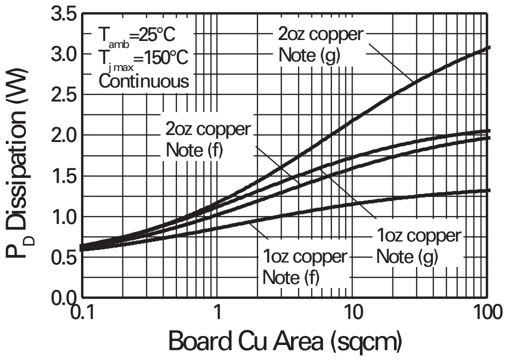
Derating Curve



Transient Thermal Impedance



Thermal Resistance v Board Area



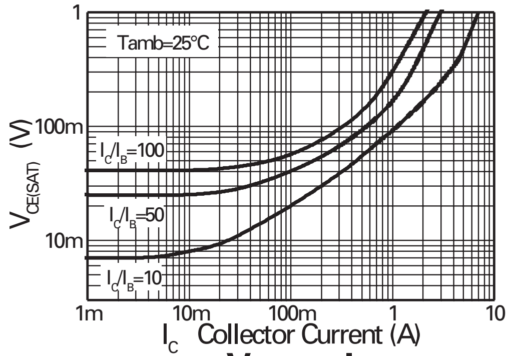
Power Dissipation v Board Area

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

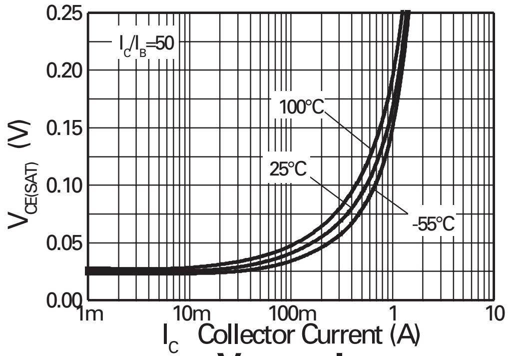
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-25	-35		V	I_C=-100µA
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	-20	-25		V	I_C=-10mA*
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	-7.5	8.5		V	I_E=-100µA
Collector Cut-Off Current	I_{CBO}			-25	nA	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	-30	mV	I_C=-0.1A, I_B=-10mA*
			-170	-220	mV	I_C=-1A, I_B=-20mA*
			-190	-250	mV	I_C=-1.5A, I_B=-50mA*
			-240	-350	mV	I_C=-2.5A, I_B=-150mA*
			-225	-300	mV	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	475			I_C=-10mA, V_{CE}=-2V*
		300	450			I_C=-0.1A, V_{CE}=-2V*
		150	230			I_C=-2A, V_{CE}=-2V*
		15	30			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
Turn-Off Time	$t_{(off)}$		670		ns	I_{B1}=I_{B2}=20mA

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

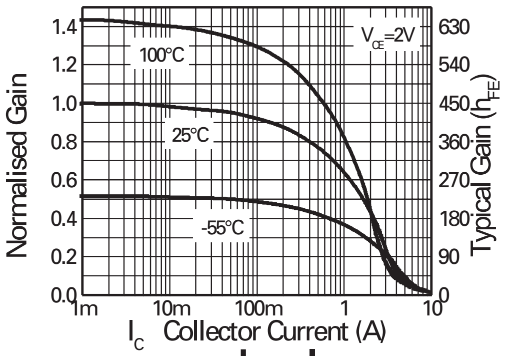
TYPICAL CHARACTERISTICS



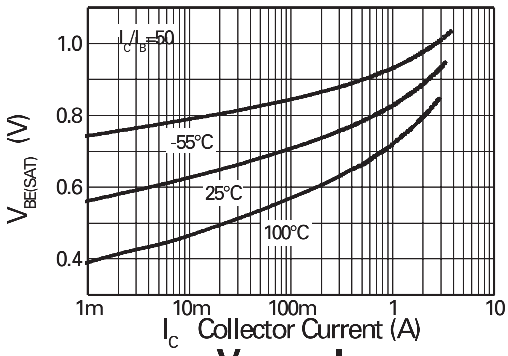
$V_{CE(SAT)}$ v I_C



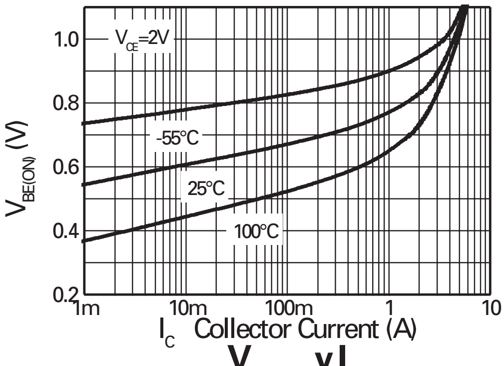
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C



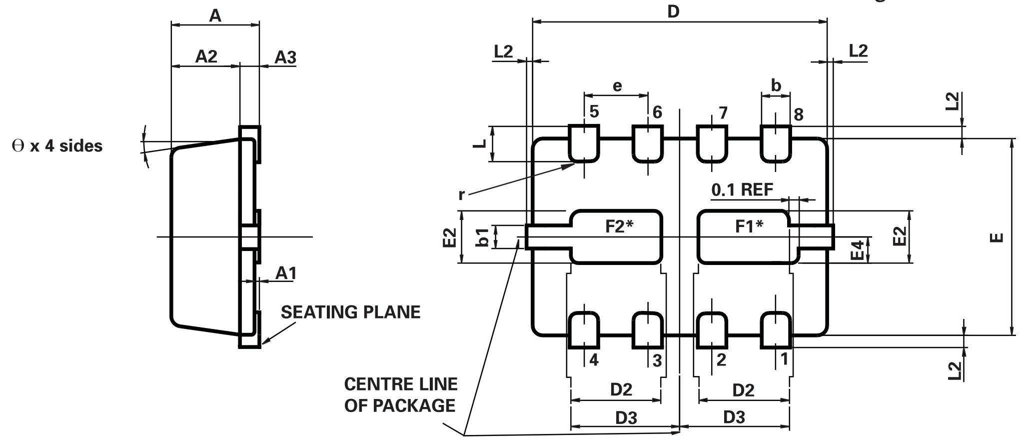
$V_{BE(SAT)}$ v I_C



$V_{BE(ON)}$ v I_C

ZXTD2M832

MLP832 PACKAGE OUTLINE (3mm x 2mm Micro Leaded Package)



***Exposed Flags. Solder connection to improve thermal dissipation is optional.**
F1 at collector 1 potential
F2 at collector 2 potential

CONTROLLING DIMENSIONS IN MILLIMETRES
APPROX. CONVERTED DIMENSIONS IN INCHES

MLP832 PACKAGE DIMENSIONS

DIM	MILLIMETRES		INCHES		DIM	MILLIMETRES		INCHES	
	MIN.	MAX.	MIN.	MAX.		MIN.	MAX.	MIN.	MAX.
A	0.80	1.00	0.031	0.039	e	0.65 REF		0.0256 BSC	
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	0.43	0.63	0.017	0.0249
A3	0.15	0.25	0.006	0.0098	E4	0.16	0.36	0.006	0.014
b	0.24	0.34	0.009	0.013	L	0.20	0.45	0.0078	0.0157
b1	0.17	0.30	0.0066	0.0118	L2	______	0.125	0.00	0.005
D	3.00 BSC		0.118 BSC		r	0.075 BSC		0.0029 BSC	
D2	0.82	1.02	0.032	0.040	Θ	0°	12°	0°	12°
D3	1.01	1.21	0.0397	0.0476					

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