ZXTDCM832

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

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

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**:

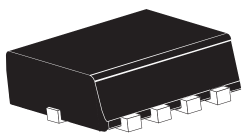
Performance capability equivalent to much larger packges

Improved circuit efficiency & power levels

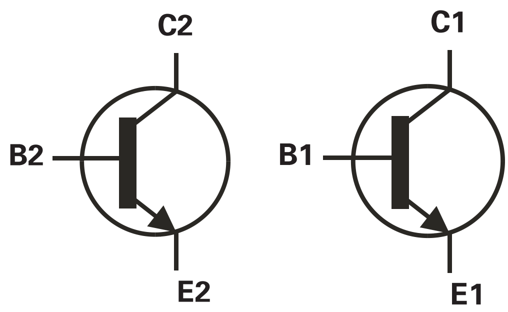
PCB area and device placement savings

Lower package height (nom 0.9mm)

Reduced component count



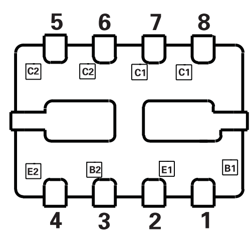
3mm x 2mm (Dual die) MLP



FEATURES
- Low Equivalent On Resistance
- Extremely Low Saturation Voltage **(100mV @1A)**
- h_{FE} characterised up to 6A
- I_C=4A Continuous Collector Current
- 3mm x 2mm MLP

APPLICATIONS
- DC - DC Converters
- Charging circuits
- CCFL Backlighting
- Power switches
- Motor control

PINOUT



3mm x 2mm MLP underside view

ORDERING INFORMATION

DEVICE	REEL	TAPE WIDTH	QUANTITY PER REEL
ZXTDCM832TA	7′′	8mm	3000
ZXTDCM832TC	13′′	8mm	10000

DEVICE MARKING
DCC

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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	I_{CM}	6	A
Continuous Collector Current (a)(f)	I_C	4	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.

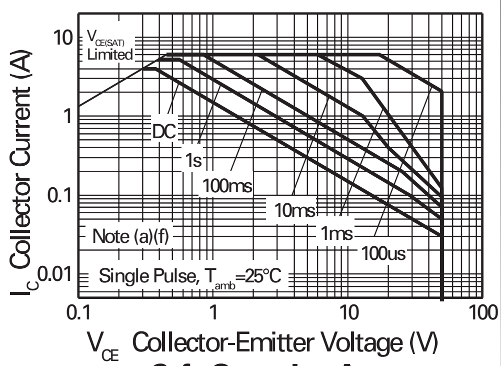
(f) For a dual device with one active die.

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

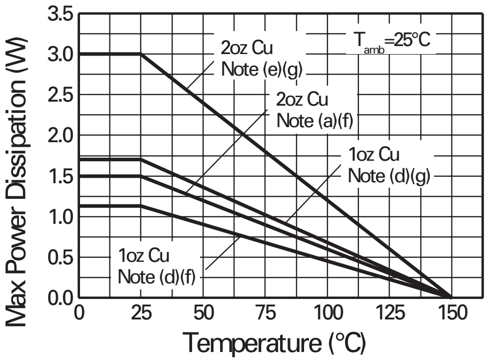
(h) Repetitive rating - pulse width limited by max junction temperature. Refer to Transient Thermal Impedance graph.

(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.

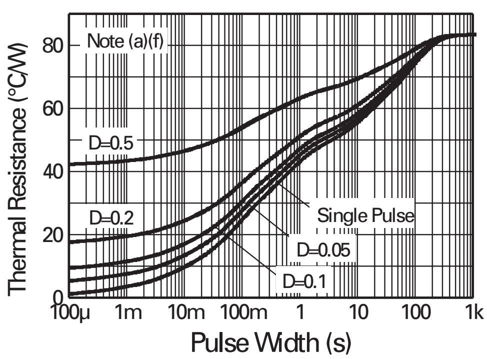
TYPICAL CHARACTERISTICS



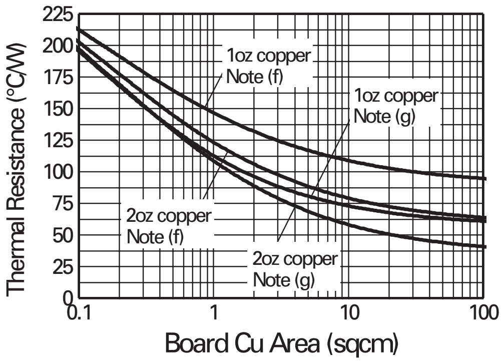
Safe Operating Area



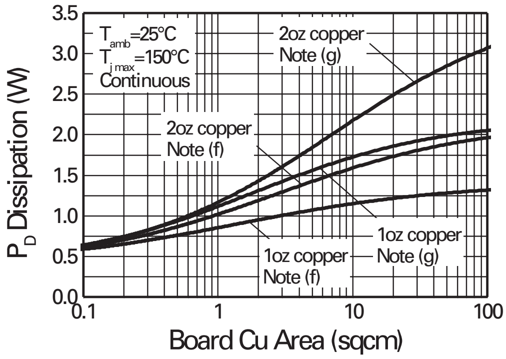
Derating Curve



Transient Thermal Impedance



Thermal Resistance v Board Area



Power Dissipation v Board Area

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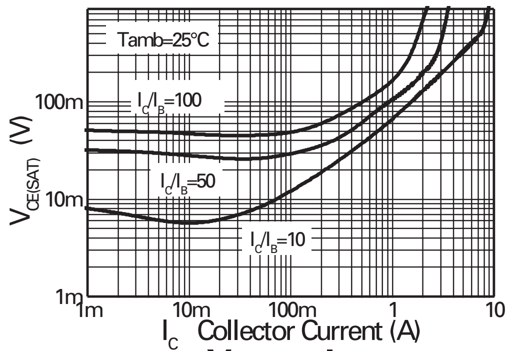
ELECTRICAL CHARACTERISTICS (at T_{amb} = 25°C unless otherwise stated).

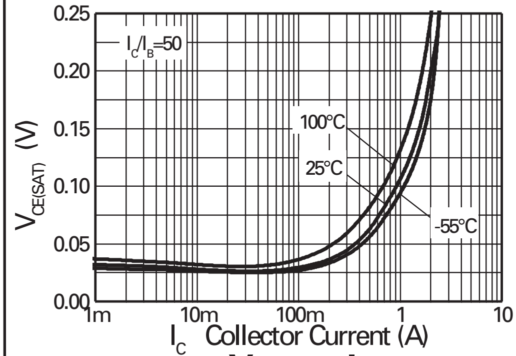
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	100	190		V	I_C=100µA
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	50	65		V	I_C=10mA*
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	7.5	8.2		V	I_E=100µA
Collector Cut-Off Current	I_{CBO}			25	nA	V_{CB}=80V
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
Turn-Off Time	$t_{(off)}$		750		ns	I_{B1}=I_{B2}=10mA

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

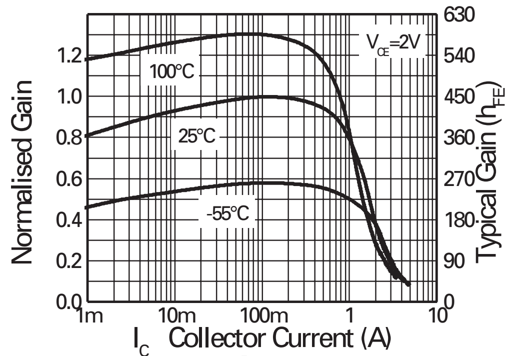
TYPICAL CHARACTERISTICS



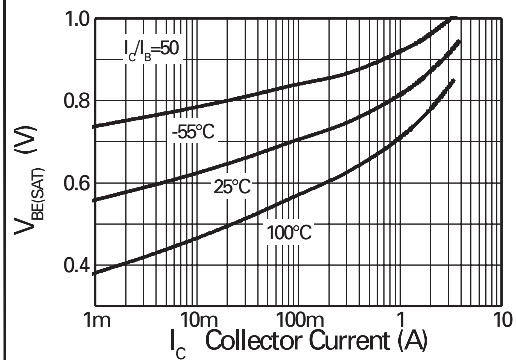
$V_{CE(SAT)}$ v I_C



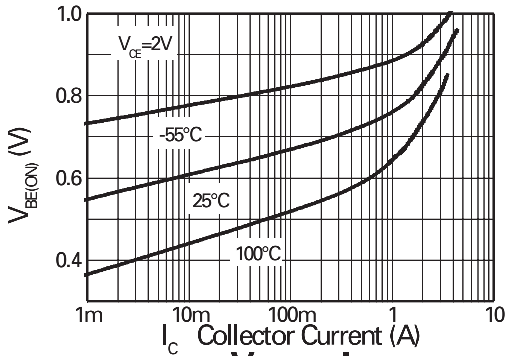
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C



$V_{BE(SAT)}$ v I_C



$V_{BE(ON)}$ v I_C

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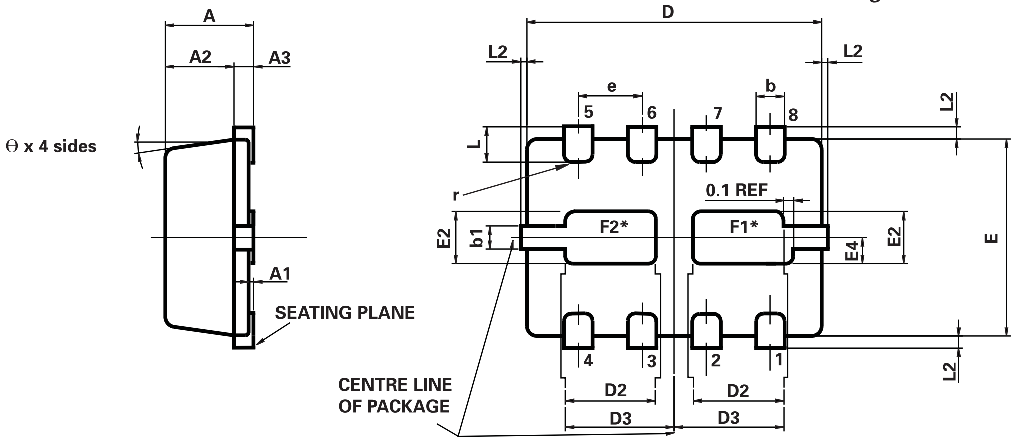
MLP832 PACKAGE OUTLINE (3mm x 2mm Micro Leaded Package)



***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					

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