ZXMN2AM832

MPPS™ Miniature Package Power Solutions
DUAL 20V N-CHANNEL ENHANCEMENT MODE MOSFET

SUMMARY

$V_{(BR)DSS}$ = 20V; $R_{DS(ON)}$ = 0.12Ω; I_D= 3A

DESCRIPTION

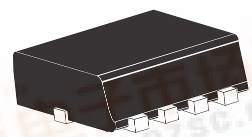
Packaged in the new innovative 3mm x 2mm MLP(Micro Leaded Package) outline this dual 20V N channel Trench MOSFET utilizes a unique structure combining the benefits of Low on-resistance with fast switching speed. This makes them ideal for high efficiency, low voltage power management applications. Users 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

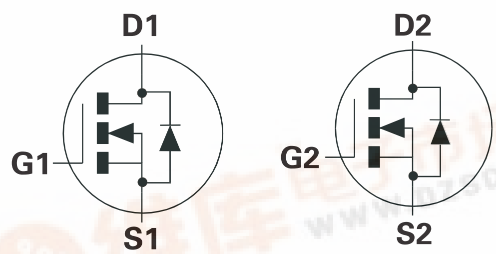
Reduced component count



3x2mm Dual Die MLP

FEATURES

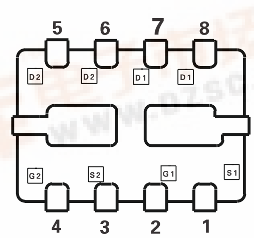
- Low On - Resistance
- Fast switching speed
- Low threshold
- Low gate drive
- 3mm x 2mm MLP



APPLICATIONS

- DC-DC Converters
- Power Management Functions
- Disconnection switches
- Motor Control

PINOUT



3mm x 2mm Dual MLP
underside view

ORDERING INFORMATION

DEVICE	REEL	TAPE WIDTH	QUANTITY PER REEL
ZXMN2AM832TA	7''	8mm	3000 units
ZXMN2AM832TC	13''	8mm	10000 units

DEVICE MARKING

DNA

ZXMN2AM832

ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	N-Channel	UNIT
Drain-Source Voltage	V_{DSS}	20	V
Gate-Source Voltage	V_{GS}	$\pm$12	V
Continuous Drain Current @V_{GS}=10V; T_A=25°C (b) (f) @V_{GS}=10V; T_A=70°C (b) (f) @V_{GS}=10V; T_A=25°C (a) (f)	I_D	3.7 3.0 2.9	A A A
Pulsed Drain Current	I_{DM}	13	A
Continuous Source Current (Body Diode) (b) (f)	I_S	3.0	A
Pulsed Source Current (Body Diode)	I_{SM}	13	A
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.

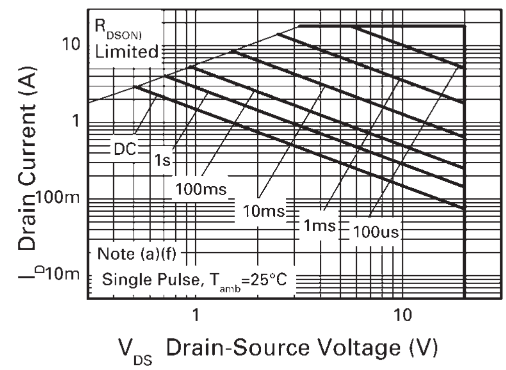
(f) For a dual device with one active die.

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

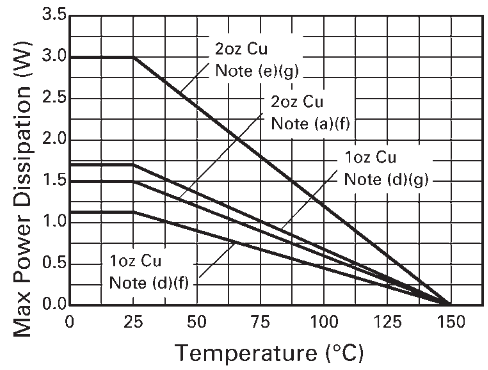
(h) Repetitive rating - pulse width limited by max junction temperature. Refer to Transient Thermal Impedance graph.

(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.

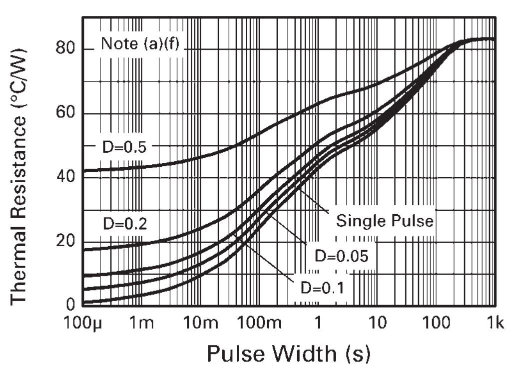
TYPICAL CHARACTERISTICS



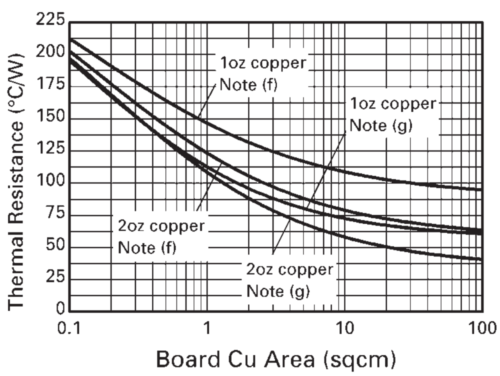
Safe Operating Area



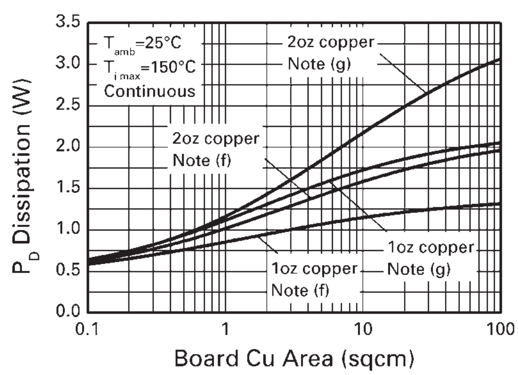
Derating Curve



Transient Thermal Impedance



Thermal Resistance v Board Area



Power Dissipation v Board Area

ZXMN2AM832

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

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	20			V	I_D=250μA, V_{GS}=0V
Zero Gate Voltage Drain Current	I_{DSS}			1	μA	V_{DS}=20V, V_{GS}=0V
Gate-Body Leakage	I_{GSS}			100	nA	V_{GS}=±12V, V_{DS}=0V
Gate-Source Threshold Voltage	$V_{GS(th)}$	0.7			V	I_D=250μA, V_{DS}=V_{GS}
Static Drain-Source On-State Resistance (1)	$R_{DS(on)}$		0.09	0.12 0.30	Ω Ω	V_{GS}=4.5V, I_D=4A V_{GS}=2.5V, I_D=1.5A
Forward Transconductance (3)	g_{fs}		6.2		S	V_{DS}=10V,I_D=4A
DYNAMIC (3)						
Input Capacitance	C_{iss}		299		pF	V_{DS}=15 V, V_{GS}=0V, f=1MHz
Output Capacitance	C_{oss}		60		pF	
Reverse Transfer Capacitance	C_{rss}		33		pF	
SWITCHING(2) (3)						
Turn-On Delay Time	$t_{d(on)}$		2.31		ns	V_{DD} =10V, I_D=4A R_G≅6.0Ω, V_{GS}=5V
Rise Time	t_r		2.60		ns	
Turn-Off Delay Time	$t_{d(off)}$		1.55		ns	
Fall Time	t_f		1.31		ns	
Total Gate Charge	Q_g		3.1		nC	V_{DS}=10V,V_{GS}=4.5V, I_D=4A
Gate-Source Charge	Q_{gs}		0.7		nC	
Gate-Drain Charge	Q_{gd}		1.0		nC	
SOURCE-DRAIN DIODE						
Diode Forward Voltage (1)	V_{SD}		0.9	0.95	V	T_J=25°C, I_S=3.2A, V_{GS}=0V
Reverse Recovery Time (3)	t_{rr}		23		ns	T_J=25°C, I_F=4A, di/dt= 100A/μs
Reverse Recovery Charge (3)	Q_{rr}		5.65		nC	

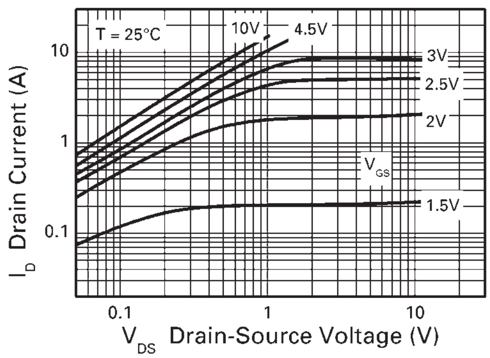
NOTES

(1) Measured under pulsed conditions. Width ≤300μs. Duty cycle ≤ 2%.

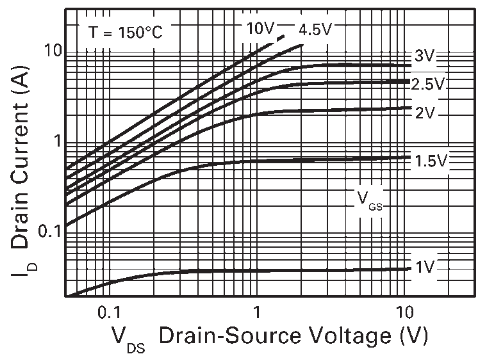
(2) Switching characteristics are independent of operating junction temperature.

(3) For design aid only, not subject to production testing.

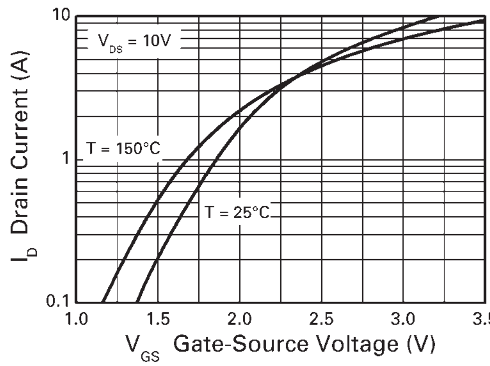
TYPICAL CHARACTERISTICS



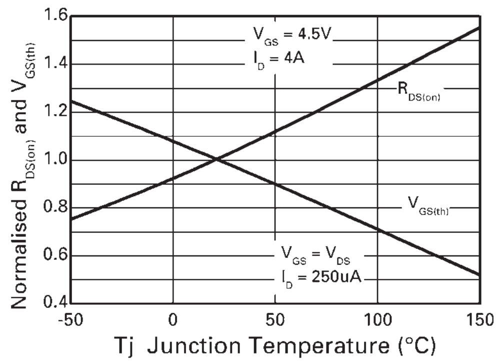
Output Characteristics



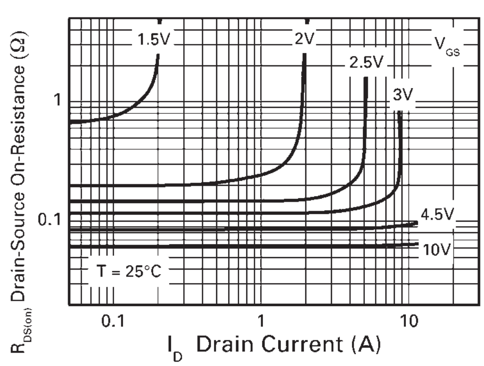
Output Characteristics



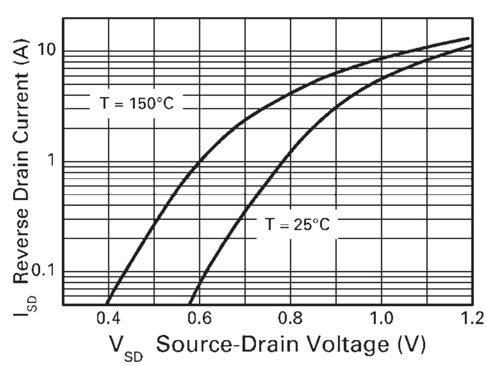
Typical Transfer Characteristics



Normalised Curves v Temperature

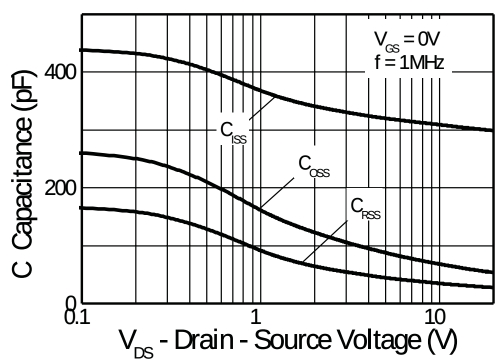


On-Resistance v Drain Current

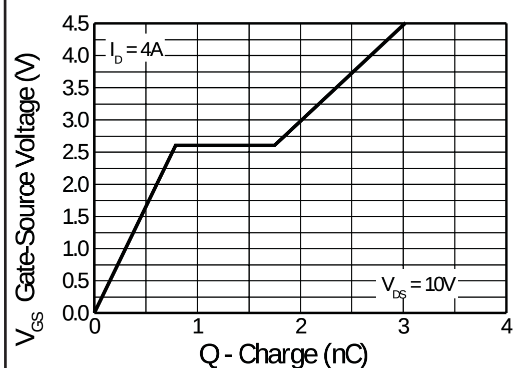


Source-Drain Diode Forward Voltage

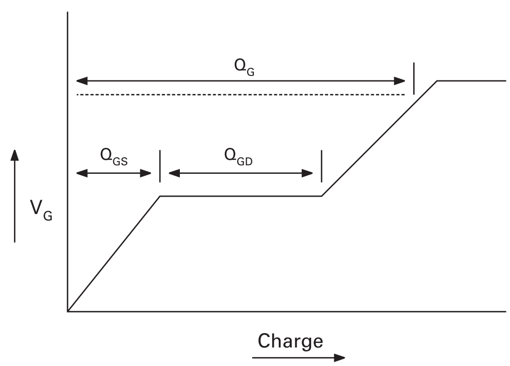
TYPICAL CHARACTERISTICS



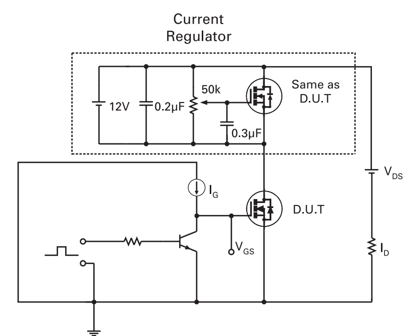
Capacitance v Drain-Source Voltage



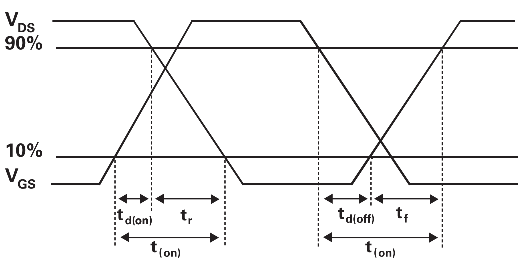
Gate-Source Voltage v Gate Charge



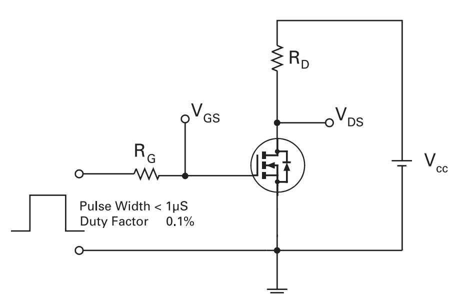
Basic Gate Charge Waveform



Gate Charge Test Circuit

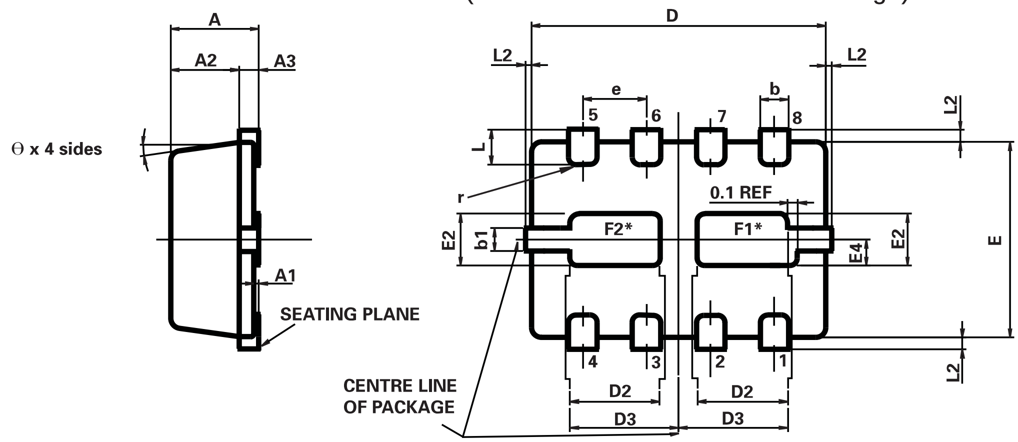


Switching Time Waveforms



Switching Time Test Circuit

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°

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