

ZXMN3A04DN8

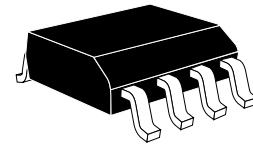
DUAL 30V N-CANNEL ENHANCEMENT MODE MOSFET

SUMMARY

$V_{(BR)DSS} = 30V$; $R_{DS(ON)} = 0.02\Omega$; $I_D = 8.5A$

DESCRIPTION

This new generation of TRENCH MOSFETs from Zetex utilizes a unique structure that combines the benefits of low on-resistance with fast switching speed. This makes them ideal for high efficiency, low voltage, power management applications.



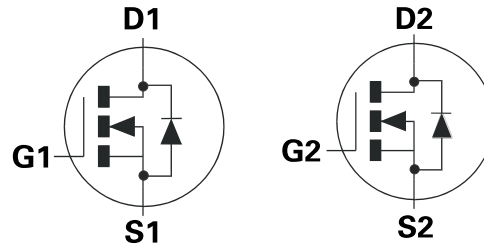
SO8

FEATURES

- Low on-resistance
- Fast switching speed
- Low threshold
- Low gate drive
- Low profile SOIC package

APPLICATIONS

- DC - DC Converters
- Power Management Functions
- Disconnect switches
- Motor control



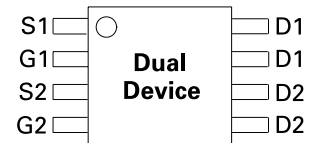
ORDERING INFORMATION

| DEVICE | REEL | TAPE WIDTH | QUANTITY PER REEL |
|---------------|------|------------|-------------------|
| ZXMN3A04DN8TA | 7" | 12mm | 500 units |
| ZXMN3A04DN8TC | 13" | 12mm | 2500 units |

DEVICE MARKING

ZXMN
3A04D

PINOUT



Top view

ZXMN3A04DN8

ABSOLUTE MAXIMUM RATINGS.

| PARAMETER | SYMBOL | LIMIT | UNIT |
|--|-------------------|-------------------|---------------------|
| Drain-Source Voltage | V_{DSS} | 30 | V |
| Gate Source Voltage | V_{GS} | ± 20 | V |
| Continuous Drain Current ($V_{GS}=10V$; $T_A=25^\circ C$)(b)(d) ($V_{GS}=10V$; $T_A=70^\circ C$)(b)(d) ($V_{GS}=10V$; $T_A=25^\circ C$)(a)(d) | I_D | 8.5 6.8 6.5 | A |
| Pulsed Drain Current (c) | I_{DM} | 39 | A |
| Continuous Source Current (Body Diode) (b) | I_S | 3.6 | A |
| Pulsed Source Current (Body Diode)(c) | I_{SM} | 39 | A |
| Power Dissipation at $T_A=25^\circ C$ (a)(d) Linear Derating Factor | P_D | 1.25 10 | W mW/ $^\circ C$ |
| Power Dissipation at $T_A=25^\circ C$ (a)(e) Linear Derating Factor | P_D | 1.81 14.5 | W mW/ $^\circ C$ |
| Power Dissipation at $T_A=25^\circ C$ (b)(d) Linear Derating Factor | P_D | 2.15 17.2 | W mW/ $^\circ C$ |
| Operating and Storage Temperature Range | T_J : T_{stg} | -55 to +150 | $^\circ C$ |

THERMAL RESISTANCE

| PARAMETER | SYMBOL | VALUE | UNIT |
|----------------------------|-----------------|-------|--------------|
| Junction to Ambient (a)(d) | $R_{\theta JA}$ | 100 | $^\circ C/W$ |
| Junction to Ambient (b)(e) | $R_{\theta JA}$ | 69 | $^\circ C/W$ |
| Junction to Ambient (b)(d) | $R_{\theta JA}$ | 58 | $^\circ C/W$ |

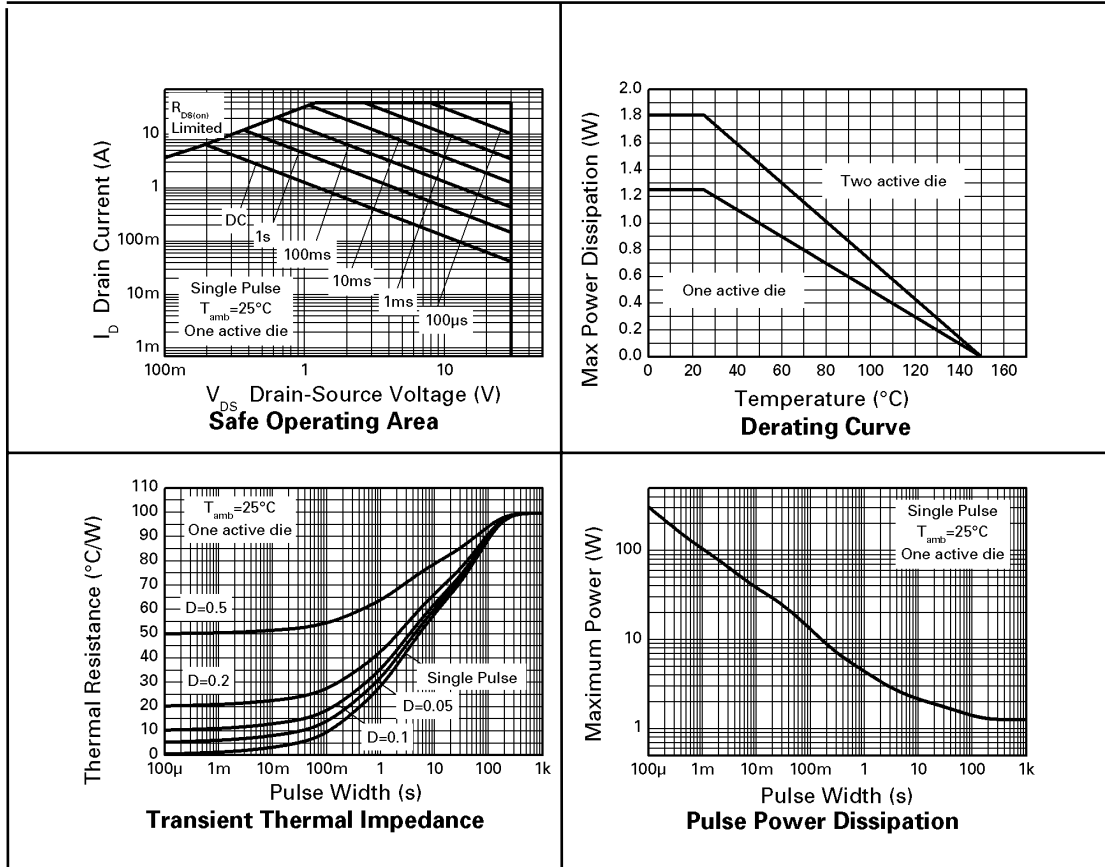
Notes

- (a) For a dual device surface mounted on 25mm x 25mm FR4 PCB with coverage of single sided 1oz copper in still air conditions.
 (b) For a dual device surface mounted on FR4 PCB measured at $t \leq 10$ sec.
 (c) Repetitive rating 25mm x 25mm FR4 PCB, $D=0.02$ pulse width=300 μs - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance Graph.
 (d) For a dual device with one active die.



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CHARACTERISTICS



ZXMN3A04DN8

ELECTRICAL CHARACTERISTICS (at $T_A = 25^\circ\text{C}$ unless otherwise stated).

| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT | CONDITIONS. |
|---|---------------|------|------|--------------|----------------------|---|
| STATIC | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | 30 | | | V | $I_D=250\mu\text{A}, V_{GS}=0\text{V}$ |
| Zero Gate Voltage Drain Current | I_{DSS} | | | 0.5 | μA | $V_{DS}=30\text{V}, V_{GS}=0\text{V}$ |
| Gate-Body Leakage | I_{GSS} | | | 100 | nA | $V_{GS}=\pm 20\text{V}, V_{DS}=0\text{V}$ |
| Gate-Source Threshold Voltage | $V_{GS(th)}$ | 1.0 | | | V | $I_D=250\mu\text{A}, V_{DS}=V_{GS}$ |
| Static Drain-Source On-State Resistance (1) | $R_{DS(on)}$ | | | 0.02 0.03 | Ω Ω | $V_{GS}=10\text{V}, I_D=12.6\text{A}$ $V_{GS}=4.5\text{V}, I_D=10.6\text{A}$ |
| Forward Transconductance (3) | g_{fs} | | 22.1 | | S | $V_{DS}=15\text{V}, I_D=12.6\text{A}$ |
| DYNAMIC (3) | | | | | | |
| Input Capacitance | C_{iss} | | 1890 | | pF | $V_{DS}=15\text{V}, V_{GS}=0\text{V}, f=1\text{MHz}$ |
| Output Capacitance | C_{oss} | | 349 | | pF | |
| Reverse Transfer Capacitance | C_{rss} | | 218 | | pF | |
| SWITCHING(2) (3) | | | | | | |
| Turn-On Delay Time | $t_{d(on)}$ | | 5.2 | | ns | $V_{DD}=15\text{V}, I_D=1\text{A}$ $R_G=6.0\Omega, V_{GS}=10\text{V}$ |
| Rise Time | t_r | | 6.1 | | ns | |
| Turn-Off Delay Time | $t_{d(off)}$ | | 38.1 | | ns | |
| Fall Time | t_f | | 20.2 | | ns | |
| Gate Charge | Q_g | | 19.9 | | nC | $V_{DS}=15\text{V}, V_{GS}=5\text{V}, I_D=6.5\text{A}$ |
| Total Gate Charge | Q_g | | 36.8 | | nC | $V_{DS}=15\text{V}, V_{GS}=10\text{V}, I_D=6.5\text{A}$ |
| Gate-Source Charge | Q_{gs} | | 5.8 | | nC | |
| Gate-Drain Charge | Q_{gd} | | 7.1 | | nC | |
| SOURCE-DRAIN DIODE | | | | | | |
| Diode Forward Voltage (1) | V_{SD} | | 0.85 | 0.95 | V | $T_J=25^\circ\text{C}, I_S=6.8\text{A}, V_{GS}=0\text{V}$ |
| Reverse Recovery Time (3) | t_{rr} | | 18.4 | | ns | $T_J=25^\circ\text{C}, I_F=2.3\text{A}, di/dt=100\text{A}/\mu\text{s}$ |
| Reverse Recovery Charge (3) | Q_{rr} | | 11 | | nC | |

NOTES

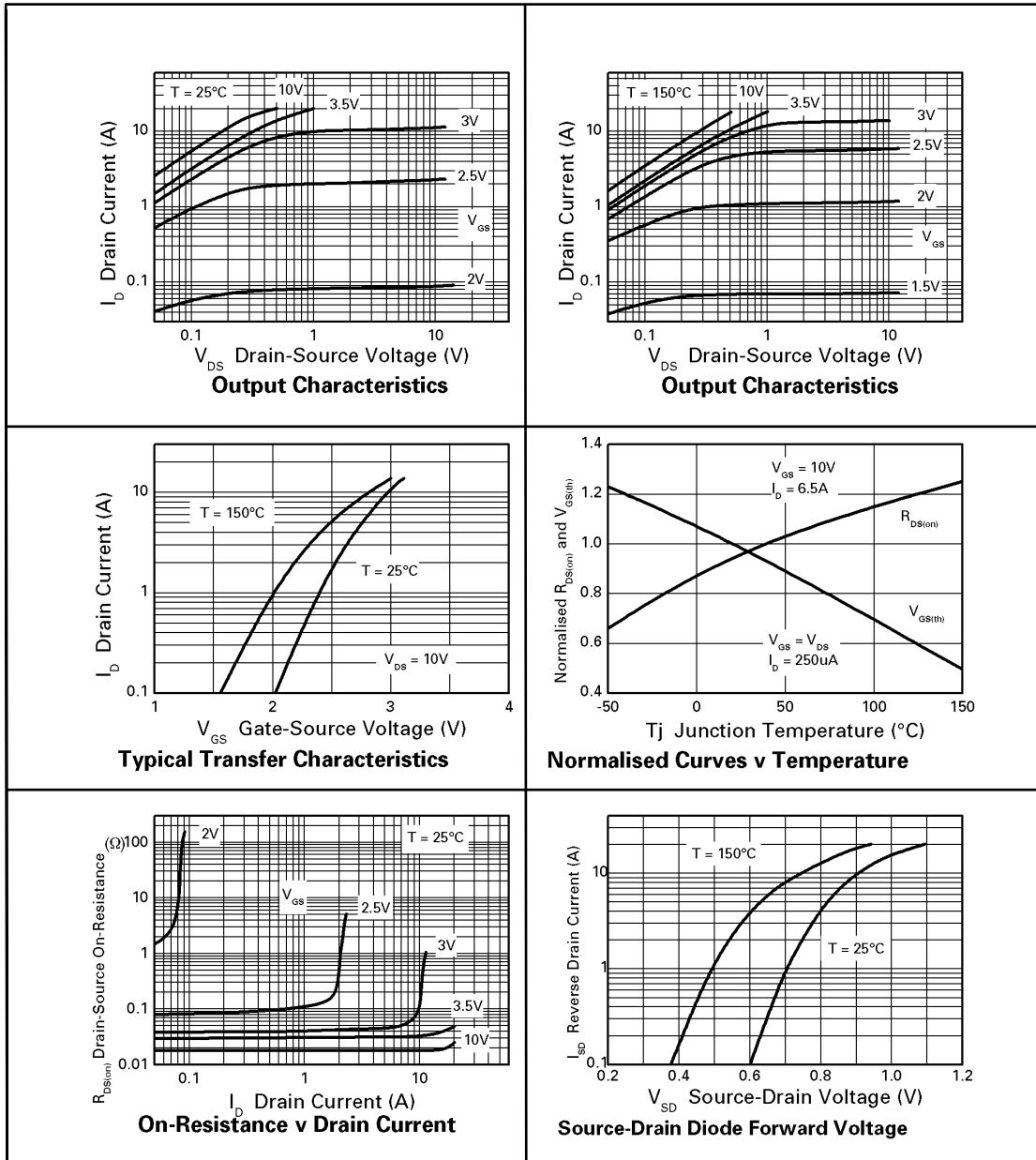
- (1) Measured under pulsed conditions. Width=300 μs . Duty cycle $\leq 2\%$.
 (2) Switching characteristics are independent of operating junction temperature.
 (3) For design aid only, not subject to production testing.



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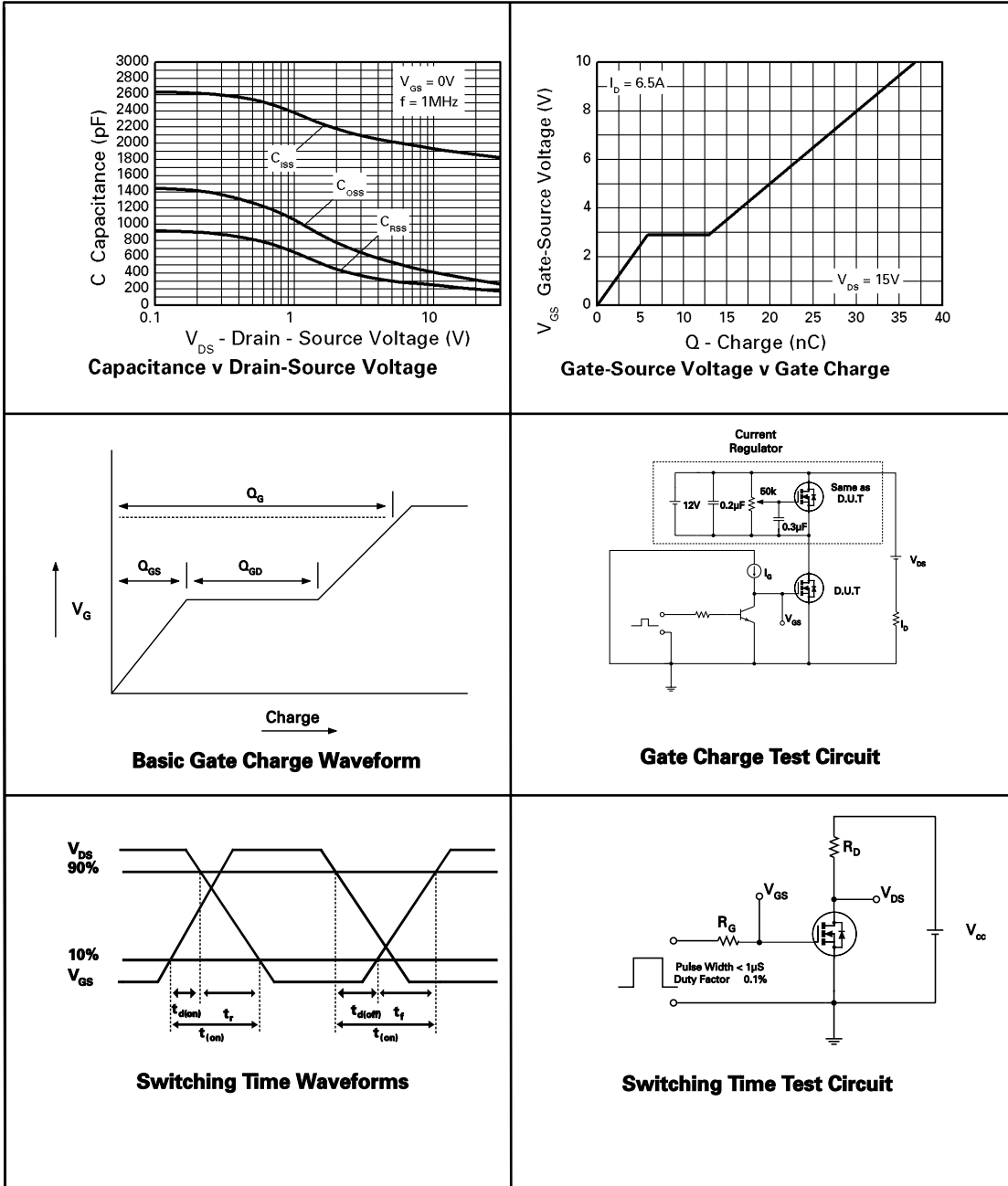
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TYPICAL CHARACTERISTICS



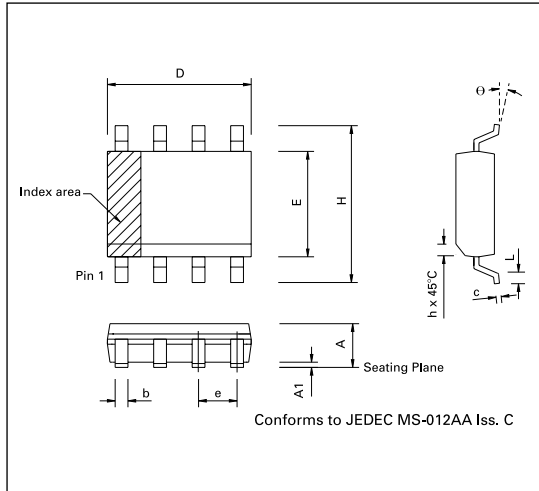
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TYPICAL CHARACTERISTICS



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PACKAGE OUTLINE



CONTROLLING DIMENSIONS ARE IN INCHES
APPROX IN MILLIMETRES

PACKAGE DIMENSIONS

| DIM | INCHES | | MILLIMETRES | |
|-----|-----------|-------|-------------|------|
| | MIN | MAX | MIN | MAX |
| A | 0.053 | 0.069 | 1.35 | 1.75 |
| A1 | 0.004 | 0.010 | 0.10 | 0.25 |
| D | 0.189 | 0.197 | 4.80 | 5.00 |
| H | 0.228 | 0.244 | 5.80 | 6.20 |
| E | 0.150 | 0.157 | 3.80 | 4.00 |
| L | 0.016 | 0.050 | 0.40 | 1.27 |
| e | 0.050 BSC | | 1.27 BSC | |
| b | 0.013 | 0.020 | 0.33 | 0.51 |
| c | 0.008 | 0.010 | 0.19 | 0.25 |
| θ | 0° | 8° | 0° | 8° |
| h | 0.010 | 0.020 | 0.25 | 0.50 |

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ZETEX



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