

Not Recommended for New Design
Use DMN3025LSS

ZXMN2A02X8

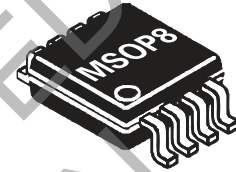
20V N-CANNEL ENHANCEMENT MODE MOSFET

SUMMARY

$V_{(BR)DSS} = 20V$; $R_{DS(ON)} = 0.02\Omega$ $I_D = 7.8A$

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.



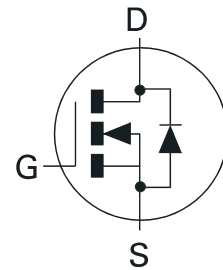
MSOP8

FEATURES

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

APPLICATIONS

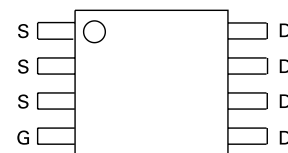
- DC - DC Converters
- Power Management Functions
- Disconnect switches
- Motor control



ORDERING INFORMATION

| DEVICE | REEL SIZE | TAPE WIDTH | QUANTITY PER REEL |
|--------------|-----------|------------|-------------------|
| ZXMN2A02X8TA | 7" | 12mm | 1000 units |
| ZXMN2A02X8TC | 13" | 12mm | 4000 units |

PINOUT



Top View

DEVICE MARKING

- ZXMN
2A02

ZXMN2A02X8

ABSOLUTE MAXIMUM RATINGS.

| PARAMETER | SYMBOL | LIMIT | UNIT |
|--|----------------|-------------------|---------------------|
| Drain-Source Voltage | V_{DSS} | 20 | V |
| Gate Source Voltage | V_{GS} | ± 20 | V |
| Continuous Drain Current $V_{GS}=10V$; $T_A=25^\circ C$ (b) $V_{GS}=10V$; $T_A=70^\circ C$ (b) $V_{GS}=10V$; $T_A=25^\circ C$ (a) | I_D | 7.8 6.3 6.2 | A |
| Pulsed Drain Current (c) | I_{DM} | 39 | A |
| Continuous Source Current (Body Diode) (b) | I_S | 3.1 | A |
| Pulsed Source Current (Body Diode) (c) | I_{SM} | 39 | A |
| Power Dissipation at $T_A=25^\circ C$ (a) Linear Derating Factor | P_D | 1.1 8.8 | W mW/ $^\circ C$ |
| Power Dissipation at $T_A=25^\circ C$ (b) Linear Derating Factor | P_D | 1.67 13.4 | 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) | $R_{\theta JA}$ | 113 | $^\circ C/W$ |
| Junction to Ambient (b) | $R_{\theta JA}$ | 74.5 | $^\circ C/W$ |

NOTES

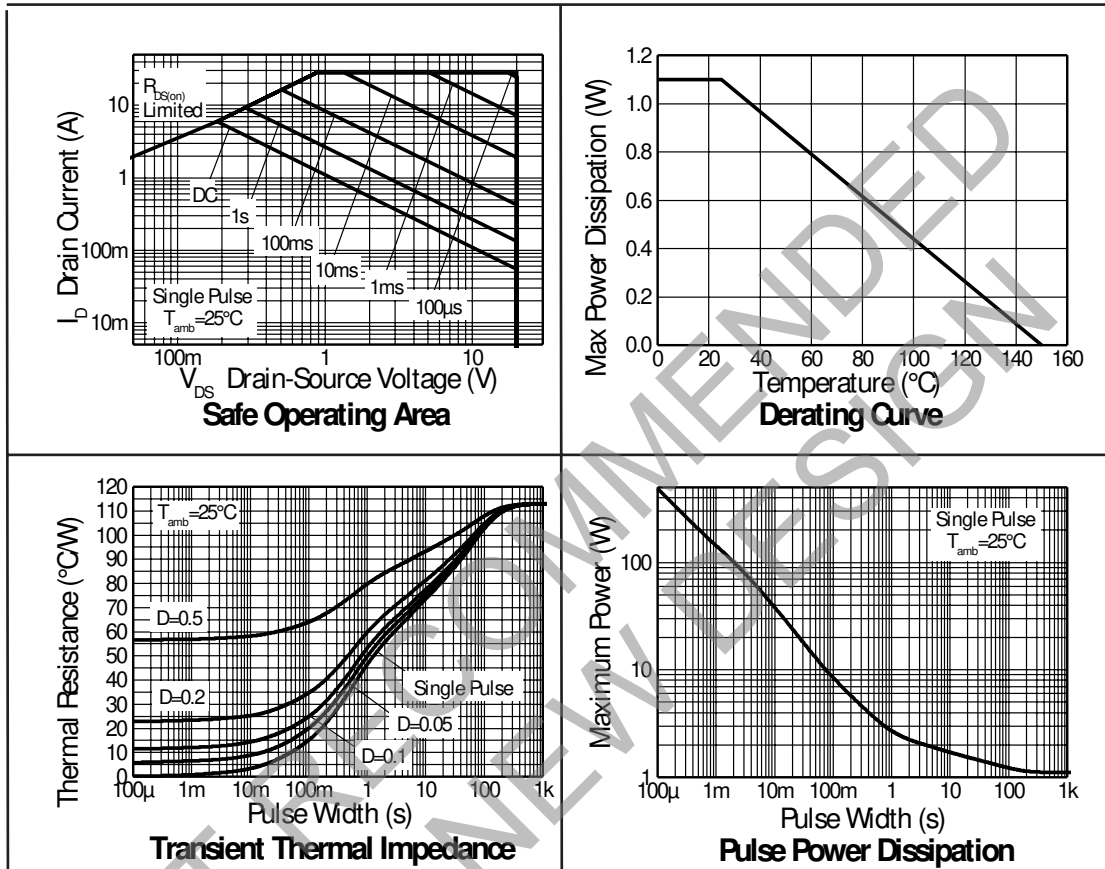
(a) For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions

(b) For a device surface mounted on FR4 PCB measured at $t \leq 10$ secs.

(c) Repetitive rating 25mm x 25mm FR4 PCB, $D = 0.05$, pulse width $10\mu s$ - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance graph. Refer to transient thermal impedance graph.

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CHARACTERISTICS



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

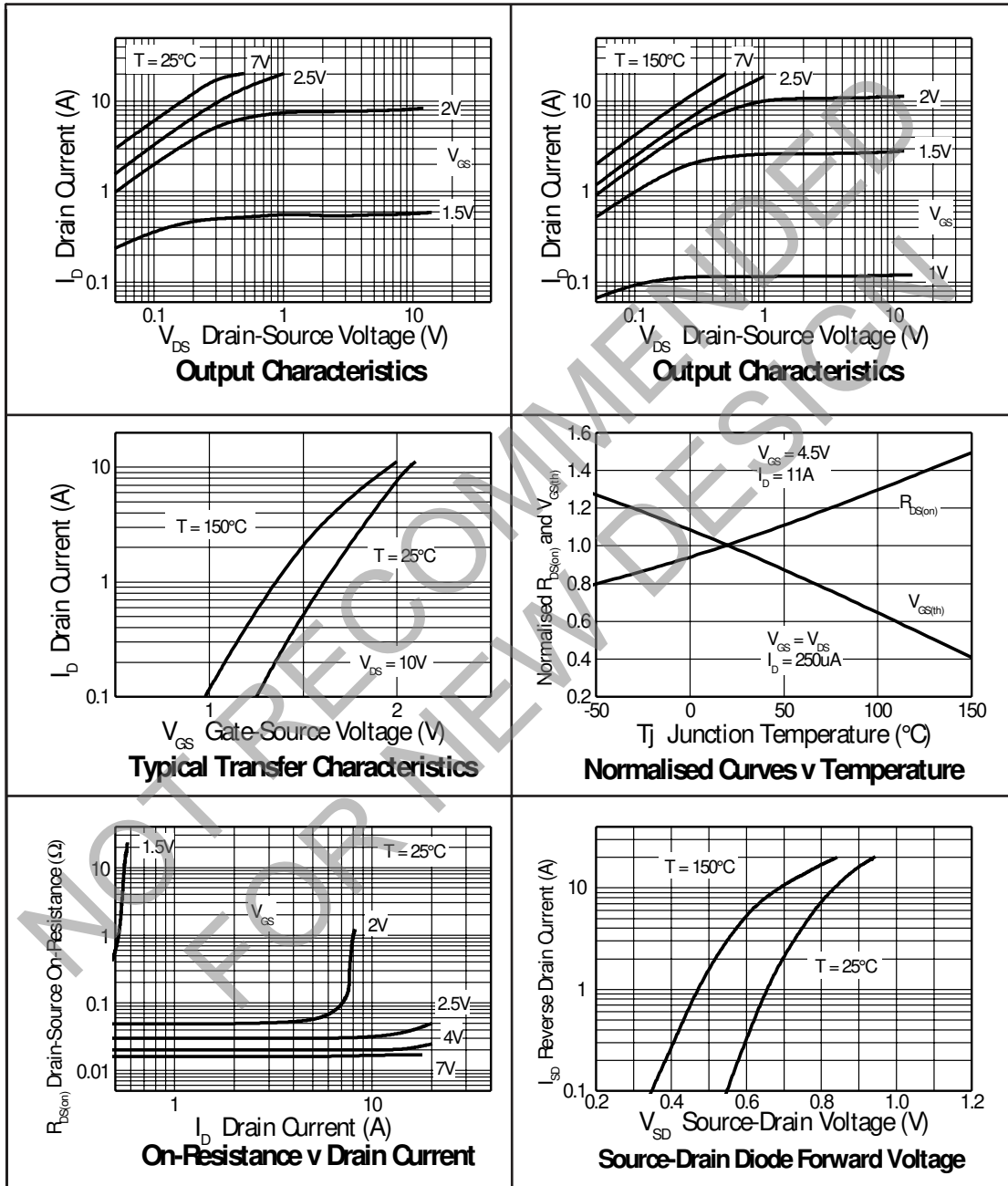
| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT | CONDITIONS. |
|---|---------------|------|------|--------------|---------------|---|
| STATIC | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | 20 | | | V | $I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$ |
| Zero Gate Voltage Drain Current | I_{DSS} | | | 1 | μA | $V_{DS}=20\text{V}$, $V_{GS}=0\text{V}$ |
| Gate-Body Leakage | I_{GSS} | | | 100 | nA | $V_{GS}=\pm 12\text{V}$, $V_{DS}=0\text{V}$ |
| Gate-Source Threshold Voltage | $V_{GS(th)}$ | 0.7 | | | V | $I_D=250\mu\text{A}$, $V_{DS}=V_{GS}$ |
| Static Drain-Source On-State Resistance (1) | $R_{DS(on)}$ | | | 0.02 0.04 | Ω | $V_{GS}=4.5\text{V}$, $I_D=11\text{A}$ $V_{GS}=2.5\text{V}$, $I_D=8.4\text{A}$ |
| Forward Transconductance (1)(3) | g_{fs} | | 27 | | S | $V_{DS}=10\text{V}$, $I_D=11\text{A}$ |
| DYNAMIC (3) | | | | | | |
| Input Capacitance | C_{iss} | | 1900 | | pF | $V_{DS}=10\text{V}$, $V_{GS}=0\text{V}$, $f=1\text{MHz}$ |
| Output Capacitance | C_{oss} | | 356 | | pF | |
| Reverse Transfer Capacitance | C_{rss} | | 218 | | pF | |
| SWITCHING(2) (3) | | | | | | |
| Turn-On Delay Time | $t_{d(on)}$ | | 7.9 | | ns | $V_{DD}=10\text{V}$, $I_D=1\text{A}$ $R_G=6.0\Omega$, $V_{GS}=4.5\text{V}$ |
| Rise Time | t_r | | 10 | | ns | |
| Turn-Off Delay Time | $t_{d(off)}$ | | 33.3 | | ns | |
| Fall Time | t_f | | 13.6 | | ns | |
| Total Gate Charge | Q_g | | 18.6 | | nC | $V_{DS}=10\text{V}$, $V_{GS}=4.5\text{V}$, $I_D=11\text{A}$ |
| Gate-Source Charge | Q_{gs} | | 5.2 | | nC | |
| Gate-Drain Charge | Q_{gd} | | 4.9 | | nC | |
| SOURCE-DRAIN DIODE | | | | | | |
| Diode Forward Voltage (1) | V_{SD} | | 0.85 | 0.95 | V | $T_J=25^\circ\text{C}$, $I_S=11.5\text{A}$, $V_{GS}=0\text{V}$ |
| Reverse Recovery Time (3) | t_{rr} | | 16.3 | | ns | $T_J=25^\circ\text{C}$, $I_F=2.1\text{A}$, $di/dt=100\text{A}/\mu\text{s}$ |
| Reverse Recovery Charge (3) | Q_{rr} | | 7.8 | | 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.

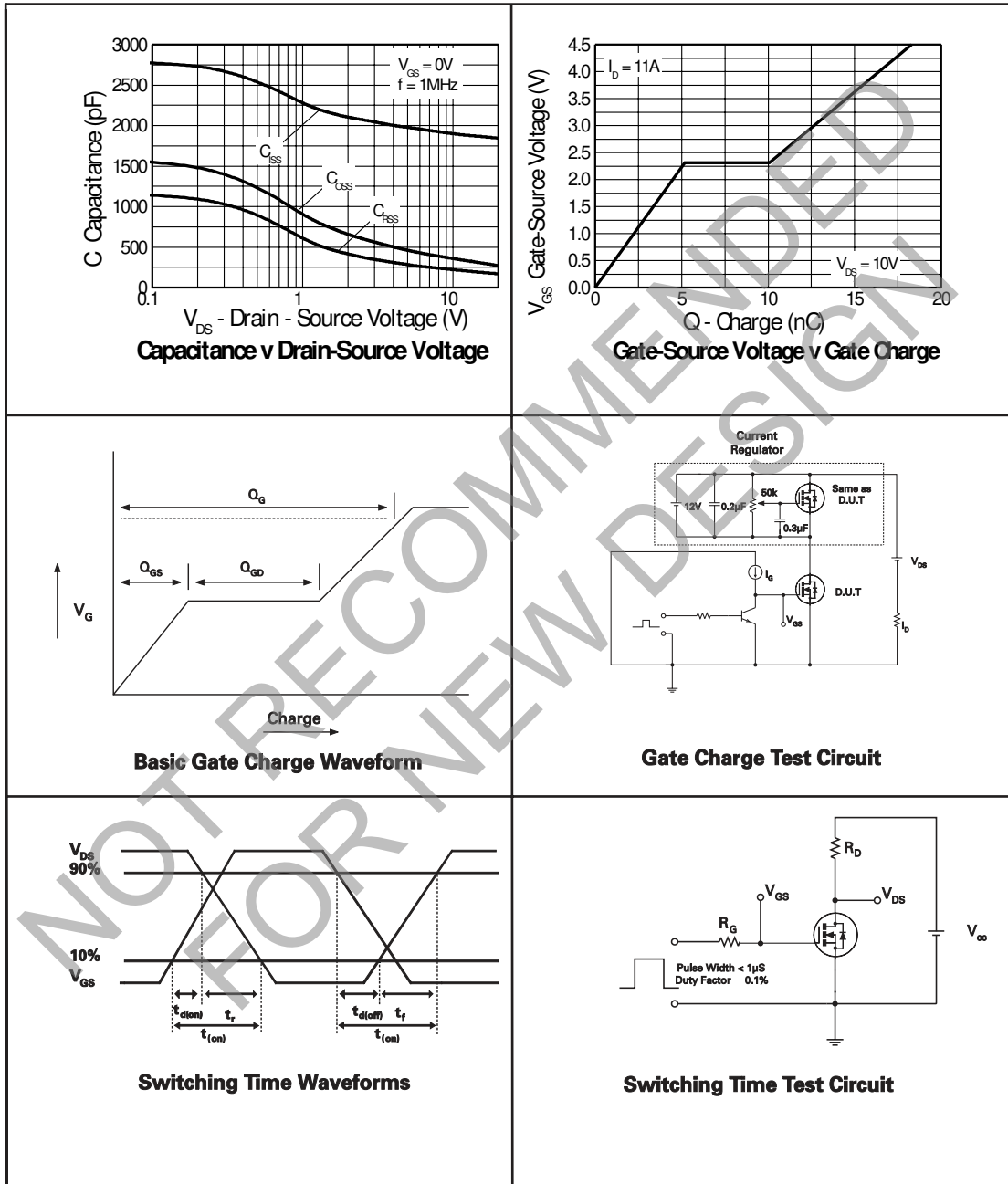
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TYPICAL CHARACTERISTICS



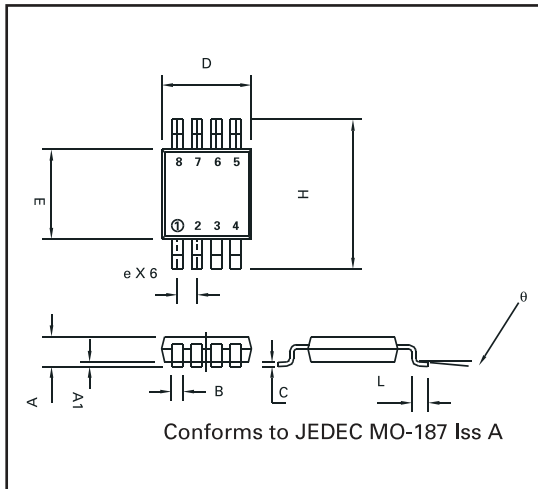
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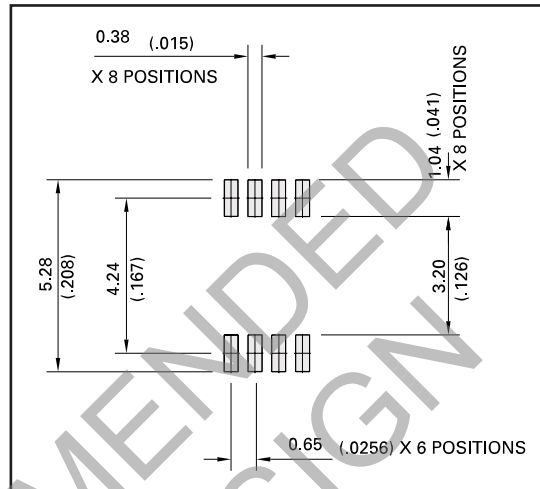


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PACKAGE OUTLINE



PAD LAYOUT



PACKAGE DIMENSIONS

| DIM | Millimetres | | Inches | | DIM | Millimetres | | Inches | |
|-----|-------------|------|--------|-------|-----|-------------|------|------------|-------|
| | MIN | MAX | MIN | MAX | | MIN | MAX | MIN | MAX |
| A | — | 1.10 | — | 0.043 | e | 0.65 BSC | | 0.0256 BSC | |
| A1 | 0.05 | 0.15 | 0.002 | 0.006 | E | 2.90 | 3.10 | 0.114 | 0.122 |
| B | 0.25 | 0.40 | 0.010 | 0.016 | H | 4.90 BSC | | 0.193 BSC | |
| C | 0.13 | 0.23 | 0.005 | 0.009 | L | 0.40 | 0.70 | 0.016 | 0.028 |
| D | 2.90 | 3.10 | 0.114 | 0.122 | θ° | 0° | 6° | 0° | 6° |

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