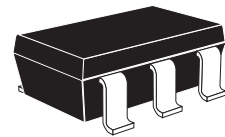


ZXMN6A08E6

60V N-CANNEL ENHANCEMENT MODE MOSFET

SUMMARY

| $V_{(BR)DSS}$ | $R_{DS(on)}$ (Ω) | I_D (A) |
|---------------|---------------------------|-----------|
| 60 | 0.080 @ $V_{GS} = 10V$ | 3.5 |
| | 0.150 @ $V_{GS} = 4.5V$ | 2.5 |



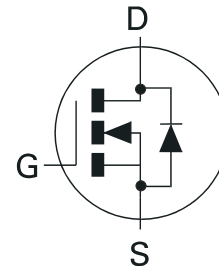
SOT23-6

DESCRIPTION

This new generation trench MOSFET from Zetex features a unique structure combining the benefits of low on-resistance and fast switching, making it ideal for high efficiency power management applications.

FEATURES

- Low on-resistance
- Fast switching speed
- Low threshold
- Low gate drive
- SOT23-6 package

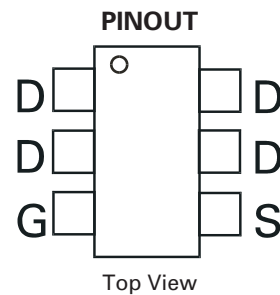


APPLICATIONS

- DC - DC converters
- Power management functions
- Disconnect switches
- Motor control

ORDERING INFORMATION

| DEVICE | REEL SIZE | TAPE WIDTH | QUANTITY PER REEL |
|--------------|-----------|------------|-------------------|
| ZXMN6A08E6TA | 7" | 8mm | 3000 units |
| ZXMN6A08E6TC | 13" | 8mm | 10000 units |



DEVICE MARKING

- 6A8

ZXMN6A08E6

ABSOLUTE MAXIMUM RATINGS

| PARAMETER | SYMBOL | LIMIT | UNIT |
|--|----------------|-------------------|---------------------|
| Drain-Source Voltage | V_{DSS} | 60 | 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 | 3.5 2.8 2.8 | A |
| Pulsed Drain Current (c) | I_{DM} | 16 | A |
| Continuous Source Current (Body Diode) (b) | I_S | 2.6 | A |
| Pulsed Source Current (Body Diode) (c) | I_{SM} | 16 | 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 | 1.7 13.6 | W mW/ $^\circ C$ |
| Operating and Storage Temperature Range | $T_j; T_{stg}$ | -55 to +150 | $^\circ C$ |

THERMAL RESISTANCE

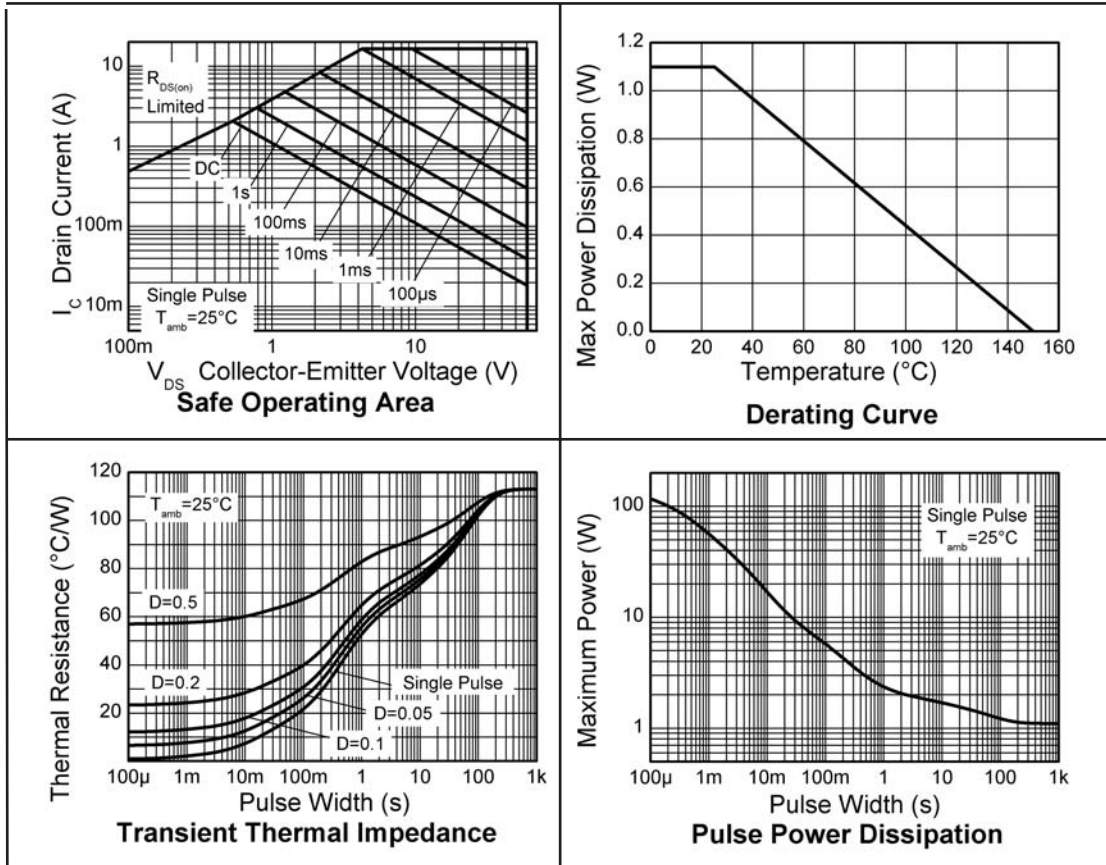
| PARAMETER | SYMBOL | VALUE | UNIT |
|-------------------------|-----------------|-------|--------------|
| Junction to Ambient (a) | $R_{\theta JA}$ | 113 | $^\circ C/W$ |
| Junction to Ambient (b) | $R_{\theta JA}$ | 73 | $^\circ C/W$ |

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, $D = 0.02$, pulse width 300 μs - pulse width limited by maximum junction temperature.

ZXMN6A08E6

CHARACTERISTICS



ZXMN6A08E6

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

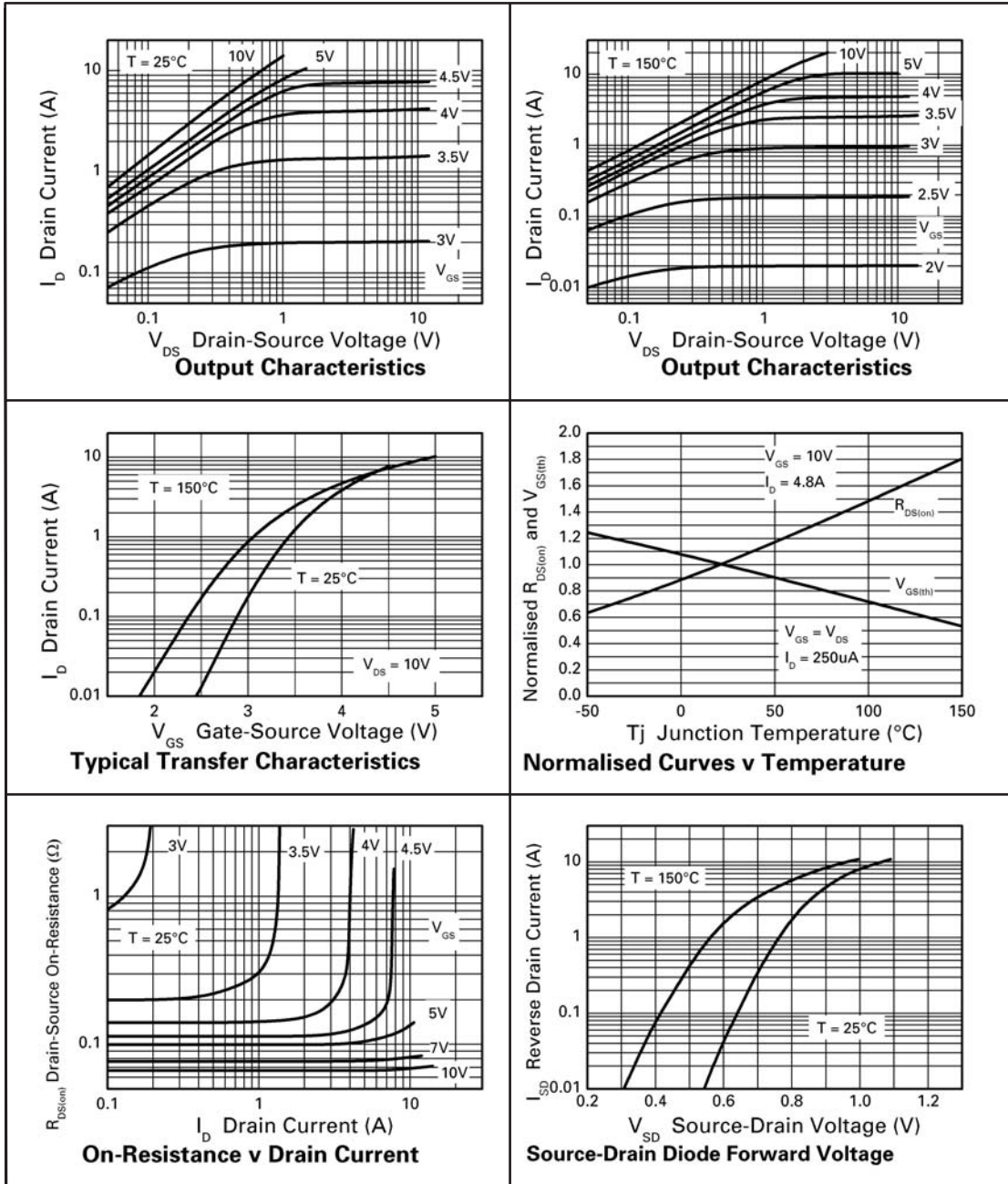
| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT | CONDITIONS. |
|---|---------------|------|------|----------------|---------------|--|
| STATIC | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | 60 | | | V | $I_D=250\mu\text{A}, V_{GS}=0\text{V}$ |
| Zero Gate Voltage Drain Current | I_{DSS} | | | 0.5 | μA | $V_{DS}=60\text{V}, V_{GS}=0\text{V}$ |
| 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 | | | V | $I_D=250\mu\text{A}, V_{DS}=V_{GS}$ |
| Static Drain-Source On-State Resistance (1) | $R_{DS(on)}$ | | | 0.080 0.150 | Ω | $V_{GS}=10\text{V}, I_D=4.8\text{A}$ $V_{GS}=4.5\text{V}, I_D=4.2\text{A}$ |
| Forward Transconductance (1)(3) | g_{fs} | | 6.6 | | S | $V_{DS}=15\text{V}, I_D=4.8\text{A}$ |
| DYNAMIC (3) | | | | | | |
| Input Capacitance | C_{iss} | | 459 | | pF | $V_{DS}=40\text{V}, V_{GS}=0\text{V},$ $f=1\text{MHz}$ |
| Output Capacitance | C_{oss} | | 44.2 | | pF | |
| Reverse Transfer Capacitance | C_{rss} | | 24.1 | | pF | |
| SWITCHING(2) (3) | | | | | | |
| Turn-On Delay Time | $t_{d(on)}$ | | 2.6 | | ns | $V_{DD}=30\text{V}, I_D=1.5\text{A}$ $R_{G\equiv 6.0\Omega}, V_{GS}=10\text{V}$ |
| Rise Time | t_r | | 2.1 | | ns | |
| Turn-Off Delay Time | $t_{d(off)}$ | | 12.3 | | ns | |
| Fall Time | t_f | | 4.6 | | ns | |
| Gate Charge | Q_g | | 4.0 | | nC | $V_{DS}=30\text{V}, V_{GS}=5\text{V},$ $I_D=1.4\text{A}$ |
| Total Gate Charge | Q_g | | 5.8 | | nC | $V_{DS}=30\text{V}, V_{GS}=10\text{V},$ $I_D=1.4\text{A}$ |
| Gate-Source Charge | Q_{gs} | | 1.4 | | nC | |
| Gate-Drain Charge | Q_{gd} | | 1.9 | | nC | |
| SOURCE-DRAIN DIODE | | | | | | |
| Diode Forward Voltage (1) | V_{SD} | | 0.88 | 1.2 | V | $T_J=25^{\circ}\text{C}, I_S=4\text{A},$ $V_{GS}=0\text{V}$ |
| Reverse Recovery Time (3) | t_{rr} | | 19.2 | | ns | $T_J=25^{\circ}\text{C}, I_S=1.4\text{A},$ $di/dt=100\text{A}/\mu\text{s}$ |
| Reverse Recovery Charge (3) | Q_{rr} | | 30.3 | | nC | |

NOTES

- (1) Measured under pulsed conditions. Pulse 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.

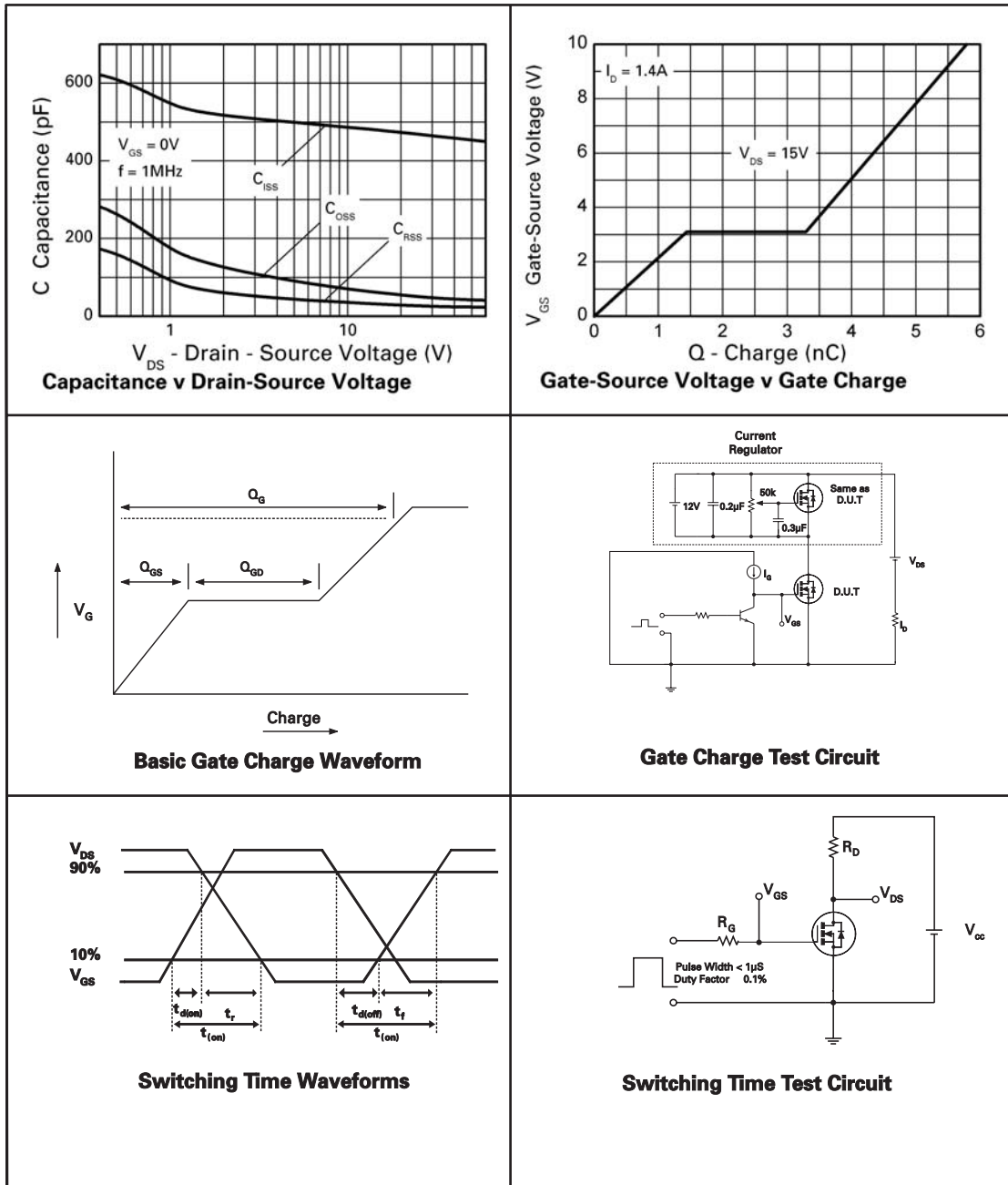
ZXMN6A08E6

TYPICAL CHARACTERISTICS



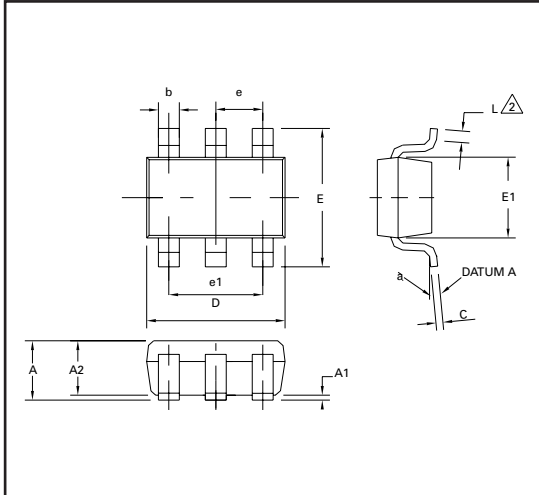
ZXMN6A08E6

TYPICAL CHARACTERISTICS

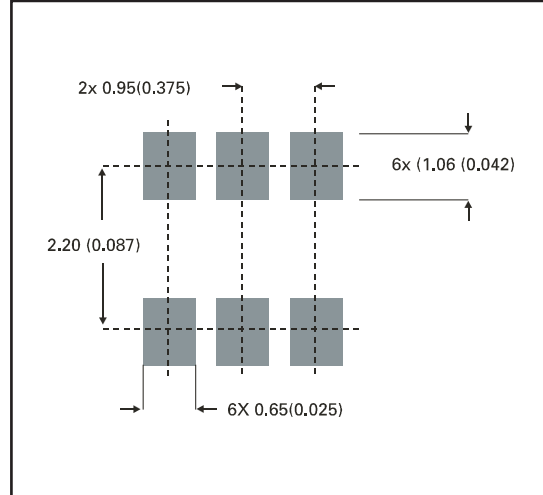


ZXMN6A08E6

PACKAGE OUTLINE



PAD LAYOUT DETAILS



CONTROLLING DIMENSIONS IN MILLIMETERS APPROX CONVERSIONS INCHES.

PACKAGE DIMENSIONS

| DIM | Millimetres | | Inches | | DIM | Millimetres | | Inches | |
|-----|-------------|------|--------|-------|-----|-------------|------|-----------|-------|
| | Min | Max | Min | Max | | Min | Max | Min | Max |
| A | 0.90 | 1.45 | 0.35 | 0.057 | E | 2.60 | 3.00 | 0.102 | 0.118 |
| A1 | 0.00 | 0.15 | 0 | 0.006 | E1 | 1.50 | 1.75 | 0.059 | 0.069 |
| A2 | 0.90 | 1.30 | 0.035 | 0.051 | L | 0.10 | 0.60 | 0.004 | 0.002 |
| b | 0.35 | 0.50 | 0.014 | 0.019 | e | 0.95 REF | | 0.037 REF | |
| C | 0.09 | 0.20 | 0.0035 | 0.008 | e1 | 1.90 REF | | 0.074 REF | |
| D | 2.80 | 3.00 | 0.110 | 0.118 | L | 0° | 10° | 0° | 10° |

© Zetex Semiconductors plc 2006

| Europe | Americas | Asia Pacific | Corporate Headquarters |
|---|--|--|---|
| Zetex GmbH Streitfeldstraße 19 D-81673 München Germany | Zetex Inc 700 Veterans Memorial Hwy Hauppauge, NY 11788 USA | Zetex (Asia) Ltd 3701-04 Metroplaza Tower 1 Hing Fong Road, Kwai Fong Hong Kong | Zetex Semiconductors plc Zetex Technology Park Chadderton, Oldham, OL9 9LL United Kingdom |
| Telefon: (49) 89 45 49 49 0 Fax: (49) 89 45 49 49 49 europa.sales@zetex.com | Telephone: (1) 631 360 2222 Fax: (1) 631 360 8222 usa.sales@zetex.com | Telephone: (852) 26100 611 Fax: (852) 24250 494 asia.sales@zetex.com | Telephone (44) 161 622 4444 Fax: (44) 161 622 4446 hq@zetex.com |

These offices are supported by agents and distributors in major countries world-wide.

This publication is issued to provide outline information only which (unless agreed by the Company in writing) may not be used, applied or reproduced for any purpose or form part of any order or contract or be regarded as a representation relating to the products or services concerned. The Company reserves the right to alter without notice the specification, design, price or conditions of supply of any product or service.

For the latest product information, log on to www.zetex.com

ISSUE 4 - MAY 2006