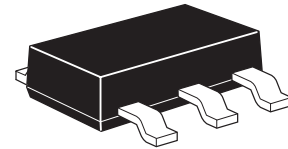


ZXMN6A08G

60V SOT223 N-channel enhancement mode MOSFET

Summary

| $V_{(BR)DSS}$ | $R_{DS(on)}$ (Ω) | I_D (A) |
|---------------|---------------------------|-----------|
| 60 | 0.080 @ $V_{GS} = 10V$ | 5.3 |
| | 0.150 @ $V_{GS} = 4.5V$ | 2.8 |

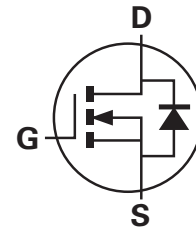


Description

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.

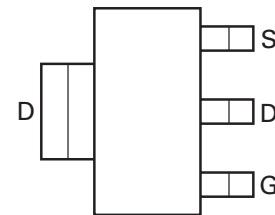
Features

- Low on-resistance
- Fast switching speed
- Low threshold
- Low gate drive
- SOT223 package



Applications

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



Pinout - top view

Ordering information

| Device | Reel size (inches) | Tape width (mm) | Quantity per reel |
|-------------|--------------------|-----------------|-------------------|
| ZXMN6A08GTA | 7 | 12 | 1,000 |
| ZXMN6A08GTC | 13 | 12 | 4,000 |

Device marking

ZXMN
6A08

ZXMN6A08G

Absolute maximum ratings

| Parameter | Symbol | Limit | Unit | |
|---|----------------|---|----------------|---|
| Drain-source voltage | V_{DSS} | 60 | V | |
| Gate-source voltage | V_{GS} | ± 20 | V | |
| Continuous drain current | I_D | @ $V_{GS} = 10V$; $T_{amb} = 25^\circ C^{(b)}$ | 5.3 | A |
| | | @ $V_{GS} = 10V$; $T_{amb} = 70^\circ C^{(b)}$ | 4.2 | |
| | | @ $V_{GS} = 10V$; $T_{amb} = 25^\circ C^{(a)}$ | 3.8 | |
| Pulsed drain current ^(c) | I_{DM} | 20 | A | |
| Continuous source current (body diode) ^(b) | I_S | 2.1 | A | |
| Pulsed source current (body diode) ^(c) | I_{SM} | 20 | A | |
| Power dissipation at $T_{amb} = 25^\circ C^{(a)}$ | P_D | 2 | W | |
| Linear derating factor | | 16 | mW/ $^\circ C$ | |
| Power dissipation at $T_{amb} = 25^\circ C^{(b)}$ | P_D | 3.9 | W | |
| Linear derating factor | | 31 | mW/ $^\circ C$ | |
| Operating and storage temperature range | T_j, T_{stg} | -55 to +150 | $^\circ C$ | |

Thermal resistance

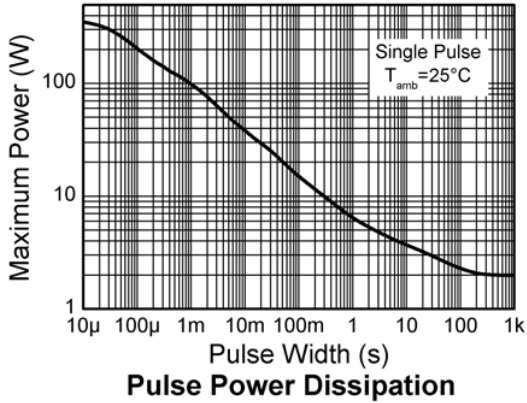
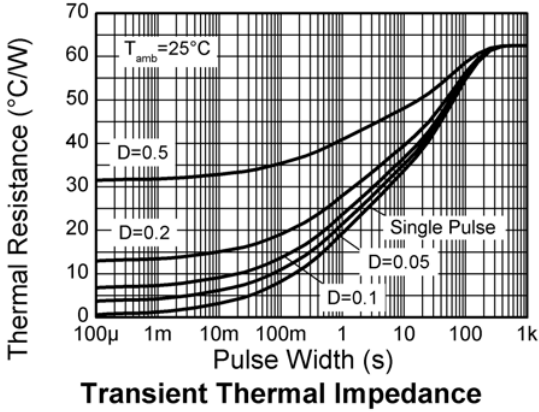
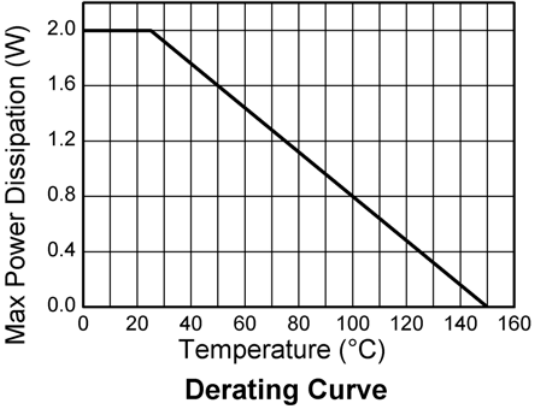
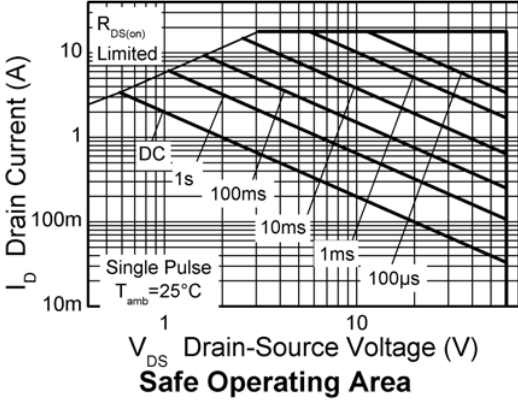
| Parameter | Symbol | Limit | Unit |
|------------------------------------|-----------------|-------|--------------|
| Junction to ambient ^(a) | $R_{\theta JA}$ | 62.5 | $^\circ C/W$ |
| Junction to ambient ^(b) | $R_{\theta JA}$ | 32 | $^\circ C/W$ |

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 $t \leq 10$ sec.
- (c) Repetitive rating - 25mm x 25mm FR4 PCB, $D=0.02$, pulse width 300 μs - pulse width limited by maximum junction temperature.

ZXMN6A08G

Typical characteristics



ZXMN6A08G

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 ^(*) | $R_{DS(on)}$ | | | 0.080 | Ω | $V_{GS} = 10\text{V}, I_D = 4.8\text{A}$ |
| | | | | 0.150 | Ω | $V_{GS} = 4.5\text{V}, I_D = 4.2\text{A}$ |
| Forward transconductance ^(*) (‡) | g_{fs} | | 6.6 | | S | $V_{DS} = 15\text{V}, I_D = 4.8\text{A}$ |
| Dynamic^(‡) | | | | | | |
| 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^(†) (‡) | | | | | | |
| Turn-on delay time | $t_{d(on)}$ | | 2.6 | | ns | $V_{DD} = 30\text{V}, I_D = 1.5\text{A}$ $R_G = 6.0\Omega, V_{GS} = 10\text{V}$ |
| 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 ^(*) | 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 ^(‡) | 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 ^(‡) | Q_{rr} | | 30.3 | | nC | |

NOTES:

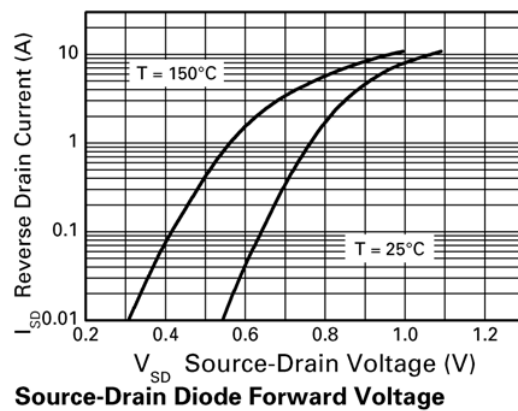
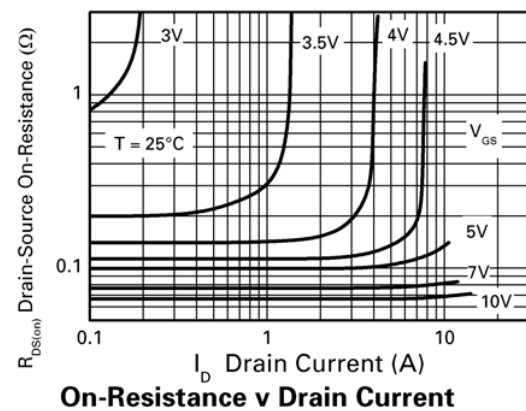
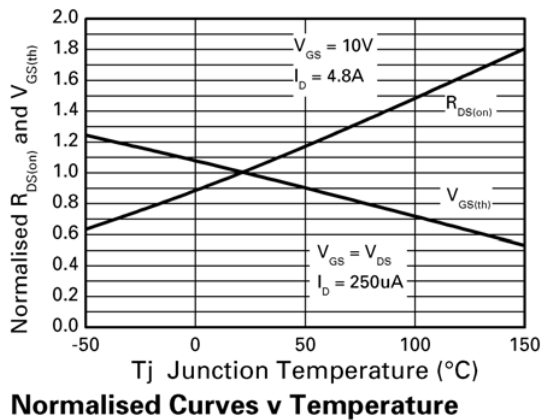
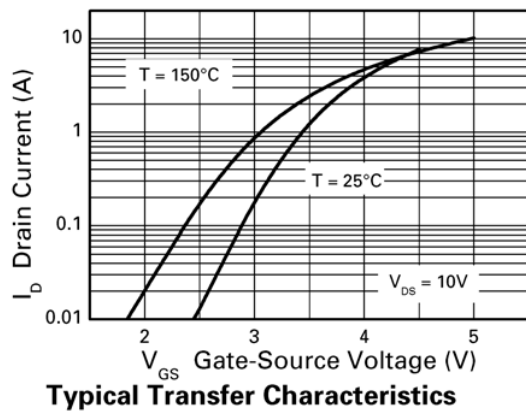
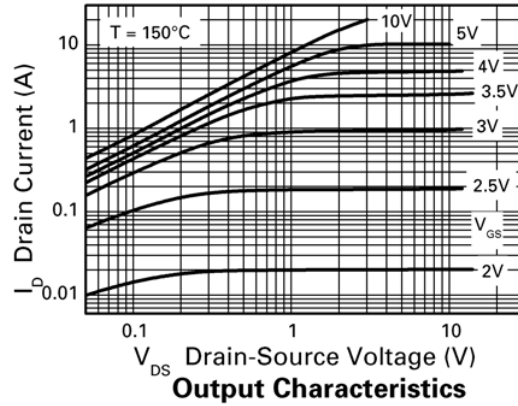
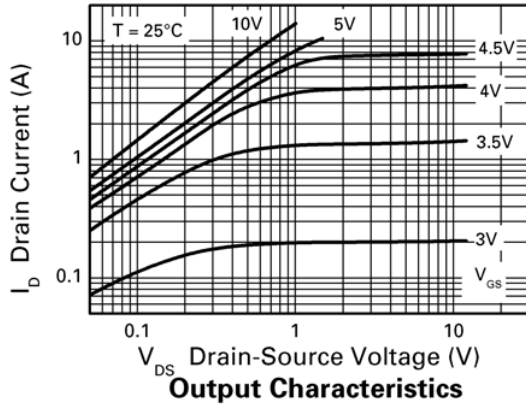
(*) Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.

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

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

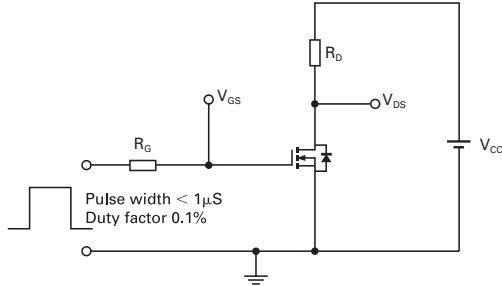
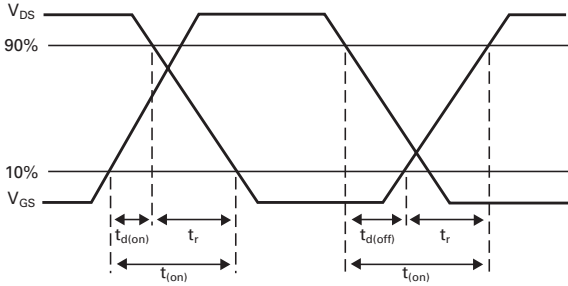
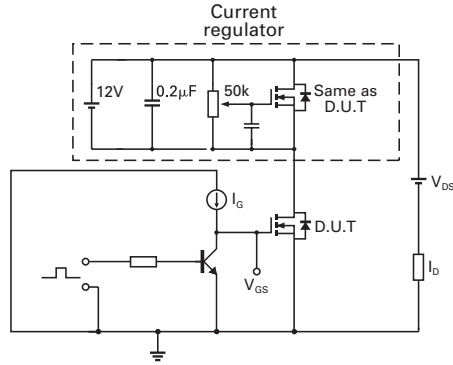
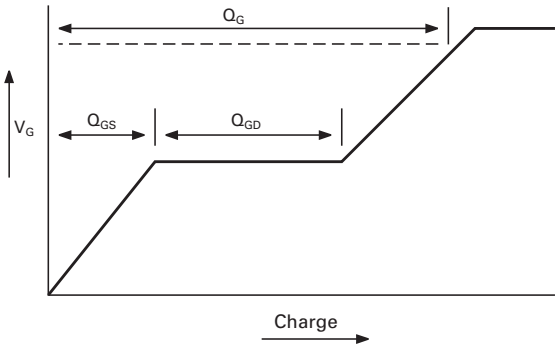
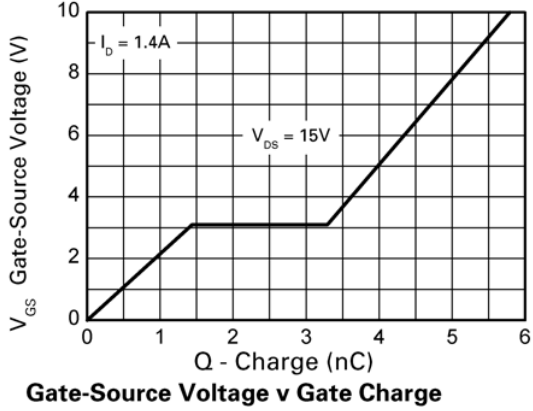
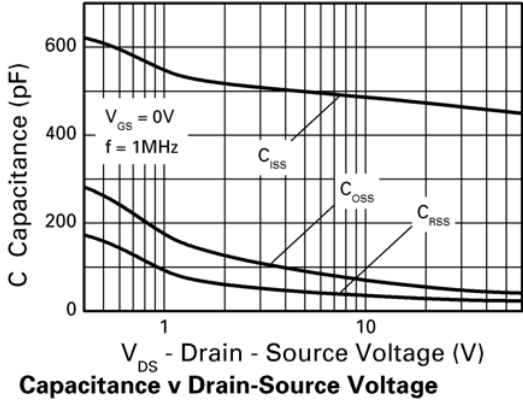
ZXMN6A08G

Typical characteristics



ZXMN6A08G

Typical characteristics

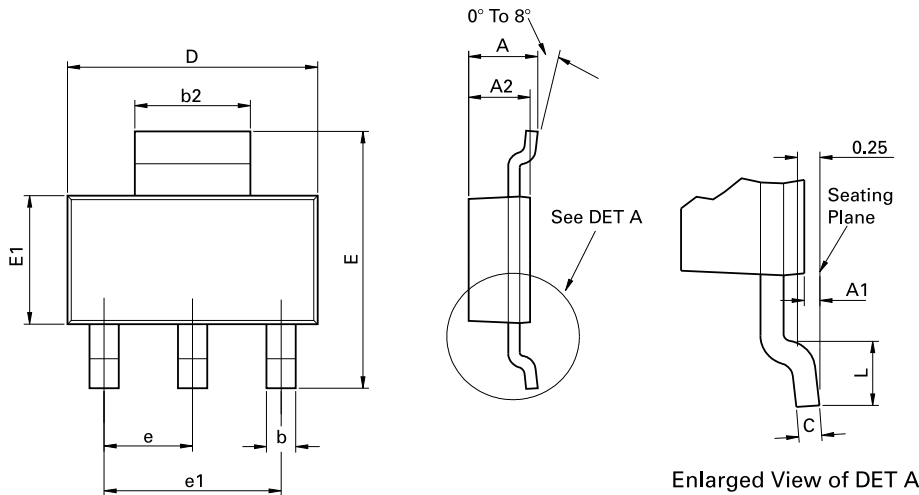


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Package outline - SOT223



Conforms to JEDEC TO-261 AA Issue B

| DIM | Millimeters | | Inches | | DIM | Millimeters | | Inches | |
|-----|-------------|------|--------|-------|-----|-------------|------|------------|-------|
| | Min | Max | Min | Max | | Min | Max | Min | Max |
| A | - | 1.80 | - | 0.071 | e | 2.30 BSC | | 0.0905 BSC | |
| A1 | 0.02 | 0.10 | 0.0008 | 0.004 | e1 | 4.60 BSC | | 0.181 BSC | |
| b | 0.66 | 0.84 | 0.026 | 0.033 | E | 6.70 | 7.30 | 0.264 | 0.287 |
| b2 | 2.90 | 3.10 | 0.114 | 0.122 | E1 | 3.30 | 3.70 | 0.130 | 0.146 |
| C | 0.23 | 0.33 | 0.009 | 0.013 | L | 0.90 | - | 0.355 | - |
| D | 6.30 | 6.70 | 0.248 | 0.264 | - | - | - | - | - |

Note: Controlling dimensions are in millimeters. Approximate dimensions are provided in inches

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