

ZXMN3G32DN8

30V SO8 dual N-channel enhancement mode MOSFET

Summary

| $V_{(BR)DSS}$ | $R_{DS(on)}$ (Ω) | I_D (A) |
|---------------|---------------------------|-----------|
| 30 | 0.028 @ $V_{GS} = 10V$ | 7.1 |
| | 0.045 @ $V_{GS} = 4.5V$ | 5.6 |



Description

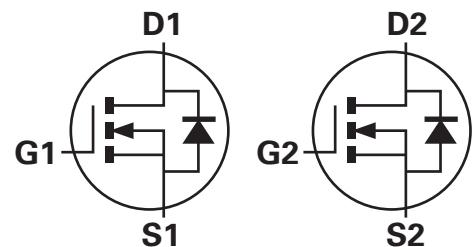
This new generation Trench MOSFET from Zetex features low on-resistance and fast switching speed.

Features

- Low on-resistance
- 4.5V gate drive capability
- Fast switching bullet

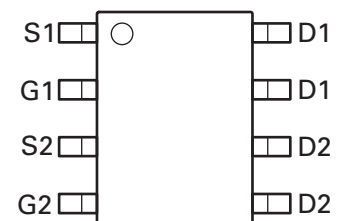
Applications

- DC-DC Converters
- Power management functions
- Motor Control
- Backlighting



Ordering information

| DEVICE | Reel size (inches) | Tape width (mm) | Quantity per reel |
|---------------|--------------------|-----------------|-------------------|
| ZXMN3G32DN8TA | 7 | 12 | 500 |



Device marking

ZXMN

3G32D

ZXMN3G32DN8

Absolute maximum ratings

| Parameter | Symbol | Limit | Unit |
|---|----------------|-------------------|-----------------------------|
| Drain source voltage | V_{DSS} | 30 | V |
| Gate source voltage | V_{GS} | ± 20 | V |
| Continuous Drain Current @ $V_{GS}=10$; $T_A=25^{\circ}\text{C}^{(b)}$ @ $V_{GS}=10$; $T_A=70^{\circ}\text{C}^{(b)}$ @ $V_{GS}=10$; $T_A=25^{\circ}\text{C}^{(a)}$ | I_D | 7.1 5.7 5.5 | A A A |
| Pulsed drain current ^(c) | I_{DM} | 33.6 | A |
| Continuous source current (body diode) ^(b) | I_S | 3.1 | A |
| Pulsed source current (body diode) ^(c) | I_{SM} | 33.6 | A |
| Power dissipation at $T_A=25^{\circ}\text{C}^{(a)(d)}$ Linear derating factor | P_D | 1.25 10 | W mW/ $^{\circ}\text{C}$ |
| Power dissipation at $T_A=25^{\circ}\text{C}^{(a)(e)}$ Linear derating factor | P_D | 1.8 14 | W mW/ $^{\circ}\text{C}$ |
| Power dissipation at $T_A=25^{\circ}\text{C}^{(b)(d)}$ Linear derating factor | P_D | 2.1 17 | W mW/ $^{\circ}\text{C}$ |
| Operating and storage temperature range | T_j, T_{stg} | -55 to 150 | $^{\circ}\text{C}$ |

Thermal resistance

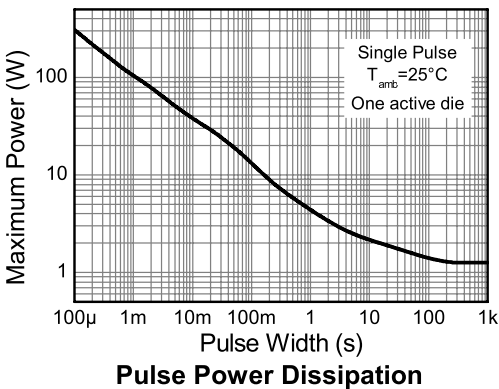
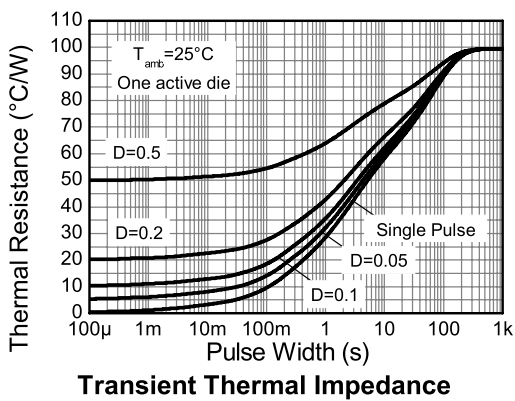
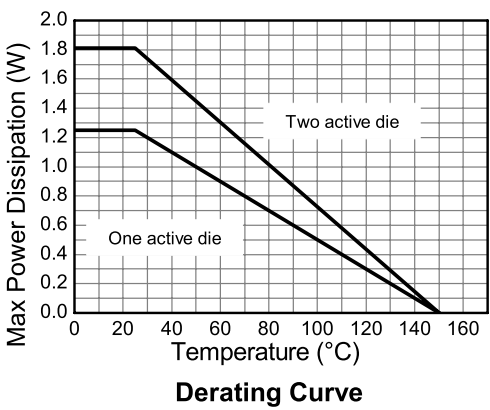
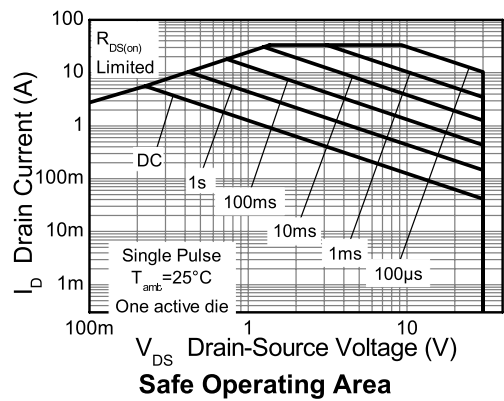
| Parameter | Symbol | Limit | Unit |
|---------------------------------------|-----------------|-------|----------------------|
| Junction to ambient ^{(a)(d)} | $R_{\theta JA}$ | 100 | $^{\circ}\text{C/W}$ |
| Junction to ambient ^{(a)(e)} | $R_{\theta JA}$ | 70 | $^{\circ}\text{C/W}$ |
| Junction to ambient ^{(b)(d)} | $R_{\theta JA}$ | 60 | $^{\circ}\text{C/W}$ |
| Junction to lead ^(f) | $R_{\theta JL}$ | 51 | $^{\circ}\text{C/W}$ |

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.
- (d) For a dual device with one active die.
- (e) For a device with two active die running at equal power.
- (f) Thermal resistance from junction to solder-point (at end of drain lead).

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Thermal characteristics



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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} | 30 | | | V | I _D = 250μA, V _{GS} =0V |
| Zero Gate Voltage Drain Current | I _{DSS} | | | 0.5 | μA | V _{DS} = 30V, V _{GS} =0V |
| Gate-Body Leakage | I _{GSS} | | | 100 | nA | V _{GS} =±20V, V _{DS} =0V |
| Gate-Source Threshold Voltage | V _{GS(th)} | 1.0 | | 3.0 | V | I _D = 250μA, V _{DS} =V _{GS} |
| Static Drain-Source On-State Resistance ^(*) | R _{DS(on)} | | | 0.028 0.045 | Ω Ω | V _{GS} = 10V, I _D = 6.0A V _{GS} = 4.5V, I _D = 4.9A |
| Forward Transconductance ^(*) (†) | g _{fs} | | 12 | | S | V _{DS} = 15V, I _D = 6.0A |
| Dynamic ^(†) | | | | | | |
| Input Capacitance | C _{iss} | | 472 | | pF | V _{DS} = 15V, V _{GS} =0V f=1MHz |
| Output Capacitance | C _{oss} | | 178 | | pF | |
| Reverse Transfer Capacitance | C _{rss} | | 65 | | pF | |
| Switching ^(‡) (†) | | | | | | |
| Turn-On-Delay Time | t _{d(on)} | | 2.5 | | ns | V _{DD} = 15V, I _D = 1A R _G ≅ 6.0Ω, V _{GS} =10V |
| Rise Time | t _r | | 3.1 | | ns | |
| Turn-Off Delay Time | t _{d(off)} | | 14 | | ns | |
| Fall Time | t _f | | 9.7 | | ns | |
| Total Gate Charge | Q _g | | 10.5 | | nC | V _{DS} = 15V, V _{GS} = 10V I _D = 6A |
| Gate-Source Charge | Q _{gs} | | 1.86 | | nC | |
| Gate Drain Charge | Q _{gd} | | 2.3 | | nC | |
| Source-drain diode | | | | | | |
| Diode Forward Voltage ^(*) | V _{SD} | | 0.68 | 1.2 | V | T _j =25°C, I _S = 1.7A, V _{GS} =0V |

NOTES:

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

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

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

Typical characteristics

Fig1. $I_D - V_{DS}$

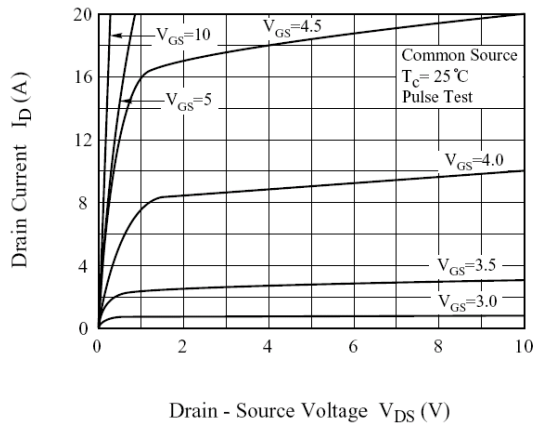


Fig2. $R_{DS(on)} - I_D$

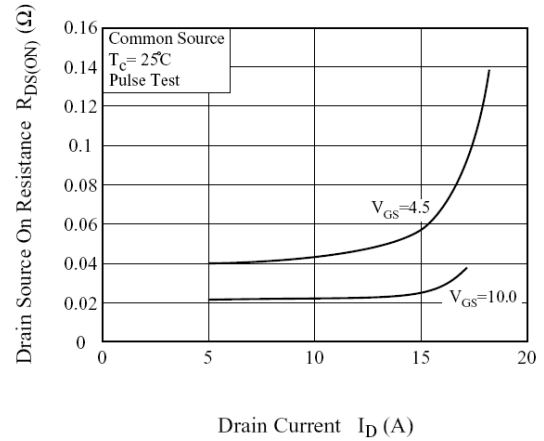


Fig3. $I_D - V_{GS}$

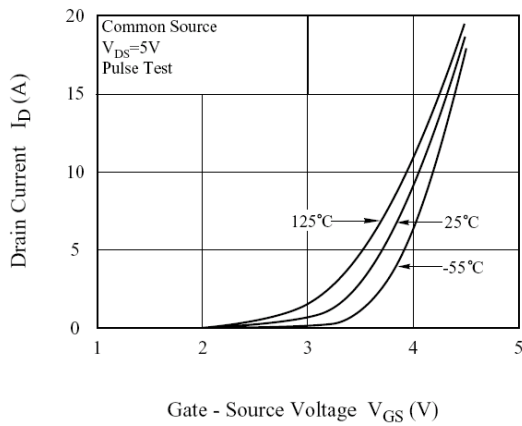


Fig4. $R_{DS(on)} - T_j$

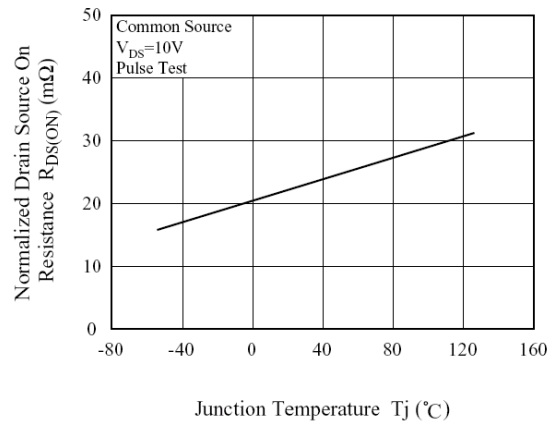


Fig5. $V_{th} - T_j$

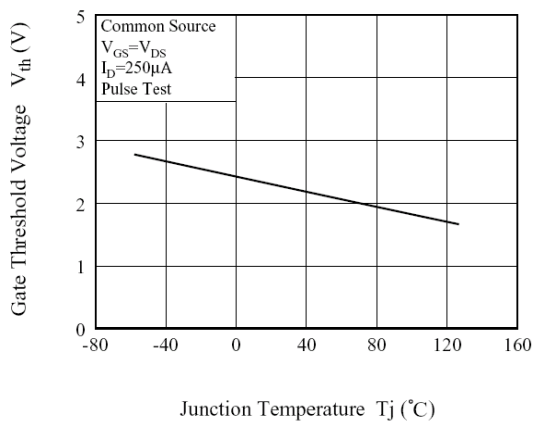
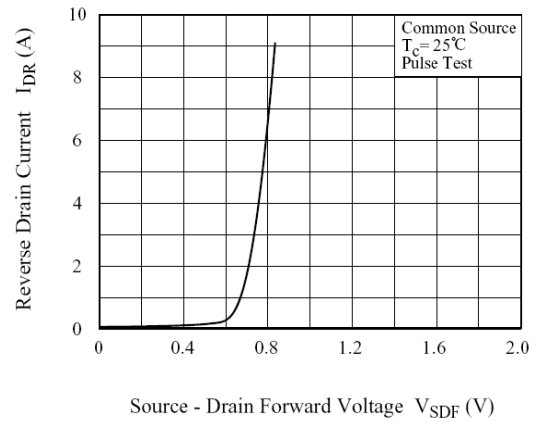
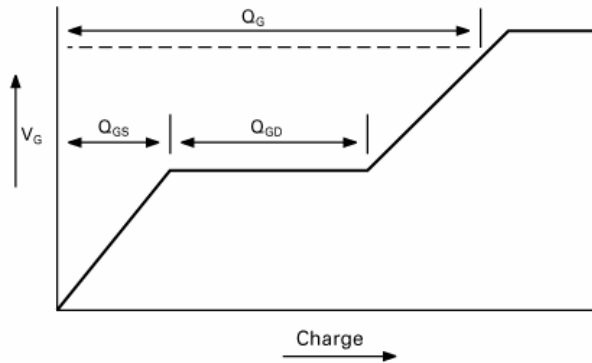


Fig6. $I_{DR} - V_{SDF}$

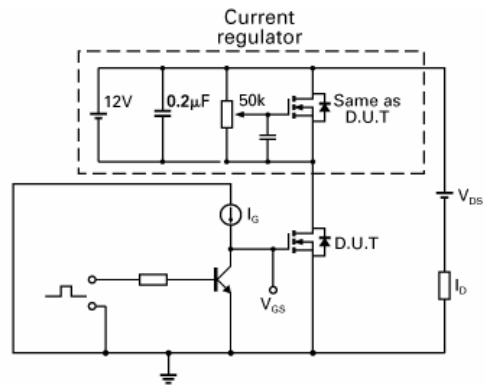


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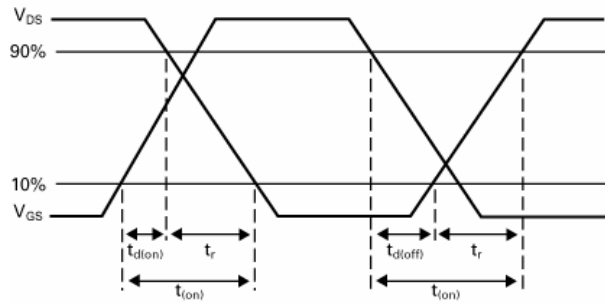
Test circuits



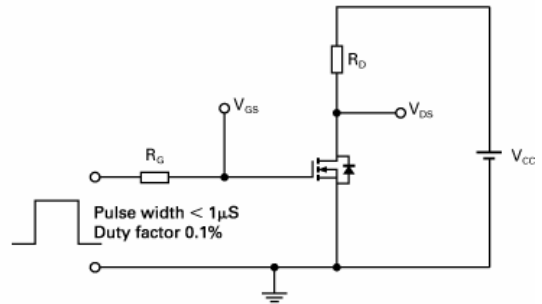
Basic gate charge waveform



Gate charge test circuit



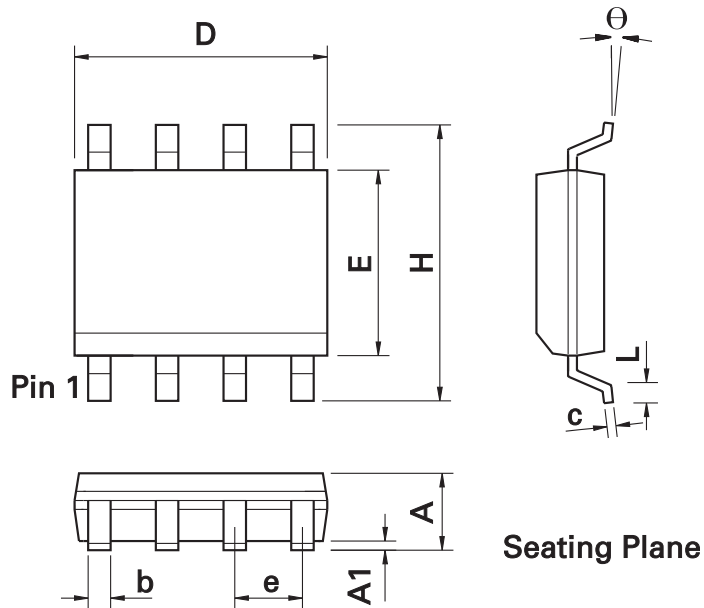
Switching time waveforms



Switching time test circuit

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Package outline - SO8



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

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

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| | |
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Issue 1 - January 2008

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