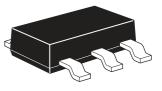


ZXMN6A25G 60V SOT223 N-channel enhancement mode MOSFET

Summary

| V _{(BR)DSS} | R_{DS(on)} (Ω) | I _D (A) |
|----------------------|--------------------------------|--------------------|
| 60 | 0.050 @ V _{GS} = 10V | 6.7 |
| | 0.070 @ V _{GS} = 4.5V | 5.7 |



G

D

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 gate drive
- SOT223 package

Applications

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

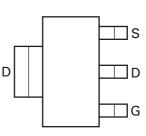
Ordering information

| Device | Reel size | Tape width | Quantity | |
|-------------|-----------|------------|----------|--|
| | (inches) | (mm) | per reel | |
| ZXMN6A25GTA | 7 | 12 | 1,000 | |

Device marking

ZXMN 6A25





Pinout - top view

Absolute maximum ratings

| Parameter | Symbol | Limit | Unit |
|---|-----------------------------------|-------------|-------|
| Drain-source voltage | V _{DSS} | 60 | V |
| Gate-source voltage | V _{GS} | ±20 | V |
| Continuous drain current @ $V_{GS} = 10V$; $T_{amb} = 25^{\circ}C^{(b)}$ | ۱ _D | 6.7 | А |
| @ V _{GS} = 10V; T _{amb} = 70°C ^(b) | | 5.4 | А |
| @ V _{GS} = 10V; T _{amb} = 25°C ^(a) | | 4.8 | А |
| Pulsed drain current ^(c) | I _{DM} | 28.5 | А |
| Continuous source current (body diode) ^(b) | ۱ _S | 5.7 | А |
| Pulsed source current (body diode) ^(c) | I _{SM} | 28.5 | А |
| Power dissipation at $T_{amb} = 25^{\circ}C^{(a)}$ | P _D | 2 | W |
| Linear derating factor | | 16 | mW/°C |
| Power dissipation at $T_{amb} = 25^{\circ}C^{(b)}$ | P _D | 3.9 | W |
| Linear derating factor | | 31 | mW/°C |
| Operating and storage temperature range | T _j , T _{stg} | -55 to +150 | °C |

Thermal resistance

| Parameter | Symbol | Limit | Unit |
|---------------------|----------------|-------|------|
| Junction to ambient | R_{\ThetaJA} | 62.5 | °C/W |
| Junction to ambient | R_{\ThetaJA} | 32 | °C/W |

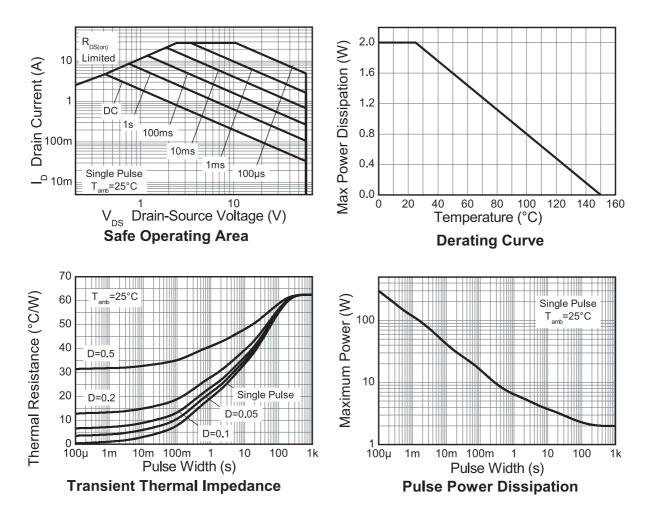
NOTES:

(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 300µ.s - pulse width limited by maximum junction temperature.

Typical characteristics



| Parameter | Symbol | Min. | Тур. | Max. | Unit | Conditions |
|---|----------------------|------|------|-------|------|---|
| STATIC | | | | | | |
| Drain-source breakdown voltage | V _{(BR)DSS} | 60 | | | V | I_{D} = 250 μ A, V_{GS} =0V |
| Zero gate voltage drain current | I _{DSS} | | | 1.0 | μA | V _{DS} = 60V, V _{GS} =0V |
| Gate-body leakage | I _{GSS} | | | 100 | nA | $V_{GS}=\pm 20V, V_{DS}=0V$ |
| Gate-source threshold voltage | V _{GS(th)} | 1 | | | V | $I_D=250\mu A$, $V_{DS}=V_{GS}$ |
| Static drain-source on-state | R _{DS(on)} | | | 0.050 | Ω | V _{GS} = 10V, I _D = 3.6A |
| resistance ^(*) | | | | 0.070 | Ω | V_{GS} = 4.5V, I_{D} = 3.0A |
| Forward transconductance ^{(*) (‡)} | 9 _{fs} | | 10.2 | | S | V _{DS} = 15V, I _D = 4.5A |
| Dynamic ^(‡) | | | | | | |
| Input capacitance | C _{iss} | | 1063 | | pF | V _{DS} = 30V, V _{GS} =0V |
| Output capacitance | C _{oss} | | 104 | | pF | f=1MHz |
| Reverse transfer capacitance | C _{rss} | | 64 | | pF | |
| Switching ^{(†) (‡)} | | | | | | |
| Turn-on-delay time | t _{d(on)} | | 3.8 | | ns | V _{DD} = 30V, I _D = 1A |
| Rise time | t _r | | 4.0 | | ns | R _G ≅6.0W, V _{GS} = 10V |
| Turn-off delay time | t _{d(off)} | | 26.2 | | ns | |
| Fall time | t _f | | 10.6 | | ns | |
| Gate charge | Q _g | | 11.0 | | nC | V_{DS} = 30V, V_{GS} = 5V I _D = 1.4A |
| Total gate charge | Qg | | 20.4 | | nC | V _{DS} = 30V, V _{GS} = 10V |
| Gate-source charge | 0 _{gs} | | 4.1 | | nC | I _D = 1.4A |
| Gate Drain Charge | Q _{gd} | | 5.1 | | nC | |
| Source-drain diode | | | | | | |
| Diode forward voltage ^(*) | V _{SD} | | 0.85 | 0.95 | V | T _j =25°C, I _S = 5.5A, V _{GS} =0V |
| Reverse recovery time ^(‡) | t _{rr} | | 22.0 | | ns | T _j =25°C, I _S = 2.2A, |
| Reverse recovery charge ^(‡) | Q _{rr} | | 21.4 | | nC | di/dt=100A/µs |

Electrical characteristics (at $T_{amb} = 25^{\circ}C$ unless otherwise stated)

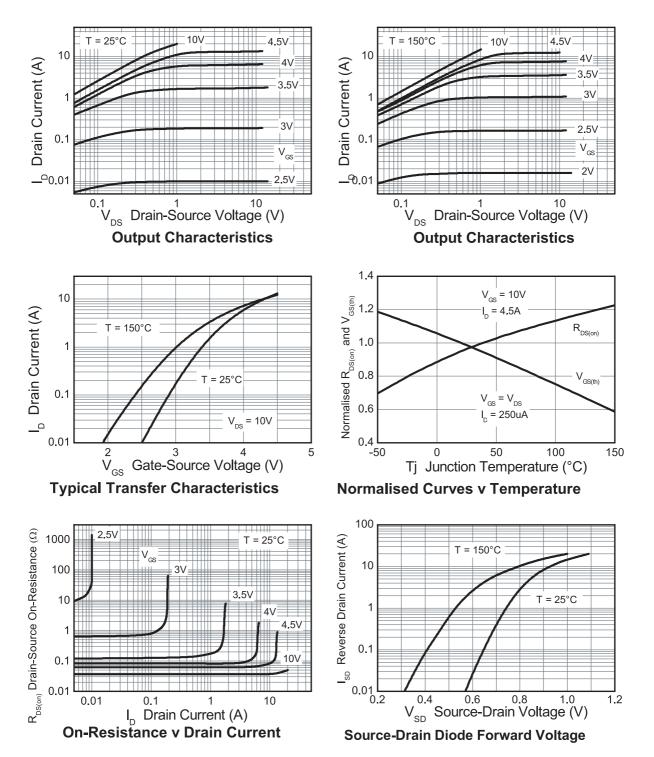
NOTES:

(*) Measured under pulsed conditions. Pulse width \leq 300 μ s; duty cycle \leq 2%.

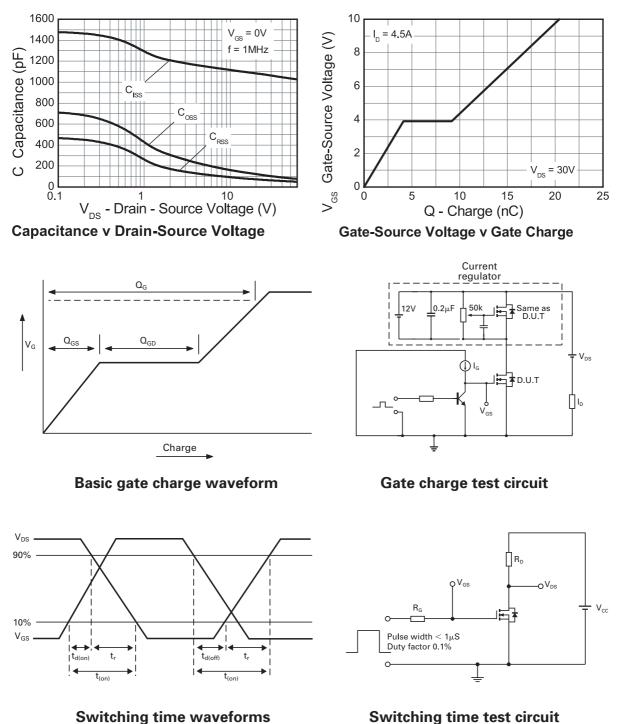
(†) Switching characteristics are independent of operating junction temperature.

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

Typical characteristics

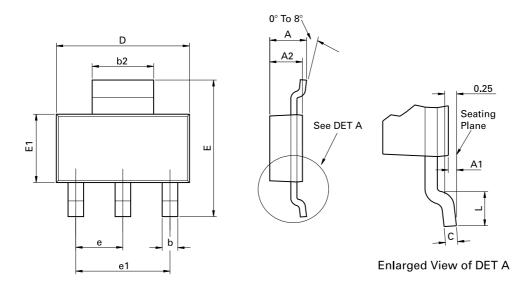


Typical characteristics



Switching time test circuit

Package outline - SOT223



Conforms to JEDEC TO-261 AA Issue B

| DIM | Millin | neters | Inc | hes | DIM | Millimeters | | Inches | |
|-----|--------|--------|--------|-------|-----|-------------|------|--------|-------|
| | Min | Max | Min | Max | | Min | Max | Min | Max |
| А | - | 1.80 | - | 0.071 | е | 2.30 | BSC | 0.090 | 5 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 |
| С | 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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