

ZXMN2A01F

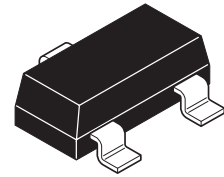
20V N-CANNEL ENHANCEMENT MODE MOSFET

SUMMARY

$V_{(BR)DSS} = 20V$; $R_{DS(ON)} = 0.12\Omega$; $I_D = 2.2A$

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.



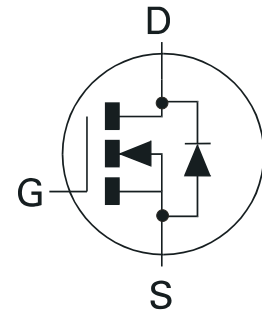
SOT23

FEATURES

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

APPLICATIONS

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



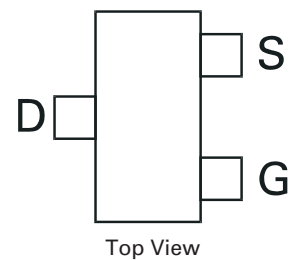
ORDERING INFORMATION

| DEVICE | REEL SIZE | TAPE WIDTH | QUANTITY PER REEL |
|-------------|-----------|------------|-------------------|
| ZXMN2A01FTA | 7" | 8mm | 3000 units |
| ZXMN2A01FTC | 13" | 8mm | 10000 units |

DEVICE MARKING

- 7N2

PINOUT



ZXMN2A01F

ABSOLUTE MAXIMUM RATINGS

| PARAMETER | SYMBOL | LIMIT | UNIT |
|---|----------------|-------------------|----------------------|
| Drain-Source Voltage | V_{DSS} | 20 | V |
| Gate-Source Voltage | V_{GS} | ± 12 | 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 | 2.2 1.7 1.9 | A |
| Pulsed Drain Current (c) | I_{DM} | 8 | A |
| Continuous Source Current (Body Diode) (b) | I_S | 1.29 | A |
| Pulsed Source Current (Body Diode) (c) | I_{SM} | 8 | A |
| Power Dissipation at $T_A=25^\circ C$ (a) Linear Derating Factor | P_D | 625 5 | mW mW/ $^\circ C$ |
| Power Dissipation at $T_A=25^\circ C$ (b) Linear Derating Factor | P_D | 806 6.4 | mW 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) | $R_{\theta JA}$ | 200 | $^\circ C/W$ |
| Junction to Ambient (b) | $R_{\theta JA}$ | 155 | $^\circ C/W$ |

NOTES:

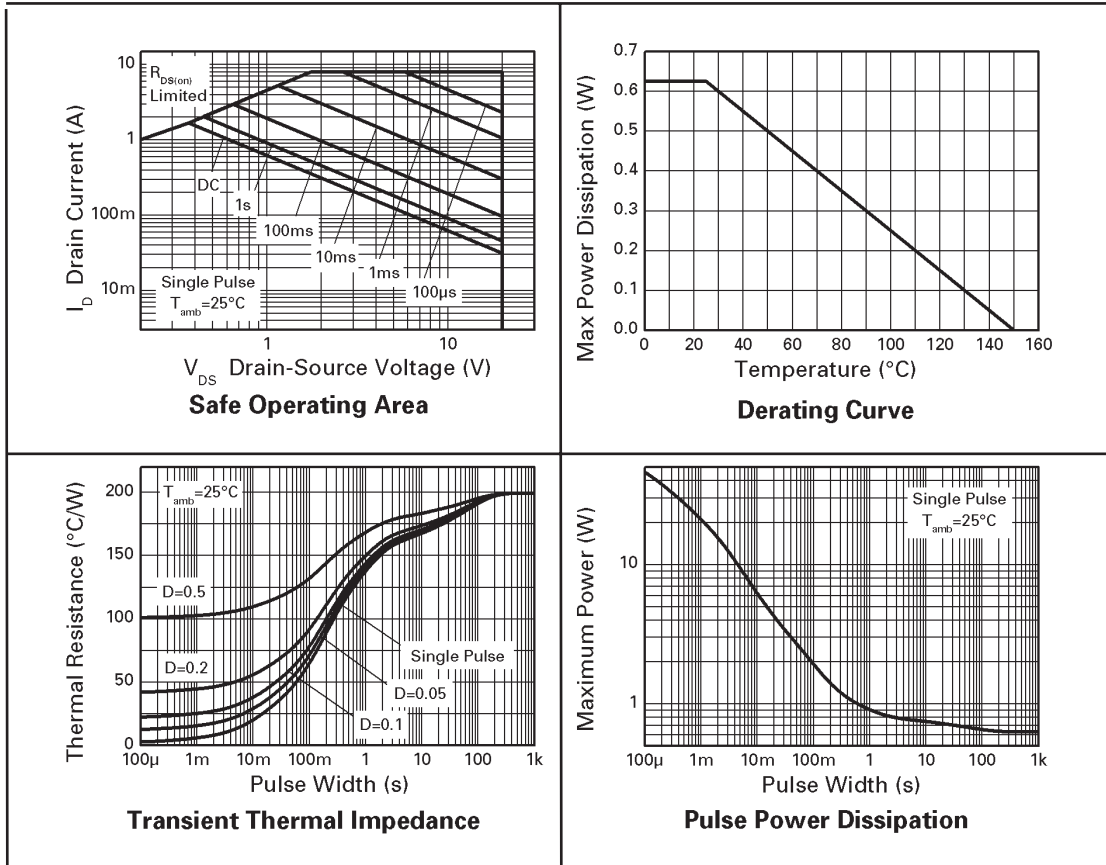
(a) For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions

(b) For a device surface mounted on FR4 PCB measured at $t \leq 5$ secs.

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

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CHARACTERISTICS



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

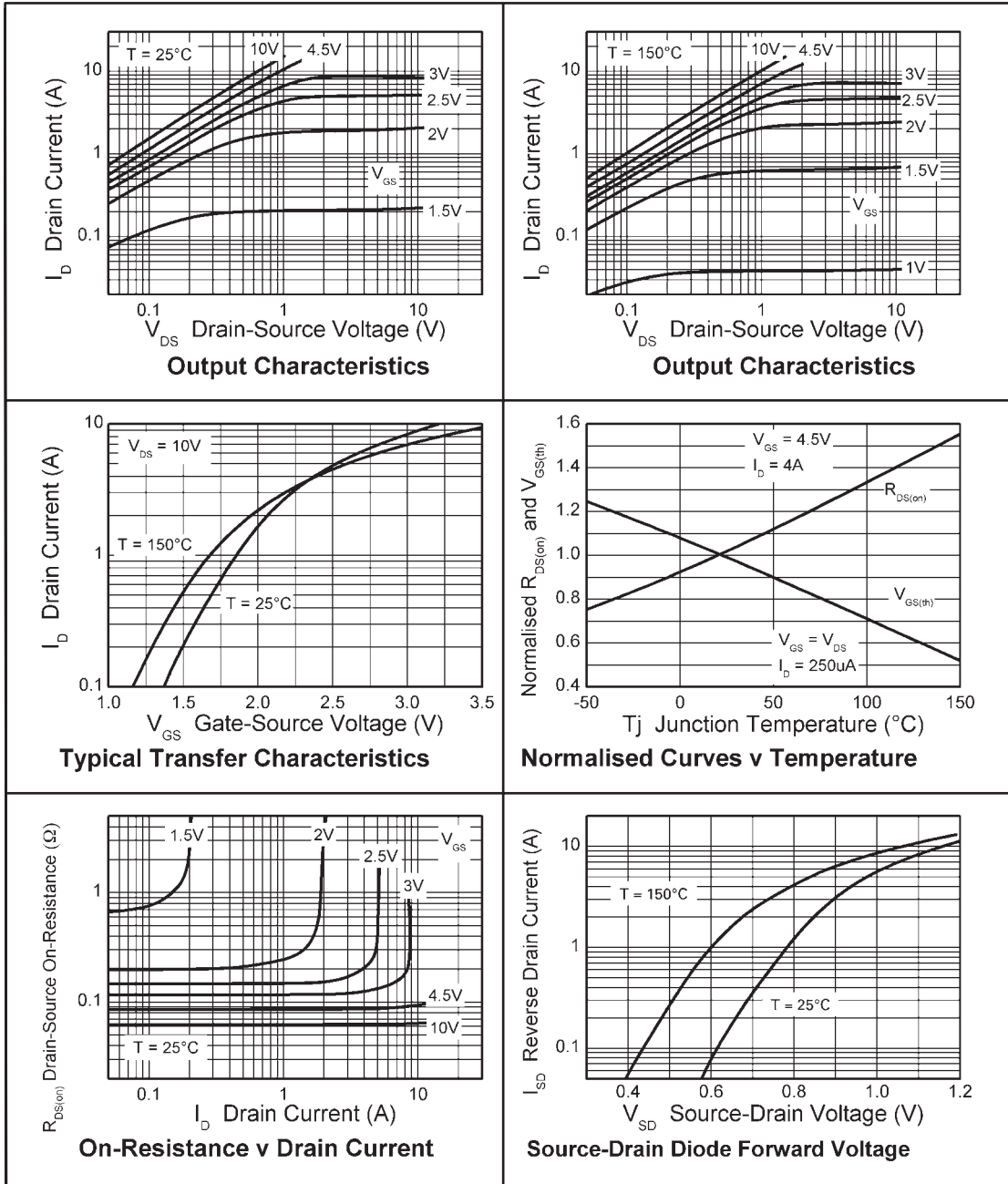
| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT | CONDITIONS. |
|---|---------------|------|------|---------------|----------------------|--|
| STATIC | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | 20 | | | V | $I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$ |
| Zero Gate Voltage Drain Current | 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) | $R_{DS(on)}$ | | | 0.12 0.225 | Ω Ω | $V_{GS}=4.5\text{V}$, $I_D=4\text{A}$ $V_{GS}=2.5\text{V}$, $I_D=1.5\text{A}$ |
| Forward Transconductance (1)(3) | g_{fs} | | 6.1 | | S | $V_{DS}=10\text{V}$, $I_D=4\text{A}$ |
| DYNAMIC (3) | | | | | | |
| Input Capacitance | C_{iss} | | 303 | | pF | $V_{DS}=15\text{V}$, $V_{GS}=0\text{V}$, $f=1\text{MHz}$ |
| Output Capacitance | C_{oss} | | 59 | | pF | |
| Reverse Transfer Capacitance | C_{rss} | | 30 | | pF | |
| SWITCHING (2) (3) | | | | | | |
| Turn-On Delay Time | $t_{d(on)}$ | | 2.49 | | ns | $V_{DD}=10\text{V}$, $I_D=4\text{A}$ $R_G=6.0\Omega$, $V_{GS}=5\text{V}$ |
| Rise Time | t_r | | 5.21 | | ns | |
| Turn-Off Delay Time | $t_{d(off)}$ | | 7.47 | | ns | |
| Fall Time | t_f | | 4.62 | | ns | |
| Total Gate Charge | Q_g | | 3.0 | | nC | $V_{DS}=10\text{V}$, $V_{GS}=4.5\text{V}$, $I_D=4\text{A}$ |
| Gate-Source Charge | Q_{gs} | | 0.8 | | nC | |
| Gate-Drain Charge | Q_{gd} | | 1.0 | | nC | |
| SOURCE-DRAIN DIODE | | | | | | |
| Diode Forward Voltage (1) | V_{SD} | | 0.85 | 0.95 | V | $T_J=25^\circ\text{C}$, $I_S=3.2\text{A}$, $V_{GS}=0\text{V}$ |
| Reverse Recovery Time (3) | t_{rr} | | 23 | | ns | $T_J=25^\circ\text{C}$, $I_F=4\text{A}$, $di/dt=100\text{A}/\mu\text{s}$ |
| Reverse Recovery Charge (3) | Q_{rr} | | 5.65 | | 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.

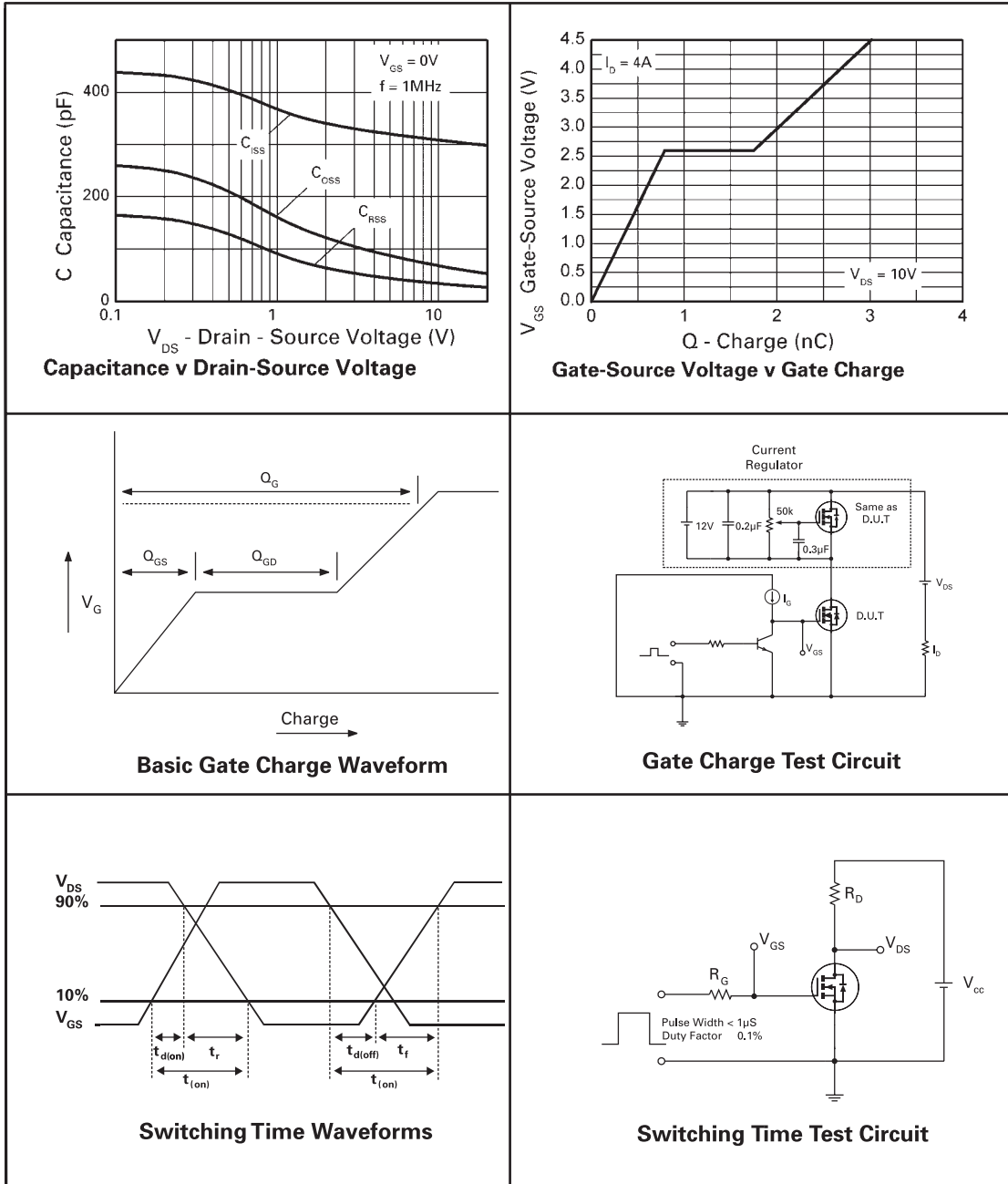
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TYPICAL CHARACTERISTICS



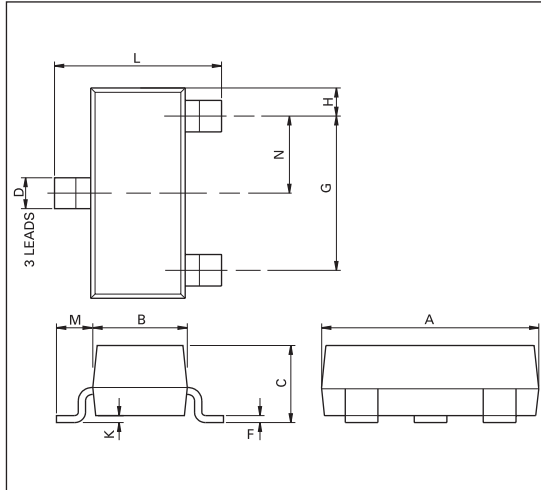
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TYPICAL CHARACTERISTICS

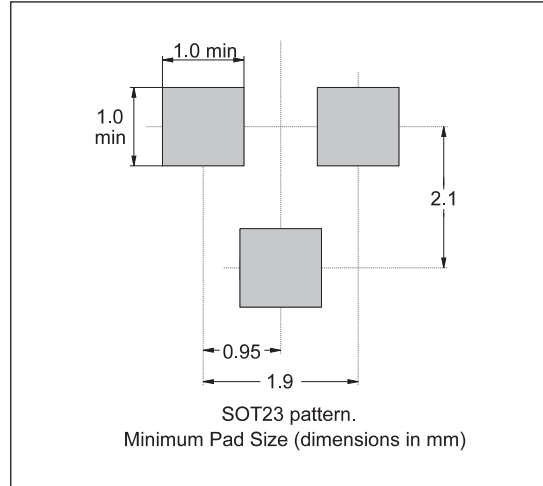


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PACKAGE OUTLINE



PAD LAYOUT



CONTROLLING DIMENSIONS IN MILLIMETERS APPROX CONVERSIONS INCHES

PACKAGE DIMENSIONS

| DIM | Millimeters | | Inches | | DIM | Millimeters | | Inches | |
|-----|-------------|------|-----------|--------|-----|-------------|------|------------|--------|
| | Min | Max | Min | Max | | Min | Max | Max | Max |
| A | 2.67 | 3.05 | 0.105 | 0.120 | H | 0.33 | 0.51 | 0.013 | 0.020 |
| B | 1.20 | 1.40 | 0.047 | 0.055 | K | 0.01 | 0.10 | 0.0004 | 0.004 |
| C | — | 1.10 | — | 0.043 | L | 2.10 | 2.50 | 0.083 | 0.0985 |
| D | 0.37 | 0.53 | 0.015 | 0.021 | M | 0.45 | 0.64 | 0.018 | 0.025 |
| F | 0.085 | 0.15 | 0.0034 | 0.0059 | N | 0.95 NOM | | 0.0375 NOM | |
| G | 1.90 NOM | | 0.075 NOM | | — | — | | — | |

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