

ZXMP3A16N8

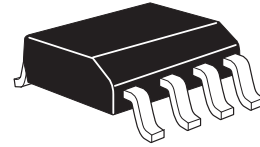
30V P-CHANNEL ENHANCEMENT MODE MOSFET

SUMMARY

$V_{(BR)DSS} = -30V$; $R_{DS(ON)} = 0.040\Omega$; $I_D = -6.7A$

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.



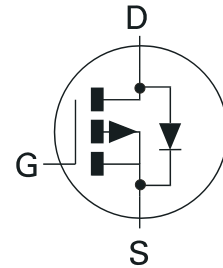
SO8

FEATURES

- Low on-resistance
- Fast switching speed
- Low threshold
- Low gate drive
- Low profile SOIC package

APPLICATIONS

- Disconnect switches
- Motor control



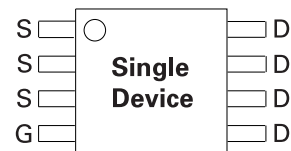
ORDERING INFORMATION

| DEVICE | REEL SIZE | TAPE WIDTH | QUANTITY PER REEL |
|--------------|-----------|------------|-------------------|
| ZXMP3A16N8TA | 7" | 12mm | 500 units |
| ZXMP3A16N8TC | 13" | 12mm | 2500 units |

DEVICE MARKING

- ZXMP
3A16

PINOUT



Top View

ZXMP3A16N8

ABSOLUTE MAXIMUM RATINGS

| PARAMETER | SYMBOL | LIMIT | UNIT |
|---|---------------|----------------------|---------------------|
| Drain-Source Voltage | V_{DSS} | -30 | V |
| Gate Source Voltage | V_{GS} | ± 20 | V |
| Continuous Drain Current $V_{GS}=-10V$; $T_A=25^\circ C$ (b) $V_{GS}=-10V$; $T_A=70^\circ C$ (b) $V_{GS}=-10V$; $T_A=25^\circ C$ (a) | I_D | -6.7 -5.4 -5.6 | A |
| Pulsed Drain Current (c) | I_{DM} | -26 | A |
| Continuous Source Current (Body Diode) (b) | I_S | -3.2 | A |
| Pulsed Source Current (Body Diode) (c) | I_{SM} | -26 | A |
| Power Dissipation at $T_A=25^\circ C$ (a) Linear Derating Factor | P_D | 1.9 15.2 | W mW/ $^\circ C$ |
| Power Dissipation at $T_A=25^\circ C$ (b) Linear Derating Factor | P_D | 2.8 22.4 | 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) | $R_{\theta JA}$ | 65 | $^\circ C/W$ |
| Junction to Ambient (b) | $R_{\theta JA}$ | 45 | $^\circ C/W$ |

NOTES

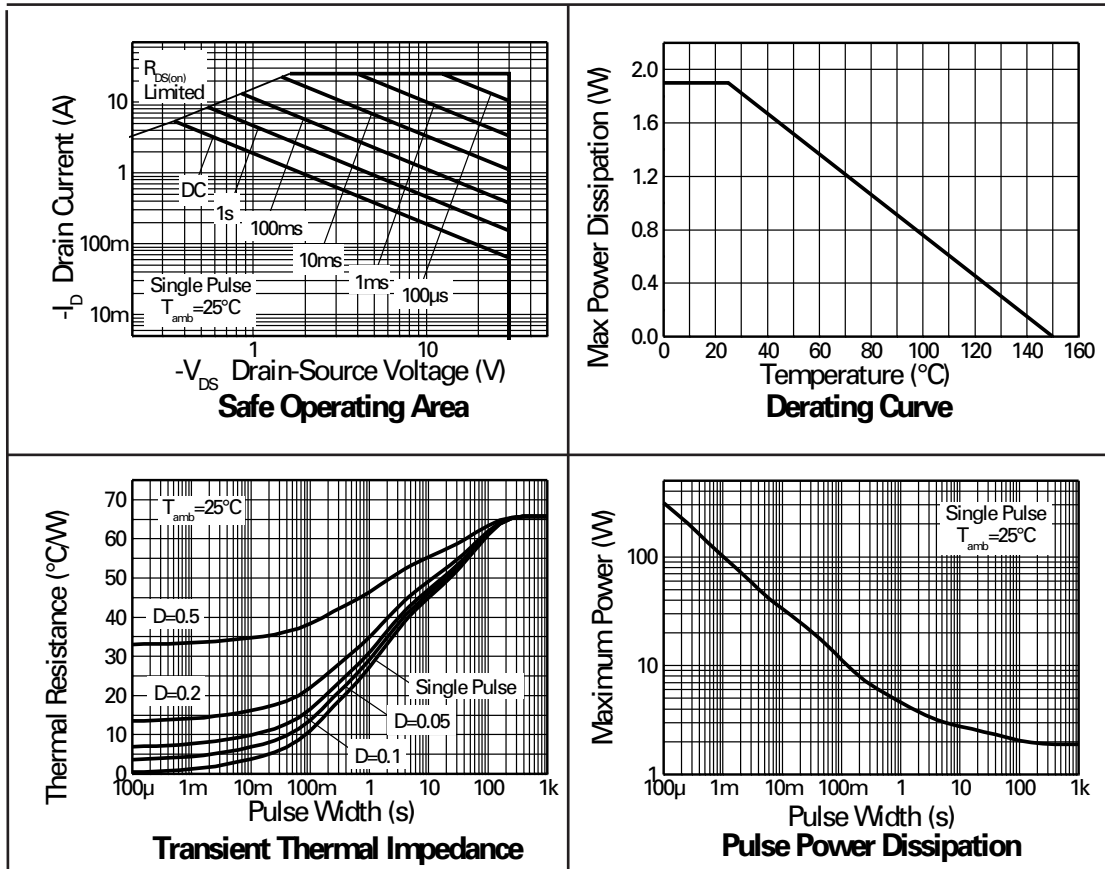
(a) For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions

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

(c) Repetitive rating 25mm x 25mm FR4 PCB, $D = 0.05$, pulse width $10 \mu s$ - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance graph.

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CHARACTERISTICS



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

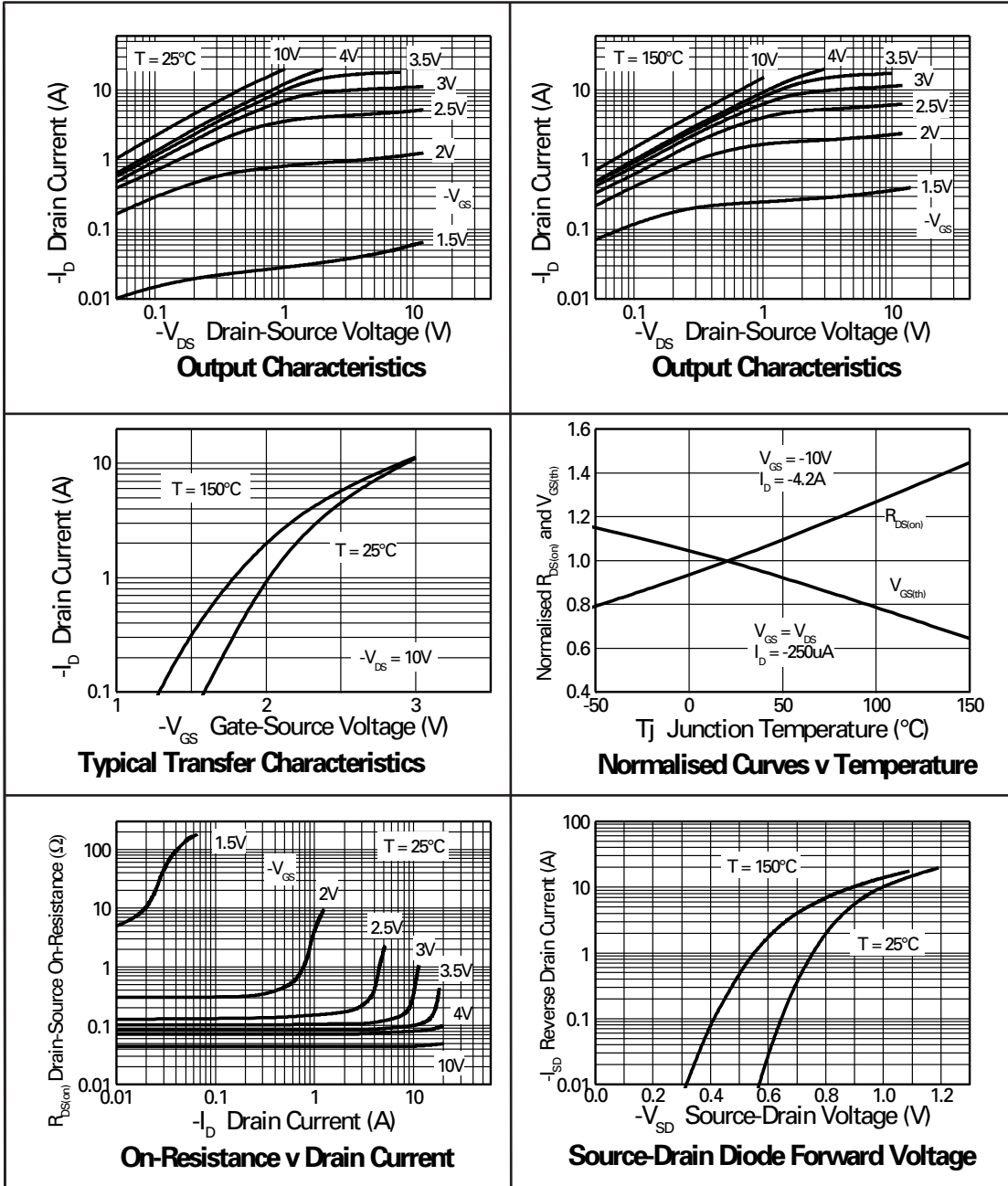
| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT | CONDITIONS |
|---|---------------|------|-------|----------------|----------------------|---|
| STATIC | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | -30 | | | V | $I_D = -250\mu\text{A}, V_{GS} = 0\text{V}$ |
| Zero Gate Voltage Drain Current | I_{DSS} | | | -1.0 | μA | $V_{DS} = -30\text{V}, V_{GS} = 0\text{V}$ |
| Gate-Body Leakage | I_{GSS} | | | 100 | nA | $V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$ |
| Gate-Source Threshold Voltage | $V_{GS(th)}$ | -1.0 | | | V | $I_D = -250\mu\text{A}, V_{DS} = V_{GS}$ |
| Static Drain-Source On-State Resistance (1) | $R_{DS(on)}$ | | | 0.040 0.070 | Ω Ω | $V_{GS} = -10\text{V}, I_D = -4.2\text{A}$ $V_{GS} = -4.5\text{V}, I_D = -3.4\text{A}$ |
| Forward Transconductance (1)(3) | g_{fs} | | 9.2 | | S | $V_{DS} = -15\text{V}, I_D = -4.2\text{A}$ |
| DYNAMIC (3) | | | | | | |
| Input Capacitance | C_{iss} | | 1022 | | pF | $V_{DS} = -15\text{V}, V_{GS} = 0\text{V},$ $f = 1\text{MHz}$ |
| Output Capacitance | C_{oss} | | 267 | | pF | |
| Reverse Transfer Capacitance | C_{rss} | | 229 | | pF | |
| SWITCHING(2) (3) | | | | | | |
| Turn-On Delay Time | $t_{d(on)}$ | | 3.8 | | ns | $V_{DD} = -15\text{V}, I_D = -1\text{A}$ $R_G = 6.0\Omega, V_{GS} = -10\text{V}$ |
| Rise Time | t_r | | 6.5 | | ns | |
| Turn-Off Delay Time | $t_{d(off)}$ | | 37.1 | | ns | |
| Fall Time | t_f | | 21.4 | | ns | |
| Gate Charge | Q_g | | 17.2 | | nC | $V_{DS} = -15\text{V}, V_{GS} = -5\text{V},$ $I_D = -4.2\text{A}$ |
| Total Gate Charge | Q_g | | 29.6 | | nC | $V_{DS} = -15\text{V}, V_{GS} = -10\text{V},$ $I_D = -4.2\text{A}$ |
| Gate-Source Charge | Q_{gs} | | 2.8 | | nC | |
| Gate-Drain Charge | Q_{gd} | | 8.6 | | nC | |
| SOURCE-DRAIN DIODE | | | | | | |
| Diode Forward Voltage (1) | V_{SD} | | -0.85 | -0.95 | V | $T_J = 25^{\circ}\text{C}, I_S = -3.6\text{A},$ $V_{GS} = 0\text{V}$ |
| Reverse Recovery Time (3) | t_{rr} | | 21.7 | | ns | $T_J = 25^{\circ}\text{C}, I_F = -2\text{A},$ $di/dt = 100\text{A}/\mu\text{s}$ |
| Reverse Recovery Charge (3) | Q_{rr} | | 16.1 | | nC | |

NOTES

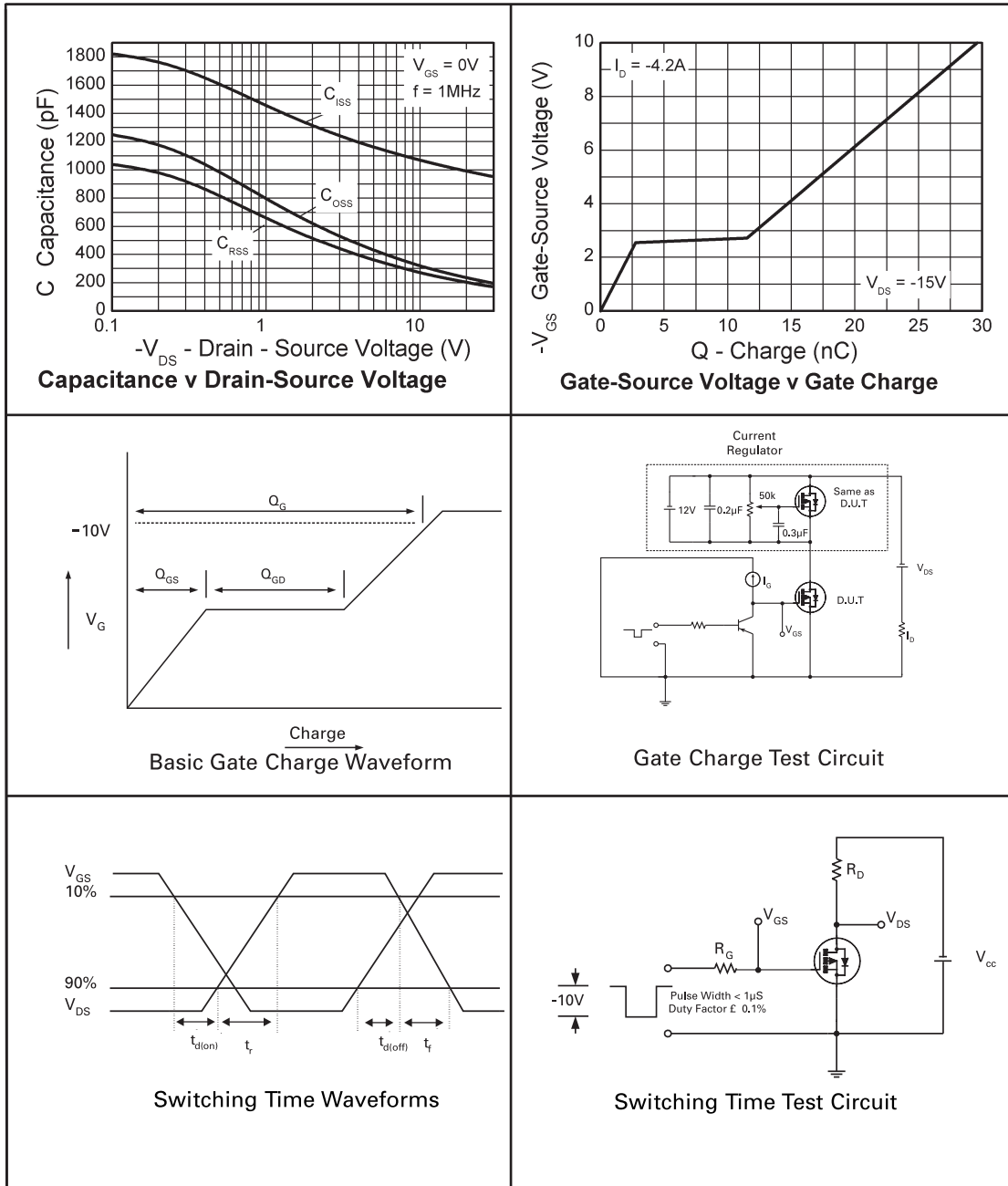
- (1) Measured under pulsed conditions. Width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$.
 (2) Switching characteristics are independent of operating junction temperature.
 (3) For design aid only, not subject to production testing.

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CHARACTERISTICS



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"Obsolete"Production has been discontinued

Datasheet status key:

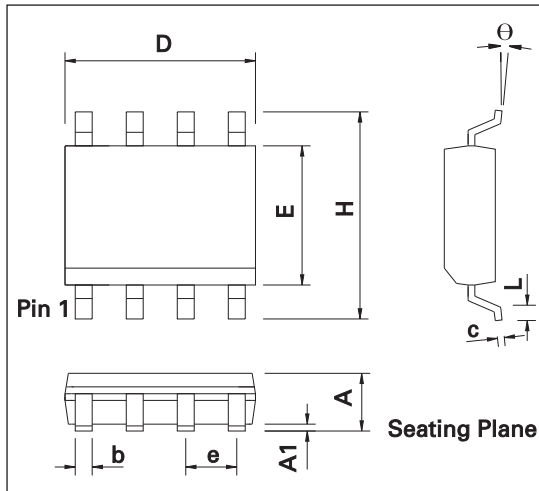
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PACKAGE OUTLINE



CONTROLLING DIMENSIONS ARE IN INCHES
APPROX IN MILLIMETERS

PACKAGE DIMENSIONS

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

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ISSUE 2 - MAY 2007