

# ZXMP6A18DN8

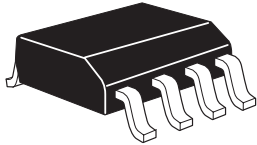
## DUAL P-CHANNEL 60V ENHANCEMENT MODE MOSFET

### SUMMARY

$V_{(BR)DSS} = -60V$ ;  $R_{DS(ON)} = 0.055\Omega$ ;  $I_D = -4.8A$

### 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.



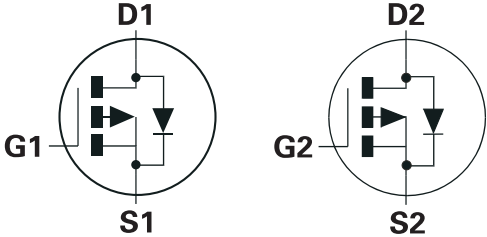
SO8

### FEATURES

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

### APPLICATIONS

- Motor drive
- Disconnect switches



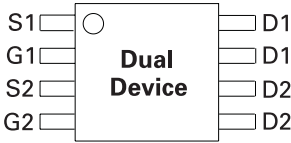
### ORDERING INFORMATION

| DEVICE        | REEL | TAPE WIDTH | QUANTITY PER REEL |
|---------------|------|------------|-------------------|
| ZXMP6A18DN8TA | 7"   | 12mm       | 500 units         |
| ZXMP6A18DN8TC | 13"  | 12mm       | 2500 units        |

### DEVICE MARKING

ZXMP  
6A18

### PINOUT



Top view

# ZXMP6A18DN8

## ABSOLUTE MAXIMUM RATINGS

| PARAMETER   | SYMBOL         | LIMIT                | UNIT                |
|---|----------------|----------------------|---------------------|
| Drain-Source Voltage  | $V_{DSS}$      | -60                  | V                   |
| Gate-Source Voltage   | $V_{GS}$       | $\pm 20$             | V                   |
| Continuous Drain Current @ $V_{GS}=10V$ ; $T_A=25^\circ C$ (b)(d)<br>@ $V_{GS}=10V$ ; $T_A=70^\circ C$ (b)(d)<br>@ $V_{GS}=10V$ ; $T_A=25^\circ C$ (a)(d) | $I_D$          | -4.8<br>-3.8<br>-3.7 | A<br>A<br>A         |
| Pulsed Drain Current (c)  | $I_{DM}$       | -23                  | A                   |
| Continuous Source Current (Body Diode)(b)   | $I_S$          | -3.3                 | A                   |
| Pulsed Source Current (Body Diode)(c)   | $I_{SM}$       | -23                  | A                   |
| Power Dissipation at $T_A=25^\circ C$ (a)(d)<br>Linear Derating Factor  | $P_D$          | 1.25<br>10           | W<br>mW/ $^\circ C$ |
| Power Dissipation at $T_A=25^\circ C$ (a)(e)<br>Linear Derating Factor  | $P_D$          | 1.8<br>14            | W<br>mW/ $^\circ C$ |
| Power Dissipation at $T_A=25^\circ C$ (b)(d)<br>Linear Derating Factor  | $P_D$          | 2.1<br>17            | W<br>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)(d) | $R_{\theta JA}$ | 100   | $^\circ C/W$ |
| Junction to Ambient (b)(e) | $R_{\theta JA}$ | 69    | $^\circ C/W$ |
| Junction to Ambient (b)(d) | $R_{\theta JA}$ | 58    | $^\circ C/W$ |

### Notes

(a) For a dual device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with a high coverage of single sided 1oz copper in still air conditions.

(b) For a dual device surface mounted on FR4 PCB measured at  $t \leq 10$  sec.

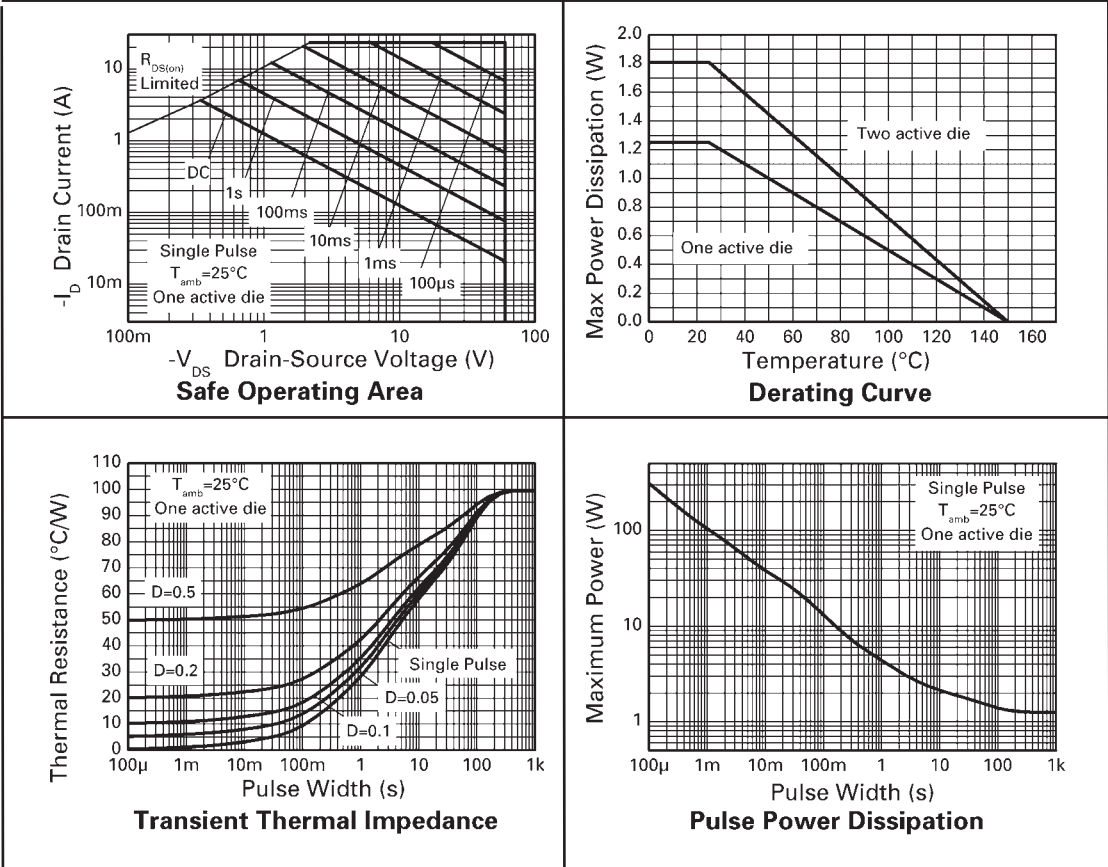
(c) Repetitive rating 25mm x 25mm FR4 PCB,  $D=0.02$ , pulse width=300 $\mu s$  - pulse width limited by maximum junction temperature.

(d) For a dual device with one active die.

(e) For a device with two active die running at equal power.

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## CHARACTERISTICS



# ZXMP6A18DN8

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

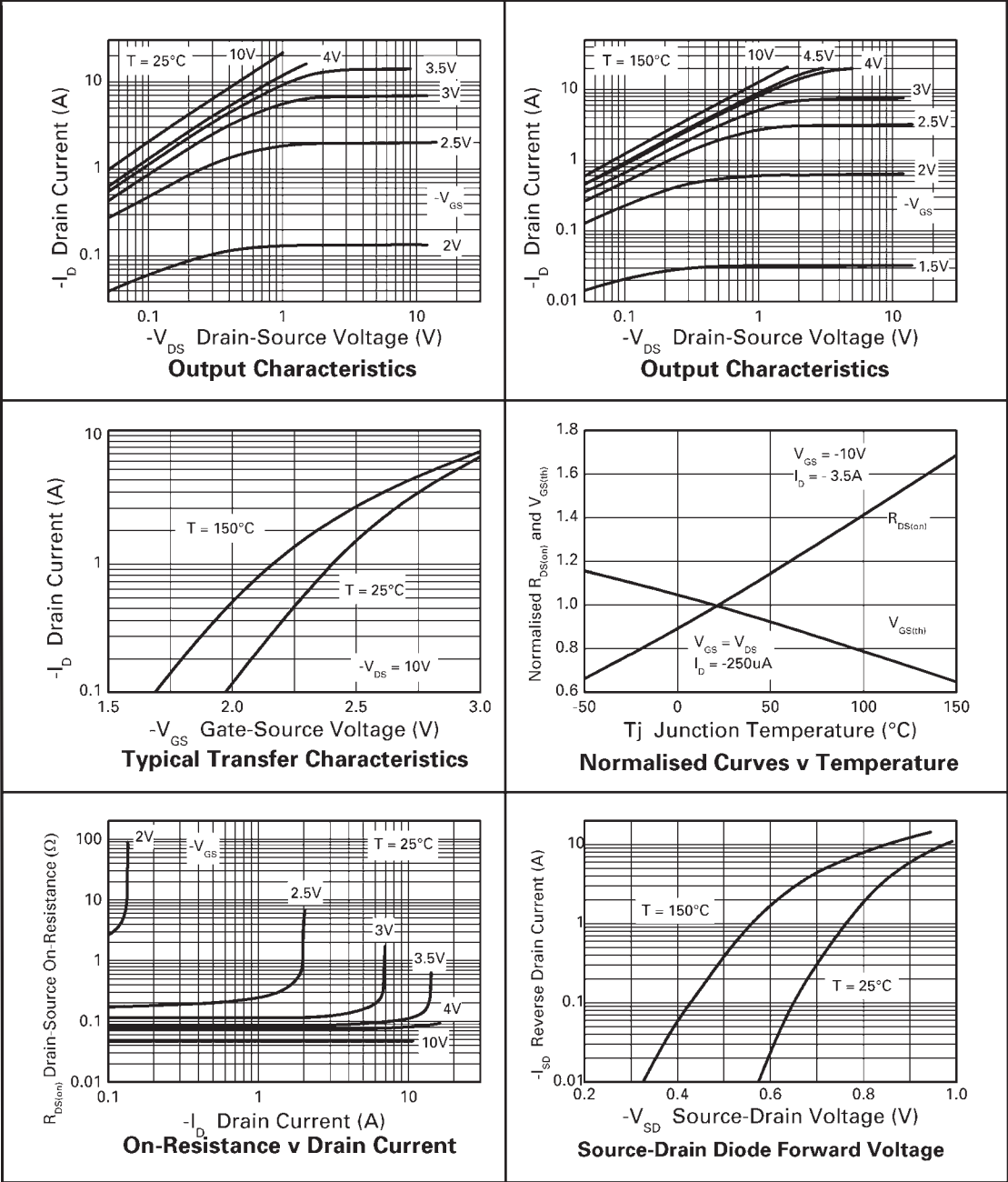
| PARAMETER  | SYMBOL        | MIN. | TYP.  | MAX.           | UNIT          | CONDITIONS  |
|--|---------------|------|-------|----------------|---------------|---|
| <b>STATIC</b>  |               |      |       |                |               |   |
| Drain-Source Breakdown Voltage                         | $V_{(BR)DSS}$ | -60  |       |                | V             | $I_D = -250\mu\text{A}$ , $V_{GS} = 0\text{V}$  |
| Zero Gate Voltage Drain Current                        | $I_{DSS}$     |      |       | -1.0           | $\mu\text{A}$ | $V_{DS} = -60\text{V}$ , $V_{GS} = 0\text{V}$   |
| Gate-Body Leakage                                      | $I_{GSS}$     |      |       | 100            | nA            | $V_{GS} = \pm 20\text{V}$ , $V_{DS} = 0\text{V}$  |
| Gate-Source Threshold Voltage                          | $V_{GS(th)}$  | -1.0 |       |                | V             | $I_D = -250\mu\text{A}$ ,<br>$V_{DS} = V_{GS}$  |
| Static Drain-Source On-State Resistance <sup>(1)</sup> | $R_{DS(on)}$  |      |       | 0.055<br>0.080 | $\Omega$      | $V_{GS} = -10\text{V}$ , $I_D = -3.5\text{A}$<br>$V_{GS} = -4.5\text{V}$ , $I_D = -2.9\text{A}$ |
| Forward Transconductance <sup>(1)(3)</sup>             | $g_{fs}$      |      | 8.7   |                | S             | $V_{DS} = -15\text{V}$ , $I_D = -3.5\text{A}$   |
| <b>DYNAMIC <sup>(3)</sup></b>                          |               |      |       |                |               |   |
| Input Capacitance                                      | $C_{iss}$     |      | 1580  |                | pF            | $V_{DS} = -30\text{V}$ , $V_{GS} = 0\text{V}$ ,<br>$f = 1\text{MHz}$                            |
| Output Capacitance                                     | $C_{oss}$     |      | 160   |                | pF            |   |
| Reverse Transfer Capacitance                           | $C_{rss}$     |      | 140   |                | pF            |   |
| <b>SWITCHING <sup>(2) (3)</sup></b>                    |               |      |       |                |               |   |
| Turn-On Delay Time                                     | $t_{d(on)}$   |      | 4.6   |                | ns            | $V_{DD} = -30\text{V}$ , $I_D = -1\text{A}$<br>$R_G \approx 6.0\Omega$ , $V_{GS} = -10\text{V}$ |
| Rise Time  | $t_r$         |      | 5.8   |                | ns            |   |
| Turn-Off Delay Time                                    | $t_{d(off)}$  |      | 55    |                | ns            |   |
| Fall Time  | $t_f$         |      | 23    |                | ns            |   |
| Gate Charge  | $Q_g$         |      | 23    |                | nC            | $V_{DS} = -30\text{V}$ , $V_{GS} = -5\text{V}$ ,<br>$I_D = -3.5\text{A}$                        |
| Total Gate Charge                                      | $Q_g$         |      | 44    |                | nC            | $V_{DS} = -30\text{V}$ , $V_{GS} = -10\text{V}$ ,<br>$I_D = -3.5\text{A}$                       |
| Gate-Source Charge                                     | $Q_{gs}$      |      | 3.9   |                | nC            |   |
| Gate-Drain Charge                                      | $Q_{gd}$      |      | 9.8   |                | nC            |   |
| <b>SOURCE-DRAIN DIODE</b>                              |               |      |       |                |               |   |
| Diode Forward Voltage <sup>(1)</sup>                   | $V_{SD}$      |      | -0.85 | -0.95          | V             | $T_J = 25^{\circ}\text{C}$ , $I_S = -4.2\text{A}$ ,<br>$V_{GS} = 0\text{V}$                     |
| Reverse Recovery Time <sup>(3)</sup>                   | $t_{rr}$      |      | 37    |                | ns            | $T_J = 25^{\circ}\text{C}$ , $I_F = -2.1\text{A}$ ,<br>$di/dt = 100\text{A}/\mu\text{s}$        |
| Reverse Recovery Charge <sup>(3)</sup>                 | $Q_{rr}$      |      | 56    |                | 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.

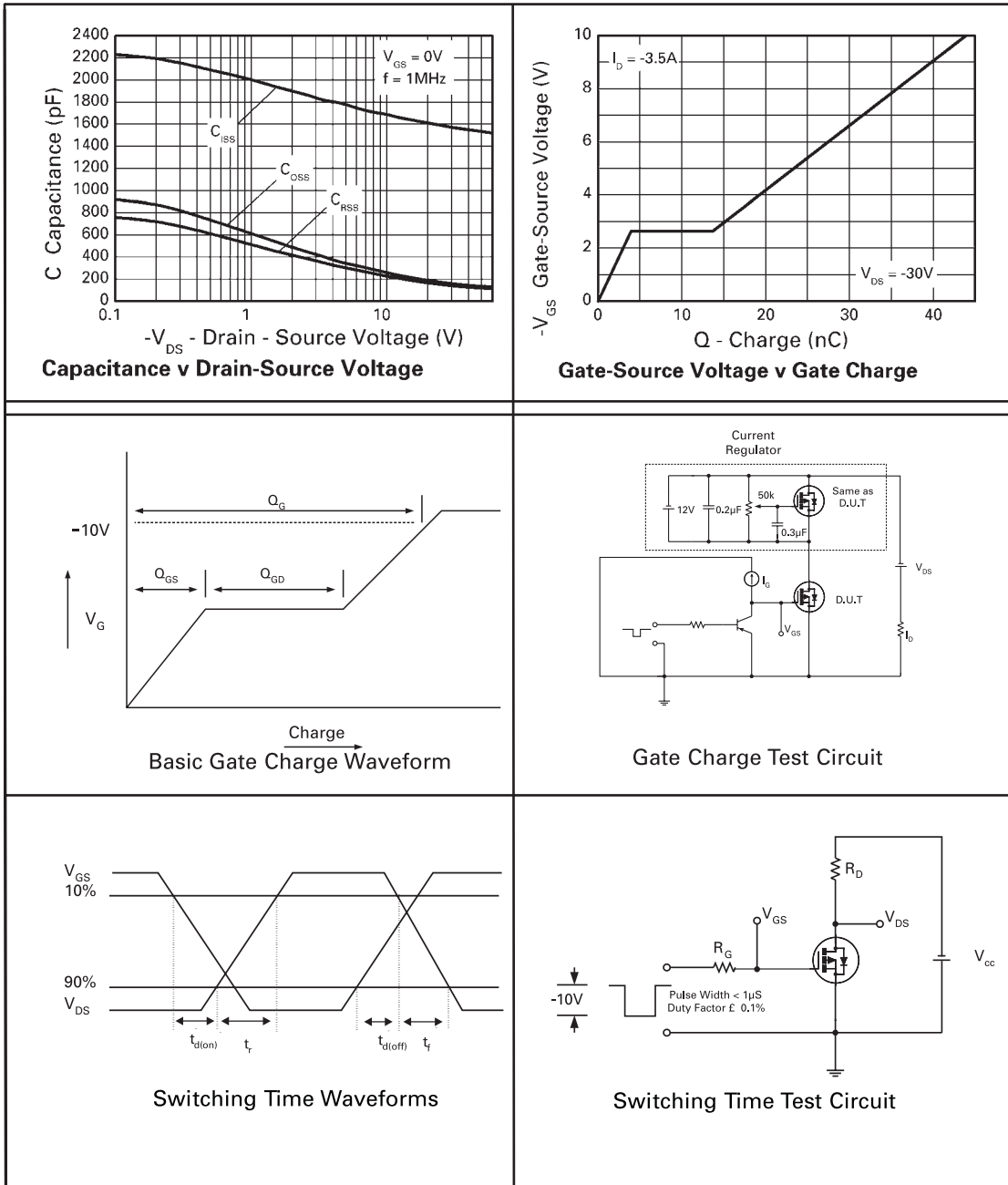
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## TYPICAL CHARACTERISTICS



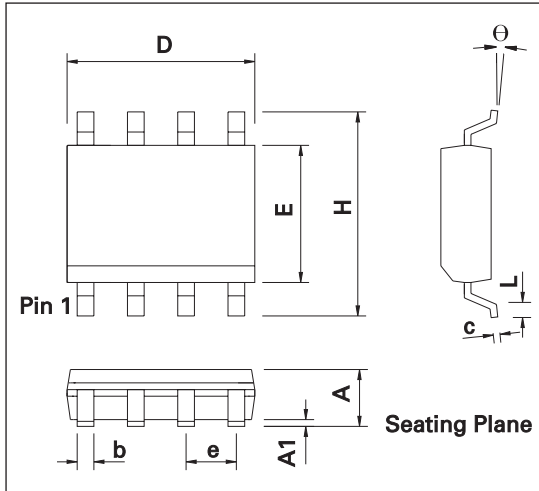
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## TYPICAL CHARACTERISTICS



# ZXMP6A18DN8

## 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 |

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