

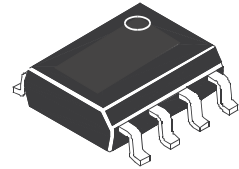
## DUAL 20V N-CANNEL ENHANCEMENT MODE MOSFET

### SUMMARY

$V_{(BR)DSS}=20V$ ;  $R_{DS(ON)}=0.025V$ ;  $I_D=6.6A$

### DESCRIPTION

This new generation of high density MOSFETs from Zetex utilises 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.



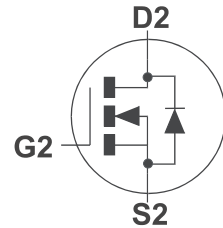
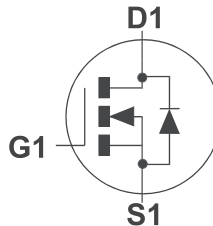
**SO8**

### FEATURES

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

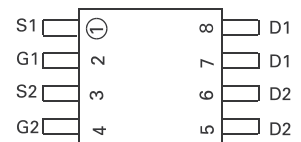
### APPLICATIONS

- DC - DC Converters
- Power Management Functions
- Disconnect switches
- Motor control



### ORDERING INFORMATION

| DEVICE        | REEL SIZE (inches) | TAPE WIDTH (mm) | QUANTITY PER REEL |
|---------------|--------------------|-----------------|-------------------|
| ZXMD65N02N8TA | 13                 | 12mm embossed   | 1000 units        |



Top View

### DEVICE MARKING

- ZXMD  
65N02

# ZXMD65N02N8

## ABSOLUTE MAXIMUM RATINGS.

| PARAMETER                                                                                                         | SYMBOL    | LIMIT      | UNIT                |
|-------------------------------------------------------------------------------------------------------------------|-----------|------------|---------------------|
| Drain-Source Voltage                                                                                              | $V_{DSS}$ | 20         | V                   |
| Gate- Source Voltage                                                                                              | $V_{GS}$  | $\pm 12$   | V                   |
| Continuous Drain Current ( $V_{GS}=4.5V$ ; $T_A=25^\circ C$ )(b)(d)<br>( $V_{GS}=4.5V$ ; $T_A=70^\circ C$ )(b)(d) | $I_D$     | 6.6<br>5.3 | A                   |
| Pulsed Drain Current (c)(d)                                                                                       | $I_{DM}$  | 26         | A                   |
| Continuous Source Current (Body Diode)(b)(d)                                                                      | $I_S$     | 2.5        | A                   |
| Pulsed Source Current (Body Diode)(c)(d)                                                                          | $I_{SM}$  | 26         | A                   |
| Power Dissipation at $T_A=25^\circ C$ (a)(d)<br>Linear Derating Factor                                            | $P_D$     | -<br>-     | W<br>mW/ $^\circ C$ |
| Power Dissipation at $T_A=25^\circ C$ (a)(e)<br>Linear Derating Factor                                            | $P_D$     | -<br>-     | W<br>mW/ $^\circ C$ |
| Power Dissipation at $T_A=25^\circ C$ (b)(d)<br>Linear Derating Factor                                            | $P_D$     | 2.0<br>16  | W<br>mW/ $^\circ C$ |

## THERMAL RESISTANCE

| PARAMETER                  | SYMBOL          | VALUE | UNIT         |
|----------------------------|-----------------|-------|--------------|
| Junction to Ambient (a)(d) | $R_{\theta JA}$ | -     | $^\circ C/W$ |
| Junction to Ambient (b)(d) | $R_{\theta JA}$ | 62.5  | $^\circ C/W$ |
| Junction to Ambient (a)(e) | $R_{\theta JA}$ | -     | $^\circ C/W$ |

### 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  $t \leq 10$  secs.
- (c) Repetitive rating - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance graph.
- (d) For device with one active die.
- (e) For device with two active die running at equal power.

# ZXMD65N02N8

## 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              | $V_{(BR)DSS}$ | 20   |      |                | V             | $I_D=250\mu\text{A}, V_{GS}=0\text{V}$                                                         |
| Zero Gate Voltage Drain Current             | $I_{DSS}$     |      |      | 1              | $\mu\text{A}$ | $V_{DS}=16\text{V}, V_{GS}=0\text{V}$                                                          |
| 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) | $R_{DS(on)}$  |      |      | 0.025<br>0.060 | $\Omega$      | $V_{GS}=4.5\text{V}, I_D=6\text{A}$<br>$V_{GS}=2.5\text{V}, I_D=5\text{A}$                     |
| Forward Transconductance (3)                | $g_{fs}$      |      | 20   |                | S             | $V_{DS}=15\text{V}, I_D=6\text{A}$                                                             |
| <b>DYNAMIC (3)</b>                          |               |      |      |                |               |                                                                                                |
| Input Capacitance                           | $C_{iss}$     |      | -    |                | pF            | $V_{DS}=15\text{V}, V_{GS}=0\text{V},$<br>$f=1\text{MHz}$                                      |
| Output Capacitance                          | $C_{oss}$     |      | -    |                | pF            |                                                                                                |
| Reverse Transfer Capacitance                | $C_{rss}$     |      | -    |                | pF            |                                                                                                |
| <b>SWITCHING(2) (3)</b>                     |               |      |      |                |               |                                                                                                |
| Turn-On Delay Time                          | $t_{d(on)}$   |      | -    |                | ns            | $V_{DD}=10\text{V}, I_D=6\text{A}$<br>$R_G=6.0\Omega, R_D=10\Omega$<br>(Refer to test circuit) |
| Rise Time                                   | $t_r$         |      | -    |                | ns            |                                                                                                |
| Turn-Off Delay Time                         | $t_{d(off)}$  |      | -    |                | ns            |                                                                                                |
| Fall Time                                   | $t_f$         |      | -    |                | ns            |                                                                                                |
| Total Gate Charge                           | $Q_g$         |      |      | -              | nC            | $V_{DS}=10\text{V}, V_{GS}=4.5\text{V}$<br>$I_D=6\text{A}$<br>(Refer to test circuit)          |
| Gate-Source Charge                          | $Q_{gs}$      |      |      | -              | nC            |                                                                                                |
| Gate Drain Charge                           | $Q_{gd}$      |      |      | -              | nC            |                                                                                                |
| <b>SOURCE-DRAIN DIODE</b>                   |               |      |      |                |               |                                                                                                |
| Diode Forward Voltage (1)                   | $V_{SD}$      |      |      | 0.95           | V             | $T_j=25^{\circ}\text{C}, I_S=6\text{A},$<br>$V_{GS}=0\text{V}$                                 |
| Reverse Recovery Time (3)                   | $t_{rr}$      |      | -    |                | ns            | $T_j=25^{\circ}\text{C}, I_F=6\text{A},$<br>$di/dt=100\text{A}/\mu\text{s}$                    |
| Reverse Recovery Charge(3)                  | $Q_{rr}$      |      | -    |                | nC            |                                                                                                |

(1) Measured under pulsed conditions. Width=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.

# ZXMD65N02N8



# ZETEX

Zetex plc.

Fields New Road, Chadderton, Oldham, OL9-8NP, United Kingdom.

Telephone: (44)161 622 4422 (Sales), (44)161 622 4444 (General Enquiries)

Fax: (44)161 622 4420

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Zetex GmbH  
Streitfeldstraße 19  
D-81673 München  
Germany  
Telefon: (49) 89 45 49 49 0  
Fax: (49) 89 45 49 49 49

Zetex Inc.  
47 Mall Drive, Unit 4  
Commack NY 11725  
USA  
Telephone: (631) 543-7100  
Fax: (631) 864-7630

Zetex (Asia) Ltd.  
3701-04 Metroplaza, Tower 1  
Hing Fong Road,  
Kwai Fong, Hong Kong  
Telephone:(852) 26100 611  
Fax: (852) 24250 494

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