

## ZXMN10B08E6

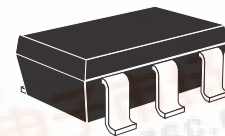
### 100V N-CHANNEL ENHANCEMENT MODE MOSFET

#### SUMMARY

$V_{(BR)DSS} = 100V$ ;  $R_{DS(ON)} = 0.230\Omega$   $I_D = 1.9A$

#### 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.



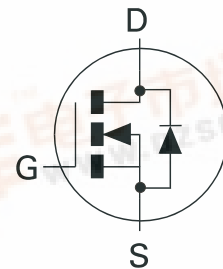
SOT23-6

#### FEATURES

- Low on-resistance
- Fast switching speed
- Low threshold
- Low gate drive
- SOT23-6 package

#### APPLICATIONS

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



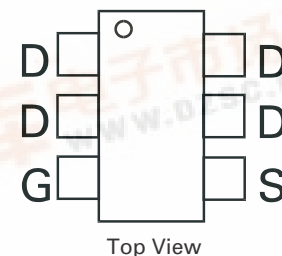
#### ORDERING INFORMATION

| DEVICE        | REEL SIZE | TAPE WIDTH | QUANTITY PER REEL |
|---------------|-----------|------------|-------------------|
| ZXMN10B08E6TA | 7"        | 8mm        | 3000 units        |
| ZXMN10B08E6TC | 13"       | 8mm        | 10000 units       |

#### DEVICE MARKING

- 10B8

#### PINOUT



# ZXMN10B08E6

## ABSOLUTE MAXIMUM RATINGS.

| PARAMETER                                                                                                                                  | SYMBOL         | LIMIT             | UNIT                |
|--------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------------|---------------------|
| Drain-Source Voltage                                                                                                                       | $V_{DSS}$      | 100               | V                   |
| Gate Source Voltage                                                                                                                        | $V_{GS}$       | $\pm 20$          | V                   |
| Continuous Drain Current $V_{GS}=10V$ ; $T_A=25^\circ C$ (b)<br>$V_{GS}=10V$ ; $T_A=70^\circ C$ (b)<br>$V_{GS}=10V$ ; $T_A=25^\circ C$ (a) | $I_D$          | 1.9<br>1.5<br>1.6 | A                   |
| Pulsed Drain Current (c)                                                                                                                   | $I_{DM}$       | 9                 | A                   |
| Continuous Source Current (Body Diode) (b)                                                                                                 | $I_S$          | 2.5               | A                   |
| Pulsed Source Current (Body Diode) (c)                                                                                                     | $I_{SM}$       | 9                 | A                   |
| Power Dissipation at $T_A=25^\circ C$ (a)<br>Linear Derating Factor                                                                        | $P_D$          | 1.1<br>8.8        | W<br>mW/ $^\circ C$ |
| Power Dissipation at $T_A=25^\circ C$ (b)<br>Linear Derating Factor                                                                        | $P_D$          | 1.7<br>13.6       | 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) | $R_{\theta JA}$ | 113   | $^\circ C/W$ |
| Junction to Ambient (b) | $R_{\theta JA}$ | 73    | $^\circ C/W$ |

### NOTES

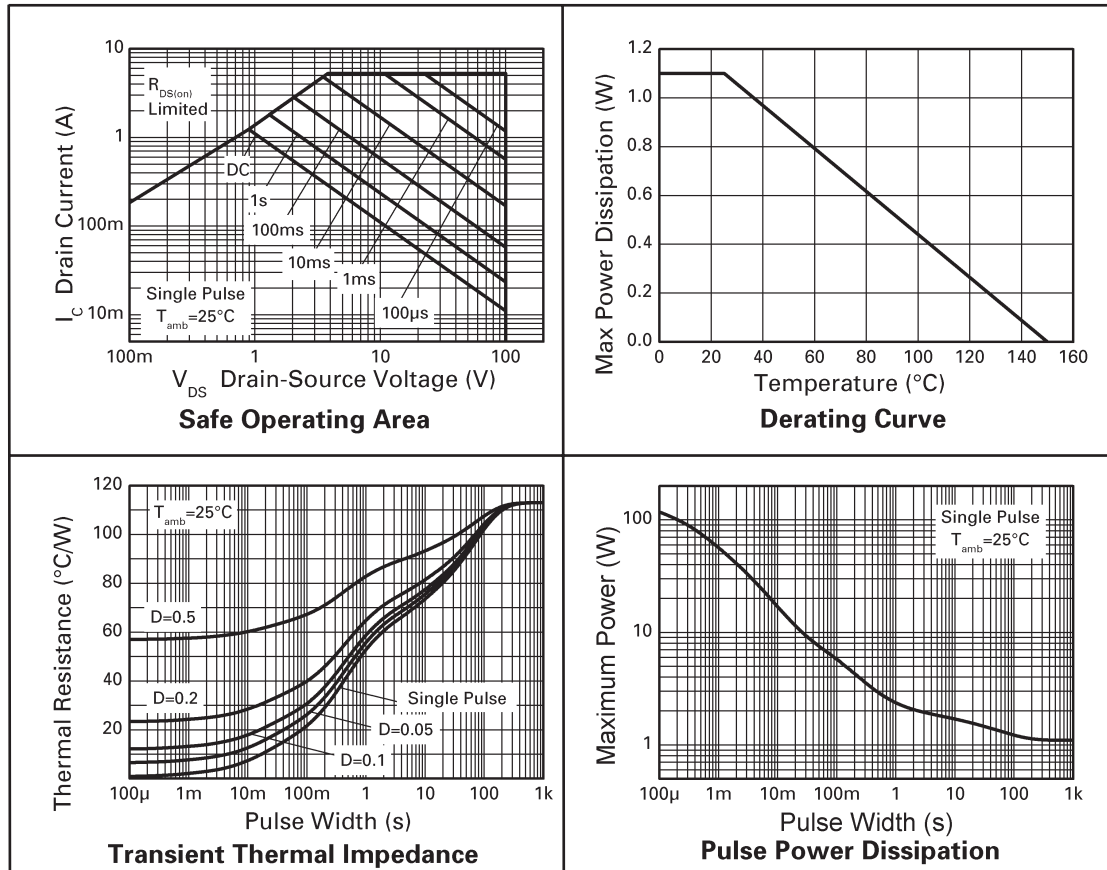
(a) For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions

(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 $\mu s$  - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance graph

# ZXMN10B08E6

## CHARACTERISTICS



# ZXMN10B08E6

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

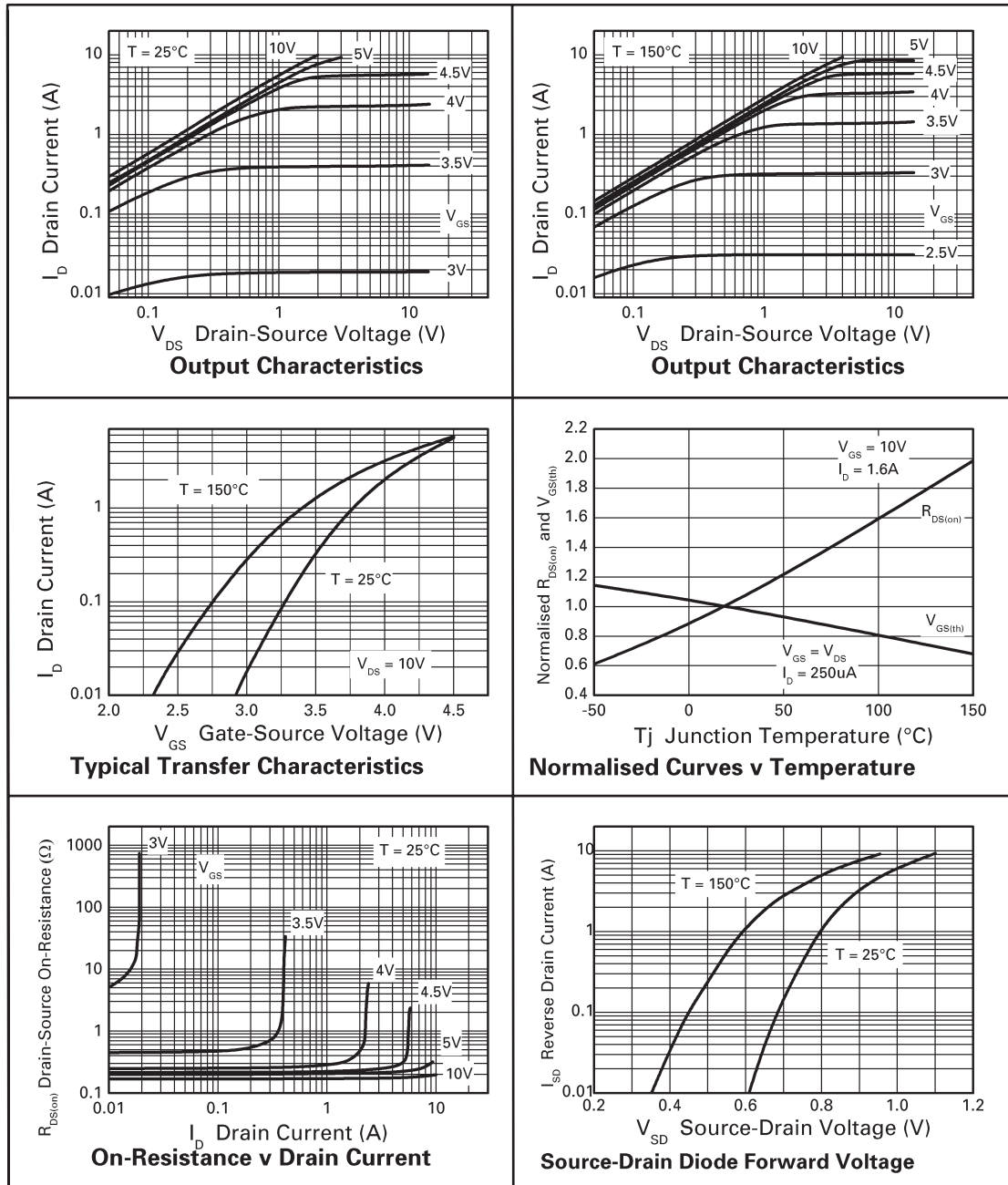
| PARAMETER                                   | SYMBOL               | MIN. | TYP. | MAX.                    | UNIT   | CONDITIONS.                                                                                                                              |
|---------------------------------------------|----------------------|------|------|-------------------------|--------|------------------------------------------------------------------------------------------------------------------------------------------|
| STATIC                                      |                      |      |      |                         |        |                                                                                                                                          |
| Drain-Source Breakdown Voltage              | V <sub>(BR)DSS</sub> | 100  |      |                         | V      | I <sub>D</sub> =250μA, V <sub>GS</sub> =0V                                                                                               |
| Zero Gate Voltage Drain Current             | I <sub>DSS</sub>     |      |      | 0.5                     | μA     | V <sub>DS</sub> =100V, V <sub>GS</sub> =0V                                                                                               |
| Gate-Body Leakage                           | I <sub>GSS</sub>     |      |      | 100                     | nA     | V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V                                                                                               |
| Gate-Source Threshold Voltage               | V <sub>GS(th)</sub>  | 1.0  |      | 3.0                     | V      | I <sub>D</sub> =250μA, V <sub>DS</sub> = V <sub>GS</sub>                                                                                 |
| Static Drain-Source On-State Resistance (1) | R <sub>DS(on)</sub>  |      |      | 0.230<br>0.300<br>0.500 | Ω<br>Ω | V <sub>GS</sub> =10V, I <sub>D</sub> =1.6A<br>V <sub>GS</sub> =4.5V, I <sub>D</sub> =1.4A<br>V <sub>GS</sub> =4.3V, I <sub>D</sub> =1.1A |
| Forward Transconductance (1)(3)             | g <sub>fs</sub>      |      | 4.8  |                         | S      | V <sub>DS</sub> =15V,I <sub>D</sub> =1.6A                                                                                                |
| DYNAMIC (3)                                 |                      |      |      |                         |        |                                                                                                                                          |
| Input Capacitance                           | C <sub>iss</sub>     |      | 497  |                         | pF     | V <sub>DS</sub> =50 V, V <sub>GS</sub> =0V, f=1MHz                                                                                       |
| Output Capacitance                          | C <sub>Oss</sub>     |      | 29   |                         | pF     |                                                                                                                                          |
| Reverse Transfer Capacitance                | C <sub>rss</sub>     |      | 18   |                         | pF     |                                                                                                                                          |
| SWITCHING(2) (3)                            |                      |      |      |                         |        |                                                                                                                                          |
| Turn-On Delay Time                          | t <sub>d(on)</sub>   |      | 2.9  |                         | ns     | V <sub>DD</sub> =50V, I <sub>D</sub> =1.0A<br>R <sub>G</sub> =6.0Ω, V <sub>GS</sub> =10V                                                 |
| Rise Time                                   | t <sub>r</sub>       |      | 2.1  |                         | ns     |                                                                                                                                          |
| Turn-Off Delay Time                         | t <sub>d(off)</sub>  |      | 12.1 |                         | ns     |                                                                                                                                          |
| Fall Time                                   | t <sub>f</sub>       |      | 5.0  |                         | ns     |                                                                                                                                          |
| Gate Charge                                 | Q <sub>g</sub>       |      | 5.0  |                         | nC     | V <sub>DS</sub> =50V,V <sub>GS</sub> =5V, I <sub>D</sub> =1.6A                                                                           |
| Total Gate Charge                           | Q <sub>g</sub>       |      | 9.2  |                         | nC     | V <sub>DS</sub> =50V,V <sub>GS</sub> =10V, I <sub>D</sub> =1.6A                                                                          |
| Gate-Source Charge                          | Q <sub>gs</sub>      |      | 1.7  |                         | nC     |                                                                                                                                          |
| Gate-Drain Charge                           | Q <sub>gd</sub>      |      | 2.5  |                         | nC     |                                                                                                                                          |
| SOURCE-DRAIN DIODE                          |                      |      |      |                         |        |                                                                                                                                          |
| Diode Forward Voltage (1)                   | V <sub>SD</sub>      |      | 0.85 | 0.95                    | V      | T <sub>J</sub> =25°C, I <sub>S</sub> =2.0A, V <sub>GS</sub> =0V                                                                          |
| Reverse Recovery Time (3)                   | t <sub>rr</sub>      |      | 32.0 |                         | ns     | T <sub>J</sub> =25°C, I <sub>F</sub> =1.7A, di/dt= 100A/μs                                                                               |
| Reverse Recovery Charge (3)                 | Q <sub>rr</sub>      |      | 40.0 |                         | nC     |                                                                                                                                          |

## NOTES

- (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.

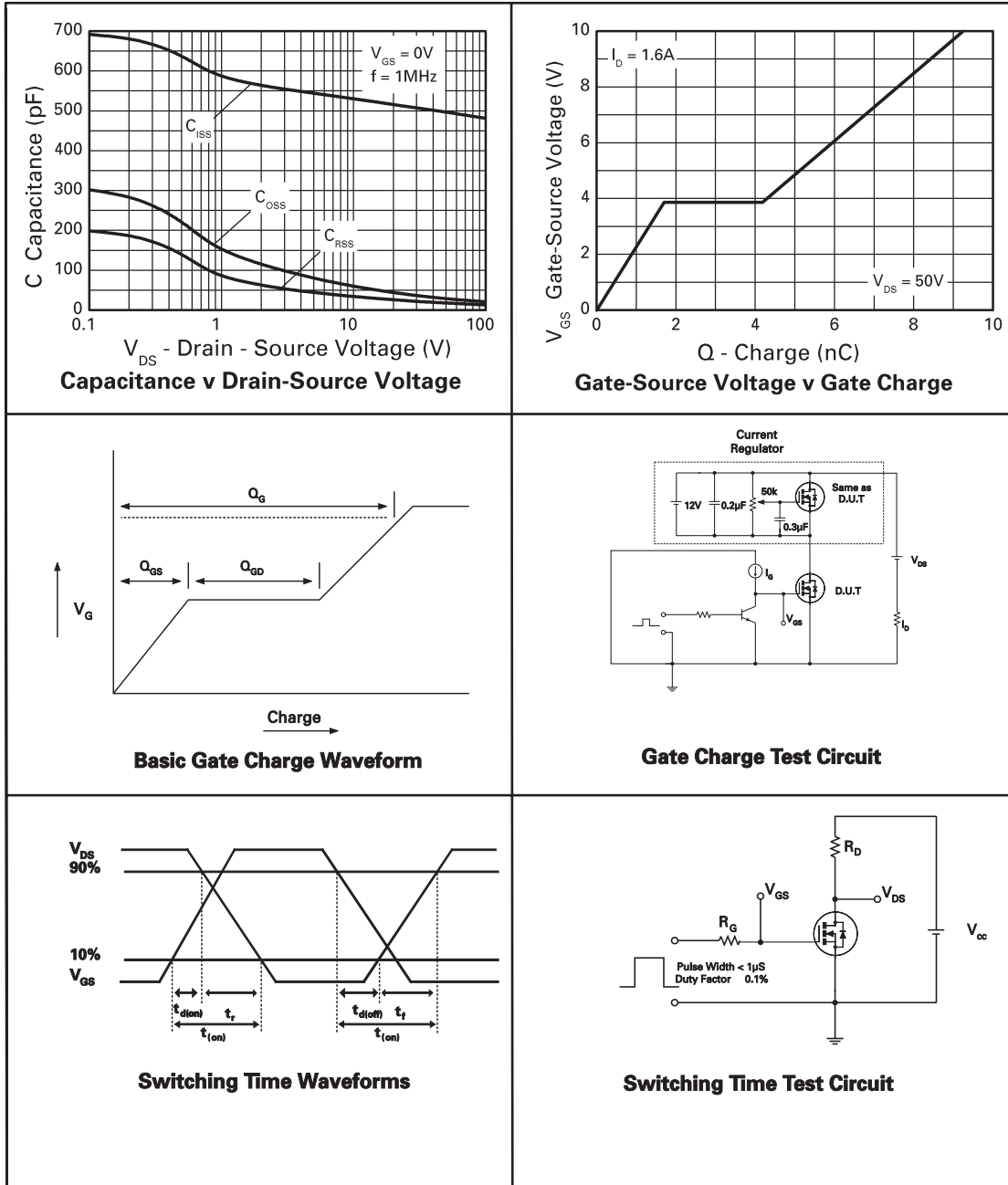
# ZXMN10B08E6

## TYPICAL CHARACTERISTICS



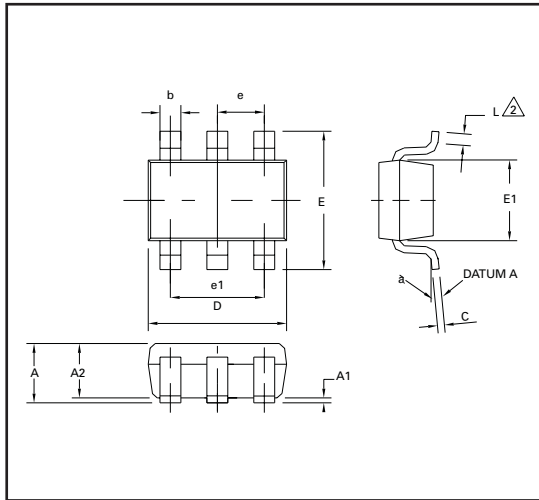
# ZXMN10B08E6

## TYPICAL CHARACTERISTICS

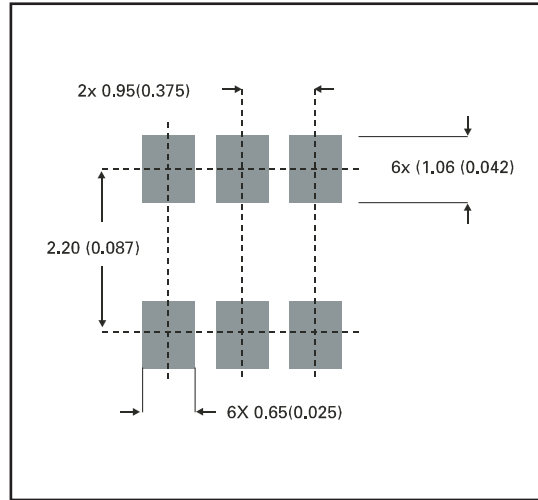


# ZXMN10B08E6

## PACKAGE OUTLINE



## PAD LAYOUT DETAILS



CONTROLLING DIMENSIONS IN MILLIMETRES APPROX CONVERSIONS INCHES.

## PACKAGE DIMENSIONS

| DIM | Millimetres |      | Inches |       | DIM | Millimetres |      | Inches    |       |
|-----|-------------|------|--------|-------|-----|-------------|------|-----------|-------|
|     | Min         | Max  | Min    | Max   |     | Min         | Max  | Min       | Max   |
| A   | 0.90        | 1.45 | 0.35   | 0.057 | E   | 2.60        | 3.00 | 0.102     | 0.118 |
| A1  | 0.00        | 0.15 | 0      | 0.006 | E1  | 1.50        | 1.75 | 0.059     | 0.069 |
| A2  | 0.90        | 1.30 | 0.035  | 0.051 | L   | 0.10        | 0.60 | 0.004     | 0.002 |
| b   | 0.35        | 0.50 | 0.014  | 0.019 | e   | 0.95 REF    |      | 0.037 REF |       |
| C   | 0.09        | 0.20 | 0.0035 | 0.008 | e1  | 1.90 REF    |      | 0.074 REF |       |
| D   | 2.80        | 3.00 | 0.110  | 0.118 | L   | 0°          | 10°  | 0°        | 10°   |

© Zetex plc 2003

| Europe                                                                                                                                                   | Americas                                                                                                                                             | Asia Pacific                                                                                                                                                             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Zetex plc<br>Fields New Road<br>Chadderton<br>Oldham, OL9 8NP<br>United Kingdom<br>Telephone (44) 161 622 4444<br>Fax: (44) 161 622 4446<br>hq@zetex.com | Zetex GmbH<br>Streitfeldstraße 19<br>D-81673 München<br>Germany<br>Telefon: (49) 89 45 49 49 0<br>Fax: (49) 89 45 49 49 49<br>europe.sales@zetex.com | Zetex (Asia) Ltd<br>3701-04 Metroplaza Tower 1<br>Hing Fong Road<br>Kwai Fong<br>Hong Kong<br>Telephone: (852) 26100 611<br>Fax: (852) 24250 494<br>asia.sales@zetex.com |

These offices are supported by agents and distributors in major countries world-wide.

This publication is issued to provide outline information only which (unless agreed by the Company in writing) may not be used, applied or reproduced for any purpose or form part of any order or contract or be regarded as a representation relating to the products or services concerned. The Company reserves the right to alter without notice the specification, design, price or conditions of supply of any product or service.

For the latest product information, log on to [www.zetex.com](http://www.zetex.com)

PROVISIONAL ISSUE B - MAY 2003

**ZETEX**  
SEMICONDUCTORS