

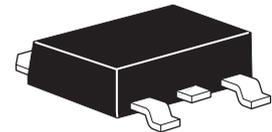
ZXMP7A17K

70V P-channel enhancement mode MOSFET

Summary

$V_{DSS}=70V : R_{DS(on)}=0.16\Omega$

$I_D=5.7A$

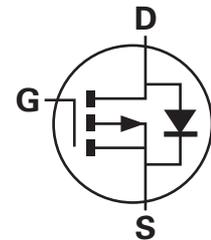


Description

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.

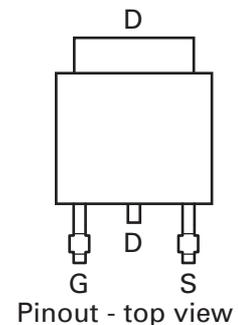
Features

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



Applications

- DC-DC converters
- Power management functions
- Disconnect switches
- Motor control
- Class D audio output stages



Ordering information

| Device | Reel size (inches) | Tape width (mm) | Quantity per reel |
|-------------|--------------------|-----------------|-------------------|
| ZXMP7A17KTC | 13 | 16 | 2,500 |

Device marking

ZXMP
7A17

Absolute maximum ratings

| Parameter | Symbol | Limit | Unit |
|---|----------------|----------------------|------------|
| Drain-source voltage | V_{DSS} | -70 | V |
| Gate-source voltage | V_{GS} | ± 20 | V |
| Continuous drain current @ $V_{GS}=10V$; $T_A=25^\circ C$ ^(b) @ $V_{GS}=10V$; $T_A=25^\circ C$ ^(b) @ $V_{GS}=10V$; $T_A=25^\circ C$ ^(a) | I_D | -5.7 -4.6 -3.8 | A |
| Pulsed drain current ^(c) | I_{DM} | -17.7 | A |
| Continuous source current (body diode) ^(b) | I_S | -9.2 | A |
| Pulsed source current (body diode) ^(c) | I_{SM} | -17.7 | A |
| Power dissipation at $T_A = 25^\circ C$ ^(a) Linear derating factor | P_D | 4.17 33.3 | W mW/°C |
| Power dissipation at $T_A = 25^\circ C$ ^(b) Linear derating factor | P_D | 9.25 74 | W mW/°C |
| Power dissipation at $T_A = 25^\circ C$ ^(d) Linear derating factor | P_D | 2.11 16.8 | W mW/°C |
| Operating and storage temperature range | T_j, T_{stg} | -55 to +150 | °C |

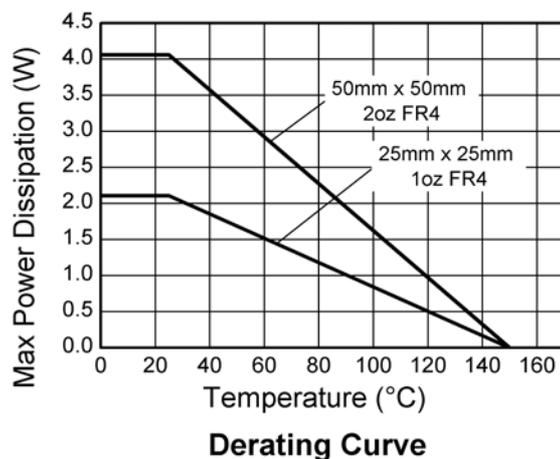
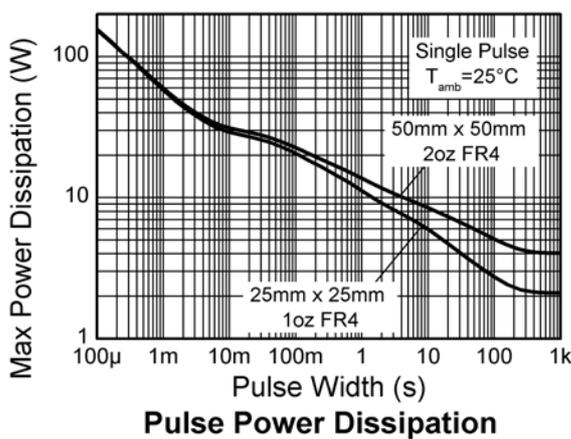
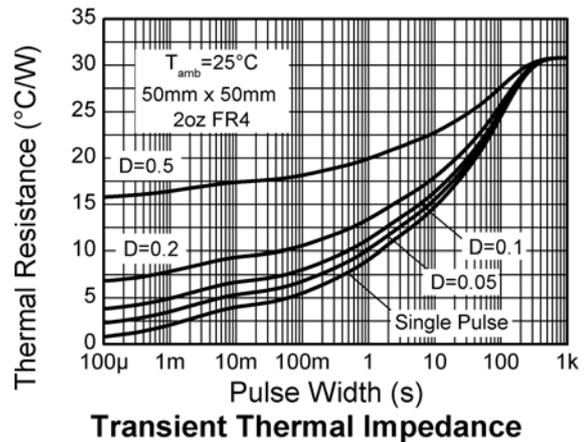
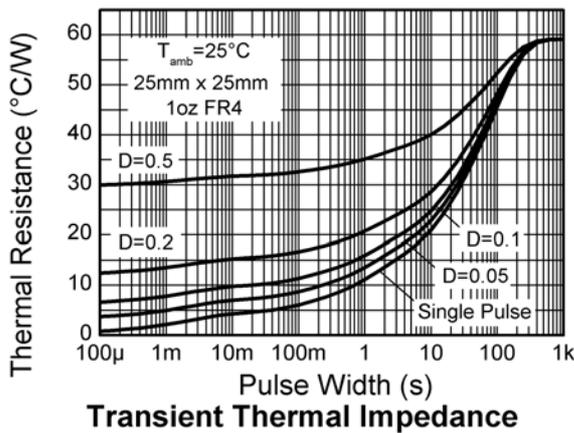
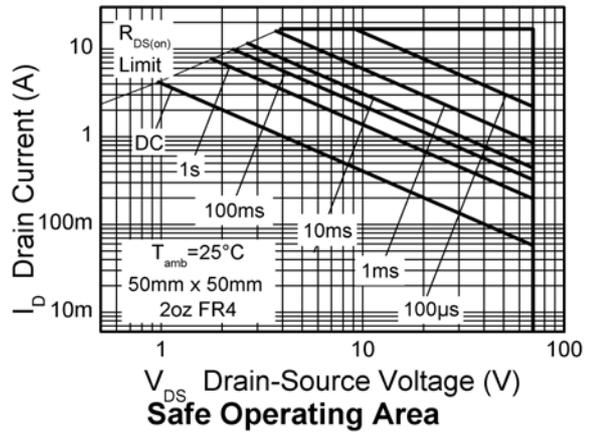
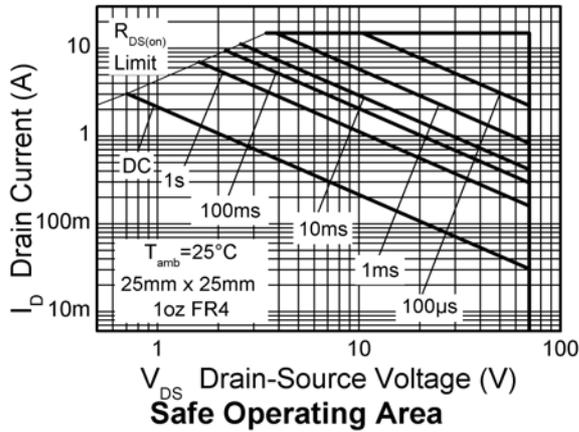
Thermal resistance

| Parameter | Symbol | Limit | Unit |
|------------------------------------|-----------------|-------|------|
| Junction to ambient ^(a) | $R_{\theta JA}$ | 30 | °C/W |
| Junction to ambient ^(b) | $R_{\theta JA}$ | 13.5 | °C/W |
| Junction to ambient ^(c) | $R_{\theta JA}$ | 59.1 | °C/W |

NOTES:

- (a) For a device surface mounted on 50mm x 50mm x 1.6mm FR4 PCB with high coverage of single sided 2oz copper, in still air conditions.
- (b) For a device surface mounted on FR4 PCB measured at $t \leq 10$ sec.
- (c) Repetitive rating 50mm x 50mm x 1.6mm FR4 PCB, $D=0.02$ pulse width=300 μs - pulse width limited by maximum junction temperature.
- (d) For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

Characteristics



ZXMP7A17K

ELECTRICAL CHARACTERISTICS (at Tamb = 25°C unless otherwise stated)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|--|---------------|------|-------|-------|----------|--|
| Static | | | | | | |
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | -70 | | | V | $I_D = -250\mu A, V_{GS} = 0V$ |
| Zero gate voltage drain current | I_{DSS} | | | -1 | μA | $V_{DS} = -70V, V_{GS} = 0V$ |
| Gate-body leakage | I_{GSS} | | | 100 | nA | $V_{GS} = \pm 20V, V_{DS} = 0V$ |
| Gate-source threshold voltage | $V_{GS(th)}$ | -1.0 | | | V | $I_D = -250\mu A, V_{DS} = V_{GS}$ |
| Static drain-source on-state resistance ^(*) | $R_{DS(on)}$ | | | 0.16 | Ω | $V_{GS} = -10V, I_D = -2.1A$ |
| | | | | 0.25 | Ω | $V_{GS} = -4.5V, I_D = -1.7A$ |
| Forward transconductance ^{(*)(‡)} | g_{fs} | | 4.4 | | S | $V_{DS} = -15V, I_D = -2.1A$ |
| Dynamic^(‡) | | | | | | |
| Input capacitance | C_{iss} | | 635 | | pF | $V_{DS} = -40V, V_{GS} = 0V$ $f = 1MHz$ |
| Output capacitance | C_{oss} | | 52 | | pF | |
| Reverse transfer capacitance | C_{rss} | | 42.5 | | pF | |
| Switching^{(†)(‡)} | | | | | | |
| Turn-on-delay time | $t_{d(on)}$ | | 2.5 | | ns | $V_{DD} = -35V, I_D = -1A$ $R_G = 6.0\Omega, V_{GS} = -10V$ |
| Rise time | t_r | | 3.4 | | ns | |
| Turn-off delay time | $t_{d(off)}$ | | 27.9 | | ns | |
| Fall time | t_f | | 8 | | ns | |
| Total gate charge | Q_g | | 9.6 | | nC | $V_{DS} = -35V, V_{GS} = -5V$ $I_D = -2.1A$ |
| Total gate charge | Q_g | | 18 | | nC | $V_{DS} = -35V, V_{GS} = -10V$ $I_D = -2.1A$ |
| Gate-source charge | Q_{gs} | | 1.77 | | nC | |
| Gate drain charge | Q_{gd} | | 3.66 | | nC | |
| Source-drain diode | | | | | | |
| Diode forward voltage ^(*) | V_{SD} | | -0.85 | -0.95 | V | $T_j = 25^\circ C, I_S = -2.0A, V_{GS} = 0V$ |
| Reverse recovery time ^(‡) | t_{rr} | | 29.8 | | ns | $T_j = 25^\circ C, I_S = -2.1A, di/dt = 100A/\mu s$ |
| Reverse recovery charge ^(‡) | Q_{rr} | | 38.5 | | nC | |

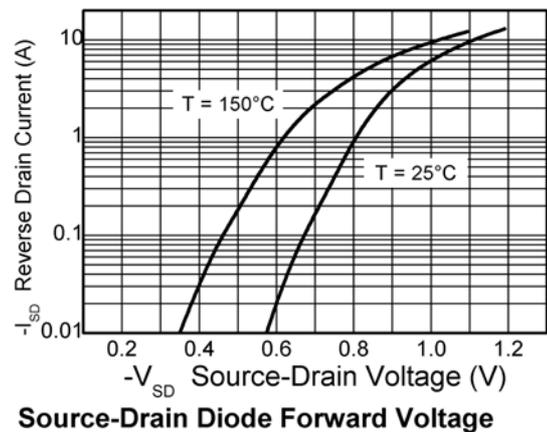
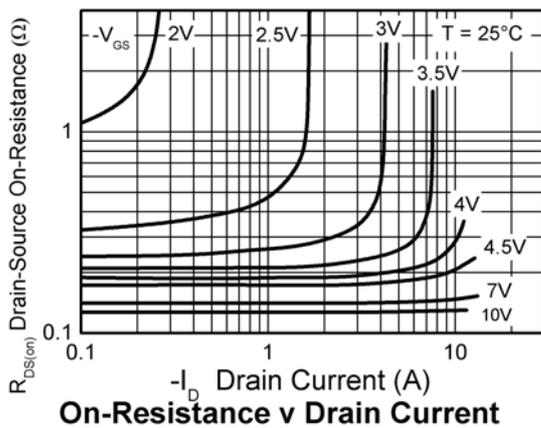
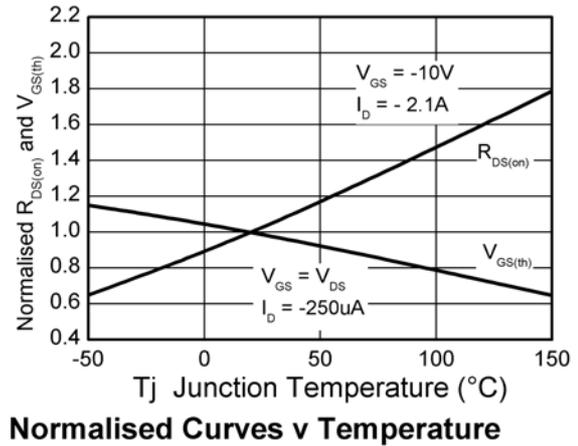
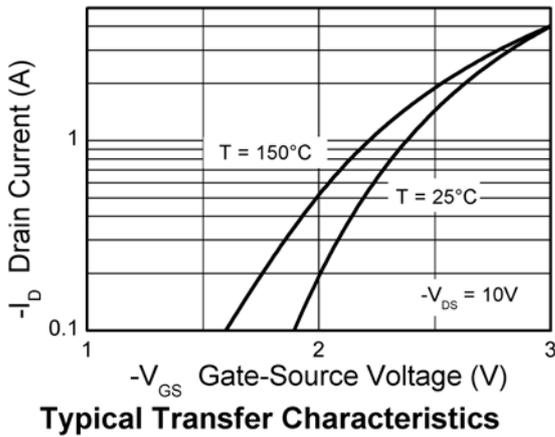
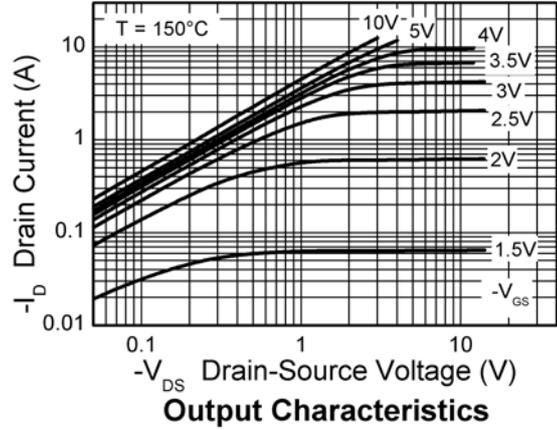
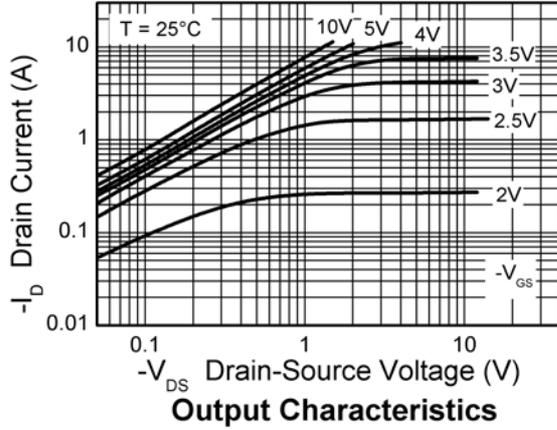
NOTES:

(*) Measured under pulsed conditions. Pulse width $\leq 300\mu s$; duty cycle $\leq 2\%$.

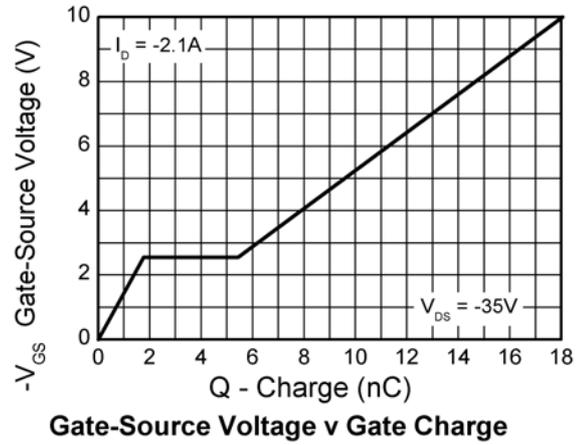
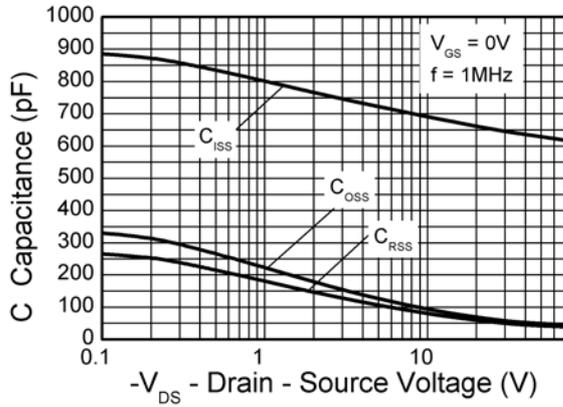
(†) Switching characteristics are independent of operating junction temperature.

(‡) For design aid only, not subject to production testing.

Typical characteristics



Typical characteristics

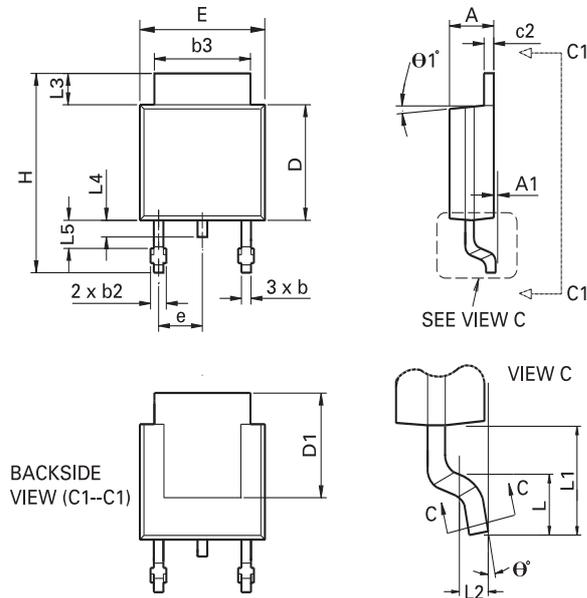


ZXMP7A17K

Intentionally left blank

ZXMP7A17K

Package outline - DPAK



| DIM | Inches | | Millimeters | | DIM | Inches | | Millimeters | |
|-----|--------|-------|-------------|-------|----------|-----------|-------|-------------|-------|
| | Min | Max | Min | Max | | Min | Max | Min | Max |
| A | 0.086 | 0.094 | 2.18 | 2.39 | e | 0.090 BSC | | 2.29 BSC | |
| A1 | - | 0.005 | - | 0.127 | H | 0.370 | 0.410 | 9.40 | 10.41 |
| b | 0.020 | 0.035 | 0.508 | 0.89 | L | 0.055 | 0.070 | 1.40 | 1.78 |
| b2 | 0.030 | 0.045 | 0.762 | 1.14 | L1 | 0.108 REF | | 2.74 REF | |
| b3 | 0.205 | 0.215 | 5.21 | 5.46 | L2 | 0.020 BSC | | 0.508 BSC | |
| c | 0.018 | 0.024 | 0.457 | 0.61 | L3 | 0.035 | 0.065 | 0.89 | 1.65 |
| c2 | 0.018 | 0.023 | 0.457 | 0.584 | L4 | 0.025 | 0.040 | 0.635 | 1.016 |
| D | 0.213 | 0.245 | 5.41 | 6.22 | L5 | 0.045 | 0.060 | 1.14 | 1.52 |
| D1 | 0.205 | - | 5.21 | - | theta 1° | 0° | 10° | 0° | 10° |
| E | 0.250 | 0.265 | 6.35 | 6.73 | theta 2° | 0° | 15° | 0° | 15° |
| E1 | 0.170 | - | 4.32 | - | - | - | - | - | - |

Note: Controlling dimensions are in inches. Approximate dimensions are provided in millimeters

| Europe | Americas | Asia Pacific | Corporate Headquarters |
|--|---|--|--|
| Zetex GmbH Kustermann-park Balanstraße 59 D-81541 München Germany Telephone: (49) 89 45 49 49 0 Fax: (49) 89 45 49 49 49 europe.sales@zetex.com | Zetex Inc 700 Veterans Memorial Highway Hauppauge, NY 11788 USA Telephone: (1) 631 360 2222 Fax: (1) 631 360 8222 usa.sales@zetex.com | Zetex (Asia Ltd) 3701-04 Metroplaza Tower 1 Hing Fong Road, Kwai Fong Hong Kong Telephone: (852) 26100 611 Fax: (852) 24250 494 asia.sales@zetex.com | Zetex Semiconductors plc Zetex Technology Park, Chadderton Oldham, OL9 9LL United Kingdom Telephone: (44) 161 622 4444 Fax: (44) 161 622 4446 hq@zetex.com |

For international sales offices visit www.zetex.com/offices

Zetex products are distributed worldwide. For details, see www.zetex.com/salesnetwork

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 contact 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.