

30V P-CHANNEL ENHANCEMENT MODE MOSFET

SUMMARY

$V_{(BR)DSS} = -30V$; $R_{DS(ON)} = 0.075\Omega$; $I_D = -3.8A$

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.

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

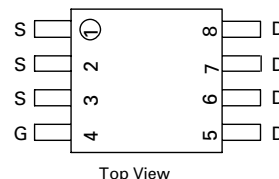
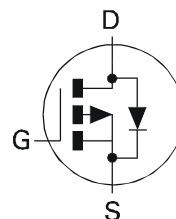
| DEVICE | REEL SIZE (inches) | TAPE WIDTH (mm) | QUANTITY PER REEL |
|-------------|--------------------|-----------------|-------------------|
| ZXM64P03XTA | 7 | 12mm embossed | 1000 units |
| ZXM64P03XTC | 13 | 12mm embossed | 4000 units |

DEVICE MARKING

- ZXM4P03



MSOP8



ZXM64P03X

ABSOLUTE MAXIMUM RATINGS.

| PARAMETER | SYMBOL | LIMIT | UNIT |
|---|---------------|--------------|---------------------|
| Drain-Source Voltage | V_{DSS} | -30 | V |
| Gate- Source Voltage | V_{GS} | ± 20 | V |
| Continuous Drain Current ($V_{GS}=4.5V$; $T_A=25^\circ C$)(b) ($V_{GS}=4.5V$; $T_A=70^\circ C$)(b) | I_D | -3.8 -3.0 | A |
| Pulsed Drain Current (c) | I_{DM} | -19 | A |
| Continuous Source Current (Body Diode)(b) | I_S | -2.3 | A |
| Pulsed Source Current (Body Diode)(c) | I_{SM} | -19 | A |
| Power Dissipation at $T_A=25^\circ C$ (a) Linear Derating Factor | P_D | 1.1 8.8 | W mW/ $^\circ C$ |
| Power Dissipation at $T_A=25^\circ C$ (b) Linear Derating Factor | P_D | 1.8 14.4 | 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) | $R_{\theta JA}$ | 113 | $^\circ C/W$ |
| Junction to Ambient (b) | $R_{\theta JA}$ | 70 | $^\circ C/W$ |

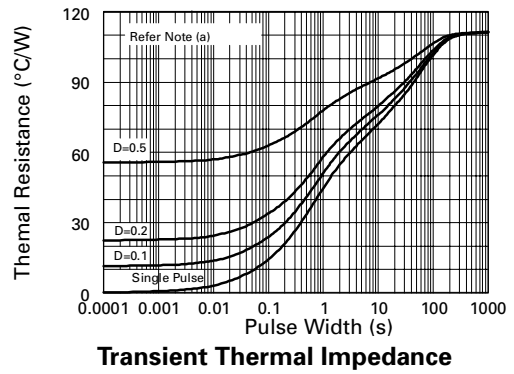
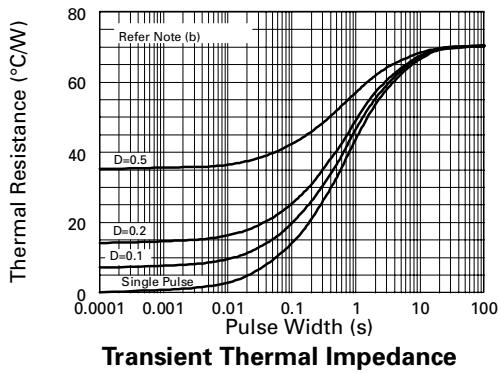
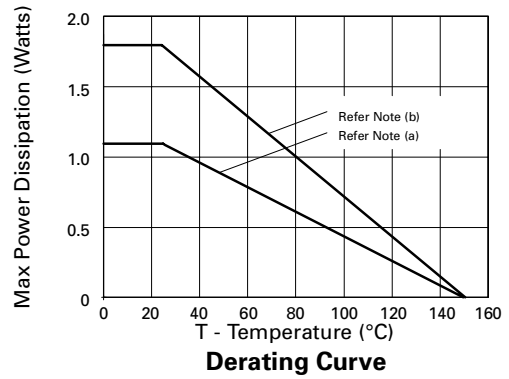
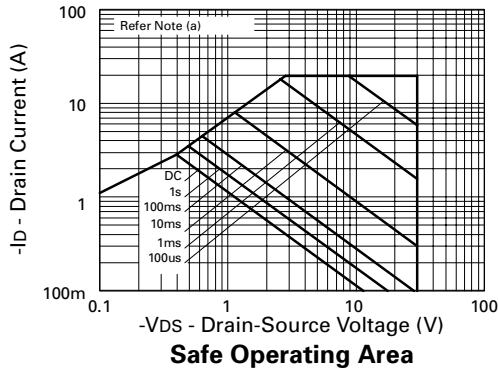
NOTES

(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.

CHARACTERISTICS



ZXM64P03X

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

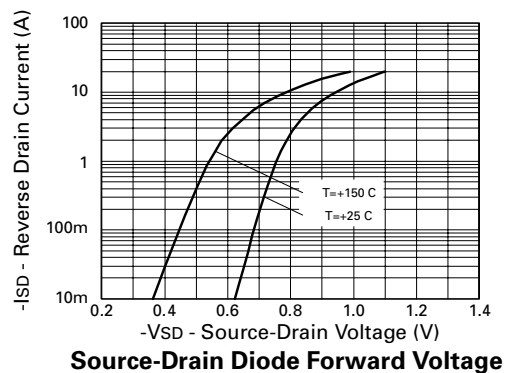
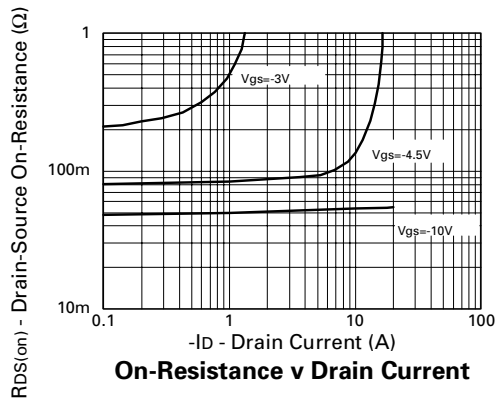
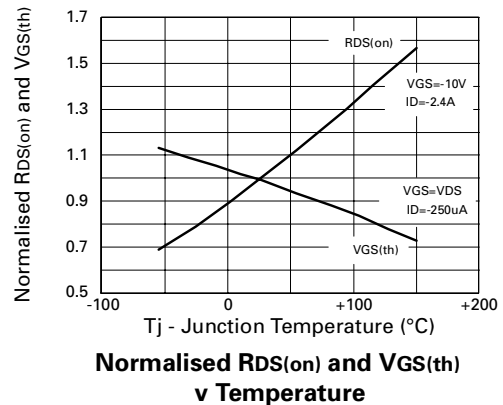
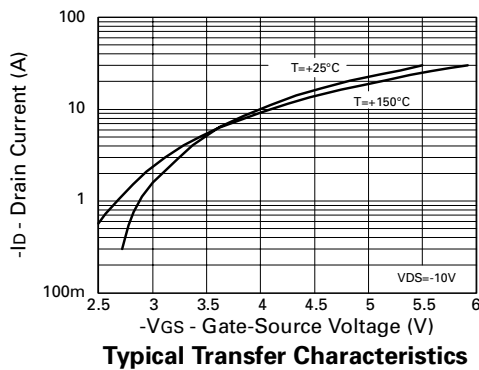
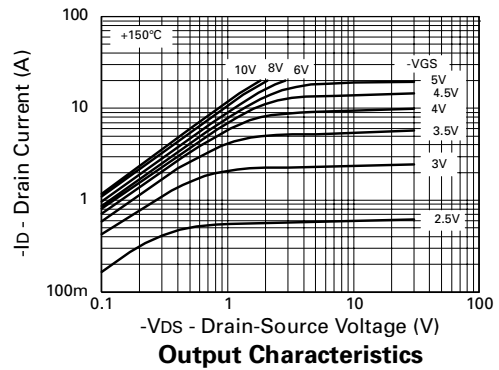
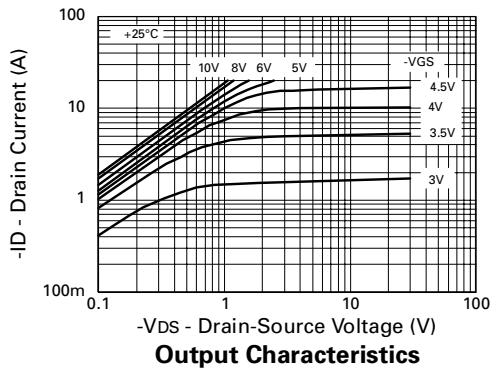
| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT | CONDITIONS. |
|---|----------------------|------|------|----------------|--------|---|
| STATIC | | | | | | |
| Drain-Source Breakdown Voltage | V _{(BR)DSS} | -30 | | | V | I _D =-250μA, V _{GS} =0V |
| Zero Gate Voltage Drain Current | I _{DSS} | | | -1 | μA | V _{DS} =-30V, V _{GS} =0V |
| Gate-Body Leakage | I _{GSS} | | | ±100 | nA | V _{GS} =± 20V, V _{DS} =0V |
| Gate-Source Threshold Voltage | V _{GS(th)} | -1.0 | | | V | I _D =-250μA, V _{DS} =V _{GS} |
| Static Drain-Source On-State Resistance (1) | R _{DS(on)} | | | 0.075 0.100 | Ω Ω | V _{GS} =-10V, I _D =-2.4A V _{GS} =-4.5V, I _D =-1.2A |
| Forward Transconductance (3) | g _{fs} | 2.3 | | | S | V _{DS} =-10V,I _D =-1.2A |
| DYNAMIC (3) | | | | | | |
| Input Capacitance | C _{iss} | | 825 | | pF | V _{DS} =-25 V, V _{GS} =0V, f=1MHz |
| Output Capacitance | C _{oss} | | 250 | | pF | |
| Reverse Transfer Capacitance | C _{rss} | | 80 | | pF | |
| SWITCHING(2) (3) | | | | | | |
| Turn-On Delay Time | t _{d(on)} | | 4.4 | | ns | V _{DD} =-15V, I _D =-2.4A R _G =6.2Ω, R _D =6.2Ω (Refer to test circuit) |
| Rise Time | t _r | | 6.2 | | ns | |
| Turn-Off Delay Time | t _{d(off)} | | 40 | | ns | |
| Fall Time | t _f | | 29.2 | | ns | |
| Total Gate Charge | Q _g | | | 46 | nC | V _{DS} =-24V,V _{GS} =-10V, I _D =-2.4A (Refer to test circuit) |
| Gate-Source Charge | Q _{gs} | | | 9 | nC | |
| Gate Drain Charge | Q _{gd} | | | 11.5 | nC | |
| SOURCE-DRAIN DIODE | | | | | | |
| Diode Forward Voltage (1) | V _{SD} | | | -0.95 | V | T _j =25°C, I _S =-2.4A, V _{GS} =0V |
| Reverse Recovery Time (3) | t _{rr} | | 30.2 | | ns | T _j =25°C, I _F =-2.4A, di/dt= 100A/μs |
| Reverse Recovery Charge(3) | Q _{rr} | | 27.8 | | nC | |

(1) Measured under pulsed conditions. Width=300 μs . Duty cycle $\leq 2\%$.

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

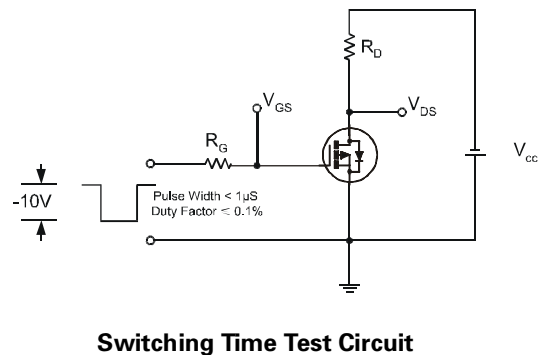
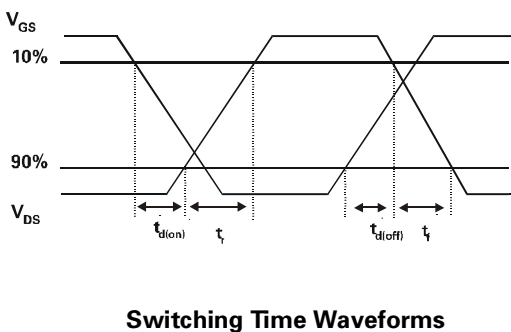
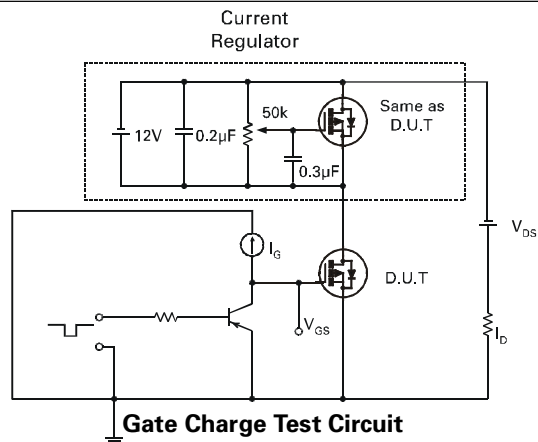
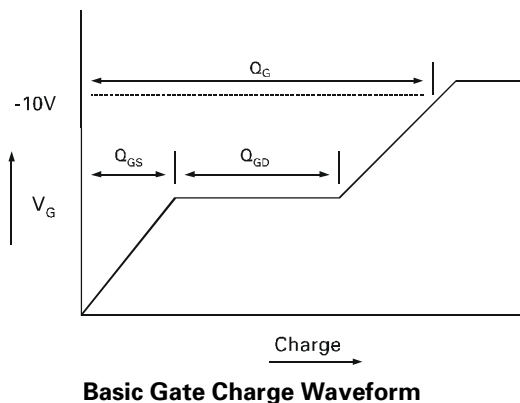
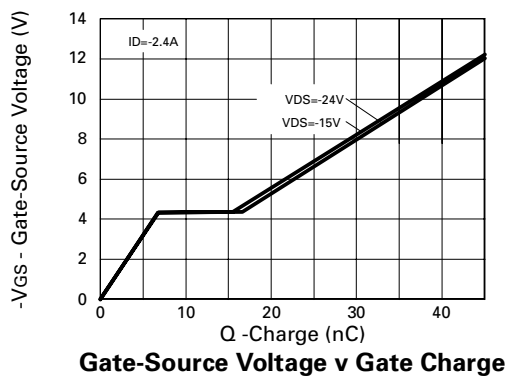
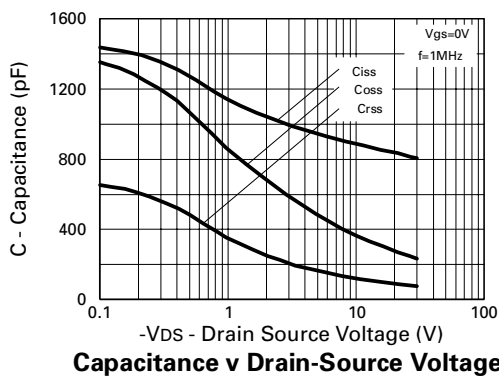
(3) For design aid only, not subject to production testing.

TYPICAL CHARACTERISTICS



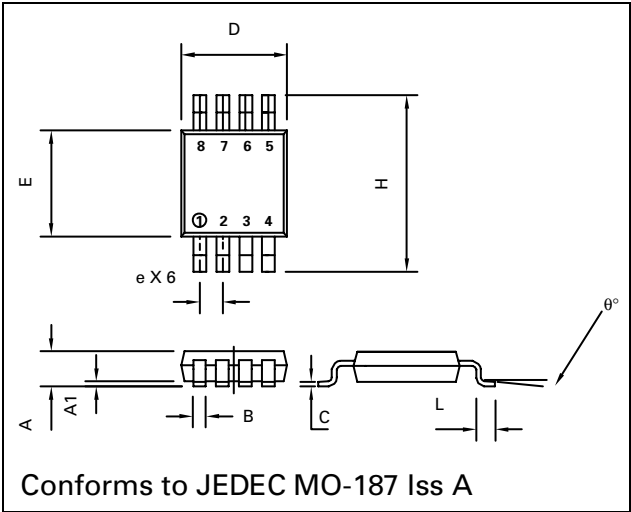
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TYPICAL CHARACTERISTICS



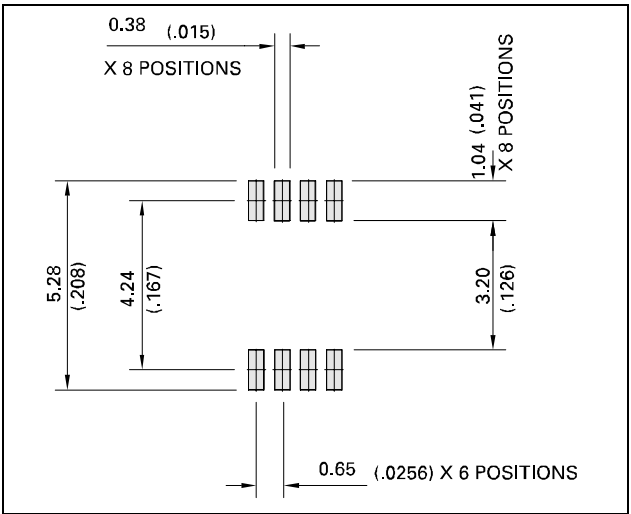
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PACKAGE DIMENSIONS



| DIM | Millimetres | | Inches | |
|-----|-------------|------|--------|-------|
| | MIN | MAX | MIN | MAX |
| A | | 1.10 | | 0.043 |
| A1 | 0.05 | 0.15 | 0.002 | 0.006 |
| B | 0.25 | 0.40 | 0.010 | 0.016 |
| C | 0.13 | 0.23 | 0.005 | 0.009 |
| D | 2.90 | 3.10 | 0.114 | 0.122 |
| e | 0.65 | BSC | 0.0256 | BSC |
| E | 2.90 | 3.10 | 0.114 | 0.122 |
| H | 4.90 | BSC | 0.193 | BSC |
| L | 0.40 | 0.70 | 0.016 | 0.028 |
| q° | 0° | 6° | 0° | 6° |

PAD LAYOUT DETAILS



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