

20V P-CHANNEL ENHANCEMENT MODE MOSFET

SUMMARY

$V_{(BR)DSS} = -20V$; $R_{DS(ON)} = 0.025\Omega$; $I_D = -8.0A$

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

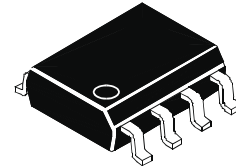
- DC - DC Converters
- Power Management Functions
- Disconnect switches
- Motor control

ORDERING INFORMATION

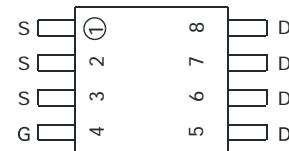
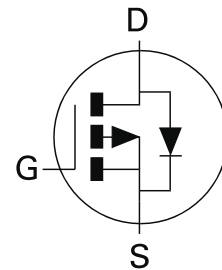
| DEVICE | REEL SIZE | TAPE WIDTH | QUANTITY PER REEL |
|--------------|-----------|------------|-------------------|
| ZXM66P02N8TA | 7" | 12mm | 500 units |
| ZXM66P02N8TC | 7" | 12mm | 2500 units |

DEVICE MARKING

- ZXM6
6P02



SO8



Top View

ZXM66P02N8

ABSOLUTE MAXIMUM RATINGS.

| PARAMETER | SYMBOL | LIMIT | UNIT |
|--|-------------------|----------------------|---------------------|
| Drain-Source Voltage | V_{DSS} | -20 | V |
| Gate- Source Voltage | V_{GS} | ± 12 | V |
| Continuous Drain Current $V_{GS}=-4.5V$; $T_A=25^\circ C$ (b) $V_{GS}=-4.5V$; $T_A=70^\circ C$ (b) $V_{GS}=-4.5V$; $T_A=25^\circ C$ (a) | I_D | -8.0 -6.5 -6.4 | A |
| Pulsed Drain Current (c) | I_{DM} | -28 | A |
| Continuous Source Current (Body Diode)(b) | I_S | -4.15 | A |
| Pulsed Source Current (Body Diode)(c) | I_{SM} | -28 | A |
| Power Dissipation at $T_A=25^\circ C$ (a) Linear Derating Factor | P_D | 1.56 12.5 | W mW/ $^\circ C$ |
| Power Dissipation at $T_A=25^\circ C$ (b) Linear Derating Factor | P_D | 2.5 20 | 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) | $R_{\theta JA}$ | 80 | $^\circ C/W$ |
| Junction to Ambient (b) | $R_{\theta JA}$ | 50 | $^\circ C/W$ |

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 25mm x 25mm FR4 PCB, $D = 0.05$, pulse width 10 μs - pulse width limited by maximum junction temperature.



ZXM66P02N8

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

| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNI T | CONDITIONS. |
|---|---------------|------|-------|----------------|----------------------|--|
| STATIC | | | | | | |
| 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 | μA | $V_{DS} = -16\text{V}$, $V_{GS} = 0\text{V}$ |
| 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 0.045 | Ω Ω | $V_{GS} = -4.5\text{V}$, $I_D = -3.2\text{A}$ $V_{GS} = -2.5\text{V}$, $I_D = -2.7\text{A}$ |
| Forward Transconductance (1)(3) | g_{fs} | | 13.3 | | S | $V_{DS} = -10\text{V}$, $I_D = -3.2\text{A}$ |
| DYNAMIC (3) | | | | | | |
| Input Capacitance | C_{iss} | | 2068 | | pF | $V_{DS} = -15\text{V}$, $V_{GS} = 0\text{V}$, $f = 1\text{MHz}$ |
| Output Capacitance | C_{oss} | | 1038 | | pF | |
| Reverse Transfer Capacitance | C_{rss} | | 506 | | pF | |
| SWITCHING(2) (3) | | | | | | |
| Turn-On Delay Time | $t_{d(on)}$ | | 14.0 | | ns | $V_{DD} = -10\text{V}$, $I_D = -3.2\text{A}$ $R_G = 6.0\Omega$, $V_{GS} = -5\text{V}$ |
| Rise Time | t_r | | 44.3 | | ns | |
| Turn-Off Delay Time | $t_{d(off)}$ | | 118.4 | | ns | |
| Fall Time | t_f | | 98.4 | | ns | |
| Total Gate Charge | Q_g | | 43.3 | - | nC | $V_{DS} = -10\text{V}$, $V_{GS} = -4.5\text{V}$ $I_D = -3.2\text{A}$ |
| Gate-Source Charge | Q_{gs} | | 3.5 | - | nC | |
| Gate Drain Charge | Q_{gd} | | 21.3 | - | nC | |
| SOURCE-DRAIN DIODE | | | | | | |
| Diode Forward Voltage (1) | V_{SD} | | | 0.95 | V | $T_j = 25^{\circ}\text{C}$, $I_S = -3.2\text{A}$, $V_{GS} = 0\text{V}$ |
| Reverse Recovery Time (3) | t_{rr} | | 23.1 | | ns | $T_j = 25^{\circ}\text{C}$, $I_F = -3.2\text{A}$, $di/dt = 100\text{A}/\mu\text{s}$ |
| Reverse Recovery Charge(3) | Q_{rr} | | 12.2 | | nC | |

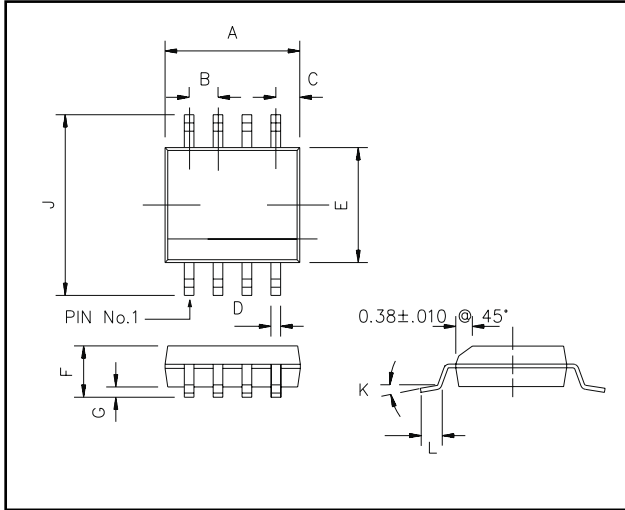
(1) Measured under pulsed conditions. Width=300 μs . Duty cycle $\leq 2\%$.

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

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

ZXM66P02N8

PACKAGE DIMENSIONS



| DIM | Millimetres | | Inches | |
|-----|-------------|------|----------|-------|
| | Min | Max | Min | Max |
| A | 4.80 | 4.98 | 0.189 | 0.196 |
| B | 1.27 BSC | | 0.05 BSC | |
| C | 0.53 REF | | 0.02 REF | |
| D | 0.36 | 0.46 | 0.014 | 0.018 |
| E | 3.81 | 3.99 | 0.15 | 0.157 |
| F | 1.35 | 1.75 | 0.05 | 0.07 |
| G | 0.10 | 0.25 | 0.004 | 0.010 |
| J | 5.80 | 6.20 | 0.23 | 0.24 |
| K | 0° | 8° | 0° | 8° |
| L | 0.41 | 1.27 | 0.016 | 0.050 |

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