# FMT2308 3Amps 60 Voltage N - Channel POWER MOSFET

| | |
|---|---|
| $BV_{DSS}$ | 60V |
| $R_{DS(ON)}$ | 160mΩ |
| $I_D$ | 3A |

**N-CHANNEL ENHANCEMENT MODE POWER MOSFET**

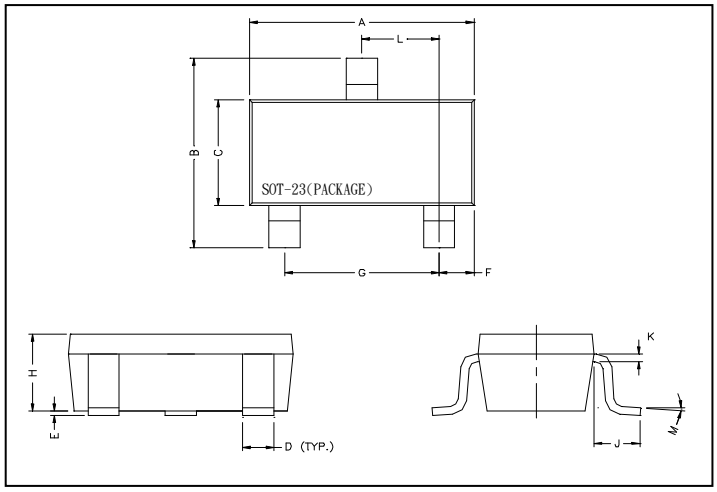
## Description

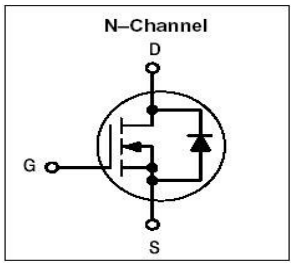
The FMT2308 utilized advanced processing techniques to achieve the lowest possible on-resistance, extremely efficient and cost-effectiveness device.
The FMT2308 is universally used for all commercial-industrial applications.

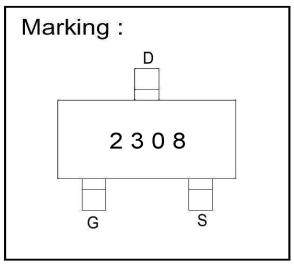
## Features

*Simple Drive Requirement
*Small Package Outline

## Package Dimensions




| REF. | Min. | Max. | REF. | Min. | Max. |
|---|---|---|---|---|---|
| A | 2.70 | 3.10 | G | 1.90 | REF. |
| B | 2.40 | 2.80 | H | 1.00 | 1.30 |
| C | 1.40 | 1.60 | K | 0.10 | 0.20 |
| D | 0.35 | 0.50 | J | 0.40 | - |
| E | 0 | 0.10 | L | 0.85 | 1.15 |
| F | 0.45 | 0.55 | M | 0° | 10° |

## Absolute Maximum Ratings

| Parameter | Symbol | Ratings | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | 60 | V |
| Gate-Source Voltage | $V_{GS}$ | ±20 | V |
| Continuous Drain Current[3], $V_{GS}$@4.5V | $I_D$ @$T_A$=25℃ | 3.0 | A |
| Continuous Drain Current[3], $V_{GS}$@4.5V | $I_D$ @$T_A$=70℃ | 2.3 | A |
| Pulsed Drain Current[1,2] | $I_{DM}$ | 10 | A |
| Power Dissipation | $P_D$ @$T_A$=25℃ | 1.38 | W |
| Linear Derating Factor | | 0.01 | W/℃ |
| Operating Junction and Storage Temperature Range | Tj, Tstg | -55 ~ +150 | ℃ |

## Thermal Data

| Parameter | Symbol | Ratings | Unit |
|---|---|---|---|
| Thermal Resistance Junction-ambient[3] Max. | Rthj-a | 90 | ℃/W |

## Electrical Characteristics(Tj = 25℃ Unless otherwise specified)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Conditions |
|---|---|---|---|---|---|---|
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | 60 | - | - | V | $V_{GS}$=0, $I_D$=250uA |
| Breakdown Voltage Temperature Coefficient | $\triangle BV_{DSS}/\triangle Tj$ | - | 0.05 | - | V/℃ | Reference to 25℃, $I_D$=1mA |
| Gate Threshold Voltage | $V_{GS(th)}$ | 1.0 | - | 3.0 | V | $V_{DS}$=$V_{GS}$, $I_D$=250uA |
| Forward Transconductance | $g_{fs}$ | - | 5.0 | - | S | $V_{DS}$=5V, $I_D$=3A |
| Gate-Source Leakage Current | $I_{GSS}$ | - | - | ±100 | nA | $V_{GS}$= ±20V |
| Drain-Source Leakage Current(Tj=25℃) | $I_{DSS}$ | - | - | 10 | uA | $V_{DS}$=60V, $V_{GS}$=0 |
| Drain-Source Leakage Current(Tj=70℃) | | - | - | 25 | uA | $V_{DS}$=48V, $V_{GS}$=0 |
| Static Drain-Source On-Resistance | $R_{DS(ON)}$ | - | - | 160 | mΩ | $V_{GS}$=10V, $I_D$=2.0A |
| | | - | - | 220 | | $V_{GS}$=4.5V, $I_D$=1.7A |
| Total Gate Charge[2] | $Q_g$ | - | 6 | 10 | nC | $I_D$=3A<br>$V_{DS}$=48V<br>$V_{GS}$=4.5V |
| Gate-Source Charge | $Q_{gs}$ | - | 1.6 | - | | |
| Gate-Drain (“Miller”) Change | $Q_{gd}$ | - | 3 | - | | |
| Turn-on Delay Time[2] | $T_{d(on)}$ | - | 6 | - | ns | $V_{DS}$=30V<br>$I_D$=1A<br>$V_{GS}$=10V<br>$R_G$=3.3Ω<br>$R_D$=30Ω |
| Rise Time | $T_r$ | - | 5 | - | | |
| Turn-off Delay Time | $T_{d(off)}$ | - | 16 | - | | |
| Fall Time | $T_f$ | - | 3 | - | | |
| Input Capacitance | $C_{iss}$ | - | 490 | 780 | pF | $V_{GS}$=0V<br>$V_{DS}$=25V<br>f=1.0MHz |
| Output Capacitance | $C_{oss}$ | - | 55 | - | | |
| Reverse Transfer Capacitance | $C_{rss}$ | - | 40 | - | | |

## Source-Drain Diode

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Conditions |
|---|---|---|---|---|---|---|
| Forward On Voltage[2] | $V_{SD}$ | - | - | 1.2 | V | $I_S$=1.2A, $V_{GS}$=0V |
| Reverse Recovery Time | $T_{rr}$ | - | 25 | - | ns | $I_S$=3A, $V_{GS}$=0V<br>dI/dt=100A/μs |
| Reverse Recovery Charge | $Q_{rr}$ | - | 26 | - | nC | |

Notes: 1. Pulse width limited by Max. junction temperature.

2. Pulse width≦300us, duty cycle≦2%.

3. Surface mounted on 1 $in^2$ copper pad of FR4 board;270℃/W when mounted on min. copper pad.

## Characteristics Curve

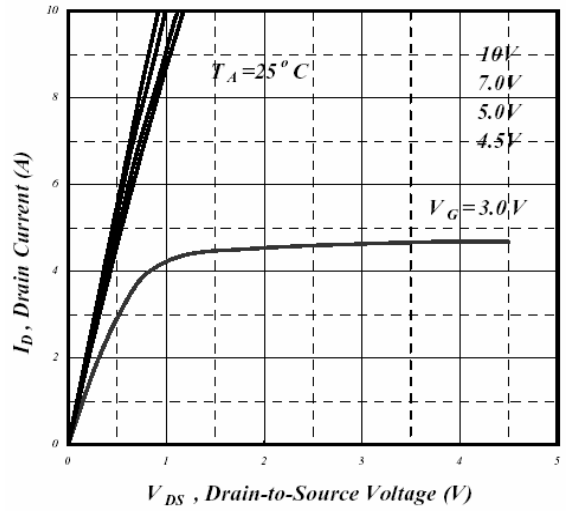



**Fig 1. Typical Output Characteristics**

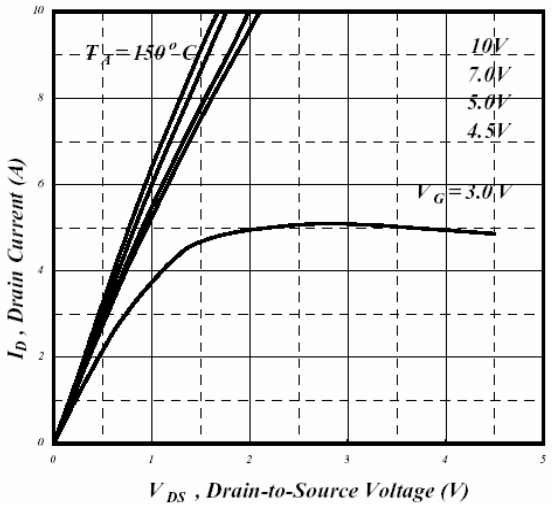



**Fig 2. Typical Output Characteristics**

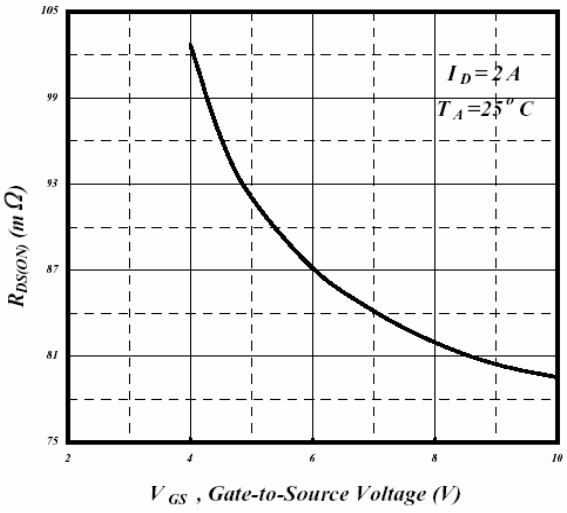



**Fig 3. On-Resistance v.s. Gate Voltage**

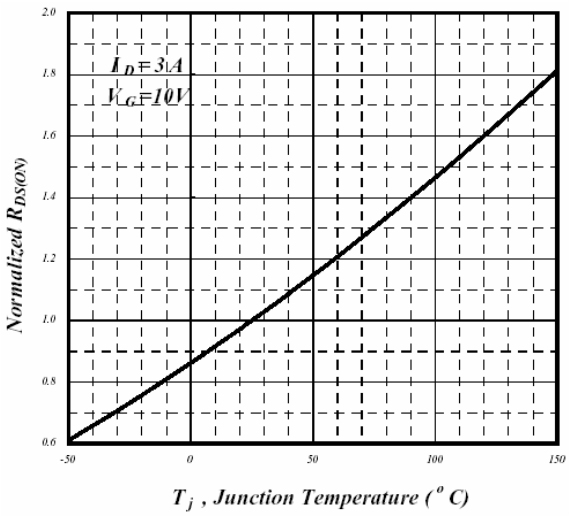



**Fig 4. Normalized On-Resistance v.s. Junction Temperature**

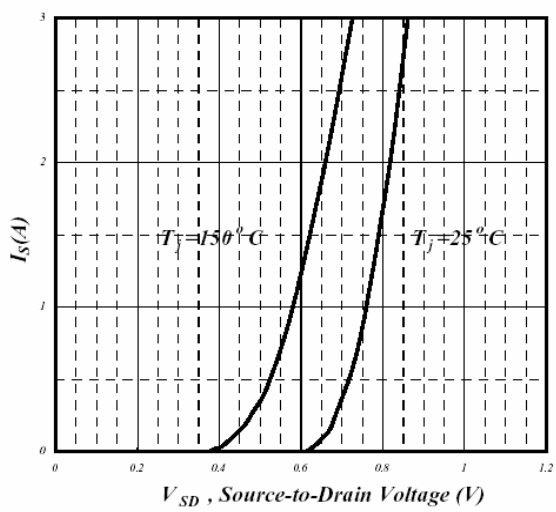



**Fig 5. Forward Characteristics of Reverse Diode**

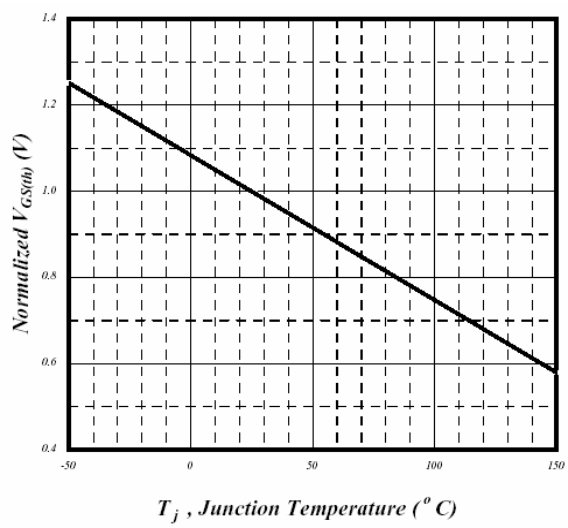



**Fig 6. Gate Threshold Voltage v.s. Junction Temperature**

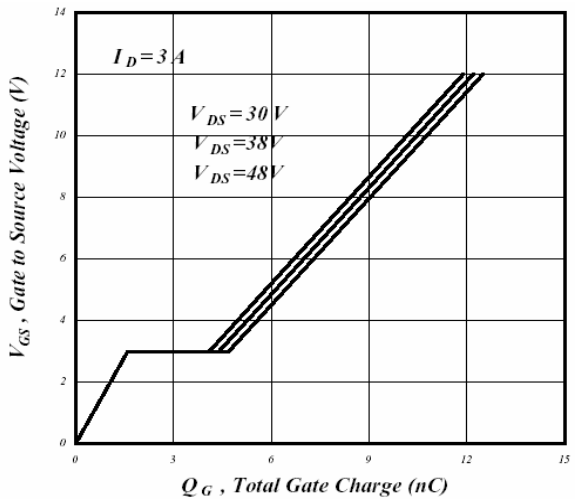



**Fig 7. Gate Charge Characteristics**

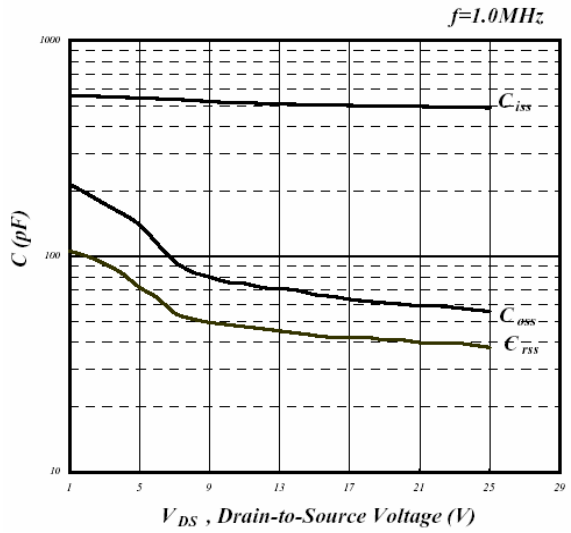



**Fig 8. Typical Capacitance Characteristics**

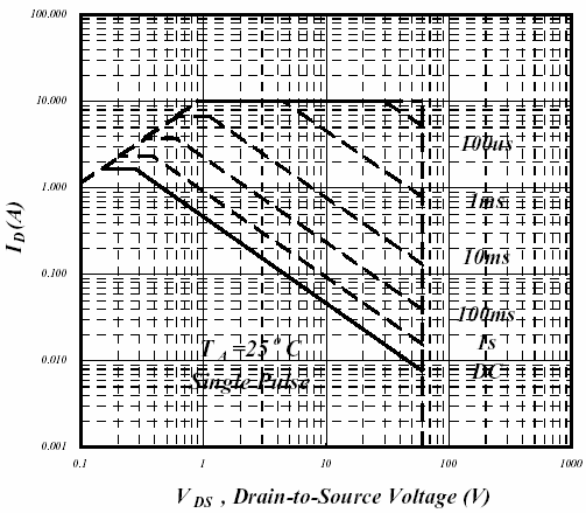



**Fig 9. Maximum Safe Operating Area**

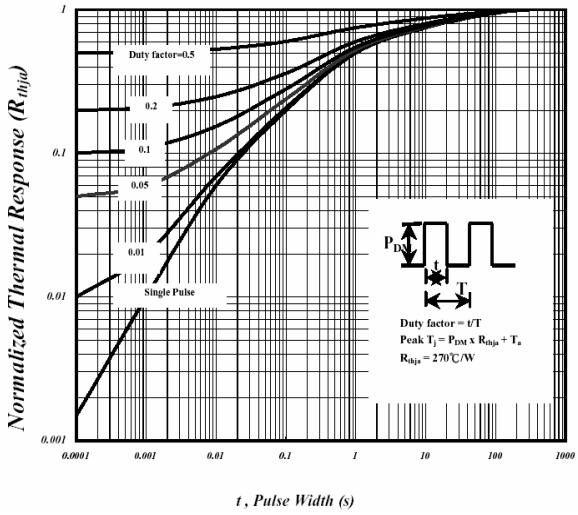



**Fig 10. Effective Transient Thermal Impedance**

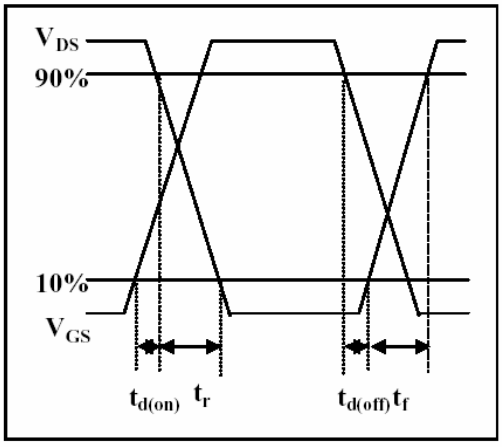



**Fig 11. Switching Time Waveform**

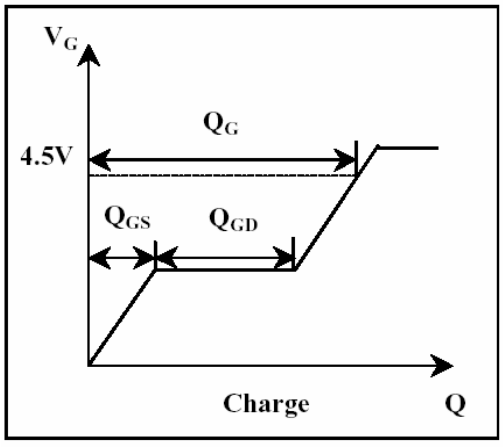



**Fig 12. Gate Charge Waveform**