# MT82P08N3

## P-Channel Enhancement Mode Field Effect Transistor

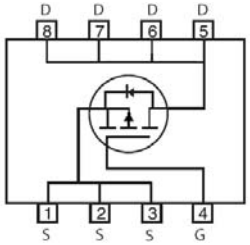
MT Semiconductor®

http://www.mtsemi.com

### Product Summary

- $V_{DS}$ = -20V
- $I_D$= -51A
- $R_{DS(ON)}$ 7.0mΩ @$V_{GS}$= -4.5V
- $R_{DS(ON)}$ 10 mΩ @$V_{GS}$= -2.5V

### Simplified Schematic



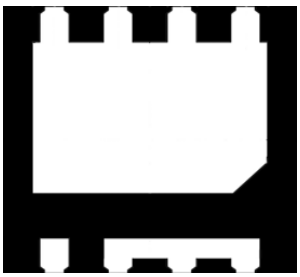

### Features

Advanced Trench Process Technology.

- High Density Cell Design for Ultra Low
- On-Resistance.
- Lead free product is acquired.
- RoHS Compliant.

### MARKING DIAGRAM & PIN ASSIGNMENT

DFN3X3-8L



PIN1

### Applications

- Notebook Computer
- Portable Battery Pack

## Absolute Maximum Ratings ($T_A$ = 25℃ unless otherwise noted)

| Parameter | Symbol | Limit | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | -20 | V |
| Gate-Source Voltage | $V_{GS}$ | ±12 | V |
| Drain Current-Continuous | $I_D$ | -51 | A |
| Drain Current-Pulsed (Note 1) | $I_{DM}$ | -210 | A |
| Maximum Power Dissipation | $P_D$ | 42 | W |
| Operating Junction and Storage Temperature Range | $T_J$,$T_{STG}$ | -55 To 150 | ℃ |

## Thermal Characteristic

| | | | |
|---|---|---|---|
| Thermal Resistance,Junction-to-Ambient (Note 2) | $R_{\theta JA}$ | 3.0 | ℃/W |

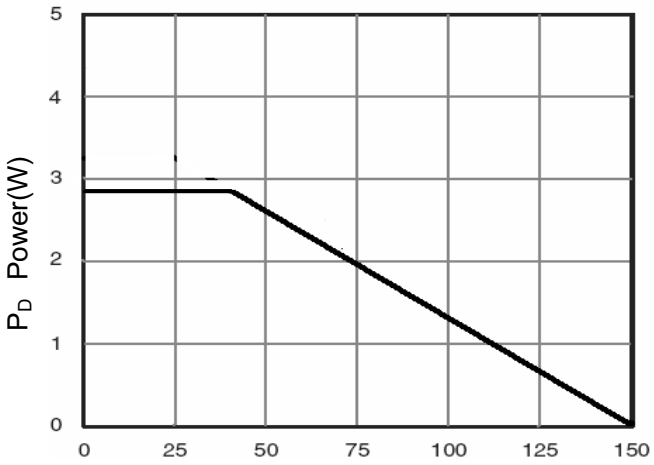
## Electrical Characteristics ($T_A$=25℃unless otherwise noted)

| Parameter | Symbol | Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Off Characteristics** | | | | | | |
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $V_{GS}$=0V $I_D$=-250μA | -20 | - | - | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=-20V,$V_{GS}$=0V | - | - | 1 | μA |
| Gate-Body Leakage Current | $I_{GSS}$ | $V_{GS}$=±12V,$V_{DS}$=0V | - | - | ±100 | nA |
| **On Characteristics** (Note 3) | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$,$I_D$=-250μA | - | -0.7 | -1.0 | V |
| Drain-Source On-State Resistance | $R_{DS(ON)}$ | $V_{GS}$=-4.5V, $I_D$=-10A | - | 7.0 | 9.5 | mΩ |
| | | $V_{GS}$=-2.5V, $I_D$= -5A | - | 10 | 13 | mΩ |
| | | | | | | |
| **Dynamic Characteristics** (Note4) | | | | | | |
| Input Capacitance | $C_{lss}$ | $V_{DS}$=-10V,$V_{GS}$=0V, F=1.0MHz | - | 2839 | - | PF |
| Output Capacitance | $C_{oss}$ | | – | 372 | – | PF |
| Reverse Transfer Capacitance | $C_{rss}$ | | – | 311 | – | PF |
| **Switching Characteristics** (Note 4) | | | | | | |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DD}$=-10V, ,$R_L$=2Ω $V_{GS}$=-10V,$R_{GEN}$=3Ω | – | 13 | – | nS |
| Turn-on Rise Time | $t_r$ | | – | 105 | – | nS |
| Turn-Off Delay Time | $t_{d(off)}$ | | – | 145 | – | nS |
| Turn-Off Fall Time | $t_f$ | | – | 150 | – | nS |
| Total Gate Charge | $Q_g$ | $V_{DS}$=-10V,$I_D$=-15A, $V_{GS}$=-4.5V | – | 54 | – | nS |
| Gate-Source Charge | $Q_{gs}$ | | – | 7 | – | nS |
| Gate-Drain Charge | $Q_{gd}$ | | – | 14 | – | nS |
| **Drain-Source Diode Characteristics** | | | | | | |
| Diode Forward Voltage (Note 3) | $V_{SD}$ | $V_{GS}$=0V,$I_S$=-30A | - | -0.7 | -1.3 | V |
| Diode Forward Current (Note 2) | $I_S$ | | - | - | -51 | A |

### Notes

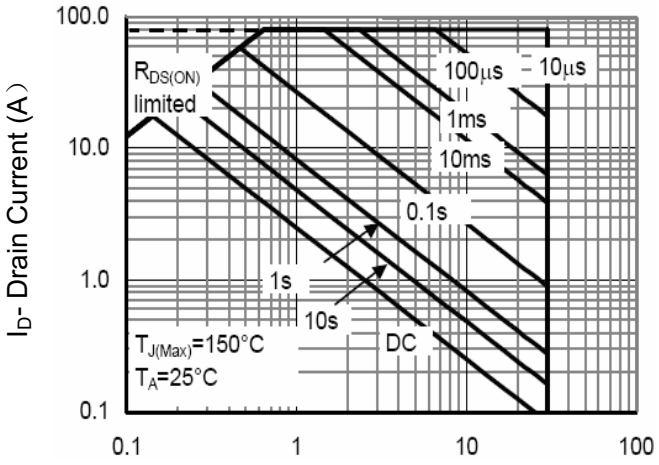
**1.** Repetitive Rating: Pulse width limited by maximum junction temperature.
**2.** Surface Mounted on FR4 Board, t ≤ 10 sec.
**3.** Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
**4.** Guaranteed by design, not subject to production

## Characteristics Curve ($T_A$=25°C, unless otherwise noted)



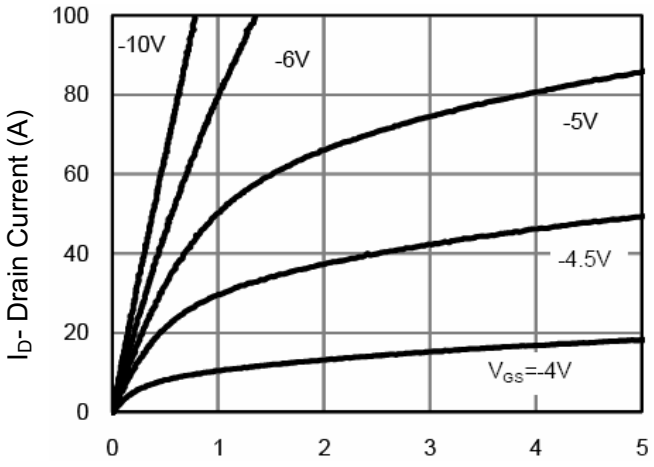

$T_J$-Junction Temperature(℃)

**Figure 1 Power Dissipation**




Vds Drain-Source Voltage (V)

**Figure 2 Safe Operation Area**




Vds Drain-Source Voltage (V)

**Figure 3 Output Characteristics**

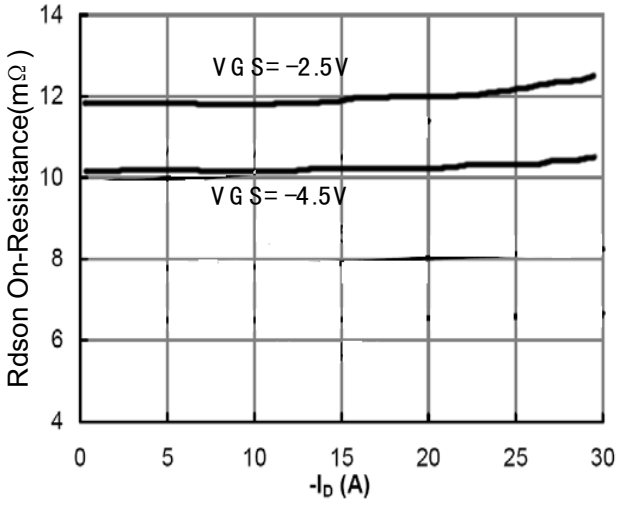
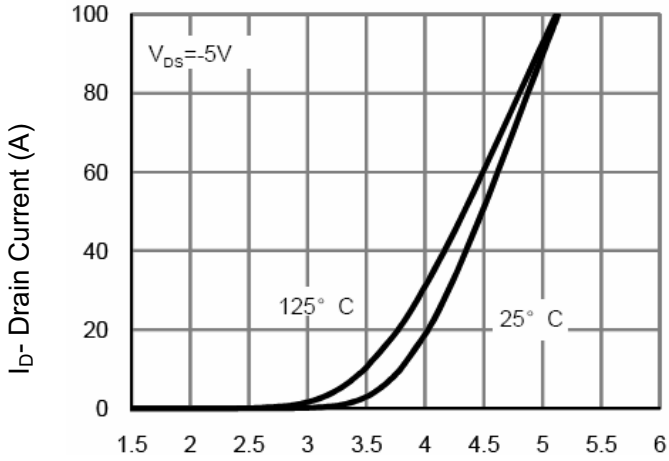
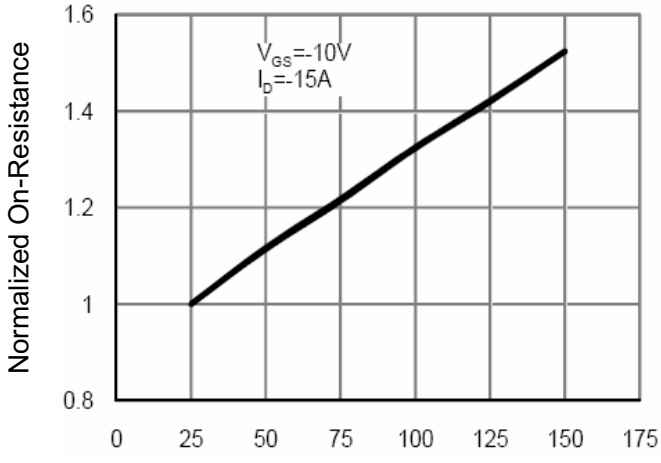



**Figure 4 Drain-Source On-Resistance**




Vgs Gate-Source Voltage (V)

**Figure 5 Transfer Characteristics**




$T_J$-Junction Temperature(℃)

**Figure 6 Drain-Source On-Resistance**

## Characteristics Curve ($T_A$=25°C, unless otherwise noted)

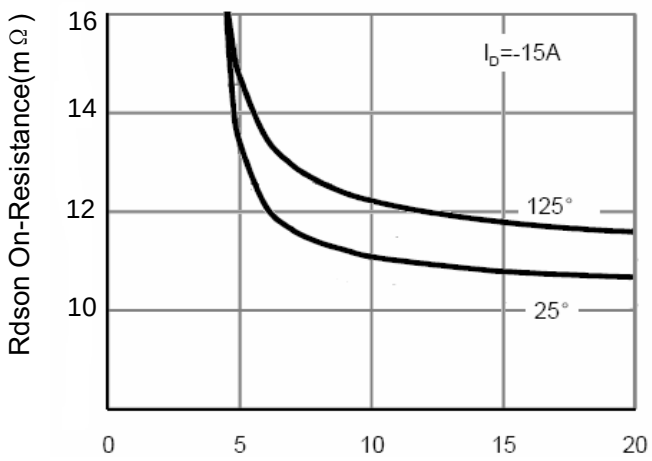



**Figure 7 Rdson vs Vgs**

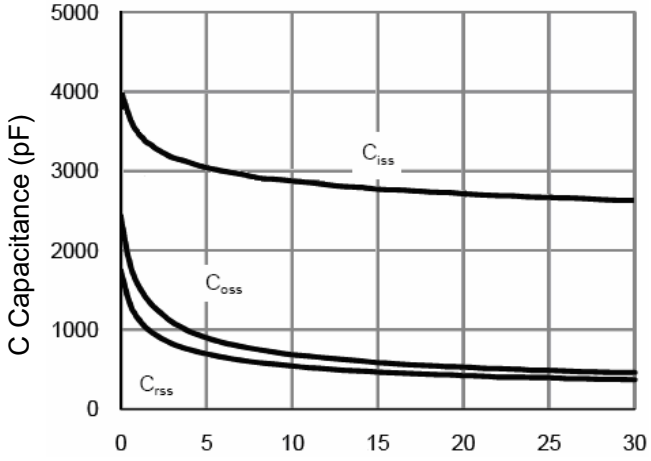



**Figure 8 Capacitance vs Vds**

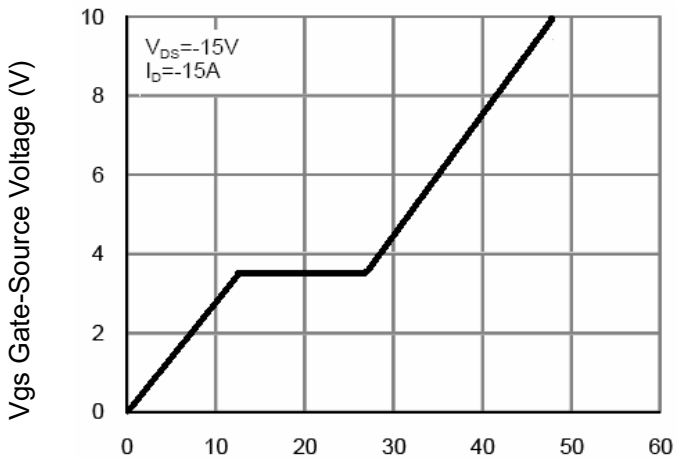



**Figure 9 Gate Charge**

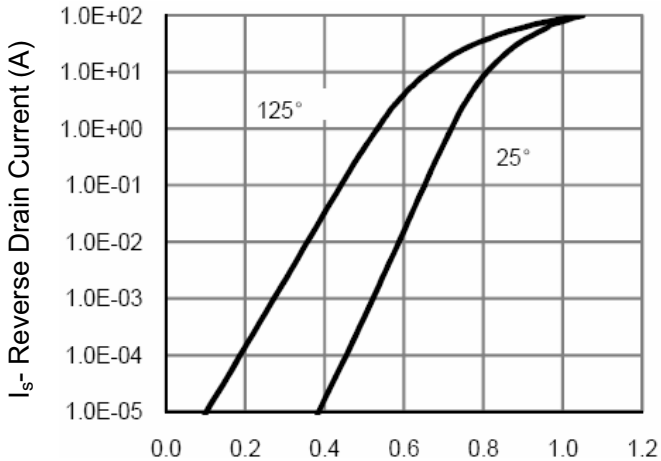



**Figure 10 Source- Drain Diode Forward**

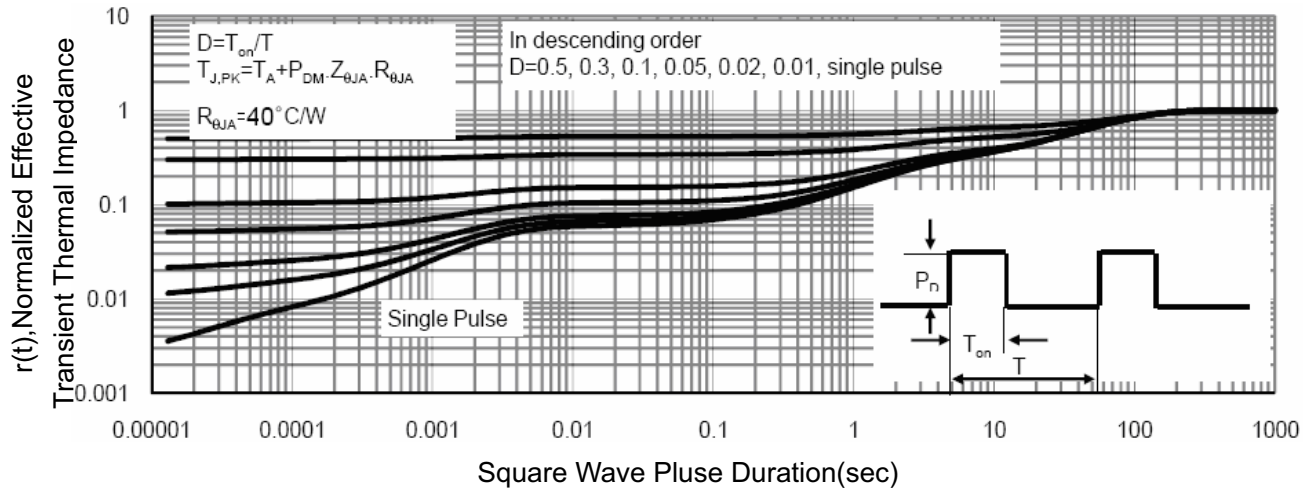
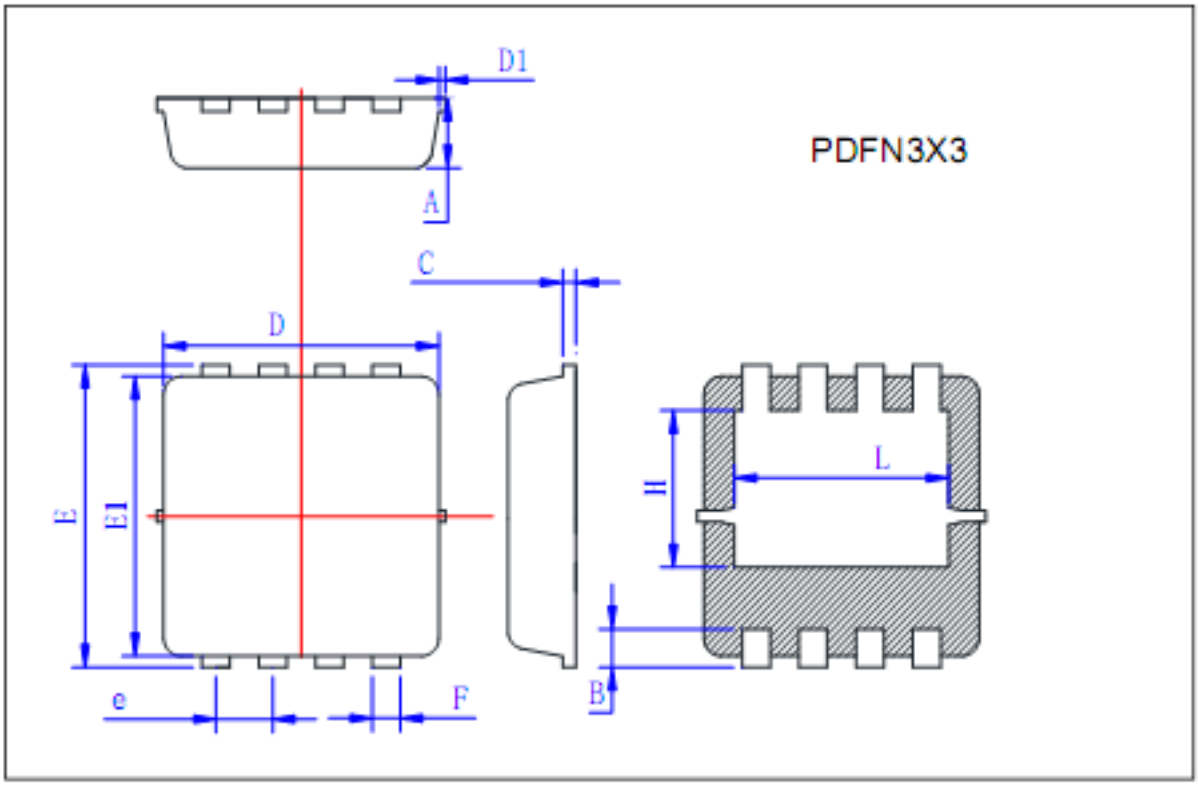



**Figure 11 Normalized Maximum Transient Thermal Impedance**

## PACKAGE OUTLINE DIMENSIONS




| Symbol | Min | Typ | Max |
|---|---|---|---|
| A | 0.725 | 0.775 | 0.825 |
| B | 0.28 | 0.38 | 0.48 |
| C | 0.13 | 0.15 | 0.20 |
| D | 3.05 | 3.15 | 3.25 |
| D1 | | | 0.10 |
| E | 3.25 | 3.35 | 3.45 |
| E1 | 3.0 | 3.1 | 3.2 |
| e | 0.60 | 0.65 | 0.70 |
| F | 0.27 | 0.32 | 0.37 |
| H | 1.63 | 1.73 | 1.83 |
| L | 2.35 | 2.45 | 2.55 |

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