Leiditech

# LMFZ18N50

## 500 V N-Channel Enhancement Mode MOSFET

### FEATURES

- Fast switching
- 100% avalanche tested
- Improved dv/dt capability

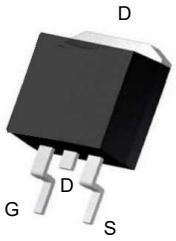
### General Features

- $V_{DS}$ = 500V $I_D$ =18A
- $R_{DS(ON)}$ < 340mΩ @ $V_{GS}$=10V

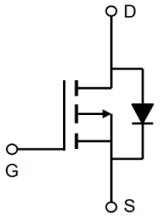
### APPLICATIONS

- Switch Mode Power Supply (SMPS)
- Uninterruptible Power Supply (UPS)
- Power Factor Correction (PFC)

### Dimensions TO-263




### Pin Configuration




### Package Marking and Ordering Information

| Product ID | Pack | Marking | Qty(PCS) |
|---|---|---|---|
| LMFZ18N50 | TO-263 | WVM18N50 | 800 |

### Absolute Maximum Ratings $T_C$ = 25ºC, unless otherwise noted

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Drain-Source Voltage ($V_{GS}$ = 0V) | $V_{DSS}$ | 500 | V |
| Continuous Drain Current | $I_D$ | 18 | A |
| Pulsed Drain Current (note1) | $I_{DM}$ | 72 | A |
| Gate-Source Voltage | $V_{GSS}$ | ±30 | V |
| Single Pulse Avalanche Energy (note2) | $E_{AS}$ | 980 | mJ |
| Avalanche Current (note1) | $I_{AS}$ | 14 | A |
| Repetitive Avalanche Energy (note1) | $E_{AR}$ | 588 | mJ |
| Power Dissipation ($T_C$ = 25ºC) | $P_D$ | 160 | W |
| Operating Junction and Storage Temperature Range | $T_J$, $T_{stg}$ | -55~+150 | ºC |

### Thermal Resistance

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Thermal Resistance, Junction-to-Case | $R_{thJC}$ | 0.6 | K/W |
| Thermal Resistance, Junction-to-Ambient | $R_{thJA}$ | 40 | |

## Specifications $T_J$ = 25ºC, unless otherwise noted

| Parameter | Symbol | Test Conditions | Value | | | Unit |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| **Static** | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}$ = 0V, $I_D$ = 250μA | 500 | -- | -- | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ = 500V, $V_{GS}$ = 0V, $T_J$ = 25ºC | -- | -- | 1 | μA |
| Gate-Source Leakage | $I_{GSS}$ | $V_{GS}$ = ±30V | -- | -- | ±100 | nA |
| Gate-Source Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$ = $V_{GS}$, $I_D$ = 250μA | 3.0 | -- | 4.0 | V |
| Drain-Source On-Resistance (Note3) | $R_{DS(on)}$ | $V_{GS}$ = 10V, $I_D$ = 9A | -- | 0.28 | 0.34 | Ω |
| **Dynamic** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{GS}$ = 0V, $V_{DS}$ = 25V, f = 1.0MHz | -- | 2367 | -- | pF |
| Output Capacitance | $C_{oss}$ | | -- | 228 | -- | |
| Reverse Transfer Capacitance | $C_{rss}$ | | -- | 15 | -- | |
| Total Gate Charge | $Q_g$ | $V_{DD}$ =400V, $I_D$ = 18A, $V_{GS}$ = 10V | -- | 53.4 | -- | nC |
| Gate-Source Charge | $Q_{gs}$ | | -- | 10 | -- | |
| Gate-Drain Charge | $Q_{gd}$ | | -- | 20 | -- | |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DD}$ = 250V, $I_D$ =18A, $R_G$ = 25 Ω | -- | 51.3 | -- | ns |
| Turn-on Rise Time | $t_r$ | | -- | 36.5 | -- | |
| Turn-off Delay Time | $t_{d(off)}$ | | -- | 232 | -- | |
| Turn-off Fall Time | $t_f$ | | -- | 61 | -- | |
| **Drain-Source Body Diode Characteristics** | | | | | | |
| Continuous Body Diode Current | $I_S$ | $T_C$ = 25 ºC | -- | -- | 18 | A |
| Pulsed Diode Forward Current | $I_{SM}$ | | -- | -- | 72 | |
| Body Diode Voltage | $V_{SD}$ | $T_J$ = 25ºC, $I_{SD}$ = 9A, $V_{GS}$ = 0V | -- | -- | 1.4 | V |
| Reverse Recovery Time | $t_{rr}$ | $V_{GS}$ = 0V,$I_S$ = 18A, $di_F/dt$ =100A /μs | -- | 497 | -- | ns |
| Reverse Recovery Charge | $Q_{rr}$ | | -- | 4 | -- | μC |

**Notes**

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. L=10mH, $V_{DD}$ = 50V, $R_G$ = 25 Ω, Starting $T_J$ = 25 ºC
3. Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 1%

## Typical Characteristics $T_J$ = 25ºC, unless otherwise noted

**Figure 1. Output Characteristics ($T_J$= 25ºC)**

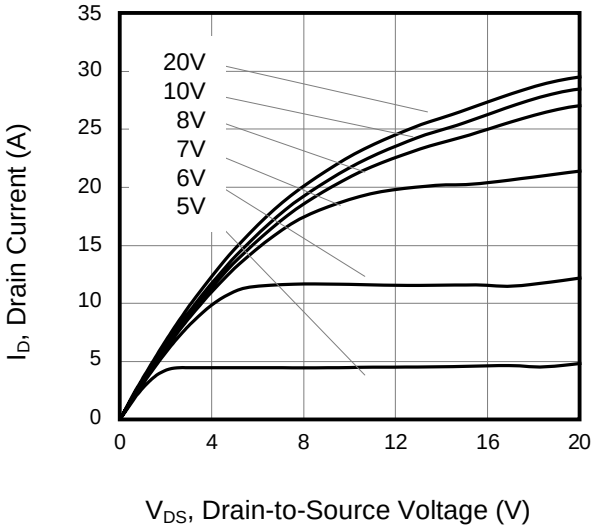



**Figure 2. Body Diode Forward Voltage**

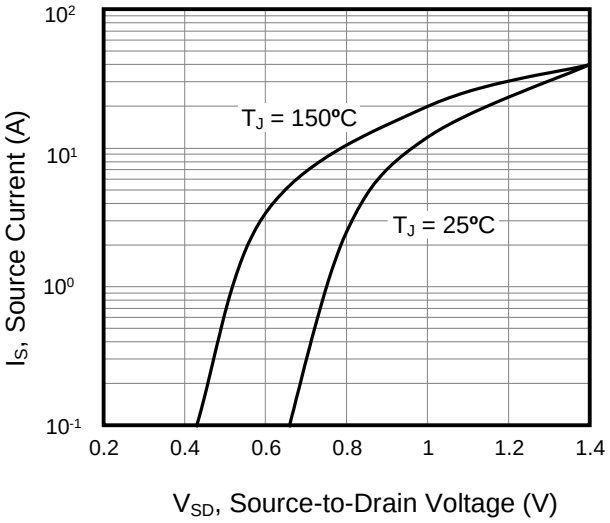



**Figure 3. Drain Current vs. Temperature**

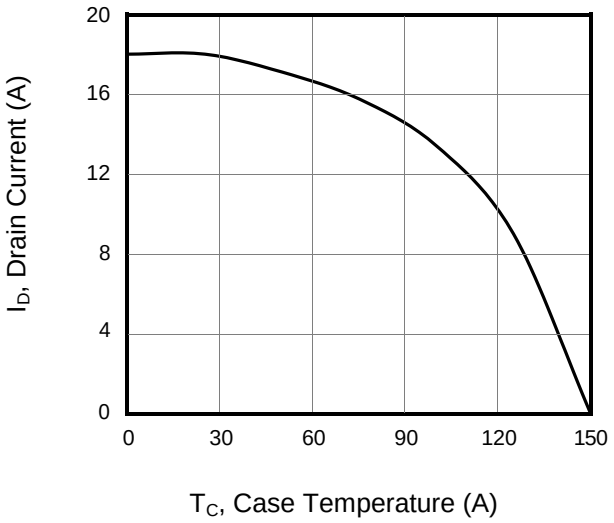



**Figure 4. $BV_{DSS}$ Variation vs. Temperature**

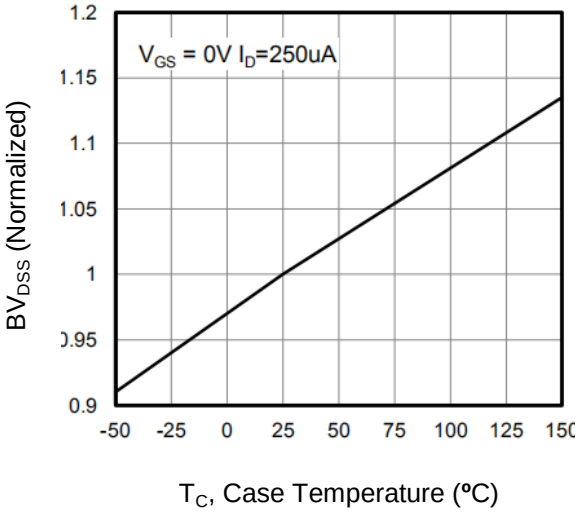



**Figure 5. Transfer Characteristics**

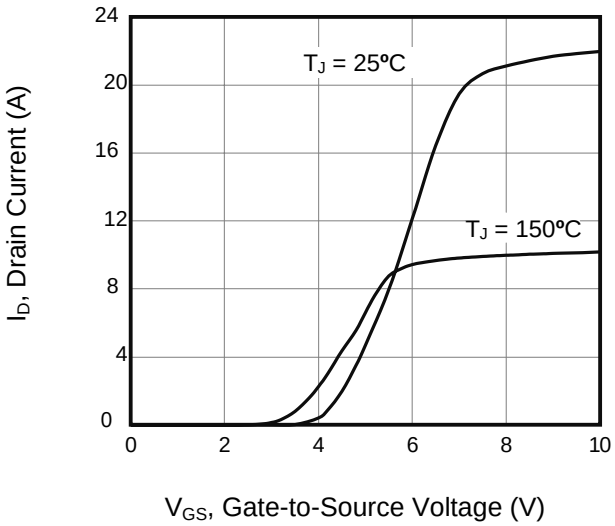
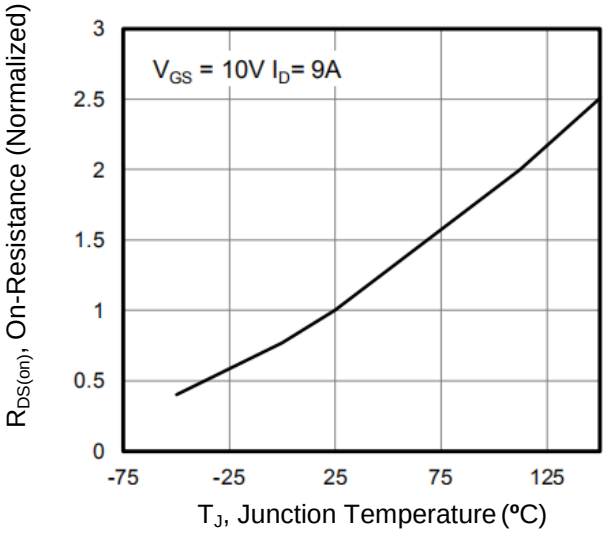



**Figure 6. On-Resistance vs. Temperature**



**Typical Characteristics** $T_J$ = 25ºC, unless otherwise noted

**Figure 7. Capacitance**

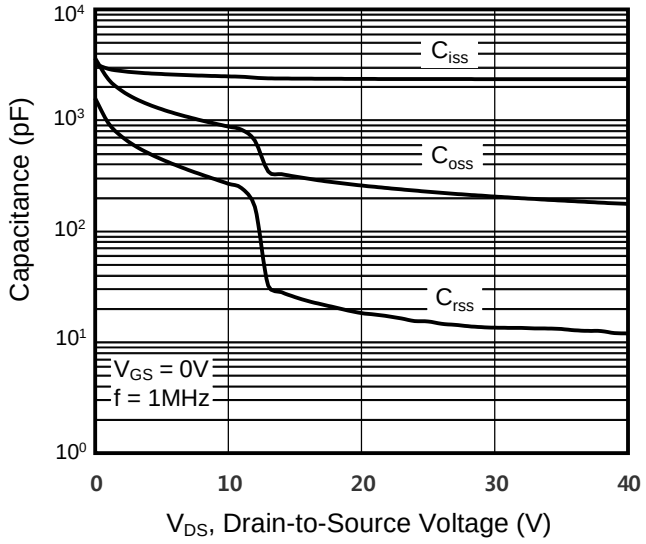



**Figure 8. Gate Charge**

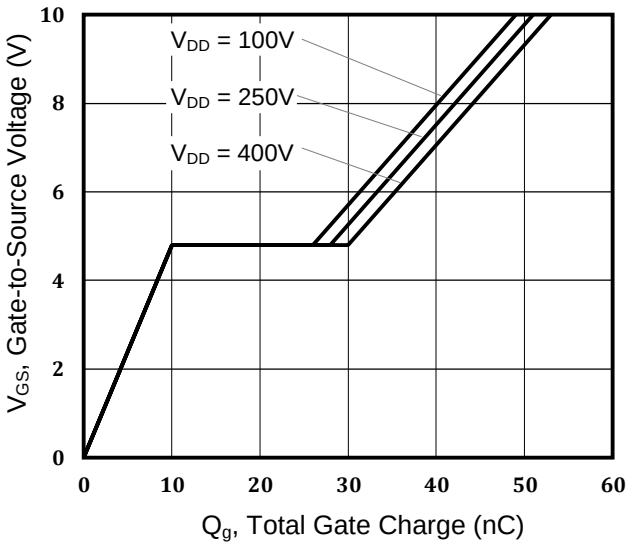


**Figure A：Gate Charge Test Circuit and Waveform**

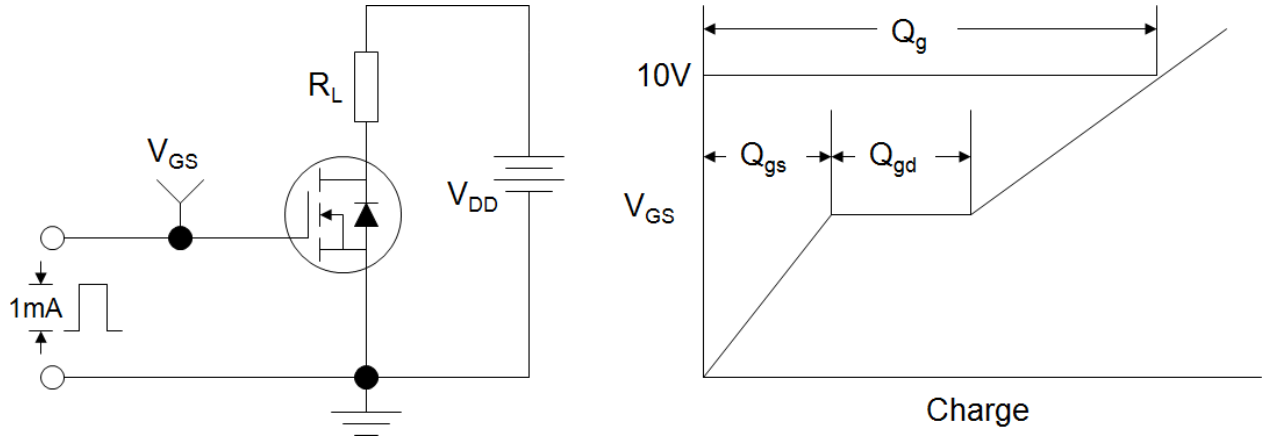



**Figure B：Resistive Switching Test Circuit and Waveform**

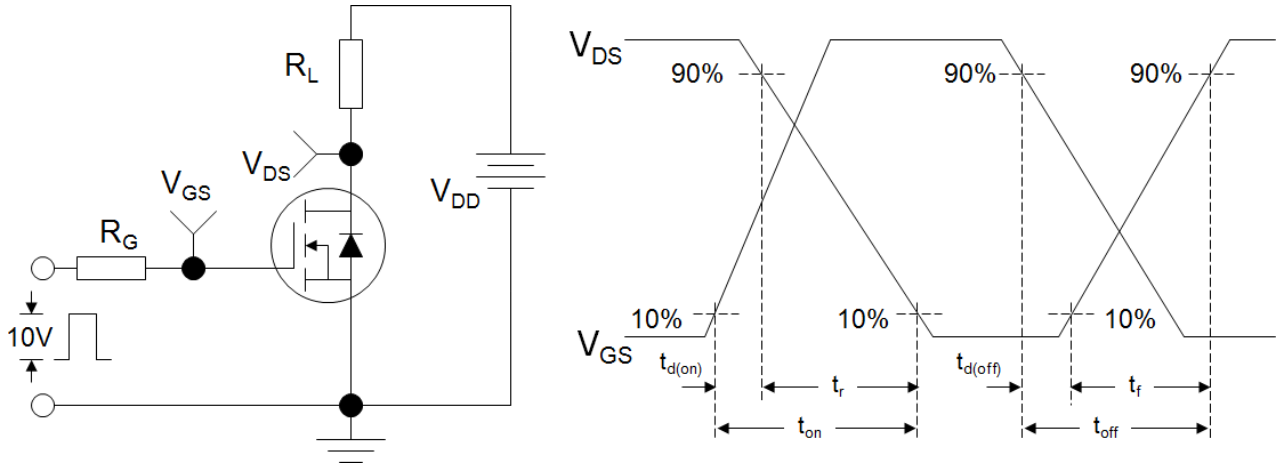
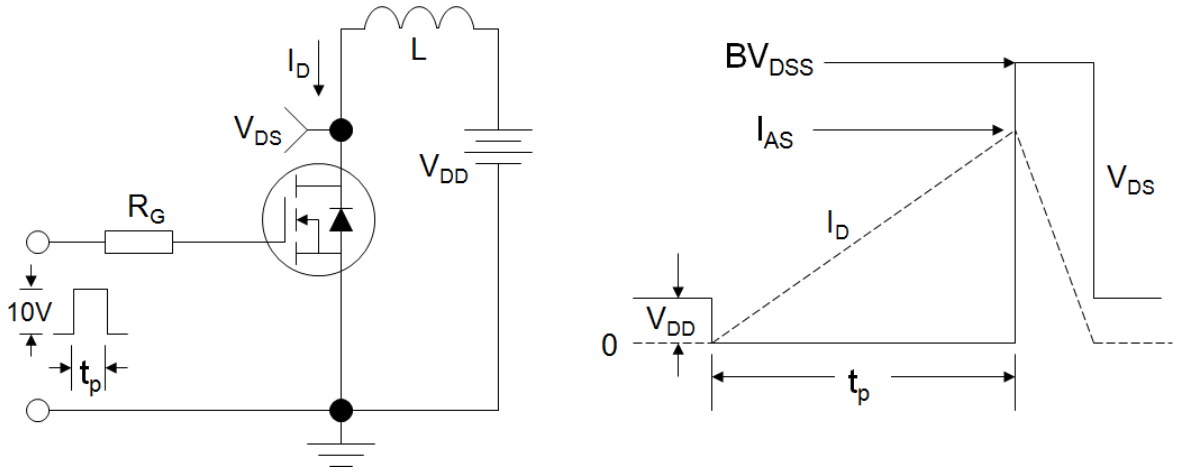
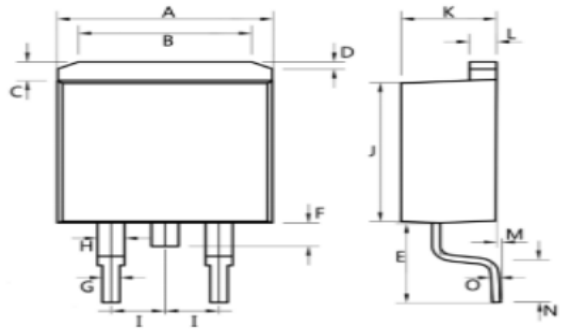



**Figure C：Unclamped Inductive Switching Test Circuit and Waveform**



## Package Mechanical Data

TO-263




| Dim. | Min. | Max. |
|---|---|---|
| A | 10.0 | 10. 5 |
| B | 7.25 | 7.75 |
| C | 1.3 | 1.5 |
| D | 0.55 | 0.75 |
| E | 5.0 | 6.0 |
| F | 1.4 | 1.6 |
| G | 0.75 | 0.95 |
| H | 1.15 | 1.35 |
| I | Typ 2.54 | |
| J | 8.4 | 8.6 |
| K | 4.4 | 4.6 |
| L | 1.25 | 1.45 |
| M | 0.02 | 0.1 |
| N | 2.4 | 2.8 |
| O | 0.35 | 0.45 |
| All Dimensions in millimeter | | |

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