

## LMN7002KTFF 60V N-Channel Enhancement Mode MOSFET

### Features

- 60V/0.5A,  $R_{DS(ON)} = 3.0\Omega @ V_{GS} = 10V$
- 60V/0.4A,  $R_{DS(ON)} = 4.0\Omega @ V_{GS} = 4.5V$
- Super high density cell design for extremely low  $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- ESD Protection (2KV) Diode design-in
- DFN1006-3L package design

These devices are particularly suited for low voltage power management, such as smart phone and notebook computer and other battery powered circuits, and low in-line power loss are needed in commercial industrial surface mount applications.

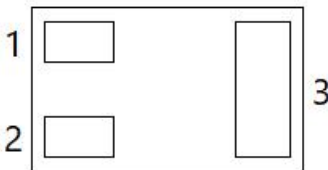
### Product Description

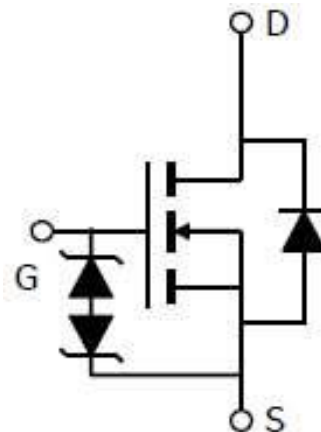
LMN7002K, N-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent  $R_{DS(ON)}$ , low gate charge.

### Applications

- Drivers: Relays, Solenoids, Lamps, Hammers, Display, Memories, Transistors, etc.
- High saturation current capability.
- Direct Logic-Level Interface: TTL/CMOS
- Battery Operated Systems
- Solid-State Relays

### Pin Configuration

| LMN7002KTFF (DFN1006-3L)                                                                                         |             |
|------------------------------------------------------------------------------------------------------------------|-------------|
|  <p>Transparent Top Views</p> |             |
| Pin                                                                                                              | Description |
| 1                                                                                                                | Gate        |
| 2                                                                                                                | Source      |
| 3                                                                                                                | Drain       |



**Ordering Information**

| Part Number | P/N      | PKG Code | Pb Free Code | Package    | Quantity Reel |
|-------------|----------|----------|--------------|------------|---------------|
| LMN7002KTFF | LMN7002K | TF       | F            | DFN1006-3L | 10000 pcs     |

**Marking Information**

| Part Marking | Part Number | LFC code |
|--------------|-------------|----------|
| e WMM        | e           | WMM      |

**Absolute Maximum Ratings**

(T<sub>A</sub>=25°C Unless otherwise noted)

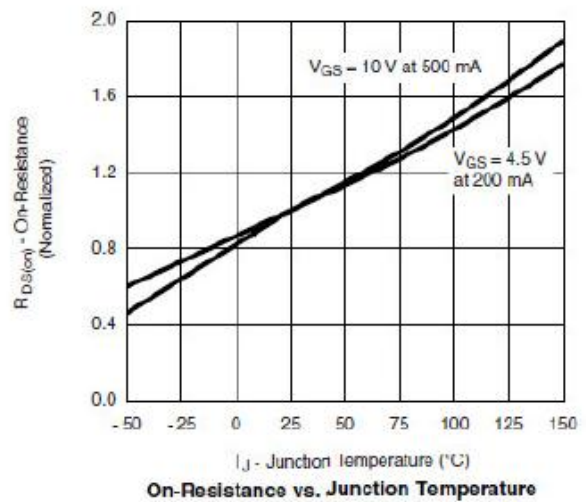
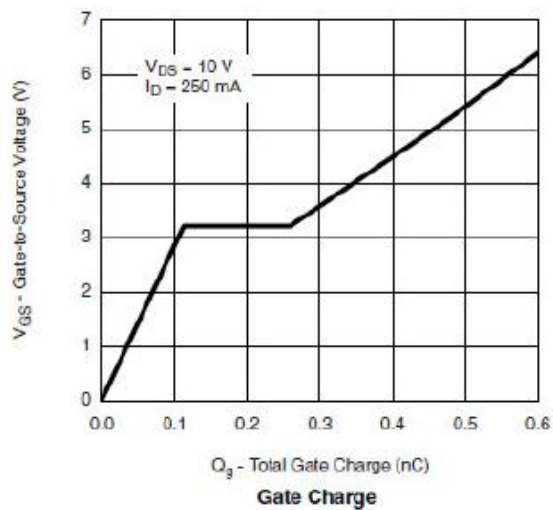
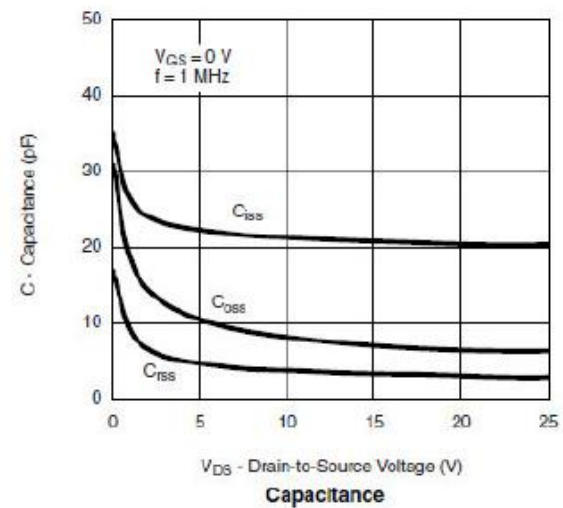
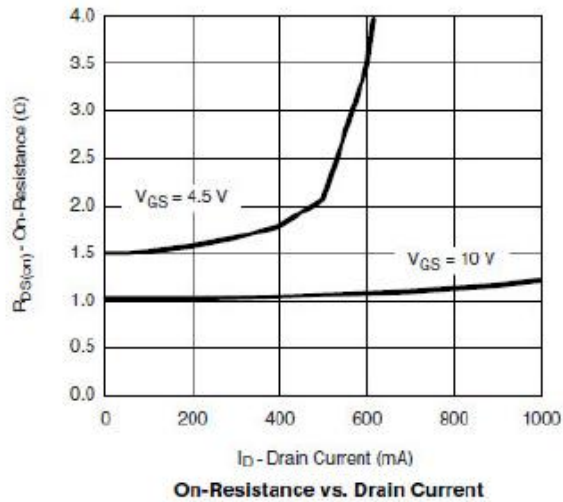
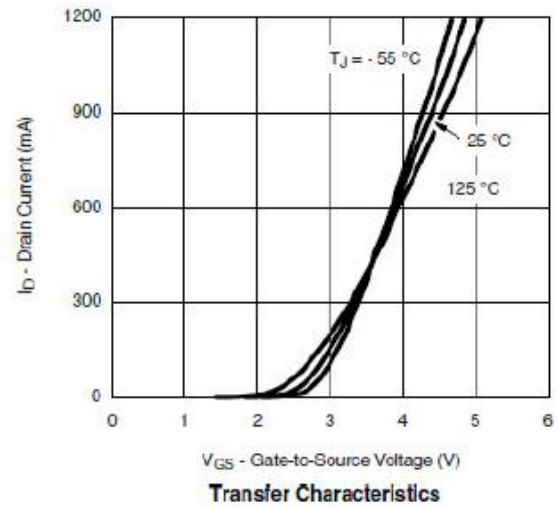
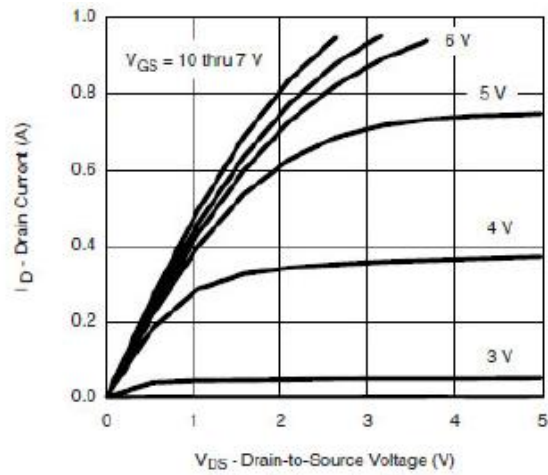
| Symbol           | Parameter                              |                      | Typical     | Unit |
|------------------|----------------------------------------|----------------------|-------------|------|
| V <sub>DSS</sub> | Drain-Source Voltage                   |                      | 60          | V    |
| V <sub>GSS</sub> | Gate-Source Voltage                    |                      | ±20         | V    |
| I <sub>D</sub>   | Continuous Drain Current               | T <sub>A</sub> =25°C | 0.27        | A    |
|                  |                                        | T <sub>A</sub> =70°C | 0.21        |      |
| I <sub>DM</sub>  | Pulsed Drain Current                   |                      | 0.90        | A    |
| P <sub>D</sub>   | Power Dissipation                      | T <sub>A</sub> =25°C | 0.35        | W    |
|                  |                                        | T <sub>A</sub> =70°C | 0.22        |      |
| T <sub>J</sub>   | Operating Junction Temperature Range   |                      | -55 to +150 | °C   |
| T <sub>STG</sub> | Storage Temperature Range              |                      | -55 to +150 | °C   |
| R <sub>θJA</sub> | Thermal Resistance-Junction to Ambient |                      | 357         | °C/W |

## Electrical Characteristics

(T<sub>A</sub>=25°C Unless otherwise noted)

| Symbol               | Parameter                      | Conditions                                                                                                    | Min | Typ | Max | Unit |
|----------------------|--------------------------------|---------------------------------------------------------------------------------------------------------------|-----|-----|-----|------|
| Static               |                                |                                                                                                               |     |     |     |      |
| V <sub>(BR)DSS</sub> | Drain-Source Breakdown Voltage | V <sub>GS</sub> =0V, I <sub>D</sub> =250uA                                                                    | 60  |     |     | V    |
| V <sub>GS(th)</sub>  | Gate Threshold Voltage         | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA                                                      | 1.0 |     | 2.0 | V    |
| I <sub>GSS</sub>     | Gate Leakage Current           | V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V                                                                    |     |     | 10  | uA   |
| I <sub>DSS</sub>     | Drain-Source Leakage Current   | V <sub>DS</sub> =48V, V <sub>GS</sub> =0V                                                                     |     |     | 1   | uA   |
|                      |                                | V <sub>DS</sub> =48V, V <sub>GS</sub> =0V, T <sub>J</sub> =85°C                                               |     |     | 30  |      |
| R <sub>DS(on)</sub>  | Drain-Source On-Resistance     | V <sub>GS</sub> =10V, I <sub>D</sub> =0.5A                                                                    |     | 1.9 | 3.0 | Ω    |
|                      |                                | V <sub>GS</sub> =4.5V, I <sub>D</sub> =0.4A                                                                   |     | 2.4 | 4.0 |      |
| g <sub>FS</sub>      | Forward Transconductance       | V <sub>DS</sub> =10V, I <sub>D</sub> =0.2A                                                                    |     | 0.5 |     | S    |
| V <sub>SD</sub>      | Diode Forward Voltage          | V <sub>GS</sub> =0V, I <sub>S</sub> =0.5A                                                                     |     | 0.7 | 1.3 | V    |
| Dynamic              |                                |                                                                                                               |     |     |     |      |
| C <sub>iss</sub>     | Input Capacitance              | V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1MHz                                                             |     | 30  |     | pF   |
| C <sub>oss</sub>     | Output Capacitance             |                                                                                                               |     | 8   |     |      |
| C <sub>rss</sub>     | Reverse Transfer Capacitance   |                                                                                                               |     | 5   |     |      |
| Q <sub>g</sub>       | Total Gate Charge              | V <sub>DS</sub> =10V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =0.25A                                            |     | 500 |     | pC   |
| Q <sub>gs</sub>      | Gate-Source Charge             |                                                                                                               |     | 100 |     |      |
| Q <sub>gd</sub>      | Gate-Drain Charge              |                                                                                                               |     | 150 |     |      |
| t <sub>d(on)</sub>   | Turn-On Time                   | V <sub>DD</sub> =30V, I <sub>D</sub> =0.2A, V <sub>GS</sub> =4.5V, R <sub>L</sub> = 150Ω, R <sub>G</sub> =10Ω |     | 10  | 20  | ns   |
| T <sub>r</sub>       |                                |                                                                                                               |     | 35  | 50  |      |
| t <sub>d(off)</sub>  | Turn-Off Time                  |                                                                                                               |     | 20  | 30  |      |
| T <sub>f</sub>       |                                |                                                                                                               |     | 40  | 60  |      |

## Typical Performance Characteristics



**Typical Performance Characteristics (continue.)**
