

# N-Channel Enhancement Mode MOSFET

## 1 Features

- $V_{DS} = 20V$ ,  $I_D = 1.2A$
- $R_{DS(ON)} = 110m\Omega @ V_{GS} = 4.5V$
- $R_{DS(ON)} = 145m\Omega @ V_{GS} = 2.5V$
- High Power and current handling capability
- Lead free product is acquired
- ESD Protected Up to 2.0KV (HBM)
- Package DFN1006-3L

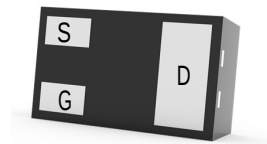
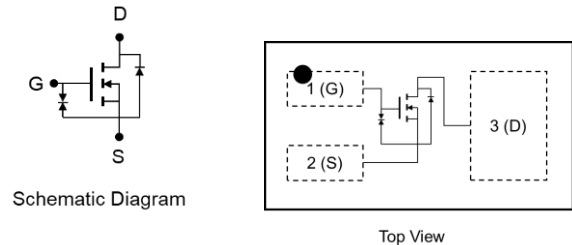
## 2 Applications

- PWM applications
- Load switch
- Power management

## 3 Description

The SLMN320V1CN provide the best combination of fast switching, low on-resistance and cost-effectiveness. The MOSFET uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 0.7V. This device is suitable for use as a load switch or in PWM applications.

## 4 Pin Configuration and Top View



**DFN1006-3L**

## 5 Device Information

| PART NUMBER | PACKAGE    | BODY SIZE (NOM)  |
|-------------|------------|------------------|
| SLMN320V1CN | DFN1006-3L | 1.00 mm x 0.60mm |

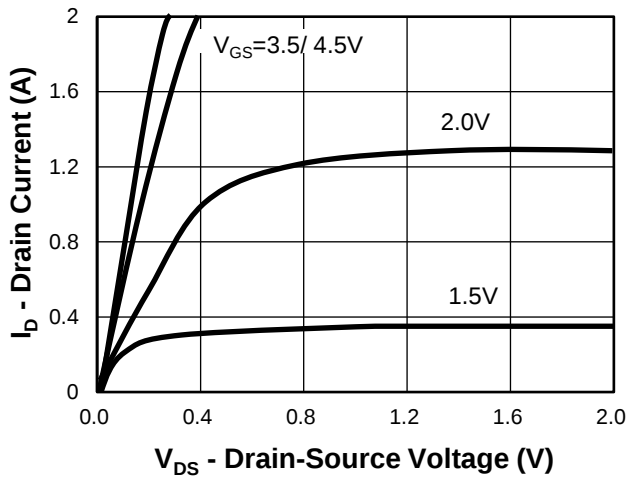
## 6 Absolute maximum Ratings @25°C

| RATING                                  | SYMBOL          | VALUE       | UNITS |
|-----------------------------------------|-----------------|-------------|-------|
| Drain-Source Voltage                    | $V_{DS}$        | 20          | V     |
| Gate-Source Voltage                     | $V_{GS}$        | $\pm 10$    | V     |
| Continuous Drain Current                | $I_D$           | 1.2         | A     |
| Pulsed Drain Current                    | $I_{DP}$        | 5           | A     |
| Total power dissipation                 | $P_D$           | 350         | mW    |
| Channel temperature                     | $T_J$           | 150         | °C    |
| Range of storage temperature            | $T_{STG}$       | -55 to +150 | °C    |
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 357         | °C/W  |

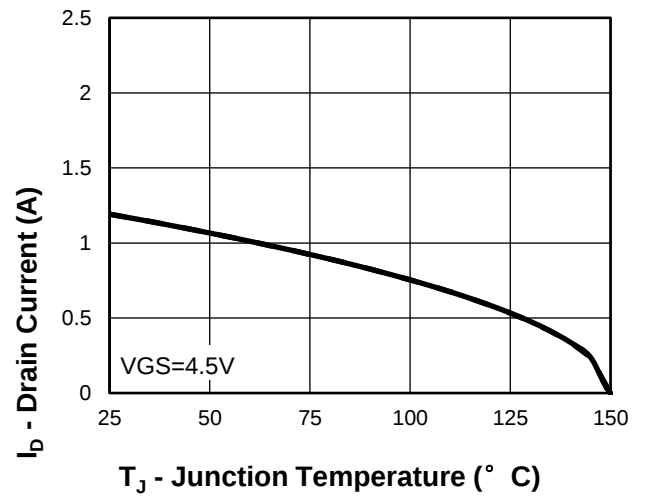
**7 Electrical characteristics (@25°C unless otherwise specified)**

| PARAMETER                               | SYMBOL              | CONDITIONS                                                                               | MIN. | TYP. | MAX. | UNITS |
|-----------------------------------------|---------------------|------------------------------------------------------------------------------------------|------|------|------|-------|
| Static Characteristics                  |                     |                                                                                          |      |      |      |       |
| Drain-Source Breakdown Voltage          | BV <sub>DSS</sub>   | I <sub>D</sub> = 250μA, V <sub>GS</sub> = 0V                                             | 20   |      |      | V     |
| Gate Threshold Voltage                  | V <sub>GS(th)</sub> | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA                               | 0.5  | 0.7  | 1.1  | V     |
| Drain Cut Off Current                   | I <sub>DSS</sub>    | V <sub>DS</sub> = 20V, V <sub>GS</sub> = 0V                                              |      |      | 1    | μA    |
| Gate Leakage Current                    | I <sub>GSS</sub>    | V <sub>GS</sub> = ±10V, V <sub>DS</sub> = 0V                                             |      |      | ±10  | μA    |
| Drain-Source ON Resistance              | R <sub>DS(ON)</sub> | V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 0.5A                                            |      | 110  | 200  | mΩ    |
|                                         |                     | V <sub>GS</sub> = 2.5V, I <sub>D</sub> = 0.4A                                            |      | 145  | 260  | mΩ    |
| Dynamic Characteristics                 |                     |                                                                                          |      |      |      |       |
| Total Gate Charge                       | Q <sub>G</sub>      | V <sub>DS</sub> =10V,<br>I <sub>D</sub> =0.75A,<br>V <sub>GS</sub> = 4.5V                |      | 1    |      | nC    |
| Gate-Source Charge                      | Q <sub>GS</sub>     |                                                                                          |      | 0.28 |      | nC    |
| Gate-Drain Charge                       | Q <sub>GD</sub>     |                                                                                          |      | 0.22 |      | nC    |
| Input Capacitance                       | C <sub>ISS</sub>    | V <sub>DS</sub> = 10V,<br>V <sub>GS</sub> = 0V,<br>f = 1.0MHz                            |      | 60   |      | pF    |
| Reverse Transfer Capacitance            | C <sub>RSS</sub>    |                                                                                          |      | 12   |      | pF    |
| Output Capacitance                      | C <sub>OSS</sub>    |                                                                                          |      | 22   |      | pF    |
| Turn-On Delay Time                      | t <sub>d(on)</sub>  | V <sub>GS</sub> =4.5V, V <sub>DS</sub> =10V<br>I <sub>D</sub> =0.5A, R <sub>G</sub> =10Ω |      | 2    |      | ns    |
| Turn-Off Delay Time                     | t <sub>d(off)</sub> |                                                                                          |      | 10   |      | ns    |
| Rise Time                               | t <sub>r</sub>      |                                                                                          |      | 19   |      | ns    |
| Fall Time                               | t <sub>f</sub>      |                                                                                          |      | 23   |      | ns    |
| Drain-Source Body Diode Characteristics |                     |                                                                                          |      |      |      |       |
| Source-Drain Diode Forward Voltage      | V <sub>SD</sub>     | I <sub>S</sub> = 1A, V <sub>GS</sub> = 0V                                                |      | 0.9  | 1.2  | V     |

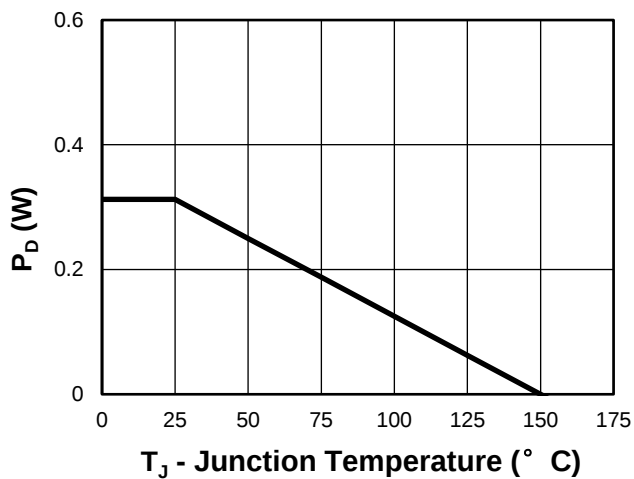
## 8 Typical Characteristics



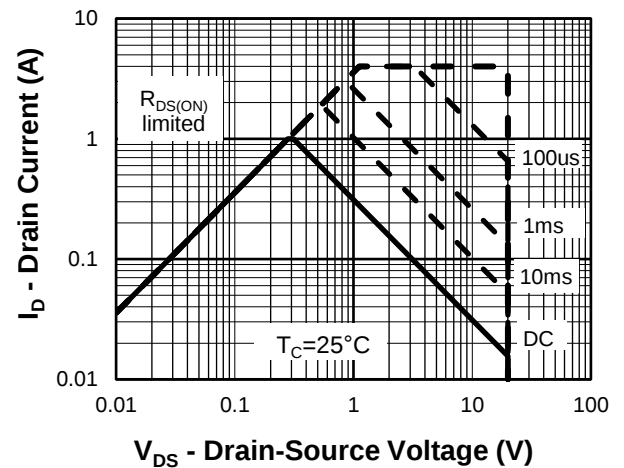
**Fig 1. Output Characteristics**



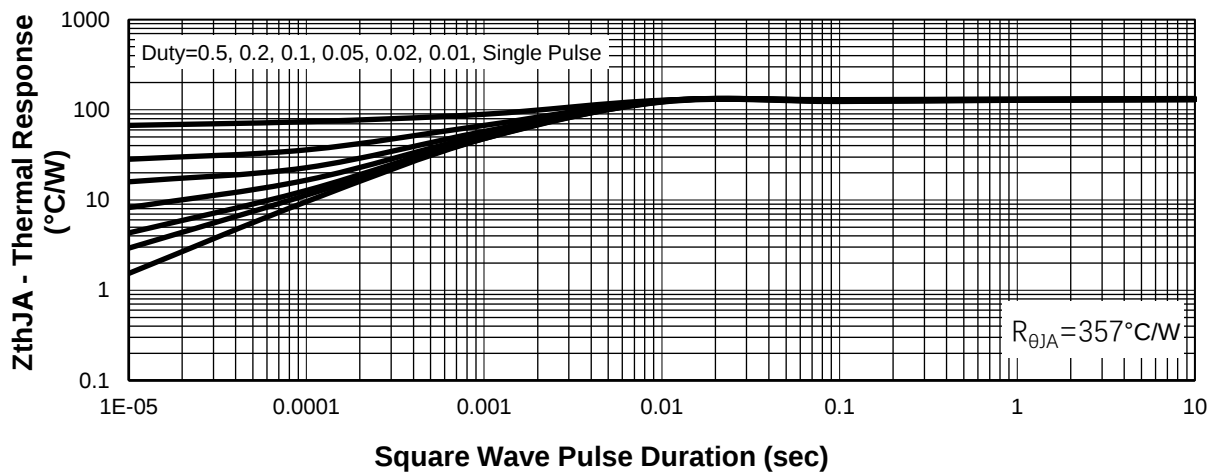
**Fig 2. Drain Current**



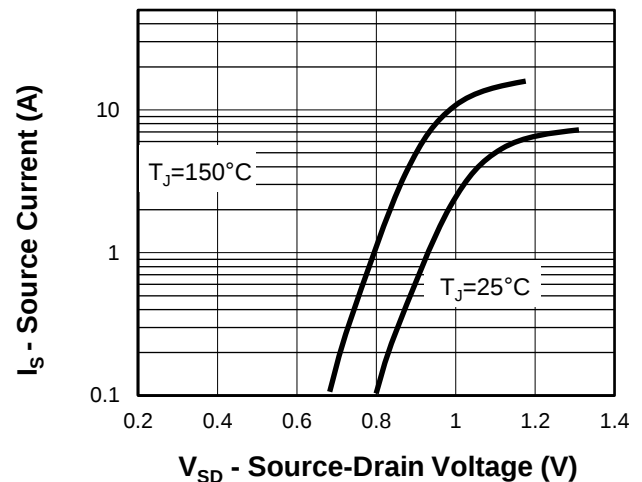
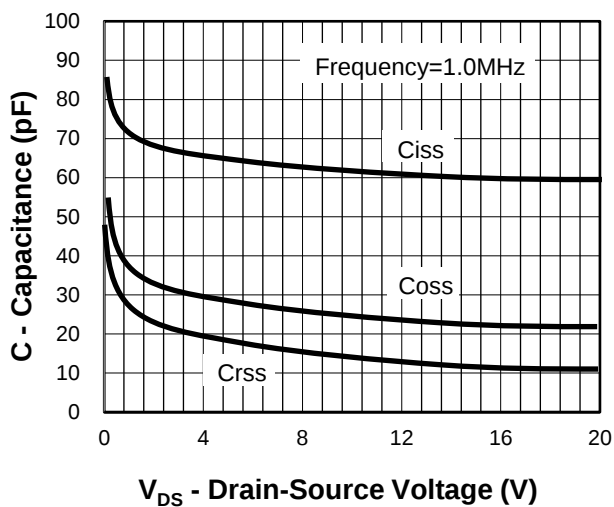
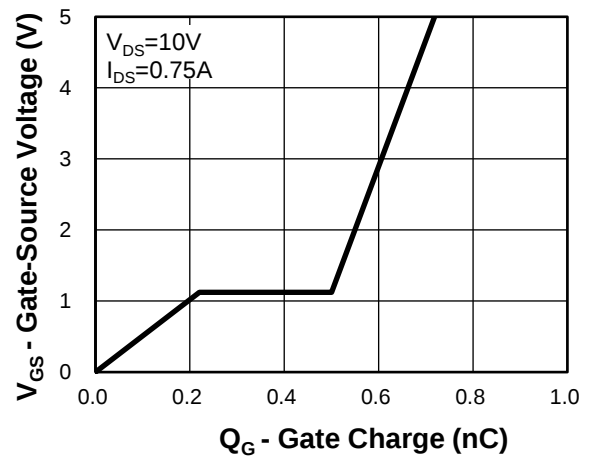
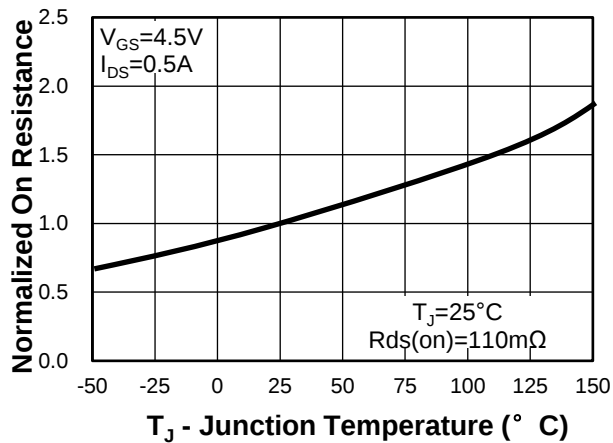
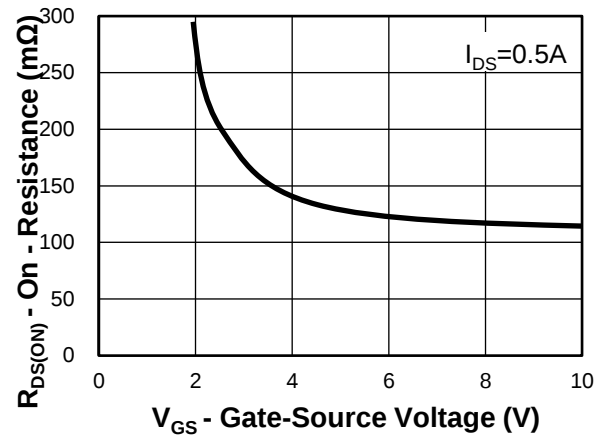
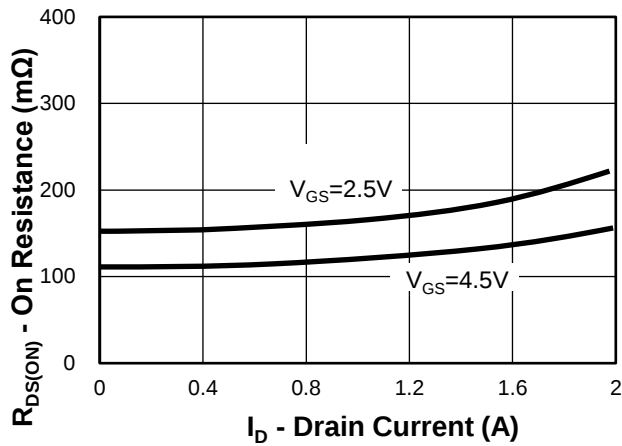
**Fig 3. Power Dissipation**



**Fig 4. Safe Operation Area(SOA)**

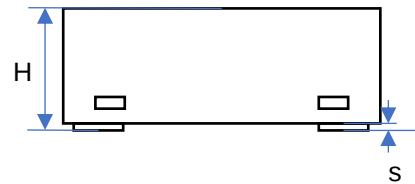
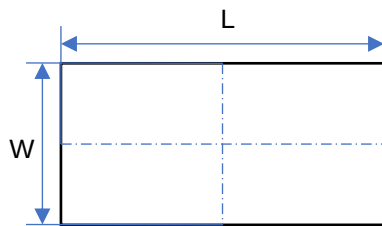


**Fig 5. Thermal Transient Impedance**

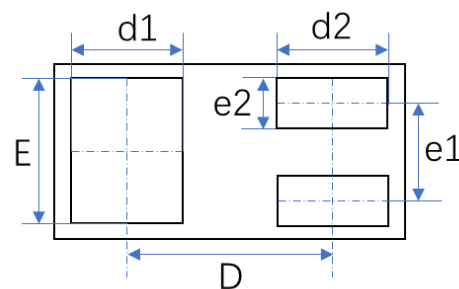


## 9 Product dimension

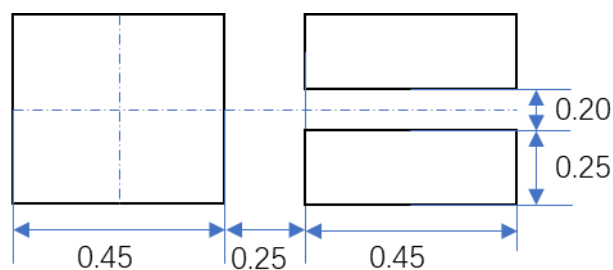
### DFN1006-3L



| DIM | UNITS (mm) |      |      |
|-----|------------|------|------|
|     | MIN.       | TYP. | MAX. |
| L   | 0.95       | 1.00 | 1.05 |
| W   | 0.55       | 0.6  | 0.65 |
| H   | 0.45       | 0.52 | 0.58 |
| s   | 0.00       | -    | 0.05 |
| D   | -          | 0.65 | -    |
| E   | 0.45       | 0.50 | 0.55 |
| d1  | 0.20       | 0.25 | 0.30 |
| d2  | 0.20       | 0.25 | 0.30 |
| e1  | -          | 0.35 | -    |
| e2  | 0.10       | 0.15 | 0.20 |



## 10 PCB Layout Footprints (Units: mm)



## 11 Ordering Information

| Part Number | Packaging         | Reel Size |
|-------------|-------------------|-----------|
| SLMN320V1CN | 10000/Tape & Reel | 7 inch    |