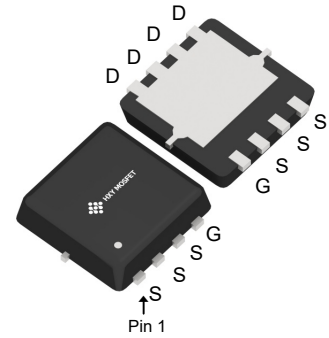


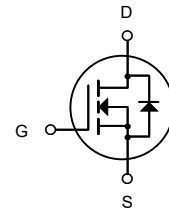


Description

The DMN3009SFGQ-7 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.



DFN3X3-8L



N-Channel MOSFET

General Features

$V_{DS} = 30V$ $I_D = 60A$

$R_{DS(ON)} < 5.5m\Omega @ V_{GS}=10V$

Application

Battery protection

Load switch

Uninterruptible power supply

Ordering Information

| Product ID | Pack | Brand | Qty(PCS) |
|---------------|-----------|------------|----------|
| DMN3009SFGQ-7 | DFN3X3-8L | HXY MOSFET | 5000 |

Absolute Maximum Ratings (Tc=25 °C unless otherwise specified)

| Symbol | Parameter | Rating | Units |
|-------------------------|--|------------|--------------|
| V_{DS} | Drain-Source Voltage | 30 | V |
| V_{GS} | Gate-Source Voltage | ± 20 | V |
| $I_D @ T_C=25^\circ C$ | Continuous Drain Current, $V_{GS} @ 10V^1$ | 60 | A |
| $I_D @ T_C=100^\circ C$ | Continuous Drain Current, $V_{GS} @ 10V^1$ | 42 | A |
| I_{DM} | Pulsed Drain Current ² | 192 | A |
| EAS | Single Pulse Avalanche Energy ³ | 144.7 | mJ |
| I_{AS} | Avalanche Current | 53.8 | A |
| $P_D @ T_C=25^\circ C$ | Total Power Dissipation ⁴ | 62.5 | W |
| $P_D @ T_A=25^\circ C$ | Total Power Dissipation ⁴ | 4.5 | W |
| T_{STG} | Storage Temperature Range | -55 to 150 | $^\circ C$ |
| T_J | Operating Junction Temperature Range | -55 to 150 | $^\circ C$ |
| $R_{\theta JA}$ | Thermal Resistance Junction-ambient ¹ | 62 | $^\circ C/W$ |
| $R_{\theta JC}$ | Thermal Resistance Junction-Case ¹ | 2.4 | $^\circ C/W$ |



Electrical Characteristics (T_J=25°C, unless otherwise noted)

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|-------------------------------------|--|--|------|--------|------|-------|
| B _V DSS | Drain-Source Breakdown Voltage | V _{GS} =0V , I _D =250uA | 30 | --- | --- | V |
| ΔB _V DSS/ΔT _J | BVDSS Temperature Coefficient | Reference to 25°C , I _D =1mA | --- | 0.0213 | --- | V/°C |
| R _{DS(ON)} | Static Drain-Source On-Resistance ² | V _{GS} =10V , I _D =30A | --- | 4 | 5.5 | mΩ |
| | | V _{GS} =4.5V , I _D =15A | | 5.2 | 6 | |
| V _{GS(th)} | Gate Threshold Voltage | V _{GS} =V _{DS} , I _D =250uA | 1.0 | --- | 2.5 | V |
| ΔV _{GS(th)} | V _{GS(th)} Temperature Coefficient | | --- | -5.8 | --- | mV/°C |
| I _{DSS} | Drain-Source Leakage Current | V _{DS} =24V , V _{GS} =0V , T _J =25°C | --- | --- | 1 | uA |
| | | V _{DS} =24V , V _{GS} =0V , T _J =55°C | --- | --- | 5 | |
| I _{GSS} | Gate-Source Leakage Current | V _{GS} =±20V , V _{DS} =0V | --- | --- | ±100 | nA |
| g _{fs} | Forward Transconductance | V _{DS} =5V , I _D =30A | --- | 26.5 | --- | S |
| R _g | Gate Resistance | V _{DS} =0V , V _{GS} =0V , f=1MHz | --- | 1.4 | --- | Ω |
| Q _g | Total Gate Charge (4.5V) | V _{DS} =15V , V _{GS} =4.5V , I _D =15A | --- | 31.6 | --- | nC |
| Q _{gs} | Gate-Source Charge | | --- | 8.6 | --- | |
| Q _{gd} | Gate-Drain Charge | | --- | 11.7 | --- | |
| T _{d(on)} | Turn-On Delay Time | V _{DD} =15V , V _{GS} =10V , R _G =3.3Ω , I _D =15A | --- | 9 | --- | ns |
| T _r | Rise Time | | --- | 19 | --- | |
| T _{d(off)} | Turn-Off Delay Time | | --- | 58 | --- | |
| T _f | Fall Time | | --- | 15.2 | --- | |
| C _{iss} | Input Capacitance | V _{DS} =15V , V _{GS} =0V , f=1MHz | --- | 3075 | --- | pF |
| C _{oss} | Output Capacitance | | --- | 400 | --- | |
| C _{rss} | Reverse Transfer Capacitance | | --- | 315 | --- | |
| I _S | Continuous Source Current ^{1,6} | V _{GS} =V _D =0V , Force Current | --- | --- | 60 | A |
| I _{SM} | Pulsed Source Current ^{2,6} | | --- | --- | 192 | A |
| V _{SD} | Diode Forward Voltage ² | V _{GS} =0V , I _S =1A , T _J =25°C | --- | --- | 1 | V |

Note :

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.
- 2.The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%
- 3 .The EAS data shows Max. rating . The test condition is V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=34A
- 4.The power dissipation is limited by 150°C junction temperature
- 5 .The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.



Typical Characteristics

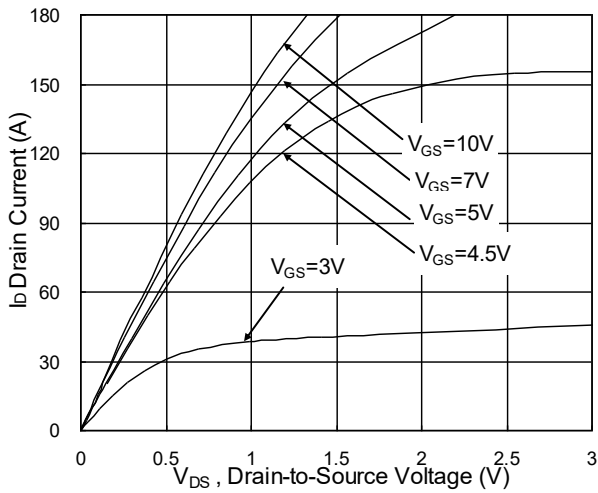


Fig.1 Typical Output Characteristics



Fig.2 On-Resistance vs. G-S Voltage



Fig.3 Forward Characteristics of Reverse



Fig.4 Gate-Charge Characteristics

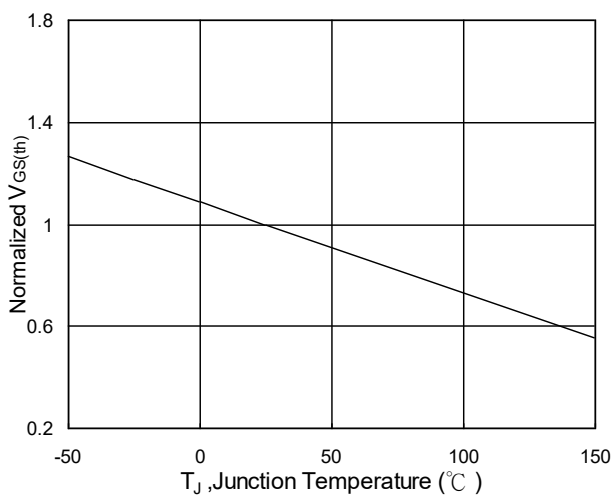


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

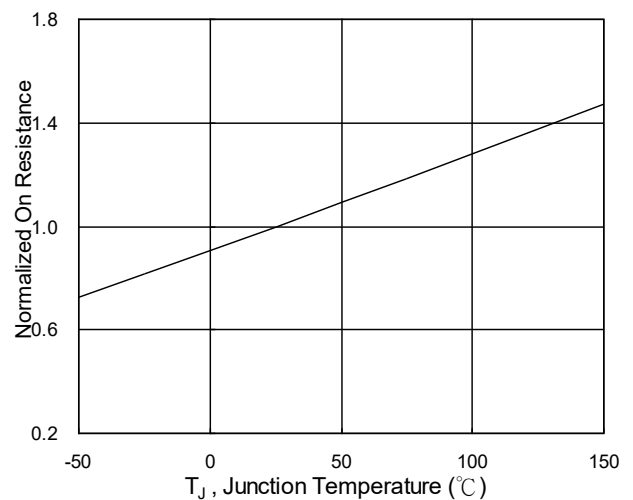


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

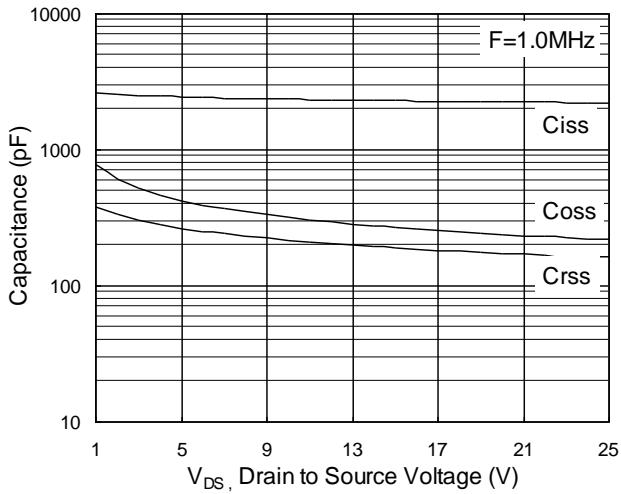


Fig.7 Capacitance

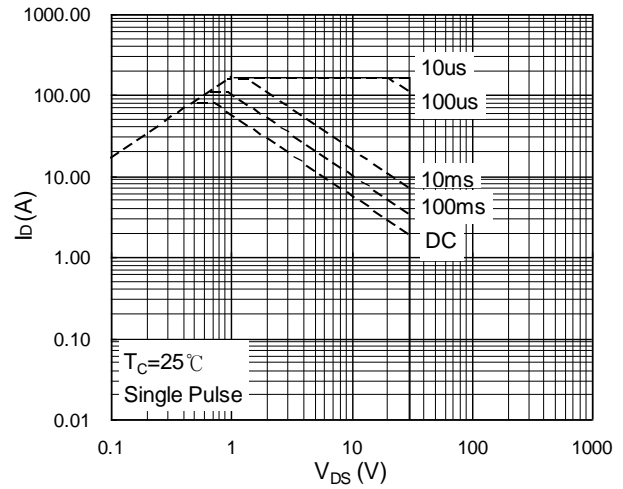


Fig.8 Safe Operating Area

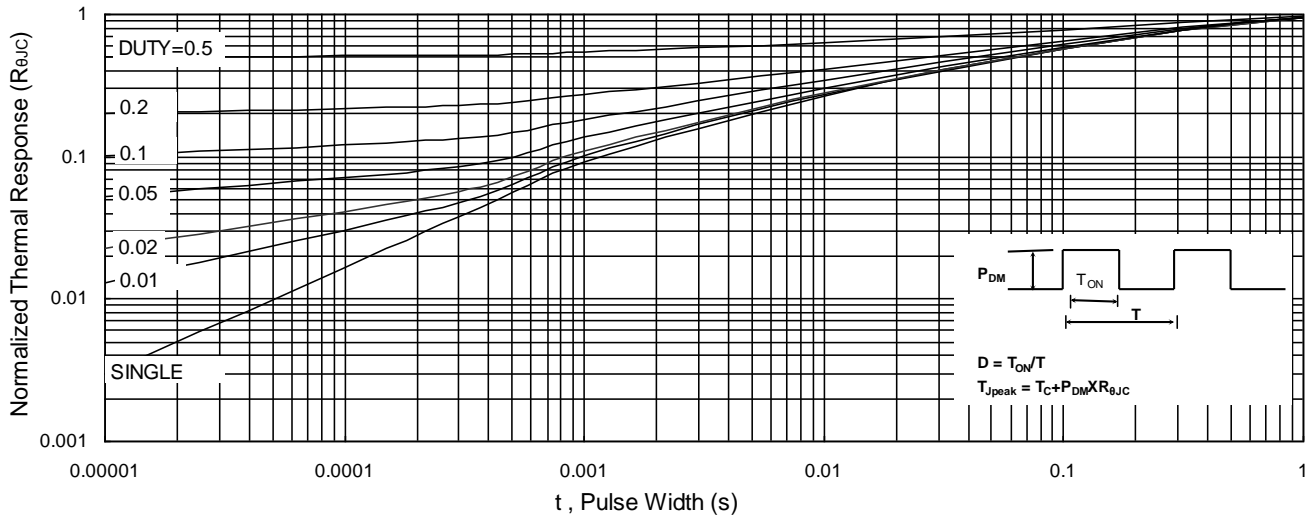


Fig.9 Normalized Maximum Transient Thermal Impedance

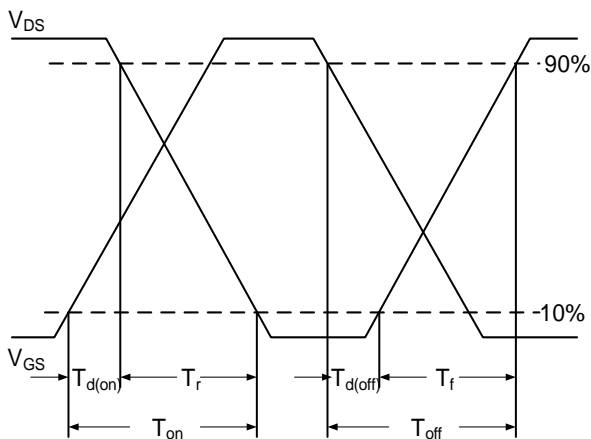


Fig.10 Switching Time Waveform

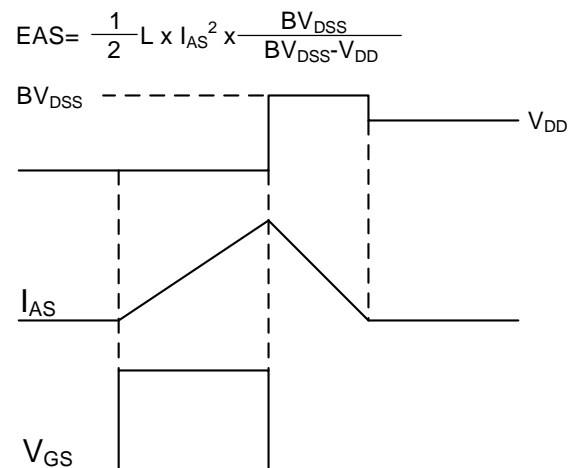


Fig.11 Unclamped Inductive Switching Waveform



DFN3X3-8L Package Information



| Symbol | Dimensions In Millimeters | | |
|----------|---------------------------|------|------|
| | Min. | Nom. | Max. |
| A | 0.70 | 0.75 | 0.80 |
| b | 0.25 | 0.30 | 0.35 |
| c | 0.10 | 0.15 | 0.25 |
| D | 3.25 | 3.35 | 3.45 |
| D1 | 3.00 | 3.10 | 3.20 |
| D2 | 1.48 | 1.58 | 1.68 |
| D3 | - | 0.13 | - |
| E | 3.20 | 3.30 | 3.40 |
| E1 | 3.00 | 3.15 | 3.20 |
| E2 | 2.39 | 2.49 | 2.59 |
| e | 0.65BSC | | |
| H | 0.30 | 0.39 | 0.50 |
| L | 0.30 | 0.40 | 0.50 |
| L1 | - | 0.13 | - |
| M | * | * | 0.15 |
| θ | | 10° | 12° |



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