



## Description

The FDMS8018 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.

## General Features

$V_{DS} = 30V$   $I_D = 150A$

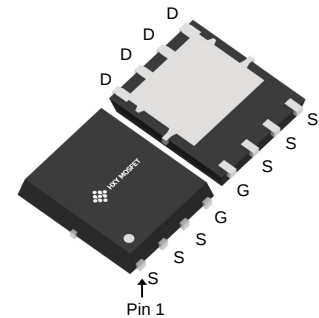
$R_{DS(ON)} < 2.4m\Omega$   $V_{GS}=10V$

## Application

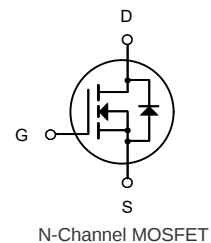
Battery protection

Load switch

Uninterruptible power supply



DFN5X6-8L  
(TDSON-8-EP(5x6))



## Package Marking and Ordering Information

| Product ID | Pack                           | Brand      | Qty(PCS) |
|------------|--------------------------------|------------|----------|
| FDMS8018   | DFN5X6-8L<br>(TDSON-8-EP(5x6)) | HXY MOSFET | 5000     |

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

| Symbol                    | Parameter                                        | Rating     | Units |
|---------------------------|--------------------------------------------------|------------|-------|
| $V_{DS}$                  | Drain-Source Voltage                             | 30         | V     |
| $V_{GS}$                  | Gate-Source Voltage                              | $\pm 20$   | V     |
| $I_D @ T_C = 25^\circ C$  | Continuous Drain Current, $V_{GS} @ 10V^1$       | 150        | A     |
| $I_D @ T_C = 100^\circ C$ | Continuous Drain Current, $V_{GS} @ 10V^1$       | 80         | A     |
| $I_{DM}$                  | Pulsed Drain Current <sup>2</sup>                | 160        | A     |
| EAS                       | Single Pulse Avalanche Energy <sup>3</sup>       | 180        | mJ    |
| $I_{AS}$                  | Avalanche Current                                | 60         | A     |
| $P_D @ T_C = 25^\circ C$  | Total Power Dissipation <sup>4</sup>             | 187        | W     |
| $T_{STG}$                 | Storage Temperature Range                        | -55 to 150 | °C    |
| $T_J$                     | Operating Junction Temperature Range             | -55 to 150 | °C    |
| $R_{\theta JA}$           | Thermal Resistance Junction-Ambient <sup>1</sup> | 62         | °C/W  |
| $R_{\theta JC}$           | Thermal Resistance Junction-Case <sup>1</sup>    | 1.1        | °C/W  |



**Electrical Characteristics (T<sub>J</sub> =25°C unless otherwise noted)**

| Symbol                              | Parameter                                      | Conditions                                                                                | Min. | Typ.  | Max. | Unit  |
|-------------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------|------|-------|------|-------|
| BV <sub>DSS</sub>                   | Drain-Source Breakdown Voltage                 | V <sub>GS</sub> =0V , I <sub>D</sub> =250uA                                               | 30   | ---   | ---  | V     |
| ΔBV <sub>DSS</sub> /ΔT <sub>J</sub> | BV <sub>DSS</sub> Temperature Coefficient      | Reference to 25°C , I <sub>D</sub> =1mA                                                   | ---  | 0.014 | ---  | V/°C  |
| R <sub>DS(on)</sub>                 | Static Drain-Source On-Resistance <sup>2</sup> | V <sub>GS</sub> =10V , I <sub>D</sub> =30A                                                | ---  | 2     | 2.4  | mΩ    |
|                                     |                                                | V <sub>GS</sub> =4.5V , I <sub>D</sub> =15A                                               | ---  | 2.5   | 3.2  |       |
| V <sub>GS(th)</sub>                 | Gate Threshold Voltage                         | V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA                                  | 1.2  | ---   | 2.5  | V     |
| ΔV <sub>GS(th)</sub>                | V <sub>GS(th)</sub> Temperature Coefficient    |                                                                                           | ---  | -4    | ---  | mV/°C |
| I <sub>DSS</sub>                    | Drain-Source Leakage Current                   | V <sub>DS</sub> =24V , V <sub>GS</sub> =0V , T <sub>J</sub> =25°C                         | ---  | ---   | 1    | uA    |
|                                     |                                                | V <sub>DS</sub> =24V , V <sub>GS</sub> =0V , T <sub>J</sub> =55°C                         | ---  | ---   | 5    |       |
| I <sub>GSS</sub>                    | Gate-Source Leakage Current                    | V <sub>GS</sub> =±20V , V <sub>DS</sub> =0V                                               | ---  | ---   | ±100 | nA    |
| g <sub>fs</sub>                     | Forward Transconductance                       | V <sub>DS</sub> =5V , I <sub>D</sub> =30A                                                 | ---  | 50    | ---  | S     |
| R <sub>g</sub>                      | Gate Resistance                                | V <sub>DS</sub> =0V , V <sub>GS</sub> =0V , f=1MHz                                        | ---  | 1.7   | ---  | Ω     |
| Q <sub>g</sub>                      | Total Gate Charge (4.5V)                       | V <sub>DS</sub> =15V , V <sub>GS</sub> =10V , I <sub>D</sub> =15A                         | ---  | 56.9  | ---  | nC    |
| Q <sub>gs</sub>                     | Gate-Source Charge                             |                                                                                           | ---  | 13.8  | ---  |       |
| Q <sub>gd</sub>                     | Gate-Drain Charge                              |                                                                                           | ---  | 23.5  | ---  |       |
| T <sub>d(on)</sub>                  | Turn-On Delay Time                             | V <sub>DD</sub> =15V , V <sub>GS</sub> =10V , R <sub>G</sub> =3.3Ω,<br>I <sub>D</sub> =1A | ---  | 20.1  | ---  | ns    |
| T <sub>r</sub>                      | Rise Time                                      |                                                                                           | ---  | 6.3   | ---  |       |
| T <sub>d(off)</sub>                 | Turn-Off Delay Time                            |                                                                                           | ---  | 124.6 | ---  |       |
| T <sub>f</sub>                      | Fall Time                                      |                                                                                           | ---  | 15.8  | ---  |       |
| C <sub>iss</sub>                    | Input Capacitance                              | V <sub>DS</sub> =15V , V <sub>GS</sub> =0V , f=1MHz                                       | ---  | 4345  | ---  | pF    |
| C <sub>oss</sub>                    | Output Capacitance                             |                                                                                           | ---  | 340   | ---  |       |
| C <sub>rss</sub>                    | Reverse Transfer Capacitance                   |                                                                                           | ---  | 225   | ---  |       |
| I <sub>S</sub>                      | Continuous Source Current <sup>1,6</sup>       | V <sub>G</sub> =V <sub>D</sub> =0V , Force Current                                        | ---  | ---   | 150  | A     |
| V <sub>SD</sub>                     | Diode Forward Voltage <sup>2</sup>             | V <sub>GS</sub> =0V , I <sub>S</sub> =1A , T <sub>J</sub> =25°C                           | ---  | ---   | 1.2  | V     |

**Note :**

- 1.The data tested by surface mounted on a 1 inch<sup>2</sup> 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<sub>DD</sub>=25V,V<sub>GS</sub>=10V,L=0.1mH,I<sub>AS</sub>=60A
- 4.The power dissipation is limited by 150°C junction temperature
- 5.The data is theoretically the same as I<sub>D</sub> and I<sub>DM</sub> , in real applications , should be limited by total power dissipation.
- 6.Package limitation current is 85A.



### Typical Characteristics



Fig.1 Typical Output Characteristics

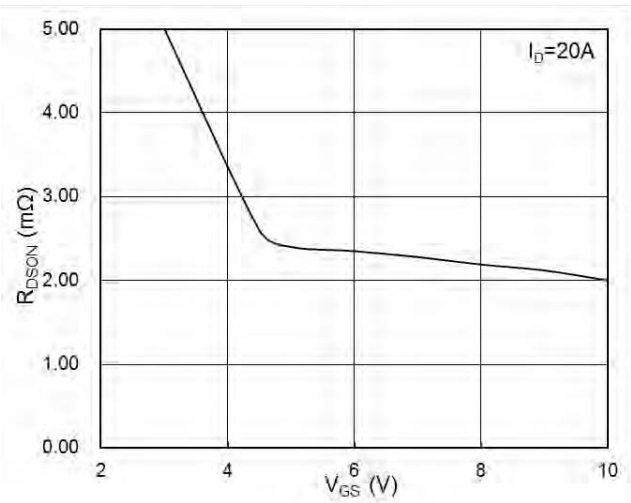


Fig.2 On-Resistance v.s Gate-Source

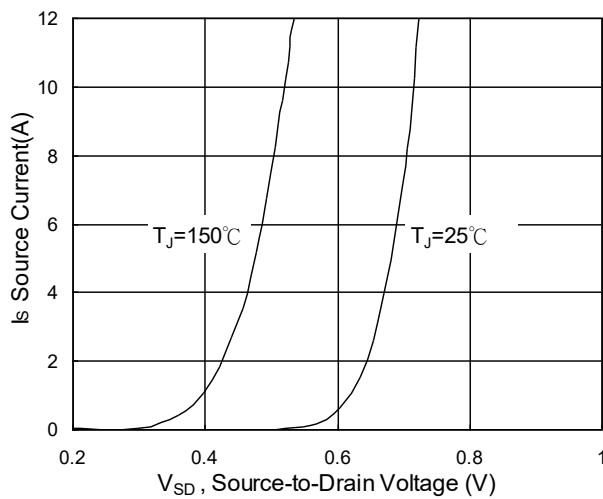


Fig.3 Forward Characteristics of Reverse

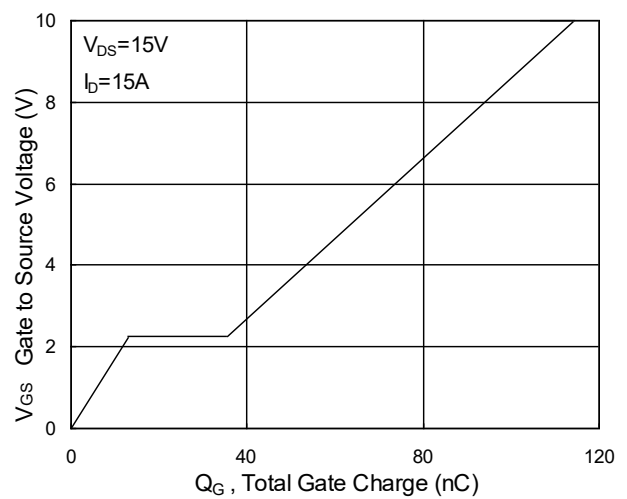


Fig.4 Gate-Charge Characteristics

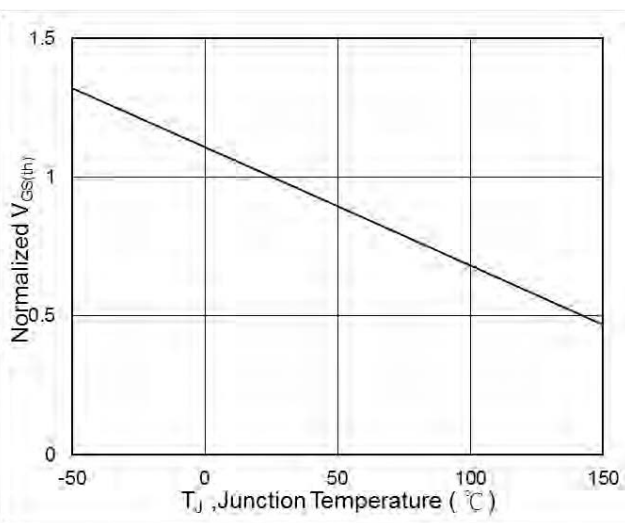


Fig.5 Normalized  $V_{GS(th)}$  v.s  $T_J$

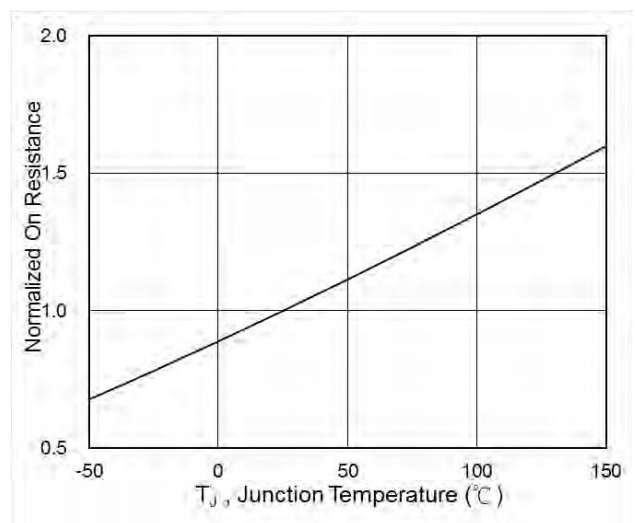


Fig.6 Normalized  $R_{DS(on)}$  v.s  $T_J$

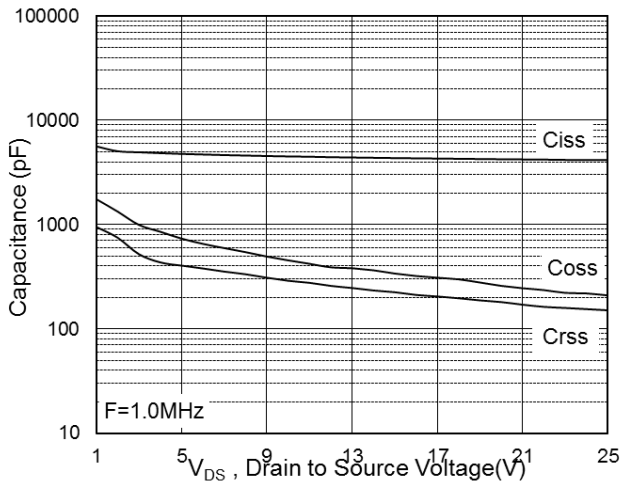


Fig.7 Capacitance

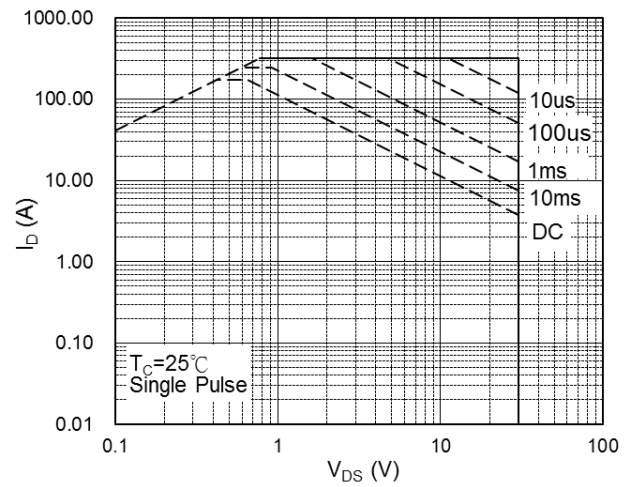


Fig.8 Safe Operating Area

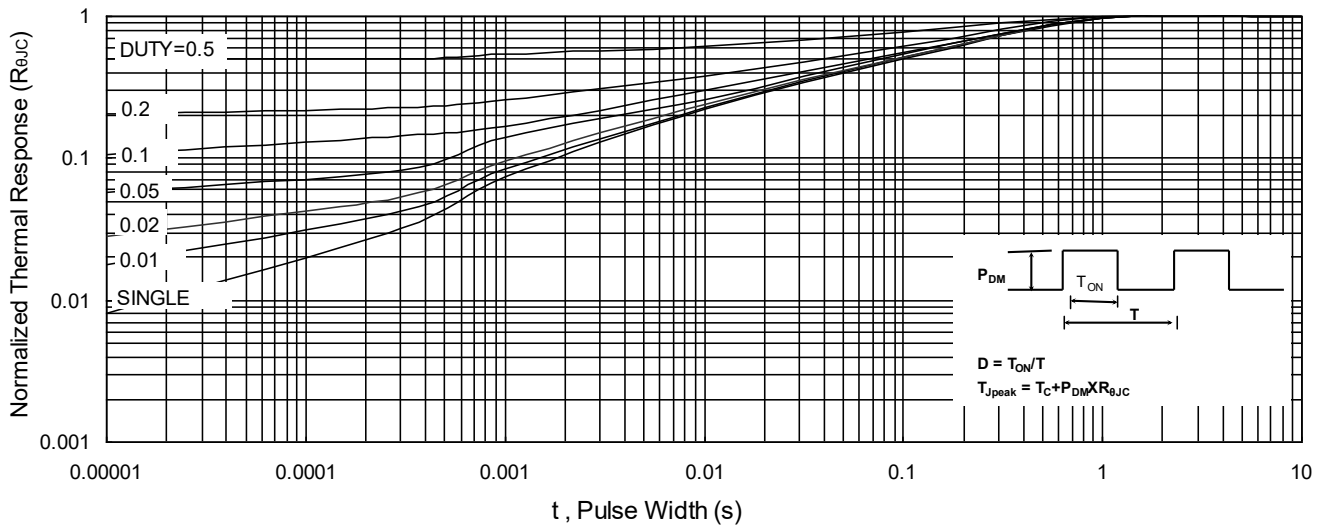


Fig.9 Normalized Maximum Transient Thermal Impedance

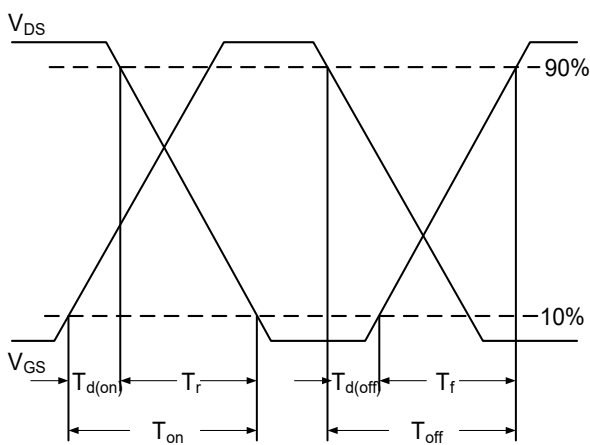


Fig.10 Switching Time Waveform

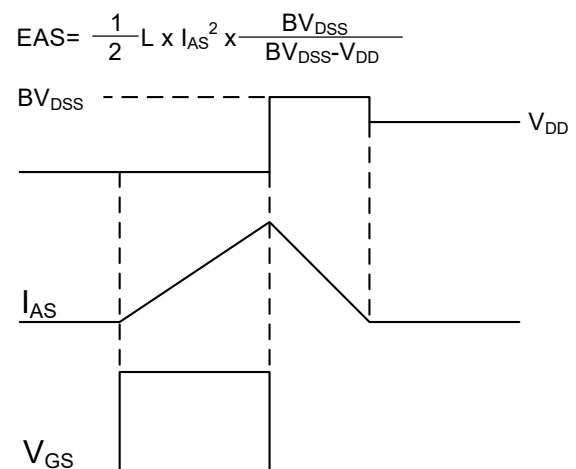
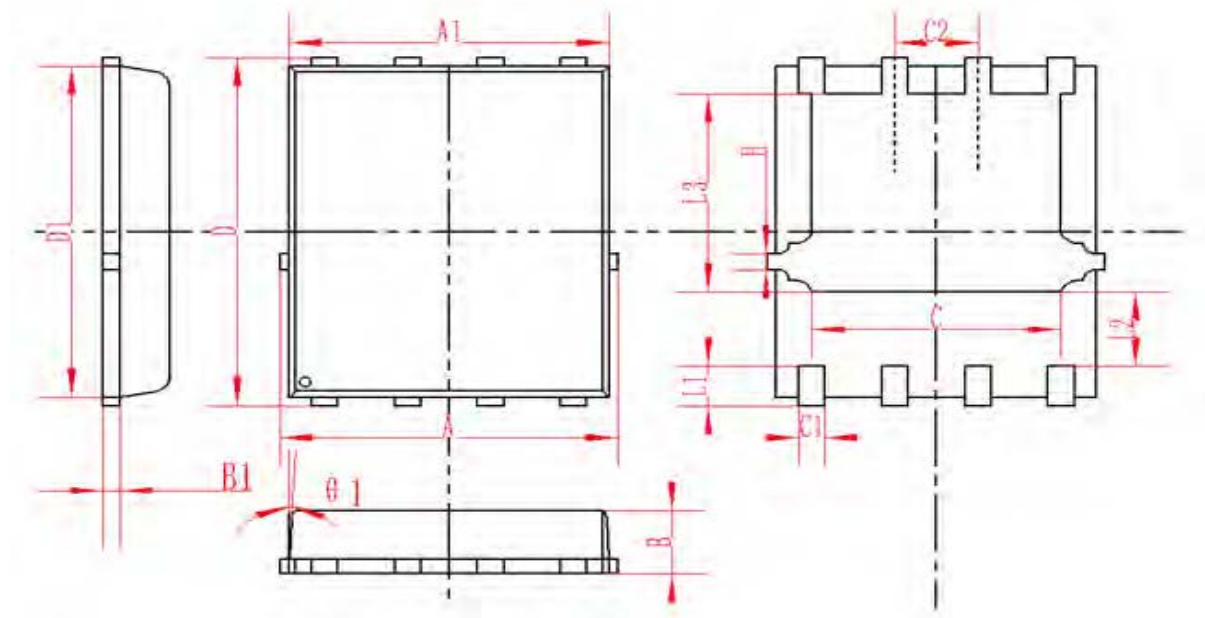


Fig.11 Unclamped Inductive Switching Waveform



## DFN5X6-8L(TDSON-8-EP(5x6)) Package Information



| SYMBOL | MM       |      |       | INCH     |       |       |
|--------|----------|------|-------|----------|-------|-------|
|        | MIN      | NOM  | MAX   | MIN      | NOM   | MAX   |
| A      | 4.95     | 5    | 5.05  | 0.195    | 0.197 | 0.199 |
| A1     | 4.82     | 4.9  | 4.98  | 0.190    | 0.193 | 0.196 |
| D      | 5.98     | 6    | 6.02  | 0.235    | 0.236 | 0.237 |
| D1     | 5.67     | 5.75 | 5.83  | 0.223    | 0.226 | 0.230 |
| B      | 0.9      | 0.95 | 1     | 0.035    | 0.037 | 0.039 |
| B1     | 0.254REF |      |       | 0.010REF |       |       |
| C      | 3.95     | 4    | 4.05  | 0.156    | 0.157 | 0.159 |
| C1     | 0.35     | 0.4  | 0.45  | 0.014    | 0.016 | 0.018 |
| C2     | 1.27TYP  |      |       | 0.5TYP   |       |       |
| θ1     | 8°       | 10°  | 12°   | 8°       | 10°   | 12°   |
| L1     | 0.63     | 0.64 | 0.65  | 0.025    | 0.025 | 0.026 |
| L2     | 1.2      | 1.3  | 1.4   | 0.047    | 0.051 | 0.055 |
| L3     | 3.415    | 3.42 | 3.425 | 0.134    | 0.135 | 0.135 |
| H      | 0.24     | 0.25 | 0.26  | 0.009    | 0.010 | 0.010 |



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