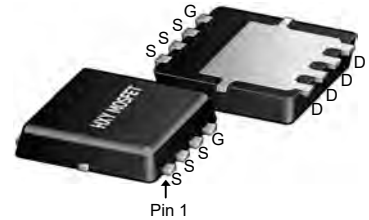




## Description

The NVMFS5834NL 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.



DFN5X6-8L

## General Features

$V_{DS} = 40V$   $I_D = 70A$

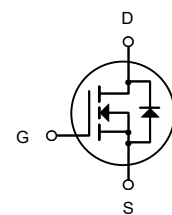
$R_{DS(ON)} < 8.5m\Omega @ V_{GS}=10V$

## Application

Battery protection

Load switch

Uninterruptible power supply



N-Channel MOSFET

## Package Marking and Ordering Information

| Product ID  | Pack      | Brand      | Qty(PCS) |
|-------------|-----------|------------|----------|
| NVMFS5834NL | DFN5X6-8L | HXY MOSFET | 5000     |

## Absolute Maximum Ratings ( $T_C=25^\circ C$ unless otherwise noted)

| Symbol                | Parameter                                                       | Rating     | Units        |
|-----------------------|-----------------------------------------------------------------|------------|--------------|
| $V_{DS}$              | Drain-Source Voltage                                            | 40         | V            |
| $V_{GS}$              | Gate-Source Voltage                                             | $\pm 20$   | V            |
| $I_D@T_C=25^\circ C$  | Continuous Drain Current, $V_{GS} @ 10V^1$                      | 70         | A            |
| $I_D@T_C=100^\circ C$ | Continuous Drain Current, $V_{GS} @ 10V^1$                      | 44         | A            |
| $I_{DM}$              | Pulsed Drain Current <sup>2</sup>                               | 280        | A            |
| EAS                   | Single Pulse Avalanche Energy <sup>3</sup>                      | 76         | mJ           |
| $P_D@T_C=25^\circ C$  | Total Power Dissipation <sup>4</sup>                            | 72.3       | 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 (Steady State) <sup>1</sup> | 62         | $^\circ C/W$ |
| $R_{\theta JC}$       | Thermal Resistance Junction-Case <sup>1</sup>                   | 1.73       | $^\circ C/W$ |



**Electrical Characteristics (Ta=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                                               | 40   | ---  | ---  | V    |
| R <sub>DS(ON)</sub> | Static Drain-Source On-Resistance <sup>2</sup> | V <sub>GS</sub> =10V, I <sub>D</sub> =10A                                                | ---  | 6.5  | 8.5  | mΩ   |
|                     |                                                | V <sub>GS</sub> =4.5V, I <sub>D</sub> =5A                                                | ---  | 10   | 15   |      |
| V <sub>GS(th)</sub> | Gate Threshold Voltage                         | V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA                                 | 1.0  | 1.7  | 3    | V    |
| I <sub>DSS</sub>    | Drain-Source Leakage Current                   | V <sub>DS</sub> =32V, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C                          | ---  | ---  | 1    | uA   |
|                     |                                                | V <sub>DS</sub> =32V, 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> =10V, I <sub>D</sub> =5A                                                 | ---  | 13   | ---  | S    |
| Q <sub>g</sub>      | Total Gate Charge (4.5V)                       | V <sub>DS</sub> =20V, V <sub>GS</sub> =10V, I <sub>D</sub> =10A                          | ---  | 20   | ---  | nC   |
| Q <sub>gs</sub>     | Gate-Source Charge                             |                                                                                          | ---  | 2.8  | ---  |      |
| Q <sub>gd</sub>     | Gate-Drain Charge                              |                                                                                          | ---  | 5.1  | ---  |      |
| T <sub>d(on)</sub>  | Turn-On Delay Time                             | V <sub>DD</sub> =15V, V <sub>GS</sub> =10V<br>R <sub>G</sub> =3.3Ω<br>I <sub>D</sub> =1A | ---  | 13.2 | ---  | ns   |
| T <sub>r</sub>      | Rise Time                                      |                                                                                          | ---  | 2.2  | ---  |      |
| T <sub>d(off)</sub> | Turn-Off Delay Time                            |                                                                                          | ---  | 72   | ---  |      |
| T <sub>f</sub>      | Fall Time                                      |                                                                                          | ---  | 4.5  | ---  |      |
| C <sub>iss</sub>    | Input Capacitance                              | V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1MHz                                        | ---  | 1278 | ---  | pF   |
| C <sub>oss</sub>    | Output Capacitance                             |                                                                                          | ---  | 135  | ---  |      |
| C <sub>rss</sub>    | Reverse Transfer Capacitance                   |                                                                                          | ---  | 87   | ---  |      |
| I <sub>S</sub>      | Continuous Source Current <sup>1,5</sup>       | V <sub>G</sub> =V <sub>D</sub> =0V, Force Current                                        | ---  | ---  | 70   | 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    | V    |

**Note :**

- 1.The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ 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>=47A.
- 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.



## Typical Characteristics

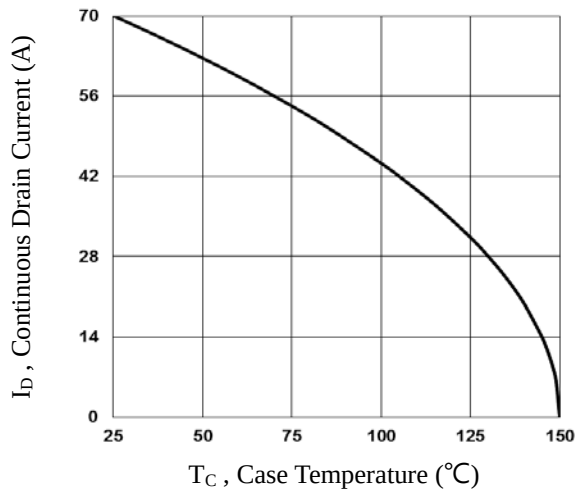


Fig.1 Continuous Drain Current vs.  $T_C$

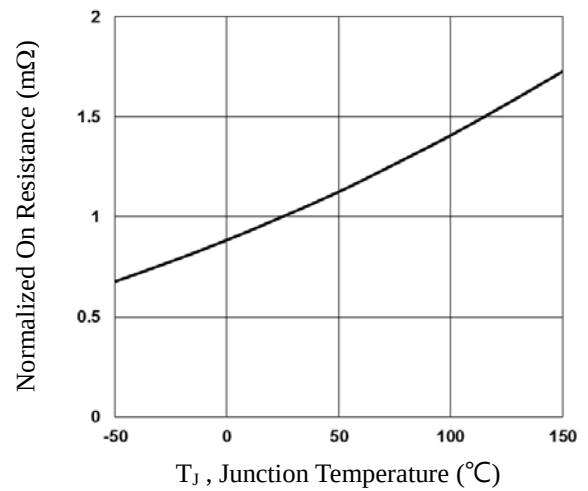


Fig.2 Normalized  $R_{DS(on)}$  vs.  $T_J$

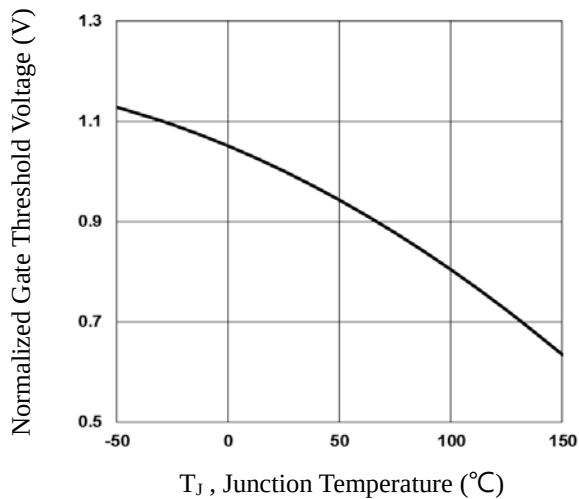


Fig.3 Normalized  $V_{th}$  vs.  $T_J$

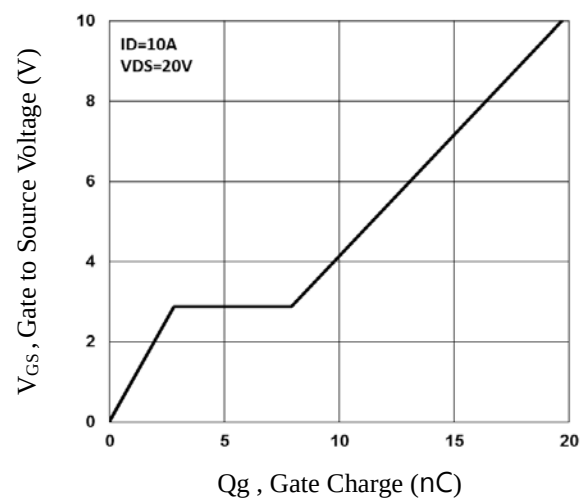


Fig.4 Gate Charge Waveform

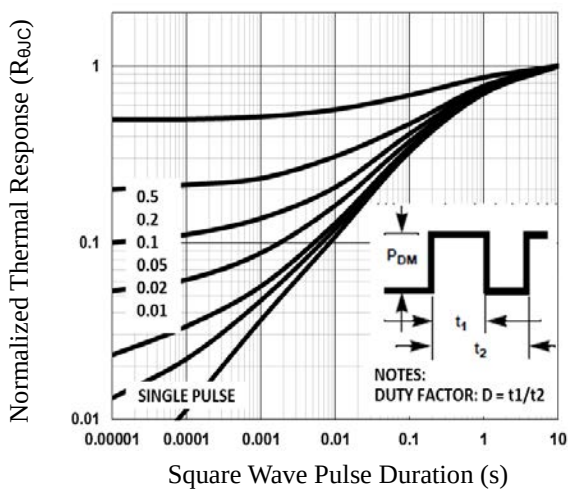


Fig.5 Normalized Transient Impedance

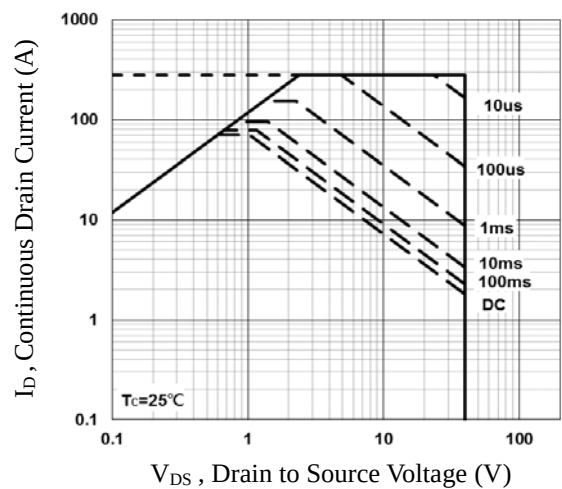


Fig.6 Maximum Safe Operation Area

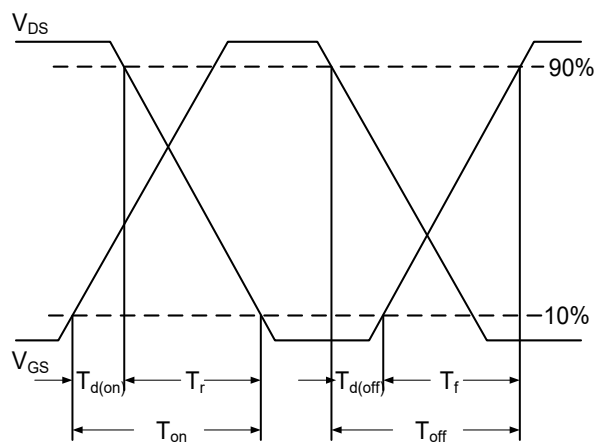


Fig.7 Switching Time Waveform

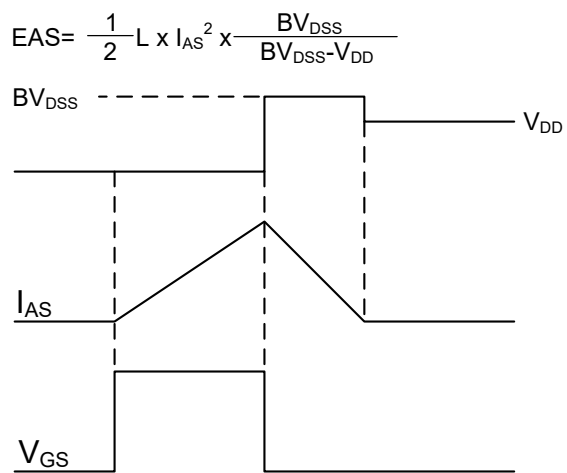
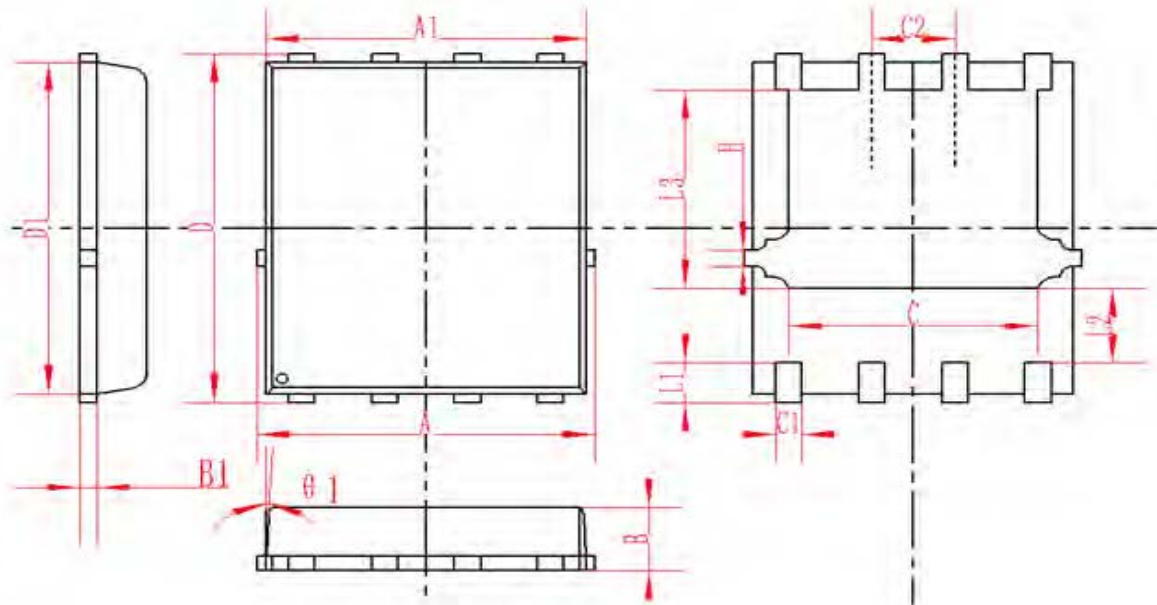


Fig.8 EAS Waveform



## DFN5X6-8L Package Information



| SYMBOL | MM       |      |       | INCH     |       |       |
|--------|----------|------|-------|----------|-------|-------|
|        | MIN      | NOM  | MAX   | MIN      | NOM   | MAX   |
| A      | 5.3      | 5.5  | 5.7   | 0.208    | 0.216 | 0.224 |
| A1     | 5.1      | 5.2  | 5.3   | 0.2      | 0.204 | 0.209 |
| D      | 5.98     | 6    | 6.02  | 0.235    | 0.236 | 0.237 |
| D1     | 5.85     | 6.05 | 6.25  | 0.23     | 0.238 | 0.246 |
| B      | 0.85     | 0.95 | 1.05  | 0.033    | 0.037 | 0.041 |
| 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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