



## Description

The HNVTF5826NLTWG 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

$V_{DS} = 60V$   $I_D = 40A$

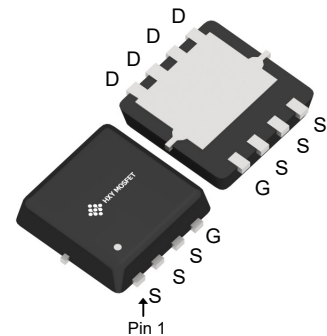
$R_{DS(ON)} < 15m\Omega$  @  $V_{GS}=10V$

## Application

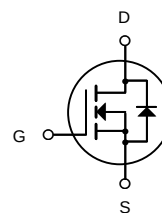
Battery protection

Load switch

Uninterruptible power supply



DFN3X3-8L



N-Channel MOSFET

## Ordering Information

| Product ID     | Pack      | Brand      | Qty(PCS) |
|----------------|-----------|------------|----------|
| HNVTF5826NLTWG | DFN3X3-8L | HXY MOSFET | 5000     |

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

| Symbol                 | Parameter                                             | Rating     | Units         |
|------------------------|-------------------------------------------------------|------------|---------------|
| $V_{DS}$               | Drain-Source Voltage                                  | 60         | V             |
| $V_{GS}$               | Gate-Source Voltage                                   | $\pm 20$   | V             |
| $I_D@T_C=25^{\circ}C$  | Continuous Drain Current, $V_{GS}$ @ 10V <sup>1</sup> | 40         | A             |
| $I_D@T_C=100^{\circ}C$ | Continuous Drain Current, $V_{GS}$ @ 10V <sup>1</sup> | 20         | A             |
| $I_{DM}$               | Pulsed Drain Current <sup>2</sup>                     | 150        | A             |
| EAS                    | Single Pulse Avalanche Energy <sup>3</sup>            | 36         | mJ            |
| $P_D@T_C=25^{\circ}C$  | Total Power Dissipation <sup>4</sup>                  | 30         | W             |
| TSTG                   | 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 <sup>1</sup>      | 62         | $^{\circ}C/W$ |
| $R_{\theta JC}$        | Thermal Resistance Junction-Case <sup>1</sup>         | 2.5        | $^{\circ}C/W$ |



**Electrical Characteristics ( $T_J=25^{\circ}\text{C}$  unless otherwise specified)**

| Symbol                                                 | Parameter                                                 | Test Condition                                                                           | Min. | Typ. | Max. | Units |
|--------------------------------------------------------|-----------------------------------------------------------|------------------------------------------------------------------------------------------|------|------|------|-------|
| Off Characteristic                                     |                                                           |                                                                                          |      |      |      |       |
| V <sub>(BR)DSS</sub>                                   | Drain-Source Breakdown Voltage                            | V <sub>GS</sub> =0V, I <sub>D</sub> =250μA                                               | 60   | -    | -    | V     |
| I <sub>DSS</sub>                                       | Zero Gate Voltage Drain Current                           | V <sub>DS</sub> =60V, V <sub>GS</sub> =0V,                                               | -    | -    | 1.0  | μA    |
| I <sub>GSS</sub>                                       | Gate to Body Leakage Current                              | V <sub>DS</sub> =0V, V <sub>GS</sub> = ±20V                                              | -    | -    | ±100 | nA    |
| On Characteristics                                     |                                                           |                                                                                          |      |      |      |       |
| V <sub>GS(th)</sub>                                    | Gate Threshold Voltage                                    | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA                                 | 1.0  | 1.6  | 2.5  | V     |
| R <sub>DS(on)</sub>                                    | Static Drain-Source on-Resistance<br><small>note3</small> | V <sub>GS</sub> =10V, I <sub>D</sub> =20A                                                | -    | 12   | 15   | mΩ    |
|                                                        |                                                           | V <sub>GS</sub> =4.5V, I <sub>D</sub> =10A                                               | -    | 15   | 20   |       |
| Dynamic Characteristics                                |                                                           |                                                                                          |      |      |      |       |
| C <sub>iss</sub>                                       | Input Capacitance                                         | V <sub>DS</sub> =25V, V <sub>GS</sub> =0V,<br>f=1.0MHz                                   | -    | 930  | -    | pF    |
| C <sub>oss</sub>                                       | Output Capacitance                                        |                                                                                          | -    | 230  | -    | pF    |
| C <sub>rss</sub>                                       | Reverse Transfer Capacitance                              |                                                                                          | -    | 8    | -    | pF    |
| Q <sub>g</sub>                                         | Total Gate Charge                                         | V <sub>DS</sub> =30V, I <sub>D</sub> =20A,<br>V <sub>GS</sub> =10V                       | -    | 22   | -    | nC    |
| Q <sub>gs</sub>                                        | Gate-Source Charge                                        |                                                                                          | -    | 4.5  | -    | nC    |
| Q <sub>gd</sub>                                        | Gate-Drain(“Miller”) Charge                               |                                                                                          | -    | 3.5  | -    | nC    |
| Switching Characteristics                              |                                                           |                                                                                          |      |      |      |       |
| t <sub>d(on)</sub>                                     | Turn-on Delay Time                                        | V <sub>DD</sub> =30V, I <sub>D</sub> =20A,<br>R <sub>G</sub> =1.6Ω, V <sub>GS</sub> =10V | -    | 4.5  | -    | ns    |
| t <sub>r</sub>                                         | Turn-on Rise Time                                         |                                                                                          | -    | 2.7  | -    | ns    |
| t <sub>d(off)</sub>                                    | Turn-off Delay Time                                       |                                                                                          | -    | 13.8 | -    | ns    |
| t <sub>f</sub>                                         | Turn-off Fall Time                                        |                                                                                          | -    | 2.7  | -    | ns    |
| Drain-Source Diode Characteristics and Maximum Ratings |                                                           |                                                                                          |      |      |      |       |
| I <sub>S</sub>                                         | Maximum Continuous Drain to Source Diode Forward Current  |                                                                                          | -    | -    | 40   | A     |
| I <sub>SM</sub>                                        | Maximum Pulsed Drain to Source Diode Forward Current      |                                                                                          | -    | -    | 150  | A     |
| V <sub>SD</sub>                                        | Drain to Source Diode Forward Voltage                     | V <sub>GS</sub> =0V, I <sub>S</sub> =30A                                                 | -    | -    | 1.2  | V     |
| t <sub>rr</sub>                                        | Body Diode Reverse Recovery Time                          | T <sub>J</sub> =25℃,<br>I <sub>F</sub> =20A,dl/dt=100A/μs                                | -    | 18   | -    | ns    |
| Q <sub>rr</sub>                                        | Body Diode Reverse Recovery Charge                        |                                                                                          | -    | 12   | -    | nC    |

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

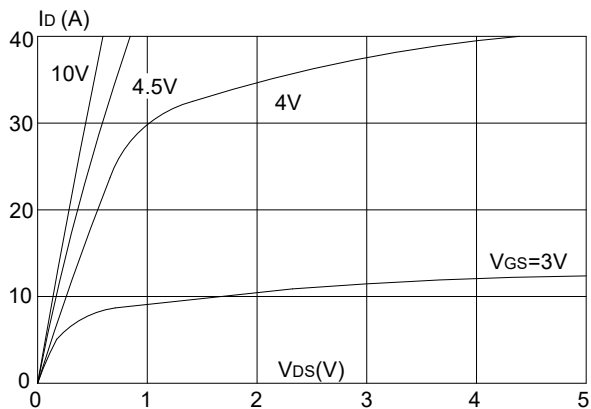
2. EAS condition:  $T_J=25^{\circ}\text{C}$ ,  $V_{DD}=30V$ ,  $V_G=10V$ ,  $R_G=25\Omega$ ,  $L=0.5mH$ ,  $I_{AS}=12A$

3. Pulse Test: Pulse Width $\leq 300\mu s$ , Duty Cycle $\leq 0.5\%$

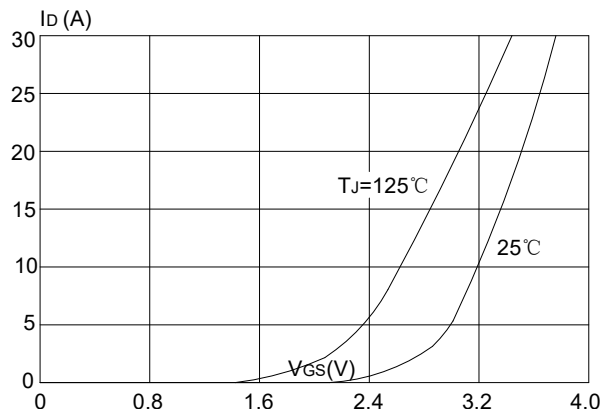


## Typical Performance Characteristics

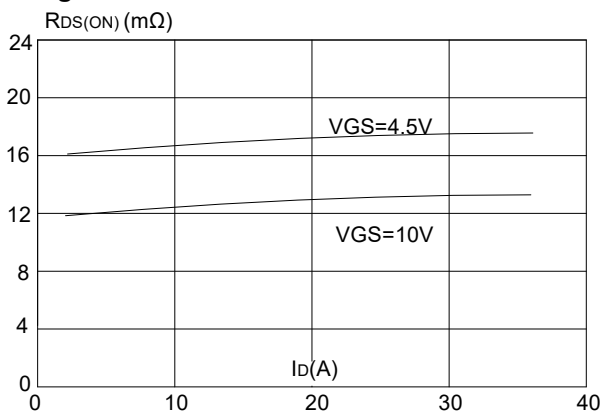
**Figure1:** Output Characteristics



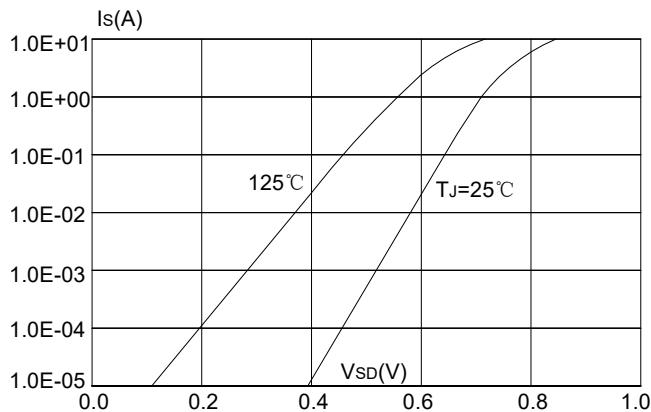
**Figure 2:** Typical Transfer Characteristics



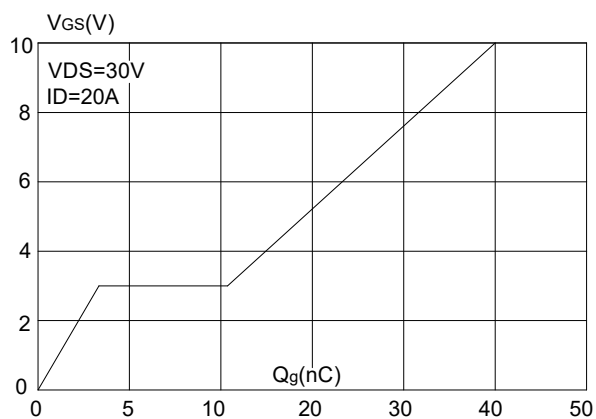
**Figure 3:** On-resistance vs. Drain Current



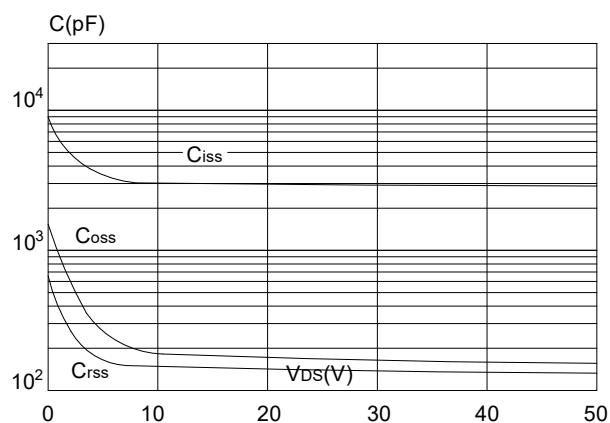
**Figure 4:** Body Diode Characteristics



**Figure 5:** Gate Charge Characteristics

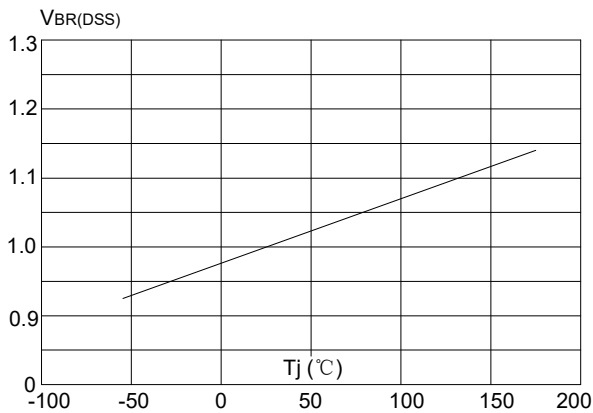


**Figure 6:** Capacitance Characteristics

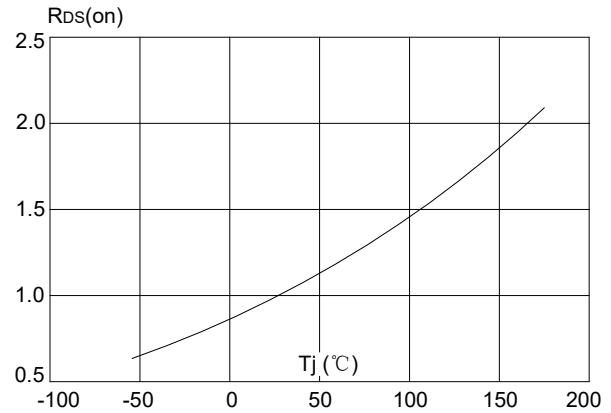




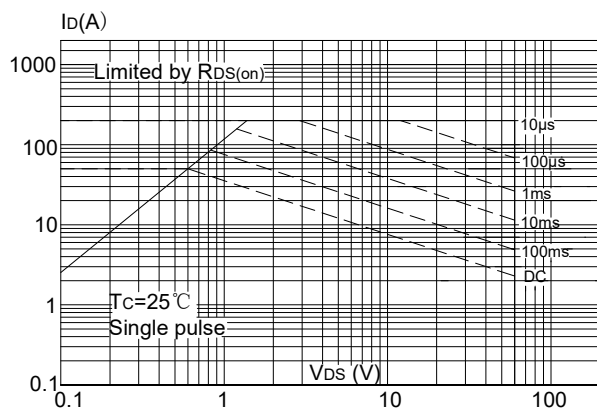
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



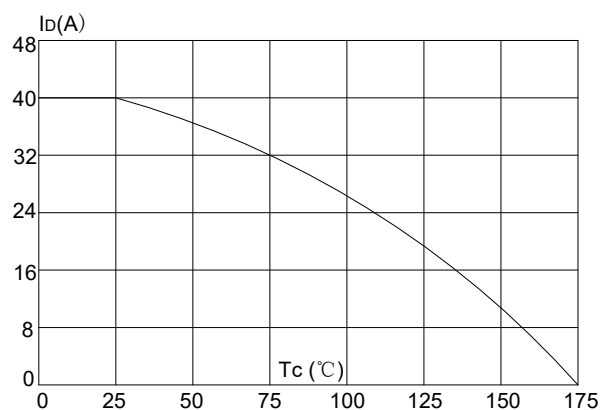
**Figure 8:** Normalized on Resistance vs. Junction Temperature



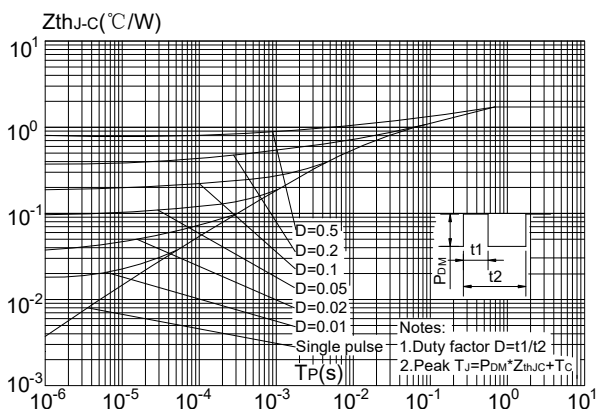
**Figure 9:** Maximum Safe Operating Area



**Figure 10:** Maximum Continuous Drain Current vs. Case Temperature

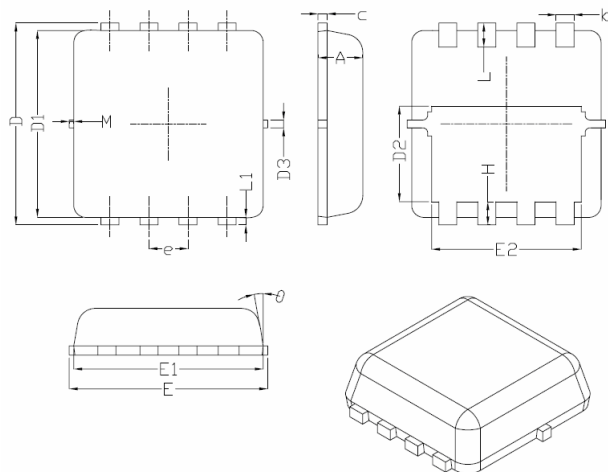


**Figure.11:** Maximum Effective Transient Thermal Impedance, Junction-to-Case





## 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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