

## 80V<sub>DS</sub>/±20V<sub>GS</sub> N-Channel Enhancement Mode MOSFET

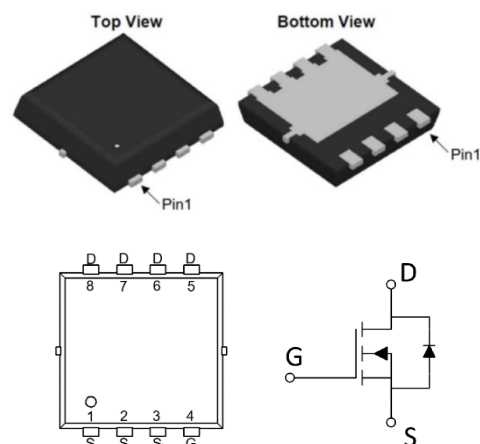
### Features

- V<sub>DS</sub>=80V, I<sub>D</sub>=100A
- R<sub>DS(ON)</sub>=4.5mΩ (TYP.) V<sub>GS</sub>=10V
- Reliable and Rugged
- Avalanche Rated
- Low On-Resistance
- High Current Capability

### Applications

- Load Switch
- Power management in portable/desktop PCs
- DC/DC conversion

### PDFN5060



### Ordering Information

| Device     | package  | Device Marking | Package Qty. |
|------------|----------|----------------|--------------|
| HGN035N08A | PDFN5060 | N035N08A       | 5000/PCS     |

### Absolute Maximum Ratings (T<sub>C</sub>=25°C, unless otherwise noted)

| Parameter                                         | Symbol                            | Value   | Unit |
|---------------------------------------------------|-----------------------------------|---------|------|
| Drain-Source Voltage (V <sub>GS</sub> =0V)        | V <sub>DS</sub>                   | 80      | V    |
| Gate-Source Voltage (V <sub>GS</sub> =0V, static) | V <sub>GS</sub>                   | ±20     | V    |
| Continuous Drain Current (T <sub>C</sub> =25°C)   | I <sub>D</sub>                    | 100     | A    |
| Continuous Drain Current (T <sub>C</sub> =100°C)  |                                   | 63      | A    |
| Pulsed Drain Current                              | I <sub>DM</sub>                   | 400     | A    |
| Single Pulsed Avalanche Energy                    | E <sub>AS</sub>                   | 230     | mJ   |
| V <sub>DS</sub> Spike 100ns                       | V <sub>SPIKE</sub>                | 65      | V    |
| Maximum Power Dissipation (T <sub>C</sub> =25°C)  | P <sub>D</sub>                    | 132     | W    |
| Operating, Storage Temperature Range              | T <sub>J</sub> , T <sub>STG</sub> | -55~150 | °C   |

### Electrical Characteristics

| Parameter                        | Symbol              | Test Conditions                                           | Min. | Typ. | Max. | Unit |
|----------------------------------|---------------------|-----------------------------------------------------------|------|------|------|------|
| Drain-Source Breakdown Voltage   | BV <sub>DSS</sub>   | V <sub>GS</sub> =0V, I <sub>D</sub> =250μA                | 80   | -    | -    | V    |
| Zero Gate Voltage Drain Current  | I <sub>DSS</sub>    | V <sub>DS</sub> =30V, V <sub>GS</sub> =0V                 | -    | -    | 1    | μA   |
| Gate -Source Leakage Current     | I <sub>GSS</sub>    | V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V                | -    | -    | ±100 | nA   |
| Gate Threshold Voltage           | V <sub>GS(th)</sub> | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =250μA | 1.2  | -    | 2.4  | V    |
| Drain-Source On-stage Resistance | R <sub>DS(ON)</sub> | V <sub>GS</sub> =10V, I <sub>D</sub> =20A                 | -    | -    | 5.5  | mΩ   |

## Thermal Characteristics

| Parameter                            | Symbol          | Min. | Typ. | Max. | Unit                        |
|--------------------------------------|-----------------|------|------|------|-----------------------------|
| Thermal Resistance, Junction-to-Case | $R_{\theta JC}$ | -    | 2.3  | -    | $^{\circ}\text{C}/\text{W}$ |

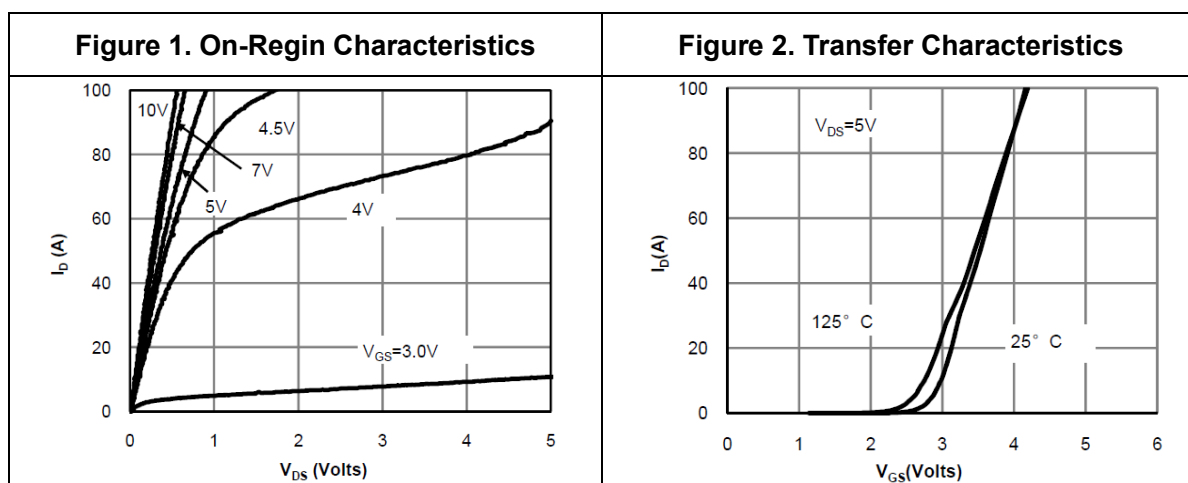
## Dynamic Characteristics

| Parameter                    | Symbol       | Test Conditions     | Min. | Typ. | Max. | Unit     |
|------------------------------|--------------|---------------------|------|------|------|----------|
| Input capacitance            | $C_{iss}$    | $V_{DS}=15\text{V}$ | -    | 4738 | -    | pF       |
| Output capacitance           | $C_{oss}$    | $V_{GS}=0\text{V}$  | -    | 621  | -    |          |
| Reverse transfer capacitance | $C_{rss}$    | $f=1\text{MHz}$     | -    | 15   | -    |          |
| Gate Resistance              | $R_g$        | $f=1\text{MHz}$     | -    | 1.5  | -    | $\Omega$ |
| Total Gate Charge            | $Q_g$        | $V_{DS}=15\text{V}$ | -    | 66   | -    | nC       |
| Gate Source Charge           | $Q_{gs}$     | $V_{GS}=10\text{V}$ | -    | 23   | -    |          |
| Gate Drain Charge            | $Q_{gd}$     | $I_D=20\text{A}$    | -    | 10   | -    |          |
| Turn-on delay Time           | $t_{d(on)}$  | $V_{GS}=10\text{V}$ | -    | 20   | -    | ns       |
| Rise time                    | $t_r$        | $V_{DS}=15\text{V}$ | -    | 79   | -    |          |
| Turn-off delay Time          | $t_{d(off)}$ | $R_L=0.75\Omega$    | -    | 68   | -    |          |
| Fall time                    | $t_f$        | $R_G=3\Omega$       | -    | 29   | -    |          |

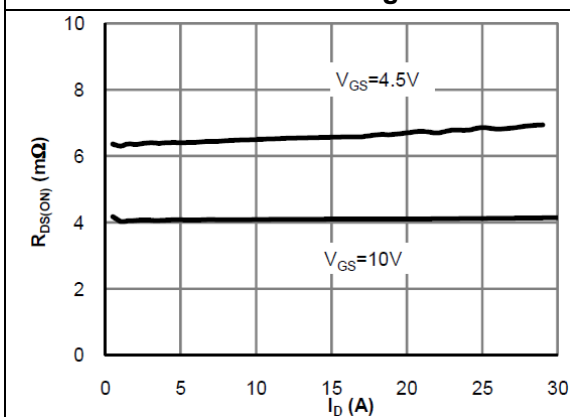
## Reverse Diode Characteristics

| Parameter                  | Symbol   | Test Conditions                       | Min. | Typ. | Max. | Unit |
|----------------------------|----------|---------------------------------------|------|------|------|------|
| Body Diode Forward Voltage | $V_{SD}$ | $V_{GS}=0\text{V}, I_{SD}=1\text{A}$  | -    | 0.7  | 1    | V    |
| Reverse Recovery Time      | $t_{rr}$ | $V_{GS}=0\text{V}, I_{SD}=20\text{A}$ | -    | 50   | -    | ns   |
| Reverse Recovery Charge    | $Q_{rr}$ | $d_i/d_t=500\text{A}/\mu\text{s}$     | -    | 75   | -    | nC   |

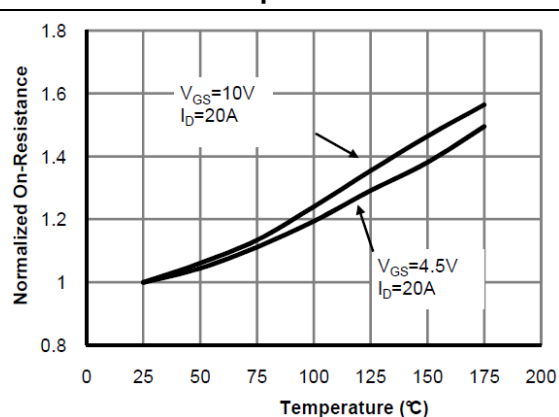
## Electrical Characteristics Diagrames



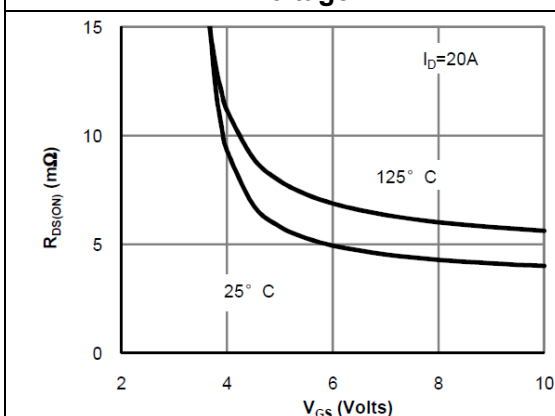
**Figure 3. On-Resistance vs. Drain Current and Gate Voltage**



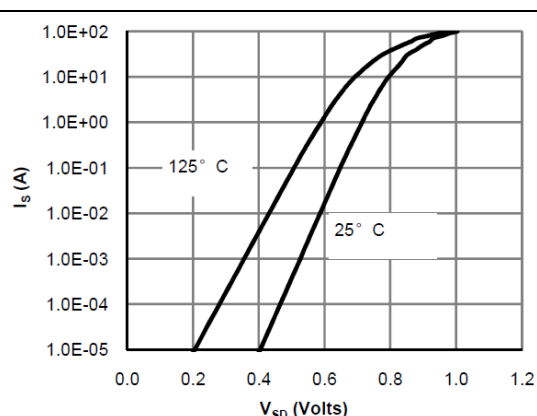
**Figure 4. On-Resistance vs. Junction Temperature**



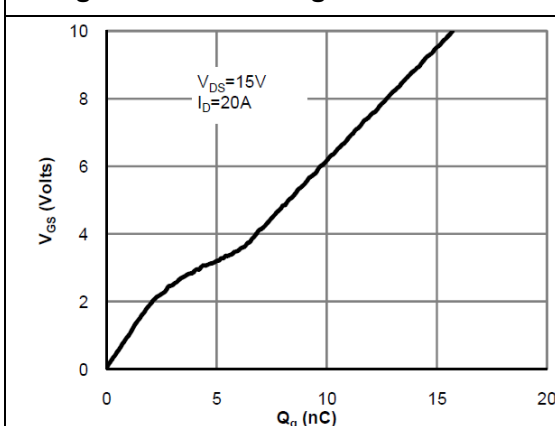
**Figure 5. On-Resistance vs. Gate-Source Voltage**



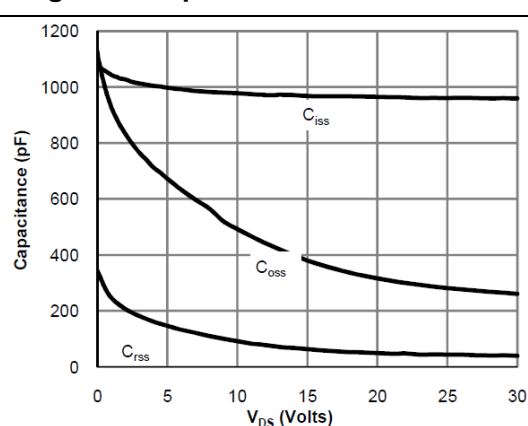
**Figure 6. Body-Diode Characteristics**



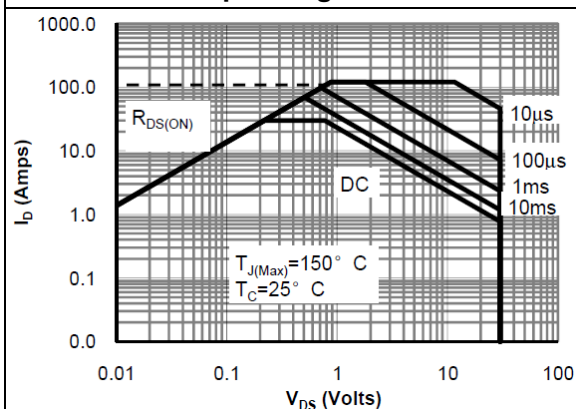
**Figure 7. Gate-Charge Characteristics**



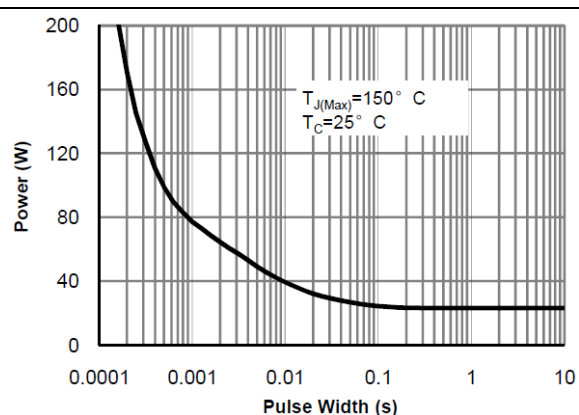
**Figure 8. Capacitance Characteristics**



**Figure 9. Maximum Forward Biased Safe Operating Area**



**Figure 10. Single Pulse Power Rating Junction-to-Case**



## Physical Dimensions

### PDFN5060

| 符号 | 尺寸 (mm) |      |      | 符号 | 尺寸 (mm) |      |      |
|----|---------|------|------|----|---------|------|------|
|    | 最小值     | 典型值  | 最大值  |    | 最小值     | 典型值  | 最大值  |
| A  | 0.90    | 1.00 | 1.10 | E1 | 5.70    | 5.75 | 5.80 |
| b  | 0.33    | 0.41 | 0.51 | E2 | 3.38    | 3.58 | 3.78 |
| c  | 0.20    | 0.25 | 0.30 | H  | 0.41    | 0.51 | 0.61 |
| D  | 4.80    | 4.90 | 5.00 | K  | 1.10    | -    | -    |
| D1 | 3.61    | 3.81 | 3.96 | L  | 0.51    | 0.61 | 0.71 |
| e  | 1.27BSC |      |      | L1 | 0.06    | 0.13 | 0.20 |
| E  | 5.90    | 6.00 | 6.10 | θ  | 0°      | -    | 12°  |

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