

## Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)TYP}$ | $I_D$ |
|---------------|-----------------|-------|
| 60V           | 2.6mΩ@10V       | 100A  |
|               | 3.5mΩ@4.5V      |       |



**合肥矽普半导体**

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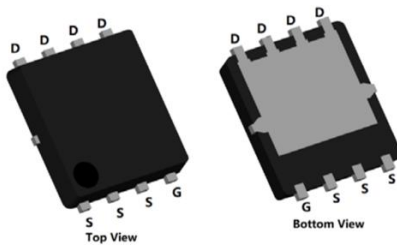
## Feature

- Fast Switching
- Low Gate Charge and Rdson
- Advanced Split Gate Trench Technology
- 100% Single Pulse avalanche energy Test

## Applications

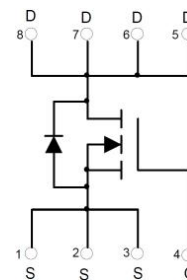
- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

## Package

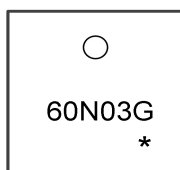


PDFN5X6-8L

## Circuit diagram



## Marking



60N03G  
\*

:Device Code  
:Month Code

## Order Information

| Device     | Package    | Unit/Tape |
|------------|------------|-----------|
| SP60N03GNK | PDFN5X6-8L | 5000      |

**Absolute maximum ratings (Ta=25°C, unless otherwise noted)**

| Parameter                                  | Symbol          | Rating     | Unit |
|--------------------------------------------|-----------------|------------|------|
| Drain-Source Voltage                       | $V_{DS}$        | 60         | V    |
| Gate-Source Voltage                        | $V_{GS}$        | $\pm 20$   | V    |
| Continuous Drain Current (Tc=25°C)         | $I_D$           | 100        | A    |
| Continuous Drain Current (Tc=100°C)        | $I_D$           | 67         | A    |
| Pulse Drain Current Tested                 | $I_{DM}$        | 400        | A    |
| Single Pulse Avalanche Energy <sup>1</sup> | $E_{AS}$        | 506        | mJ   |
| Power Dissipation (Tc=25°C)                | $P_D$           | 105        | W    |
| Thermal Resistance Junction-to-Case        | $R_{\theta JC}$ | 1.19       | °C/W |
| Maximum Junction Temperature               | $T_J$           | -55 to 150 | °C   |
| Storage Temperature Range                  | $T_{STG}$       | -55 to 150 | °C   |

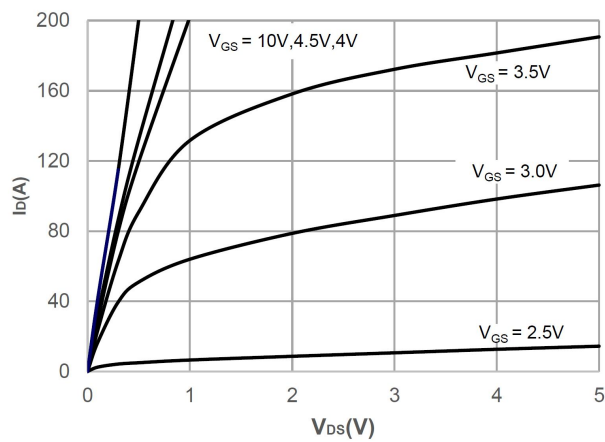
**Electrical characteristics (Ta=25°C, unless otherwise noted)**

| Characteristics                         | Symbol            | Test Condition                  | Min | Typ  | Max  | Unit |
|-----------------------------------------|-------------------|---------------------------------|-----|------|------|------|
| Static Characteristics                  |                   |                                 |     |      |      |      |
| Drain-Source Breakdown Voltage          | BV <sub>DSS</sub> | VGS=0V, ID=250mA                | 60  | -    | -    | V    |
| Zero Gate Voltage Drain Current         | IDSS              | VDS=48V, VGS=0V                 | -   | -    | 1    | uA   |
| Gate Leakage Current                    | IGSS              | VGS=±20V, VDS=0V                | -   | -    | ±100 | nA   |
| Gate Threshold Voltage                  | VGS(th)           | VDS=VGS, ID=250uA               | 1   | 1.7  | 2.5  | V    |
| Drain-Source On-state Resistance        | RDS(ON)           | VGS=10V, ID=20A                 | -   | 2.6  | 3.2  | mΩ   |
|                                         |                   | VGS=4.5V, ID=10A                | -   | 3.5  | 4.3  |      |
| Dynamic Characteristics                 |                   |                                 |     |      |      |      |
| Input Capacitance                       | Ciss              | VGS=0V, VDS=30V,F=1MHz          | -   | 4250 | -    | pF   |
| Output Capacitance                      | Coss              |                                 | -   | 975  | -    |      |
| Reverse Transfer Capacitance            | Crss              |                                 | -   | 41   | -    |      |
| Total Gate Charge                       | Qg                | VDS=30V, VGS=10V, ID=20A        | -   | 42   | -    | nC   |
| Gate-Source Charge                      | Qgs               |                                 | -   | 12   | -    |      |
| Gate-Drain Charge                       | Qgd               |                                 | -   | 10   | -    |      |
| Switching Characteristics               |                   |                                 |     |      |      |      |
| Turn-On Delay Time                      | td(on)            | VDD=30V, ID=20A, VGS=10V, RG=3Ω | -   | 13.5 | -    | nS   |
| Rise Time                               | tr                |                                 | -   | 96   | -    |      |
| Turn-Off Delay Time                     | td(off)           |                                 | -   | 40   | -    |      |
| Fall Time                               | tf                |                                 | -   | 115  | -    |      |
| Drain-Source Body Diode Characteristics |                   |                                 |     |      |      |      |
| Source-Drain Diode Forward Voltage      | VSD               | VGS=0V , IS=1A , TJ=25℃         | -   | -    | 1.2  | V    |
| Maximum Body-Diode Continuous Current   | IS                |                                 | -   | -    | 100  | A    |
| Reverse Recovery Time                   | Trr               | IS=50 A,di/dt=100 A/μs, TJ=25℃  | -   | 35   | -    | nS   |
| Reverse Recovery Charge                 | Qrr               |                                 | -   | 30   | -    | nC   |

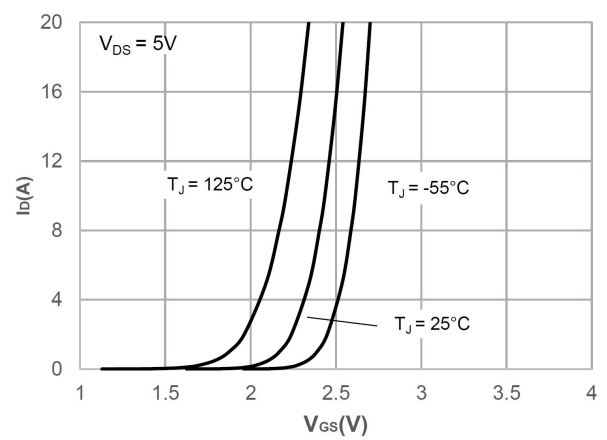
**Note :**

The test condition is  $V_{DD}=30V, V_{GS}=10V, L=0.5mH, R_G=25\Omega$

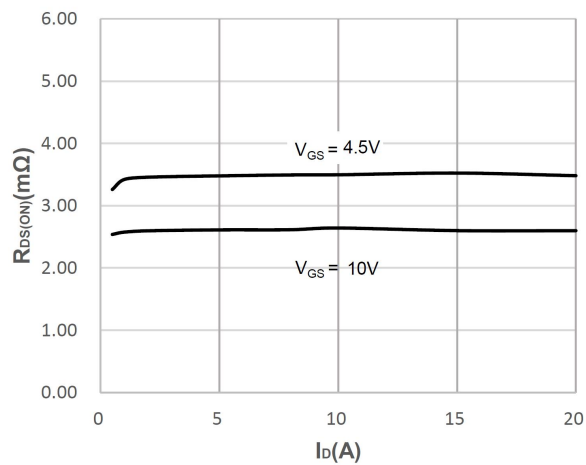
## Typical Characteristics



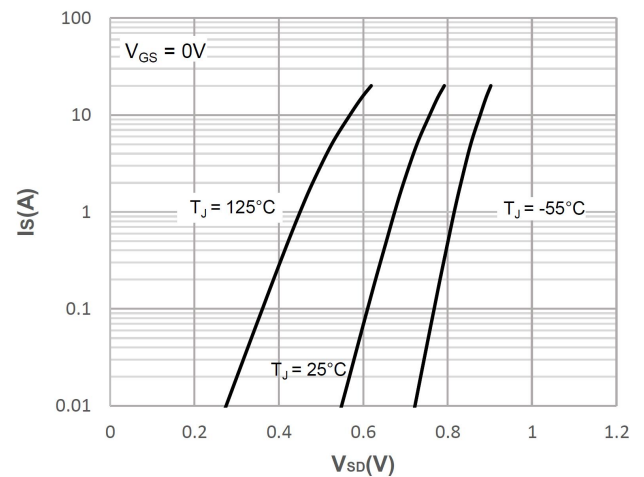
Output Characteristics



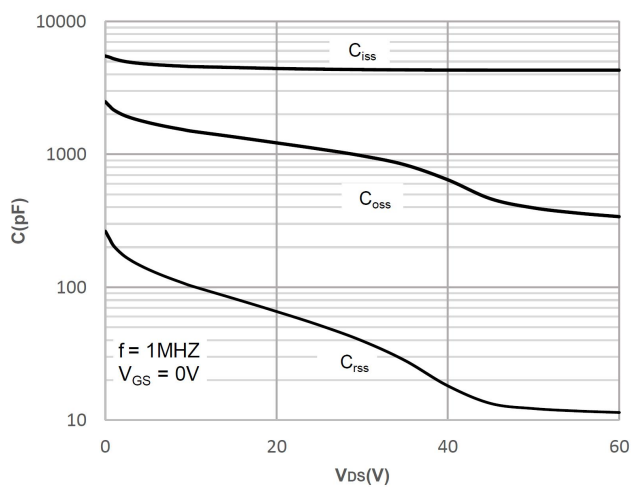
Typical Transfer Characteristics



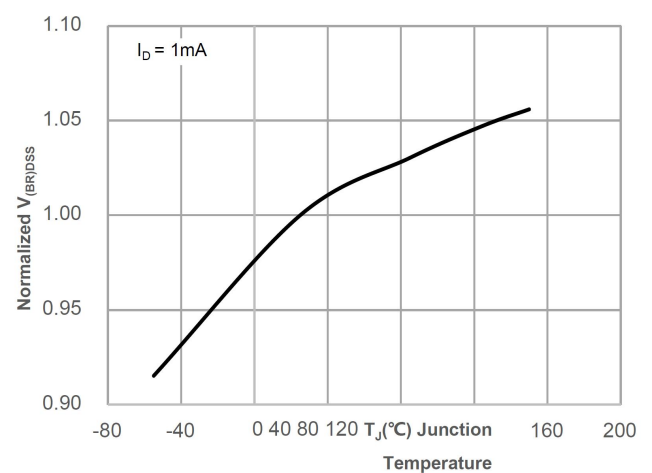
On-resistance vs. Drain Current



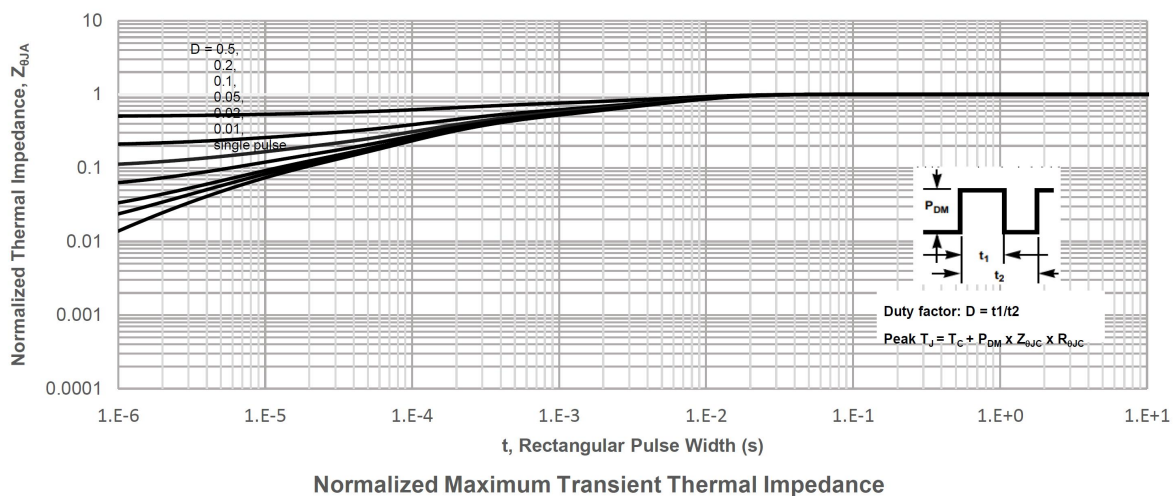
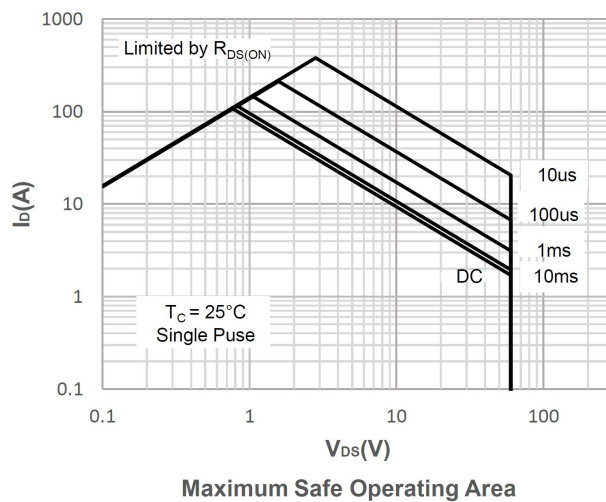
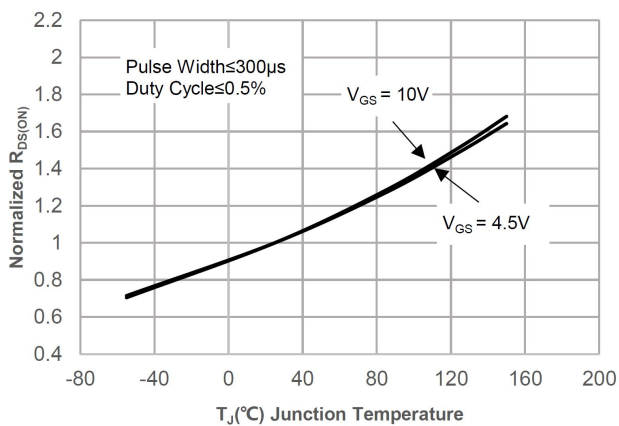
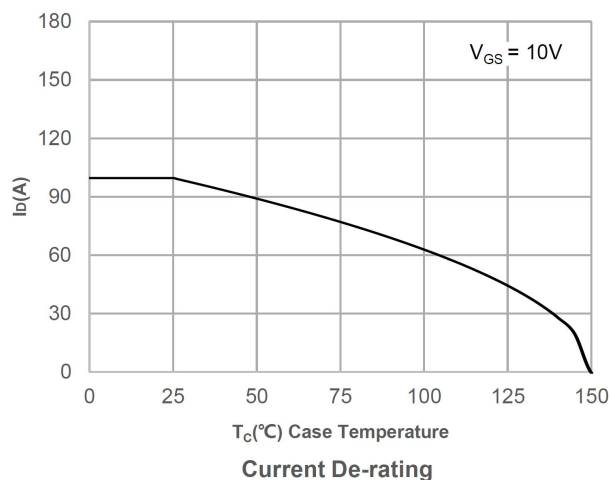
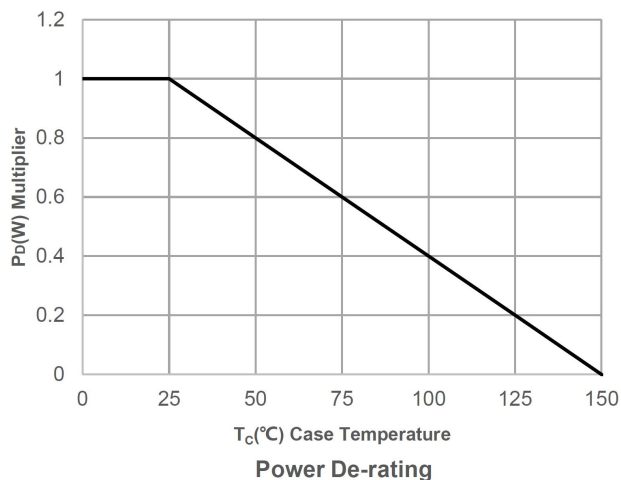
Body Diode Characteristics



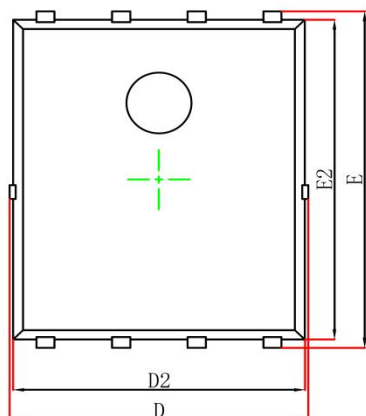
Capacitance Characteristics



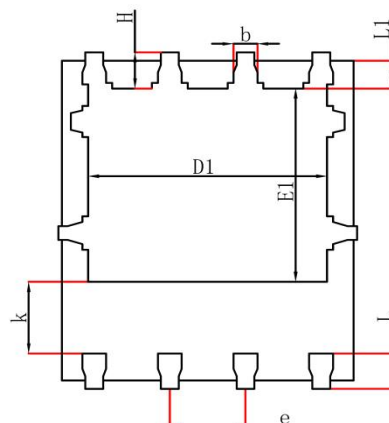
Normalized Breakdown voltage vs. Junction Temperature



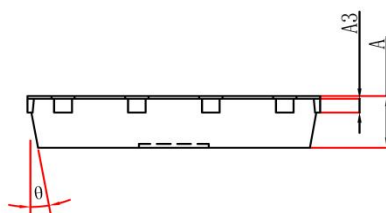
## PDFN5X6-8L Package Information



Top View  
[顶视图]



Bottom View  
[背视图]



Side View  
[侧视图]

| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min.                      | Max.  | Min.                 | Max.  |
| A      | 0.900                     | 1.000 | 0.035                | 0.039 |
| A3     | 0.254REF.                 |       | 0.010REF.            |       |
| D      | 4.944                     | 5.096 | 0.195                | 0.201 |
| E      | 5.974                     | 6.126 | 0.235                | 0.241 |
| D1     | 3.910                     | 4.110 | 0.154                | 0.162 |
| E1     | 3.375                     | 3.575 | 0.133                | 0.141 |
| D2     | 4.824                     | 4.976 | 0.190                | 0.196 |
| E2     | 5.674                     | 5.826 | 0.223                | 0.229 |
| k      | 1.190                     | 1.390 | 0.047                | 0.055 |
| b      | 0.350                     | 0.450 | 0.014                | 0.018 |
| e      | 1.270TYP.                 |       | 0.050TYP.            |       |
| L      | 0.559                     | 0.711 | 0.022                | 0.028 |
| L1     | 0.424                     | 0.576 | 0.017                | 0.023 |
| H      | 0.574                     | 0.726 | 0.023                | 0.029 |
| θ      | 10°                       | 12°   | 10°                  | 12°   |