

Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)TYP}$ | I_D |
|---------------|-----------------|-------|
| 80V | 8.5mΩ@10V | 60A |
| | 11.5mΩ@4.5V | |



合肥矽普半导体

Siliup Semiconductor Technology Co., Ltd

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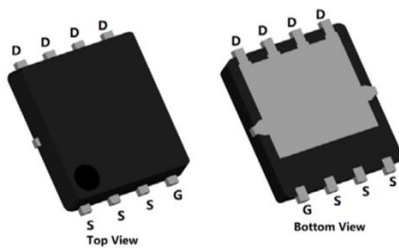
Feature

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

Applications

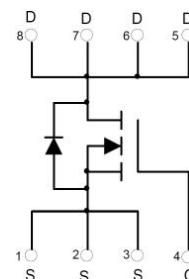
- Power switching application
- DC-DC Converter
- Uninterruptible power supply

Package



PDFN5X6-8L

Circuit diagram



Marking



SP80N09GNK
**

:Device Code
:Week Code

Order Information

| Device | Package | Unit/Tape |
|------------|------------|-----------|
| SP80N09GNK | PDFN5X6-8L | 5000 |

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

| Parameter | Symbol | Rating | Unit |
|--|-----------------|------------|------|
| Drain-Source Voltage | V_{DS} | 80 | V |
| Gate-Source Voltage | V_{GS} | ± 20 | V |
| Continuous Drain Current (Tc=25°C) | I_D | 60 | A |
| Continuous Drain Current (Tc=100°C) | I_D | 40 | A |
| Pulse Drain Current Tested | I_{DM} | 240 | A |
| Single Pulse Avalanche Energy ¹ | E_{AS} | 78 | mJ |
| Power Dissipation (Tc=25°C) | P_D | 71.4 | W |
| Thermal Resistance Junction-to-Case | $R_{\theta JC}$ | 1.75 | °C/W |
| Maximum Junction Temperature | T_J | -55 to 150 | °C |
| Storage Temperature Range | T_{STG} | -55 to 150 | °C |

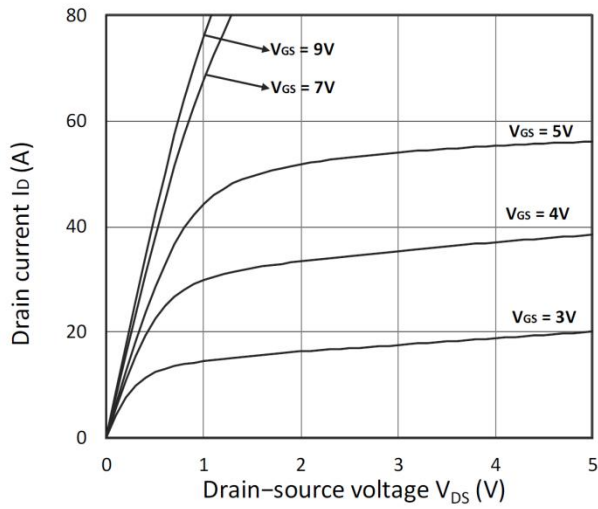
Electrical characteristics (Ta=25°C, unless otherwise noted)

| Characteristics | Symbol | Test Condition | Min | Typ | Max | Unit |
|---|---------------------|--|-----|------|------|------|
| Static Characteristics | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | I _D = 250μA, V _{GS} = 0V | 80 | - | - | V |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} = 64V, V _{GS} = 0V | - | - | 1 | uA |
| Gate Leakage Current | I _{GSS} | V _{GS} = ±20V, V _{DS} = 0V | - | - | ±100 | nA |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} = V _{GS} , I _D = 250μA | 1.0 | 2.0 | 3.0 | V |
| Drain-Source On-state Resistance | R _{DS(on)} | V _{GS} = 10V, I _D = 20A | - | 8.5 | 11.5 | mΩ |
| | | V _{GS} = 4.5V, I _D = 20A | - | 11.5 | 16.0 | |
| Dynamic Characteristics | | | | | | |
| Input Capacitance | C _{iss} | VGS=0V, VDS=40V,F=1MHz | - | 1000 | - | pF |
| Output Capacitance | C _{oss} | | - | 330 | - | |
| Reverse Transfer Capacitance | C _{rss} | | - | 20 | - | |
| Total Gate Charge | Q _g | VDS=40V, VGS=10V, ID=20A | - | 16 | - | nC |
| Gate-Source Charge | Q _{gs} | | - | 4.8 | - | |
| Gate-Drain Charge | Q _{gd} | | - | 4.4 | - | |
| Switching Characteristics | | | | | | |
| Turn-On Delay Time | t _{d(on)} | VDD=40V, ID=20A, VGS=10V, R _G =3Ω | - | 8.0 | - | nS |
| Rise Time | t _r | | - | 5.6 | - | |
| Turn-Off Delay Time | t _{d(off)} | | - | 14 | - | |
| Fall Time | t _f | | - | 4.8 | - | |
| Drain-Source Body Diode Characteristics | | | | | | |
| Source-Drain Diode Forward Voltage | V _{SD} | VGS=0V , IS=1A , TJ=25℃ | - | - | 1.2 | V |
| Maximum Body-Diode Continuous Current | I _s | | - | - | 60 | A |
| Reverse Recovery Time | Trr | Is=20 A,di/dt=100 A/μs, TJ=25℃ | - | 35 | - | nS |
| Reverse Recovery Charge | Qrr | | - | 27.8 | - | nC |

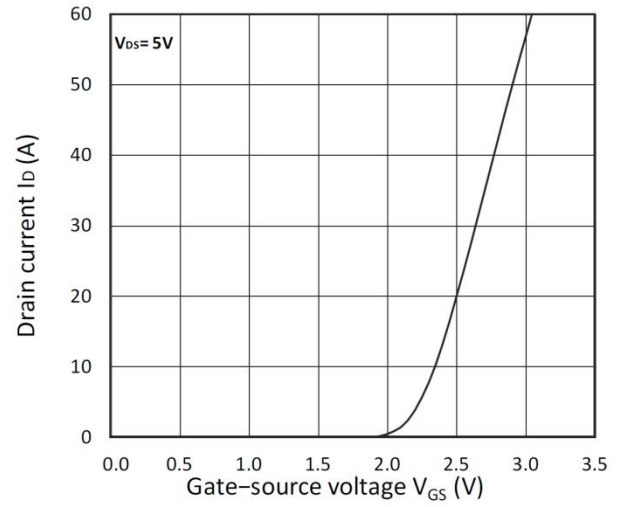
Note :

1. The test condition is $V_{DD}=40V, V_{GS}=10V, L=0.5mH, R_G=25\Omega$

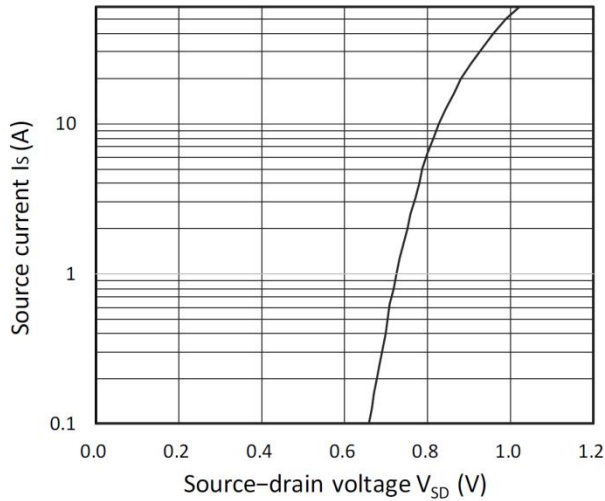
Typical Characteristics



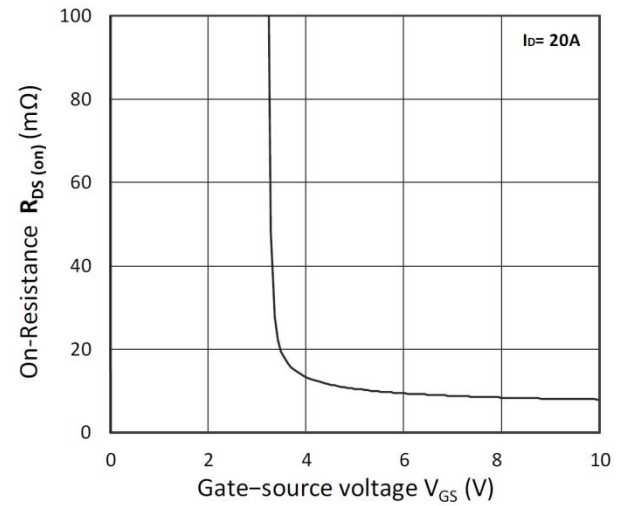
Output Characteristics



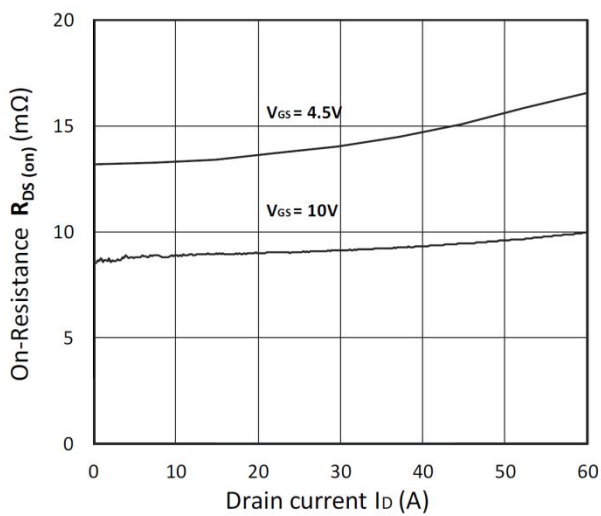
Transfer Characteristics



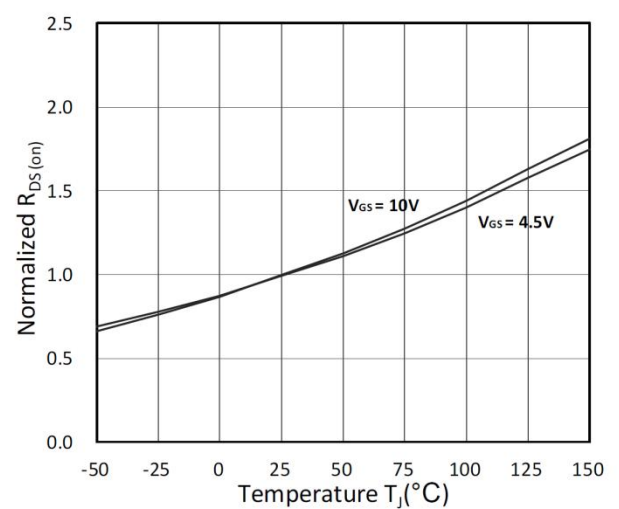
Forward Characteristics of Reverse



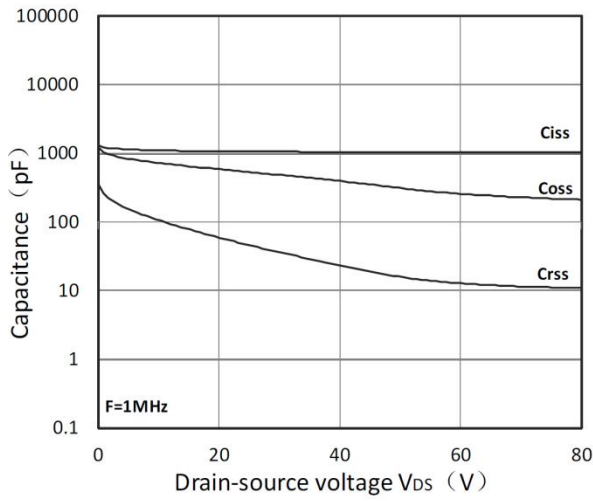
$R_{DS(on)}$ vs. V_{GS}



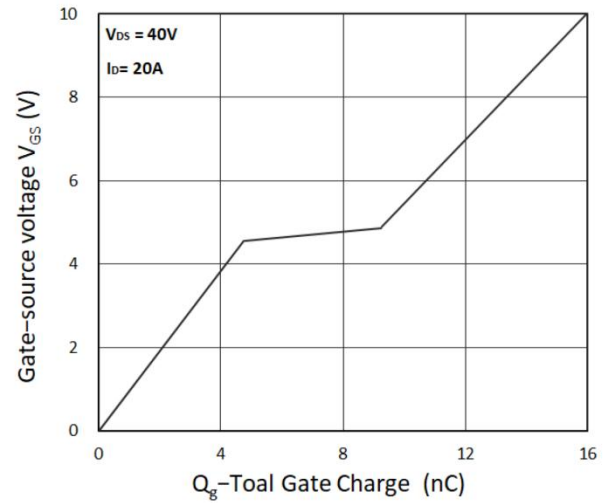
$R_{DS(on)}$ vs. I_D



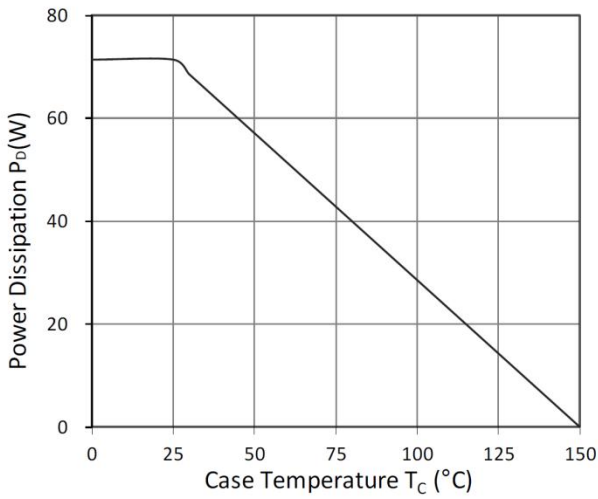
Normalized $R_{DS(on)}$ vs. Temperature



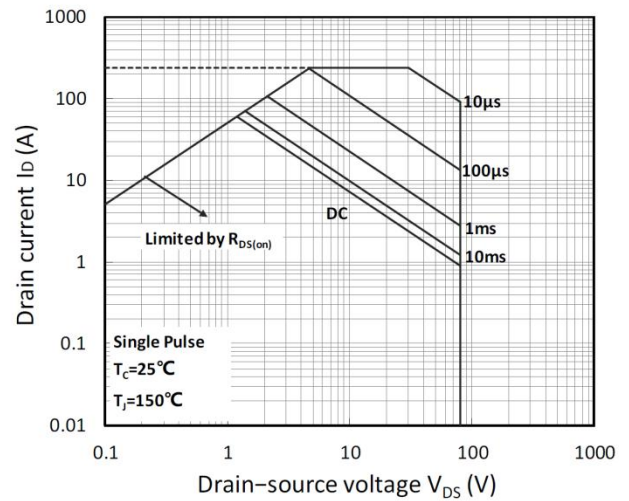
Capacitance Characteristics



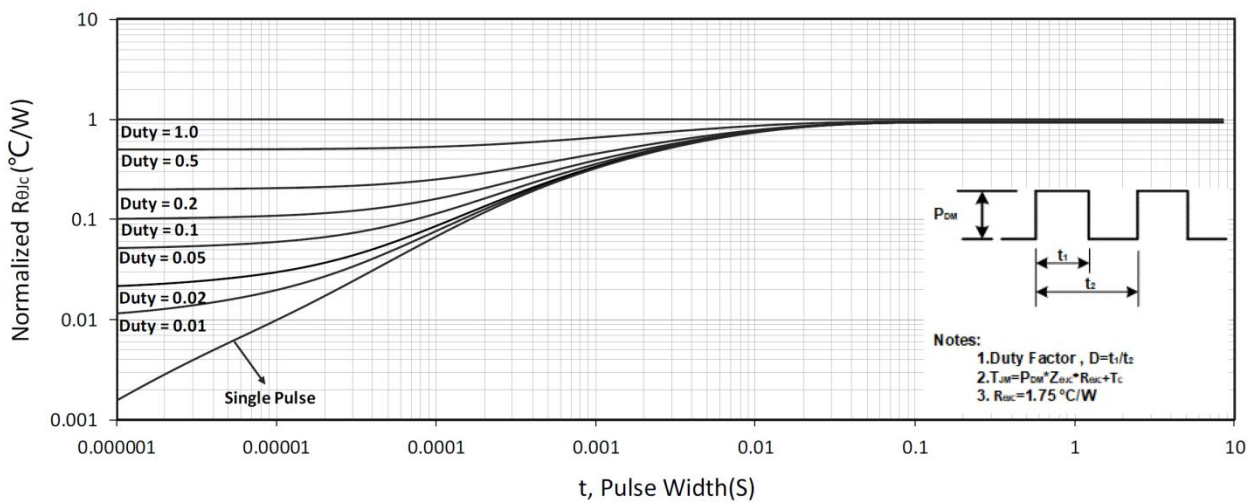
Gate Charge Characteristics



Power Dissipation



Safe Operating Area



Normalized Maximum Transient Thermal Impedance

