

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
80V	9m Ω @10V	60A
	12m Ω @4.5V	



合肥矽普半导体

Siliup Semiconductor Technology Co., Ltd

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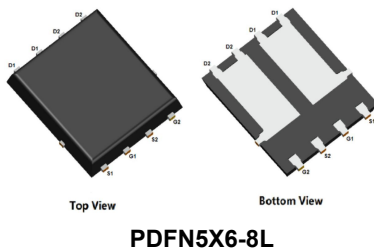
Feature

- Fast Switching
- Low Gate Charge and $R_{DS(on)}$
- Advanced Split Gate Trench Technology
- 100% Single Pulse avalanche energy Test

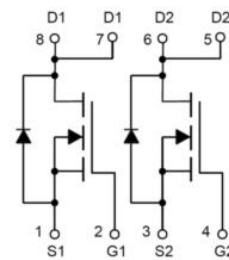
Applications

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

Package



Circuit diagram



Marking



SP80N09GDNK :Device Code
** :Week Code

Order Information

Device	Package	Unit/Tape
SP80N09GDNK	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	38	A
Pulse Drain Current Tested	I_{DM}	240	A
Single Pulse Avalanche Energy ¹	E_{AS}	156	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

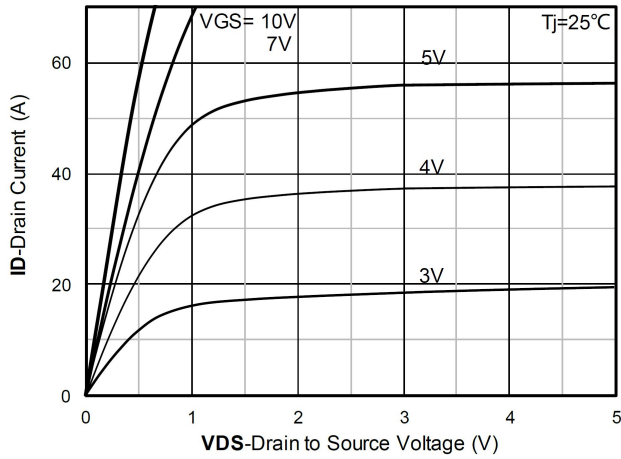
Electrical characteristics (Ta=25°C, unless otherwise noted)

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	ID = 250μA, VGS = 0V	80	-	-	V
Zero Gate Voltage Drain Current	IDSS	VDS = 64V, VGS = 0V	-	-	1	uA
Gate Leakage Current	IGSS	VGS = ±20V, VDS = 0V	-	-	±100	nA
Gate Threshold Voltage	VGS(th)	VDS = VGS, ID = 250μA	1.0	2.0	3.0	V
Drain-Source On-state Resistance	RDS(ON)	VGS = 10V, ID = 20A	-	9	12	mΩ
		VGS = 4.5V, ID = 20A	-	12	16	
Dynamic Characteristics						
Input Capacitance	Ciss	VGS = 0V, VDS = 40V, F = 1MHz	-	1232	-	pF
Output Capacitance	Coss		-	357	-	
Reverse Transfer Capacitance	Crss		-	25	-	
Total Gate Charge	Qg	VDS = 40V, VGS = 10V, ID = 20A	-	20	-	nC
Gate-Source Charge	Qgs		-	5.9	-	
Gate-Drain Charge	Qgd		-	5.4	-	
Switching Characteristics						
Turn-On Delay Time	td(on)	VDD = 40V, ID = 20A, VGS = 10V, RG = 3Ω	-	9.8	-	nS
Rise Time	tr		-	6.9	-	
Turn-Off Delay Time	td(off)		-	17	-	
Fall Time	tf		-	5.9	-	
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	VSD	VGS = 0V, IS = 1A, TJ = 25°C	-	-	1.2	V
Maximum Body-Diode Continuous Current	IS		-	-	60	A
Reverse Recovery Time	Trr	IS = 20A, di/dt = 100A/μs, TJ = 25°C	-	43	-	nS
Reverse Recovery Charge	Qrr		-	34.2	-	nC

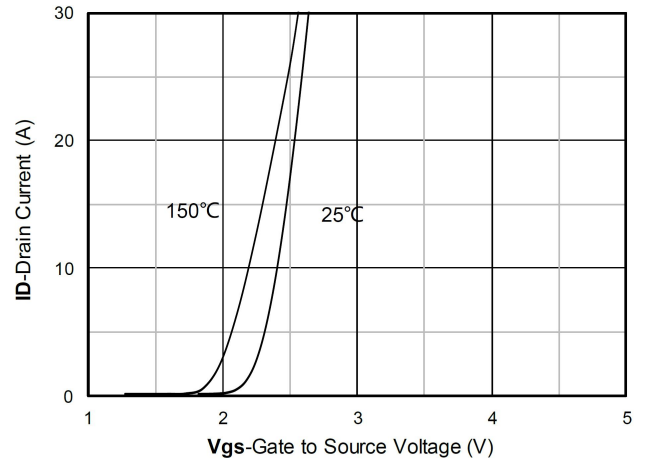
Note :

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

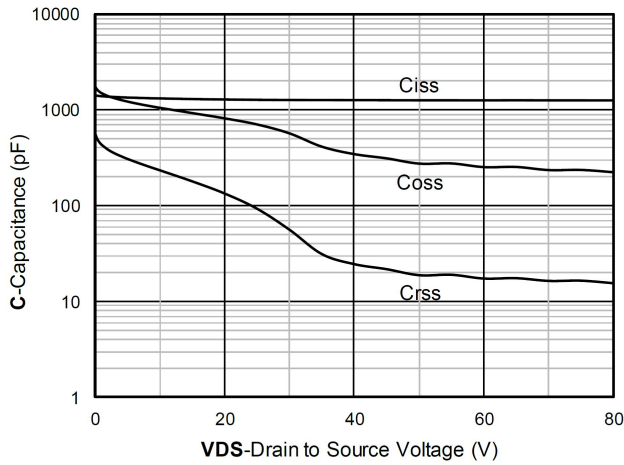
Typical Characteristics



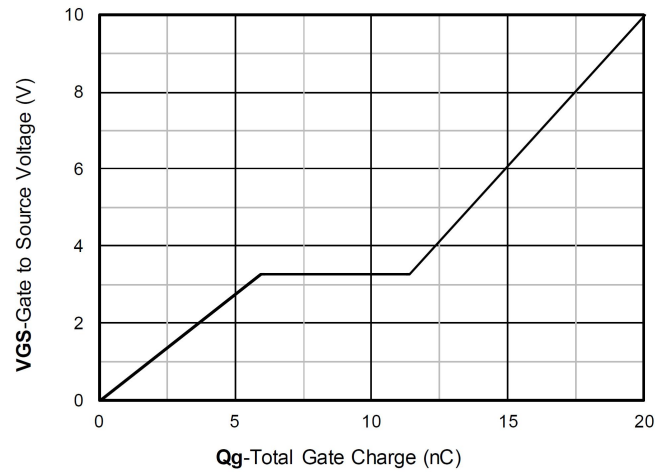
Output Characteristics



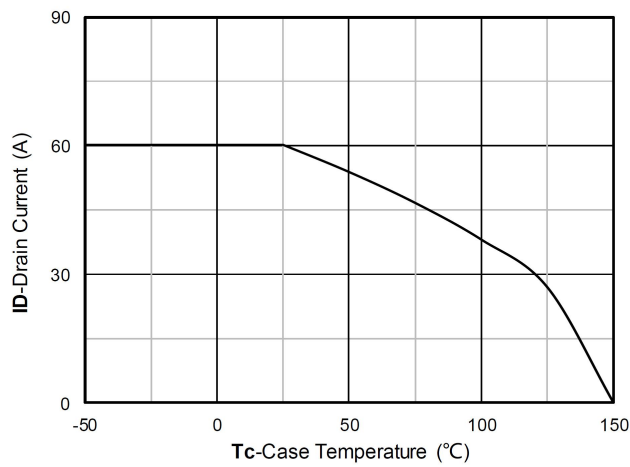
Transfer Characteristics



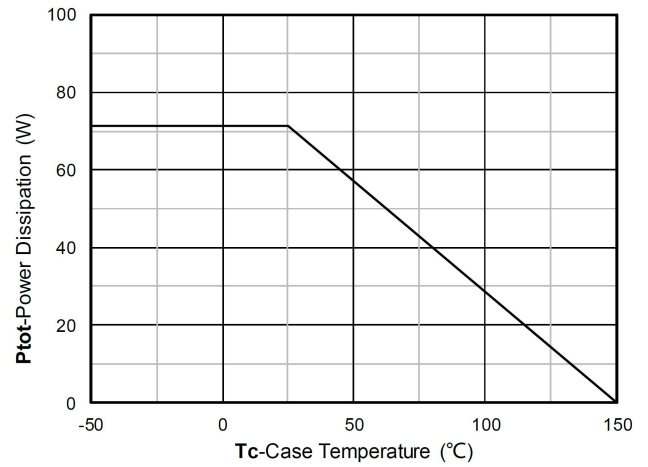
Capacitance Characteristics



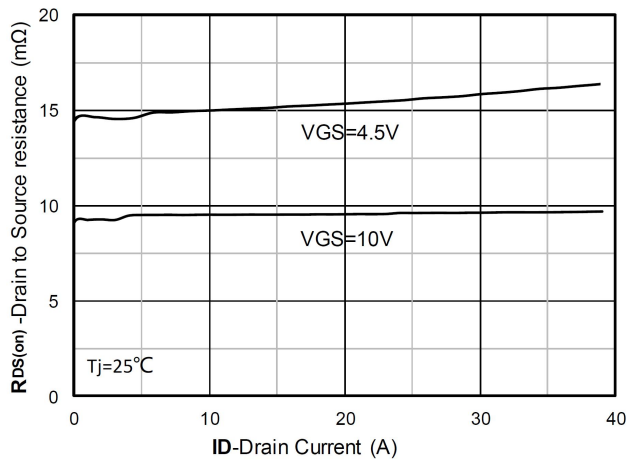
Gate Charge



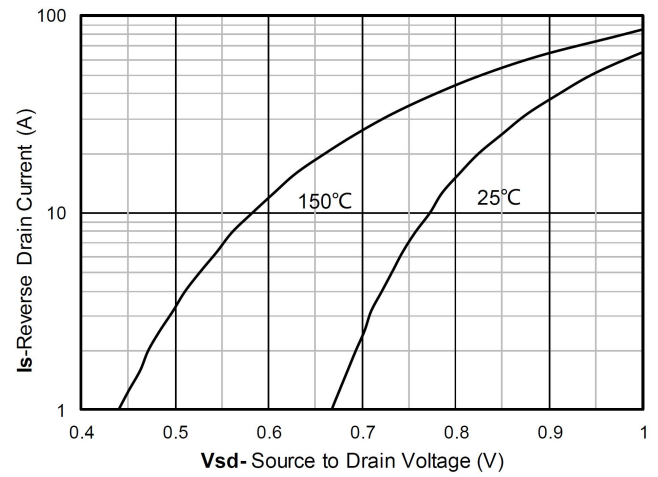
Current dissipation



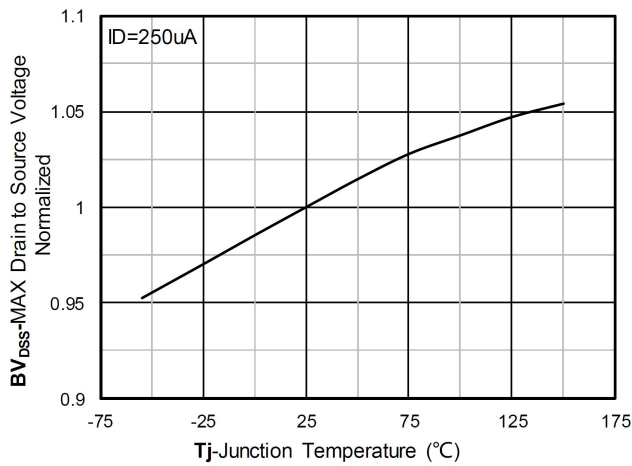
Power dissipation



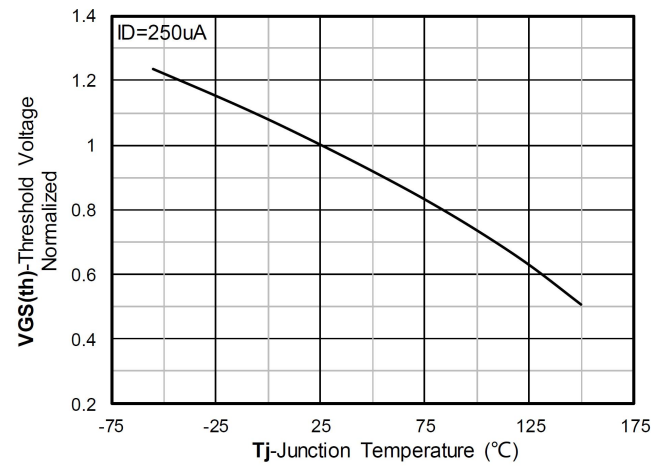
$R_{DS(on)}$ VS Drain Current



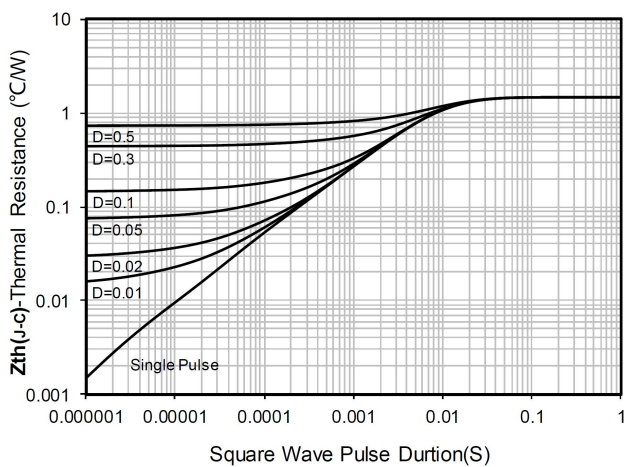
Forward characteristics of reverse diode



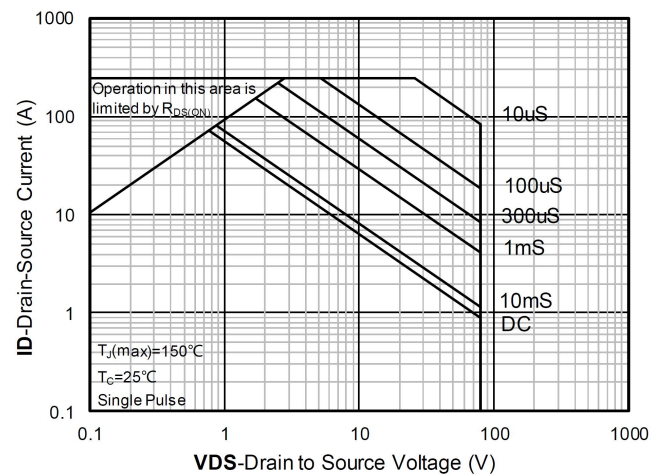
Normalized breakdown voltage



Normalized Threshold voltage

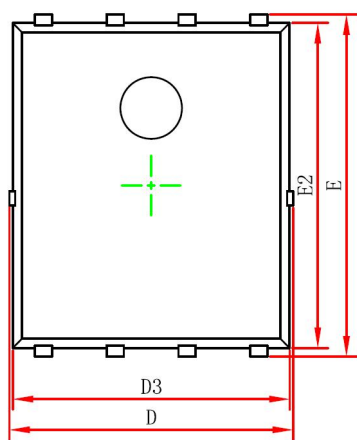


Maximum Transient Thermal Impedance

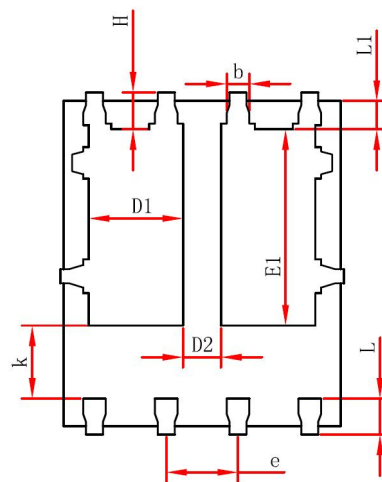


Safe Operation Area

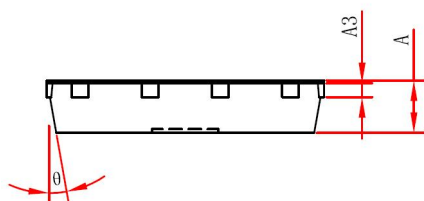
PDFN5x6-8L Package Information



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	0.254 REF.		0.010REF.	
D	4.944	5.096	0.195	0.201
E	5.974	6.126	0.235	0.241
D1	1.470	1.870	0.058	0.074
D2	0.470	0.870	0.019	0.034
E1	3.375	3.575	0.133	0.141
D3	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°