

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
40V	0.75mΩ@10V	275A
	1.1mΩ@4.5V	



合肥矽普半导体
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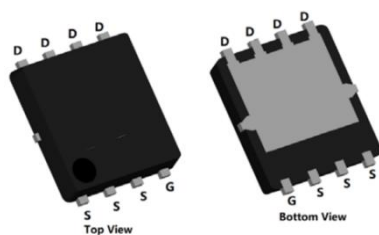
Feature

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

Applications

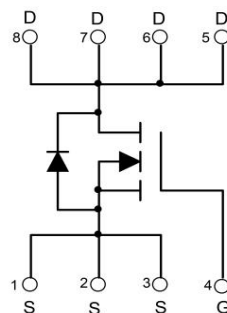
- PWM Application
- Hard switched and high frequency circuits
- Power Management

Package

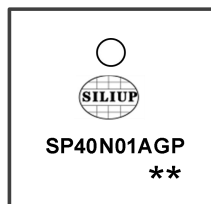


PDFN5X6-8L

Circuit diagram



Marking



SP40N01AGP
** :Device Code
** :Week Code

Order Information

Device	Package	Unit/Tape
SP40N01AGNP	PDFN5X6-8L	5000

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

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current (Tc=25°C)	I_D	275	A
Continuous Drain Current (Tc=100°C)	I_D	175	A
Pulsed Drain Current	I_{DM}	1100	A
Single Pulse Avalanche Energy ¹	E_{AS}	930	mJ
Power Dissipation (Tc=25°C)	P_D	160	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	0.78	°C/W
Storage Temperature Range	T_{STG}	-55 to 150	°C
Operating Junction Temperature Range	T_J	-55 to 150	°C

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

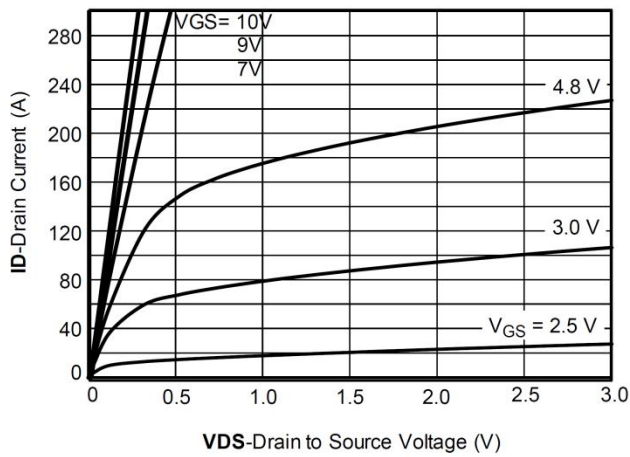
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	VGS=0V , ID=250uA	40	-	-	V
Drain-Source Leakage Current	I _{DSS}	VDS=32V , VGS=0V , TJ=25℃	-	-	1	uA
Gate-Source Leakage Current	I _{GSS}	VGS=±20V , VDS=0V	-	-	±100	nA
Gate Threshold Voltage	VGS(th)	VGS=VDS , ID =250uA	1	1.6	2.5	V
Static Drain-Source On-Resistance	R _{DS(ON)}	VGS=10V , ID=20A	-	0.75	0.95	mΩ
		VGS=4.5V , ID=20A	-	1.1	1.5	
Dynamic characteristics						
Input Capacitance	C _{iss}	VDS=20V , VGS=0V , f=1MHz	-	6329	-	pF
Output Capacitance	C _{oss}		-	3659	-	
Reverse Transfer Capacitance	C _{rss}		-	142	-	
Total Gate Charge	Q _g	VDS=20V , VGS=10V , ID=120A	-	87	-	nC
Gate-Source Charge	Q _{gs}		-	28	-	
Gate-Drain Charge	Q _{gd}		-	17	-	
Switching Characteristics						
Turn-On Delay Time	T _{d(on)}	VDD=20V , VGS=10V , RG=3.5Ω ID=120A	-	13	-	nS
Rise Time	T _r		-	8	-	
Turn-Off Delay Time	T _{d(off)}		-	28.6	-	
Fall Time	T _f		-	13.7	-	
Diode Characteristics						
Diode Forward Voltage	V _{SD}	VGS=0V , IS=1A , TJ=25℃	-	-	1.2	V
Maximum Body-Diode Continuous Current	I _S		-	-	275	A
Reverse Recovery Time	T _{rr}	IS=120A, di/dt=100A/us, TJ=25℃	-	78	-	nS
Reverse Recovery Charge	Q _{rr}		-	95	-	nC

Note :

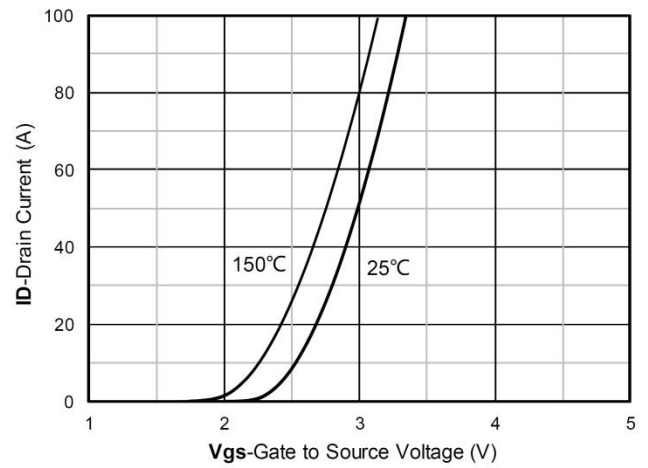
1. The test condition is $V_{DD}=20V, V_{GS}=10V, L=0.5mH, R_G=25\Omega$



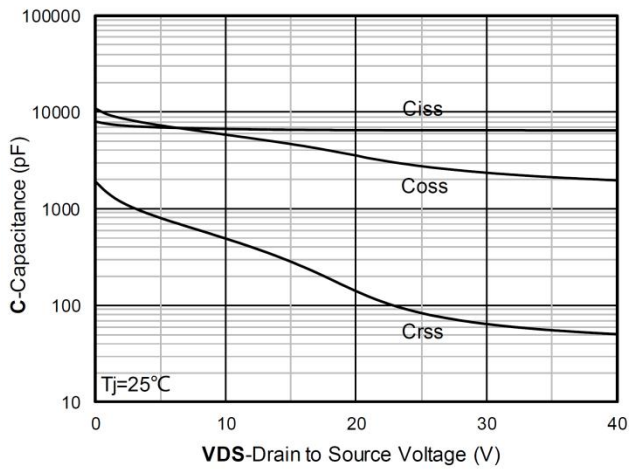
Typical Characteristics



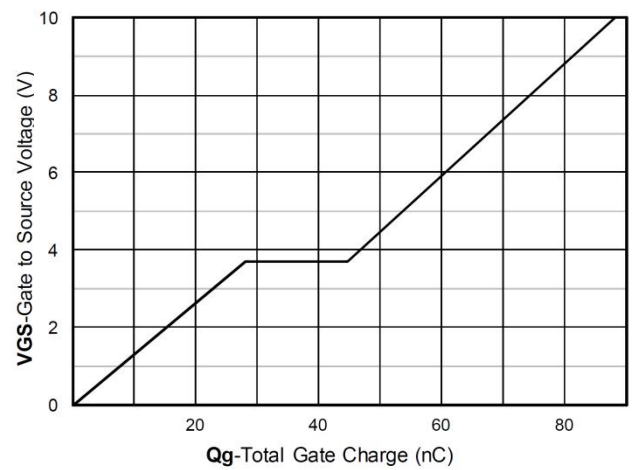
Output Characteristics



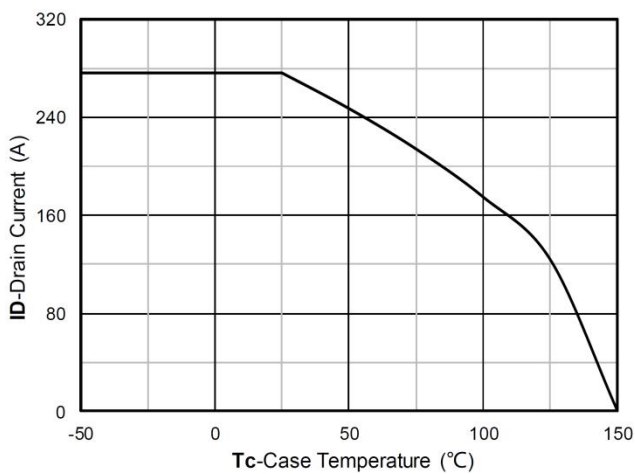
Transfer Characteristics



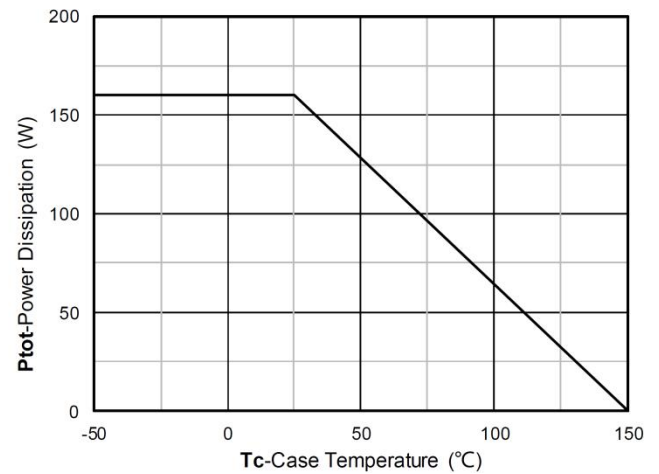
Capacitance Characteristics



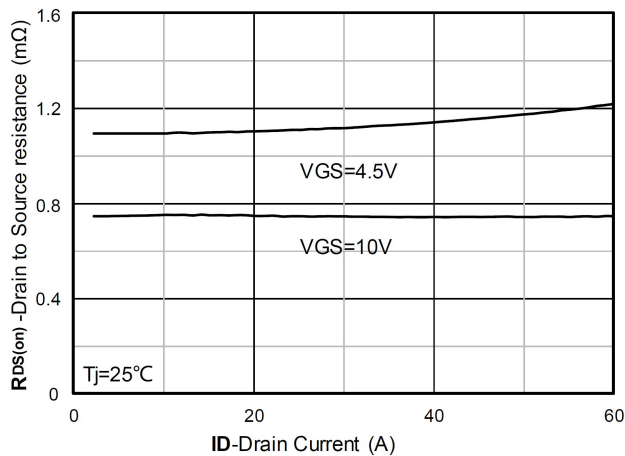
Gate Charge



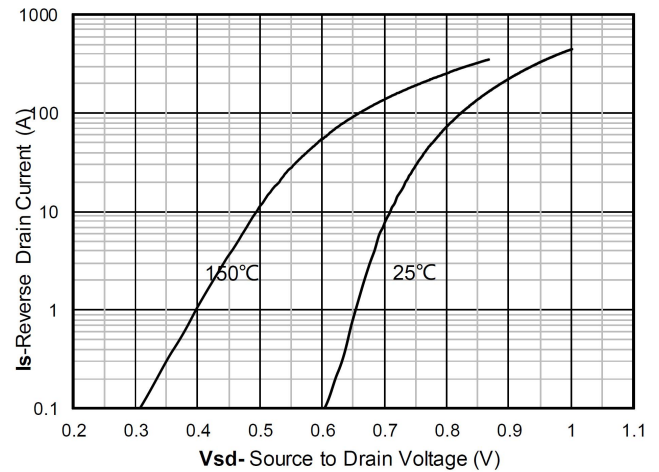
Current dissipation



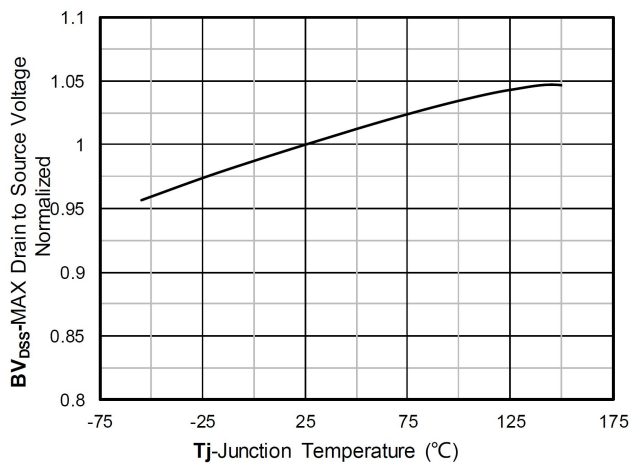
Power dissipation



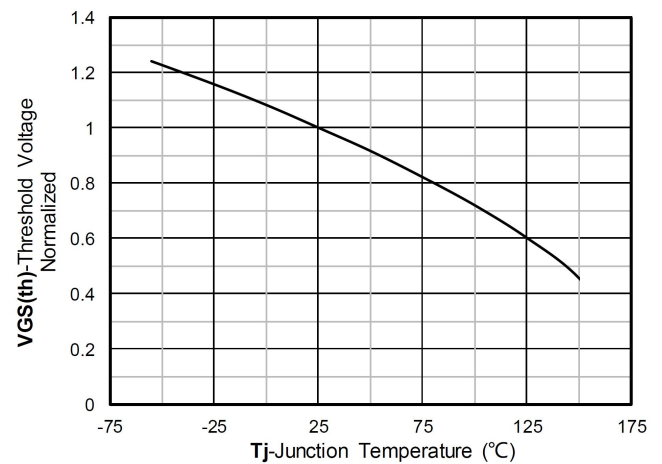
RDS(on) VS Drain Current



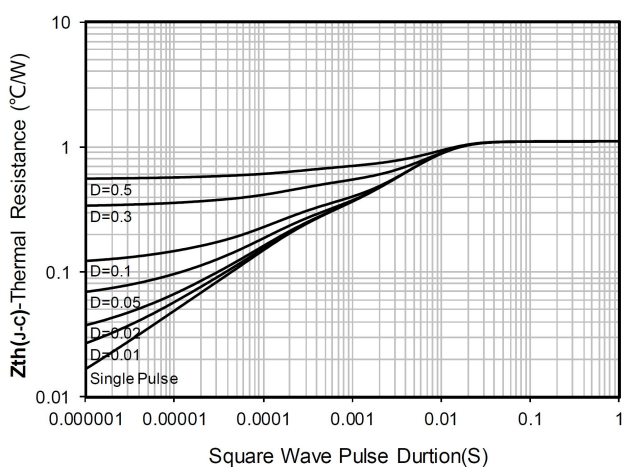
Forward characteristics of reverse diode



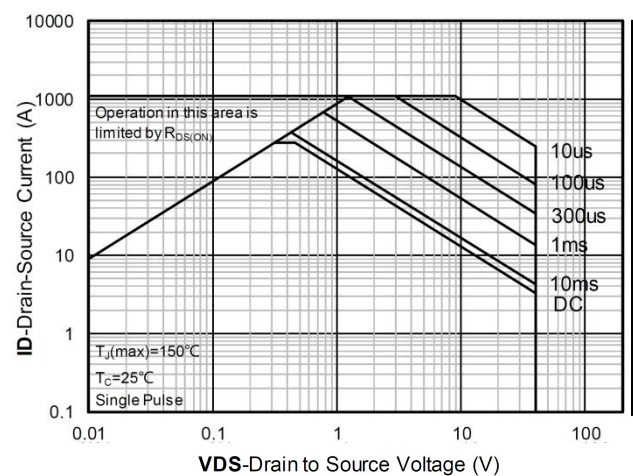
Normalized breakdown voltage



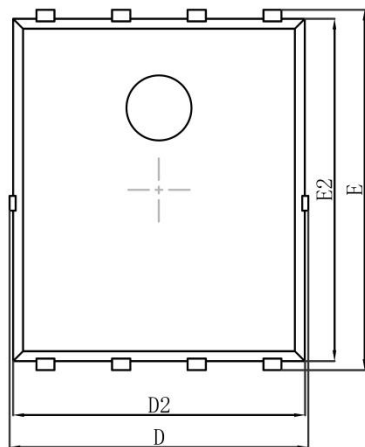
Normalized Threshold voltage



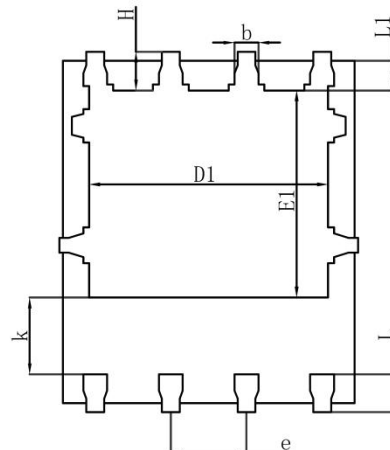
Maximum Transient Thermal Impedance



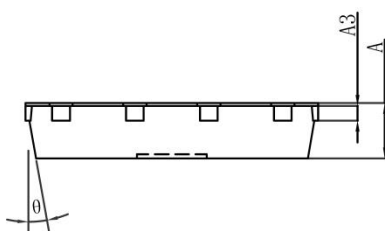
Safe Operation Area

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	0.254REF.		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°