

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
60V	13mΩ@10V	25A
	16mΩ@4.5V	



合肥矽普半导体

Siliup Semiconductor Technology Co., Ltd.

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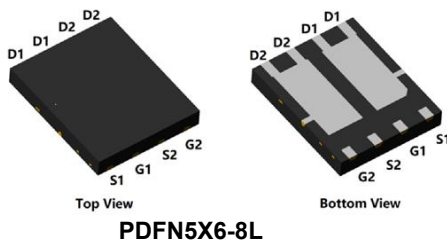
Feature

- Fast switching speed
- Surface mount package
- Advanced Split Gate Trench Technology
- 100% Single Pulse avalanche energy Test

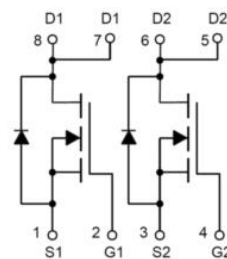
Applications

- DC-DC Converters.
- Motor Control.

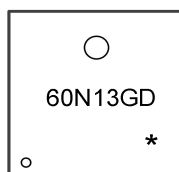
Package



Circuit diagram



Marking



60N13GD :Device Code
***** :Month Code

Order Information

Device	Package	Unit/Tape
SP60N13GDNK	PDFN5X6-8L	5000

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DSS}	60	V
Gate-Source Voltage	V_{GSS}	± 20	V
Continuous Drain Current (Tc=25°C)	I_D	25	A
Continuous Drain Current (Tc=100°C)	I_D	16	A
Pulse Drain Current Tested	I_{DM}	100	A
Single Pulse Avalanche Energy ¹	E_{AS}	64	mJ
Power Dissipation (Tc=25°C)	P_D	45	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	2.78	°C/W
Maximum Junction Temperature	T_J	-55 to 150	°C
Storage Temperature Range	T_{STG}	-55 to 150	°C

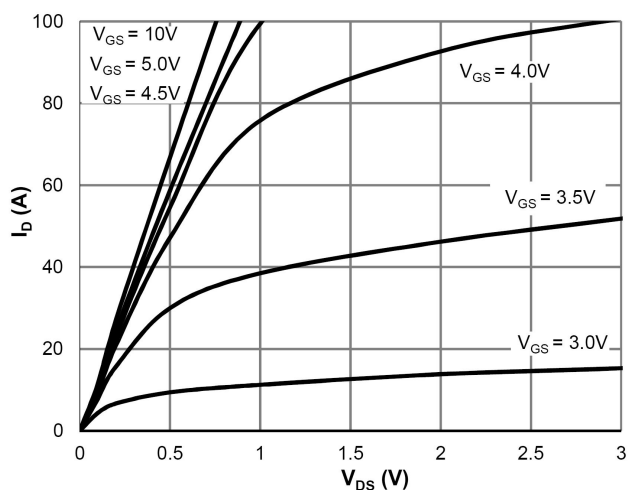
Electrical characteristics (Ta=25°C, unless otherwise noted)

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	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	1.8	2.5	V
Drain-Source On-state Resistance	RDS(ON)	VGS=10V, ID=15A	-	13	16	mΩ
		VGS=4.5V, ID=10A	-	16	21	
Dynamic Characteristics						
Input Capacitance	Ciss	VGS=0V, VDS=30V,F=1MHz	-	940	-	pF
Output Capacitance	Coss		-	235	-	
Reverse Transfer Capacitance	Crss		-	10	-	
Total Gate Charge	Qg	VDS=30V, VGS=10V, ID=10A	-	15.9	-	nC
Gate-Source Charge	Qgs		-	2.8	-	
Gate-Drain Charge	Qgd		-	4.2	-	
Switching Characteristics						
Turn-On Delay Time	td(on)	VDD=30V, ID=10A, VGS=10V, RG=4.7Ω	-	4	-	nS
Rise Time	tr		-	6	-	
Turn-Off Delay Time	td(off)		-	18.8	-	
Fall Time	tf		-	6.4	-	
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		-	-	25	A
Reverse Recovery Time	Trr	IS=10 A,di/dt=100 A/μs, TJ=25℃	-	19	-	nS
Reverse Recovery Charge	Qrr		-	12	-	nC

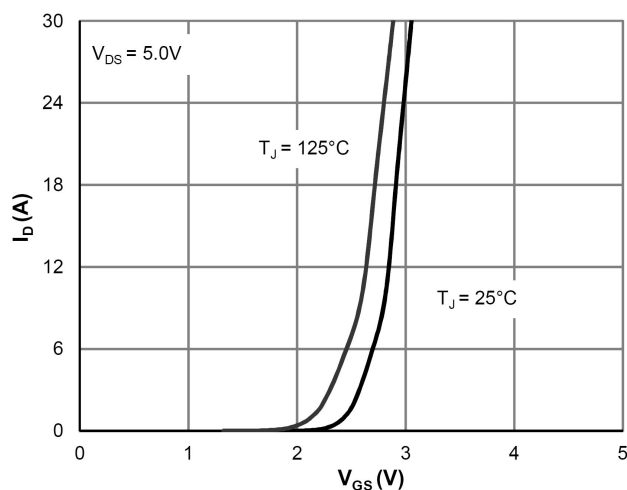
Note :

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

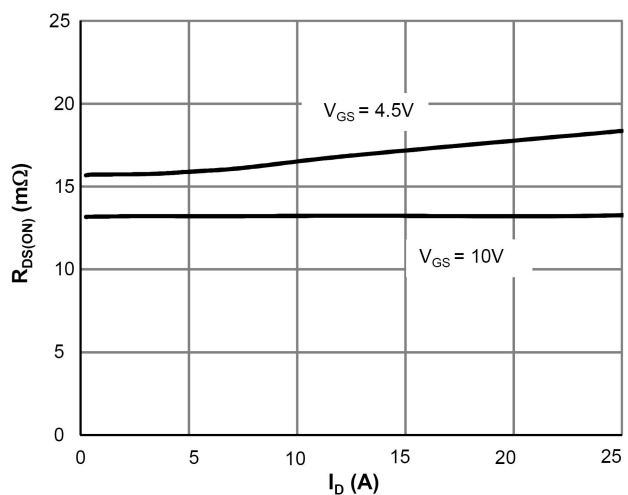
Typical Characteristics



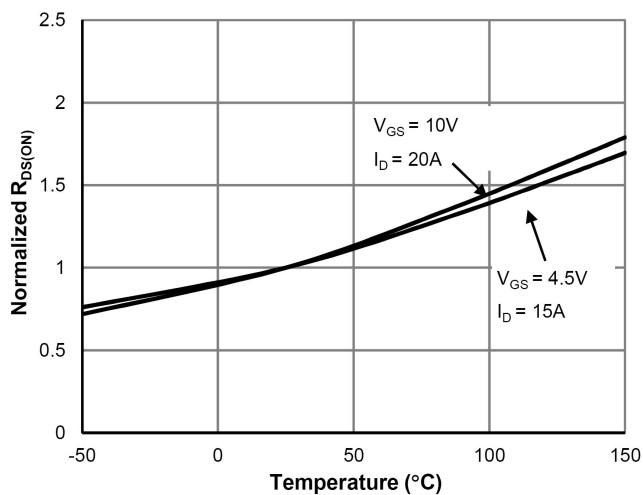
Saturation Characteristics



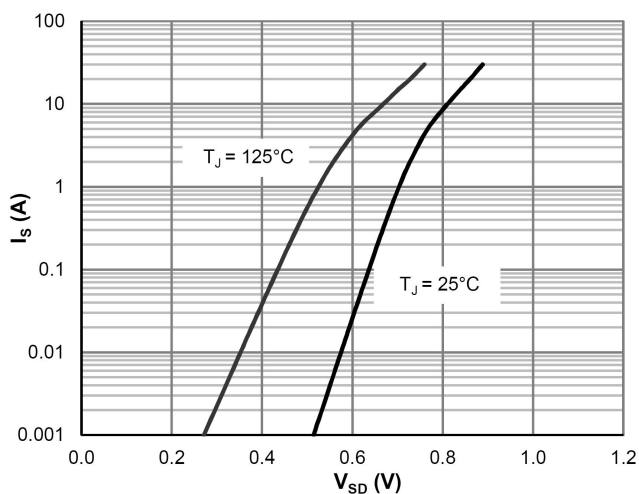
Transfer Characteristics



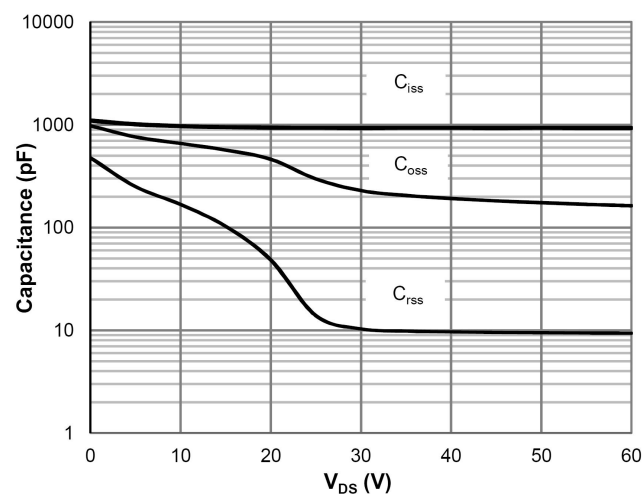
$R_{DS(on)}$ vs. Drain Current



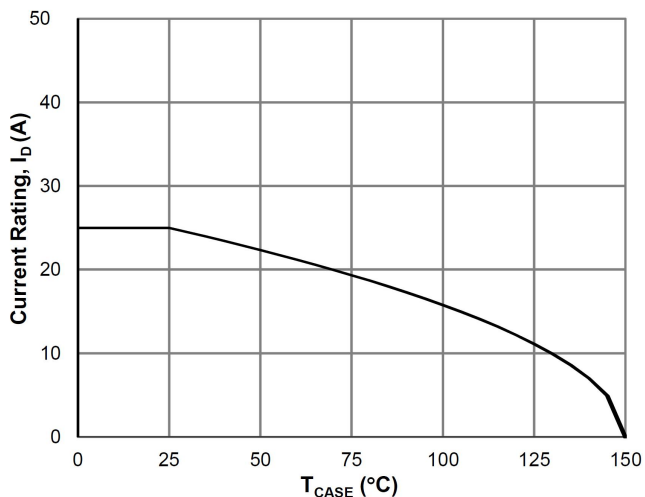
$R_{DS(on)}$ vs. Junction Temperature



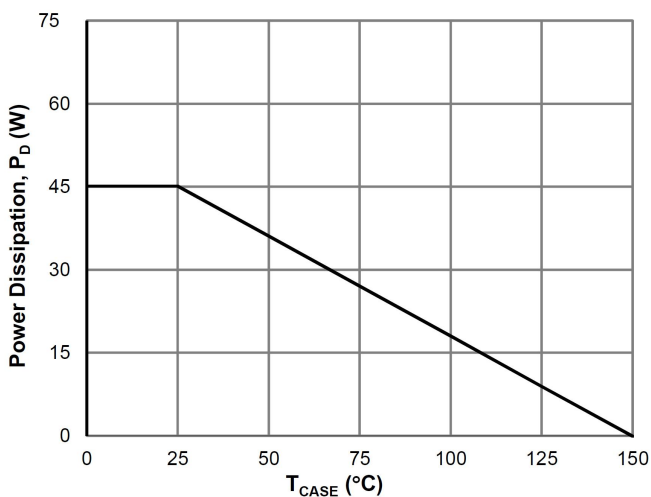
Body-Diode Characteristics



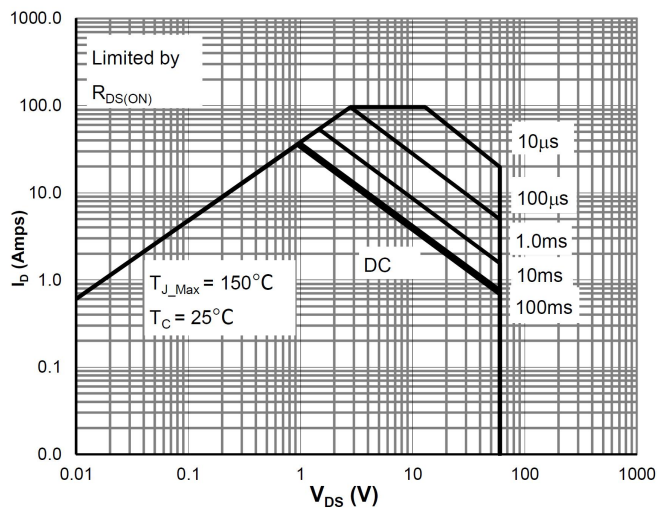
Capacitance Characteristics



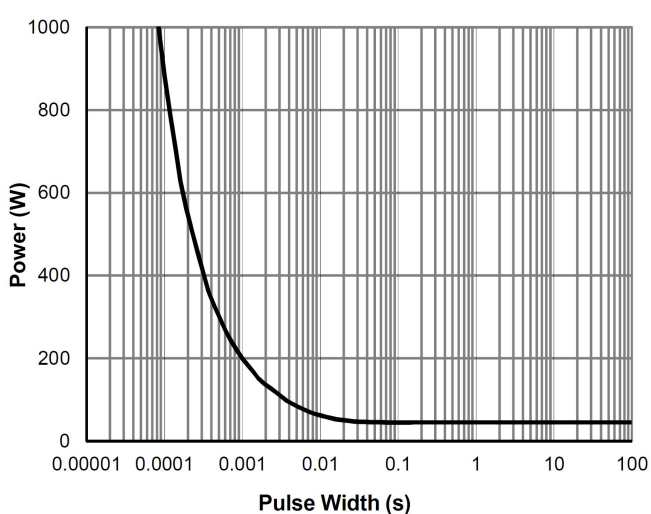
Current De-rating



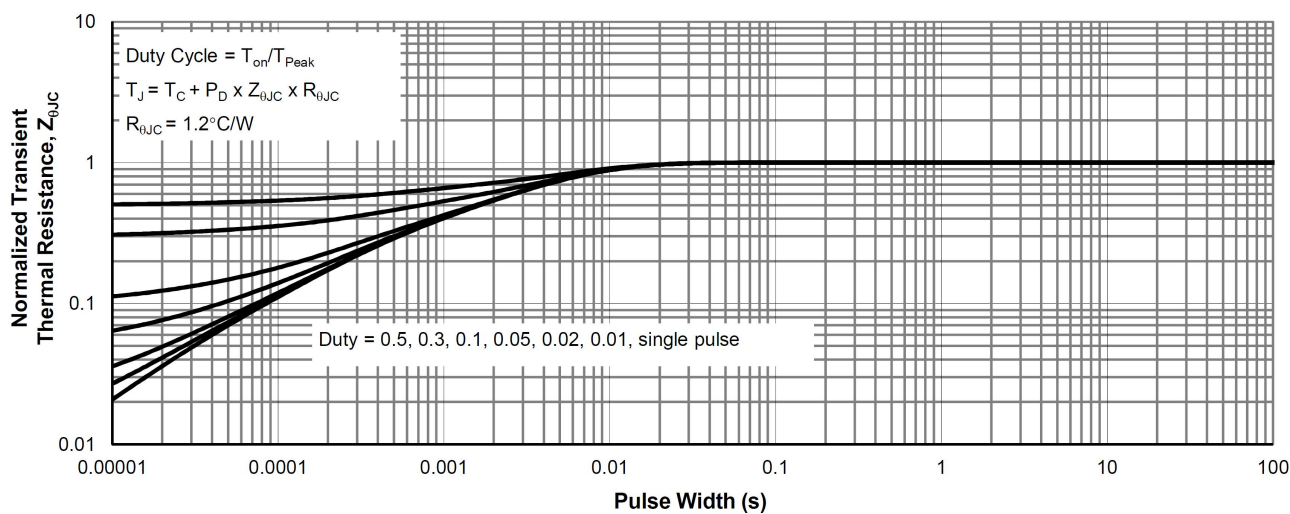
Power De-rating



Maximum Safe Operating Area

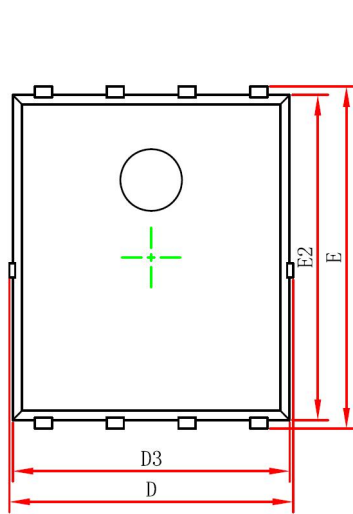


Single Pulse Power Rating, Junction-to-Case

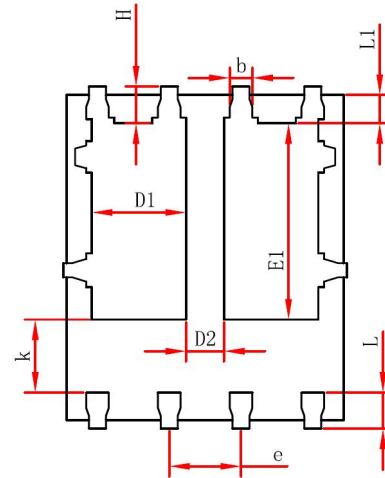


Normalized Maximum Transient Thermal Impedance

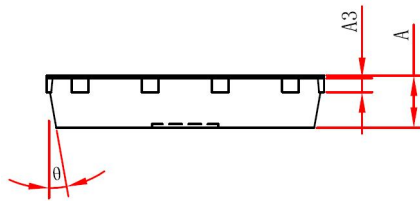
PDFN5x6-8L Package Information



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°