

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
60V	9mΩ@10V	22A
	11mΩ@4.5V	



合肥矽普半导体

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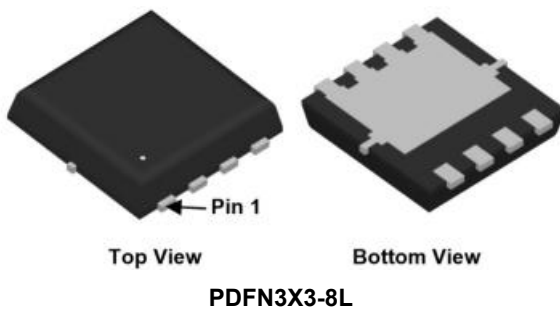
Feature

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

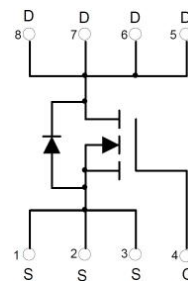
Applications

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

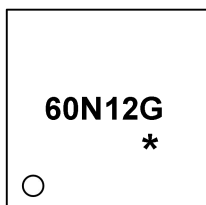
Package



Circuit diagram



Marking



60N12G :Device Code
* :Month Code

Order Information

Device	Package	Unit/Tape
SP60N12GNJ	PDFN3X3-8L	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	22	A
Continuous Drain Current (Tc=100°C)	I_D	15	A
Pulse Drain Current Tested	I_{DM}	88	A
Single Pulse Avalanche Energy ¹	E_{AS}	100	mJ
Power Dissipation (Tc=25°C)	P_D	32	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	3.91	°C/W
Maximum Junction Temperature	T_J	-55 to 150	°C
Storage Temperature Range	T_{STG}	-55 to 150	°C

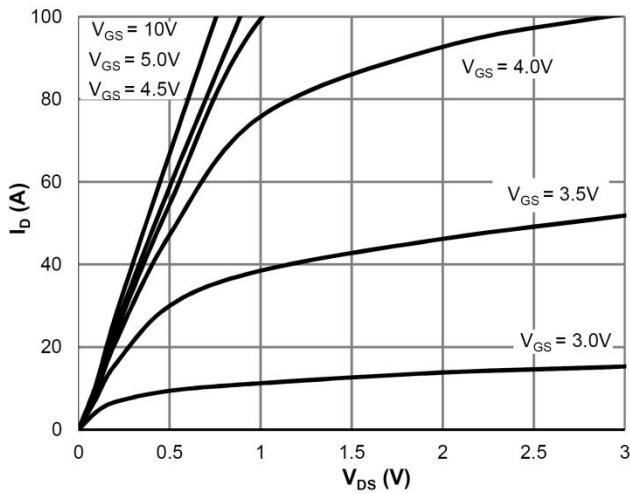
Electrical characteristics (Ta=25°C, unless otherwise noted)

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	1.6	2.5	V
Drain-Source On-state Resistance	RDS(ON)	VGS=10V, ID=20A	-	9	12.5	mΩ
		VGS=4.5V, ID=10A	-	11	17	
Dynamic Characteristics						
Input Capacitance	Ciss	VGS=0V, VDS=30V,F=1MHz	-	1002	-	pF
Output Capacitance	Coss		-	382	-	
Reverse Transfer Capacitance	Crss		-	10.3	-	
Total Gate Charge	Qg	VDS=30V, VGS=10V, ID=20A	-	24	-	nC
Gate-Source Charge	Qgs		-	5	-	
Gate-Drain Charge	Qgd		-	4	-	
Switching Characteristics						
Turn-On Delay Time	td(on)	VDD=30V, ID=20A, VGS=10V, RG=4.7Ω	-	5	-	nS
Rise Time	tr		-	3.1	-	
Turn-Off Delay Time	td(off)		-	15	-	
Fall Time	tf		-	3.1	-	
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		-	-	22	A
Reverse Recovery Time	Trr	IS=20 A,di/dt=100 A/μs, TJ=25℃	-	19	-	nS
Reverse Recovery Charge	Qrr		-	12	-	nC

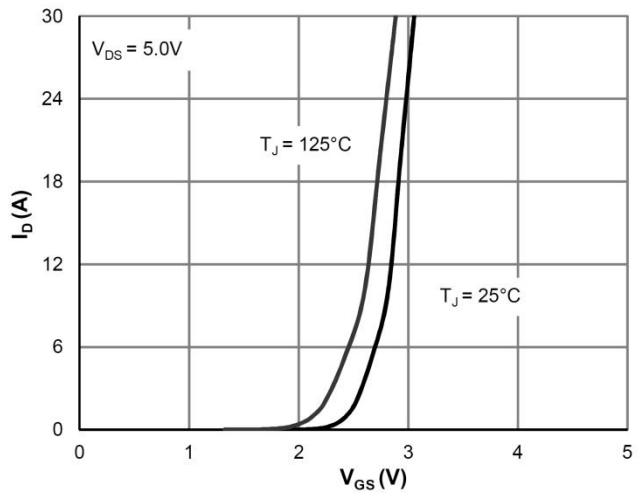
Note :

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

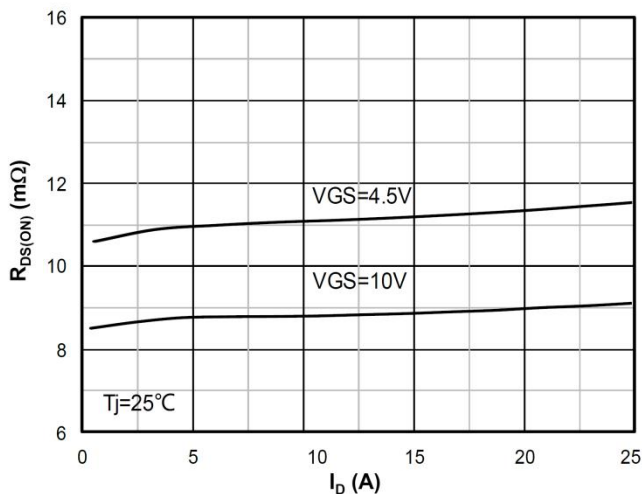
Typical Characteristics



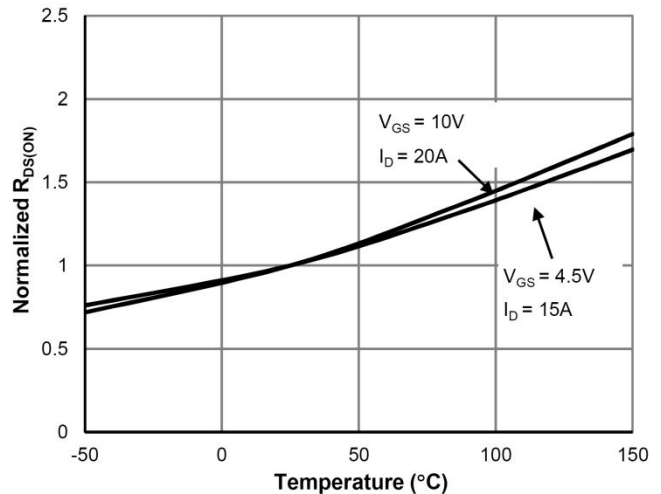
Saturation Characteristics



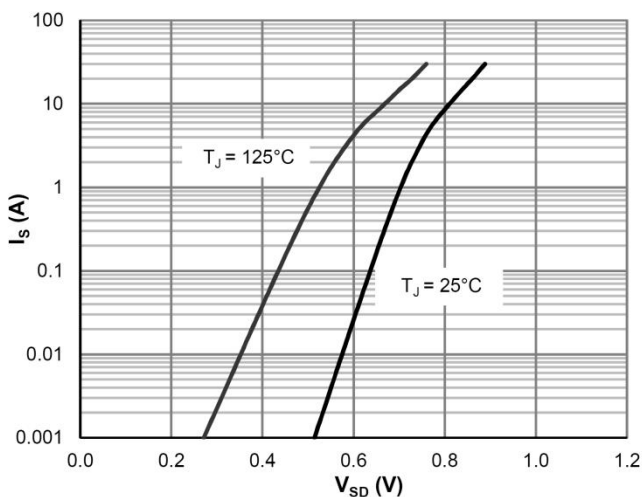
Transfer Characteristics



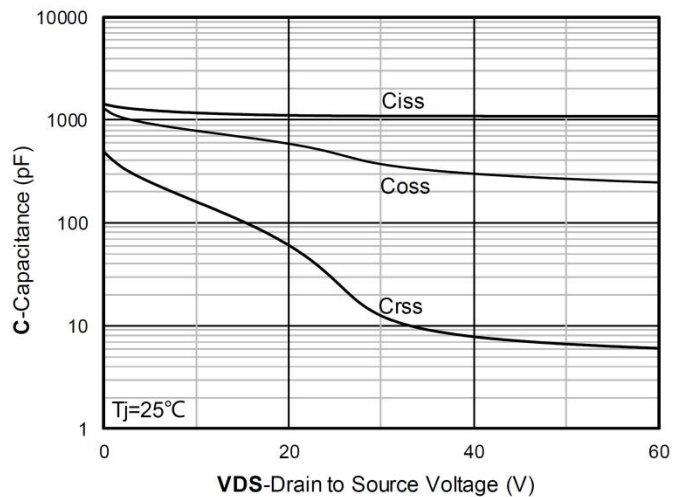
$R_{DS(ON)}$ vs. Drain Current



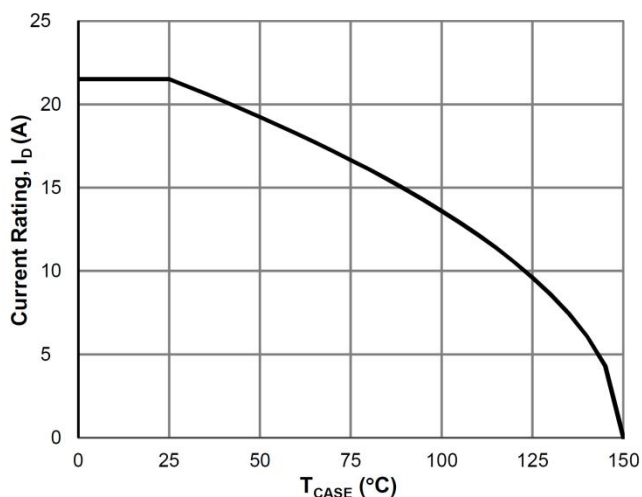
$R_{DS(ON)}$ vs. Junction Temperature



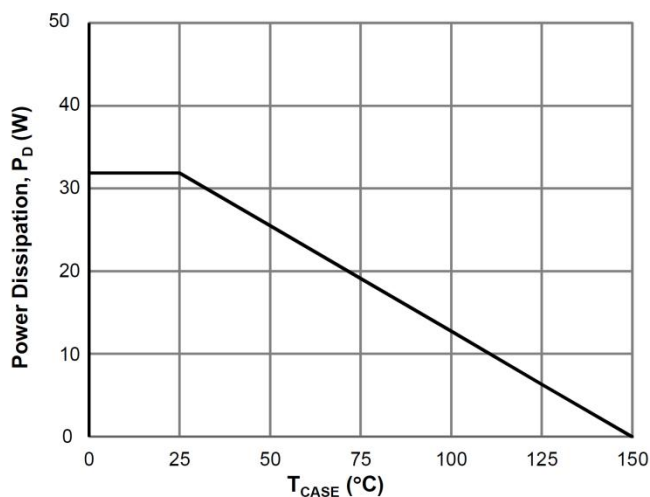
Body-Diode Characteristics



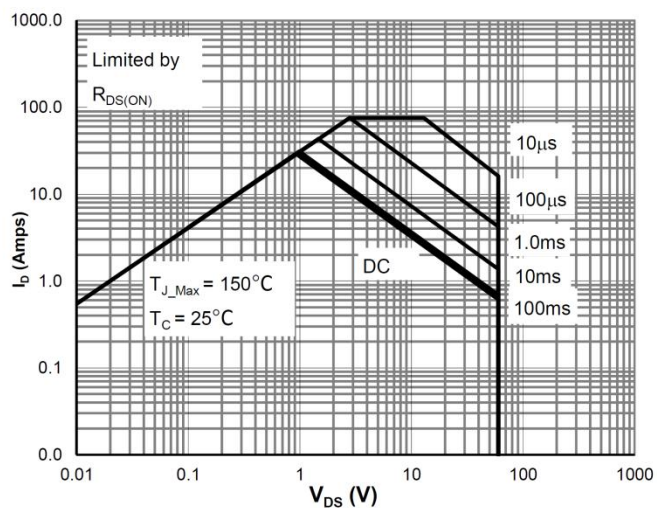
Capacitance Characteristics



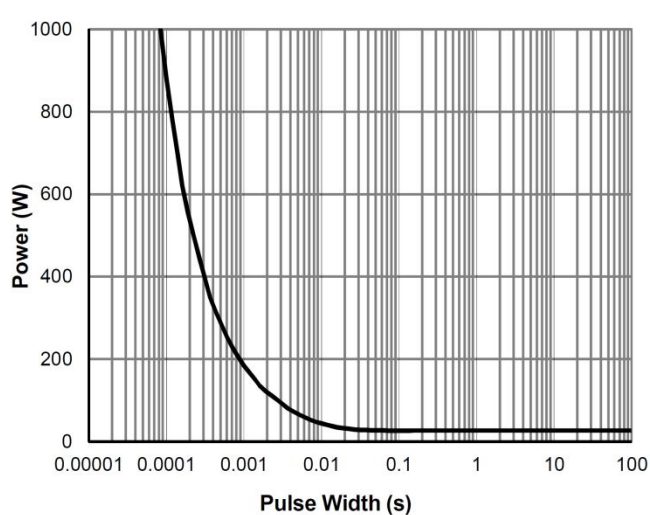
Current De-rating



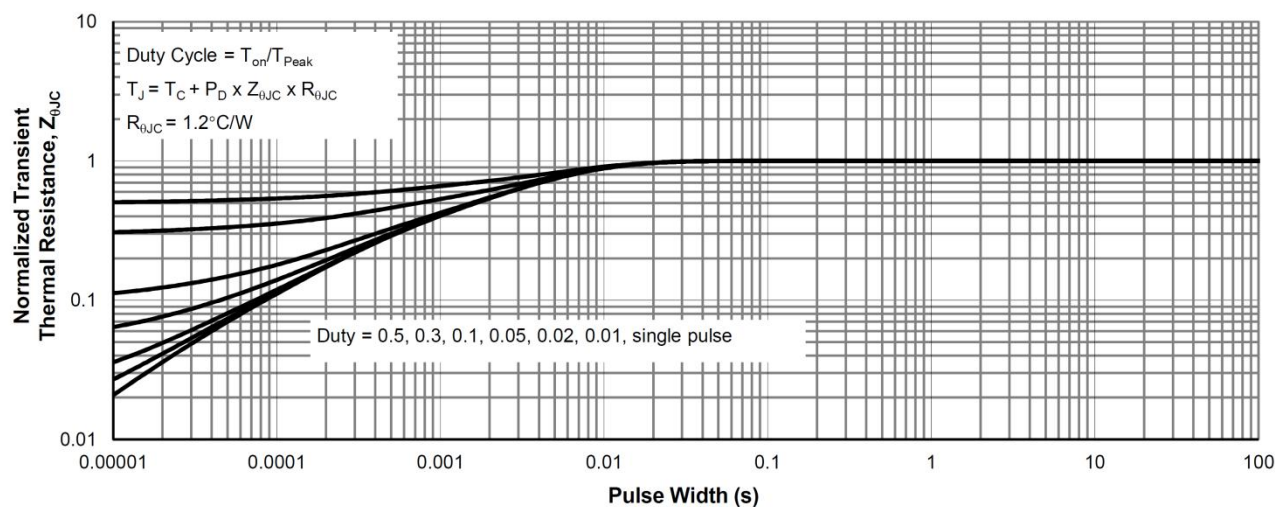
Power De-rating



Maximum Safe Operating Area

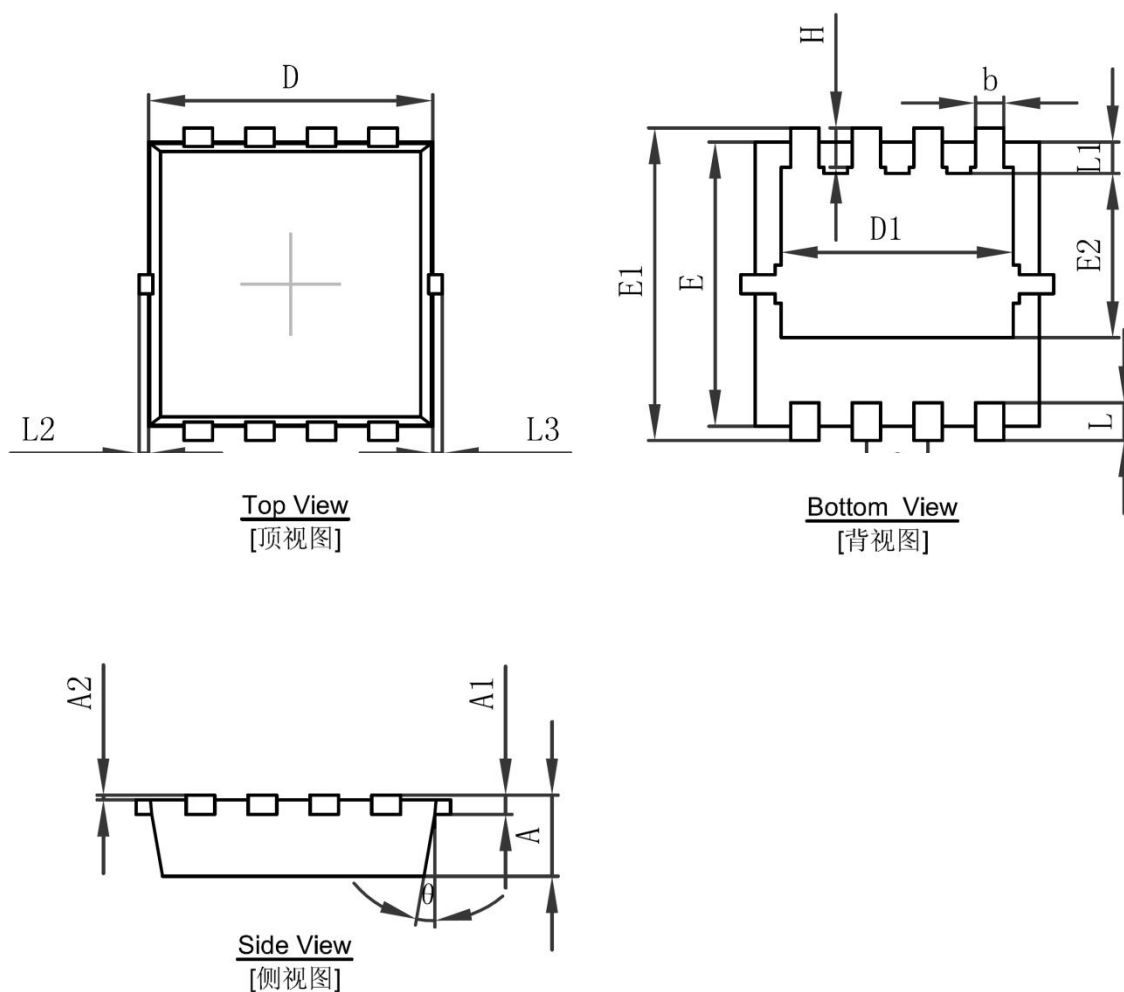


Single Pulse Power Rating, Junction-to-Case



Normalized Maximum Transient Thermal Impedance

PDFN3X3-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.650	0.850	0.026	0.033
A1	0.152 REF.		0.006 REF.	
A2	0~0.05		0~0.002	
D	2.900	3.100	0.114	0.122
D1	2.300	2.600	0.091	0.102
E	2.900	3.100	0.114	0.122
E1	3.150	3.450	0.124	0.136
E2	1.535	1.935	0.060	0.076
b	0.200	0.400	0.008	0.016
e	0.550	0.750	0.022	0.030
L	0.300	0.500	0.012	0.020
L1	0.180	0.480	0.007	0.019
L2	0~0.100		0~0.004	
L3	0~0.100		0~0.004	
H	0.315	0.515	0.012	0.020
θ	9°	13°	9°	13°