

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
-40V	10.5mΩ@-10V	-23A
	14mΩ@-4.5V	



合肥矽普半导体

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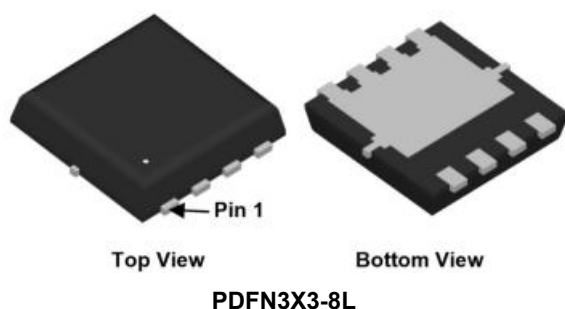
Feature

- Fast switching speed
- Low On-Resistance
- 100% Single Pulse avalanche energy Test

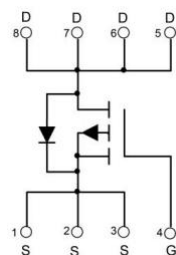
Applications

- DC-DC Converters.
- Power Management

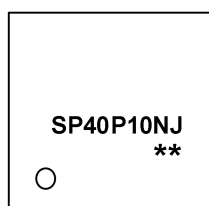
Package



Circuit diagram



Marking



SP40P10NJ
**

:Device Code
:Week Code

Order Information

Device	Package	Unit/Tape
SP40P10NJ	PDFN3X3-8L	5000

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-40	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current (Tc=25°C)	I_D	-23	A
Continuous Drain Current (Tc=100°C)	I_D	-15	A
Pulse Drain Current Tested	I_{DM}	-92	A
Single Pulse Avalanche Energy ¹	E_{AS}	144	mJ
Power Dissipation (Tc=25°C)	P_D	50	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	2.5	°C/W
Storage Temperature Range	T_{STG}	-55 to 150	°C
Operating Junction Temperature Range	T_J	-55 to 150	°C

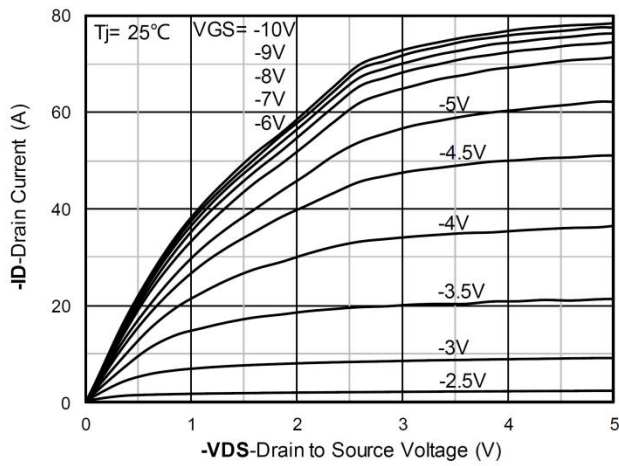
Electrical characteristics (Ta=25°C, unless otherwise noted)

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	IDSS	VDS=-32V , VGS=0V , TJ=25℃	-	-	-1	uA
Gate-Source Leakage Current	IGSS	VGS=±20V , VDS=0V	-	-	±100	nA
Gate Threshold Voltage	VGS(th)	VGS=VDS , ID =-250uA	-1.0	-1.6	-2.5	V
Static Drain-Source On-Resistance	RDS(on)	VGS=-10V , ID=-12A	-	10.5	14	mΩ
		VGS=-4.5V , ID=-10A	-	14	20	
Dynamic characteristics						
Input Capacitance	Ciss	VDS=-20V , VGS=0V , f=1MHz	-	3500	-	pF
Output Capacitance	Coss		-	323	-	
Reverse Transfer Capacitance	Crss		-	222	-	
Total Gate Charge	Qg	VDS=-25V , VGS=-10V , ID=-25A	-	72	-	nC
Gate-Source Charge	Qgs		-	8	-	
Gate-Drain Charge	Qgd		-	15	-	
Switching Characteristics						
Turn-On Delay Time	Td(on)	VDD=-25V,VGS=-10V,RG=6Ω, ID=-25A	-	12	-	nS
Rise Time	Tr		-	10	-	
Turn-Off Delay Time	Td(off)		-	203	-	
Fall Time	Tf		-	91	-	
Diode Characteristics						
Diode Forward Voltage	VSD	VGS=0V , IS=-1A , TJ=25℃	-	-	-1.2	V
Maximum Body-Diode Continuous Current	IS		-	-	-23	A
Reverse recover time	Trr	IS=-25A, di/dt=100A/us, TJ=25℃	-	24	-	nS
Reverse recovery charge	Qrr		-	12	-	nC

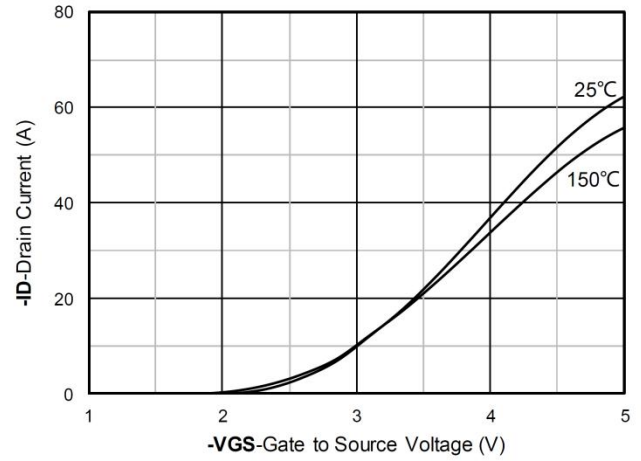
Note:

- The EAS test condition is $V_{DD}=-25V, V_G=-10V, L=0.1mH, R_G=25\Omega$

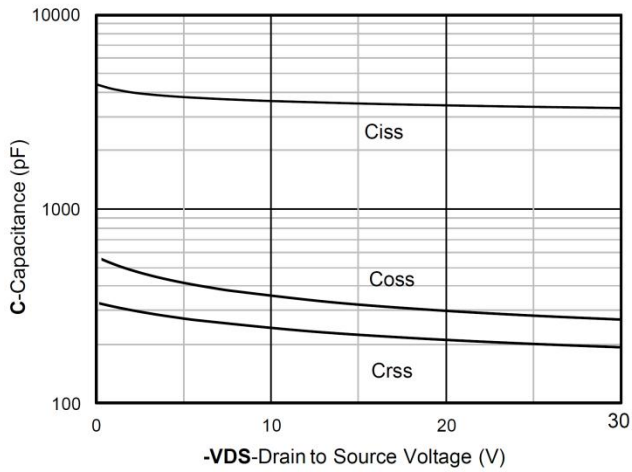
Typical Characteristics



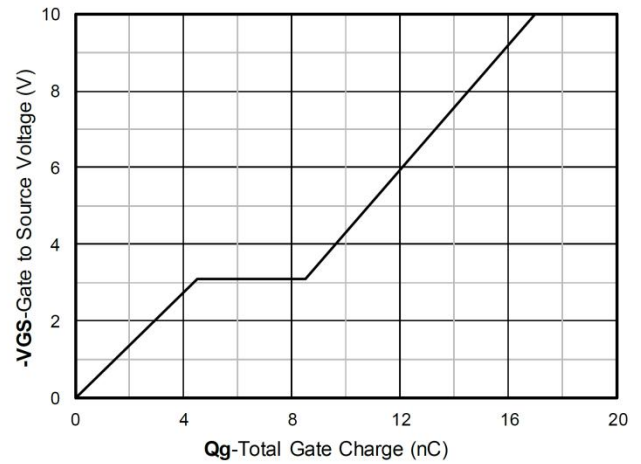
Output Characteristics



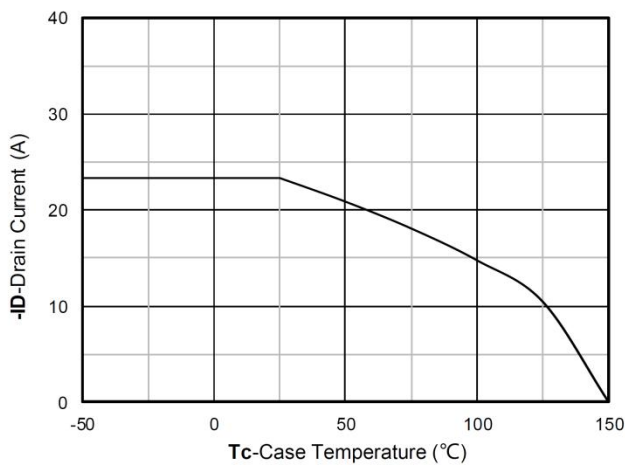
Transfer Characteristics



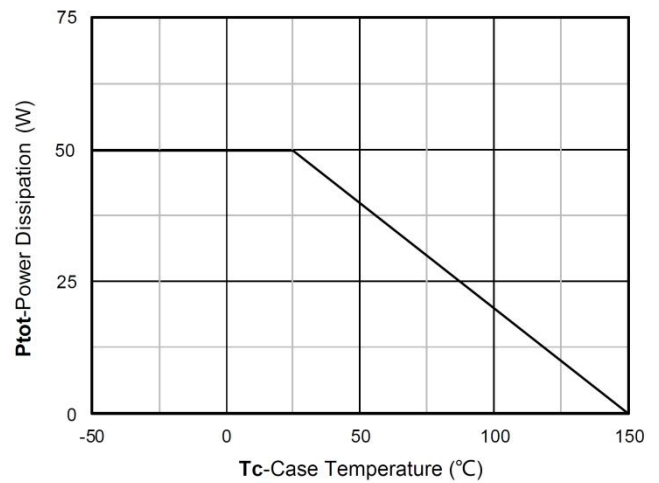
Capacitance Characteristics



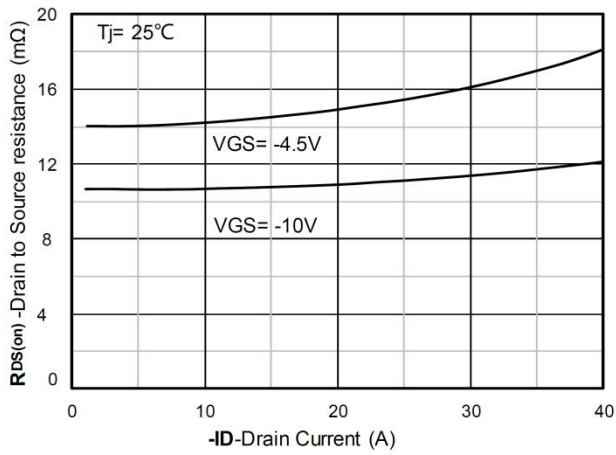
Gate Charge



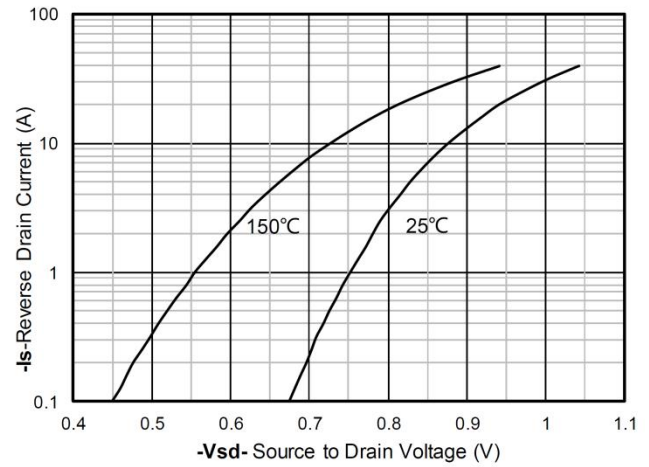
Current dissipation



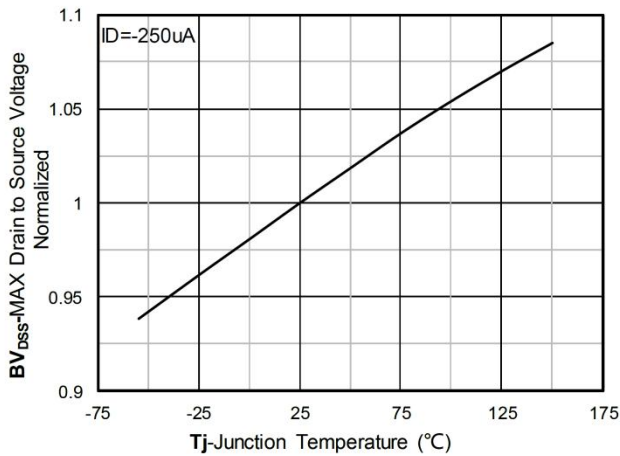
Power dissipation



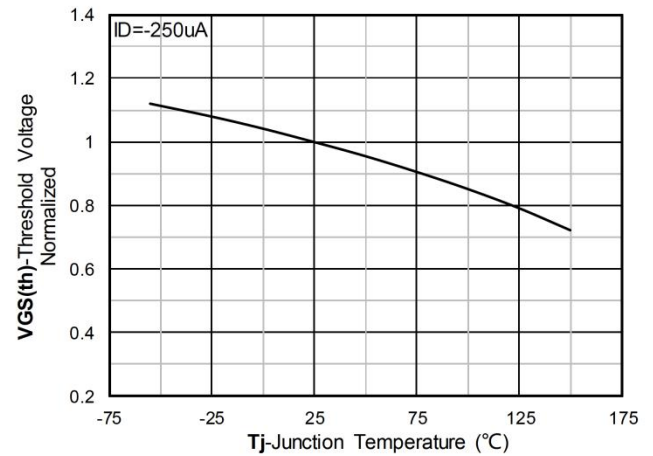
RDS(on) VS Drain Current



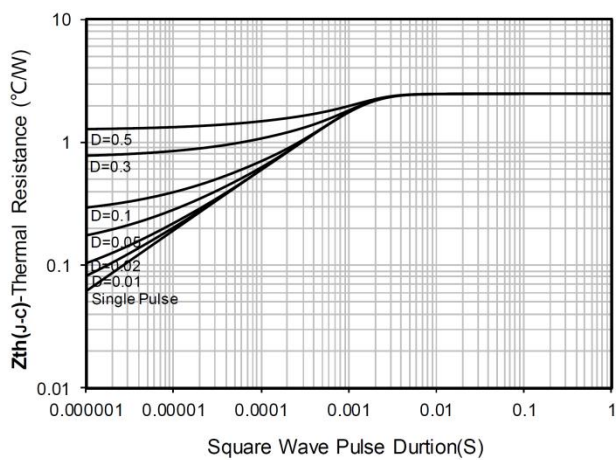
Forward characteristics of reverse diode



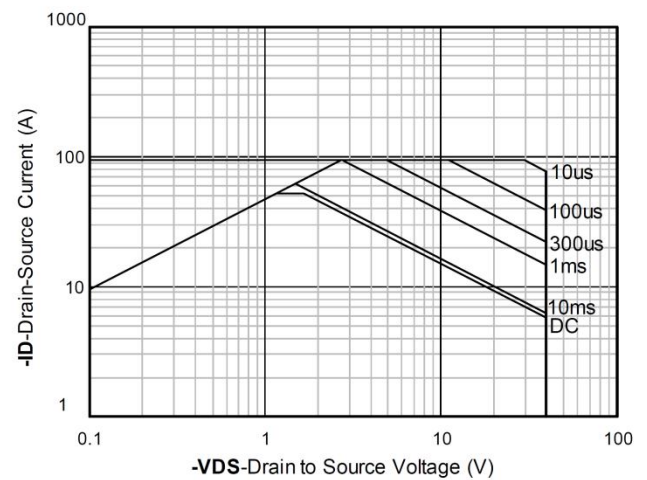
Normalized breakdown voltage



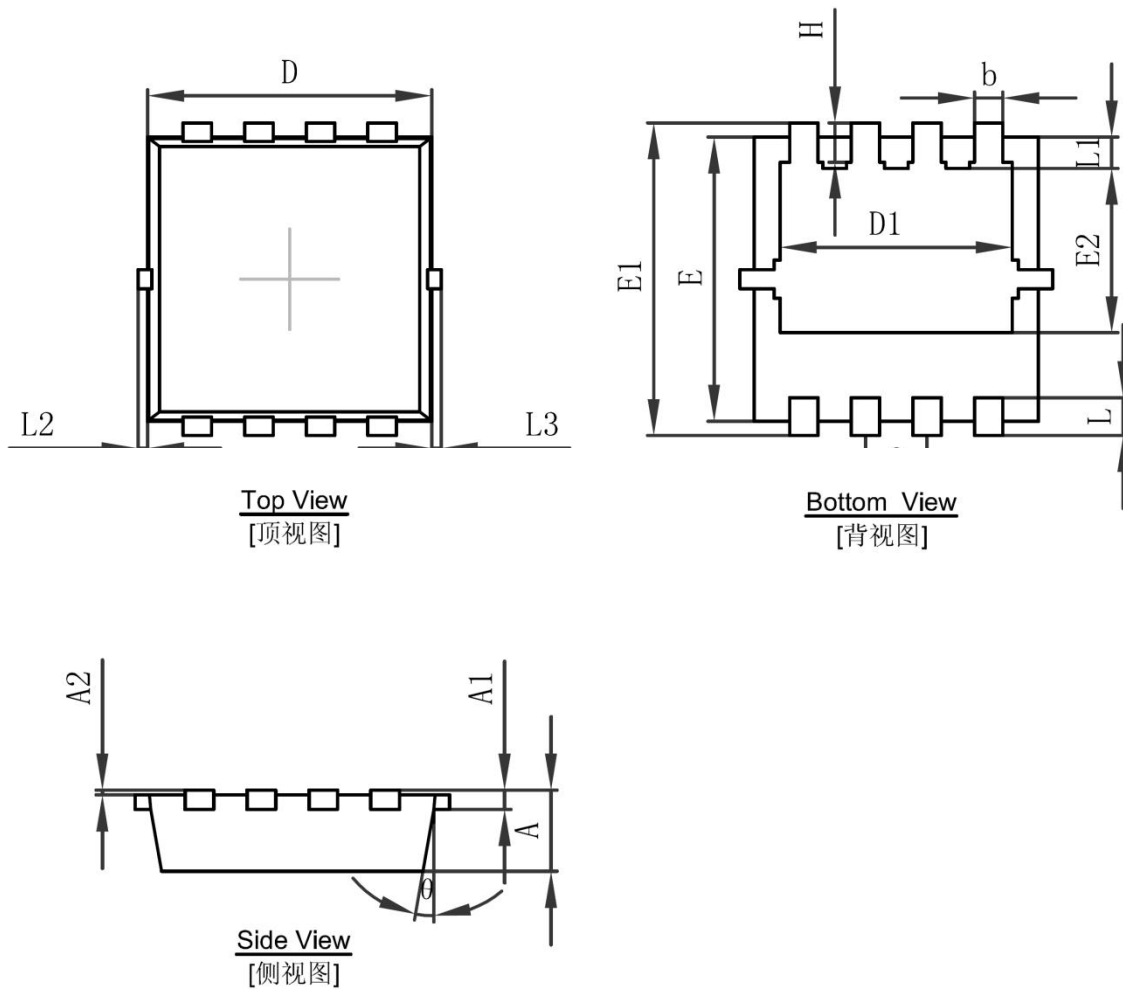
Normalized Threshold voltage



Maximum Transient Thermal Impedance



Safe Operation Area

**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°