Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
-40V	3mΩ@-10V	-120A
	4mΩ@-4.5V	

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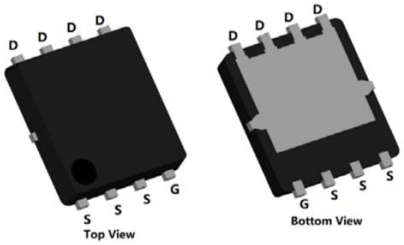
Feature

- Fast switching speed
- Surface mount package
- ROHS Compliant & Halogen-Free
- 100% Single Pulse avalanche energy Test

Applications

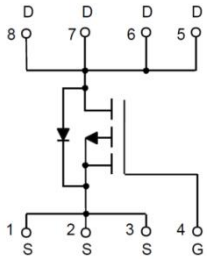
- DC-DC Converters.
- Motor Control.

Package



PDFN5X6-8L

Circuit diagram



Marking



SP40P03NK :Device Code
** :Week Code

Order Information

Device	Package	Unit/Tape
SP40P03NK	PDFN5X6-8L	5000

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DSS}	-40	V
Gate-Source Voltage	V_{GSS}	±20	V
Continuous Drain Current (Package Limit)	I_D	-120	A
Continuous Drain Current (Tc=25℃ Silicon Limit)	I_D	-190	A
Pulse Drain Current Tested	I_{DM}	-480	A
Single pulsed avalanche energy[1]	E_{AS}	900	mJ
Power Dissipation (Tc=25℃)	P_D	130	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	0.96	°C/W
Storage Temperature Range	T_{STG}	-55 to 150	°C
Operating Junction Temperature Range	T_J	-55 to 150	°C

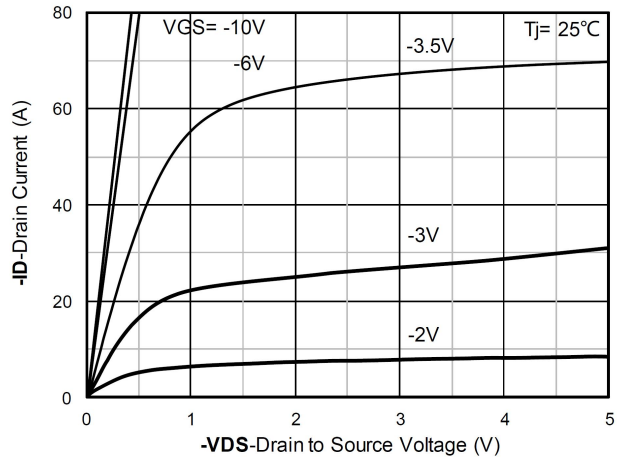
Electrical characteristics (Ta=25℃, unless otherwise noted)

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	$V_{GS(th)}$	VGS=VDS , ID=-250uA	-1.0	-1.7	-2.5	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	VGS =-10V , ID=-20A	-	3	3.8	mΩ
		VGS =-4.5V , ID=-20A	-	4	5.3	
Dynamic characteristics						
Input Capacitance	C_{iss}	VDS=-20V , VGS=0V , f=1MHz	-	10730	-	pF
Output Capacitance	C_{oss}		-	772	-	
Reverse Transfer Capacitance	C_{rss}		-	695	-	
Total Gate Charge	Q_g	VDS=-20V , VGS=-10V , ID=-20A	-	196	-	nC
Gate-Source Charge	Q_{gs}		-	24	-	
Gate-Drain Charge	Q_{gd}		-	40	-	
Switching Characteristics						
Turn-On Delay Time	$T_{d(on)}$	VDD=-20V , ID=-20A , VGS=-10V , R_G=3Ω	-	20	-	nS
Rise Time	T_r		-	3.5	-	
Turn-Off Delay Time	$T_{d(off)}$		-	23	-	
Fall Time	T_f		-	37	-	
Diode Characteristics						
Diode Forward Voltage	V_{SD}	VGS=0V , IS=-1A , TJ=25℃	-	-	-1.2	V
Maximum Body-Diode Continuous Current	I_S		-	-	-120	A
Reverse recover time	T_{rr}	I_S=-20A , di/dt=100A/us , TJ=25℃	-	36.5	-	nS
Reverse recovery charge	Q_{rr}		-	35	-	nC

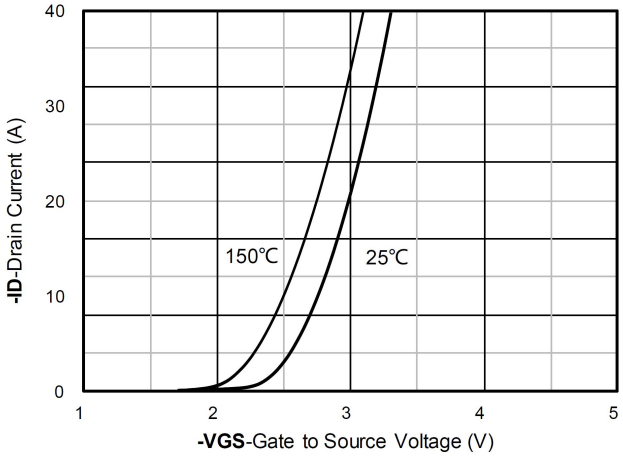
Note：

1. The EAS Test condition is VDD=-20V,VGS=-10V,L=0.5mH,Rg=25Ω

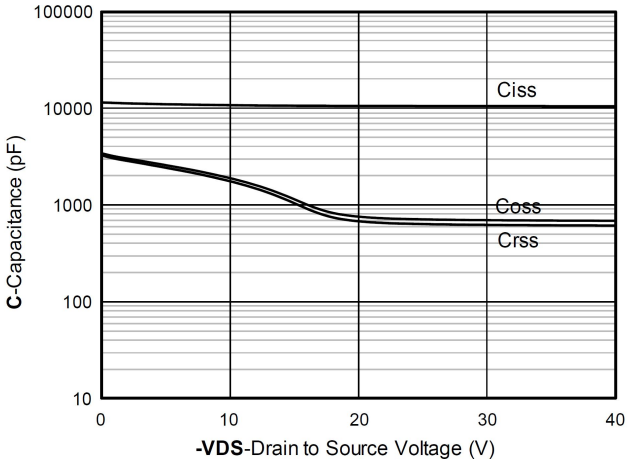
Typical Characteristics



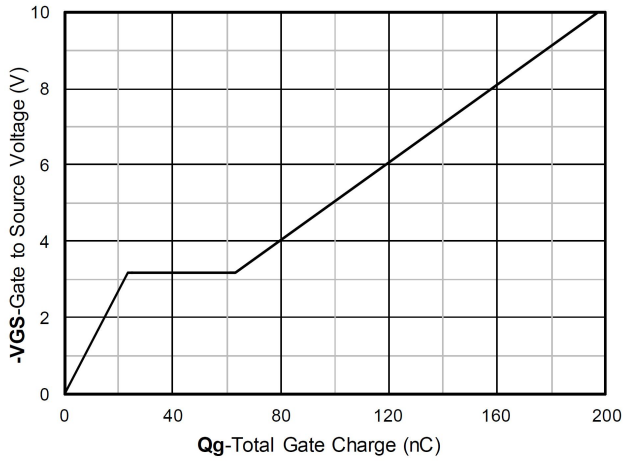
Output Characteristics



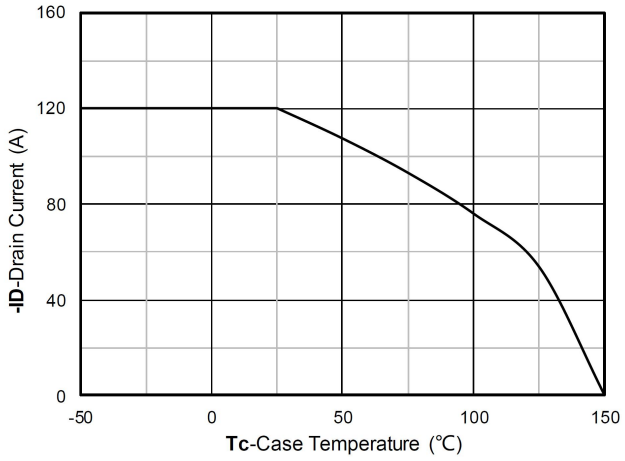
Transfer Characteristics



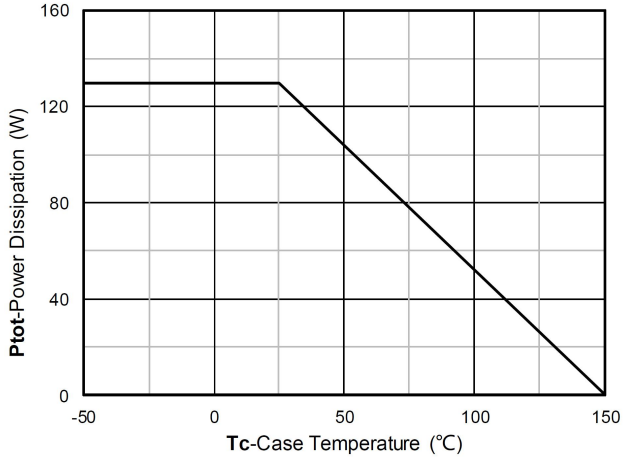
Capacitance Characteristics



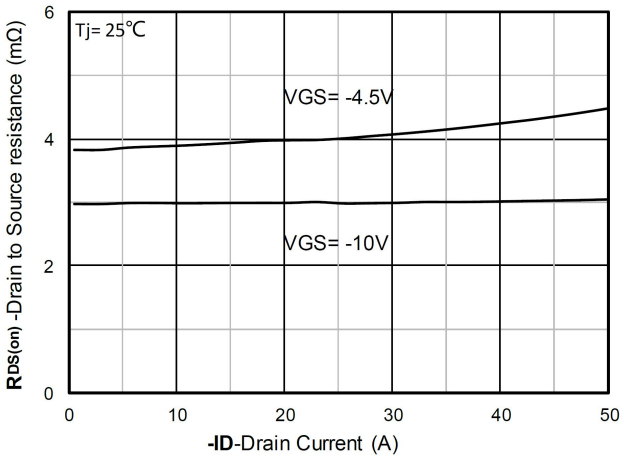
Gate Charge



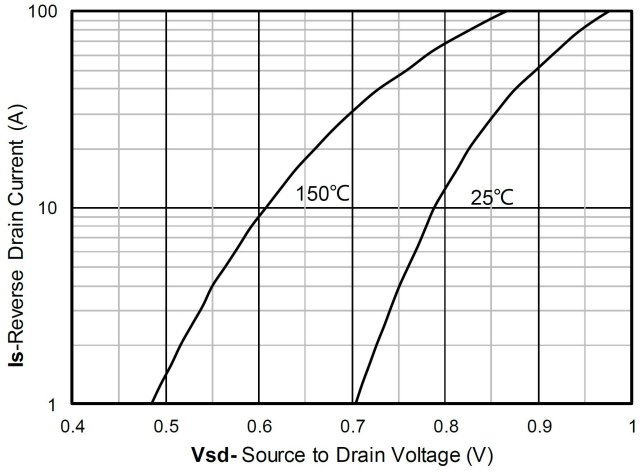
Current dissipation



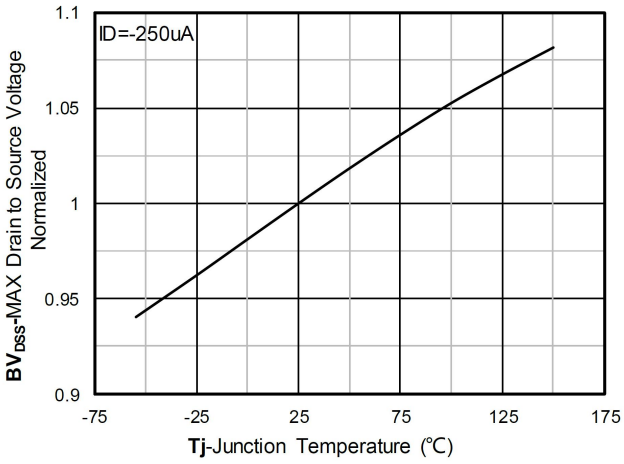
Power dissipation



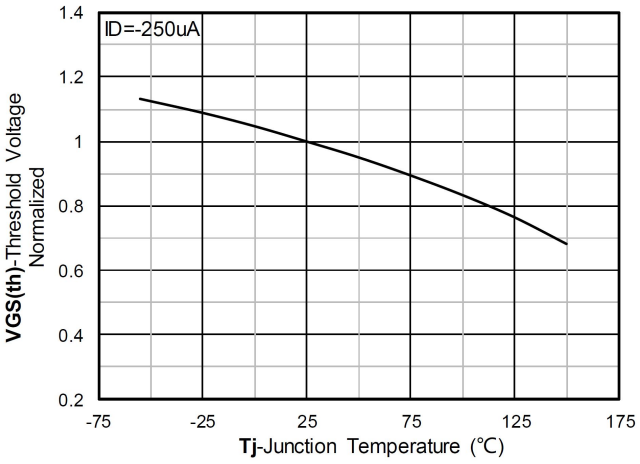
RDS(on) VS Drain Current



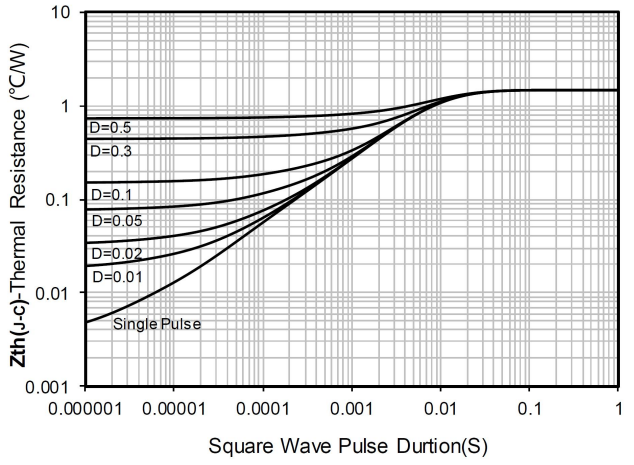
Forward characteristics of reverse diode



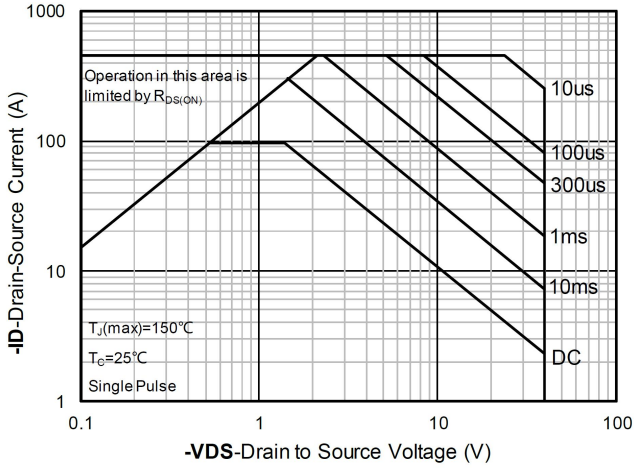
Normalized breakdown voltage



Normalized Threshold voltage

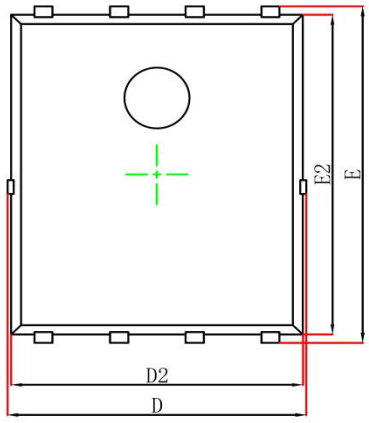


Maximum Transient Thermal Impedance

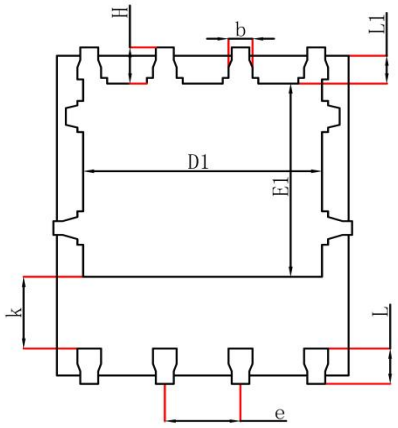


Safe Operation Area

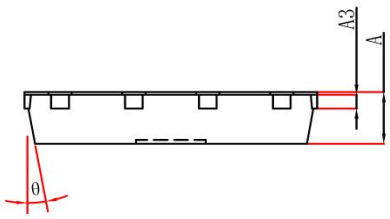
PDFN5X6-8L Package Information



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°