

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
40V	19mΩ@10V	23A
	25mΩ@4.5V	
-40V	40mΩ@-10V	-12A
	50mΩ@-4.5V	



合肥矽普半导体

Siliup Semiconductor Technology Co., Ltd

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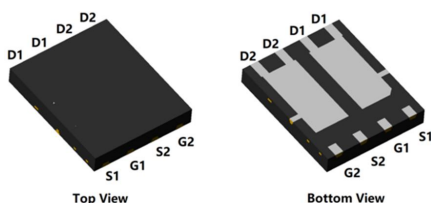
Feature

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

Applications

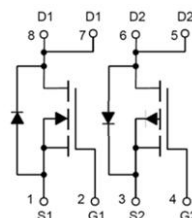
- DC-DC Converters.
- Motor Control.

Package



PDFN5X6-8L

Circuit diagram



Marking



SP4024CNK :Device Code
** :Week Code

Order Information

Device	Package	Unit/Tape
SP4024CNK	PDFN5X6-8L	5000

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

Parameter	Symbol	Rating		Unit
		N-Channel	P-Channel	
Drain-Source Voltage	V_{DS}	40	-40	V
Gate-Source Voltage	V_{GS}	± 20	± 20	V
Continuous Drain Current (Tc=25°C)	I_D	23	-12	A
Continuous Drain Current (Tc=100°C)	I_D	15	-8	A
Pulse Drain Current Tested	I_{DM}	92	-48	A
Single pulsed avalanche energy ¹	E_{AS}	30	36	mJ
Power Dissipation (Tc=25°C)	P_D	23		W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	5.4		°C/W
Storage Temperature Range	T_{STG}	-55 to 150		°C
Operating Junction Temperature Range	T_J	-55 to 150		°C

N-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	1.7	2.5	V
Static Drain-Source On-Resistance	RDS(ON)	VGS = 10V, ID = 10A	-	19	24	mΩ
		VGS = 4.5V, ID = 8A	-	25	32	
Dynamic characteristics						
Input Capacitance	Ciss	VDS=15V , VGS=0V , f=1MHz	-	834	-	pF
Output Capacitance	Coss		-	51	-	
Reverse Transfer Capacitance	Crss		-	45	-	
Total Gate Charge	Qg	VDS=20V , VGS=4.5V , ID=5A	-	25	-	nC
Gate-Source Charge	Qgs		-	6	-	
Gate-Drain Charge	Qgd		-	5	-	
Switching Characteristics						
Turn-On Delay Time	Td(on)	VDD=20V, VGS=10V , RG=3Ω, ID=5A	-	8	-	nS
Rise Time	Tr		-	7	-	
Turn-Off Delay Time	Td(off)		-	26	-	
Fall Time	Tf		-	4	-	
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=20A, di/dt=100A/us, Tj=25℃	-	10	-	nS
Reverse recovery charge	Qrr		-	5	-	nC

Note:

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

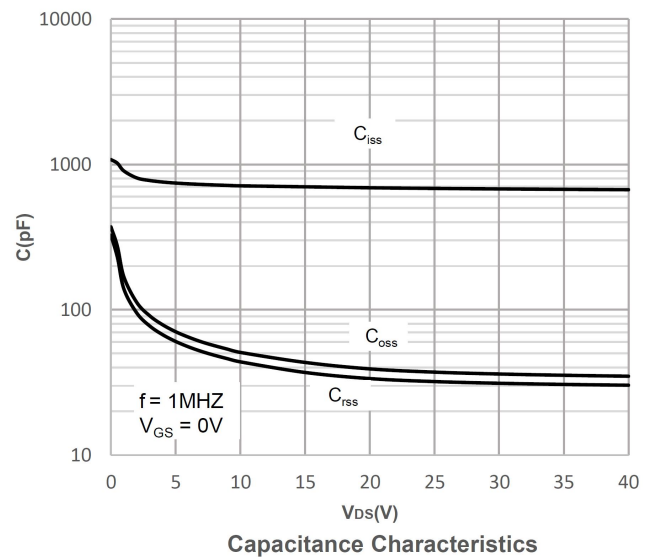
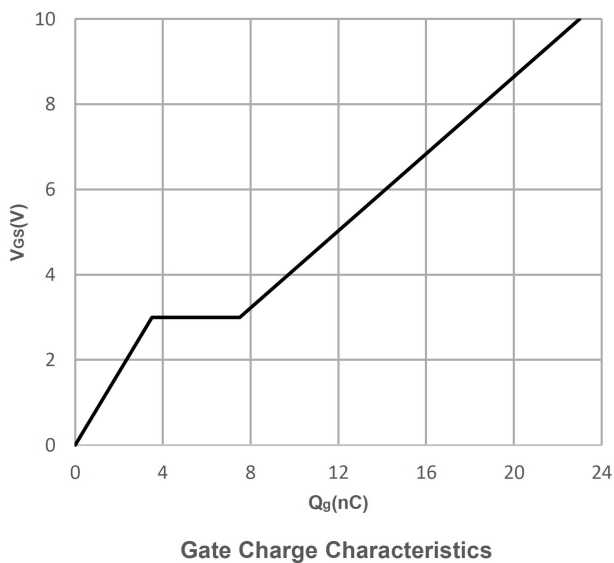
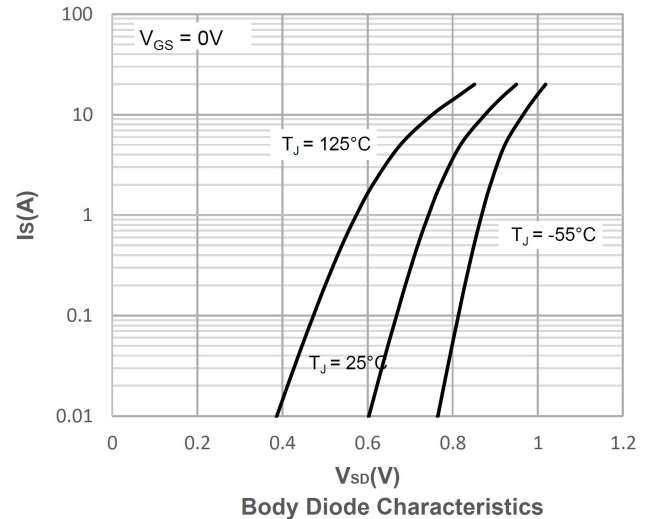
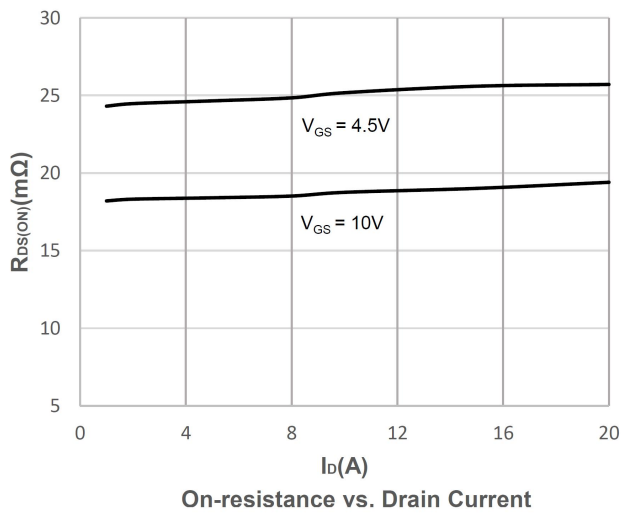
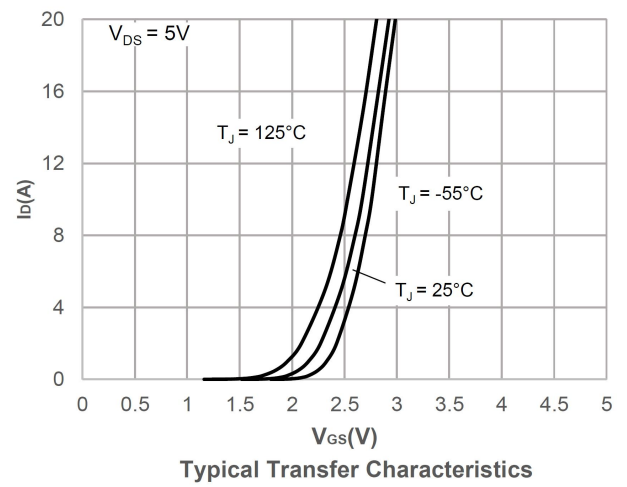
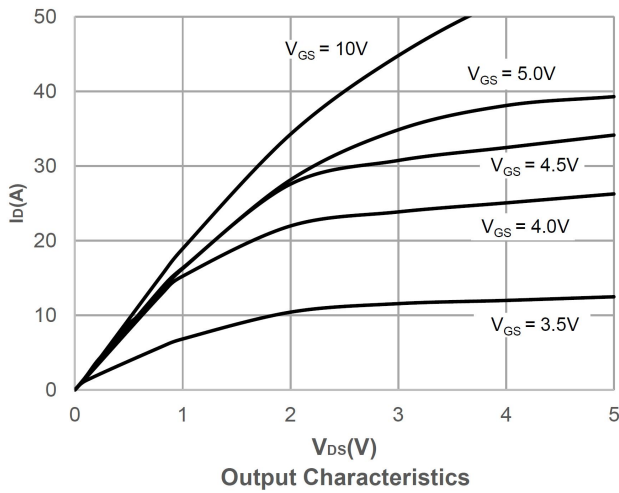
P-Electrical characteristics (Ta=25°C, unless otherwise noted)

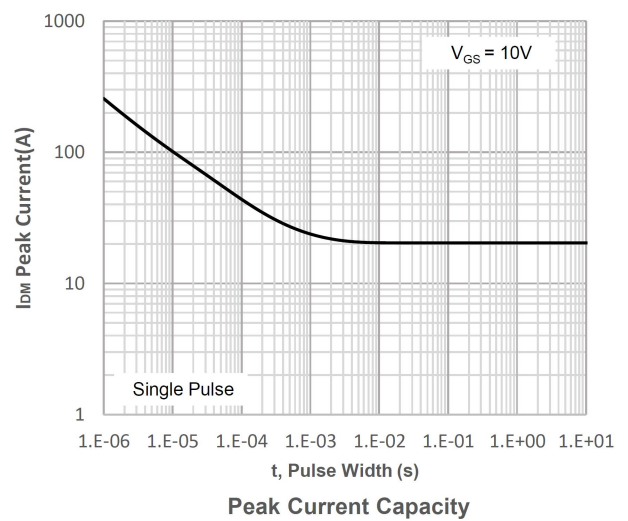
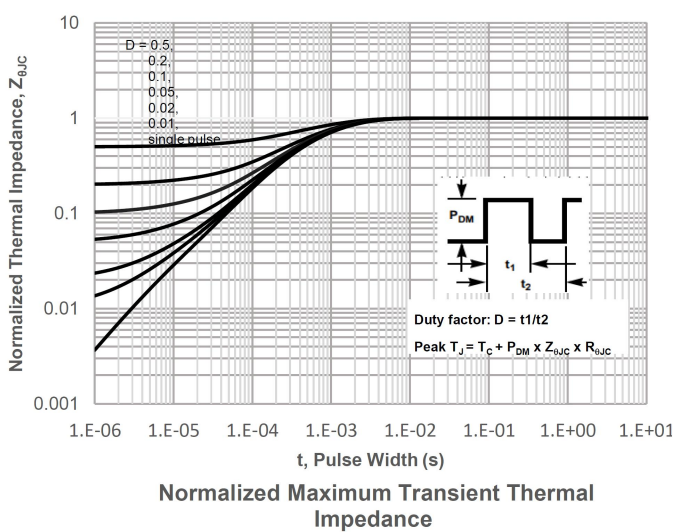
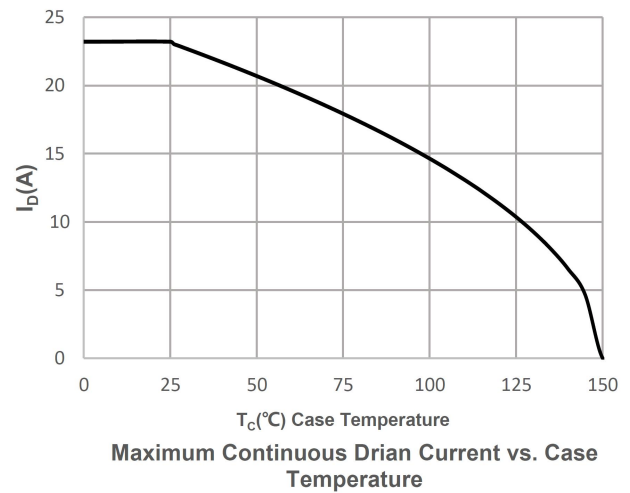
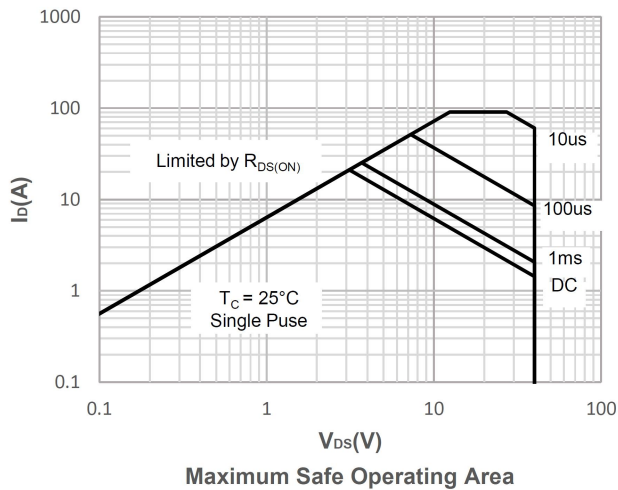
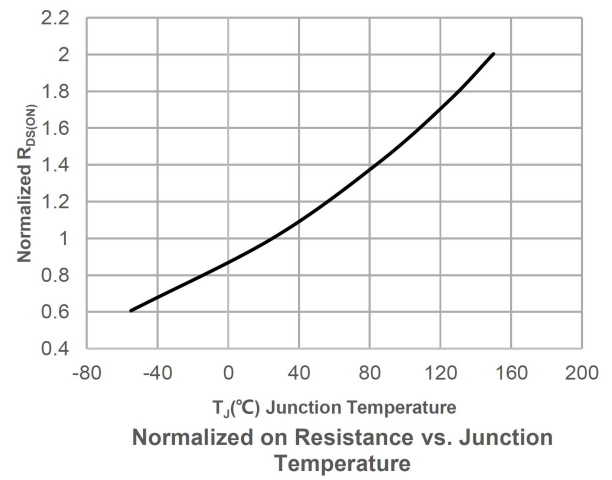
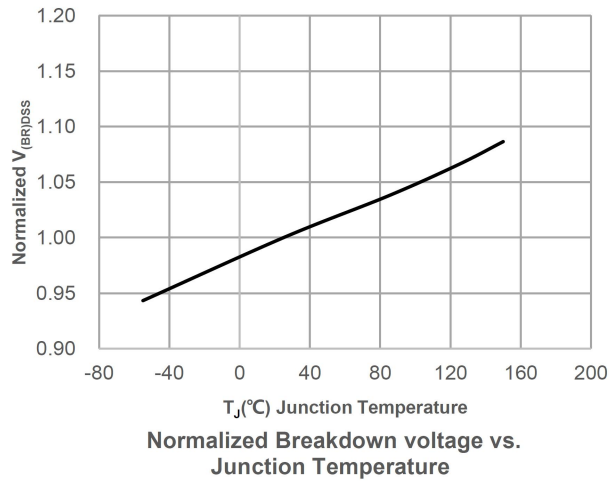
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	VGS=0V , ID=-250uA	-40	-	-	V
Drain-Source Leakage Current	IDSS	VDS=-32V , VGS=0V , TJ=25℃	-	-	-1	uA
Gate-Source Leakage Current	IGSS	VGS=±20V , VDS=0V	-	-	±100	nA
Gate Threshold Voltage	VGS(th)	VGS=VDS , ID =-250uA	-1.0	-1.6	-2.5	V
Static Drain-Source On-Resistance	RDS(ON)	VGS =-10V, ID =-5A	-	40	48	mΩ
		VGS =-4.5V, ID =-3A	-	50	60	
Dynamic characteristics						
Input Capacitance	Ciss	VDS=-15V , VGS=0V , f=1MHz	-	915	-	pF
Output Capacitance	Coss		-	104	-	
Reverse Transfer Capacitance	Crss		-	92	-	
Total Gate Charge	Qg	VDS=-15V , VGS=-4.5V , ID=-1A	-	24	-	nC
Gate-Source Charge	Qgs		-	3	-	
Gate-Drain Charge	Qgd		-	4	-	
Switching Characteristics						
Turn-On Delay Time	Td(on)	VDD=-15V, VGS=-10V , RG=3Ω, ID=-1A	-	11	-	nS
Rise Time	Tr		-	17	-	
Turn-Off Delay Time	Td(off)		-	55	-	
Fall Time	Tf		-	19	-	
Diode Characteristics						
Diode Forward Voltage	VSD	VGS=0V , IS=-1A , TJ=25℃	-	-	-1.2	V
Maximum Body-Diode Continuous Current	IS		-	-	-12	A
Reverse recover time	Trr	IS=-5A, di/dt=100A/us, TJ=25℃	-	13	-	nS
Reverse recovery charge	Qrr		-	7	-	nC

Note:

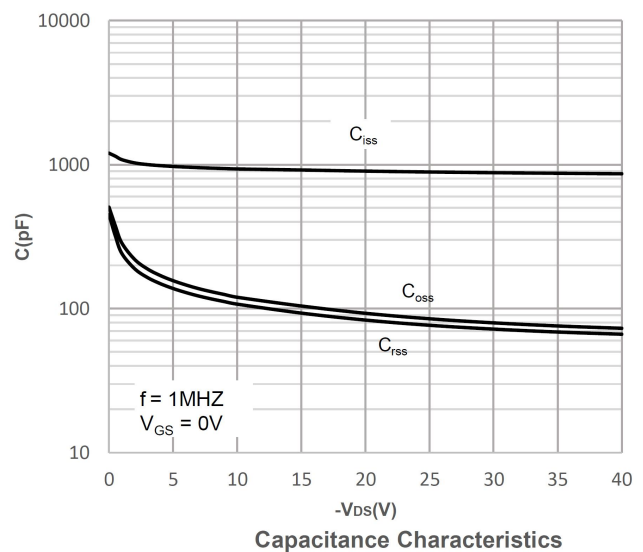
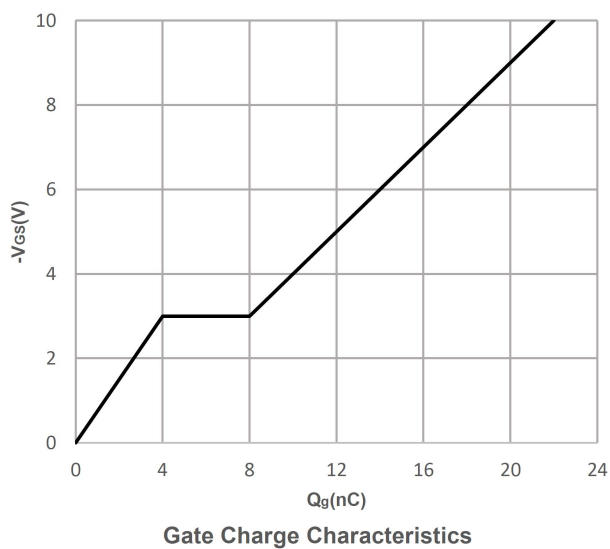
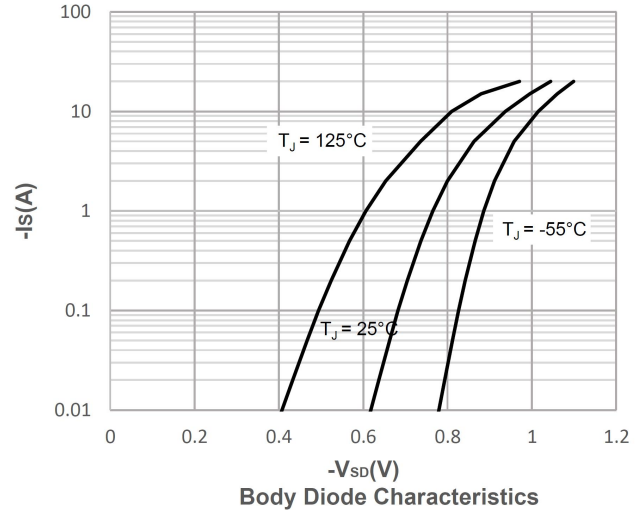
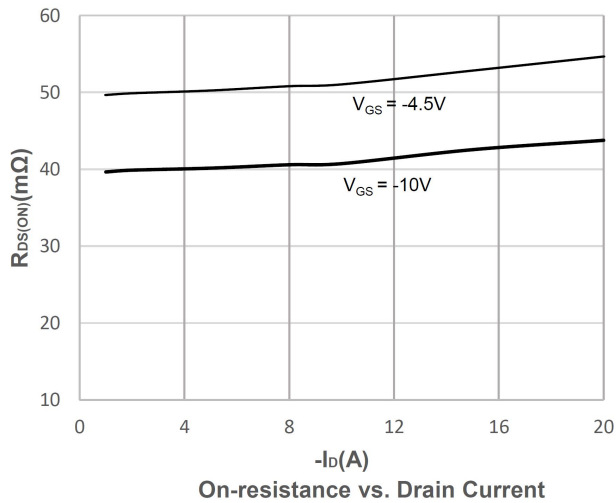
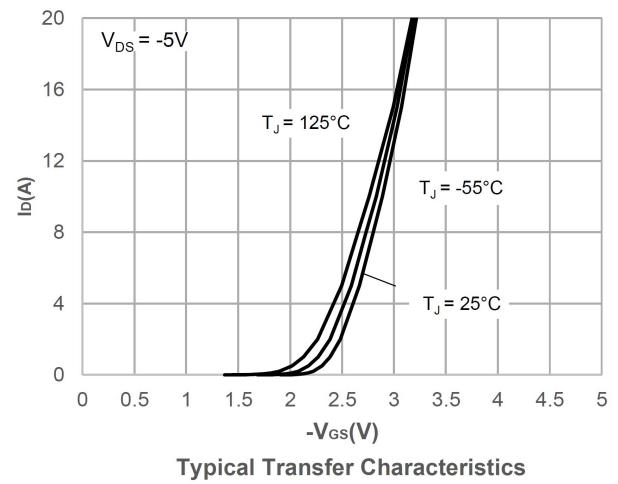
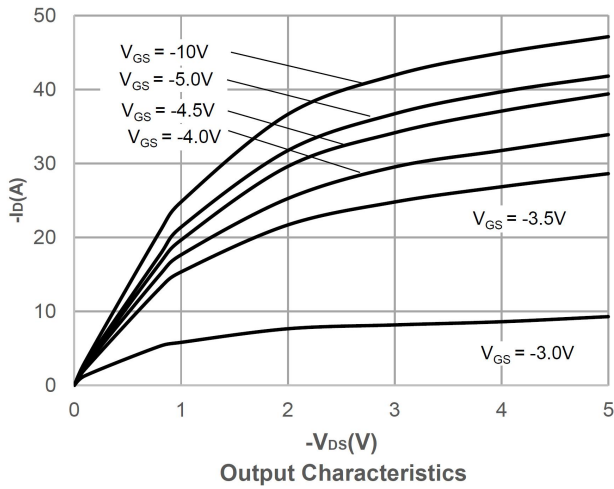
1. The EAS Test condition is $V_{DD}=-20V$, $V_{GS}=-10V$, $L=0.5mH$, $R_G=25\Omega$

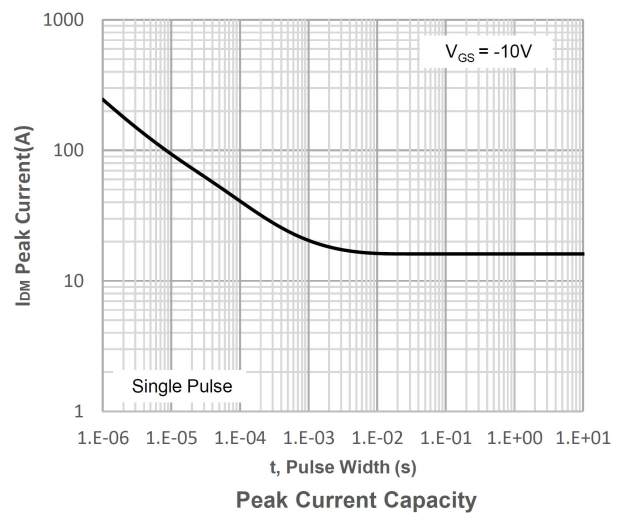
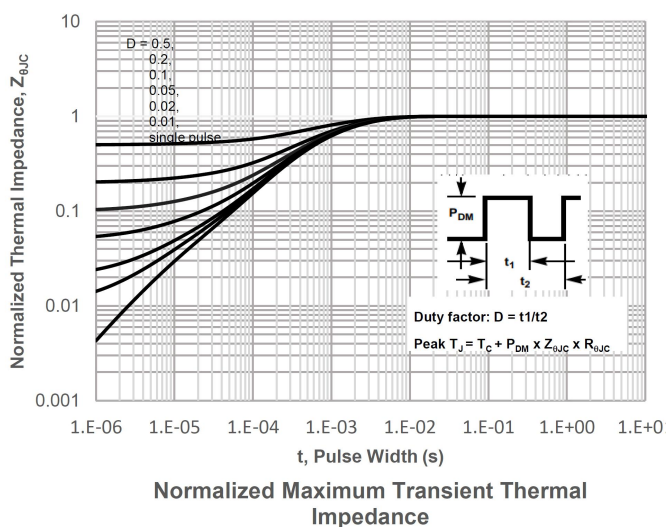
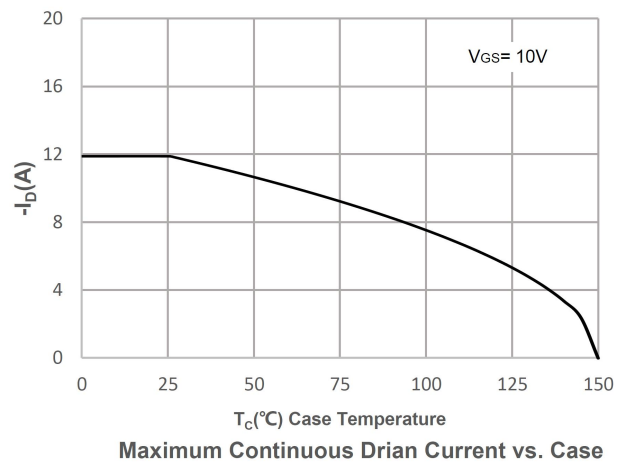
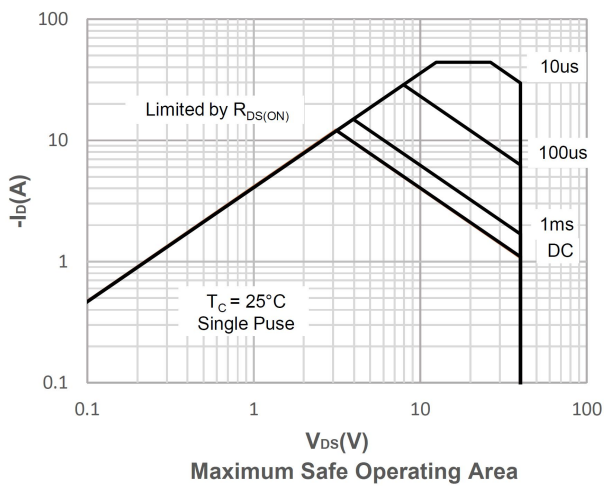
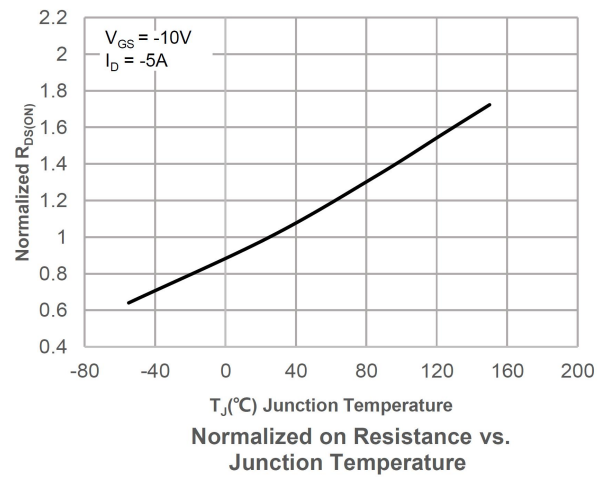
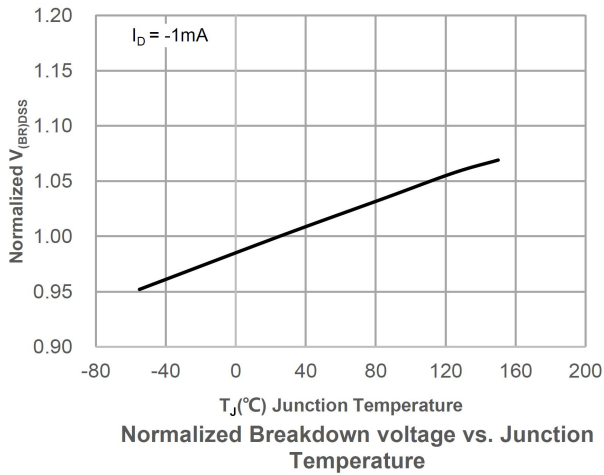
N-Channel Typical Characteristics



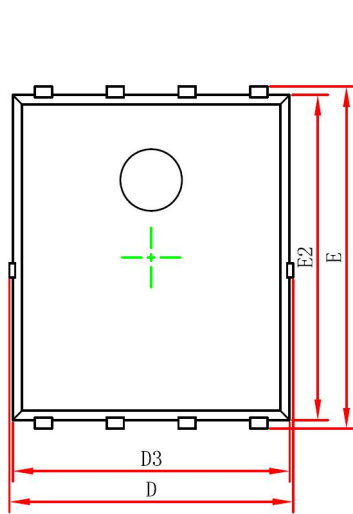


P-Channel Typical Characteristics

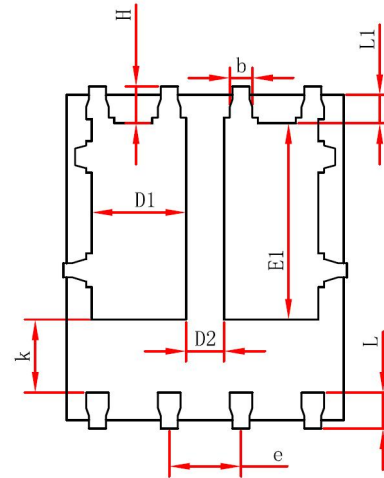




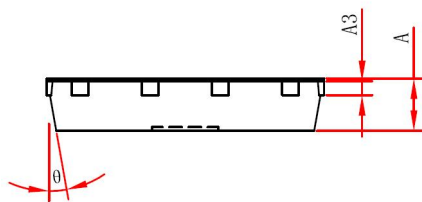
PDFN5X6-8L Package Information



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°