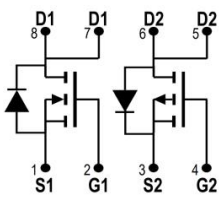
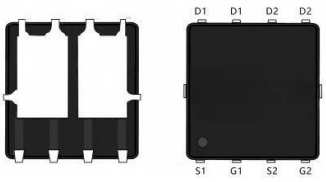
20V N-Channel and P-Channel MOSFET

	V_{DS}	$R_{DS(on)}$Typ	I_D
N-Channel	20V	10mΩ	25A
P-Channel	-20V	20mΩ	-20A





PDFN3x3

Features

- N Channel+P Channel
- High power and current handling capability
- Surface Mount Package

Applications

- Battery protection
- Load switch
- Power management

Absolute Maximum Ratings

Symbol	Parameter		N-Channel	P-Channel	Unit
Common Ratings (T_C=25°C Unless Otherwise Noted)					
V_{DS}	Drain-Source Breakdown Voltage		20	-20	V
V_{GS}	Gate-Source Voltage		±12	±12	V
T_J	Maximum Junction Temperature		150	150	°C
T_{STG}	Storage Temperature Range		-55 to 150	-55 to 150	°C
I_S	Diode Continuous Forward Current	T_C=25°C	25	-20	A
Mounted on Large Heat Sink					
I_{DM}	Pulse Drain Current Tested	T_C=25°C	110	85	A
I_D	Continuous Drain Current	T_C=25°C	25	-20	A
P_D	Maximum Power Dissipation	T_C=25°C	30	30	W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient		10.5	10.5	°C/W

N-CH Electrical Characteristics(T_J=25℃,unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics						
$BV_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250μA	20	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=20V, V_{GS}=0V	--	--	1.0	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±12V, V_{DS}=0V	--	--	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS} , I_D=250μA	0.4	0.75	1.0	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=4.5V , I_D=10A	--	10	15	mΩ
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=2.5V , I_D=5A	--	13	18	mΩ
Dynamic Electrical Characteristics						
C_{ISS}	Input Capacitance	V_{DS}=10V, V_{GS}=0V f=1MHz	--	1460	--	pF
C_{OSS}	Output Capacitance		--	240	--	pF
C_{RSS}	Reverse Transfer Capacitance		--	215	--	pF
Switching Characteristics						
Q_g	Total Gate Charge	V_{DS}=10V ,I_D=10A V_{GS}=10V	--	20	--	nC
Q_{gs}	Gate Source Charge		--	3	--	nC
Q_{gd}	Gate Drain Charge		--	6.5	--	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=10V ,I_D=10A V_{GS}=4.5V ,R_G=3Ω	--	10	--	nS
t_r	Turn-on Rise Time		--	20	--	nS
$t_{d(off)}$	Turn-Off Delay Time		--	40	--	nS
t_f	Turn-Off Fall Time		--	20	--	nS
Source- Drain Diode Characteristics						
V_{SD}	Forward on voltage	T_j=25℃, I_S=10A	--	--	1.2	V

P-CH Electrical Characteristics(T_J=25℃,unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics						
$BV_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=-250μA	-20	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-20V , V_{GS}=0V	--	--	-1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±12V , V_{DS}=0V	--	--	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS} , I_D=-250μA	-0.4	-0.7	-1.0	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=-4.5V , I_D=-10A	--	20	25	mΩ
		V_{GS}=-2.5V , I_D=-5A	--	30	40	mΩ
Dynamic Electrical Characteristics						
C_{ISS}	Input Capacitance	V_{DS}=-9V , V_{GS}=0V f=1MHz	--	1015	--	pF
C_{OSS}	Output Capacitance		--	138	--	pF
C_{RSS}	Reverse Transfer Capacitance		--	105	--	pF
Switching Characteristics						
Q_g	Total Gate Charge	V_{DS}=-9V , I_D=-5.6A V_{GS}=-4.5V	--	11.3	--	nC
Q_{gs}	Gate Source Charge		--	2.3	--	nC
Q_{gd}	Gate Drain Charge		--	2.4	--	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=-9V , I_D=-1A V_{GS}=-4.5V , R_G=2.5Ω	--	8.5	--	nS
t_r	Turn-on Rise Time		--	35.5	--	nS
$t_{d(off)}$	Turn-Off Delay Time		--	78	--	nS
t_f	Turn-Off Fall Time		--	58	--	nS
Source- Drain Diode Characteristics						
V_{SD}	Forward on voltage	T_j=25℃ , I_S=-10A	--	--	-1.2	V

N-Channel Typical Characteristics

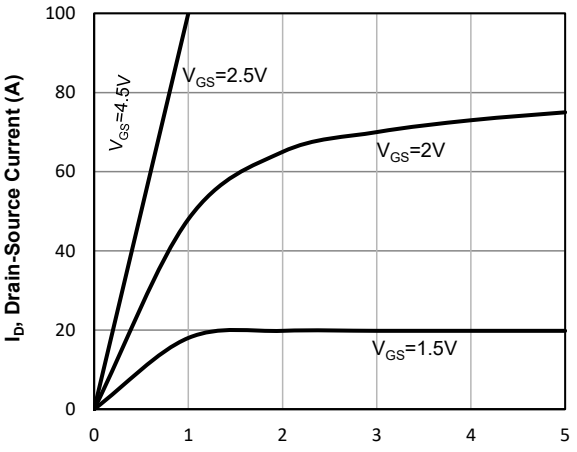


Fig1. Typical Output Characteristics

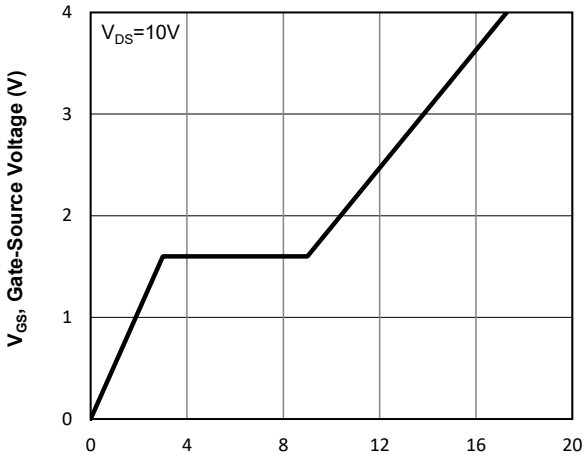


Fig2. Typical Gate Charge Vs.Gate-Source Voltage

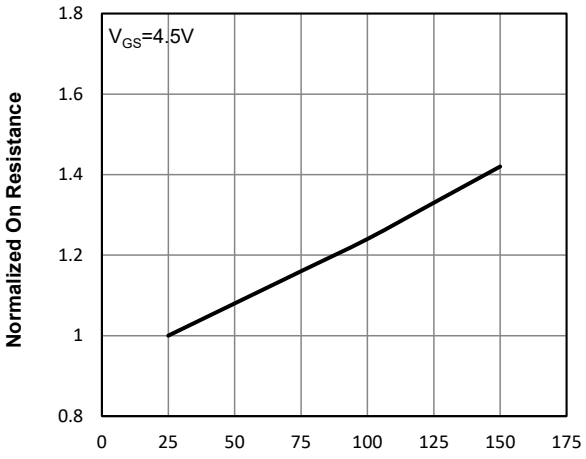


Fig3. Normalized On-Resistance Vs. Temperature

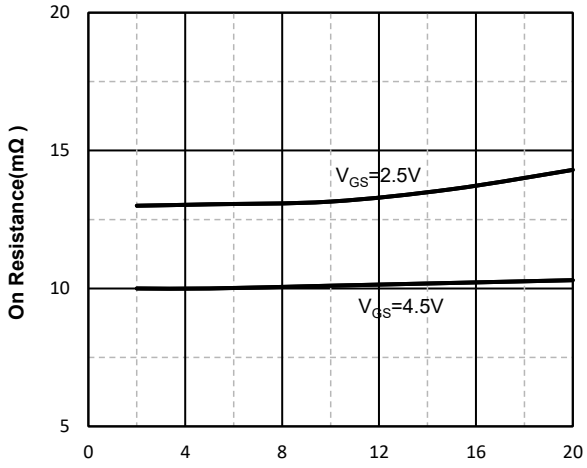


Fig4. On-Resistance Vs. Drain-Source Current

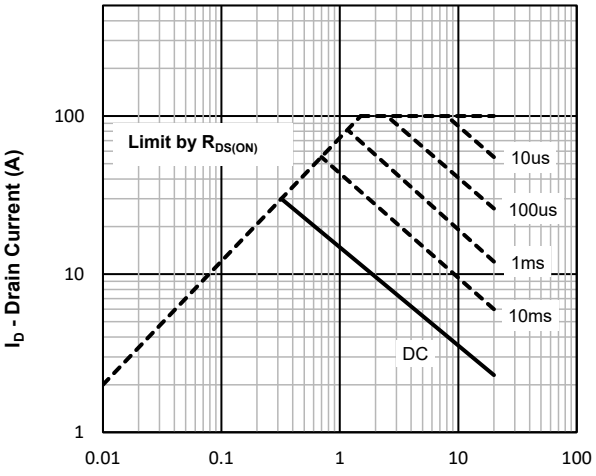


Fig5. Maximum Safe Operating Area

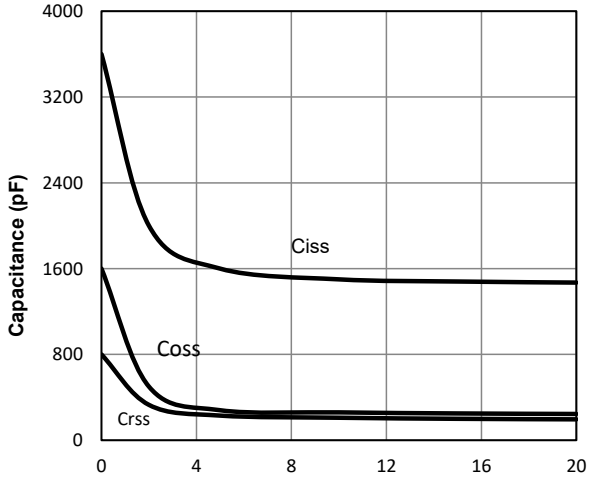


Fig6 Typical Capacitance Vs.Drain-Source Voltage

P-Channel Typical Characteristics

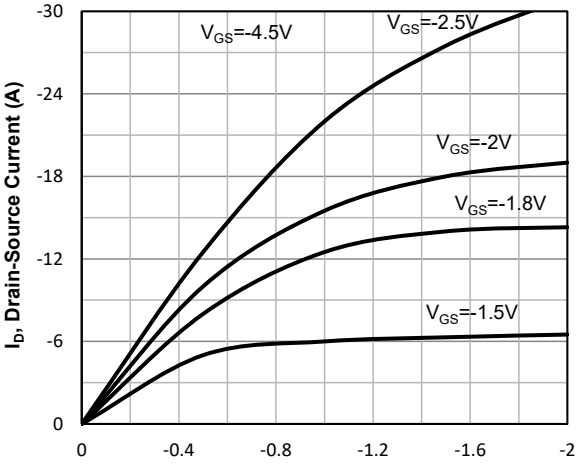


Fig7. Typical Output Characteristics

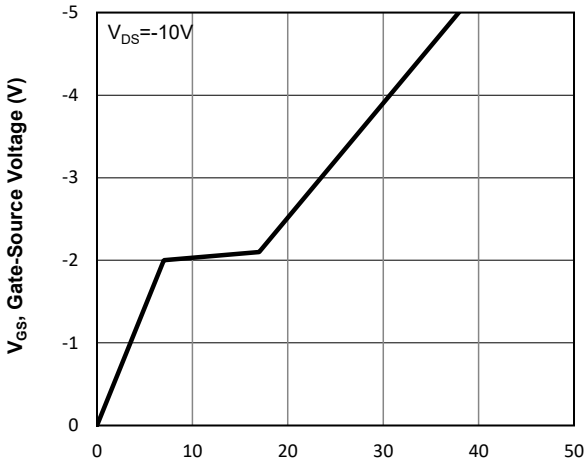


Fig8. Typical Gate Charge Vs.Gate-Source Voltage

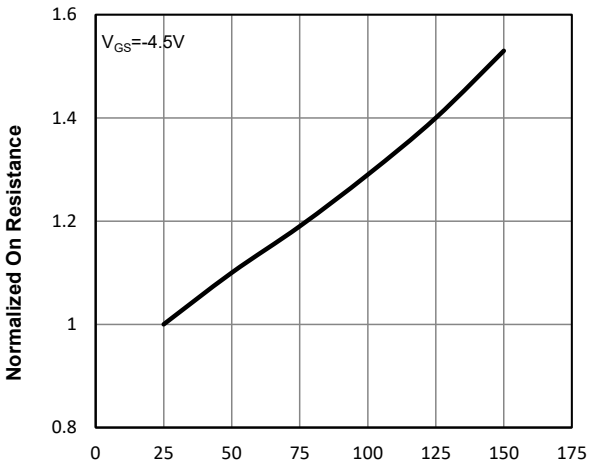


Fig9. Normalized On-Resistance Vs. Temperature

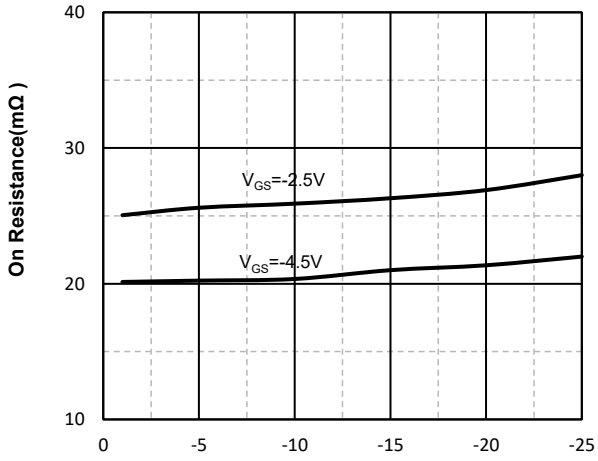


Fig10. On-Resistance Vs. Drain-Source Current

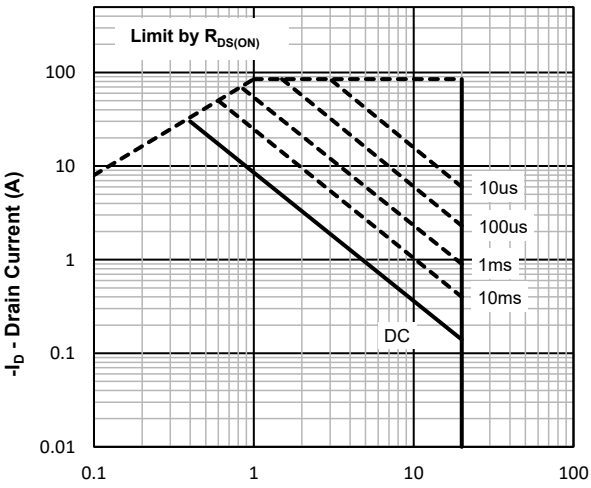


Fig11. Maximum Safe Operating Area

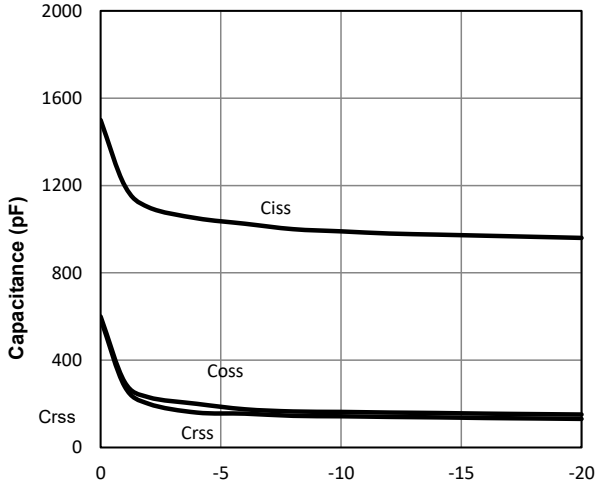
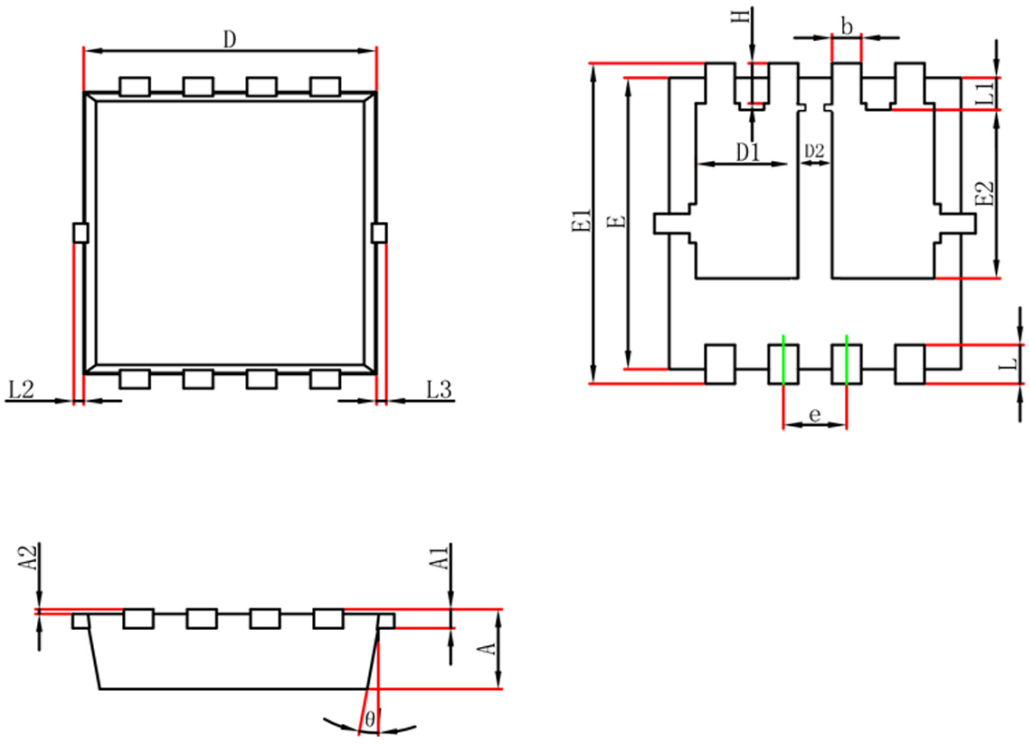


Fig12. Typical Capacitance Vs.Drain-Source Voltage

Package Outline

PDFN3X3



Symbol	Dimensions in Millimeters(mm)		Dimensions In Inches	
	Min	Max	Min	Max
A	0.750	0.850	0.030	0.034
A1	0.152 REF.		0.006 REF.	
A2	0~0.05		0~0.002	
D	3.050	3.150	0.121	0.125
D1	0.985	1.085	0.039	0.043
D2	0.330	0.430	0.013	0.017
E	2.950	3.050	0.117	0.121
E1	3.250	3.350	0.129	0.132
E2	1.685	1.785	0.067	0.071
b	0.250	0.350	0.010	0.014
e	0.600	0.700	0.024	0.028
L	0.350	0.450	0.014	0.018
L1	0.280	0.380	0.011	0.015
L2	0~0.100		0~0.004	
L3	0~0.100		0~0.004	
H	0.350	0.450	0.014	0.018
θ	9°	13°	10°	12°

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