MEPD20A

30V N-Channel and P-Channel MOSFET

Features

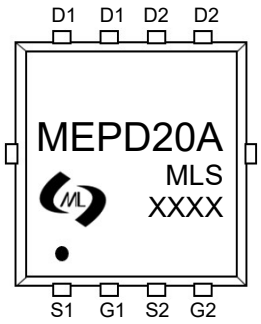
- High power and current handing capability
- Lead free product is acquired
- Surface mount package

Product Summary

V_{DS}	$R_{DS(ON)}$ MAX	I_D MAX
30V	20mΩ@10V	20A
	28mΩ@4.5V	
-30V	45mΩ@-10V	-20A
	55mΩ@-4.5V	

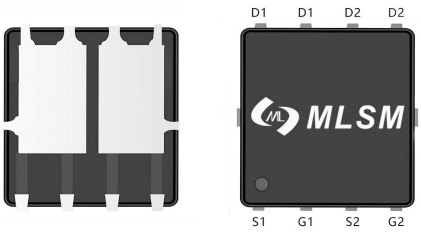
Application

- Battery protection
- Load switch
- Power management

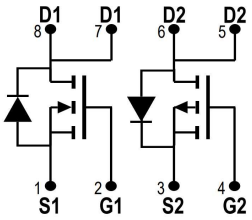


MEPD20A : Device code
XXXX : Code

Marking and pin assignment



PDFN3X3-8L view



Schematic diagram

Pb-Free RoHS Halogen-Free

Absolute Maximum Ratings (TA=25℃unless otherwise noted)

Symbol	Parameter		N-Channel	P-Channel	Unit
Common Ratings (TC=25°C Unless Otherwise Noted)					
V_{DS}	Drain-Source Breakdown Voltage		30	-30	V
V_{GS}	Gate-Source Voltage		±20	±20	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	Tc=25°C	20	-20	A
Mounted on Large Heat Sink					
I_{DM}	Pulse Drain Current Tested	Tc=25°C	100	-80	A
I_D	Continuous Drain Current	Tc=25°C	20	-20	A
P_D	Maximum Power Dissipation	Tc=25°C	30	25	W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient		83.3	83.3	°C/W

Ordering Information (Example)

Type	Package	Marking	Minimum Package(pcs)	Inner Box Quantity(pcs)	Outer Carton Quantity(pcs)	Delivery Mode
MEPD20A	PDFN3X3-8L	MEPD20A	5,000	10,000	70,000	13"reel

N-Ch Electrical Characteristics (TJ=25℃ unless otherwise noted)						
Symbol	**Parameter**	**Condition**	**Min**	**Typ**	**Max**	**Unit**
Static Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
$BV_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V，I_D=250μA	30	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=30V，V_{GS}=0V	--	--	1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V，V_{DS}=0V	--	--	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}，I_D=250μA	1.0	1.5	2.5	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=10V， I_D=20A	--	15	20	mΩ
		V_{GS}=4.5V，I_D=10A	--	21	28	mΩ
Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
C_{ISS}	Input Capacitance	V_{DS}=15V，V_{GS}=0V， f=1MHz	--	572	--	pF
C_{OSS}	Output Capacitance		--	81	--	pF
C_{RSS}	Reverse Transfer Capacitance		--	65	--	pF
Switching Characteristics						
Q_g	Total Gate Charge	V_{DS}=15V，I_D=12A，V_{GS}=10V	--	6.2	--	nC
Q_{gs}	Gate Source Charge		--	2.4	--	nC
Q_{gd}	Gate Drain Charge		--	2.5	--	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=30V，I_D=10A，V_{GS}=10V，R_G=3Ω	--	3	--	nS
t_r	Turn-on Rise Time		--	7.5	--	nS
$t_{d(off)}$	Turn-Off Delay Time		--	20	--	nS
t_f	Turn-Off Fall Time		--	4	--	nS
Source- Drain Diode Characteristics						
V_{SD}	Forward on voltage	Tj=25℃，Is=10A	--	--	1.2	V

P-CH Electrical Characteristics (TJ=25℃ unless otherwise noted)						
Symbol	**Parameter**	**Condition**	**Min**	**Typ**	**Max**	**Unit**
Static Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
$BV_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V，I_D=-250μA	-30	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-30V，V_{GS}=0V	--	--	-1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V，V_{DS}=0V	--	--	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}，I_D=-250μA	-1.0	-1.5	-2.5	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=-10V， I_D=-20A	--	35	45	mΩ
		V_{GS}=-4.5V，I_D=-10A	--	40	55	mΩ
Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
C_{ISS}	Input Capacitance	V_{DS}=-15V，V_{GS}=0V， f=1MHz	--	570	--	pF
C_{OSS}	Output Capacitance		--	80	--	pF
C_{RSS}	Reverse Transfer Capacitance		--	70	--	pF
Switching Characteristics						
Q_g	Total Gate Charge	V_{DS}=-15V，I_D=-10A，V_{GS}=-10V	--	11.5	--	nC
Q_{gs}	Gate Source Charge		--	2.3	--	nC
Q_{gd}	Gate Drain Charge		--	2.1	--	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=-15V，I_D=-10A，V_{GS}=-10V，R_G=3Ω	--	3.8	--	nS
t_r	Turn-on Rise Time		--	17.5	--	nS
$t_{d(off)}$	Turn-Off Delay Time		--	18	--	nS
t_f	Turn-Off Fall Time		--	21.8	--	nS
Source- Drain Diode Characteristics						
V_{SD}	Forward on voltage	Tj=25℃，Is=-10A	--	--	-1.2	V

N-Channel Typical Operating Characteristics

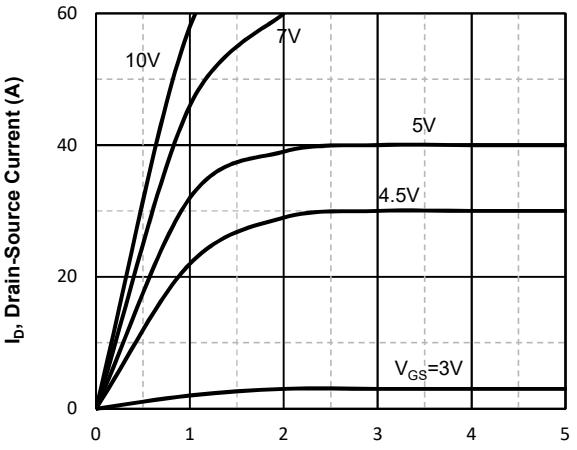


Fig1. Typical Output Characteristics

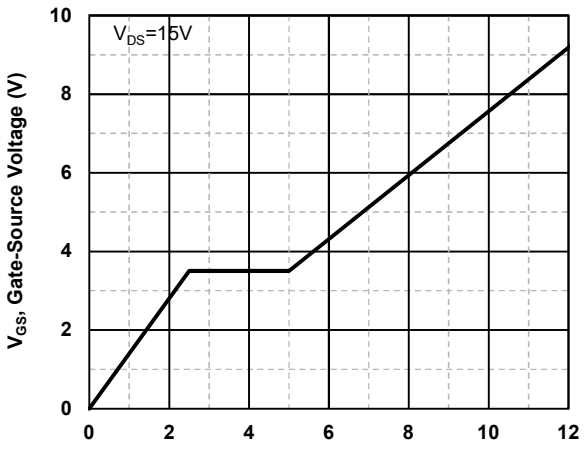


Fig2. Typical Gate Charge Vs.Gate-Source Voltage

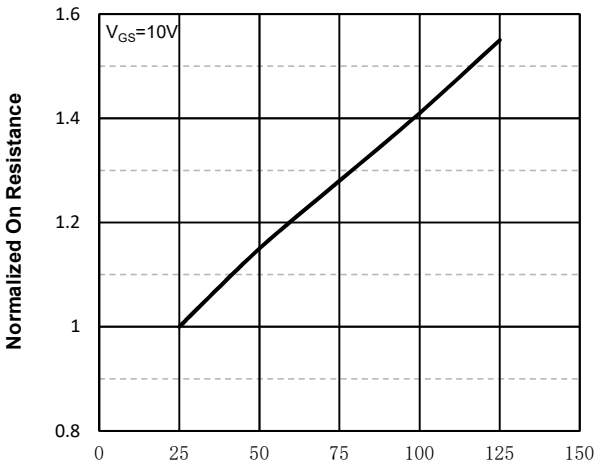


Fig3. Normalized On-Resistance Vs. Temperature

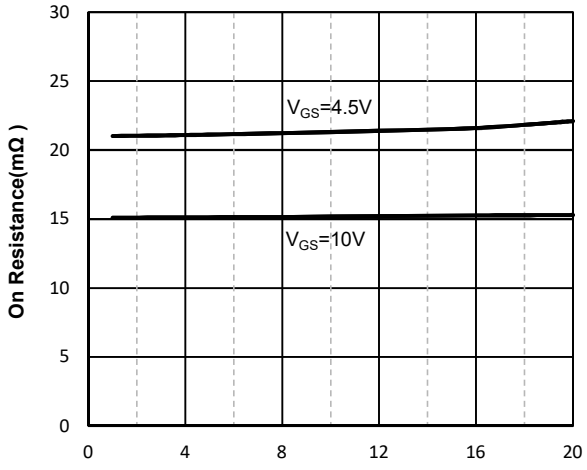


Fig4. On-Resistance Vs. Drain-Source Current

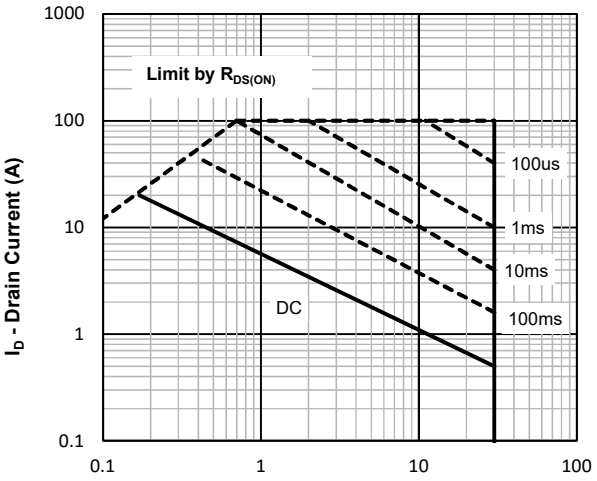


Fig5. Maximum Safe Operating Area

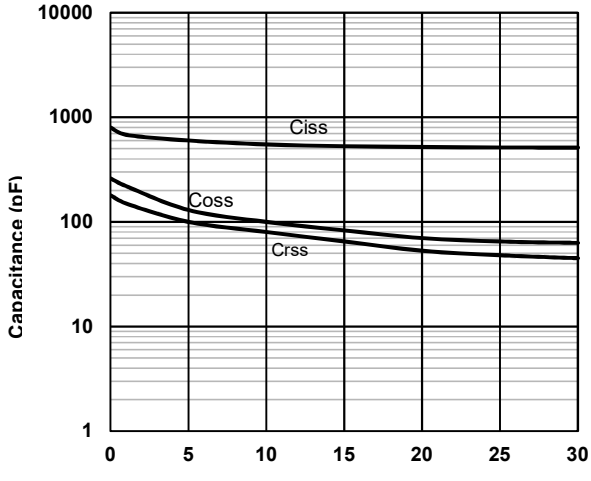


Fig6 Typical Capacitance Vs.Drain-Source Voltage

P-Channel Typical Operating Characteristics

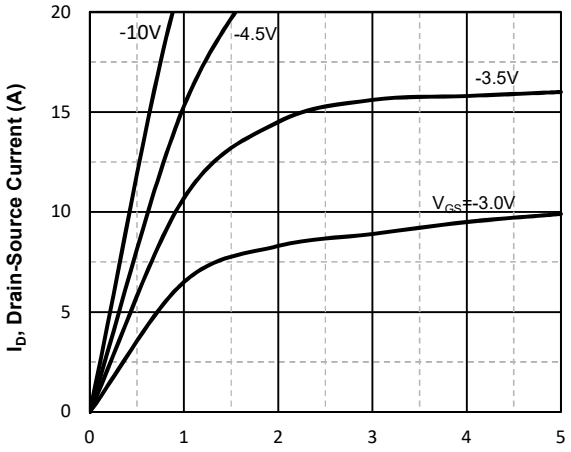


Fig7. Typical Output Characteristics

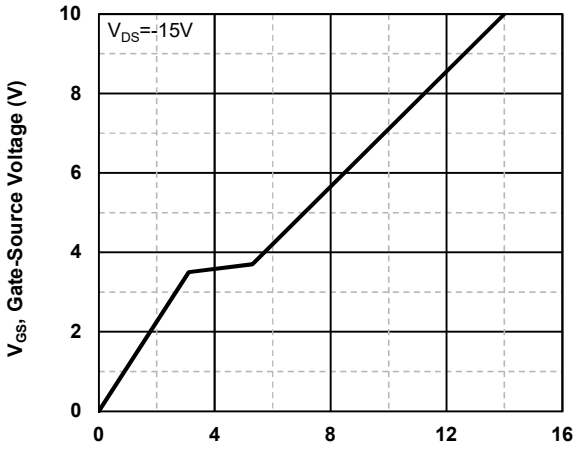


Fig8. Typical Gate Charge Vs.Gate-Source Voltage

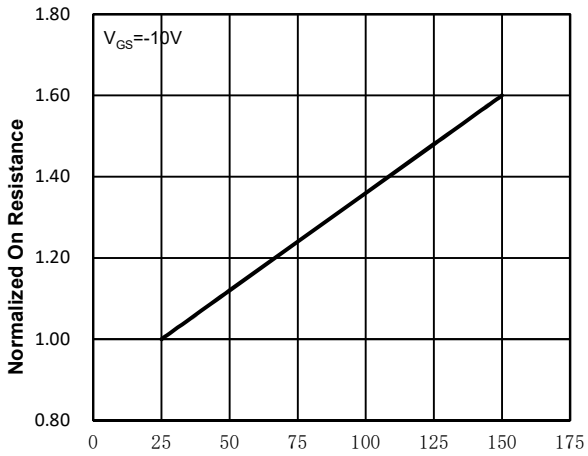


Fig9. Normalized On-Resistance Vs. Temperature

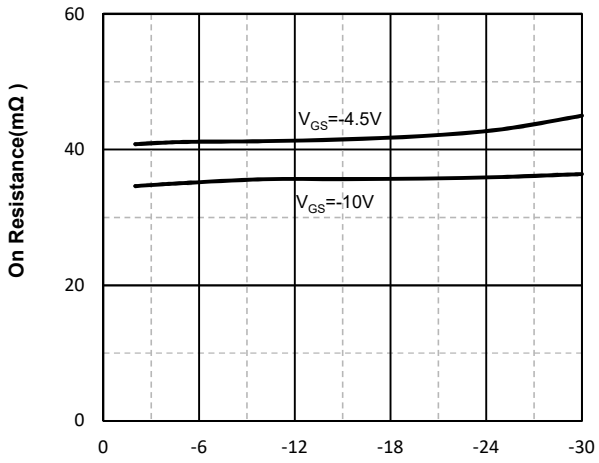


Fig10. On-Resistance Vs. Drain-Source Current

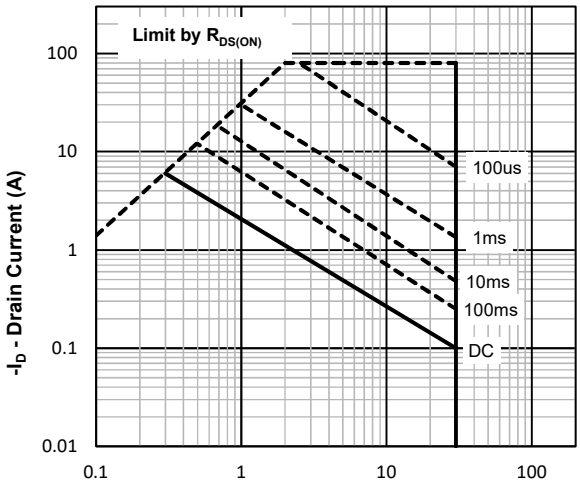


Fig11. Maximum Safe Operating Area

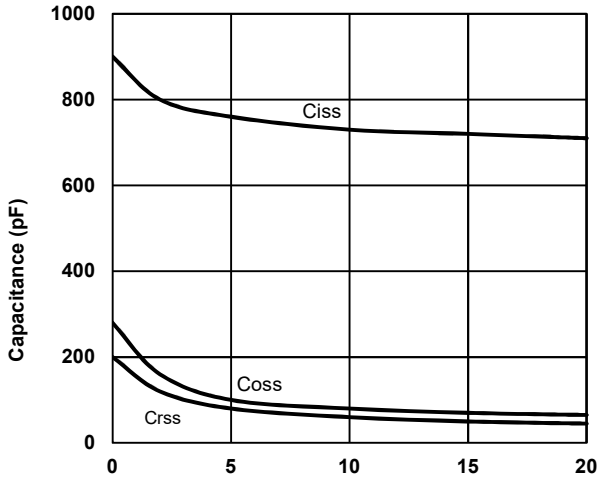
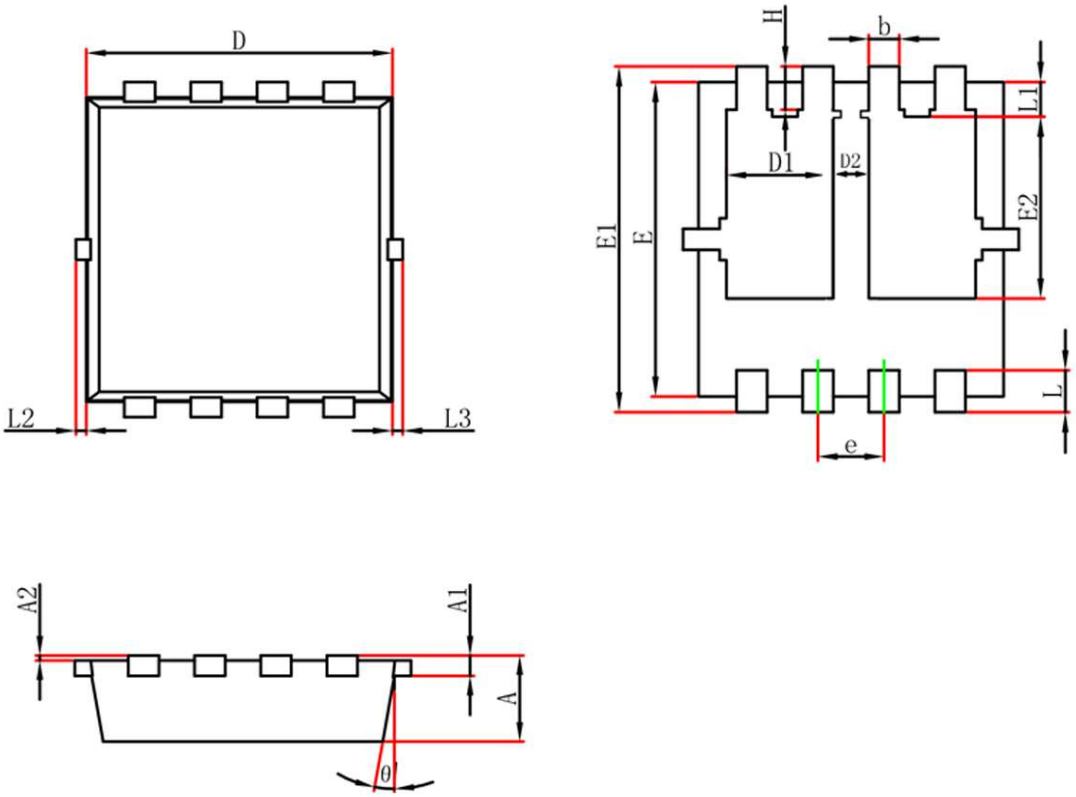


Fig12. Typical Capacitance Vs.Drain-Source Voltage

PDFN3X3-8L Package information



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°