MEPC15A

20V N-Channel and P-Channel MOSFET

Features

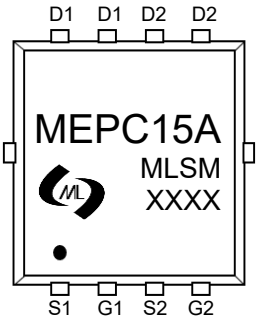
- High power and current handing capability
- Lead free product is acquired
- Surface mount package

Application

- Battery protection
- Load switch
- Power management

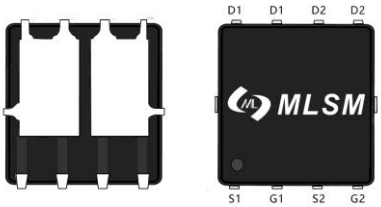
Product Summary

V_{DS}	$R_{DS(ON)}$ TYP	I_D
20V	20mΩ@4.5V	15A
	25mΩ@2.5V	
-20V	23mΩ@-4.5V	-15A
	30mΩ@-2.5V	

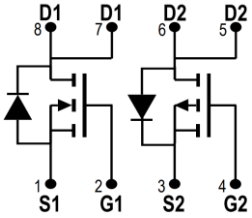


MEPC15A : Device code
XXXX : Code

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		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	Tc=25°C	15	-15	A
Mounted on Large Heat Sink					
I_{DM}	Pulse Drain Current Tested	Tc=25°C	60	-60	A
I_D	Continuous Drain Current	Tc=25°C	15	-15	A
P_D	Maximum Power Dissipation	Tc=25°C	25	25	W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient		10.5	10.5	°C/W

Ordering Information (Example)

Type	Package	Marking	Minimum Package(pcs)	Inner Box Quantity(pcs)	Outer Carton Quantity(pcs)	Delivery Mode
MEPC15A	PDFN3X3-8L	MEPC15A	5,000	10,000	70,000	13"reel

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	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	--	25	32	mΩ
Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
C_{ISS}	Input Capacitance	V_{DS}=10V，V_{GS}=0V， f=1MHz	--	378	--	pF
C_{OSS}	Output Capacitance		--	74	--	pF
C_{RSS}	Reverse Transfer Capacitance		--	58	--	pF
Switching Characteristics						
Q_g	Total Gate Charge	V_{DS}=10V，I_D=4.5A，V_{GS}=4.5V	--	6.05	--	nC
Q_{gs}	Gate Source Charge		--	1.07	--	nC
Q_{gd}	Gate Drain Charge		--	1.95	--	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=10V，R_L=1Ω，V_{GS}=4.5V，R_G=3Ω	--	4.2	--	nS
t_r	Turn-on Rise Time		--	19.8	--	nS
$t_{d(off)}$	Turn-Off Delay Time		--	22.6	--	nS
t_f	Turn-Off Fall Time		--	23.2	--	nS
Source- Drain Diode Characteristics						
V_{SD}	Forward on voltage	Tj=25°C，Is=10A	--	--	1.2	V

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	-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	--	23	28	mΩ
		V_{GS}=-2.5V，I_D=-5A	--	30	40	mΩ
Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
C_{lSS}	Input Capacitance	V_{DS}=-9V，V_{GS}=0V， f=1MHz	--	980	--	pF
C_{OSS}	Output Capacitance		--	130	--	pF
C_{RSS}	Reverse Transfer Capacitance		--	110	--	pF
Switching Characteristics						
Q_g	Total Gate Charge	V_{DS}=-9V，I_D=-5.6A，V_{GS}=-4.5V	--	11.5	--	nC
Q_{gs}	Gate Source Charge		--	2	--	nC
Q_{gd}	Gate Drain Charge		--	2.5	--	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=-9V，I_D=-1A，V_{GS}=-4.5V，R_G=2.5Ω	--	8.3	--	nS
t_r	Turn-on Rise Time		--	35.2	--	nS
$t_{d(off)}$	Turn-Off Delay Time		--	80	--	nS
t_f	Turn-Off Fall Time		--	55	--	nS
Source- Drain Diode Characteristics						
V_{SD}	Forward on voltage	Tj=25°C，Is=-10A	--	--	-1.2	V

N-Channel Typical Operating Characteristics

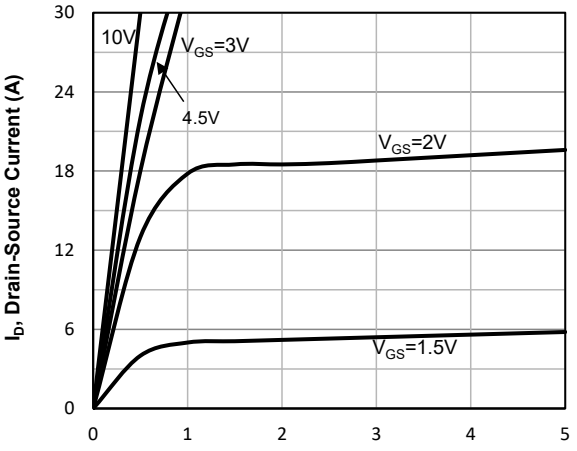


Fig1. Typical Output Characteristics

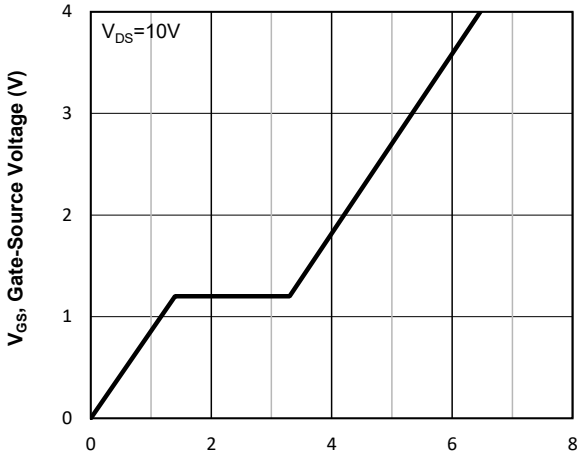


Fig2. Typical Gate Charge Vs.Gate-Source Voltage

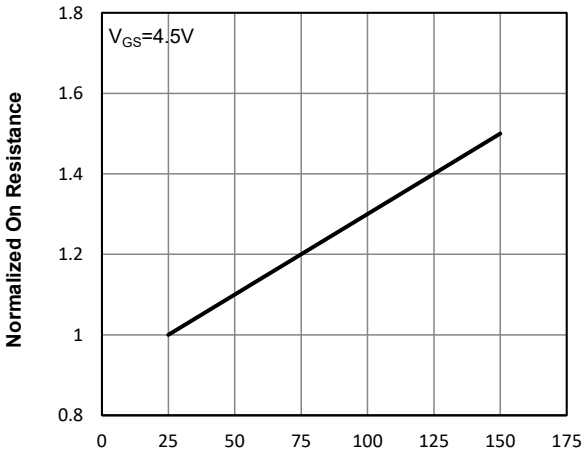


Fig3. Normalized On-Resistance Vs. Temperature

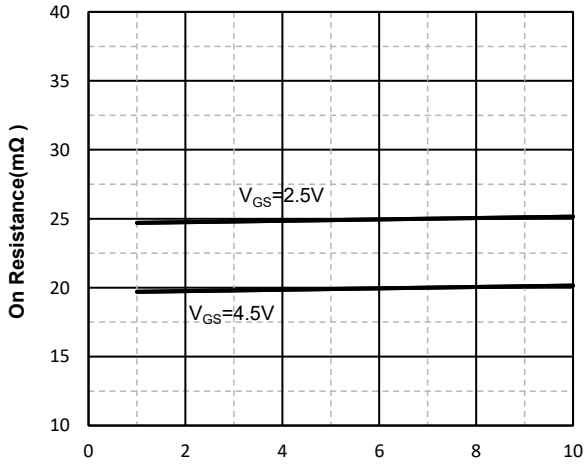


Fig4. On-Resistance Vs. Drain-Source Current

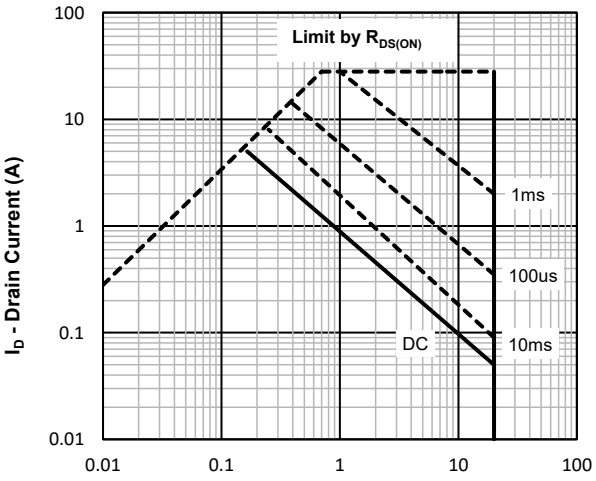


Fig5. Maximum Safe Operating Area

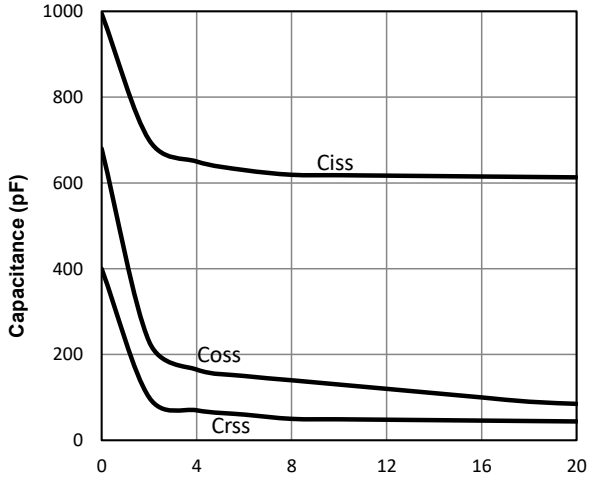
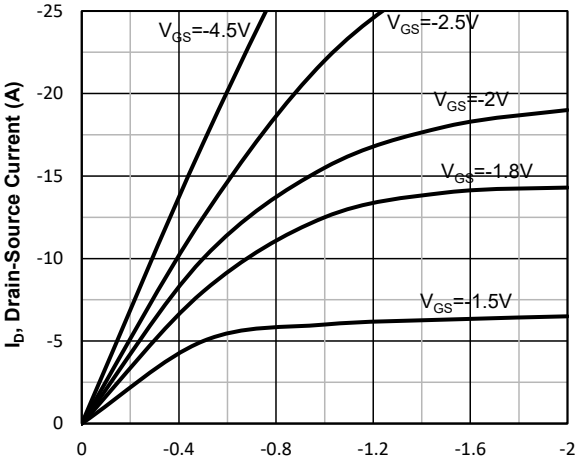
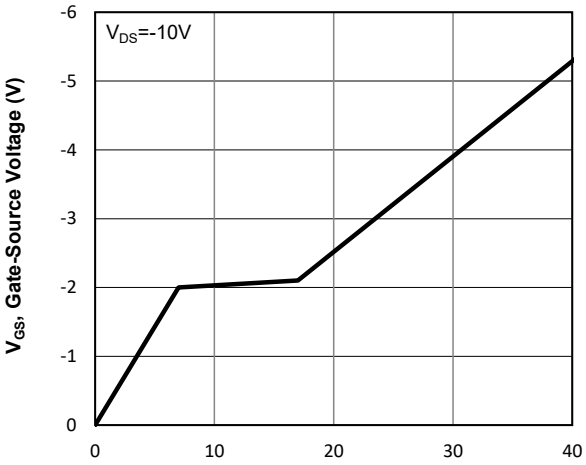


Fig6 Typical Capacitance Vs.Drain-Source Voltage

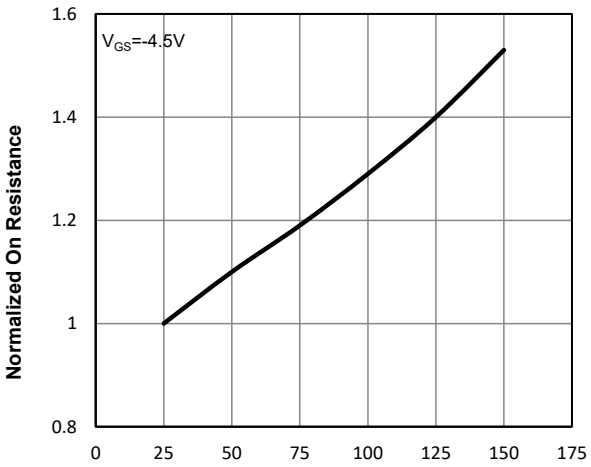
P-Channel Typical Operating Characteristics



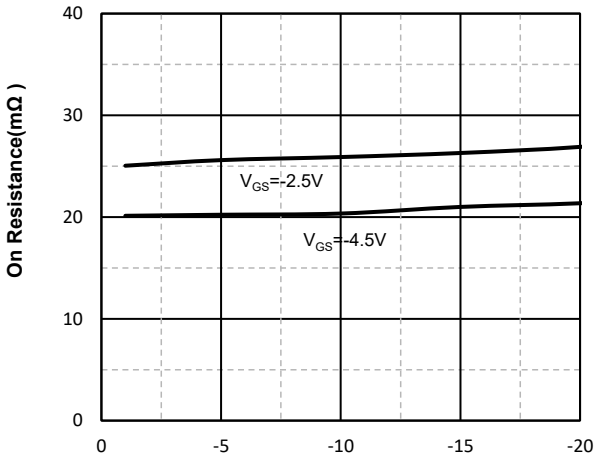
V_{DS}, Drain -Source Voltage (V)
Fig7. Typical Output Characteristics



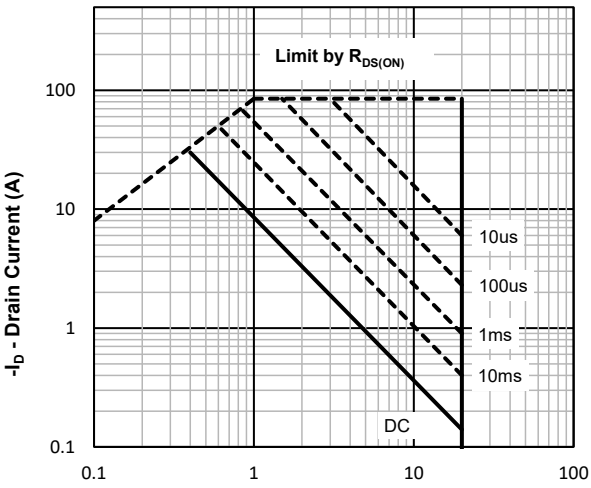
Qg -Total Gate Charge (nC)
Fig8. Typical Gate Charge Vs.Gate-Source Voltage



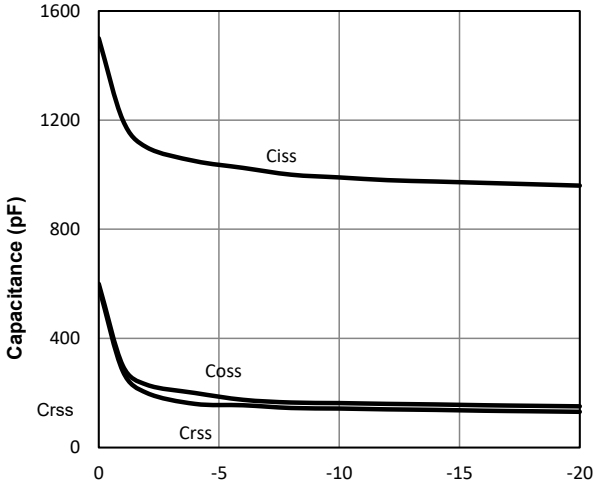
Tj - Junction Temperature (°C)
Fig9. Normalized On-Resistance Vs. Temperature



I_D, Drain-Source Current (A)
Fig10. On-Resistance Vs. Drain-Source Current

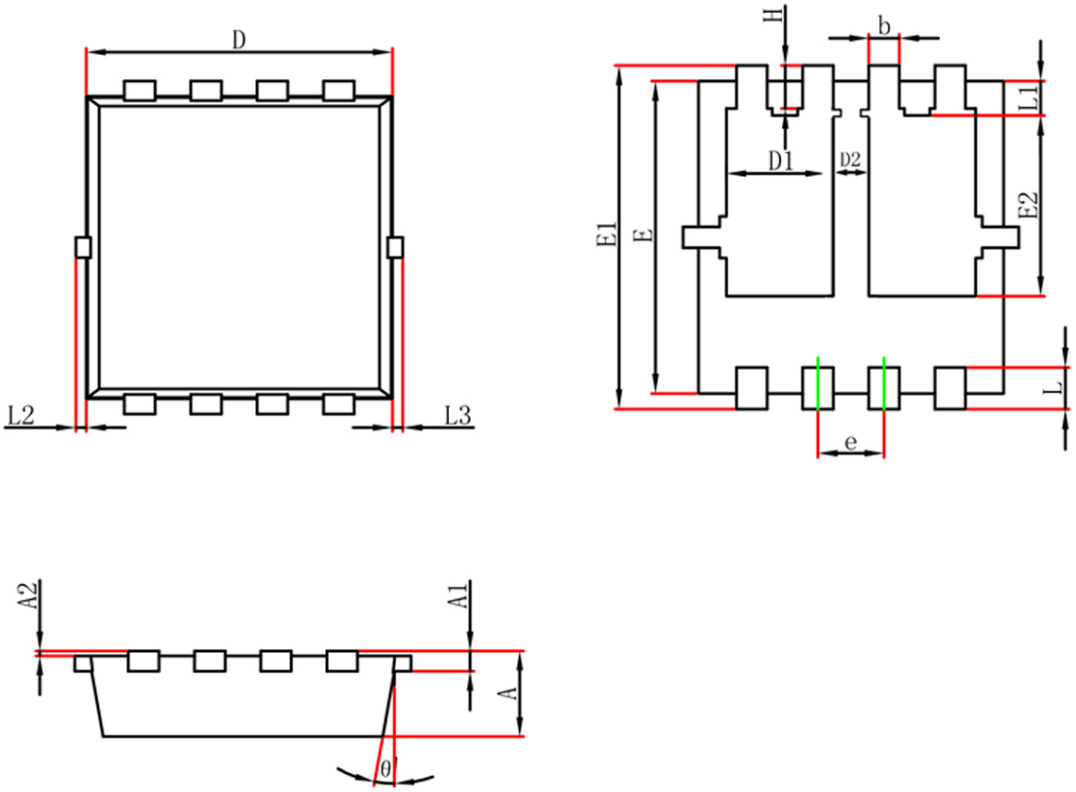


$-V_{DS}$, Drain -Source Voltage (V)
Fig11. Maximum Safe Operating Area



V_{DS} , Drain-Source Voltage (V)
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°