MC1C100AG

120V/100A N-Channel MOSFET

MLSM MICROELECTRONICS

Features

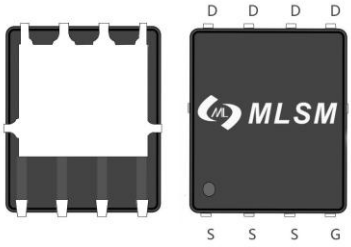
- Fast switching speed
- Low On-Resistance
- Excellent FoM(figure of merit)
- 100% UIS and Rg tested

Application

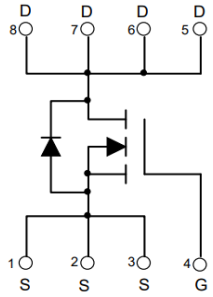
- Motor Driver
- DC/DC Converter
- Battery Management System

Product Summary

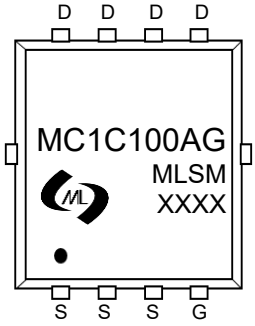
V_{DS}	$R_{DS(ON)}$ TYP	I_D
120V	6.0mΩ@10V	100A
	6.8mΩ@4.5V	



PDFN5X6-8L view



Schematic diagram



MC1C100AG: Device code
XXXX : Code

Marking and pin assignment

Pb-Free RoHS Halogen-Free

Absolute Maximum Ratings (TA=25℃unless otherwise noted)				
Symbol	**Parameter**		**Rating**	**Unit**
Common Ratings (TC=25°C Unless Otherwise Noted)				
V_{DS}	Drain-Source Breakdown Voltage		120	V
V_{GS}	Gate-Source Voltage		±20	V
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-50 to 155	°C
E_{AS}	Single Pulse Avalanche Energy[Note1]		470	mJ
I_S	Diode Continuous Forward Current	Tc=25°C	100	A
Mounted on Large Heat Sink				
I_{DM}	Pulse Drain Current Tested	Tc=25°C	400	A
I_D	Continuous Drain Current	Tc=25°C	100	A
P_D	Maximum Power Dissipation	Tc=25°C	114	W
$R_{\theta JA}$	Thermal Resistance Junction-to-Ambient		62.5	°C/W

Ordering Information (Example)						
Type	**Package**	**Marking**	**Minimum Package(pcs)**	**Inner Box Quantity(pcs)**	**Outer Carton Quantity(pcs)**	**Delivery Mode**
MC1C100AG	PDFN5X6-8L	MC1C100AG	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	120	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=120V，V_{GS}=0V	--	--	1.0	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	--	2.5	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=10V，I_D=30A	--	6	7.8	mΩ
		V_{GS}=4.5V，I_D=20A	--	6.8	8.5	mΩ
Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
C_{ISS}	Input Capacitance	V_{DS}=60V，V_{GS}=0V， f=1MHz	--	3900	--	pF
C_{OSS}	Output Capacitance		--	323	--	pF
C_{RSS}	Reverse Transfer Capacitance		--	10	--	pF
Switching Characteristics						
Q_g	Total Gate Charge	V_{DS}=50V，I_D=50A，V_{GS}=10V	--	90	--	nC
Q_{gs}	Gate-Source Charge		--	14	--	nC
Q_{gd}	Gate-Drain Charge		--	22	--	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=50V，I_D=50A，V_{GS}=10V，R_G=3Ω	--	22	--	nS
t_r	Turn-on Rise Time		--	18	--	nS
$t_{d(off)}$	Turn-Off Delay Time		--	49	--	nS
t_f	Turn-off fall Time		--	19	--	nS
Source- Drain Diode Characteristics						
V_{SD}	Forward on voltage	Tj=25°C，Is=30A	--	0.83	1.2	V

Note 1:L=0.5mH, R_G=25Ω, V_{GS}=10V, V_{DD}=80V, Start T_J=25℃

Typical Operating Characteristics

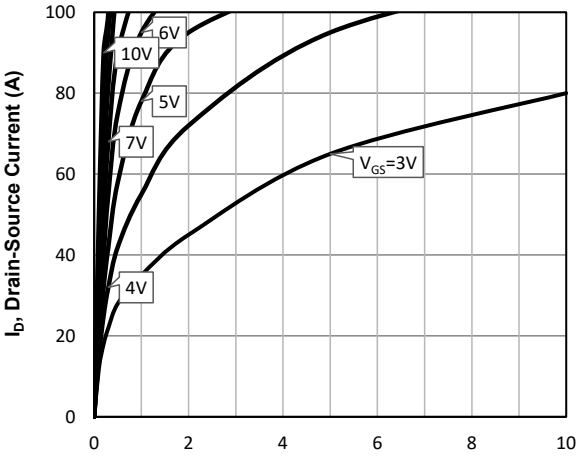


Fig1. Typical Output Characteristics

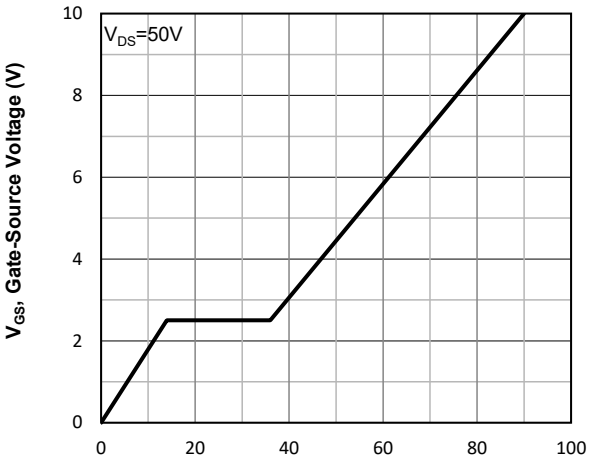


Fig2. Typical Gate Charge Vs.Gate-Source Voltage

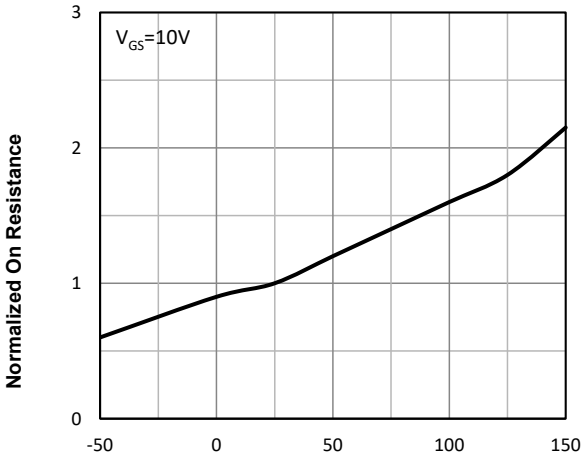


Fig3. Normalized On-Resistance Vs. Temperature

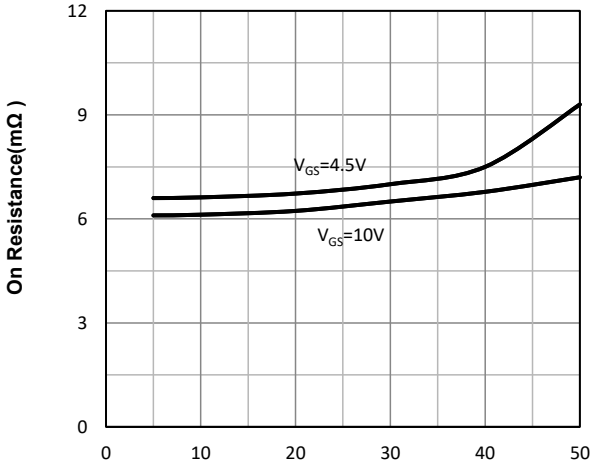


Fig4. On-Resistance Vs. Drain-Source Current

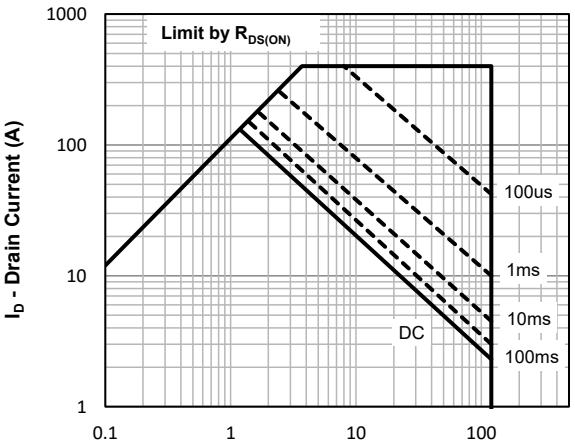


Fig5. Maximum Safe Operating Area

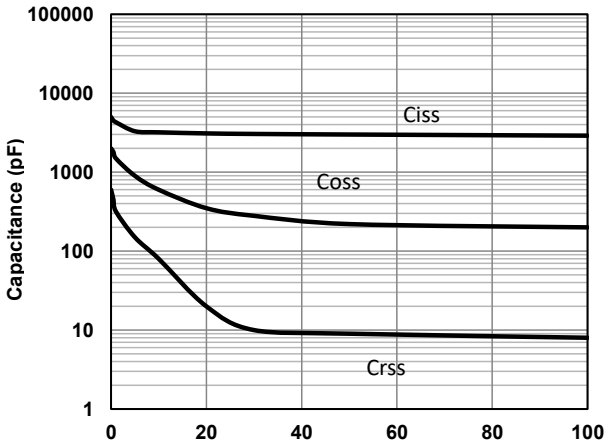
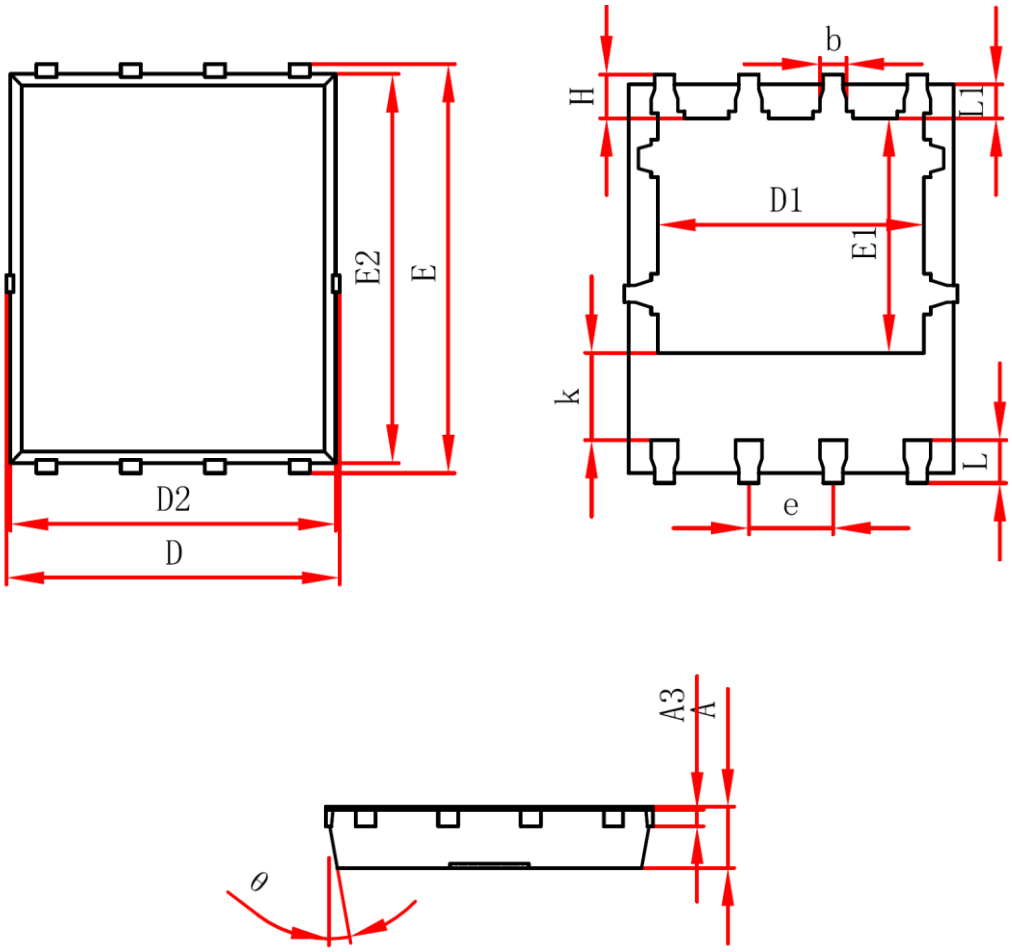


Fig6 Typical Capacitance Vs.Drain-Source Voltage

PDFN5X6-8L Package information



Symbol	Dimensions in Millimeters(mm)		Dimensions In Inches	
	Min	Max	Min	Max
A	0.950	1.050	0.035	0.039
A3	0.254REF.		0.010REF.	
D	4.950	5.050	0.196	0.200
E	5.950	6.050	0.235	0.239
D1	4.026	4.126	0.159	0.163
E1	3.510	3.610	0.139	0.143
D2	4.850	4.950	0.192	0.196
E2	5.700	5.800	0.225	0.229
k	1.190	1.390	0.047	0.055
b	0.300	0.400	0.012	0.016
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°