MLSM
MICROELECTRONICS

MCAG50AG

60V/50A Dual N-Channel MOSFET

Features

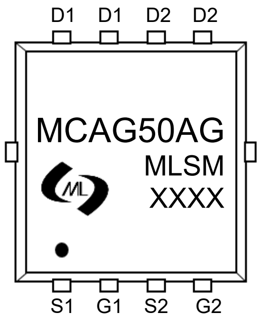
- Low $R_{DS(on)}$ & FOM
- Extremely low switching loss
- Split gate trench MOSFET technology
- Fast switching and soft recovery

Application

- Consumer electronic power supply
- Motor control
- Synchronous-rectification
- Isolated DC/DC convertor

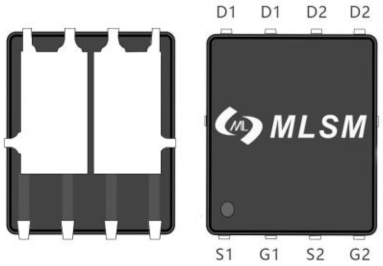
Product Summary

V_{DS}	$R_{DS(ON)}$ TYP	I_D
60V	11mΩ@10V	50A
	16mΩ@4.5V	

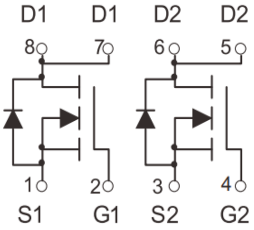


MCAG50AG: Device code
XXXX : Code

Marking and pin assignment



PDFN5X6-8L view



Schematic diagram

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		60	V
V_{GS}	Gate-Source Voltage		±20	V
T_J,T_{STG}	Operating Junction and Storage Temperature Range		-55 to 175	°C
E_{AS}	Single pulse avalanche energy(Note1)		50	mJ
I_S	Diode Continuous Forward Current	Tc=25°C	50	A
Mounted on Large Heat Sink				
I_{DM}	Pulse Drain Current Tested	Tc=25°C	160	A
I_D	Continuous Drain Current	Tc=25°C	50	A
P_D	Maximum Power Dissipation	Tc=25°C	40	W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient		62.5	°C/W

Ordering Information (Example)

Type	Package	Marking	Minimum Package(pcs)	Inner Box Quantity(pcs)	Outer Carton Quantity(pcs)	Delivery Mode
MCAG50AG	PDFN5X6-8L	MCAG50AG	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	60	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=60V，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	1.7	2.5	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=10V，I_D=20A	--	11	16	mΩ
		V_{GS}=4.5V，I_D=10A	--	16	20	mΩ
Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
C_{ISS}	Input Capacitance	V_{DS}=30V，V_{GS}=0V，f=1MHz	--	821.6	--	pF
C_{OSS}	Output Capacitance		--	151.2	--	pF
C_{RSS}	Reverse Transfer Capacitance		--	139.4	--	pF
Switching Characteristics						
Q_g	Total Gate Charge	V_{DS}=48V，I_D=10A， V_{GS}=10V	--	12.9	--	nC
Q_{gs}	Gate Source Charge		--	2.01	--	nC
Q_{gd}	Gate Drain Charge		--	3.1	--	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=30V，I_D=20A， V_{GS}=10V，R_G=3.5Ω	--	2.5	--	nS
t_r	Turn-on Rise Time		--	0.9	--	nS
$t_{d(off)}$	Turn-Off Delay Time		--	3.5	--	nS
t_f	Turn-Off Fall Time		--	2	--	nS
Source- Drain Diode Characteristics						
V_{SD}	Forward on voltage	Tj=25℃，Is=40A	--	--	1.2	V

Note：

1、L=0.5mH, V_{DS}=48V,V_{GS}=10V, Starting T_J=25℃

Typical Operating Characteristics

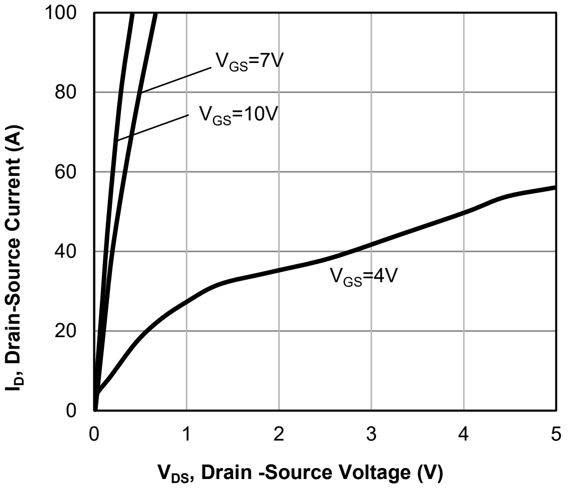


Fig1. Typical Output Characteristics

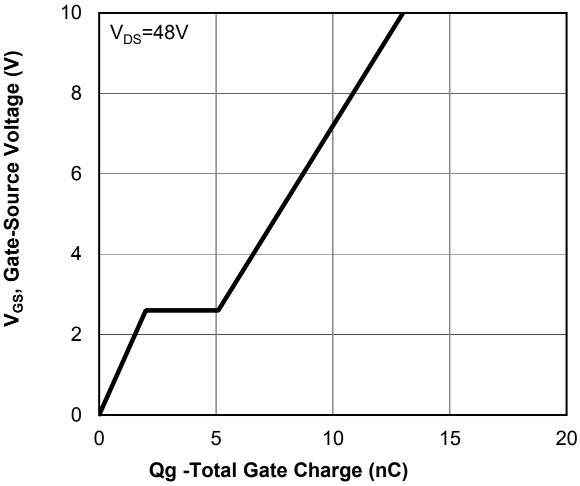


Fig2. Typical Gate Charge Vs.Gate-Source Voltage

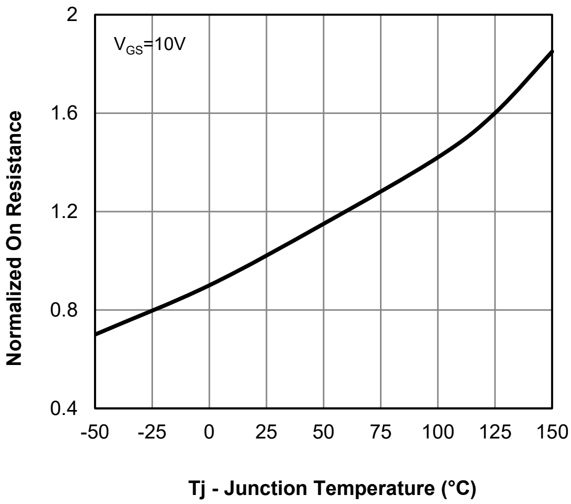


Fig3. Normalized On-Resistance Vs. Temperature

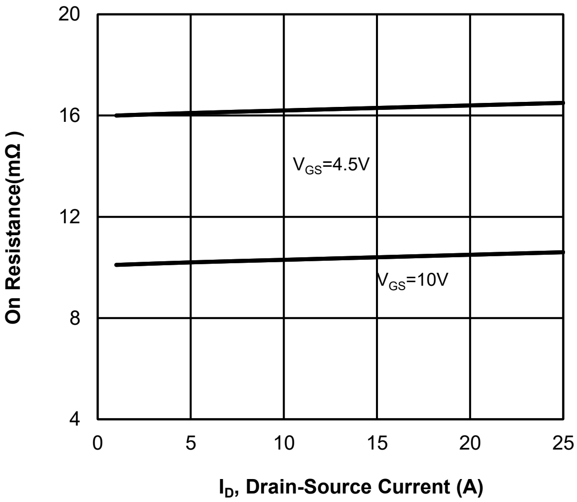


Fig4. On-Resistance Vs. Drain-Source Current

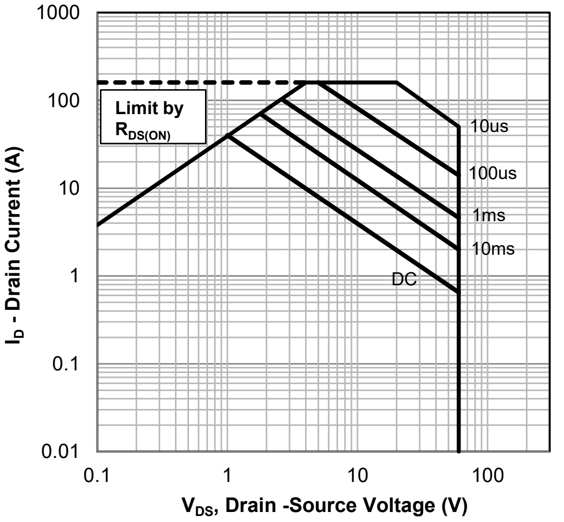


Fig5. Maximum Safe Operating Area

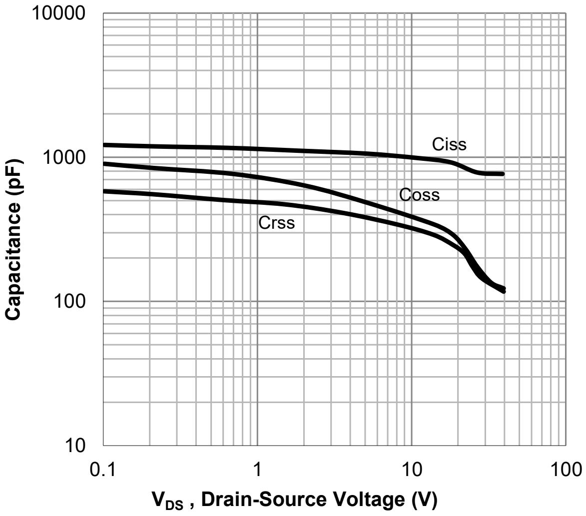
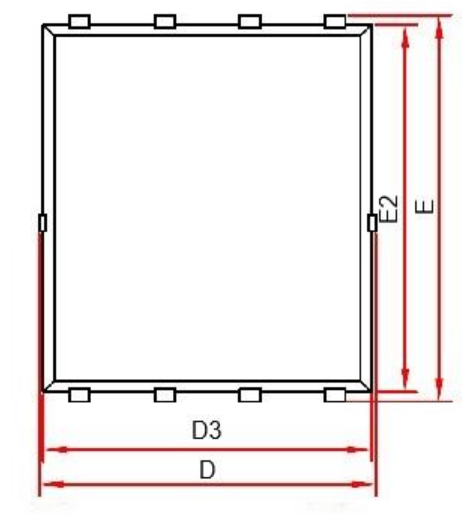
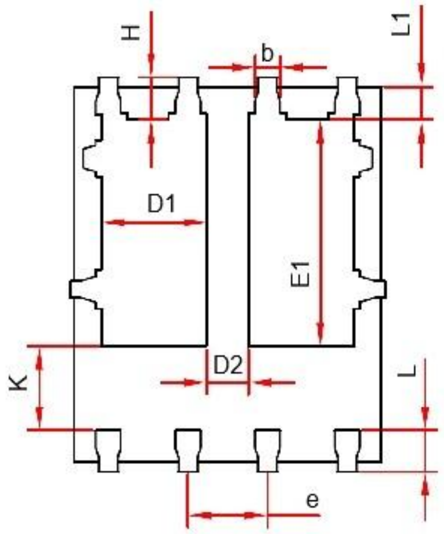
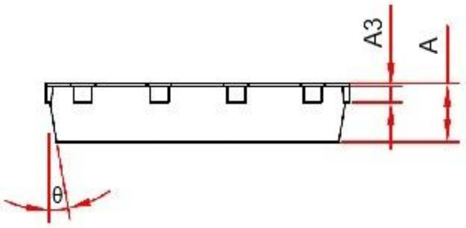


Fig6 Typical Capacitance Vs.Drain-Source Voltage

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	1.470	1.870	0.058	0.074
D2	0.470	0.870	0.019	0.034
E1	3.510	3.610	0.139	0.143
D3	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°