

Features

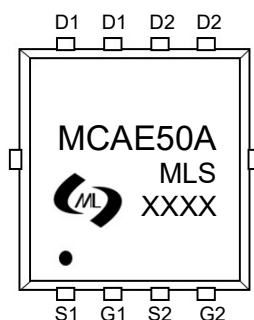
- High density cell design for ultra low $R_{DS(ON)}$
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation

Product Summary

V_{DS}	$R_{DS(ON)}$ MAX	I_D MAX
40V	8mΩ@10V	50A
	10mΩ@4.5V	

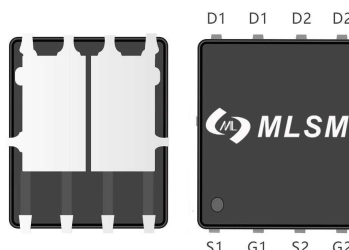
Application

- Power switching application

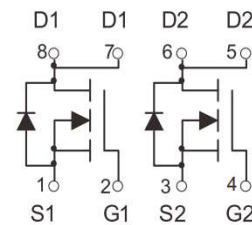


Marking and pin assignment

MCAE50A : Device code
XXXX : Code



PDFN5X6-8L view



Schematic diagram



Halogen-Free

Absolute Maximum Ratings (TA=25°C unless otherwise noted)

Symbol	Parameter	Rating	Unit
Common Ratings (TC=25°C Unless Otherwise Noted)			
V_{DS}	Drain-Source Breakdown Voltage	40	V
V_{GS}	Gate-Source Voltage	±20	V
T_J	Maximum Junction Temperature	150	°C
T_{STG}	Storage Temperature Range	-50 to 155	°C
I_S	Diode Continuous Forward Current	$T_c=25^\circ\text{C}$ 50	A

Mounted on Large Heat Sink

I_{DM}	Pulse Drain Current Tested	$T_c=25^\circ\text{C}$ 200	A
I_D	Continuous Drain Current	$T_c=25^\circ\text{C}$ 50	A
P_D	Maximum Power Dissipation	$T_c=25^\circ\text{C}$ 85	W
E_{AS}	Single pulse avalanche energy ^{Note1}	81	mJ

Ordering Information (Example)

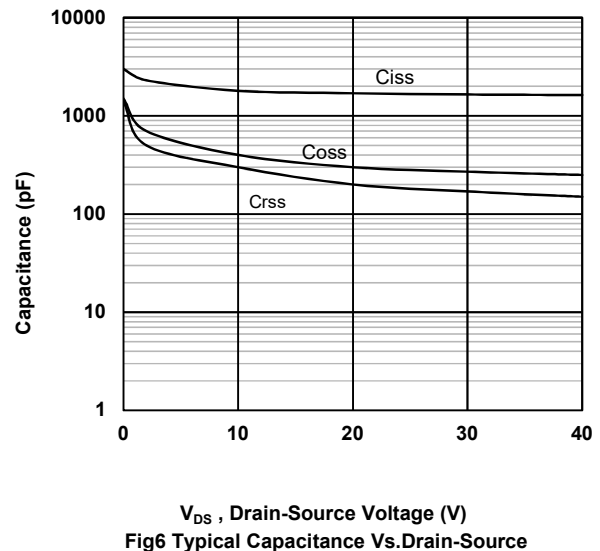
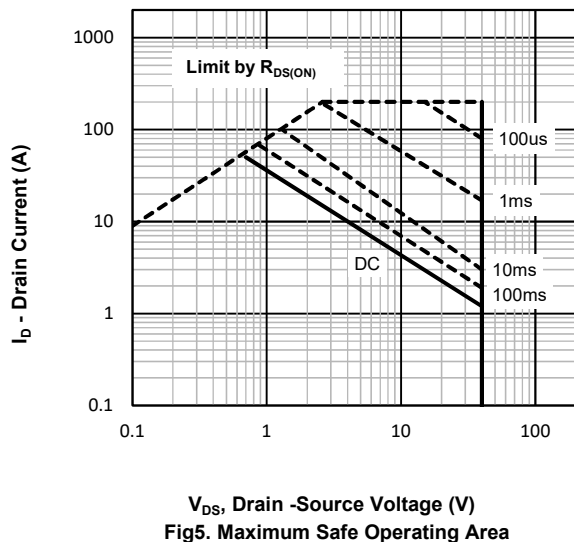
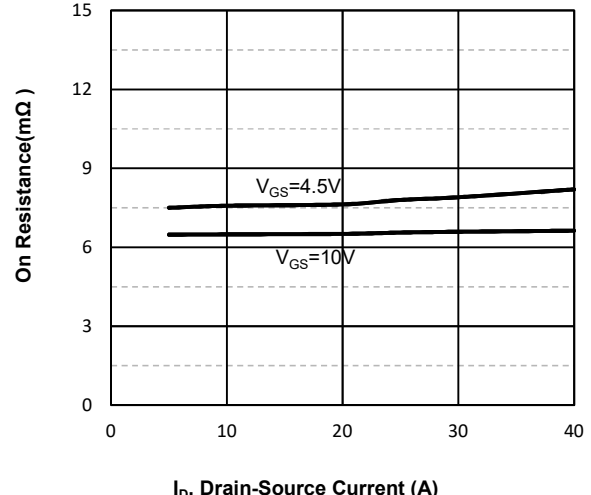
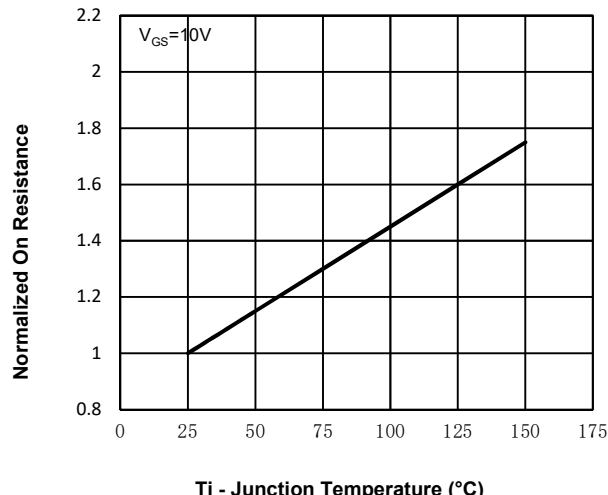
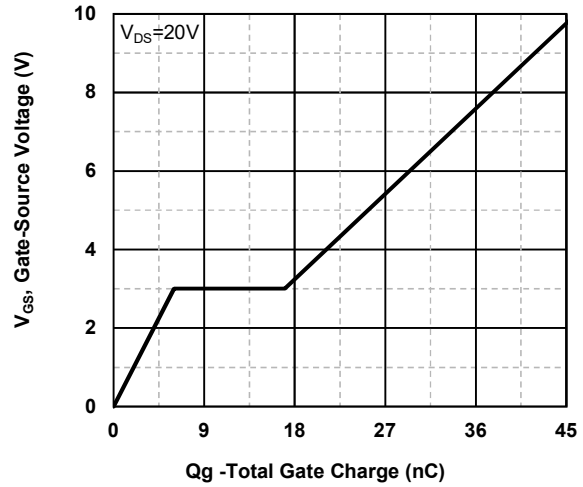
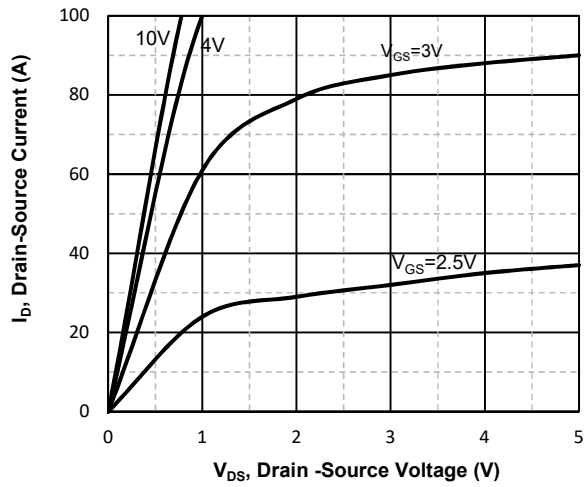
Type	Package	Marking	Minimum Package(pcs)	Inner Box Quantity(pcs)	Outer Carton Quantity(pcs)	Delivery Mode
MCAE50A	PDFN5X6-8L	MCAE50A	5,000	10,000	70,000	13"reel

Electrical Characteristics (TJ=25℃ unless otherwise noted)						
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ TJ = 25℃ (unless otherwise stated)						
BV _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	40	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =40V, 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	--	6.5	8	mΩ
		V _{GS} =4.5V, I _D =15A	--	7.8	10	mΩ
Dynamic Electrical Characteristics @ TJ = 25℃ (unless otherwise stated)						
C _{ISS}	Input Capacitance	V _{DS} =20V, V _{GS} =0V, f=1MHz	--	1800	--	pF
C _{OSS}	Output Capacitance		--	210	--	pF
C _{RSS}	Reverse Transfer Capacitance		--	170	--	pF
Switching Characteristics						
Q _g	Total Gate Charge	V _{DS} =20V, I _D =20A, V _{GS} =10V	--	45	--	nC
Q _{gs}	Gate Source Charge		--	6	--	nC
Q _{gd}	Gate Drain Charge		--	10	--	nC
t _{d(on)}	Turn-on Delay Time	V _{DS} =30V, I _D =20A, V _{GS} =10V, R _G =2.2Ω	--	6	--	nS
t _r	Turn-on Rise Time		--	20	--	nS
t _{d(off)}	Turn-Off Delay Time		--	53	--	nS
t _f	Turn-Off Fall Time		--	33	--	nS
Source- Drain Diode Characteristics						
V _{SD}	Forward on voltage	T _J =25℃, I _S =20A	--	0.8	1.2	V

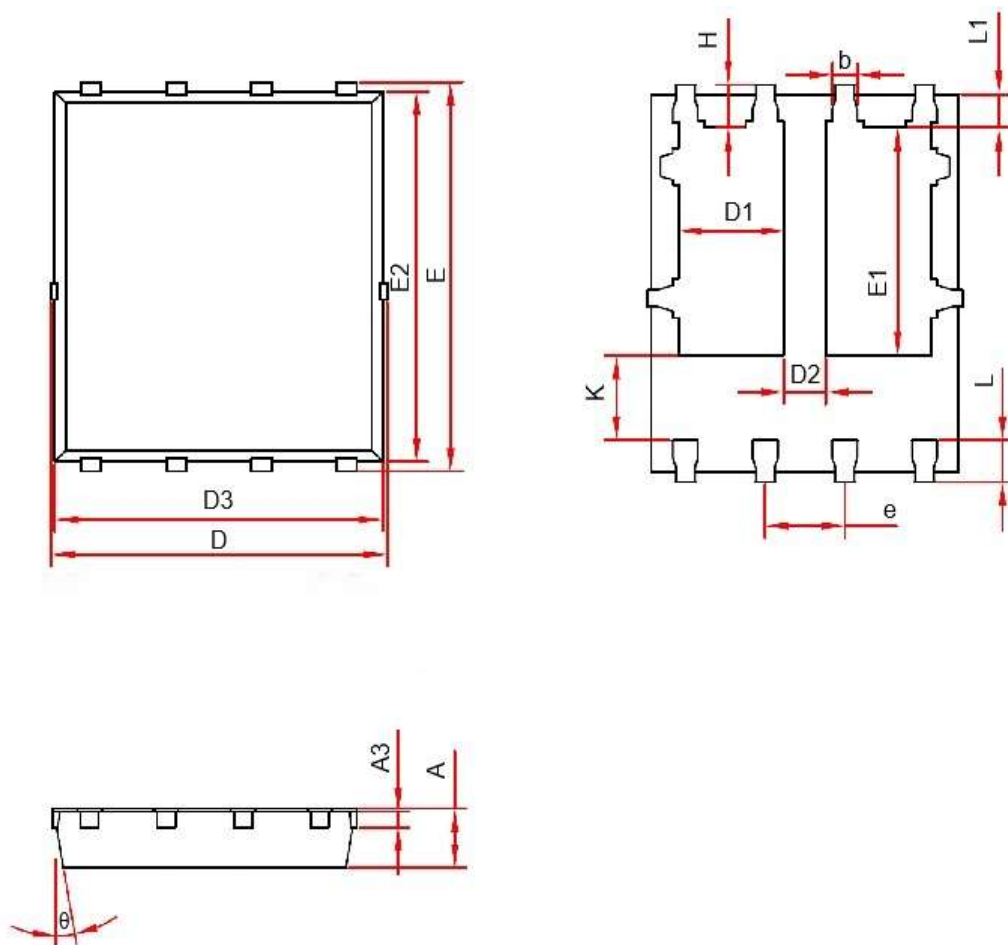
Note:

1: EAS Test condition: V_{DD}=35V, V_{GS}=10V, L=0.5mH, I_{AS}=18A, R_G=25Ω, Starting T_J = 25°C

Typical Operating Characteristics



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°