

Features

- High density cell design for ultra low $R_{DS(ON)}$
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high EAS

Product Summary

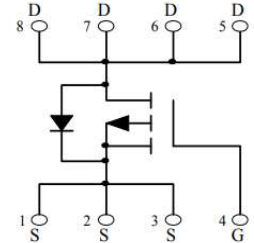
V_{DS}	$R_{DS(ON)}$ MAX	I_D MAX
-20V	3.5mΩ@-4.5V	-90A
	4mΩ@-2.5V	

Application

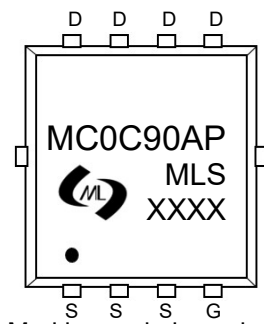
- Battery and loading switching
- Excellent package for good heat dissipation



PDFN5X6-8L view



Schematic diagram



Marking and pin assignment

MC0C90AP: Device code
XXXX: Code



Pb-Free



RoHS



Halogen-Free

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

Symbol	Parameter	Rating	Unit
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Common Ratings (TC=25°C Unless Otherwise Noted)

V_{DS}	Drain-Source Breakdown Voltage	-20	V
V_{GS}	Gate-Source Voltage	±12	V
T_J, T_{STG}	Storage Temperature Range	-55 to 175	°C
I_S	Diode Continuous Forward Current	$T_C=25^\circ\text{C}$ -90	A

Mounted on Large Heat Sink

I_{DM}	Pulse Drain Current Tested	$T_C=25^\circ\text{C}$ -310	A
I_D	Continuous Drain Current	$T_C=25^\circ\text{C}$ -90	A
P_D	Maximum Power Dissipation	$T_C=25^\circ\text{C}$ 156	W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	25	°C/W

Ordering Information (Example)

Type	Package	Marking	Minimum Package(pcs)	Inner Box Quantity(pcs)	Outer Carton Quantity(pcs)	Delivery Mode
MC0C90AP	PDFN5X6-8L	MC0C90AP	5,000	10,000	70,000	13" reel

Electrical Characteristics (TJ=25°C 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 =-20A	--	2	3.5	mΩ
		V _{GS} =-2.5V, I _D =-15A	--	2.3	4	mΩ
Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
C _{ISS}	Input Capacitance	V _{DS} =-10V, V _{GS} =0V, f=1MHz	--	14250	--	pF
C _{OSS}	Output Capacitance		--	1810	--	pF
C _{RSS}	Reverse Transfer Capacitance		--	1765	--	pF
Switching Characteristics						
Q _g	Total Gate Charge	V _{DD} =-10V, I _D =-20A, V _{GS} =-4.5V	--	310	--	nC
Q _{gs}	Gate Source Charge		--	24	--	nC
Q _{gd}	Gate Drain Charge		--	75.3	--	nC
t _{d(on)}	Turn-on Delay Time	V _{DD} =-10V, I _D =-20A, V _{GS} =-10V, R _G =3Ω	--	11	--	nS
t _r	Turn-on Rise Time		--	27	--	nS
t _{d(off)}	Turn-Off Delay Time		--	340	--	nS
t _f	Turn-Off Fall Time		--	130	--	nS
Source- Drain Diode Characteristics						
V _{SD}	Forward on voltage	Tj=25°C, Is=-10A	--	--	-1.2	V

Typical Operating Characteristics

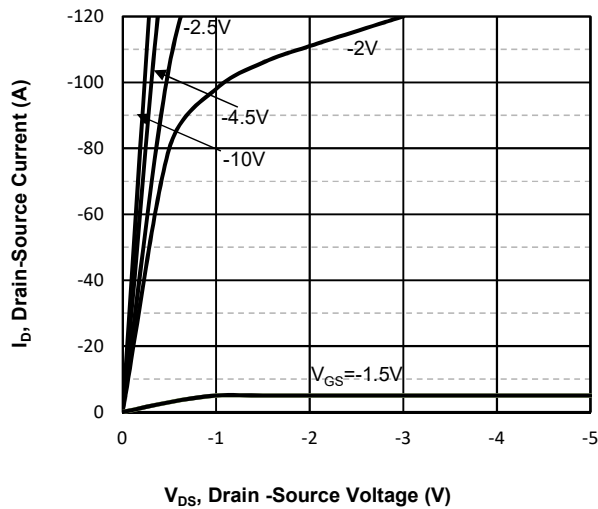


Fig1. Typical Output Characteristics

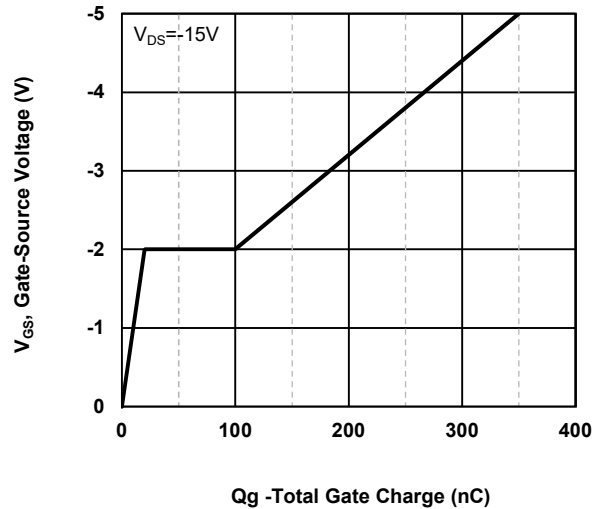


Fig2. Typical Gate Charge Vs. Gate-Source Voltage

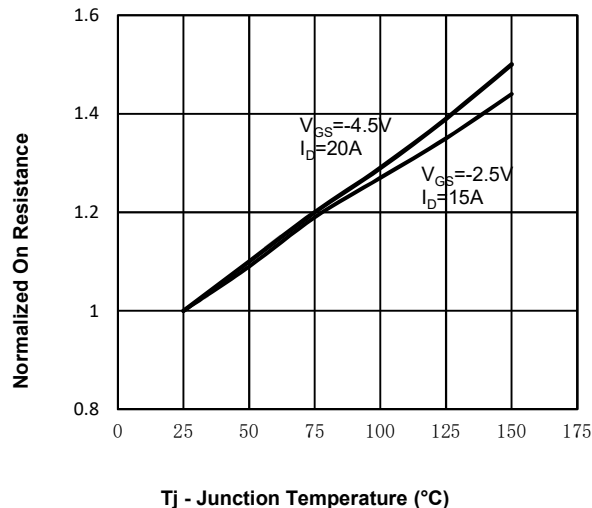


Fig3. Normalized On-Resistance Vs. Temperature

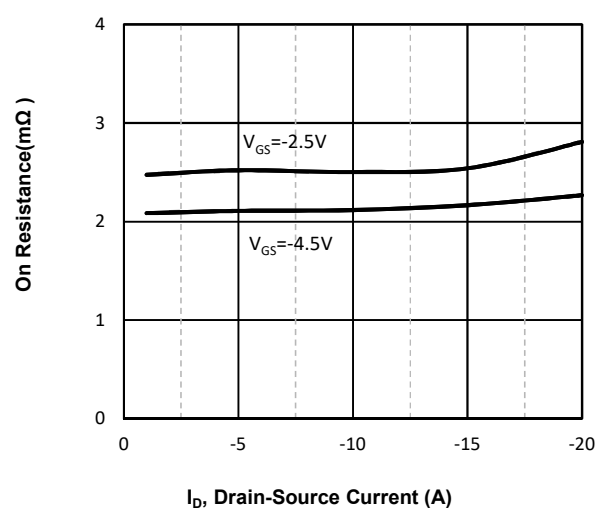


Fig4. On-Resistance Vs. Drain-Source Current

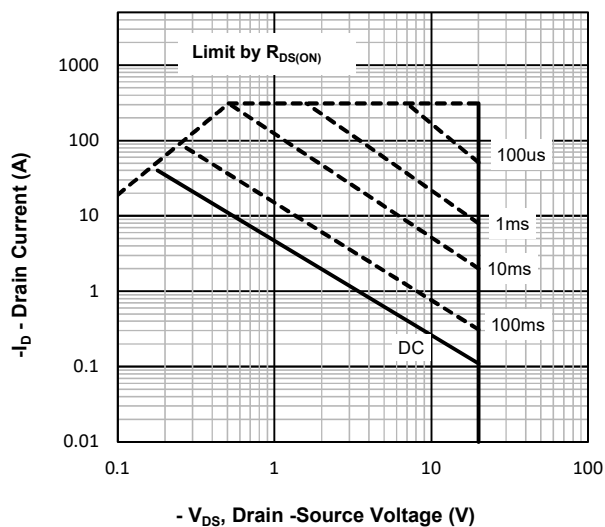


Fig5. Maximum Safe Operating Area

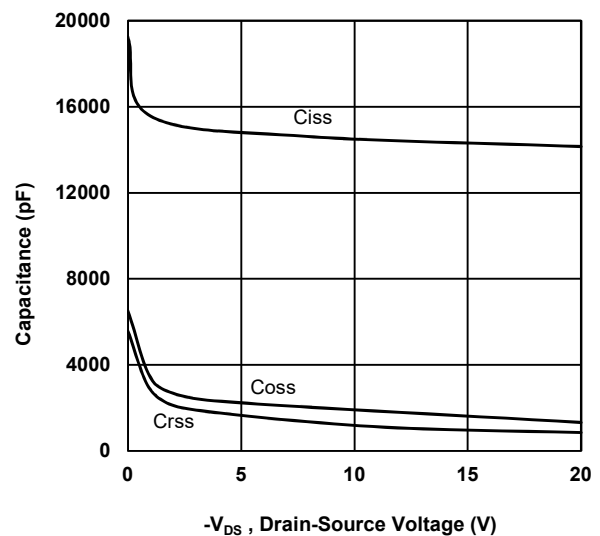
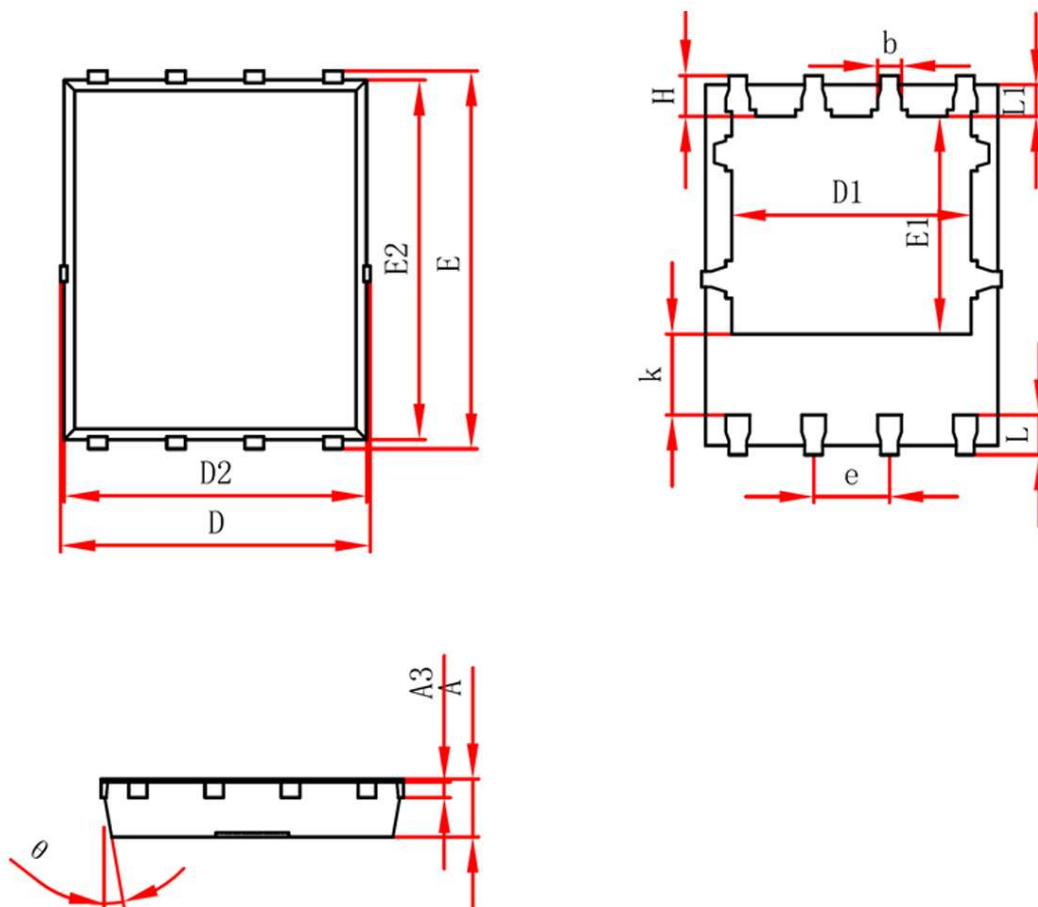


Fig6 Typical Capacitance Vs. Drain-Source Voltage

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°