

Features

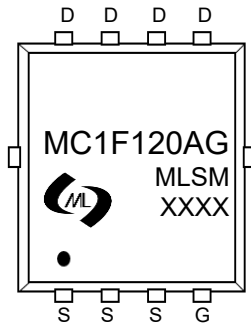
- Fast switching speed
- Low On-Resistance
- Excellent FoM(figure of merit)
- 100% UIS and Rg tested

Product Summary

V_{DS}	$R_{DS(ON)}$ TYP	I_D
150V	6.2mΩ@10V	120A

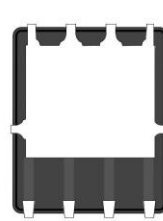
Application

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

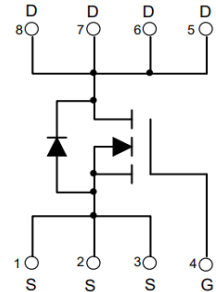


Marking and pin assignment

MC1F120AG: Device code
 XXXX : Code



PDFN5X6-8L view



Schematic diagram



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	150	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}	680	mJ
I_S	Diode Continuous Forward Current	Tc=25°C 120	A

Mounted on Large Heat Sink

I_{DM}	Pulse Drain Current Tested	Tc=25°C 480	A
I_D	Continuous Drain Current	Tc=25°C 120	A
P_D	Maximum Power Dissipation	Tc=25°C 180	W
$R_{\theta JA}$	Thermal Resistance Junction-to-Ambient	55	°C/W

Ordering Information (Example)

Type	Package	Marking	Minimum Package(pcs)	Inner Box Quantity(pcs)	Outer Carton Quantity(pcs)	Delivery Mode
MC1F120AG	PDFN5X6-8L	MC1F120AG	5,000	10,000	70,000	13"reel

Electrical Characteristics (T _J =25°C unless otherwise noted)						
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ T _J = 25°C (unless otherwise stated)						
BV _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	150	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =150V, 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	2.0	3.0	4.0	V
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D =30A	--	6.2	8.0	mΩ
Dynamic Electrical Characteristics @ T _J = 25°C (unless otherwise stated)						
C _{ISS}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz	--	5290	--	pF
C _{OSS}	Output Capacitance		--	470	--	pF
C _{RSS}	Reverse Transfer Capacitance		--	28	--	pF
Switching Characteristics						
Q _g	Total Gate Charge	V _{DS} =75V, I _D =40A, V _{GS} =10V	--	95	--	nC
Q _{gs}	Gate-Source Charge		--	18	--	nC
Q _{gd}	Gate-Drain Charge		--	35	--	nC
t _{d(on)}	Turn-on Delay Time	V _{DD} =75V, I _D =10A, V _{GS} =10V, R _G =6Ω	--	21	--	nS
t _r	Turn-on Rise Time		--	35	--	nS
t _{d(off)}	Turn-Off Delay Time		--	30	--	nS
t _f	Turn-off fall Time		--	50	--	nS
Source- Drain Diode Characteristics						
V _{SD}	Forward on voltage	T _J =25°C, I _S =30A	--	0.83	1.2	V

Note 1:L=0.5mH, R_G=25Ω, V_{GS}=20V, V_{DD}=50V, Start T_J=25°C

Typical Operating Characteristics

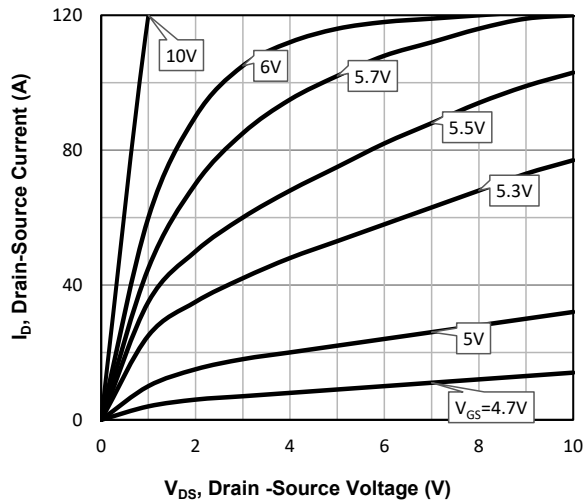


Fig1. Typical Output Characteristics

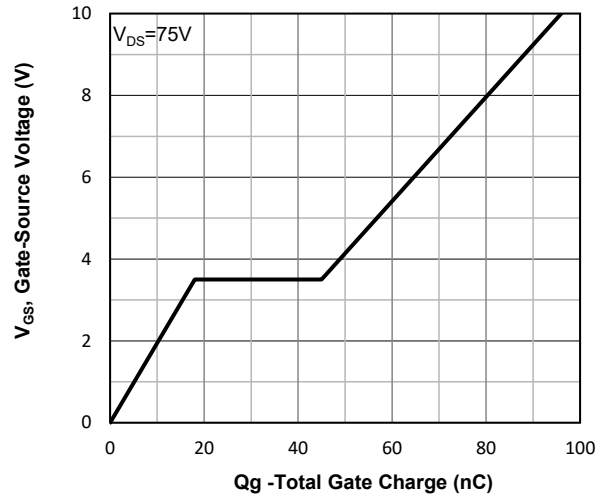


Fig2. Typical Gate Charge Vs. Gate-Source Voltage

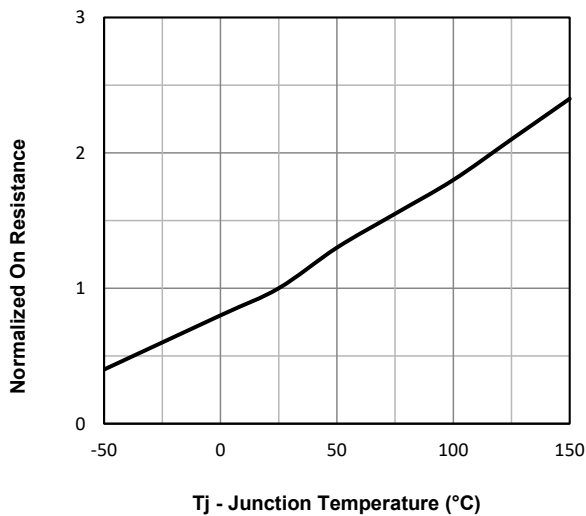


Fig3. Normalized On-Resistance Vs. Temperature

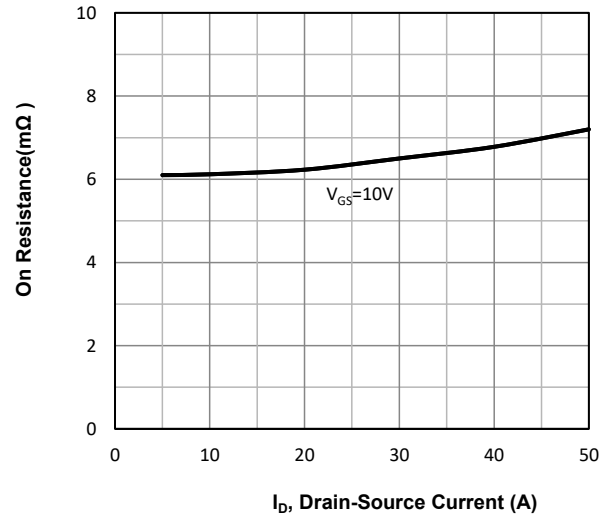


Fig4. On-Resistance Vs. Drain-Source Current

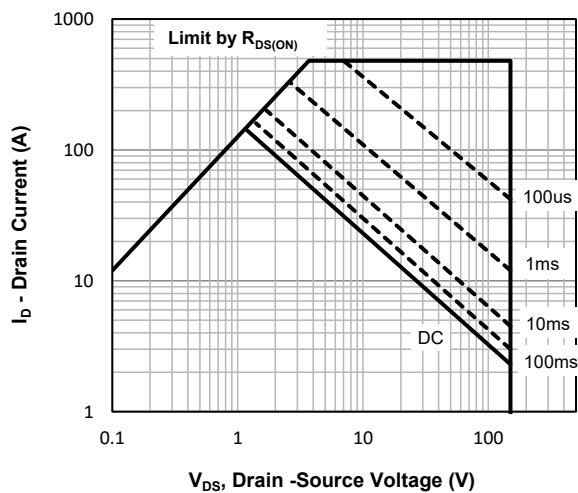


Fig5. Maximum Safe Operating Area

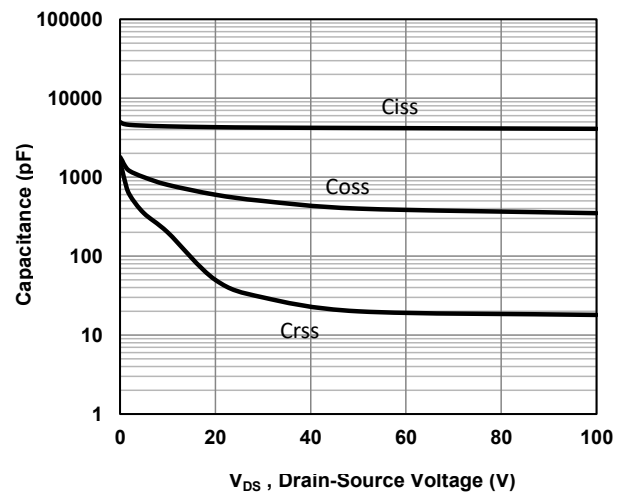
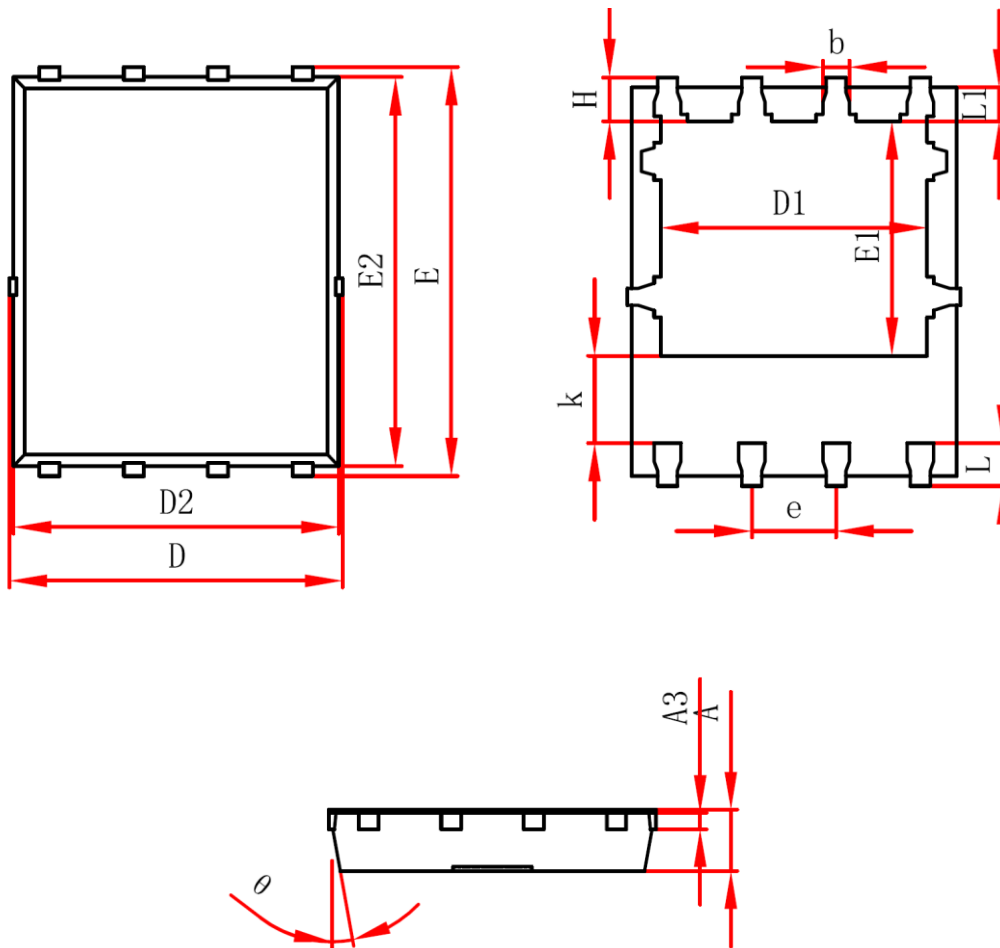


Fig6. Typical Capacitance Vs. Drain-Source Voltage

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°