

Features

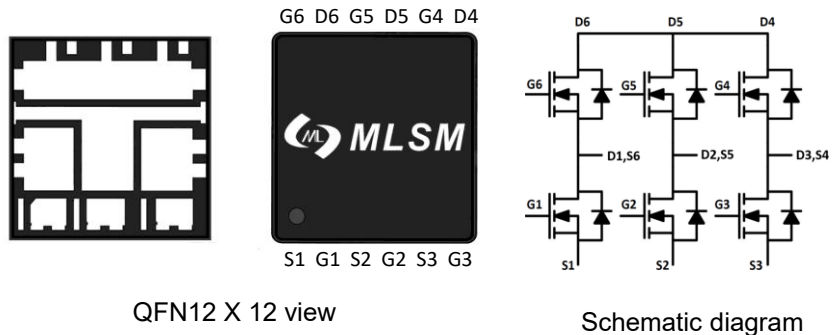
- Ultra Low On-Resistance
- Ultra Low FOM ($R_{DS(ON)} \times Q_g$)
- Good stability and uniformity with high EAS
- Excellent package for good heat dissipation

Application

- Motor Drivers

Product Summary

V_{DS}	$R_{DS(ON)}$ TYP	I_D
60V	3.1m Ω @10V	90A
	4.2m Ω @4.5V	



MM0G690A: Device code
 XXXX: Code
 Solid dot: Pin1 indicator

Pin 1

Marking and pin assignment



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	60	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	90	$T_c=25^\circ\text{C}$	A
Mounted on Large Heat Sink				
I_{DM}	Pulse Drain Current Tested	360	$T_c=25^\circ\text{C}$	A
I_D	Continuous Drain Current	90	$T_c=25^\circ\text{C}$	A
P_D	Maximum Power Dissipation	65	$T_c=25^\circ\text{C}$	W
E_{AS}	Single Pulse Avalanche Energy	380	mJ	
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	60	°C/W	

Ordering Information (Example)						
Type	Package	Marking	Minimum Package(pcs)	Inner Box Quantity(pcs)	Outer Carton Quantity(pcs)	Delivery Mode
MM0G690A	QFN12*12	MM0G690A	2,000	4,000	28,000	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	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	1.6	3.0	V
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D =25A	--	3.1	3.6	mΩ
		V _{GS} =4.5V, I _D =25A	--	4.2	6.0	mΩ
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
C _{ISS}	Input Capacitance	V _{DS} =30V, V _{GS} =0V, f=1MHz	--	2622	--	pF
C _{OSS}	Output Capacitance		--	840	--	pF
C _{RSS}	Reverse Transfer Capacitance		--	40	--	pF
Switching Characteristics						
Q _g	Total Gate Charge	V _{DS} =30V, I _D =25A, V _{GS} =10V	--	48.5	--	nC
Q _{gs}	Gate Source Charge		--	7.2	--	nC
Q _{gd}	Gate Drain Charge		--	7.5	--	nC
t _{d(on)}	Turn-on Delay Time	V _{DS} =30V, I _D =2.5Ω, V _{GS} =10V, R _G =2.5Ω	--	43	--	nS
t _r	Turn-on Rise Time		--	29	--	nS
t _{d(off)}	Turn-Off Delay Time		--	102	--	nS
t _f	Turn-Off Fall Time		--	43.2	--	nS
Source- Drain Diode Characteristics						
V _{SD}	Forward on voltage	T _J =25°C, I _S =25A	--	--	1.2	V

 EAS condition: T_J=25°C, V_{DD}=30V, V_{GS}=10V, L=0.5mH

Typical Operating Characteristics

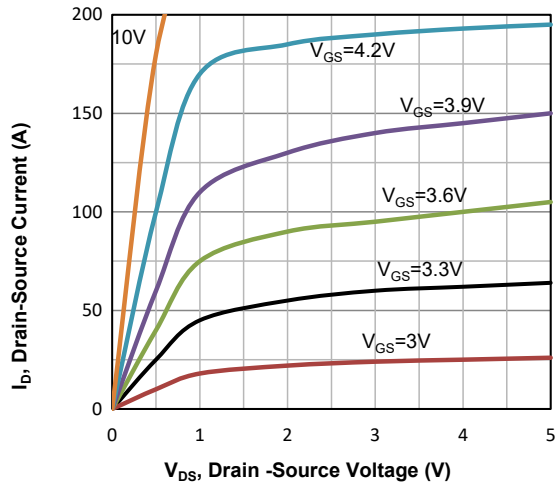


Fig1. Typical Output Characteristics

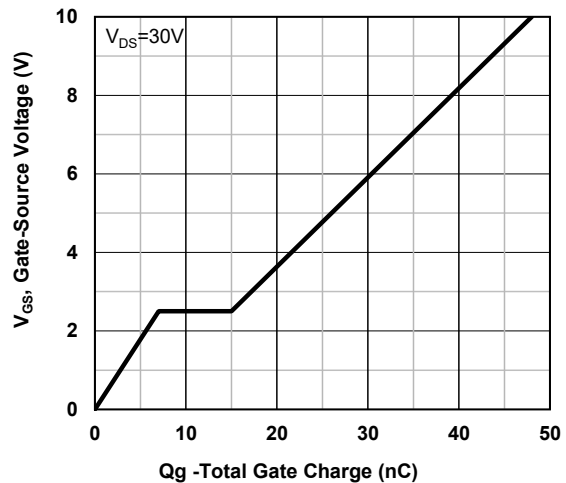


Fig2. Typical Gate Charge Vs. Gate-Source Voltage

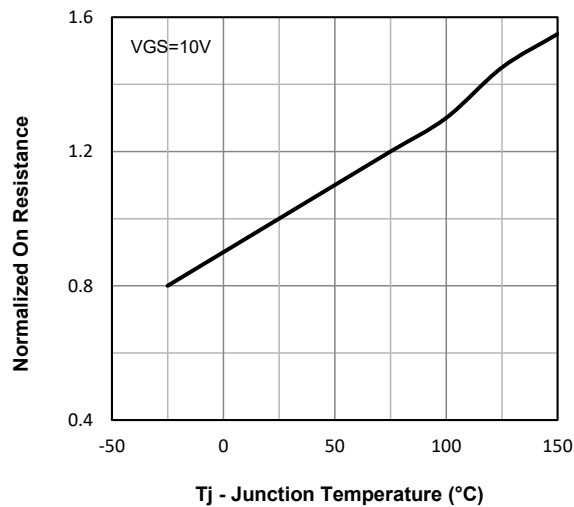


Fig3. Normalized On-Resistance Vs. Temperature

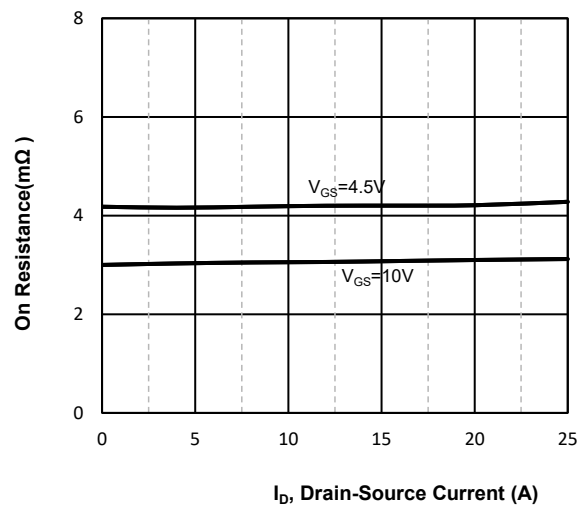


Fig4. On-Resistance Vs. Drain-Source Current

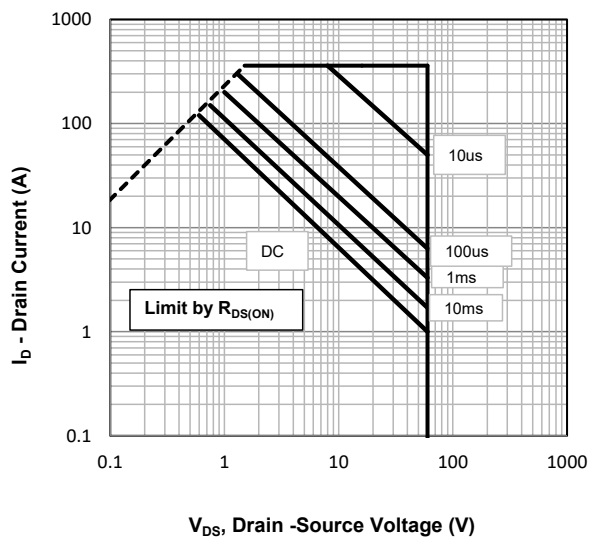


Fig5. Maximum Safe Operating Area

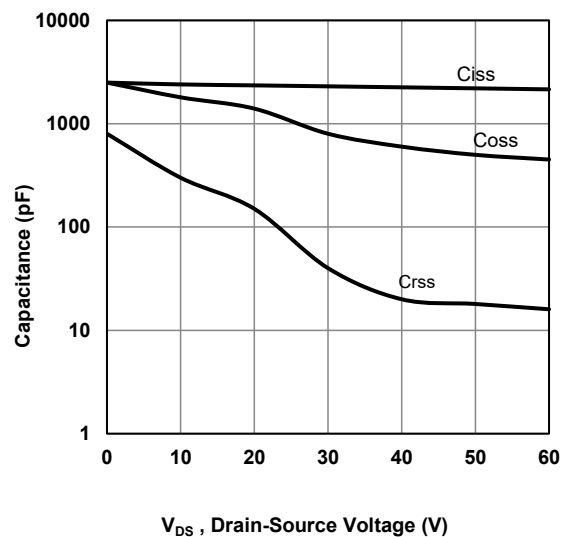
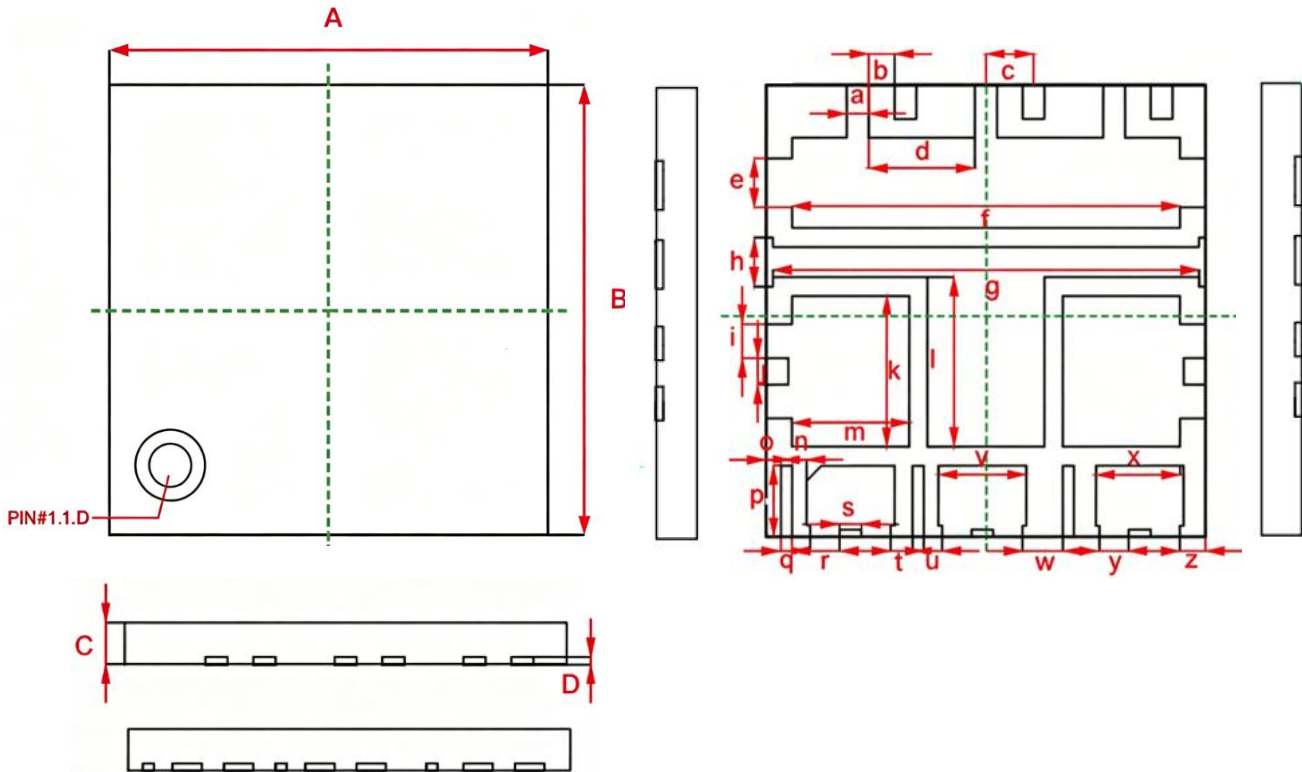


Fig6 Typical Capacitance Vs. Drain-Source Voltage

QFN12X12 Package information


Symbol	Dimensions in Millimeters(mm)		Dimensions In Inches	
	Min	Max	Min	Max
A	11.500	12.500	0.455	0.494
B	11.500	12.500	0.455	0.494
C	1.050	1.150	0.042	0.045
D	0.200	0.205	0.008	0.008
a	0.580	0.620	0.023	0.025
b	0.680	0.720	0.027	0.028
c	1.250	1.350	0.049	0.053
d	2.800	3.000	0.111	0.119
e	1.250	1.350	0.049	0.053
f	10.500	10.700	0.415	0.423
g	11.500	11.700	0.455	0.463
h	1.250	1.350	0.049	0.053
i	0.850	0.950	0.034	0.038
j	0.680	0.720	0.027	0.028
k	3.800	4.200	0.150	0.166
l	4.400	4.600	0.174	0.182
m	3.150	3.250	0.125	0.129
n	0.380	0.420	0.015	0.017
o	0.380	0.420	0.015	0.017
p	1.880	1.920	0.074	0.076
q	0.280	0.320	0.011	0.013
r	0.850	0.950	0.034	0.038
s	0.580	0.620	0.023	0.025
t	0.580	0.620	0.023	0.025
u	0.480	0.520	0.019	0.021
v	2.200	2.600	0.087	0.103
w	1.000	1.200	0.040	0.047
x	2.250	2.350	0.089	0.093
y	0.750	0.850	0.030	0.034
z	0.680	0.720	0.027	0.028