MLSM MICROELECTRONICS

MM1A655A

100V/55A N-Channel MOSFET

Features

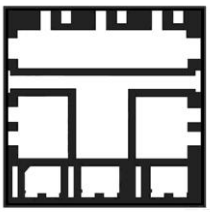
- High Speed Power Switching,Logic level
- Enhanced Body diode DV/DT capability
- Ehanced Avalanche Ruggedness
- 100% UIS Tested, 100% Rg Tested
- Lead Free, Halogen Free

Application

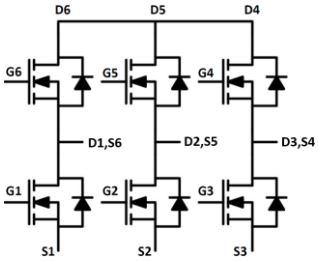
- DC/DC Converter
- Motor Drivers

Product Summary

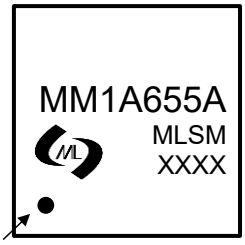
V_{DS}	$R_{DS(ON)}$ TYP	I_D
100V	6.0mΩ@10V	55A
	8.0mΩ@4.5V	



QFN12 X 12 view



Schematic diagram



MM1A655A: Device code
XXXX: Code

Marking and pin assignment

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		100	V
V_{GS}	Gate-Source Voltage		±20	V
E_{AS}	Single pulse avalanche energy[Note1]		155	mJ
T_J,T_{STG}	Storage Temperature Range		-55 to 150	°C
I_S	Diode Continuous Forward Current	Tc=25°C	55	A
Mounted on Large Heat Sink				
I_{DM}	Pulse Drain Current Tested	Tc=25°C	220	A
I_D	Continuous Drain Current	Tc=25°C	55	A
P_D	Maximum Power Dissipation	Tc=25°C	90	W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient		30	°C/W

Ordering Information (Example)						
Type	**Package**	**Marking**	**Minimum Package(pcs)**	**Inner Box Quantity(pcs)**	**Outer Carton Quantity(pcs)**	**Delivery Mode**
MM1A655A	QFN12*12	MM1A655A	2,000	4,000	28,000	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	100	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=100V，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	3.0	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=10V， I_D=30A	--	6.0	8.0	mΩ
		V_{GS}=4.5V，I_D=20A	--	8.0	12	mΩ
Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
C_{ISS}	Input Capacitance	V_{DS}=50V，V_{GS}=0V， f=1MHz	--	1985	--	pF
C_{OSS}	Output Capacitance		--	500	--	pF
C_{RSS}	Reverse Transfer Capacitance		--	25	--	pF
Switching Characteristics						
Q_g	Total Gate Charge	V_{DD}=50V，I_D=20A，V_{GS}=10V	--	38	--	nC
Q_{gs}	Gate Source Charge		--	8.1	--	nC
Q_{gd}	Gate Drain Charge		--	9	--	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=50V，I_D=20A，V_{GS}=10V，R_G=4.5Ω	--	16	--	nS
t_r	Turn-on Rise Time		--	22	--	nS
$t_{d(off)}$	Turn-Off Delay Time		--	30	--	nS
t_f	Turn-Off Fall Time		--	10	--	nS
Source- Drain Diode Characteristics						
V_{SD}	Forward on voltage	Tj=25℃，Is=20A	--	--	1.2	V

Note :

1、EAS Test condition : V_{DD}=20V,V_{GS}=10V,L=0.3mH, R_G=25Ω,Starting Tj=25° C.

Typical Operating Characteristics

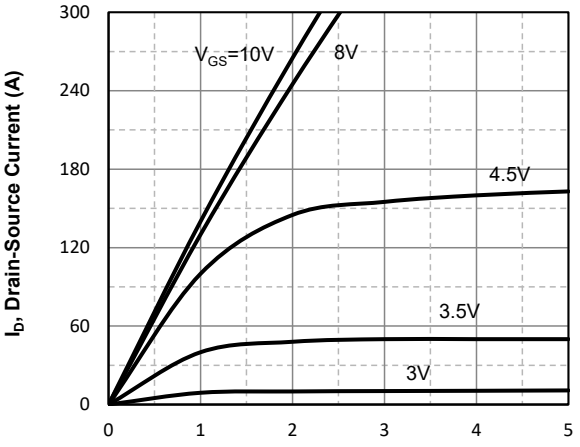


Fig1. Typical Output Characteristics

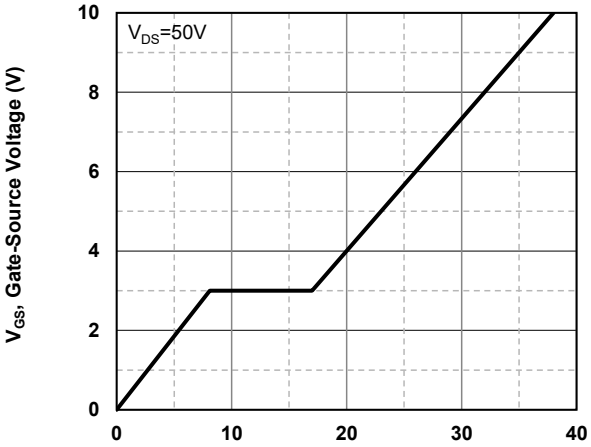


Fig2. Typical Gate Charge Vs.Gate-Source Voltage

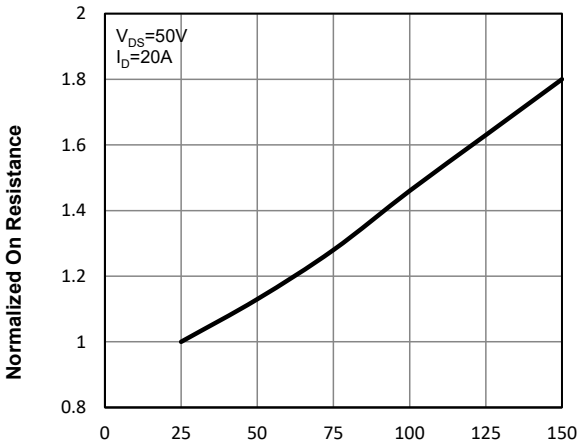


Fig3. Normalized On-Resistance Vs. Temperature

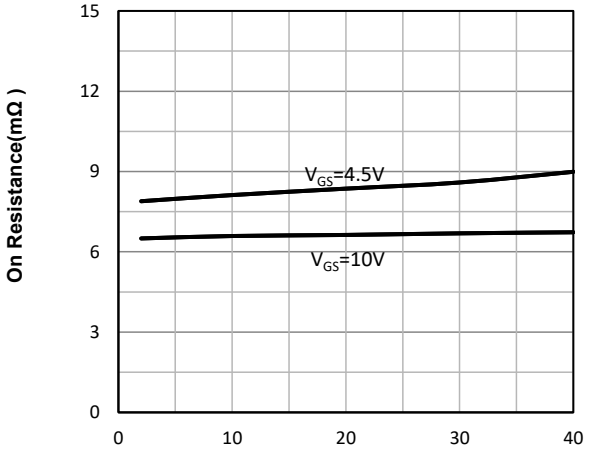


Fig4. On-Resistance Vs. Drain-Source Current

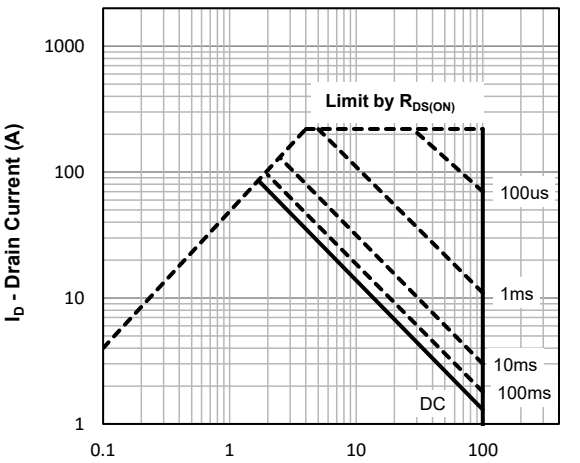


Fig5. Maximum Safe Operating Area

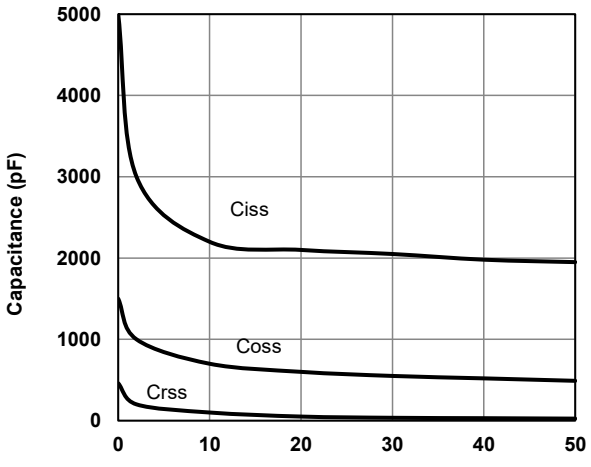
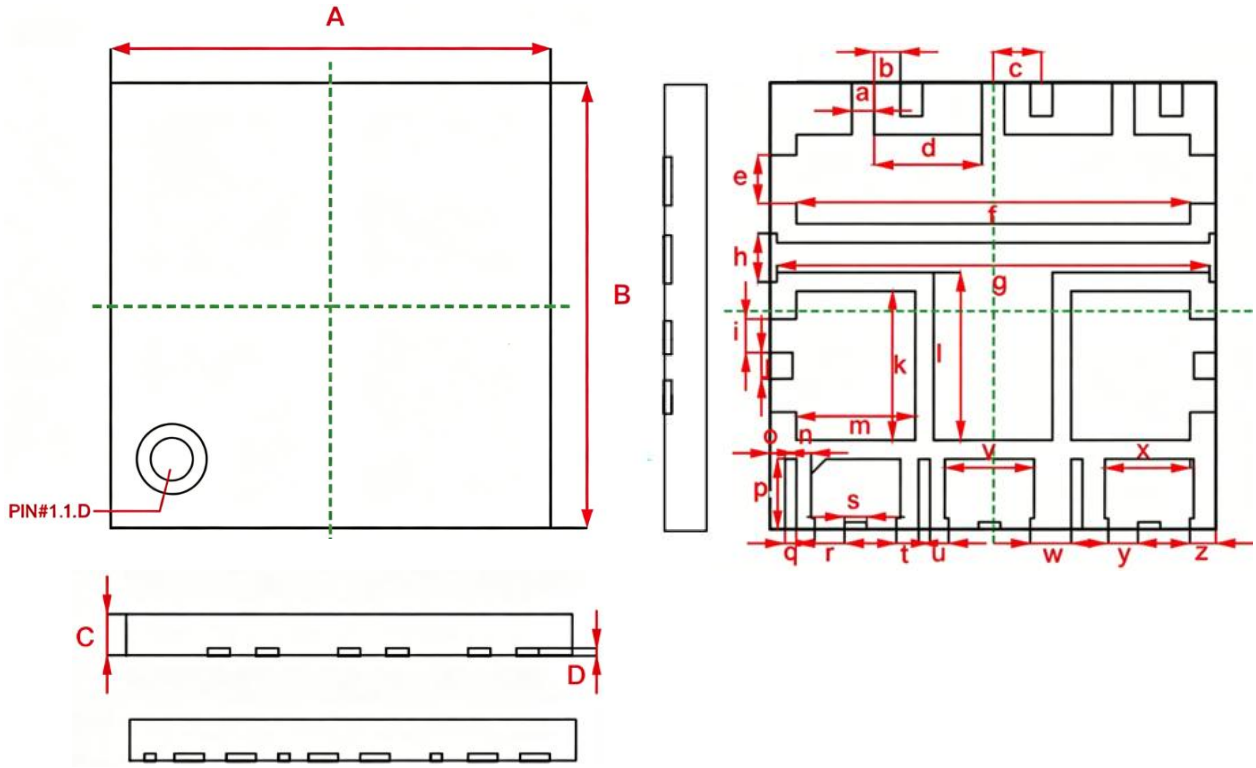


Fig6 Typical Capacitance Vs.Drain-Source Voltage

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