

Features

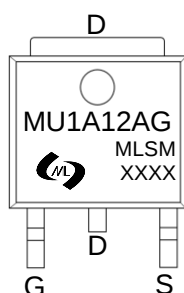
- Shielded-Gate Trench(SGT) Power LV MOSFET technology
- Ultra low gate charge
- Low reverse transfer capacitance
- Fast switching capability
- Avalanche energy specified

Application

- Power switching application

Product Summary

V_{DS}	$R_{DS(ON)}$ TYP	I_D
100V	100mΩ@10V	12A
	140mΩ@4.5V	

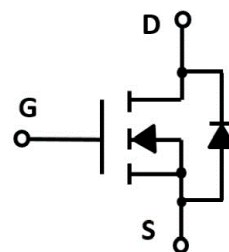


MU1A12AG : Device code
XXXX : Code

Marking and pin assignment



TO-252 top view



Schematic diagram



Pb-Free



RoHS



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	100	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	Tc=25°C 12	A

Mounted on Large Heat Sink

I_{DM}	Pulse Drain Current Tested	Tc=25°C 48	A
I_D	Continuous Drain Current	Tc=25°C 12	A
P_D	Maximum Power Dissipation	Tc=25°C 50	W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	40	°C/W

Ordering Information (Example)

Type	Package	Marking	Minimum Package(pcs)	Inner Box Quantity(pcs)	Outer Carton Quantity(pcs)	Delivery Mode
MU1A12AG	TO-252	MU1A12AG	2,500	5,000	35,000	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	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	1.8	2.5	V
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D =12A	--	100	150	mΩ
		V _{GS} =4.5V, I _D =10A	--	140	180	mΩ
Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
C _{ISS}	Input Capacitance	V _{DS} =50V, V _{GS} =0V, f=1MHz	--	940	--	pF
C _{OSS}	Output Capacitance		--	28	--	pF
C _{RSS}	Reverse Transfer Capacitance		--	28	--	pF
Switching Characteristics						
Q _g	Total Gate Charge	V _{DS} =50V, I _D =12A, V _{GS} =10V	--	19	--	nC
Q _{gs}	Gate Source Charge		--	3.1	--	nC
Q _{gd}	Gate Drain Charge		--	3.4	--	nC
t _{d(on)}	Turn-on Delay Time	V _{DD} =50V, I _D =12A, V _{GS} =10V, R _G =2.2Ω	--	7	--	nS
t _r	Turn-on Rise Time		--	25	--	nS
t _{d(off)}	Turn-Off Delay Time		--	21	--	nS
t _f	Turn-Off Fall Time		--	2.5	--	nS
Source- Drain Diode Characteristics						
V _{SD}	Forward on voltage	Tj=25°C, Is=12A	--	--	1.2	V

Typical Operating Characteristics

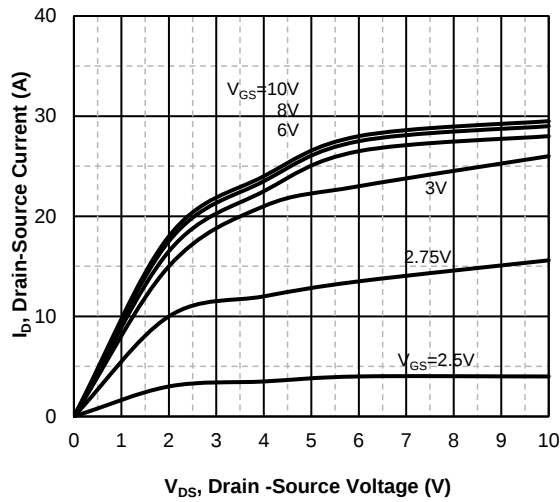


Fig1. Typical Output Characteristics

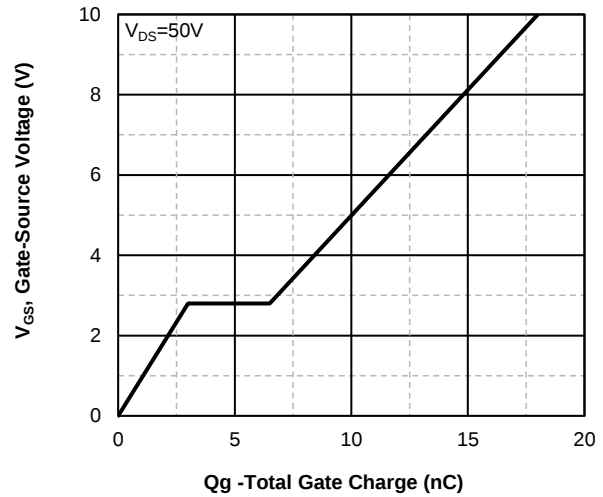


Fig2. Typical Gate Charge Vs. Gate-Source Voltage

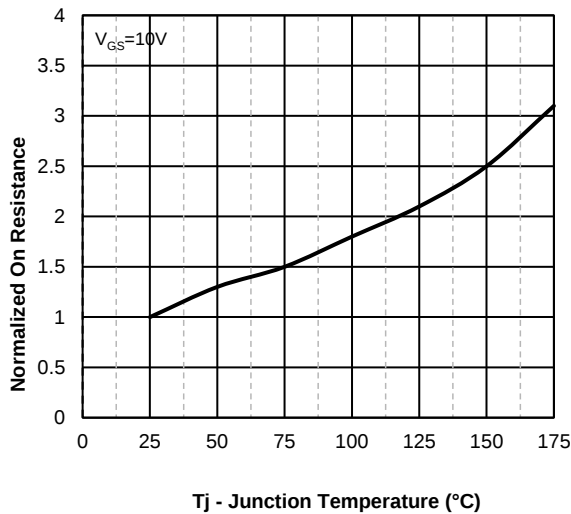


Fig3. Normalized On-Resistance Vs. Temperature

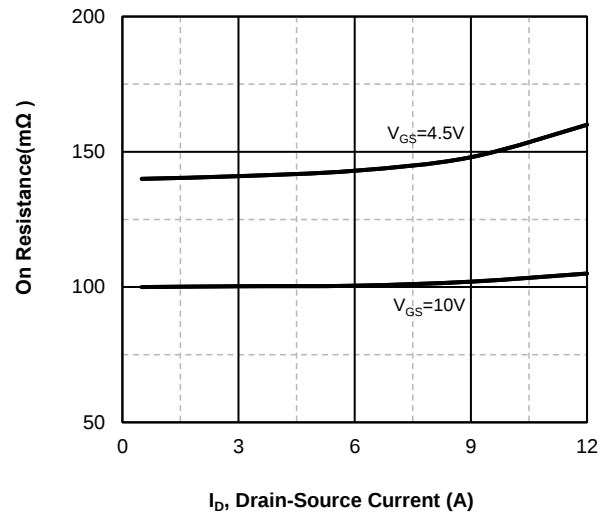


Fig4. On-Resistance Vs. Drain-Source Current

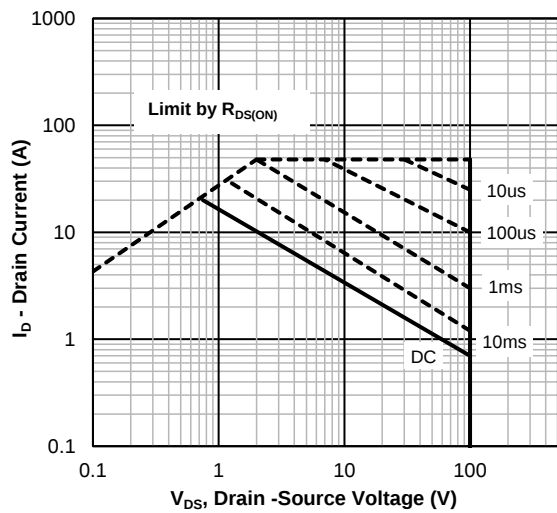


Fig5. Maximum Safe Operating Area

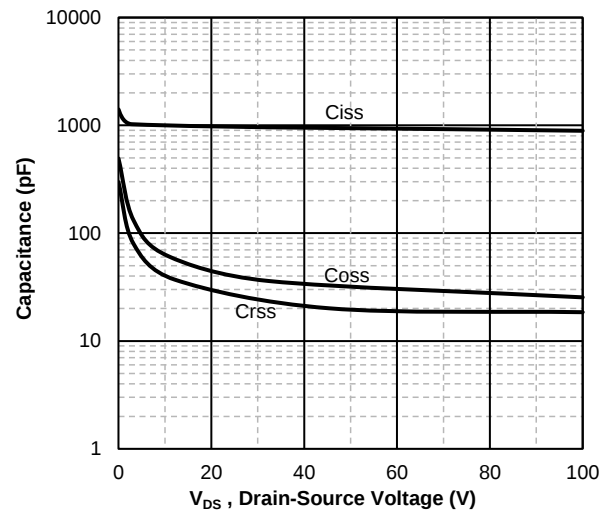
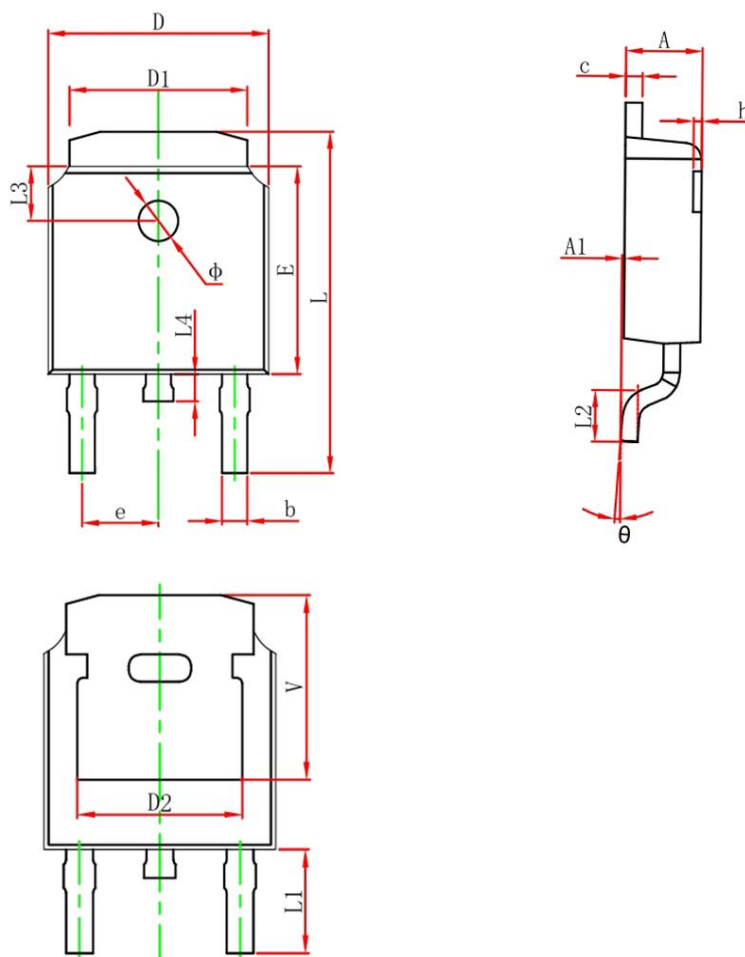


Fig6 Typical Capacitance Vs. Drain-Source

TO-252 Package information



Symbol	Dimensions in Millimeters(mm)		Dimensions In Inches	
	Min	Max	Min	Max
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.635	0.770	0.025	0.030
c	0.450	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.712	10.312	0.386	0.406
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.250 REF.		0.207 REF.	