MU1A12AP

-100V/-12A P-Channel MOSFET

Features

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

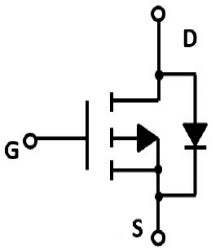
Product Summary

V_{DS}	$R_{DS(ON)}$ MAX	I_D MAX
-100V	200mΩ@-10V	-12A
	220mΩ@-4.5V	

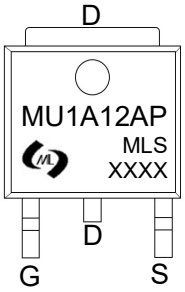
Application

- Power management
- Portable equipment

TO-252 top view



Schematic diagram



Marking and pin assignment

MU1A12AP: Device code
XXXX:Code

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
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	-40	A
I_D	Continuous Drain Current	Tc=25°C	-12	A
P_D	Maximum Power Dissipation	Tc=25°C	63	W
E_{AS}	Single Pulsed Avalanche Energy[Note1]		7.5	mJ

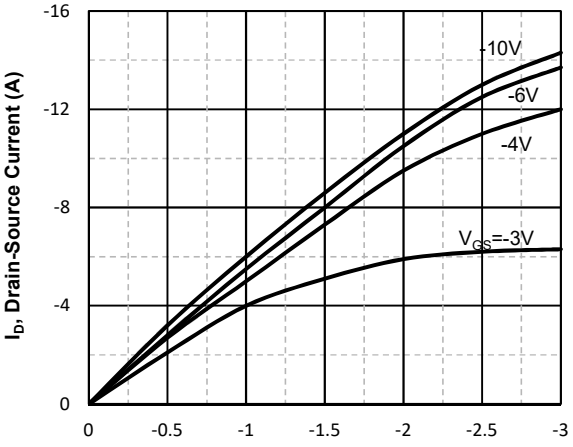
Ordering Information (Example)						
Type	**Package**	**Marking**	**Minimum Package(pcs)**	**Inner Box Quantity(pcs)**	**Outer Carton Quantity(pcs)**	**Delivery Mode**
MU1A12AP	TO-252	MU1A12AP	2,500	5,000	35,000	13"reel

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	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	-1.5	-2.5	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=-10V, I_D=-8A	--	150	200	mΩ
		V_{GS}=-4.5V, I_D=-6A	--	160	220	mΩ
Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
C_{ISS}	Input Capacitance	V_{DS}=-50V, V_{GS}=0V, f=1MHz	--	1488	--	pF
C_{OSS}	Output Capacitance		--	39	--	pF
C_{RSS}	Reverse Transfer Capacitance		--	30	--	pF
Switching Characteristics						
Q_g	Total Gate Charge	V_{DS}=-50V, I_D=-6A, V_{GS}=-10V	--	26.5	--	nC
Q_{gs}	Gate Source Charge		--	6	--	nC
Q_{gd}	Gate Drain Charge		--	4	--	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=-50V, I_D=-6A, V_{GS}=-10V, R_G=4.5Ω	--	14	--	nS
t_r	Turn-on Rise Time		--	45	--	nS
$t_{d(off)}$	Turn-Off Delay Time		--	227	--	nS
t_f	Turn-Off Fall Time		--	93	--	nS
Source- Drain Diode Characteristics						
V_{SD}	Forward on voltage	Tj=25℃, Is=-8A	--	-0.8	-1.2	V

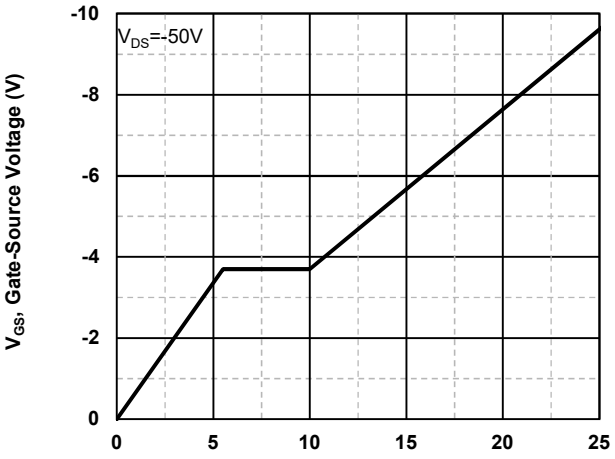
Note：

1、EAS Test condition: V_{DD}=-100V,L=0.1mH, V_{GS}=-10V, I_{AS}=-12.25A ,R_G=25Ω , Starting T_J = 25℃

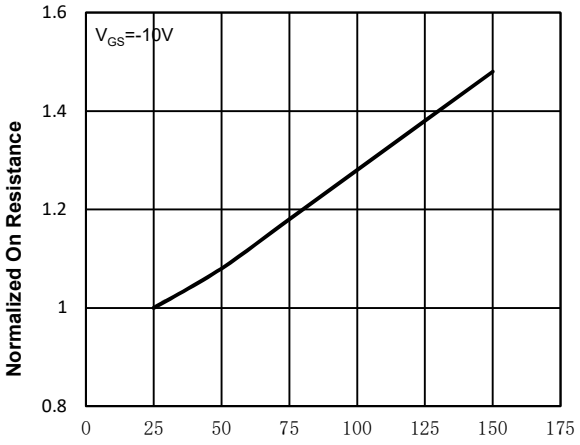
Typical Operating Characteristics



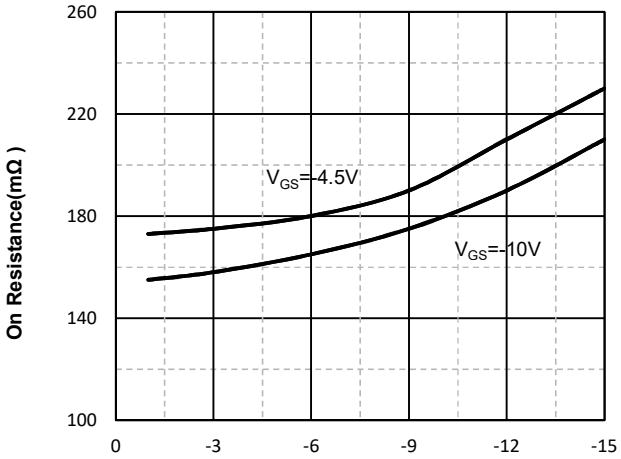
V_{DS}, Drain -Source Voltage (V)
Fig1. Typical Output Characteristics



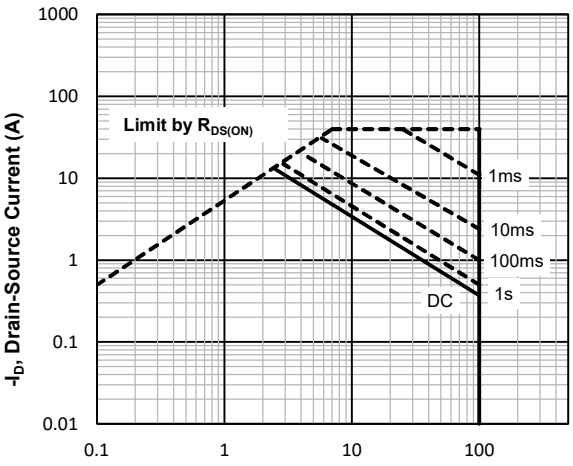
Qg -Total Gate Charge (nC)
Fig2. Typical Gate Charge Vs.Gate-Source Voltage



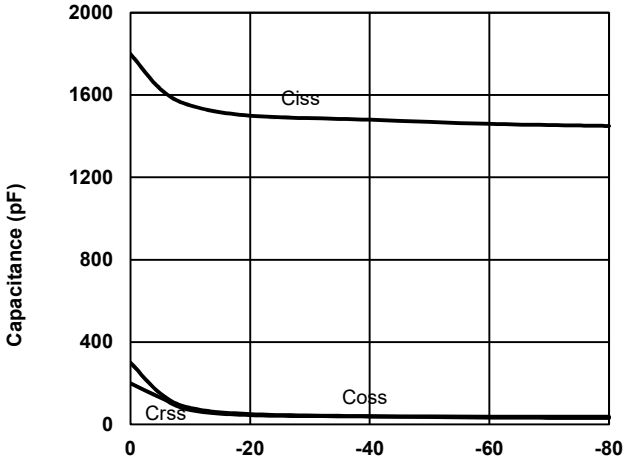
Tj - Junction Temperature (°C)
Fig3. Normalized On-Resistance Vs. Temperature



I_D, Drain-Source Current (A)
Fig4. On-Resistance Vs. Drain-Source Current

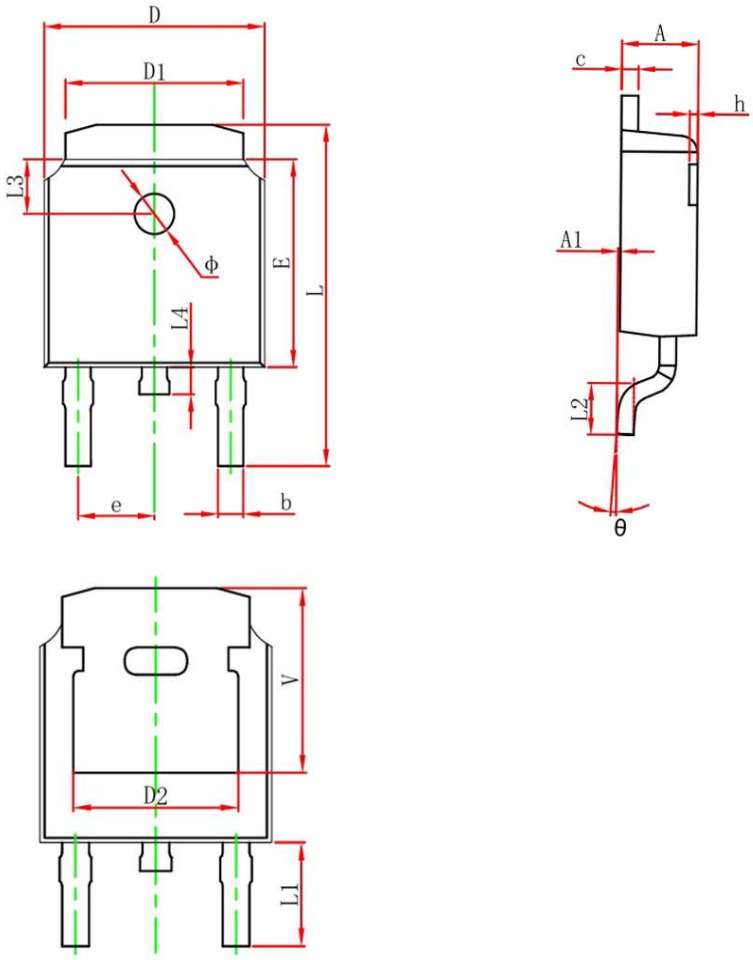


$-V_{DS}$, Drain -Source Voltage (V)
Fig5. Maximum Safe Operating Area



V_{DS} , Drain-Source Voltage (V)
Fig6 Typical Capacitance Vs.Drain-Source Voltage

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.	